

# Scheme Assessment for Implementation

[Baypark to Bayfair Link Upgrade]



17 December 2014

Ref NZ1-8640716

Approval

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0.5	1 November 2012	Incorporating learnings from PPP DBC

## Glossary of Terms

Abbreviation	Term
AEE	Assessment of Environmental Effects
AO	Approved Organisation
B2B	Baypark to Bayfair Link Upgrade Project
BCR	Benefit–Cost Ratio
CAPEX	Capital Expenditure
CBD	Central Business District
CEMP	Construction Environmental Management Plan
CVIU	Commercial Vehicles Investigation Unit
D&C	Design and Construct
DE	Design Estimate
EEM	Economic Evaluation Manual
EIR	Environmental Impact Report
EOI	Expression of Interest
EPA	Environmental Protection Agency
FYRR	First Year Rate of Return
GPS	Government Policy Statement
HCV	Heavy Commercial Vehicle
HNO	Highways and Network Operations
HPT	Historical Places Trust
IAP2	International Association for Public Participation
ILM	Investment Logic Map
IRS	Investment and Revenue Strategy
ITS	Intelligent Transport Systems
KPI	Key Performance Indicator
LLR	Lessons Learnt Review
LTMA	Land Transport Management Act
MGI	Maunganui–Girven Road Intersection
MOU	Memorandum of Understanding

Abbreviation	Term
MVKT	Million Vehicle Kilometres Travelled
NES	National Environmental Standards
NIU	National Infrastructure Unit
NLTF	National Land Transport Fund
NLTP	National Land Transport Programme
NOR	Notice of Requirement
NPC	Net Present Cost
NZCID	New Zealand Council for Infrastructure Development
NZTA (or the Agency)	The New Zealand Transport Agency
NZTS	New Zealand Transport Strategy
OPEX	Operating Expenditure
P&I	Planning and Investment
PI	Performance Indicator
PMS	Project Management Services
PoPS	Portfolio Procurement Strategy
PPFM	Planning Programming and Funding Manual
PPM	Principal Project Manager
PPP	Public Private Partnership
PT	Public Transport
PWA	Public Works Act
RAMM	Road Assessment and Maintenance Management
RFP	Request for Proposal
RLT	Regional Land Transport
RLTS	Regional Land Transport Strategy
RMA	Resource Management Act
RoNS	Road of National Significance
SAR	Scheme Assessment Report
SE	Scheme Estimate
SH(#)	State Highway (number)
SOI	Statement of Intent

Abbreviation	Term
SSC	State Services Commission
SSEMP	Site Specific Environmental Management Plan
TA	Territorial Authority
TDM	Traffic Demand Management
TOC	Total Outturn Cost
VAC	Value Assurance Committee (formerly SSRC)
VMS	Variable Messages Sign
WEBS	Wider Economic Benefits

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## 1 Executive Summary

### 1.1 Background

MGI and SH2/SH29 intersection are located on the SH2 corridor, between the Tauranga Eastern Link (TEL) and the Port of Tauranga. These intersections lie within Section One of the TEL Network Plan.

A number of investigations have been undertaken at both MGI and SH2/SH29. The MGI investigations and SH2/SH29 PFR highlighted that the intersections operate as a single intersection and any improvements need to consider both locations.

The March 2013 VAC supported only grade-separated solutions and the inclusion of the SH2/SH29 intersection at Te Maunga in the MGI Scheme Assessment, as they recognised the interdependencies between the two intersections.

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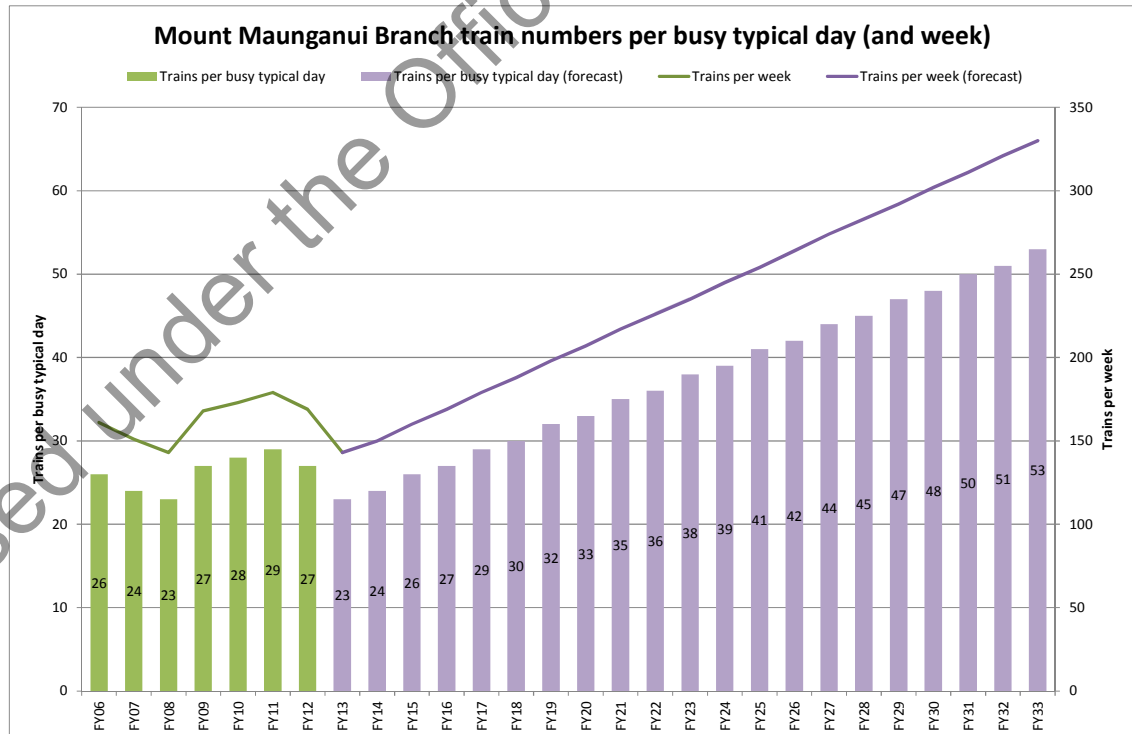
## 1.2 The Problem

The significant problems this project is seeking to address are the congestion at Bayfair constraining the TEL benefits and the competing traffic demands encouraging unsafe behaviours.

### Congestion at Bayfair will constrain the TEL Benefits

MGI currently operates at a Level of Service (LOS) F during peak traffic periods. These delays are anticipated to increase considerably as a result of traffic volumes increasing from the opening of the TEL. The TEL is currently programmed for completion by 2016. Without intervention to the intersections the performance of the MGI intersection will deteriorate further, constraining the benefits of the TEL.

The East Coast Main Trunk (ECMT) railway runs adjacent to SH2 with level crossings on Matapihi Road and SH29. Current train movements have a significant detrimental effect on the efficiency and reliability of traffic along SH2, SH29 and the local roads, while future train movements are predicted to increase by 50% in 10 years. This is shown below, as provided by KiwiRail:



As a result of the deterioration of MGI and the SH2/SH29 intersections and the flow of traffic between them (forecast ADT 51,200 on Maunganui Road in 2016), the total delay on SH2 for traffic travelling between Hewletts Road and TEL is forecast to be 5 minutes in the northbound direction during the AM peak, and 4 minutes in southbound in the PM peak.

By 2031 congestion problems at MGI are expected to increase significantly. In particular, the SH2 overall PM peak delay will increase by approximately 150% across the two hour peak period, relative to current conditions.

### **Competing traffic demands encourage unsafe behaviours**

There are a number of transport networks that all coincide at MGI and to a lesser extent the SH2/SH29 intersection at Te Maunga. All these converging networks result in a mix of users travelling in different directions and speeds, and conflicts between vulnerable users and fast or heavy vehicles and trains. This is reflected in the MGI intersection being recorded as the 118th riskiest intersection on the state highway network. The intersection has had 2 fatal and 5 serious injury crashes over the 5 year period 2007 and 2012. There is an additional fatal crash at the railway level crossing involving a train and cyclist recorded.

### **1.3 Desired Outcomes**

The desired outcomes are:

- To achieve more efficient freight supply chains
- To support long term managed growth across the Western Bay sub-region
- To produce safer travel behaviour at the Bayfair roundabout

### **1.4 Options considered**

Options were first developed by considering a corridor level solution. The preferred solution was to use the existing SH2 Maunganui corridor, for providing the primary road transport route.

Options were then developed within the preferred corridor. The various studies identified the final four large scale, grade separated options that were suitable for further detailed development, as potential solutions to the combined intersections. These were;

- Option 1 – MGI and Te Maunga SH2 to SH2 Flyovers, with Railway not relocated
- Option 2 – MGI and Te Maunga SH2 to SH2 Flyovers, with Railway relocated
- Option 3 – MGI SH2 to SH2 Flyover and Diamond Interchange at Te Maunga, with Railway relocation
- Option 3 Refinement (Option 3A) – MGI SH2 to SH2 Flyover and Diamond Interchange at Te Maunga, with Railway relocation.



## 1.5 Options Assessment and Determination of Preferred Option

The options were assessed against a range of criteria in order to identify the solution that best achieves the desired outcomes. The following 5 assessments were undertaken:

- 1) Assessment 1 – Multi Criteria Analysis against Project Outcomes
- 2) Assessment 2 – Assessment against Transport Agency Goals and Objectives
- 3) Assessment 3 – User mode comparison
- 4) Assessment 4 – Assessment against Environmental Factors
- 5) Assessment 5 – Economic and Cost Analysis

Option 3 and Option 3A provide the greatest opportunity to achieve the desired project outcomes and Transport Objectives by significantly reducing congestion and improving safety. Grade separated interchanges for the SH network and the grade separation of a busy rail corridor add significant safety advantages. In addition, these are the best options for protecting the roading network from the influences of rail movements which are planned to increase over 50% in the next 10 years.

The potential environmental effects for all options are considered to be similar and overall are relatively neutral. However it is noted that the relocation of the railway with Options 2, 3 and 3A increase the negative environmental effects compared to Option 1.

Option 3A is considered to provide the best value for money solution and provides almost exactly same level of performance as Option 3 but has a significant costing saving of \$12.9M (11%).

Therefore, considering the result of all the assessments Option 3A is recommended as the preferred option for resolving the current congestion and safety problems at MGI and meeting the strategic project objectives.

## 1.6 Description of recommended solution

The recommended solution, Option 3A includes the following key design features;

- Two free flowing lanes along SH2 (one in each direction) with median barrier
- SH 2 grade separated from the intersections at MGI and SH2/29
- Grade separation of SH29 from the ECMT railway
- At-grade auxiliary road for local traffic running parallel to SH2
- Signalised intersection at MGI
- Relocated SH29 connection to Truman Lane
- Realignment of the railway line to the existing designation west of Owens Place

### 1.7 Risks associated with the project

The key project risks that may influence the delivery of the project have been identified and mitigation measures have been developed to reduce the risks. The highest risks are:

- Construction not aligned with TEL, resulting in poor stakeholder relationships
- Opposition from tangata whenua due to the impact of the project, resulting in time delays
- Opposition from stakeholders and/or affected parties, resulting in time delays
- Opposition to level of mitigation measures provided, resulting in time delays and additional costs

### 1.8 Implementation

There have been no potential issues identified for the construction of the preferred option. Most risks are expected to be able to be reduced by way of design or consent conditions. There is strong stakeholder support for a project.

The main challenge during construction will be coordination between the project and TCC, AMP Bayfair development and KiwiRail. TCC will be upgrading their stormwater network along Matapihi Road, across MGI and along Girven Road. AMP will be expanding their site along Maunganui Road and will possibly require site construction access. KiwiRail will be concluding their rail realignment behind Owens Place and may still require site access to complete their works.

A number of consents and authorities required for the project for alteration to designations for road and rail, construction earthworks, Transpower power services relocation. Obtaining these consents has the potential to delay the start of the project.

A key part of the construction staging is to complete the rail realignment before the main roading project commences. This will enable the Transport Agency to effectively manage the programme and cashflows of the project parties reducing risk, timeframes and costs.

#### Joint Working

An opportunity for joint working has been identified with TCC to include their stormwater upgrade within the development of the preferred option.

### 1.9 Project planning (internal resources, governance)

The main state highway improvement works will be conducted under a D&C delivery model, and will be procured using the PQM (Special) supplier selection method, following a SIA stage and interactive tender process.

Specimen design services, including provision of MSQA services, will be delivered through the traditional delivery model, procured using PQM (Simple). Enabling works packages will be delivered and procured in accordance with the specialist nature of those works.

The consenting strategy is to obtain resource consents in parallel with the alteration to designation process, in order to achieve concurrent activity and enable alignment with completion of the TEL project.

The governance structure will follow a traditional model adopted by the Transport Agency to deliver D&C projects, as shown below. The project will use accepted value gates and documented policies and procedures, to manage project assurance, scope change, cost control and issues management.

### 1.10 Conclusion

This length of SH2 is a key freight route linking Eastern Bay of Plenty industries with the Port of Tauranga. The intersections on SH2 at Maunganui Rd/Girven Rd and at the intersection of SH2/SH29 create congestion and the competing travel patterns result in unsafe travel behaviour.

The desired outcome for this part of the SH 2 corridor is to provide more efficient freight supply chains, support long term managed growth and provide safer travel behaviours.

Option 3A has been identified as the best value for money option to achieve the desired outcomes. The expected estimate of Option 3A is \$102M, with a BCR of 2.8. The IRS profile for Option 3A is HHM.

### 1.11 Recommendation

It is recommended that:

- Option 3A is approved as the preferred option
- Consultation proceeds on this basis followed by lodging alterations to designation for the road and rail changes.
- The design phase proceeds immediately.

PART A – THE CASE FOR THE PROJECT

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## 2 Background

Based on the findings from the MGI PFR, the September 2010 Board resolution was to fund the I&R phase for the intersection

The MGI investigations and SH2/SH29 PFR highlighted that the intersections operate as a single intersection and any improvements need to consider both locations. The June 2012 VAC supported the increase in scope, to include the Te Maunga intersections.

The March 2013 VAC supported only grade-separated solutions and the inclusion of the SH2/SH29 intersection at Te Maunga in the MGI Scheme Assessment, as they recognised the interdependencies between the two intersections.

The GPS and National Infrastructure Plan 2011 sets a vision of an effective, efficient, safe, secure, accessible and resilient transport system that supports, and contributes, to New Zealand's economic growth and quality of life.

The Roads of National Significance (RoNS) programme was developed to support the GPS and National Infrastructure Plan. The RoNS show the government's transport investment to improve productivity and safety in key parts of the network that will support economic growth. The RoNS will support the economic growth by achieving efficient and safe movement of freight and people. Tauranga is one of the main population centres, with the Tauranga Eastern Link (TEL) as one of the seven RoNS.

The TEL is located to the east of Tauranga, providing the link from the Eastern Bay of Plenty agricultural and forestry areas to the Port of Tauranga (PoT). It is of national significance that the TEL corridor operates as efficiently as possible, enabling road and rail freight operators to transport goods to market. Import and export activities at the PoT accounted for approximately \$18–19bn (9–10%) of New Zealand's GDP in 2012<sup>1</sup>, between 50–60% of this is transported by road. The 3 main road corridors to the Port are SH29 across the Kaimai Ranges, SH2 to the south and east, and SH2 to the North. In broad terms these account for the following proportions of road freight travel<sup>2</sup>:

- 38% via SH29 across the Kaimai Ranges;
- **33% via SH2 (soon to be the TEL) to the south and east; and**
- 25% via SH2 to the north (i.e. via Katikati, Waihi)

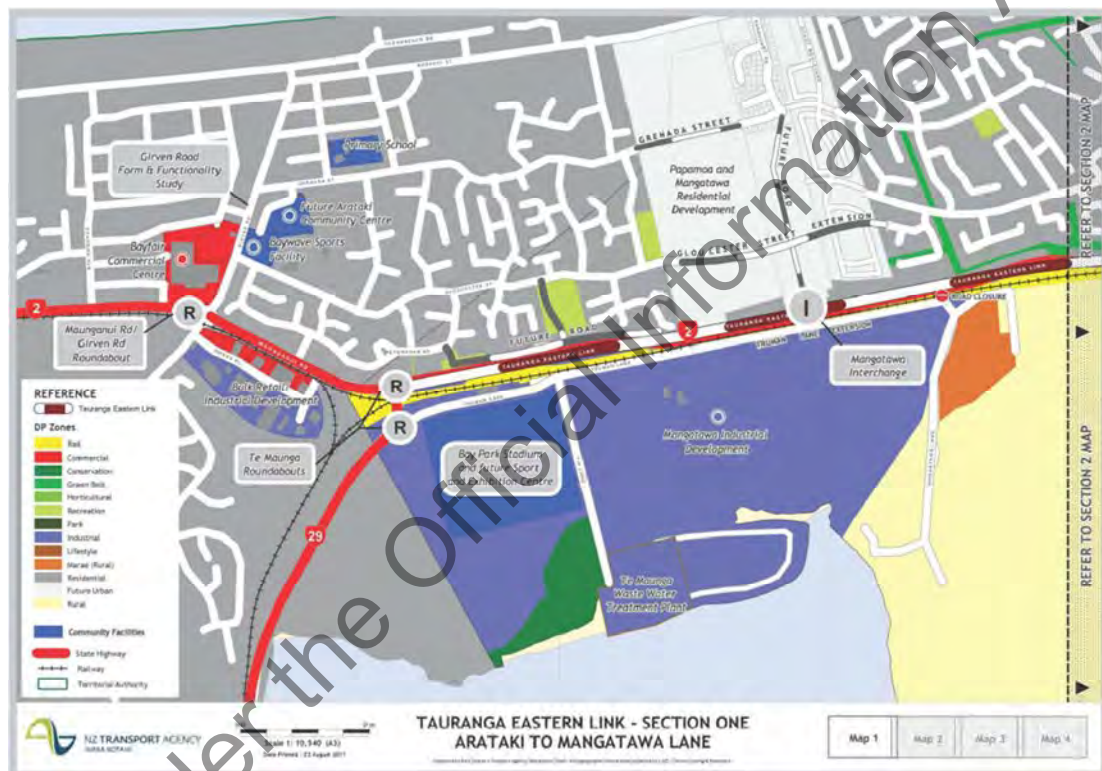
Competing with the key freight function in this corridor are sub-regional and local traffic for private vehicles accessing the city centre and surrounding areas. Once fully developed the eastern corridor will be home to upwards of 60,000 people, local industries and commercial businesses. This future development is expected to contribute to around \$8.5 billion to the subregions economy.

<sup>1</sup> Source: TEL Network Plan.

<sup>2</sup> Based on an assessment of truck travel patterns to/from the PoT from the Eroads database.

These local trips compete with freight demands at intersections along the corridor, creating congestion. The TEL Network Plan includes improvements to the SH2 network that are essential to the continued delivery of an efficient, reliable route for freight to and from the Port of Tauranga (PoT). Once the TEL is complete, the Maunganui Road/Girven Road and Te Maunga intersections will be the sole points of significant congestion remaining along the Eastern Corridor in the short-term.

MGI and SH2/SH29 intersections are located on the SH2 corridor, between the TEL and the PoT. These intersections lie within Section One of the TEL Network Plan, shown in Figure 1 below.



TEL Network Plan also highlighted safety problems. This section of SH2, from the SH2/SH29 intersection to Paengaroa, has the country's second worst rate of fatal and serious injury crashes per kilometre for state highways (KiwiRAP 2008).

## 2.1 Work Completed to Date

A number of comprehensive studies have been conducted in recent years, in relation to improvements within the study area. An overview and summary of these studies is provided below.

### 2.1.1 Girven Road/Maunganui Road Project Feasibility Report, 2008

The purpose of the study was to identify an appropriate interim intersection form that would cater for the increased traffic volumes up to 2031, as predicted in SmartGrowth.

The significant findings were;

- Increase in traffic volumes, especially from the TEL, would negatively impact on the corridor and roading network.
- Roundabout/signals, at-grade/grade separation intersection forms were tested.
- Significant interaction with the railway and Matapihi crossing require further discussion.
- By 2026 the ultimate solution would be required, based on current traffic growth projections.

The predicted increase in traffic volumes through the intersection following the opening of the TEL will have a significant negative impact on the SH2 journey times and reliability. Investigation of intersection improvement options is warranted.

September 2010 board resolution was to fund the I\$R phase for MGI.

### 2.1.2 Maunganui Road/Girven Road Intersection Improvements Scoping Report, 2011

This study evaluated a number of intersection forms against transportation, social/cultural and environmental factors and recommended that the following 4 generic forms of intersection be taken forward for more detailed investigation:

- A three lane (approach and circulatory) signalised roundabout, with no rail relocation
- A three lane hamburger roundabout arrangement (straight ahead lines through the centre)
- Two lane, grade separated, flyover over and signalised intersection below
- Two lane, grade separated, flyover over the existing roundabout

Large scale at grade and grade separated options were recommended for further investigation.

### 2.1.3 MGI Scoping Report Addendum, 2012

This study undertook further assessments on the four previously recommended options. The Addendum recommended that only flyover options are taken forward, due to issues with performance, safety and the ability deliver on NZTA's objectives with "at-grade only" options. This reinforced the findings from the PFR, in that the existing at-grade intersection has capacity issues that will increase as local development occurs. It also reported that:

- Congestion at MGI acted as a control on traffic demands at the SH2/SH29 intersection.
- In 2016 a signalised intersection is predicted to operate at LOS D in the AM and IP peak periods and LOS E in the PM peaks.
- Insufficient 'weaving' distance for traffic, between the MGI and SH2/SH29 intersections, signified that flyover options at MGI could not progress without a change in the SH2/SH29 intersection form.

Further investigations identified that only grade separated options provide a resilient long term solution. The MGI improvements need to consider their interaction with the SH2/SH29 intersection.

#### 2.1.4 SH2/SH29 Intersection Project Feasibility Report, 2012

The study identified that the current intersection generally operates with a LOS B, although the frequency of trains do cause excessive queuing. The proposed improvements to MGI and other land use changes are likely to reduce the intersection operation to LOS F, in year 2016. This translates to queues of nearly 1km and delays of over 6 minutes at peak periods. This is likely to result in traffic taking undesirable alternative routes effecting SH2 traffic.

The key finding was that the MGI and SH2/SH29 intersection operates as a single intersection, with respect to physical form and performance. Any improvements at one intersection will release constrained flows and impact on the operation of the other intersection. Therefore further option investigations should consider both intersections collectively.

The MGI and SH2/SH29 intersections operate as a single intersection and the improvements need to consider both locations. The June 2012 DMT supported the statement and increase the scope to include the Te Maunga intersection

#### 2.1.5 MGI- SH2/29 Intersection Options Report, 2012

The study considered options for both intersections. A number of options for the ultimate form for the SH2 corridor, from Mangatawa Interchange to MGI were used. The options generally considered improvements in one of the following three corridors:

- Use of rail designation south of Owens Place for a new road link
- Utilise existing SH2 corridor
- Utilise Truman Lane corridor as a parallel road to SH2

Nineteen options were defined and 4 large scale grade separated options were recommended for more detailed development, as potential solutions to the combined intersections. The remaining options were discarded due to poor performance, safety concerns and high land purchase requirements.

#### 2.1.6 MGI - SH2/SH29 Intersection Study - Scoping Report, 2013

The study investigated and compared four options for improvements to the SH2 corridor to determine the preferred options.

The study confirmed that at-grade intersections did not achieve NZTA's desired levels of service for a National Strategic (High volume) route and has a relatively short life expectancy. It also confirmed that only grade separated intersection forms at MGI and SH2/SH29 be considered in the Scheme Assessment Stage.



Three grade separated options were identified as suitable for further investigation.

The March 2013 VAC supported the decision that:

- the MGI and SH2/SH29 intersection operate as a singles intersection
- the inclusion of the SH2/SH29 Te Maunga intersection in the MGI Scheme Assessment as they recognised the interdependencies between the two intersection
- only grade-separated solutions are to be considered

Three options were confirmed for further analysis.

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### 3 Problems, Opportunities and Constraints

The significant problems this project is seeking to address are;

Congestion at the Bayfair roundabout will constrain the ability of the Tauranga Eastern Link (TEL) to deliver its economic benefits.

Poor management of competing travel demands at the Bayfair roundabout encourages unsafe travel behaviour.

Through stakeholder consultation and the Logic Investment Map (ILM) process identified the following problems, opportunities and constraints for the project.

The project site is shown below.



#### 3.1 Problems

The problems are discussed further below.

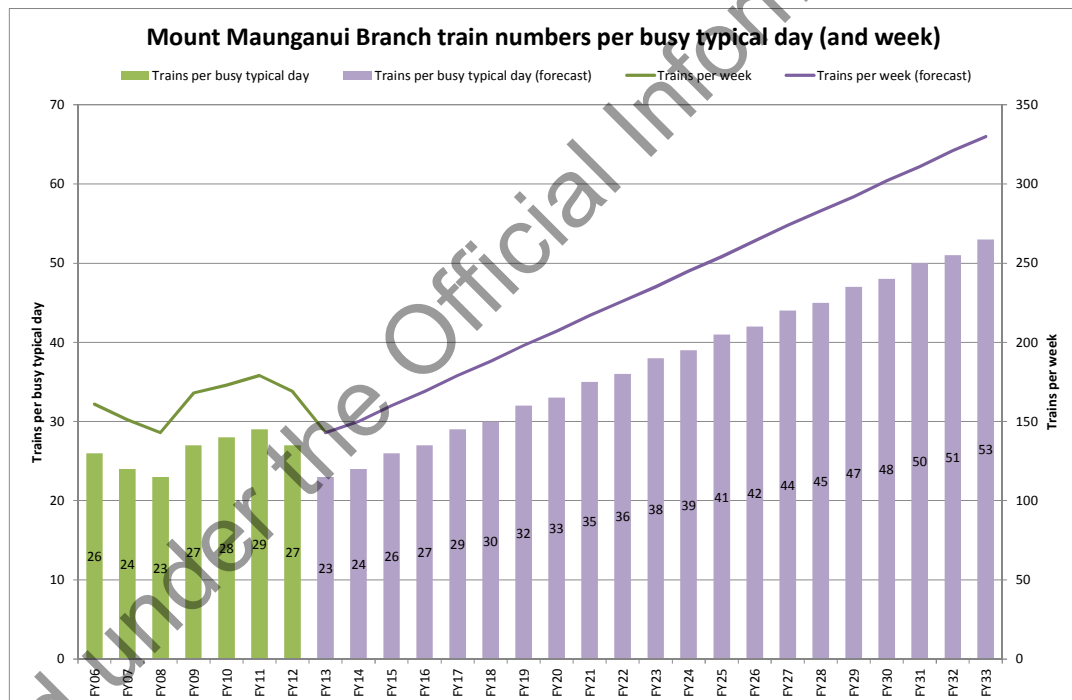
##### 3.1.1 Problem 1 - Congestion at Bayfair will constrain the TEL Benefits

MGI currently operates at a Level of Service (LOS) F during peak traffic periods. These delays are anticipated to increase considerably as a result of traffic volumes increasing from the current 30,000 vehicles per day (vpd) to a demand of over 50,000 vpd from the opening of the TEL, based on SmartGrowth predictions.

The TEL is currently programmed for completion by 2016. Without intervention to the intersections the performance of the MGI intersection will deteriorate further. Average delays at MGI in 2016 are predicted to increase by over 200% during the AM peak period and increasing by 50% in the PM peak. Increased train movements will further increase journey times and reduce reliability.

The TEL is predicted to result in 12 minutes travel time savings. Without making improvements to the MGI and SH2/SH29 intersections the 12 minutes saving on a trip to the Port of Tauranga will be reduced due to delays at the MGI and SH2/SH29 intersection.

The East Coast Main Trunk (ECMT) railway runs adjacent to SH2 with level crossings on Matapihi Road and SH29. Current train movements have a significant detrimental effect on the efficiency and reliability of traffic along SH2, SH29 and the local roads, while future train movements are predicted to increase by 50% in 10 years. This is shown below, as provided by KiwiRail:



As a result of the deterioration of MGI and the SH2/SH29 intersections and the flow of traffic between them (forecast ADT 51,200 on Maunganui Road in 2016), the total delay on SH2 for traffic travelling between Hewletts Road and TEL is forecast to be 5 minutes in the northbound direction during the AM peak, and 4 minutes in southbound in the PM peak.

By 2031 congestion problems at MGI are expected to increase significantly. In particular, the SH2 overall PM peak delay will increase by approximately 150% across the two hour peak period, relative to current conditions. The MGI delays are summarised below;

- SH2 southbound average PM peak delays will nearly double to 8 minutes.
- SH2 northbound average AM peak delays of around 5 minutes.

Journey time efficiency and reliability will deteriorate for traffic using SH2, with journey times between Hewletts Road and TEL in the PM peak expected to increase by 30% by 2031 (in both directions).

As noted in previous studies, the SH2/SH29 intersection currently performs at an acceptable level of service but requires improvements as a result of its independent relationship with MGI (refer to *SH2/SH29 Intersection Project Feasibility Report, 2012* and *MGI – SH2/SH29 Intersection Study – Scoping Report, 2013*). However, without intervention, by 2031 traffic conditions are also expected to deteriorate at this intersection with significant delays expected on the SH29 approach. Traffic approaching the intersection on SH29 is forecast to experience average delays of up to 2.5 minutes/vehicle in the two hour AM peak. The average forecast delay of 4 minutes is expected in the PM, as a result of increased volumes on SH2, particularly in northbound traffic from TEL.

### 3.1.2 Problem 2 – Competing traffic demands encourage unsafe behaviours

There are a number of transport networks that all coincide at MGI and to a lesser extent the SH2/SH29 intersection at Te Maunga. These transport networks passing through the study area include:

- SH2 and SH29 for strategic freight and car movements
- Rail link to Port of Tauranga
- Main cycle link (Tauranga City Council's Cycle Route A) between Papamoa and Tauranga CBD
- Several local roads which provide connections to key residential and retail areas, including the single access/egress to the Matapihi peninsula
- Pedestrian routes between residential, retail centres, schools and leisure sites
- Large commercial developments each side of the MGI intersection
- Regionally important sports and exhibition complex adjacent to SH2/SH29 intersection

All these converging networks result in a mix of users travelling in different directions and speeds, and conflicts between vulnerable users and fast or heavy vehicles and trains. Congestion occurring during peak periods has exacerbated these effects, leading to frustration, increased risk taking and inattention to vulnerable road users. This is reflected by the intersections poor crash record, particularly with respect to vulnerable road users such as cyclists and mobility scooter users.

This is reflected in the MGI intersection being recorded as the 118th riskiest intersection on the state highway network, with 2 fatal and 5 serious injury crashes over the 5 year period 2007 and 2012, with an additional fatal crash at the railway level crossing involving a train and cyclist.

### 3.2 Constraints

The project has a number of physical, environmental, social and economic constraints relating to;

- The TEL opening in 2015 will increase traffic volumes, affecting performance and efficiency of the existing network
- Unpredictable long term growth of the rail freight along the ECMT line will impact on the intersections performance
- The interaction between MGI and the SH2/SH29 intersections during construction, due to their close proximity to each other.
- Baypark is a regionally important facility, needing to maintain its operating ability during construction of the project

### 3.3 Opportunities

The opportunities that have been identified by the project include the ability to;

- Use the existing designated rail corridor, west of Owens Place, as a transport corridor
- Improve commuter access to Bayfair
- Improve access to public transport by relocation and rerouting of appropriate facilities
- Improve pedestrian and cycle connectivity by providing improved access to local amenities and improve the rail crossing facilities
- Improve access to Baypark stadium and arena combined with reducing impacts of events on the state highway users
- Utilise the existing local networks
- Support Tauranga City Council's intentions to address local flooding issues by aiding in the delivery of the solution, possibly through procurement opportunities and cost savings

### 3.4 Issues

The issues that have been identified for the project include;

#### **Issue 1: The project needs to align with TTS and Tauranga NOP**

- The Tauranga Transport Strategy (TTS) is still in draft form
- Tauranga Network Operating Plan (NOP) is being developed and focuses on network operating gaps for which a range of potential solutions will need to be considered
- Upgrading Hewletts Road capacity would also requiring upgrading Maunganui Road capacity south of Hewletts Flyover before the impacts are seen at MGI.

### Issue 2: Land use details not confirmed

- Timing of the Bayfair expansion is uncertain
- Ad-hoc events at Baypark/ASB Arena
- Unplanned growth along Matapihi peninsula (outside of SmartGrowth predictions)

### Issue 3: Impact of proposals linked with the TEL Network Plan

Status and impact of proposals not yet determined in detail, specifically:

- Girven Road 4-laning – TCC currently only proposing two laning, however this is not expected to significantly alter traffic demands at MGI
- Grenada Street parallel east-west link – improves ability to retain local trips on local roads and reduces demands on Girven Rd approach to MGI
- Gloucester Street extension – improves ability to retain local trips on local roads and reduces demands on Girven Rd approach to MGI
- Sandhurst link/Mangatawa interchange – allows Papamoa local traffic to join/leave SH2 immediately south of SH2/SH29 intersection (this is currently planned to be constructed in 2014)
- Eversham Drive extension is not currently being considered by TCC
- Truman Lane connection to Mangatawa Interchange – provides an alternative route to bypass SH2/SH29 thereby reducing some demand through the SH2/SH29 intersection
- Bayfair bus interchange proposal – timing is uncertain but is being planned for construction in the near future by TCC
- Bayfair to Papamoa Pedestrian and Cycle Route – upgrades planned by TCC
- Direct property access onto SH2 is not appropriate for Nationally Strategic State Highway

### Issue 4: Omanu Golf Course

- The perception that the existing flooding and stream quality issues could be exacerbated by MGI
- Relocation of the rail line through area of golf course that is currently in use by the Omanu Golf Club

### Issue 5: TCC stormwater upgrade

The timing and extent of the stormwater upgrade to address local flooding is not certain. The upgrade works go through the project site and will need to be coordinated.

## 4 Outcomes

The project outcomes are to reduce congestion at MGI and provide an efficient and safe freight route to the Port of Tauranga. This includes improving the Level of Service at MGI from the current level F to D to align with the TTS objectives.

### 4.1 Strategic Outcomes

The strategic objectives of the Tauranga Eastern Link are set out in the TEL network plan as follows:

- Support managed growth in the western Bay of Plenty Eastern Corridor
- Enhance inter- and intra-regional and national economic growth and productivity;
- Improve efficiency and contribute to economic development through improved travel time reliability
- Provide a more direct and efficient route from across the regional to Tauranga, and in particular the Port of Tauranga
- Provide a safer route between Tauranga and Paengaroa, including diverting heavy vehicles away from Te Puke's Town Centre.

### 4.2 Project Outcomes

The project objectives and desired outcomes were developed to support the TEL and TTS. A workshop was held with the project team to discuss and agree the objectives. These objectives were confirmed at the commencement of the investigation with the NZTA's Transport Planning and Projects Team. The project objectives are as follows;

- Improved access for inter-regional road freight to the Port of Tauranga whilst maintaining rail services;
- Improved safety for all road users;
- Reduce congestion, vehicle journey times and provide efficient traffic flows along a major transport link into Tauranga from the east;
- Operation of an optimised "One Network" plan that balances the needs of complementary and competing travel demands across the area;
- Improved access for public transport users; and
- Improved access for tourism through and within Tauranga.

**To deliver on these objectives, the desired outcomes for the project are;**

- **Provide greater priority to inter-regional road freight traffic associated with the commerce and industrial areas of Tauranga over other road users along this section of SH2;**
- **Provide level of service ("LOS") D or better on strategic roads and LOS E on non-strategic roads in the '2031' model year;**

- Improve the reliability of journey times for all motorised users along this section of SH2 and the link to SH29; and
- Alignment with RLTS strategy and the Bay of Plenty Regional Council Public Transport policy in the design for the intersection for pedestrians and cyclists and public transport users in this area, consistent with the “One Network” optimisation plan.

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## 5 Stakeholders

All stakeholders support the need to provide a solution to address the congestion and safety issues at the intersections.

There are opportunities to address some of the local issues with the construction of the project which include localised flooding and safer connectivity.

Public consultation highlighted the most important things to consider were providing a long-term, efficient and safe solution when considering a preferred option.

### 5.1 Consultation and Communication Approach

This section details the consultation and communication approach used during the study and scheme assessment process. The section advises the;

- Identification of key stakeholders
- Process used to identify, consult and communicate with each of these stakeholders

The consultation objectives were developed as follows:

- To make available opportunities for stakeholders and the community to provide feedback and identify any key issues and attitudes in relation to the project and its outcomes
- To receive, consider and respond to any feedback received from stakeholders and/or the community with an open mind and to document responses to any feedback

#### 5.1.1 Identification of Key Stakeholders

A stakeholder mapping workshop was undertaken in January 2011 to identify the key stakeholder for the project. The following key stakeholders were identified as groups that may be affected by or interested in the Maunganui–Girven Road and Te Maunga Intersections Improvements project:

- Tauranga City Council
- Bay of Plenty Regional Council
- KiwiRail
- Heavy Haulage and Road Transport Association
- Ngaiterangi iwi, Ngai Tukairangi hapu, Ngati Tapu hapu, Nga Potiki hapu, Ngati Hei hapu
- Owens Place businesses, retail complex and rail leases
- AMP Property (Bayfair Shopping centre)
- Baypark Stadium and ASB Arena
- Tauranga Airport Authority
- Omanu Golf Course
- Cycle Action Tauranga/Cycling Advocates

- Tauranga Western Bay of Plenty Motorcycle Group
- Utility providers (PowerCo, Telecom, Vodafone, Vector, TelstraClear)
- Residents and affected land owners and occupiers include those located along Maunganui Road, Liftan Place, Matapihi and Girven Roads. These parties may be affected by access restrictions and land-take.

## 5.1.2 Consultation and communication methods and processes

The following table outlines the consultation methods, their purpose, their target audience and stages of the project were used. Some of the methods below are also implemented for communications purposes.

Method and Purpose	Audience	Stage(s)
<b>Project newsletter</b> Develop and distribute a project newsletter informing stakeholders of project information and key dates e.g. open days	Key stakeholders and the wider community.	Distributed at key stages of the project
<b>Public open days</b> Presentation of key information regarding the project, by the project team. The purpose is for key stakeholders and the community to gain a better understanding about the project and for the project team to understand their attitudes, issues and inputs.	Key Stakeholders and the wider community	Preliminary Option Selection (March 2011) and the Option Selection (April 2013) and Preferred Option (planned May 2014)
<b>Letters, meetings for affected land owners</b> Letters and meetings to discuss the project needs and detail of the solutions and their effects.	Identified key stakeholders, landowners and occupiers.	Throughout project
<b>One-on-One Hui</b> One-on-One hui with Nga Potiki, Ngai Tukairangi, Ngati Tapu and Ngati Hei to gain their needs, behaviours and attitudes.	Hapu	Throughout project
<b>Press releases by NZTA</b> Press releases will be strategically employed at key stages of the project. This will inform the community of important dates, opportunities for input into the project outcomes and project progress/milestones.	Stakeholders, affected landowners, tangata whenua and wider community	Released at key stages of the project
<b>Internet sites</b> Internet sites will be made available (e.g. www.nzta.govt.nz) for the public to communicate information, progress and key dates of the project.	All stakeholders and wider community	Throughout project
<b>VMS signage and public notices</b> Public notices and display signage to communicate open days	VMS audience is the passing motorists. Public notices audience is all householders in the Tauranga urban area.	Prior to open days
<b>Workshops</b> To discuss options, issues and risks	Key stakeholders	Throughout the project

## 5.2 Professional Engagement Process

The development of the scheme assessment report has involved key national and regional NZTA staff including the technical specialist for structures, geometrics, stormwater, noise and vibration, environment and urban design and transportation teams.

The risk workshop undertaken for the project will include key operators and maintainers including KiwiRail, Tauranga City Council and regional NZTA staff. The project control group monthly meetings have involved Tauranga City Council and KiwiRail.

The project development will include engagement of the Bay of Plenty Regional Council for agreement of the consenting strategies and Tauranga City Council regarding property, road, stormwater, land divisions and the rail corridor.

## 5.3 Stakeholder Views

This section details the views of the stakeholders identified above. Their views have been incorporated into the option development. Further information on the consultation undertaken can be found in Appendix B, Consultation Report 2011, 2013 and 2014.

### **Ngai Tukairangi hapu and Ngati Tapu hapu**

A summary of their views are listed below. Further detail of the following views can be found in Appendix B Cultural Impact Assessment 2013, prepared by iwi and hapu. They have been asked for an addendum to their CIA to comment on the preferred option. At the time of going to print this had not been received.

- *The single most significant issue is the impact the project will have on our way of life..... The flyover is severe and piercing, and this emotional, physiological and social impact will visually and physically be impaling*
- Increased pressure for urbanisation in Matapihi will result and this is opposed. The visual effect of the MGI flyover needs to be designed to fit in with the natural character of the surroundings as far as practicable.
- Increased noise from increased traffic volumes is likely to impact upon the local community, especially in Matapihi. Planted buffers are suggested for discussion.
- Discussion on potential effects on community health from possible air pollution from the project.
- Stormwater effects are mitigated by riparian planting along waterways relating to the project.
- That the pedestrian crossings are constructed in a way that is safe for both pedestrians and motorists and that the existing underpass is removed.
- The Matapihi Community is uncomfortable with choosing an option that has the potential to have people removed from their homes.

### Nga Potiki

A summary of their views are listed below. Further detail of the following views can be found in Appendix B Cultural Impact Assessment 2013, prepared by iwi and hapu.

- Concern is expressed over the loss of cultural heritage is not only about the loss of individual sites, it is also about the degradation of cultural landscapes and seascapes, including the links between heritage places and the loss of knowledge and traditional history.
- The unsightly structures definitely have a visual impact and should try and blend into the landscape.
- Protocols between the NZTA and Nga Potiki are expected for the appropriate management of earthworks phase especially the potential for the discovery of taonga.
- Te Tahuna o Rangataua is situated near the proposed construction of the Te Maunga/SH 29, therefore serious concerns regarding stormwater runoff into the harbour.
- An on-going effective liaison and consultation process by way of an Advisory Forum between the parties is recommended.
- Nga Potiki are not at this point able to provide their views on the three options. Prior to the tangata whenua meeting held at the ASB arena Option 3 was the preferred. However, because the Tauranga Eastern link construction of the Mangatawa Interchange is also in train there will be an increase in traffic movements on Truman Lane. It is still the view of Nga Potiki that whatever option is preferred there are real concerns about the safety of our kiamatua and school children with any of the options.

Nga Potiki is also providing an addendum to the CIA to consider the preferred option. A draft copy had been received at the time of print and the following was evident but not confirmed. Nga Potiki recommendations in relation to the proposed interchange include:

- Fuller consideration of an at grade interchange at Baypark – the 15–20 year life of an intersection should not be dismissed and the option of lowering the railway line should be fully investigated
- Dedicated pedestrian and cycling access along Truman Lane across the interchanges with cultural artistic features
- For any proposal move the interchange as far west as possible (i.e. to the same alignment as the discarded at-grade Option B – signalised roundabout) and include wood carving attachments, gateway features, eco-sourcing of all plants where possible
- Any surplus lands should be returned to Nga Potiki and land for cycleways or walking paths should also be transferred to Nga Potiki
- Any bridged option has major impacts on Nga Potiki that need to be addressed including the inclusion of an off-ramp from the overpass to Truman Lane
- Meaningful participation in the project's future stages
- Separation of industrial and marae traffic at the western end of Truman Lane

- Valuation of all Nga Potiki lands before and after the interchange is constructed to ascertain the economic impacts and NZTA to restore any lost value

### **Tauranga City Council (stormwater, roading, venues and reserves staff)**

The Tauranga City Council (TCC) is in agreement with the key problems of congestion and safety, the project is trying to address. TCC support the project in developing solutions to relieve congestion at MGI and improve the general safety of the local road and pedestrian/cycle network. This is particularly with regard to the railway pedestrian crossing on Matapihi Road and pedestrian access to Baypark.

Consultation with TCC was undertaken regarding the stormwater concept design for the project. TCC highlighted the existing flooding issues that surround the project area (in the Arataki residential zone and the AMP shopping centre which they are trying to address. There is an opportunity to work collaboratively to develop an integrated solution with the roading improvements.

The Baypark TCC venue is a significant sub-regional sport and convention centre which at event times generates significant traffic flows. Discussions have concentrated on the final design of the exit points to the carpark on the state highway 29

The Reserves Department of Council have been involved in the consideration of the future safe use of the public walkway from the Matapihi Road to the Bayfair Reserve and the final design aspects of the rail relocation across the golf course.

### **KiwiRail**

KiwiRail have provided their approval in principle to the project. KiwiRail and NZTA continue to hold discussions on the agreement of services relocations, property use and disposal, final design agreement, construction costs and standards, phasing and implementation.

The project team has, and will continue to engage with KiwiRail as a major key stakeholder to discuss and work through the above issues raised by KiwiRail throughout the project.

### **Heavy Haulage and Road Transport Association**

Road Transport Authority (RTA) and Heavy Haulage (HH) representatives have stated that they would prefer an option that removes the railway impact on SH traffic.

RTA and HH representatives also reported that consideration for over height/oversize loads must be taken into account in the design of the option provided – i.e. barrier design and alternative routes on side roads. The option provided must also be built to HPMV standards.

### **AMP Property (Bayfair Shopping centre)**

AMP are in the process of developing a Master Plan to expand the Bayfair shopping centre to the scale provided for in the latest review of the City Plan. The expansion is generally to the north and west of the existing site. A clear, safe and efficient access to their site is important to the operation of the facility.

They are interested in any changes to access arrangements that will affect their traffic movements during construction and in the final solution and also the visual effect of the proposed flyovers on their activities.

The expansion of Bayfair requires an upgrade to their stormwater system. There is an opportunity to work collaboratively to develop an integrated solution with the roading and TCC improvements.

#### Owens Place businesses

Owens Place businesses reported that there are currently traffic congestion issues at the Owens Place/ Matapihi intersection. Business owners identified that a signalised intersection and signalised pedestrian crossing would be preferred at the Owens Place/ Matapihi intersection.

Business owners commented that the existing railway line should be relocated to alleviate the existing effects of rail movements on the intersection at Maunganui/Girven Road. There is concern that the signalised intersection under the flyover could create queues back to Owens Place and increase the current congestion.

Businesses in the north of Owens Place have land leased from KiwiRail. If the use of this land was lost to the project, the project team were advised that for some operations this could have a severe impact on the operation of some businesses.

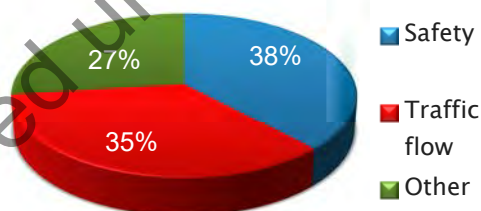
#### Omanu Golf Club

The Omanu Golf Club acknowledges the existing railway designation on their course and that the land in the designation is owned by the Crown. The consultation to date has explored various re-arrangements of one fairway and a tall screen for protection and safety of train drivers. The Omanu Golf Club would like to have supplementary planting along the screen fence.

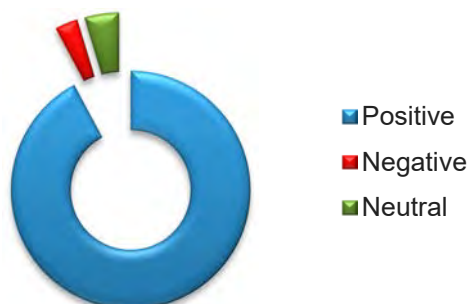
#### Public (local community and road users)

An Open Day held in 2011 requested feedback from the community about their concerns with the current MGI intersection. The Open Day was attended by 146 people who expressed significant support in a solution to the severe congestion problems. Written feedback on the project was received from 77 people. Their feedback included;

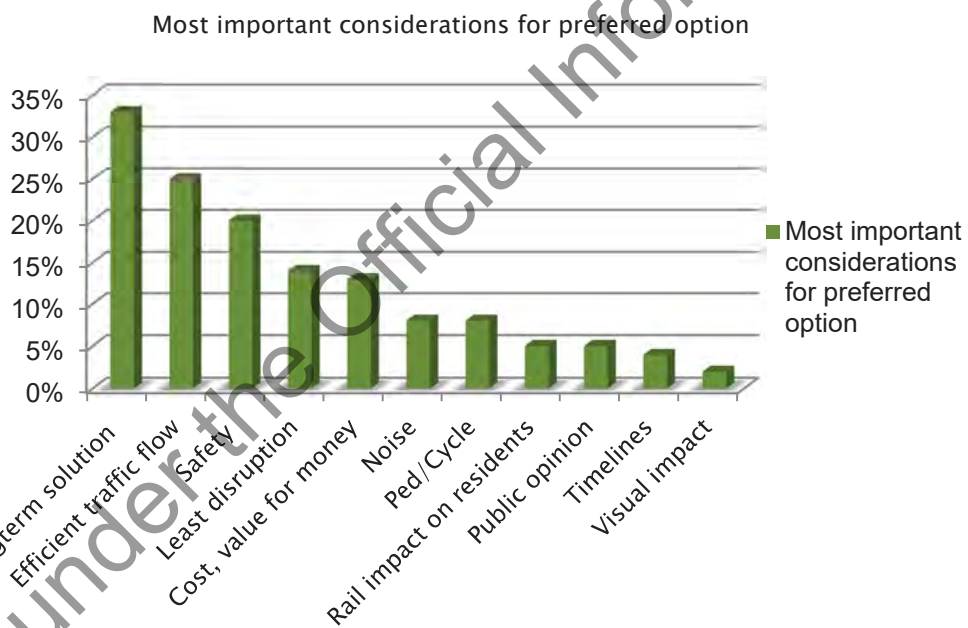
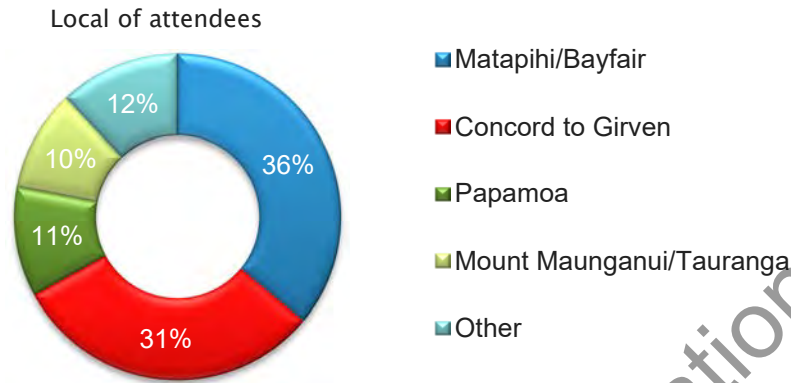
Most important issue



How do you feel about the project



The public Open Day held in April 2013 which was attended by at least 365 people. From the 106 respondents who commented on the project, the following key themes were identified;



The public Open Day (2 sessions) held on 15<sup>th</sup> July 2014 were attended by at least 420 people. There were only 26 written responses. Of those few respondents 65% had positive responses to the new layout. Another 11% have concerns about the continued lack of alternative local road access out of the Matapihi suburb. Another 11% expressed concern for the loss of house value. Eight percent questioned the cycle route from Owens Place/Matapihi Road through the MGI intersection.

## 6 Alternative and Option Assessment

Options were first developed by considering a corridor level solution. Options were then developed within the preferred corridor. Each option of the four options developed was then assessed on;

- on their ability to deliver on the project objectives and NZTA Goals and Objectives
- against a range of potential environmental factors including noise and vibration and visual and social.
- on the economic benefit cost ratios and capital costs.

### 6.1 Alternatives Analysed

A number of alternative intervention strategies have been considered and will be developed further through the Tauranga Transportation Strategy. The alternatives have considered:

- land use and transport planning through the SmartGrowth philosophy
- managing traffic demand through increasing PT share and increasing walking and cycling trips
- optimising the existing road network through a One Network approach
- investing in road infrastructure

The strategies and outcomes are explained further in Appendix C.

#### 6.1.1 Corridor Options

The MGI- SH2/SH29 Intersection Options Report identified and assessed a number of possible corridors for the ultimate form of SH2, from Mangatawa Interchange to Hewletts Road flyover. The options generally considered improvements in one of the following three corridors, as shown below:

- Matapihi corridor – use of rail designation south of Owens Place for a new road link
- Maunganui corridor – utilise existing SH2 corridor
- Truman Corridor – utilise Truman Lane corridor as a parallel road to SH2





The corridor assessment indicated that all the options had engineering and planning challenges. The challenges associated with retaining the use of the SH2 corridor, along Maunganui Road, were less substantial than relocating the road to an alternative corridor.

It was therefore recommended that the existing SH2 Maunganui corridor be used for providing the primary road transport route.

#### 6.1.2 Options within the corridor

The form of the existing SH2 corridor was assessed in the SH2 MGI – SH2/SH29 Intersection Study Scoping Report. This study reviewed the options recommended from previous investigations and confirmed that at-grade intersection options did not provide the long-term capacity and desired levels of services for a National Strategic route. The options were also discarded due to poor performance, safety concerns due to the short distance between the interchanges (800m) and high land purchase requirements.

The study identified three large scale, grade separated options that were suitable for further detailed development, as potential solutions to the combined intersections.

**Option 1 – MGI and Te Maunga SH2 to SH2 Flyovers, with Railway not relocated**

This option involved grade separating SH2 traffic from local traffic by introducing two-lane flyovers on SH2 at both the MGI and SH2/29 intersections, as shown below. The grade separation will reduce the conflicts between state highway and local turning traffic, and seek to improve the journey time level of service for SH2 traffic, as well as the safety of all users.

The combination of the level of demand along SH2 and the short distance between the MGI and SH2/29 intersections provides inadequate ability for traffic to weave safely and efficiently between the intersections. Therefore, in Option 1 the SH2 through traffic is segregated from local traffic for the entire length between the MGI and SH2/29 intersections through the use of median and side barriers.



Key elements of Option 1 are included below:

Cost

- The total expected estimate of cost for this option is \$75.6M

Benefits

- Achieves efficient, safe access for SH2 to PoT
- Provides at-grade auxiliary roads for local traffic removing interaction with SH2
- The total expected economic benefits (net present value) for this option is \$205.9M

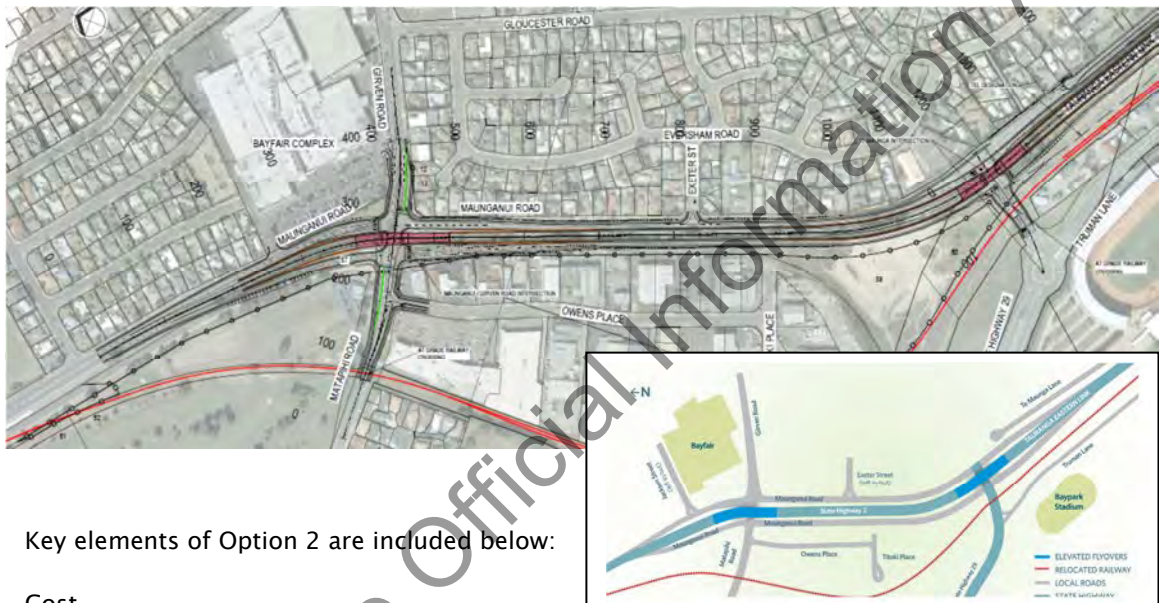
Issues

- Existing state highway road corridor constraints necessitate removal of over 50 properties and two community buildings
- Close proximity of the rail negatively impacts the journey time reliability and safety of the intersections and SH29
- Requires land from Bayfair
- Noise and vibration issues to adjacent properties on the north side of SH2
- Pedestrian and cycle safety at Matapihi Road crossing is not improved.

## Option 2 – MGI and Te Maunga SH2 to SH2 Flyovers, with Railway relocated

Option 2 has a similar road layout to Option 1. It includes the grade separation of the SH2 intersections at MGI and SH2/29 with two-lane flyovers for SH2 traffic, the conversion of the existing at-grade roundabouts to traffic signals, and the provision of segregated auxiliary lanes between the two intersections for local traffic.

Option 2 reduces the disruption caused by level crossing operations on the delays experienced by traffic approaching the SH2 corridor, especially on Matapihi Road. Similarly it looks to provide greater route security for future road and rail operations. It also sets out to significantly reduce the safety implications at the level crossings for all road users.



Key elements of Option 2 are included below:

### Cost

- The total expected estimate of cost for this option is \$81.4M

### Benefits

- Achieves efficient, safe access for SH2 to PoT
- Improves journey time reliability from the relocation of the Railway line
- Improves efficiency of freight and state highway traffic along the corridor by separation of SH2 from local traffic
- Provides at-grade auxiliary roads for local traffic removing interaction with SH2
- Reduces the impact of the uncertain rail growth on the operation of the intersections
- Improves pedestrian and cycle safety at Matapihi crossing through increasing separation
- The total expected economic benefits (net present value) for this option is \$224.3M

### Issues

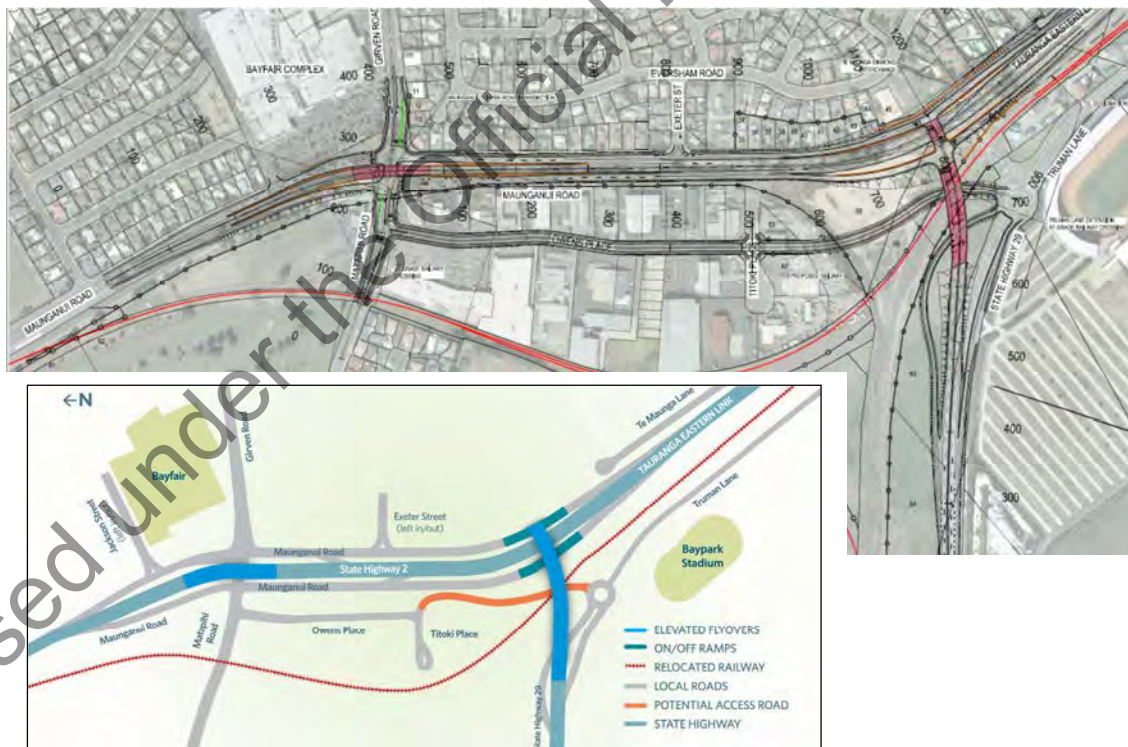
- Gain agreement with KiwiRail to relocate the Railway line and extent of mitigation required
- Attitudes and expectations of addressing flooding issues on the Omanu Golf course
- SH29 level crossing remains resulting in journey time reliability and safety concerns

**Option 3 – MGI SH2 to SH2 Flyover and Diamond Interchange at Te Maunga, with Railway relocation**

Option 3 improves journey time efficiencies and road safety through the design layout of SH2 and the use of Owens Place and Truman Lane to improve local road connectivity and cycle access. Option 3 importantly seeks to support long term local growth beyond 2031, and plan for future use of the state highway network serving the wider Tauranga area. Key longer term uncertainties and pressures are reflected in the design of Option 3 to cater for potential rail operations beyond 2023, enable flexibility in the future use and classification of SH29, and protect the status of SH2 as a National Strategic Route.

Option 3 comprises of widening SH2 and the grade separation of the MGI and SH2/29 intersections. In particular, at MGI, SH2 will be a 2-lane flyover over and an at-grade signalised intersection with Girven Road and Matapihi. SH2 will continue southward at-grade level to the SH2/SH29 intersection, where the local and SH29 movements will take place via an above-grade intersection over the SH2 carriageway (noting that SH2 will be 4 lanes at this point).

This option is expected to require the purchase of 10 residential properties along SH2, between Exeter St and the SH2/SH29 intersection, as their access would be blocked by the ramp to the SH29 bridge over SH2.



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Key elements of Option 3 are included below:

### Cost

- The total expected estimate of cost for this option is \$114.9M

### Benefits

- Achieves efficient, safe access for SH2 to PoT
- Provides at-grade auxiliary roads for local traffic removing interaction with SH2
- Reduces the impact of the uncertain rail growth on the operation of the intersections
- Improves efficiency of freight and state highway traffic along the corridor by grade separation of both intersections
- Improves connectivity for pedestrians, cyclist and local traffic to the local amenities and facilities e.g. Owens Place and Baypark
- The total expected economic benefits (net present value) for this option is \$248.9M

### Issues

- Gain agreement with KiwiRail to relocate the Railway line and extent of mitigation required
- Attitudes and expectations of addressing flooding issues on the Omanu Golf course
- Right turns at properties fronting Maunganui Rd prevented. U-turns required at the interchanges.

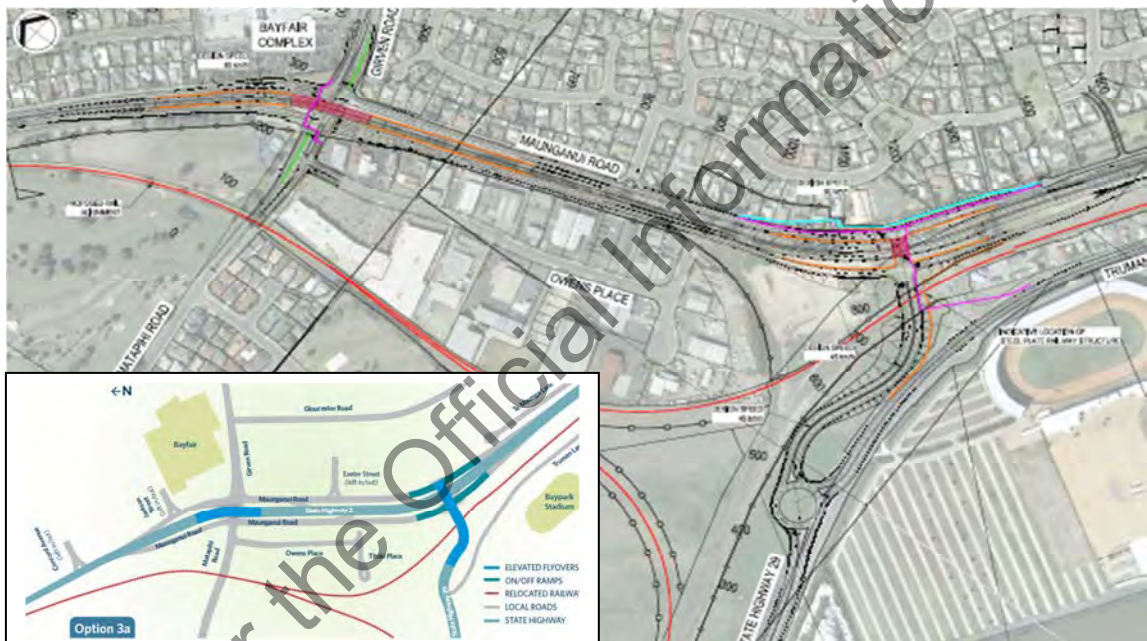
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### Option 3 Refinement (3A) – MGI SH2 to SH2 and Te Maunga SH2 to SH2 and SH2 to SH29 Flyovers with Railway relocation

Option 3 was assessed and deemed to be the best option to deliver the project outcomes and address the problems identified along the corridor. The refinement of this option was considered with the aim to reduce costs and maintain the benefits developed.

Option 3A uses the same layout as Option 3 for SH2 at MGI and Te Maunga intersections. In addition a new roundabout is provided on SH29 to replace the current connection to Truman Lane and SH29 is realigned and raised to pass over the railway and SH2.

This option is also expected to require the purchase of 10 residential properties along SH2, between Exeter St and the SH2/SH29 intersection, as their access would be blocked by the ramp to the SH29 bridge over SH2.



Key elements of Option 3A are included below:

#### Cost

- The total expected estimate of cost for this option is \$101.8M

#### Benefits

- Achieves efficient, safe access for SH2 to PoT
- Provides at-grade auxiliary roads for local traffic removing interaction with SH2
- Reduces the impact of the uncertain rail growth on the operation of the intersections
- Improves efficiency of freight and state highway traffic along the corridor by grade separation of both intersections
- Improves connectivity for pedestrians, cyclist and local traffic to the local amenities and facilities e.g. Owens Place and Baypark

- The total expected economic benefits (net present value) for this option is \$252.2M

### Issues

- Gain agreement to relocate the Railway line and address mitigation for the adjacent land owners
- Attitudes and expectations of addressing flooding issues on the Omanu Golf course.
- Right turns at properties fronting Maunganui Rd prevented. U-turns required at the interchanges.

## 6.2 Options Analysis

The options were analysed against a range of criteria in order to identify the best outcome that resolves the problems with this length of state highway network and provides a value for money solution. Overall 5 different assessments were required to determine the optimum solution.

- Assessment 1 – Multi Criteria Analysis against Project Outcomes
- Assessment 2 – Assessment against Transport Agency Goals and Objectives
- Assessment 3 – User mode comparison
- Assessment 4 – Assessment against Environmental Factors
- Assessment 5 – Economic and Cost Analysis

The similarity of some of the schemes required the Project Team to develop evaluation criteria beyond the standard Multi Criteria analysis to clearly differentiate the benefits of one option over another. Detailed commentary of the analysis work can be found in Appendix C, MGI – SH2/29 Intersection Options Assessment report. A high level summary of each assessment is presented in sections 6.2.1– 6.2.5.

### 6.2.1 Assessment 1: Multi Criteria Analysis against Project Outcomes

For this assessment the project team tested each of the shortlisted options against the project outcomes as shown in the following table. The scoring system is provided in the footnote<sup>3</sup>.

**Table 6.2.1.1: Assessment against Project Outcomes**

Outcomes	Option 1	Option 2	Option 3	Option 3A
Provide greater priority to inter-regional road freight traffic associated with the commerce and industrial areas of Tauranga over other road users along this section of SH2.	5	5	5	5
Provide level of service (LOS) D or better on strategic roads and LOS E on non-strategic roads in the '2031' model year.	4.5	4.5	4.5	4.5
Improve the reliability of journey times for all motorised road users, along this section of SH2 and the link to SH29.	4	4	4.5	4.5
Alignment with RLTS strategy and the Bay of Plenty Regional Council Public Transport policy in the design for the intersection for pedestrians and cyclists and public transport users in this area, consistent with the "One Network" optimisation plan.	4	4	4.5	4

From the MCA assessment it was found that all options are expected to perform equally well against the project objectives and would deliver the desired outcomes. There was very little to differentiate the options from this first assessment.

Therefore a further assessment was developed based upon testing each option against the Transport Agencies Goals and Objectives in order to identify differentiators between the options.

<sup>3</sup> Scoring definitions

Moderate to Significant Positive	3.6 - 5.0
Minor/ Similar to Existing	2.5 - 3.5
Moderate to Significant Negative	1.0 - 2.4



## 6.2.2 Assessment 2 against Transport Agency Goals and Objectives

The assessment against the Transport Agency Goals and Objectives relate to achieving outcomes on network efficiency and reliability, road safety, accessibility, environmental impacts, value for money and supporting economic growth and development.

A summary of how each option performs against the goals and objectives is shown below.

	Option 1	Option 2	Option 3	Option 3A	Summary
<b>Integrate one effective and resilient network for customers</b>					
1. Integrate land uses and transport networks to shape demand at national, regional and local levels.	●	●	●	●	Long term growth of the SH2 and SH29 corridors and rail freight sees the greatest support with Option 3 and 3A.
2. Integrate national and local transport networks to support strategic connections and travel choice.	●	●	●	●	Improved PT is a key benefit supported in all options, with additional support to the road and rail hierarchy shown in Option 3 and 3A.
3. Improve freight supply chain efficiency.	●	●	●	●	Removal of SH29 level crossing with Option 3 and 3A improves the freight supply chain efficiency. It also offers greater resilience in terms of the road and rail networks to cater future demands, and flexibility for the long term.
<b>Shape smart efficient, safe &amp; responsible transport choices</b>					
4. Implement the Safe System approach to create a forgiving land transport system that accommodates human error and vulnerability.	●	●	●	●	Safety benefits to all modes as a result of infrastructure changes and reduction in levels of conflicts between users. Removal of SH29 level crossing removes high safety risk to all modes with Option 3 and 3A.
5. Incentivise and shape safe and efficient travel choices using a customer focused approach.	●	●	●	●	Isolation of road and rail modes in Option 3 provides improved safety and efficiency for all customers. Improved peak journey times and reliability in all options, though greatest savings in Option 3.
6. Reduce costs for transport users through better regulation and willing compliance.	●	●	●	●	All options cater for HPMVs, although may be difficult to manage/enforce speed of through traffic.

	Option 1	Option 2	Option 3	Option 3A	Summary
<b>Deliver efficient, safe and responsible highway solutions for customers</b>					
7. Greater resilience of the state highway network.	●	●	●	●	SH2 sees greater resilience in all options. Options 3 and 3A offer greater resilience and protection of the state highway network against long term uncertainties in growth and future rail operations. Option 3 has a slight additional benefit for SH29 traffic, with some segregation of state highway and local road traffic via Owens Place.
8. Deliver consistent levels of customer service that meet current expectations and anticipate future demand.	-	●	●	●	Options 2, 3 and 3A all benefit from relocating the rail away from SH2 at MGI and therefore provide long term future resilience over increased rail operations. Options 3 and 3A further improve this benefit by grade separating road from the railway current level crossing at SH29.
9. Plan for and deliver the roads of national significance.	●	●	●	●	All options continue the safety and amenity for road users travelling from TEL along SH2
<b>Maximise effective, efficient &amp; strategic returns for New Zealand</b>					
10. Align investment to agreed national, regional and local outcomes and improve value for money in all we invest in and deliver.	●	●	●	●	Alignment with TEL and TUNS in all options
11. Ensure effective and efficient co-investment with our partners.	●	●	●	●	Supports TCC and NZTA investment priorities. Options 2, 3 and 3A improve KiwiRail assets
12. Explore innovative revenue, pricing and financing approaches that enhance the value delivered by land transport investments	-	-	-	-	Some fringe benefit from continuity of route via toll roads (TEL and Route K)

**Key:** - = Neutral or negligible impact    ● = Slight or moderate impact    ● = Significant impact

The assessment based upon the Project teams interpretation of NZTA priorities clearly indicates that Options 3 and 3A perform better than Options 1 and 2 in a number of key areas due to the ability to achieve fully grade separated railway crossing on SH29,

- providing an effective and resilient network now and into the future
- providing safe, efficient and responsible transport choices for customers
- Provide greater level of State Highway traffic efficiency and safety due to the interchange arrangements and separation of rail.

Option 3 differs subtly from Option 3A by introducing a link (*shown in orange*) through Owens Place to connect to Truman Lane. This provides benefits to local traffic movements, public transport, pedestrians and cyclists by offering an alternative to travel “off state highway”. However the increased traffic along Owens Place creates a potential safety conflict with freight and commercial vehicles currently using this commercial and industrial hub in Owens Place. These safety concerns would be further exacerbated under Option 3 with increased traffic through accessing events at Baypark stadium/ arena.

Option 3



Option 3A



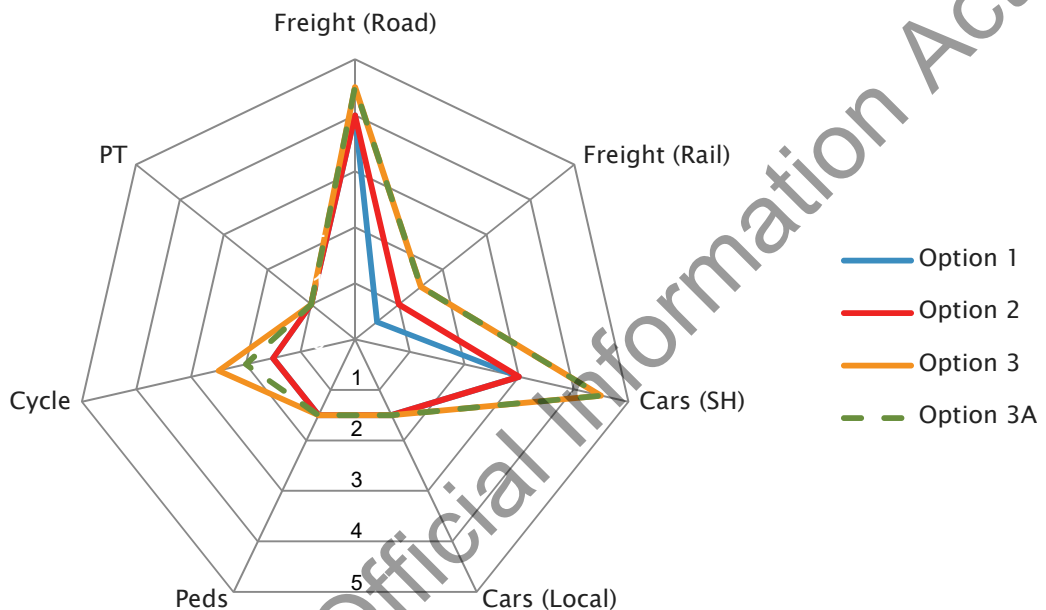
Option 3A does not provide the extension of Owens Place. The connectivity to Truman Lane is provided via a roundabout on SH29 and requires less new construction by reconfiguring the existing state highway infrastructure. Option 3A is still considered to provide an acceptable level of connectivity and therefore meets the project objectives. However an assessment of how well each option caters for the different users of the network was considered by the project.

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### 6.2.3 Assessment 3 of how well each option caters for the different users

The options were assessed by the project team against how well they support different transport customers. This considered factors such as clarity of route and ease of use, journey reliability, efficiency and safety.

The outcome of the assessment is shown in the radar plot below. The options with the better performance are reflected by being on the outer extents of the radar diagram.



This assessment shows that Option 3 and Option 3A are almost identical having the highest scoring benefits for all user types. This is predominantly the result of isolating the state highway traffic from the effects of the adjacent railway operations and providing additional performance for future network growth. Option 3 and 3A also provide a commonly understood route connection between SH29/SH2 in the form of a Grade Separated Interchange and a clearer route to destinations on the local network (e.g. Stadium). Option 3 is slightly better at providing additional choices for cyclists allowing them a connection from MGI to Baypark off the State Highway through Owens Place.

#### 6.2.4 Assessment 4 Environmental Factors

The options were assessed against a number of potential environmental effects by specialists in the respective areas, in order to determine the degree of effect. The scoring considered whether the effects were positive, negative or neutral as defined below<sup>4</sup>.

Table 6.2.4.1: Environmental Summary of Effects

Environmental Factor	Option1	Option 2	Option 3	Option 3A
Social	2.1	2.37	2.1	2.1
Noise	2.7	2.37	2.37	2.37
Vibration	3.34	1.66	1.66	1.66
Visual	2.17	2.17	1.83	1.83
Urban Design	2.75	3.25	2.25	2.25
Cultural	3.0	3.0	3.0	3.0
Ecological	3.5	3.5	3.5	3.5
Air Quality	3.5	3.5	4.0	4.0
Archaeology	3.0	3.0	3.0	3.0
Land Contamination	3.0	2.0	2.0	2.0
<b>Environmental Average</b>	<b>2.9</b>	<b>2.7</b>	<b>2.6</b>	<b>2.6</b>

Overall, all options were considered not to have any fundamental flaws and were considered similar in terms of their environmental effects. However the relocation of the railway, in Options 2, 3 and 3A, results in increased noise and vibration effects for a small number of households.

#### <sup>4</sup> Scoring definitions

Moderate to Significant Positive	3.6 - 5.0
Minor/ Similar to Existing	2.5 - 3.5
Moderate to Significant Negative	1.0 - 2.4

### 6.2.5 Assessment 5 Option Costs and Economic Analysis

A cost estimate was prepared for each option. The major cost elements in each option are bridge structures, retaining structures, pavements, service relocations, property purchase and disposal. Based upon the previous assessment particular focus was given to the comparison of Option 3 and 3A due to the analysis indicating they are the best options overall.

**Table 6.2.5.1: Summary of Option Estimates and Economic Analysis**

	Option 1	Option 2	Option 3	Option 3A
Expected Estimate	\$75.9M	\$80.4M	\$113.3M	\$102.0M
Total Costs (Total net discounted)	\$65.9M	\$68.5M	\$97.7M	\$90.4M
Total Benefits	\$205.9M	\$224.3M	\$248.9M	\$252.2M
BCR <sub>N</sub> + Agglomeration	2.7	2.9	2.2	2.4
BCRN + Agglomeration + WEBs	3.1	3.3	2.5	2.8
Incremental BCR <sub>N</sub> + Agglomeration+ WEBs	na	Option 1 v 2 = 7.1	Option 3 v 2 = 0.8	Option 3A v 2 = 1.3

BCR<sub>N</sub> = National Benefit Cost Ratio

Benefits include Wider Economic Benefits and Agglomeration benefits

Options 1 and 2 are the lowest cost options, but from the previous assessments did not provide the same level of strategic benefits that Option 3 and 3A did.

It is recognised that Options 3 and 3A are a higher cost but have significant strategic value and safety advantage by providing grade separation of SH29 over the busy railway corridor to and from the Port of Tauranga.

Option 3A was actually identified through a “value for money” exercise to try and reduce the cost of Option 3 whilst retaining the core benefit of grade separation SH from Railway. (*and has subsequently been back through the full analysis of assessments*) It has achieved this by reducing the extent of bridge structure on SH29 and removing the link road from Owens Place to Truman Lane. Option 3A saves approximately \$12.9M (11%) from the cost of Option 3.

The additional cost of Option 3A compared to Option 2 is marginally less than the additional benefits, resulting in an incremental BCR<sub>N</sub> of 1.3, which supports Option 3A.

The economic benefits for Option 3 and Option 3A are similar (within 1%) which indicates that they perform similarly in terms of the road user benefits.

#### 6.2.6 Summary of Options Analysis and Recommended Project Option

Option 3 and Option 3A provide the greatest opportunity to achieve the desired project outcomes by significantly reducing congestion and improving safety. Grade separated interchanges for the SH network and the grade separation of a busy rail corridor add significant safety advantages. In addition, these are the best options for protecting the roading network from the influences of rail movements which are planned to increase to over 30 crossings per day. It is noted that the road closure at the level crossings can result in queues that take up to 15 minutes to dissipate.

The potential environmental effects for all options are considered to be similar and overall are relatively neutral. However it is noted that the relocation of the railway with Options 2, 3 and 3A increase the negative environmental effects compared to Option 1.

Option 3A is considered to provide the best value for money solution and provides almost exactly same level of performance as Option 3 but has a significant costing saving of \$12.9M (11%).

Therefore overall, Option 3A is recommended as the preferred option for resolving the current congestion and safety problems at MGI and meeting the strategic project objectives.

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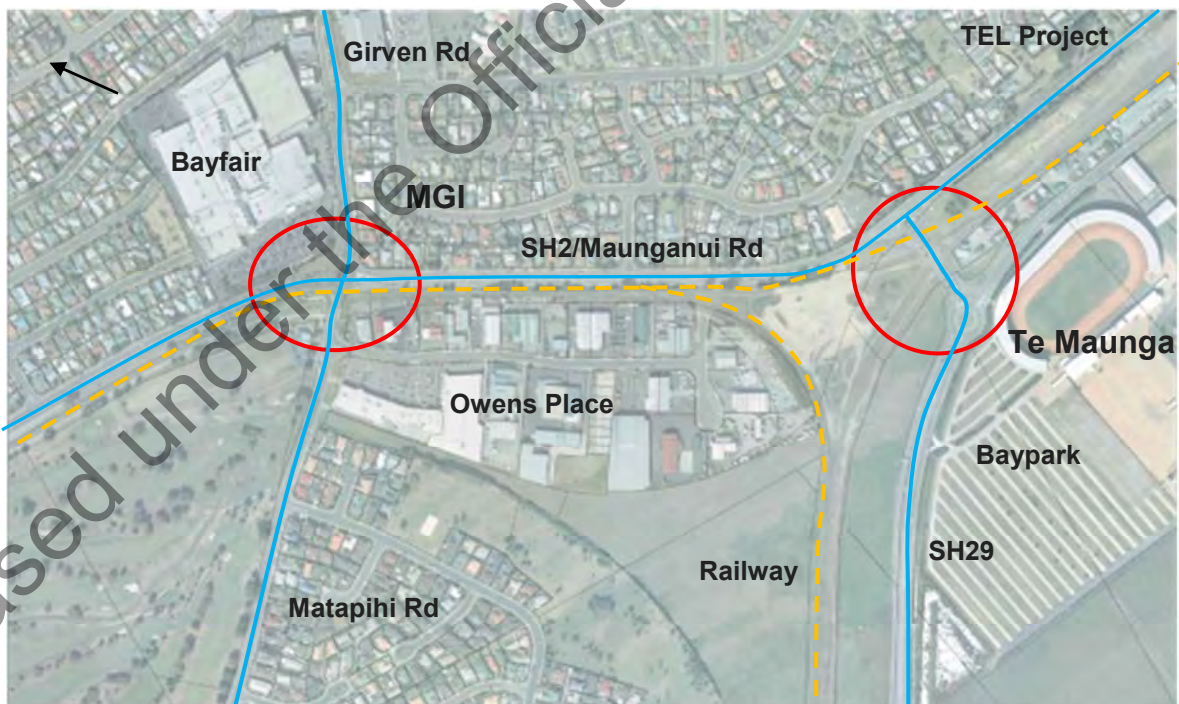
## 7 Recommended Project Option

The key design features of the recommended project option include;

- Two free flowing lanes along SH2, one in each direction, with median barrier
- Grade separated intersections at MGI and SH2/29
- Grade separation of SH29 from the railway
- At-grade auxiliary road for local traffic running parallel to SH2
- Signalised intersection at MGI
- Relocate SH29 connection to Truman Lane
- Realignment of the railway line to the existing designation west of Owens Place

### 7.1 Scope

The project is located on approximately 1.6km of SH2 is between Concorde Avenue and SH2/SH29 roundabout, in Tauranga. The extent of the project includes approximately 300m of road on the approaches to each intersection and part of SH29 adjacent to Baypark, as shown below.





The key design features and **minimum requirements** for the project include;

- Two free flowing lanes along SH2, one in each direction
- Grade separated intersections at MGI and SH2/29, with traffic signal controls.
- Grade separation of SH29 from the railway
- At-grade auxiliary road for local traffic running parallel to SH2
- Relocate SH29 connection to Truman Lane
- Realignment of the railway line to the existing designation west of Owens Place
- Pedestrian crossing facilities
- On road cycle facilities on the local network
- Transition between 70kph and 100kph speed environments
- The vertical alignment at MGI is to take account of the Tauranga Airport flight path clearance envelope. The lower boundary of the clearance envelope at MGI is at approximately RL 20.00m
- Provision for Over Dimensional Vehicles travelling along SH2 and SH29.
- Medium barrier separating SH2 traffic
- Minimum shoulder widths (typically 1.5m wide) due to the constrained site

The operational performance of the intersection has the following desired functional requirements;

- For the design year 2031 the SH2 through traffic: Level of Service (LOS) D or better at the intersections from opening, turning traffic and local road traffic: LOS E or better from opening
- Design vehicles for intersection turning movements to include for all heavy vehicles defined in the LTSA 2007 document "RTS 18 New Zealand On-road Tracking Curves for Heavy Motor Vehicles". This includes the 18 m 4-axle semi-trailer and 20m B-Train and 25m HPMV.

**Desirable Requirements** for the project include;

- Continuation of the median barrier towards Hewlett Road flyover
- Inclusion of TCC funded stormwater upgrades that cross SH2 to alleviate existing flooding issues on Eversham Rd

**Optional Requirements:**

- Construction of off road pedestrian and cycle path from Owens Place to Truman Lane, crossing under SH29 and across the railway at a level crossing

**Excluded from scope:**

- Four laning of the SH 2 - SH 2 flyover at MGI

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## 8 Recommended Option – Assessment

The recommended option provides the NZ Transport Agency with an option to achieve their long term goals and objectives and the desired project objectives. The preferred option provides the greatest level of effectiveness, road and rail safety, road network resilience and reliability for the road transport users, particularly when considered against the effects of the growing rail freight movements

This section assesses the performance of the recommended option against four key criteria:

- The Project Outcomes
- Implementability Assessment
- Wider Project Impacts
- Cost Optimisation.

A summary of performance against the above criteria is given. The economic assessment of the recommended option is reported in Section 8, Economic Analysis.

### 8.1 Recommended Option

For the NZ Transport Agency to achieve their long term goals and objectives and the desired project objectives, Option 3 Refinement (3A) is recommended as the preferred option, as outlined in Section 6.2.6.

### 8.2 Key Performance Indicators

The performance of Option 3 Refinement (3A) will be measured against the desired project outcomes post construction, based on the following Key Performance Indicators, which have been agreed with the Planning and Investment Group;

Desired Outcome	Key Performance Indicator (KPI)	KPI
More efficient supply freight chains	Reduced truck journey times on key freight route	KPI 1
	Improved truck journey time reliability from reduced railway impact	KPI 2
Supporting long-term managed growth across the Western Bay sub-region	Reduced journey times through the intersection for local trip making	KPI 3
	Improved journey time reliability through the intersection for local trip making	KPI 4
	Increase in total travel demand through the intersection	KPI 5

	Improved journey time reliability on SH2-based bus services (Routes 2, 33 and 36)	KPI 6
<b>Safer travel behaviour at the Bayfair Roundabout</b>	Reduce the number of road user deaths and serious injuries	KPI 7
	Improved safety rating of the intersection	KPI 8

## 8.3 Implementability

### 8.3.1 Constructability

There have been no potential issues identified for the construction of the preferred option. Most risks are expected to be able to be reduced by way of design or consent conditions.

There is strong stakeholder support for a project.

The realignment of the railway provides space for the road widening and bridge construction works, reducing the space constraints on the contractor.

The main challenge during construction will be coordination between the project and TCC, AMP Bayfair development and KiwiRail. TCC will be upgrading their stormwater network along Matapihi Road, across MGI and along Girven Road. AMP will be expanding their site along Maunganui Road and will possibly require site construction access. KiwiRail will be concluding their rail realignment behind Owens Place and may still require site access to complete their works.

Depending on the timing of the works, the project extent may overlap with the TEL project site, which is due for completion at the end of 2015.

A number of consents are required for the physical works including earthworks and NZ Historic Places Trust, along with Alteration of Designations for the rail and Transpower realignments. These have potential to delay the start of the project for some construction activities, if not complete before contract award.

The realignment of the railway line (civil works to track level) and Transpower poles is expected to take approximately 12 months. KiwiRail will award a separate contract for the laying of track and provision of signals and ancillary works to complete the transfer of live rail lines.

Traffic management and construction staging will need to be carefully managed due to the high volume of traffic passing through this constrained site.

A key part of the construction staging is to complete the rail realignment before the main project commences. This will enable the Transport Agency to effectively manage the programme and cashflows of the project parties reducing risk, timeframes and costs.

### 8.3.2 Operability

Operational requirements for the existing state highway network presently include;

- Temporary Variable Messages Signs (VMS) for Baypark events
- Street lighting
- Part time traffic signals for the rail crossing at MGI

The overall operation expenditure (OPEX) is expected to increase with the project due to there being additional infrastructure.

### 8.3.3 Statutory Requirements

The project will require an Alteration to Designation for the State Highway 2/29 road widening and realignments.

It is anticipated that these approvals will take a year to complete, on the assumption that there are no appeals leading to the Environment Court. At this stage, prior to the public consultation, it is not anticipated that to be a high risk of appeal.

A separate Alteration to Designation will be required for the tying in of the realigned railway to the existing railway which is anticipated to be completed with a non - notified process. It is noted that the Omanu Golf Club was compensated for the rail designation in the 1980's.

It is anticipated at this stage that resource consent for stormwater treatment and permanent discharge for the road and railway will not be required as the project will discharge into the consented Tauranga City Council catchment system.

A resource consent for earthworks construction associated with the railway relocation and for the road widening and realignments will be required.

An NZHPT Authority will be sought for the entire project.

An Outline Plan will be required for the railway realignment and for the SH2 and SH29 road widening and realignment.

The relocation of the railway will also likely require a resource consent for the relocation of the high voltage transmission line and poles.

Refer to Appendix I for the Consent Strategy

#### 8.3.4 Property Impacts

Other than the Crown, Tauranga City Council and KiwiRail, the preferred road alignment directly affects 14 residential properties of which 10 are Housing Corporation rentals.

Other impacts for properties relate to the limitation on right hand turns across the traffic due to the flyover structures. This affects much of the Maunganui Road properties and Girven Road commercial properties including the Bayfair Shopping complex.

#### 8.3.5 Asset Management

Throughout the development of the options for the project, discussions have been held with the regional operations team within NZTA. These discussions are to ensure the future needs of the network and any cost implications have been considered and incorporated into the option assessment.

There are 3 additional bridge structures, other structures (including retained earth embankments) and likely to be two additional stormwater treatment ponds.

Pavement maintenance costs would typically be reduced as a result of the new roading network. However, this will need to be considered against the increase in maintenance and inspections of the new bridges, structures, side protection, stormwater facilities, along with landscaping costs.

### 8.4 Wider Project Impacts

#### 8.4.1 Environmental Impact

On balance, the benefits from the rail relocation away from the state highway intersections mean that rail relocation is preferred. The rail designation has been in place since 1980 and all landowners directly adjacent to the railway corridor at Liftan Place, purchased with the knowledge that the line was to be relocated in the future.

The noise assessment has determined that the road project overall results in an improvement of the ambient noise environment. This improvement is through the elevation of the through traffic, the implementation of quiet seal and noise fences in discreet locations. With regards to the rail relocation into the south eastern designated corridor, the assessment under the KiwiRail unofficial criteria has found that there is a need for a 135 m long noise wall (3.5m high). This noise wall would be located adjacent to the new track alignment. An additional 2.5 m high wall would also be required on the boundary of two properties. Vibration mitigation will be required for the preferred option.

Other environmental impacts have been considered including landscape and visual effects, access arrangements of the project, which have the potential to impact on the local community. These have been managed and best practicable mitigation options agreed by the project team.

#### 8.4.2 Social and Cultural Impact

Moving the rail line is bringing the rail noise and vibration closer to the Matapihi residential suburb, although the rail designation has been in place for decades.

The preferred option brings considerable improvement to the community's connectivity. No social services are directly adversely affected. The social effects are largely at the household level.

We are advised that there are no significant archaeological and cultural sites in the project area. Many of the hapu view the project, particularly the flyover structures as another example of urbanisation and change on their ancestral landscape, which is of concern to them. They are interested in the mitigation of stormwater runoff to the harbour waters. One hapu, Nga Potiki, do not have a preferred option and have concerns for the configuration of all options because of their very recent Waitangi Tribunal Settlement package providing industrial zoned land adjacent to the Te Maunga interchange.

#### 8.4.3 Joint Working

An opportunity for joint working has been identified with TCC to develop their stormwater upgrade solution within the development of the preferred option. The collaborative approach on the stormwater design has already benefitted the project with regards to the project not requiring a separate resource consent. From the joint workshops TCC have agreed to include the projects resource consent requirements within their consented catchment plan. The potential benefit for working collaboratively with TCC also includes the cost saving for joint procurement of the stormwater upgrade. This would give more certainty of construction coordination with the main project and prevent disruption to the road network if the stormwater upgrade was constructed at a later date.

#### 8.5 Do–Minimum Option

The do–minimum layout for the network has been assumed to be:

- No changes to the existing MGI roundabout
- Improvements to the SH2/SH29 roundabout as currently being constructed under the TEL project. This involves the establishment of a left turn slip lane on the SH2 northbound approach, and changing the left lane to a shared left–right lane on the SH29 approach.

Other transport projects that have not been constructed but are included in the do–minimum include;

- Connection of Sandhurst Drive and Truman lane to either side of the Mangatawa interchange in 2016;
- Connections of the eastern and western ends of Gloucester Road and Grenada Street with roundabout intersections with Sandhurst Drive in 2026;
- Update of free speed along Ocean Beach Road, Maranui Street and Papamoa Beach Road based on information provided by TCC;

## 9 Recommended Option – Economic Analysis

A full economic assessment has been undertaken in accordance with the 2013 version of the EEM manual.

The preferred option (Option 3A) has a BCR of 2.8. The BCR of 2.8 includes Agglomeration and Wider Economic Benefits (WEB's).

A number of sensitivity tests of the key assumptions were performed. These include Discount Rate, Benefit Extrapolation, Value of Travel Time, Matrix Demand, Train Frequencies and with and without Agglomeration and WEB's. The sensitivity tests indicated that the BCR is particularly sensitive to the discount rate used, as well as the uncertainty around train frequencies. As the NZTA has minimal control over train frequencies, which are likely to increase in the future, then this level of uncertainty is likely to have the greatest risk on the BCR.

Using the NZTA's Investment Revenue and Strategy profiles, the Maunganui/Girven (MGI) – Te Maunga (SH2/29) Intersections Improvements has a **HHM** profile.

### 9.1 Economic Summary of Recommended Project Option

A full economic evaluation was performed using the NZTA EEM, Volume 1 (2013), which is included in Appendix C. The modelling and economics report details the methodologies used, as well as comments and responses of an independent peer review performed by Flow. Some key assumptions used within the assessment include:

- Variable trip matrices used within modelling, reflects and quantifies changes in travel behaviour;
- Benefits assessed using Tauranga Traffic Model (TTM) AM, IP and PM peak periods;
- Modelled years of 2016, 2026 and 2031, with interpolation between modelled years and extrapolation past 2031;
- Benefit growth capped at 2041 levels; and
- Use of Agglomeration and Wider Economic Benefits (WEB)

As a result of the economic assessment, the preferred Option 3A has a National BCR of 2.8. This includes Agglomeration and WEB's.



**Table 9.1.1: Economic Summary Table**

<b>Timing</b>				
Earliest Implementation Start Date	2014/15			
Expected Duration of Implementation	3 Years			
<b>Economic Efficiency</b>				
Time Zero	1 July 2013			
Base date for Costs and Benefits	1 July 2013			
Present Value of Total Project Cost of Do Minimum	\$1.726m			
Present Value net Total Project Cost of Recommended Option	\$92.086m			
Present Value net Benefit of Recommended Option	\$252.2m			
BCR <sub>N</sub>	2.8			
First Year Rate of Return (FYRR)	6.3%			
<b>P50 Costs</b>				
	Do Min	Recommended Option	Present Value	
			Do Min	Recom. Option
Design	\$0m	\$2.65m	\$0m	\$2.50m
Statutory Applications	\$0m	\$0m	\$0m	\$0m
Property (Purchase - Disposal)	\$0m	\$5.14m	\$0m	\$5.99m
Construction/Implementation	\$0m	\$96.85m	\$0m	\$81.41m
External Impact Mitigation	\$0m	\$0m	\$0m	\$0m
Other Capital (e.g. insurances)	\$0m	\$0m	\$0m	\$0m
Capital Risk Management	\$0m	\$0m	\$0m	\$0m
<b>TOTAL IMPLEMENTATION COST</b>	<b>\$0m</b>	<b>\$104.63m</b>	<b>\$0m</b>	<b>\$89.9m</b>
Maintenance	\$1.93m	\$2.50m	\$1.73m	\$2.19m
Renewal	\$0m	\$0m	\$0m	\$0m
Operating	\$0m	\$0m	\$0m	\$0m
Other On-going Costs	\$0m	\$0m	\$0m	\$0m
Post Project Evaluation	\$0m	\$0m	\$0m	\$0m
<b>ONGOING COST</b>	<b>\$1.93m</b>	<b>\$2.50m</b>	<b>\$1.73m</b>	<b>\$2.19m</b>
Project Contingency	\$0m	\$0m	\$0m	\$0m
<b>TOTAL P50 PROJECT COSTS</b>	<b>\$1.93m</b>	<b>\$107.13m</b>	<b>\$1.73m</b>	<b>\$92.09m</b>
<b>BENEFITS</b>				
	Present Value			
	Do Min	Recom. Option		
Travel Time Savings	\$0m	\$220.3m		
Vehicle Operating Cost Savings	\$0m	\$-19.9m		
Accident Cost Savings	\$0m	\$11.1m		
Vehicle emissions reductions	\$0m	\$-0.8m		
<b>Agglomeration</b>	\$0m	\$9.6m		
<b>PV total net benefits</b>			<b>\$0m</b>	<b>\$220.4m</b>

## 9.2 Sensitivity Analysis

### 9.2.1 Cost/Benefit Variability

A variety of sensitivity tests were carried out on the base BCR assessment. The use of sensitivity tests highlights the range in BCR's if different assumptions were adopted, with a range between 1.7 and 4.0. Full details of the sensitivity tests performed are provided in the Maunganui/Girven Intersection (MGI) – Te Maunga (SH2/29) Transport Assessment Report, attached in Appendix C

The sensitivity tests were performed on the base BCR values for with and without Agglomeration and WEB's. This allows for the assessment of the influence of adopted assumptions on the Agglomeration and WEB's.

The sensitivity tests performed (with and without Agglomeration and WEB's) include:

- Tests 1A and 1B: Discount Rate (4%, 6%, 8%);
- Tests 2A and 2B: Benefit Extrapolation (Capped 2014, no capping, capped at 2031);
- Tests 3A and 3B: Value of time travel (65% rural, 100% rural, 45% rural);
- Test 4: Demand Matrix (VTM, FTM); and
- Tests 5A and 5B: Train Frequency (2, 4, 6 per hour)

The results of sensitivity testing indicated that the assumption of the discount rate used has the greatest impact on the variability of BCR's. There was also strong sensitivity to the assumptions related to train movements. The NZTA has minimal control over the rail usage, and there is a strong likelihood that the rail frequencies will change throughout the assessment period. As such the rail operational response to the variability of the rail operations may be considered to have a higher level of importance.

**Table 9.2.1.1: Sensitivity Analysis**

Sensitivity Testing				
Test	Benefit Variability	Base Case	Lower Bound	Upper Bound
			BCR	BCR
1A	Discount Rate Sensitivity (excl. Agglomeration and WEB's)	2.3	1.7	3.4
1B	Discount Rate Sensitivity (incl. Agglomeration and WEB's)	2.8	2.0	4.0
2A	Benefit Extrapolation Sensitivity (excl. Agglomeration and WEB's)	2.3	1.9	2.4
2B	Benefit Extrapolation Sensitivity (incl. Agglomeration and WEB's)	2.8	2.3	2.9
3A	Value of Travel Time (VTTS) (excl. Agglomeration and WEB's)	2.3	2.1	2.6
3B	Value of Travel Time (VTTS) (incl. Agglomeration and WEB's)	2.8	2.5	3.1
4	Demand Matrix (excl. Agglomeration and WEB's)	2.3	2.3	2.3
5A	Train Frequency Sensitivity (excl. Agglomeration and WEB's)	2.3	1.7	2.7
5B	Train Frequency Sensitivity (incl. Agglomeration and WEB's)	2.8	2.0	2.8

### 9.2.2 Sensitivity to Land Use Growth

This study adopts the standard TTM5.9 land use inputs for traffic forecasts. Sensitivity tests on faster or slower land use growth were undertaken by allocating land use (after 2016) by 5 years earlier or later than the standard TTM5.9 inputs. The results (without agglomeration benefits) are tabulated in Table 9-3.

**Table 9.3.2.1: Discount Rate Sensitivity Test Results (without agglomeration and WEBs)**

Tests	Option 1	Option 2	Option 3	Option 3a
Base Case (6%)	2.6	2.7	2.1	2.3
Slower Growth	2.1	2.4	1.8	1.9
Faster Growth	3.3	3.2	2.6	3.0

### 9.3 Assessment Profile

The project was assessed using the latest NZTA Investment and Revenue Strategy profiles. An assessment profile of HHM has been determined for the project using the NZTA's funding allocation process as detailed below:

This project is assessed as a "Road Improvements" category (work category 324)

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

H

A **high** rating has been assessed for the strategic fit for the project for the following reasons;

- The intersections are considered critical to the operations of a RoNS, namely the TEL
- The location of the intersections are on a key freight route servicing the Port of Tauranga and is part of the Pacific Coast Highway, which is a key tourist route
- The intersections are on a National Strategic route carrying high volume of traffic.
- The project will have significant improvements to journey time reliability, easing of severe congestion and relieving capacity constraints in a main urban area.

#### **Effectiveness of the proposed solution:**

H

The **high** rating has been assessed for the effectiveness of the project for the following reasons;

- There is an agreed LoS set out in the project objectives for the project to achieve, these include LOS D or better on strategic roads and LOS E on non-strategic roads in the '2031' model year
- Optimised against multiple transport outcomes and objectives including the GPS, LTMA, RLTS and Safer Journeys by contributing to an effective, efficient, and safe land transport system
- As part of a whole network approach the intersections are an integral part of the Western Bay of Plenty SmartGrowth Eastern Corridor Strategy, the Bay of Plenty Strategic Roading Plan and the Tauranga Eastern Link Network Plan
- Considered all relevant problems, issues and opportunities, alternative options, collaboration opportunities and adverse effects or impacts as described in earlier sections. The project provides effective measureable outcomes in achieving the problems and issues raised
- A project has been developed to provide an economic, affordable solution whilst minimising the impact on additional land requirements
- The project is a long-term solution that responds to land use and growth plans, with benefits appropriate to its scale by providing an efficient route from the east to the PoT and CBD

- Provides an integrated, collaborative approach to other land use and infrastructure activities in the area, including the railway realignment, AMP expansion and TCC stormwater upgrade.
- It improves integration within and between transport modes, by improving safety and security of pedestrian and cyclists. It improves the connectivity of the surrounding area to the public transport facilities provided at Bayfair. It also improves journey times and reliability of the public transport services that travel through the intersections.

**Economic efficiency of the proposed solution:**

**M**

The preferred option (3C) has a BCR of between 2.4 and 2.8. The BCR of 2.8 includes Agglomeration and Wider Economic Benefits (WEB's).

A BCR greater than or equal to 2.0 or below 4.0 has a Medium (M) efficiency.

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## 10 Financial Case

The total expected estimate for the preferred option 3A is \$102million. The scheme estimate was reconciled to within \$4.6M or 5.6% at the construction estimate level with the industry expert.

### 10.1 Project Delivery Costs

The Scheme Estimate (SE) is based on the preliminary design for Option 3A, as at October 2013. The SE was produced using best practise techniques as defined in SM014. Risk management workshops were undertaken to identify and analyse the project risk and produce a residual target contingency and 95th percentile funding allowances.

Outlined below is a summary of the recommended project costs.

**Table 10.1.1 – Schedule of Recommended Project Costs – Option 3A Scheme Estimate**

	Total \$M
Physical Works Estimate	77.17
Construction Cost (Physical Works Estimate and MSQA Phase)	81.75
Total Base Estimate	88.62
5th Percentile Estimate (P5)	94.74
<b>Total Expected Estimate</b>	<b>102.00</b>
95th Percentile Funding Estimate (P95)	115.70

The preferred option SE has been prepared using the following assumptions:

#### Timing

- A 3 year construction period has been estimated which includes road and rail works.

#### Property Purchase, Management and Disposal Costs

- The cost of property to be purchased is \$10.8M. A credit of \$8.2M for the disposal value of surplus property has been assumed (as advised by The Property Group). The overall (net) allowance for property is \$2.5M
- Allowance of \$10,000 for accommodation works to each partial property acquisition, \$25,000 for total removal of house and ancillary works and \$10,000 for solatium payment for each total property acquisition has been included within the Base Estimate.
- The property purchase and disposal costs are a desktop estimate only. No properties have been inspected. The estimates are based upon current sales evidence and data provided by a registered Valuer. Residential properties, for example, have had a premium applied to their rating values based upon the sales evidence.

### Design Costs

- Based on developing Specimen Design and Principals Requirements, including obtaining Statutory Consents for the roading improvements.
- Design costs for the railway relocation are based on detailed design of the civil works for traditional measure and value construction.
- KiwiRail will be engaged to undertake the detailed design for the track, signals and level crossings.
- An allowance of \$200,000 is included for additional geotechnical investigations.

### Construction Costs

- Ground Improvements at bridge abutments are assumed to be a stone column type treatment. 15m deep at 1.50m centres extending generally 25m from bridge abutment and 5m beyond the MSE wall or shoulder of pavement.
- Bridge embankments will be undercut 1m deep to waste on site, backfilled with imported rubble (undercut starts 25m from bridge abutment and extends to bottom of ramp). This assumption has been based on traditional embankment ground improvement construction (e.g. the adjacent Hewlett's Rd fly-over used stone columns). Note that the NZTA Bridge Manual No.3 was issued part way through the estimating process and has not been specifically allowed for. However allowances have been made in the project risk register and contingency allowances for changes to design standards
- Existing pavements – cut 230mm deep, new 50mm fatigue layer (structural asphalt) and 150mm structural asphalt layer with 30mm SMA surfacing.
- New pavements – 150mm GAP40 sub-basecourse, 50mm fatigue layer (structural asphalt) and 150mm structural asphalt layer with 30mm SMA surfacing.
- A preliminary review of existing services requiring relocation has been carried out. A combination of pricing from utility providers and historical projects had been used to estimate the services relocation allowances.

### Procurement Costs

- A separate enabling earthworks and KiwiRail contract to relocate the railway.
- Roading works, including the grade separated interchanges will be procured with a Design and Construct Contract.
- Rail relocation works will be tendered as a separate enabling works project and will be procured with a traditional Measure and Value Contract.
- An allowance of \$1.5M as a contribution to the unsuccessful D&C tenderers (assumed contribution to two tenderers).
- NZTA managed costs have been assessed at \$0.5M for the D&PD phase and \$0.5M for the MSQA phase as advised by the NZTA.

- It is assumed that no additional land purchase for stormwater requirements is required regarding the construction of a combined NZTA and TCC treatment/detention device within Omanu Golf Course.

### Risk Assessment

A risk workshop was held in December 2013. The risks have had mitigation measures developed and residual risk scores determined. The risk register is included in Appendix D.

The key project risks that may influence the delivery of the project are:

- Construction not aligned with TEL, resulting in poor stakeholder relationships
- Opposition from tangata whenua due to the impact of the project, resulting in time delays
- Opposition from stakeholders and/or affected parties, resulting in time delays
- Opposition to level of mitigation measures provided, resulting in time delays and additional costs

### Exclusions

The following items are excluded from the SE:

- Property purchase cost for noise mitigation measures to any properties in Russley Drive.
- Investigation and Reporting fees (sunk cost).
- Goods and Services Tax (GST).
- Escalation beyond 30 September 2013.

### Cost Estimate Peer Review

The SE was selected and parallel estimated by Construction Consulting Group Ltd as the NZTA industry expert (IE) in February 2014. The SE was reconciled to within \$4.6M or 5.6% at the Construction Estimate level with the IE, however the following major differences were identified;

- property purchase costs were excluded from the industry experts estimate (for the purpose of this report Beca has added these to the IE estimate),
- the industry expert applied a flat 20% allowance for contingency and a further 35% for the 95th percentile funding risk, rather than assessing the residual/contingency risk requirements for the project

The Scheme Estimate Report and a detailed comparison between the Beca and IE estimates is included in Appendix D.

An Implementation Funding Forecast is provided in Appendix F.



Traffic Modelling and Economic Evaluation Peer Review

A peer review of the base traffic model, the future model and the economic analysis has been undertaken by Flow Transportation Ltd. This is included in Transport Assessment Report in Appendix C.

## 10.2 On-going Maintenance and Operations Costs

The following maintenance costs have been assumed and included in the economic analysis;

- Annual maintenance – \$20,000
- Periodic maintenance (every 10 years) – \$2,502,000

## 10.3 Project Revenues

There are no third party contributions, development contributions or toll revenue forecasts for the project.

If the TCC stormwater improvements are included in the project scope, they will be funded by TCC.

## 10.4 Funding Options

All funding for this project will be provided through the National Land Transport Fund (NLTF), and delivered under the Road improvement Activity Class, as part of the National Land Transport Programme (NLTP).

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PART B – READINESS AND ASSURANCE

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## 11 Commercial Analysis

The main state highway improvement works will be conducted under a D&C delivery model, and will be procured using the PQM (Special) supplier selection method, following a SIA stage and interactive tender process.

Specimen design services, including provision of MSQA services, will be delivered through the traditional delivery model, procured using PQM (Special). Enabling works packages will be delivered and procured in accordance with the specialist nature of those works.

The consenting strategy is to obtain resource consents in parallel with the alteration to designation process, in order to achieve concurrent activity and enable alignment with completion of the TEL project.

### 11.1 Introduction

A procurement strategy has been developed for all future project activities still to be carried out, in accordance with the Transport Agency's *Procurement Manual* and *Contract Procedures Manual*, and details how the market will be engaged to deliver a commercially viable proposal. A consenting strategy is also in place describing the approach which will be taken to obtain all statutory approvals and consents.

### 11.2 Output Based Specification

All project outcomes to be delivered during the implementation phase are described in Chapter 4. These are chiefly to:-

- reduce congestion at MGI, by improving the Level of Service at MGI from the current level F to D, and;
- provide an efficient and safe freight route to the Port of Tauranga.

In addition to achieving the above outcomes, the procurement and consenting strategies have been developed to:-

- enable the project to progress quickly, in order to align with the completion of the TEL project
- facilitate the railway relocation works as early as possible. This work will need to be completed and fully operational prior to decommissioning of the existing railway line and commencement of physical works on the state highway.

All project outputs will be fully detailed and specified through development of the Project Requirements, as part of the following Pre-Implementation phase.

### 11.3 Implementation Strategy

#### Designations

The works will be progressed under the Resource Management Act (RMA) through two separate processes to secure the designations required for the relocated railway, and the widened state highway.

The railway relocation will need to be completed and fully operational prior to decommissioning of the existing railway line and commencement of physical works on the state highway. To facilitate this process, the rail Outline Plan application will be staged first before lodging the Alteration to Designation application for roading improvements.

#### Resource Consents

As it is important to progress the project quickly to align with the completion of the TEL project, the consenting strategy aims to complete resource consents in parallel with the designation process and achieve concurrent activity. This has been identified as an opportunity to drive efficiencies and accelerate project development by incorporating the designation and resource consenting process into a single stage of hearings. For full details of the designating and consenting strategy, refer to Appendix I.

#### Procurement

Given the scale, level of complexity and risk associated with the works, the delivery model for this project is to be conducted primarily under a Design and Construct (D&C) approach. The supplier will be procured using the PQM (Special) supplier selection method, following a SIA stage and interactive tender process.

Design and MSQA services will be delivered under the traditional model and procured through the PQM (Simple) process including provision of MSQA services.

Enabling works packages will be delivered in accordance with the specialist nature of those works.

For full details of the procurement strategy, refer to Appendix K.

The following programme is based upon delivering the project in accordance with the above implementation strategies;-

Phase	Activity	Indicative Date
I&R – Scheme Assessment Report	HNO Approval of Preferred Scheme	May 2014
Pre-Implementation Phase	Preparation of tender document for Specimen Design / MSQA works	June 2014
	Advertisement of Specimen Design / MSQA works	October 2014
	Tender period	Nov – Dec 2014
	Evaluation process	Jan – Feb 2015
	Contract Award	March 2015
Implementation Phase – Enabling Works	Transpower Pole Relocation*	August 2015
	Rail Relocation – Civil Works	May 2015
	Rail Relocation – Track Construction / Signals installation*	September 2015
Implementation Phase – Main Works	SIA Process	November 2015
	Tender Document Preparation	January 2016
	Interactive Tender process	February 2016
	Contract Award	July 2016

\*These activities require input from specialist suppliers, and the design, procurement and delivery of these items will be provided by the asset owners.

#### 11.4 Risk Allocation and Transfer

The project will involve a range of risks (such as unforeseen ground conditions, delays, cost overruns etc.).

Under the D&C procurement model the risks will be allocated between the NZTA and the private sector contractor to the party best able to effectively manage the risk and the mitigation should it occur. This requires an optimal rather than maximum transfer of risk. Neither the NZTA nor the private sector contractor will be best placed to manage all of the risks.

The intent under a D&C is to ultimately pass all responsibility for the construction and operation of the Project to the private sector contractor.

Transferring risk to the private sector contractor will come at a cost. The price the Contractor will charge to deliver the Project will include some allowance for the risks it is required to manage. Where a risk is to be transferred to the Contractor, the Contractor should be given a substantial degree of flexibility to determine the best method of controlling the costs associated with that risk. This creates a powerful incentive for the Contractor to manage the risk in the overall interests of the project, while delivering value for money to the NZTA.

An efficient allocation of risks will allow the NZTA to obtain greatest value for money by harnessing the respective skills of all parties. However, if too much risk or the wrong risks are transferred to the contractor, the NZTA may pay more than if they were retained as the private sector may require a risk premium over and above the estimated cost of NZTA retaining the risk.

A risk quantification exercise forms part of the D&C supplier selection method to be carried out during the tender process for the main works. This is known as the Tangible Cost Adjustment process and is an attempt to identify and quantify all of the material project risks. These risks will include risks to be retained by the NZTA and risks to be transferred to the contractor. Tenderers ability to demonstrate how these risks will be effectively managed will inform the basis for selecting the Preferred Supplier.

### 11.5 Sourcing Options

The project will be delivered and sourced through traditional means, on the open market. The scale of the works is likely to generate interest from most of the large suppliers using the GETS national database, who should be well sourced to deliver a project of this complexity. There is insufficient justification to attract international suppliers which is likely to come at a premium to cover establishment costs.

### 11.6 Payment Mechanisms

Contract payments will be ledgered, reviewed and approved in accordance with the Transport Agency's standard procedures for a D&C physical works contract and the Conditions of Contract NZS:3910.

### 11.7 Pricing Framework and Charging Mechanisms

As above, all pricing and charging mechanisms will be carried out in accordance with the Transport Agency's standard procedures for a D&C physical works contract and the Conditions of Contract NZS:3910.

## 11.8 Contract Length

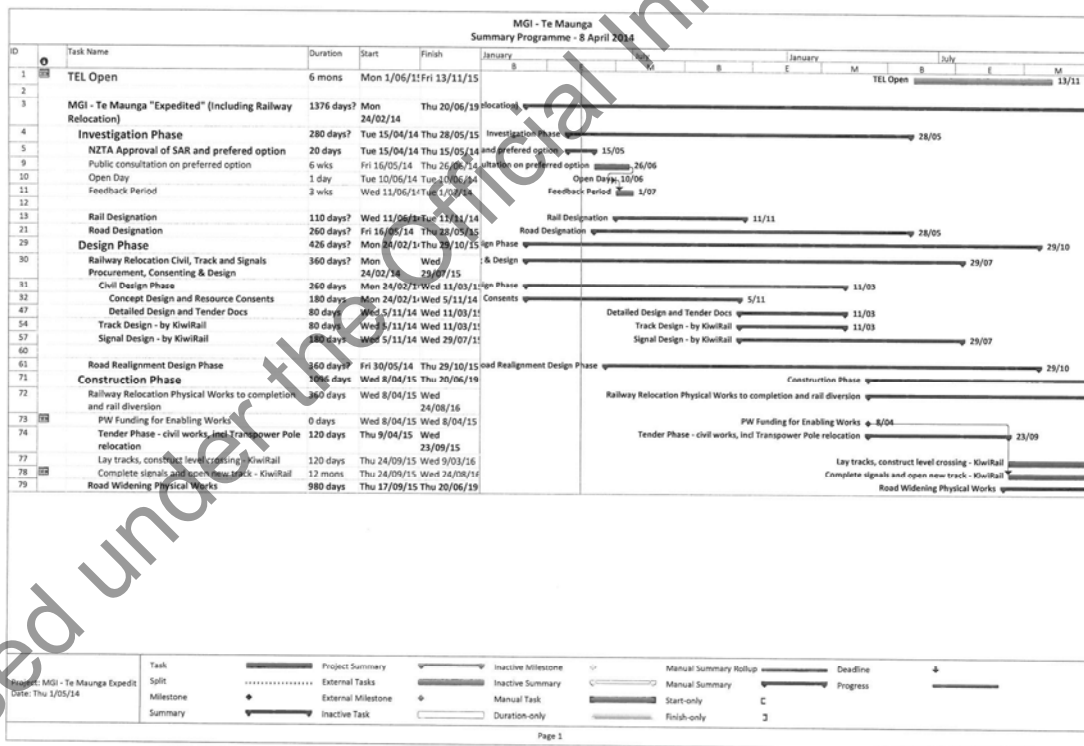
The most likely scenario for delivery of the project is to relocate the railway as an enabling works package, prior to commencing the main improvement works on the state highway.

Relocation of the railway is expected to take approximately 12 months.

The contract for the main SH improvement works is expected to last 36 months, although it is accepted this estimate is conservative, to allow for minimising disruption to road users on a National Strategic (High Volume) state highway.

## 11.9 Schedule

Below is a summary Gantt chart programme.



## 12 Management Case

The governance structure will follow a traditional model adopted by the Transport Agency to deliver D&C projects.

The project will use accepted value gates and documented policies and procedures, to manage project assurance, scope change, cost control and issues management.

### 12.1 Project Roles

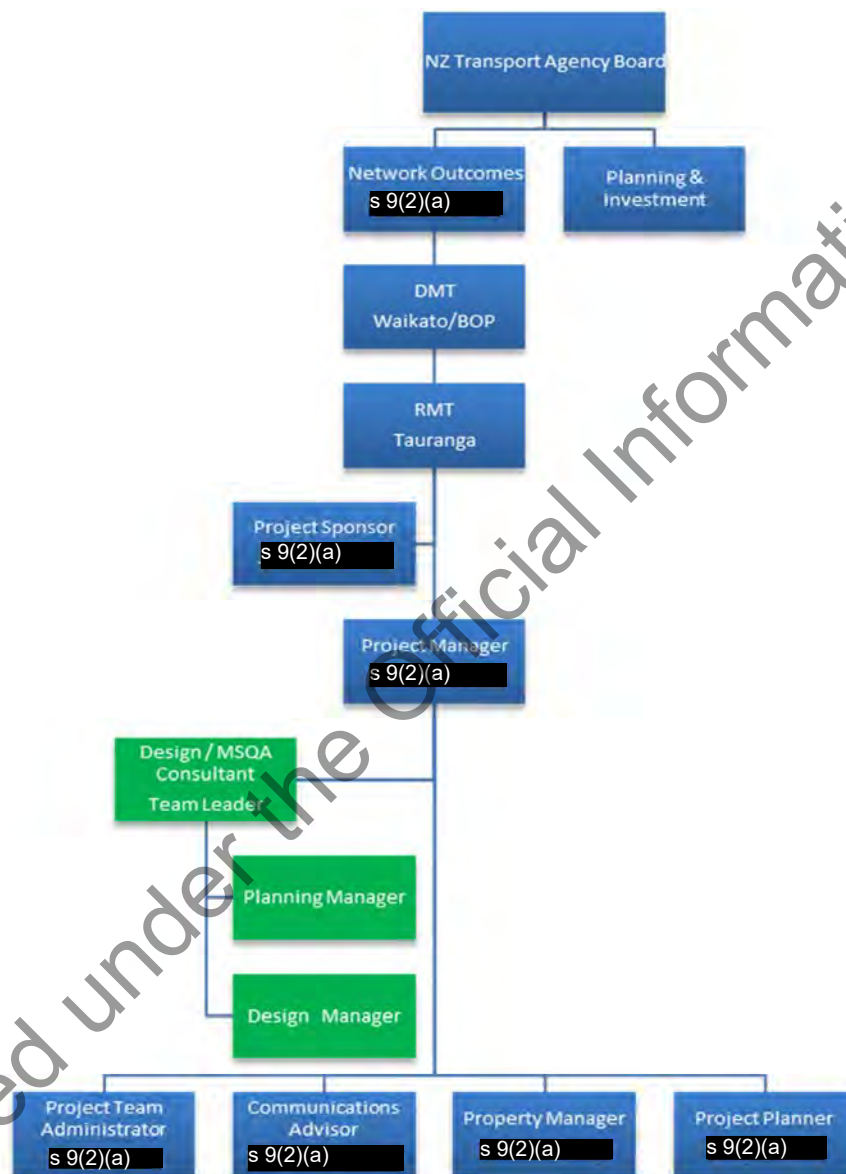
The Project Team will comprise of:

ROLE	NAME
Project Sponsor (HNO)	s 9(2)(a)
Investor Client (P&I)	s 9(2)(a)
Project Manager	s 9(2)(a)
Senior Supplier	TBC
Team leader	TBC
Communications Advisor	s 9(2)(a)
Planning Advisor	s 9(2)(a)
Tender Secretary / Project Administrator	s 9(2)(a)
Property Manager	s 9(2)(a)



## 12.2 Governance Structure

The governance structure is outlined below.



### 12.3 Assurance & Acceptance

Approval of Preferred Option 3A as the recommended scheme, and of all findings contained herein the Scheme Assessment Report, will be required at the sub-regional level; the Regional Meeting Team (RMT), the business unit level; Decision Making Team (DMT), and at the national HNO level; Network Outcomes Team (NOT), formerly known as the Value Assurance Committee (VAC).

Formal construction funding acceptance (sign-off) of a project over the \$100M threshold requires NZTA Board approval. Under the proposed procurement model (D&C), all standard HNO and P&I value gate processes would apply, including risk and assurance, NOT, and P&I GM and HNO GM, prior to going to the Board.

With regards to project assurance, the Transport Agency has well documented processes and policies around the requirement for Independent road safety audits, cost estimates and economic evaluation reviews, in addition to structures design reviews, environmental and social impact reviews, including urban and landscape design reviews under the traditional project delivery procurement approach.

In addition to the above, some key project assurance deliverables for the pre-implementation and implementation stages are shown in the following table:

ITEM	COMPONENT
Cost Review	Construction Estimate
Economic Evaluation Review	Project Benefits
Physical Works Document Review	RFT documents
Road Safety Audit (RSA)	Pre-tender RSA Post-tender RSA Post-construction RSA

### 12.4 Change Control

The HNO Group of the Transport Agency has documented policies and procedures on scope change with financial delegations set out in the NZTA *Instruments of Delegation* document. These change controls will be adhered to during the delivery of the project with escalation to the appropriate scope committees as required to ensure that any initiated scope change is given full value-for-money considerations, as any significant change in scope post-financial close may have significant implications on delivery of the Transport Agency's capital works portfolio.

### 12.5 Cost Management

As for scope, cost management policies are well documented within the Transport Agency and within the financial delegations of the organisation. These will be adhered to with invoice certification against agreed contract budgets and deliverables undertaken by the NZTA before payment being made assuming a traditional design and construct procurement model.

The Transport Agency or its agent's role will be limited to exception reporting on delivery failure, and agreement with the operator that an abatement notice is applicable. The Transport Agency will put in place suitable monitoring and reporting mechanisms to ensure that its contracted performance deliverables are being achieved.

### 12.6 Issues Management

Under the proposed D&C delivery model, the Transport Agency will be engaging a client's representative and/or designers' representative to undertake random verification testing and a surveillance role during construction to provide assurance that specified levels of quality are being delivered.

Where such levels are not met, escalation triggers will apply where repeated Performance Indicator (PI) failure and the abatement penalties fail to deliver the required contract performance.

Initial escalation will be by way of the project governance board structure (Project Sponsor's representative), and the agreed dispute resolution mechanism. Unsatisfactory resolution would require rapid escalation up the Transport Agency management structure, as the financial implications of any failure to agree is likely to exceed current delegations, and may have wider portfolio implications.

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## 13 Lessons Learned and Post Implementation Monitoring

Lessons learnt from this project will be fed back into NZTA's project development and delivery lifecycle through a number of different mechanisms and levels of project and corporate management.

KPI's have been agreed and include measures on what data will be collected post construction to determine whether the outcomes envisaged have been delivered. These measures will be refined during the next phase of the project, to identify the specific data to be collected and how this will be carried out through a post construction monitoring regime.

The benefits realisation assessment for the project will allow lessons learnt and mitigation plans to be developed and fed back into the NZTA.

### 13.1 Lessons Learned

Lessons learnt from this project will be fed back into the Transport Agency's project development and delivery lifecycle through a number of different mechanisms and levels of project and corporate management. These include the project management value assurance team, project management training workshops, Lessons Learnt Review (LLR) and Contract Management Review (CMR) processes. All lessons learnt dissemination is traditionally included within existing Transport Agency administration budgets.

### 13.2 Post Implementation Monitoring – Approach and Schedule

There are a number of KPI's that have been agreed and confirmed in section 8.2, which will determine whether the desired outcomes have been achieved post construction. The following table confirms the KPI's and measures on what data is to be collected post construction.

The KPI's will need to be monitored as the project progresses, while specific measures and the post construction monitoring regime used to capture this data will need to be refined through the design, construction and operation phases.

This benefits realisation assessment will then allow lessons learnt and mitigation plans to be developed and fed back into the Transport Agency.

KPI	Indicator	Measure	Comment
KPI 1	Travel time, by mode	Minutes travel time	HCV's only.
KPI 2	Reliability – actual, HCV	Observed queue length on SH2 during train movements at peak times	Proxy for reliability.
KPI 3	Travel time, by mode	Minutes travel time	Motor vehicles only.
KPI 4	Reliability – actual, vehicles	Coefficient of variation: Standard deviation of travel time / average minutes travel time	–

<b>KPI 5</b>	Throughput – pedestrians & vehicles incl. cyclists, by mode	Number of pedestrians & vehicles, including cyclists, by mode	For pedestrian, cycle, light vehicle, HCV, PT bus modes.
	Traffic volume	Average annual daily traffic (by vehicle class, as appropriate)	–
<b>KPI 6</b>	Reliability – actual, public transport	Percentage of scheduled service trips between 59 seconds before and 4 minutes and 59 seconds after the scheduled departure time at selected points.  Reliability – perceived, public transport level of satisfaction	If data is available from real time information or ticketing system for the relevant road section.
	Reliability – actual, vehicles	Coefficient of variation: Standard deviation of travel time / average minutes travel time	For PT buses if data for above measure is not available, but data for congestion monitoring is available for relevant road section.
<b>KPI 7</b>	Deaths and serious injuries, by mode	Number of deaths and serious injuries, by mode	By pedestrian, motor vehicle modes
<b>KPI 8</b>	Road assessment rating – urban roads	High Risk Intersection Guide assessment rating	

## Appendix A – Investment Logic Map

The investigation phase has been completed in accordance with the traditional Scheme Assessment Report specification. The following Investment Logic Map (ILM) was developed by the project team as an exercise to express the perceived problems and desired outcomes under the Business Case Approach, and is provided here for information purposes only.

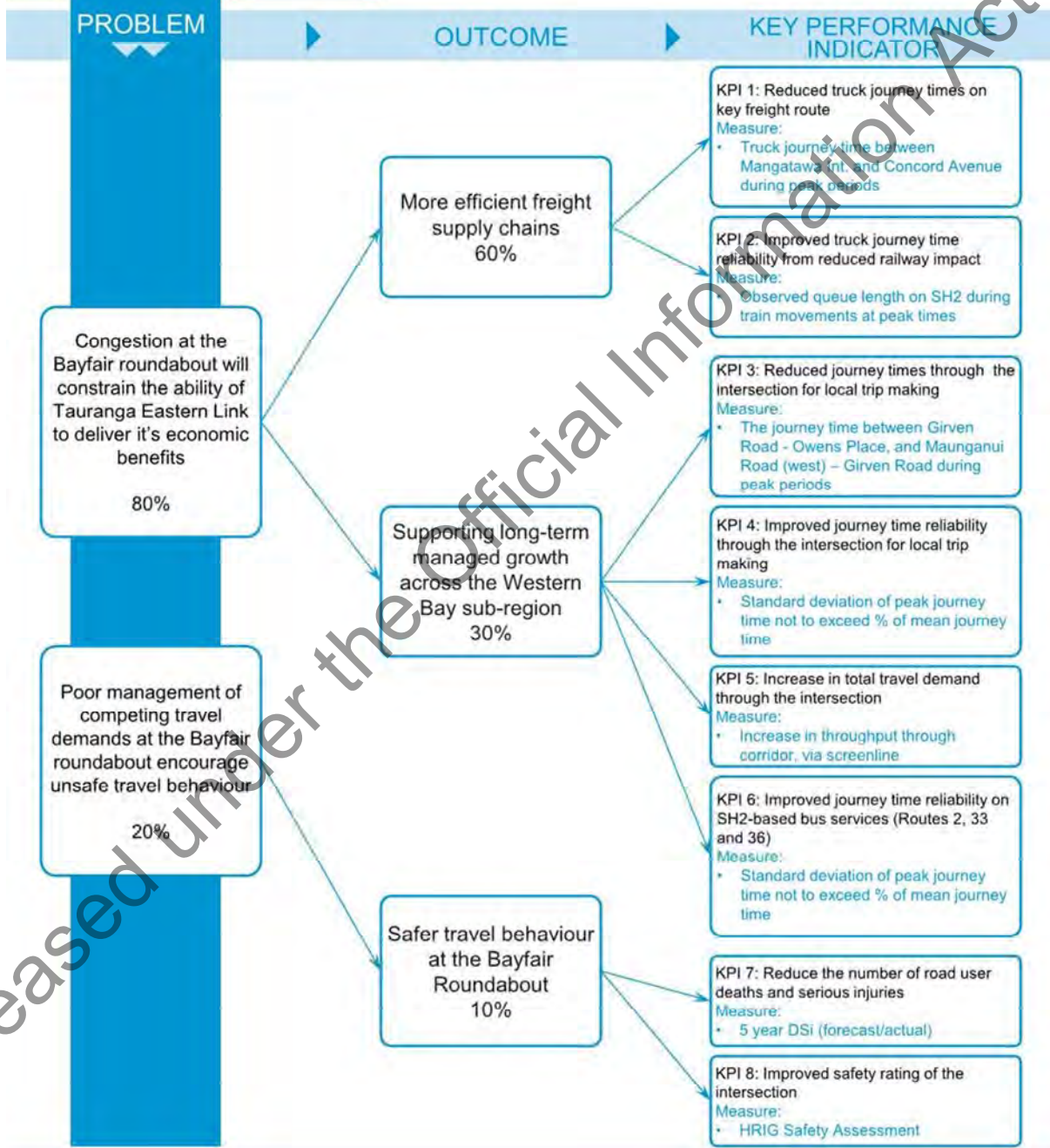
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## Maunganui-Girven Road Intersection & SH2/29 Intersection Improvements(MGI)

New Zealand Transport Agency

### INVESTMENT LOGIC MAP Project Development

Investor: HNO  
Version no: 4.0  
Last modified by: Greig Stephen



ILM developed internally with input from Key Stakeholders

## Appendix B – Stakeholder Consultation

MGI Intersection Improvement Consultation Report 2011

MGI Intersection Improvement Consultation Report 2013

Baypark to Bayfair (B2B) Consultation Report 2014

Cultural Impact Assessment: MGI Flyovers 2013

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Report

# Maunganui Girven Road Intersection Improvement Consultation Report

Prepared for NZTA

By Beca Infrastructure Ltd (Beca)

20 April 2011

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## Revision History

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Approved by	s 9(2)(a)		
on behalf of	Beca Infrastructure Ltd		

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## Appendices

**Appendix A - Consultation Plan**

**Appendix B - Newsletter**

**Appendix C - Stakeholder Meeting Minutes**

**Appendix D - Summary of Public Feedback**

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## 1 Introduction

This report documents the feedback gained in the scoping phase of the Maunganui-Girven Road Intersection Improvements project. Consultation has been undertaken in accordance with the Consultation Plan for the project.

An initial round of consultation was undertaken between January 2011 and March 2011 to introduce the project and gain information on the issues and opportunities that the study area presents. It included:

- Personal meetings (i.e. one to one) with key stakeholders: KiwiRail; AMP/Bayfair and Tauranga City Council stormwater and roading departments;
- Meeting with Ngai Tukairangi, Ngati Tapu hapu and Ngaiterangi;
- A public newsletter dated March 2011 advising of the Open Day and progress on the project investigation. A copy of this newsletter is attached as Appendix A; and
- An information open day where the wider community were invited to attend and provide feedback on the project.

## 2 Consultation Feedback

### 2.1 Key Stakeholder Organisations

- The key stakeholder organisations consulted on the project to date are detailed in the following table:

Key Stakeholder Organisations	
Tauranga City Council	KiwiRail
AMP/Bayfair	

The purpose of the first consultation meeting was to gain feedback from the organisations on their future plans and to identify potential constraints. These are detailed in the meeting minutes included in Appendix B and are summarised below.

#### 2.1.1 Tauranga City Council (Council)

##### i. Roading

There are a number of Council projects occurring in the area and that relate to the Maunganui Girven Road intersection including the:

- Relocation of bus stops (Arataki Transport Centre);
- Girven Road Form Investigation;
- Sandhurst Road design;
- Sports and Exhibition Centre;
- Council's Settlement Review;
- Extension of Grenada and Gloucester Streets; and
- Baypark pedestrian facility.

Council are also developing a cycle track which promotes a connection between Girven and Matapihi Roads. Part of the cycle track will involve the development of a new footpath at the Maunganui Girven Road intersection to connect to the underpass in 2012.

## ii. Stormwater

The area of the intersection has a high water table and soakage in the area is considered 'not good'. The intersection is drained via a 1200 dia pipe down Matapihi Road which connects to the public drain on the Golf Course and there are some flooding issues with the south western corner of the intersection. There is no existing spare capacity in the Council's stormwater pipes at the intersection.

The site is included in Council's Comprehensive Stormwater Catchment consent which is currently under preparation.

### 2.1.2 KiwiRail

KiwiRail advised that the railway line will be used more frequently in the future and that there is no current intention to use the designated road corridor to the west of the currently used corridor.

In relation to land take KiwiRail is not opposed to the principle but any option needs to protect the potential for a future double railway track within the current corridor.

Railway line geometric restrictions include a minimum of 25m vehicle clearance between the railway line and the new limit line on Matapihi Road and a minimum of 5m clearance between the road kerb and the railway boundary or track.

From KiwiRail's perspective a pedestrian crossing should be 2m in width and preferably grade separated.

### 2.1.3 AMP/Bayfair

Bayfair is currently developing a Master Plan to define their expansion plans. They could potentially expand to the north, west, with cinemas to the east and above ground. AMP now owns 10 titles in the northern direction of the site (excluding the Council reserve). AMP plan to have a preferred Master Plan option by the end of 2011.

AMP referenced a 'Bayfair Expansion Traffic Analysis Report' which identified the impact of expansion plans to 2021 and a further five year extension to 2026.

The site has recently experienced internal circulation changes to Girven Road entry at the traffic lights and the entry/exit from the car parking building which AMP perceive to have produced an improvement on site.

## 2.2 Tangata Whenua

A meeting was held with Ngai Tukairangi and Ngati Tapu who are the hapu with an interest in the investigation area. The details of the meeting are contained in Appendix B and are summarised below.

It was acknowledged by both hapu that there are multiple problems with the Maunganui Girven Road intersection particularly relating to safety, trains blocking traffic which queues back to the intersection, and issues associated with traffic from Owens Place commercial area and the Bayfair Estate residential area.

Hapu representatives noted the potential residential growth increasing from 158 homes to 500 by 2020. Future hapu development aspirations for Matapihi were captured in the Matapihi Landuse Plan developed by Tauranga City Council in partnership with the Matapihi community. The Plan seeks to provide for future housing while maintaining the rural character of Matapihi. The Proposed Tauranga City Plan makes provisions for an additional 50 dwellings to be constructed within each Rural Marae Community Zone (Hungahungatoroa and Waikari); and Scheduled Sites to cater for papakainga development.

There are no known cultural or archaeological sites in the immediate area that will be impacted although it was noted that Omanu urupa is located further away.

There is a need to keep Ngaiterangi Iwi, Ngati Kuku and Nga Potiki informed of the project. They do not desire formal consultation.

## 2.3 Public Feedback

An Open Day was held on 22<sup>nd</sup> March 2011 at the Hillier Centre, 31 Gloucester Road, Mount Maunganui.

An Open Day sign-in form recorded that 146 attended the Open Day. The public provided feedback at the Open Day through comments on the aerial photographs and by filling in a feedback form. Written feedback was received from 77 people. Our perception is that many of the attendees were local residents, particularly from Matapihi with few motorists who pass through the intersection.

Further feedback was also provided through telephone conversations and emails.

The feedback received is summarised in Appendix C and reported below.

### Intersection Use

The 77 respondents predominantly use the intersection by car (98%), as pedestrians (41%), by bike (23%) and bus (18%). Reasons for travel included to get to and from the shops, work, the gym, sports, and school.

### Constraints

The most important factor to respondents when traveling through the area is safety (38%) and a smooth or improved traffic flow (35%).

Key constraints included:

- The railway line and Matapihi Road crossing;
- Environmental constraints including noise from trucks engine breaking at night & visual;
- Ownership of land; and
- A high water table.

### General Comments

General public comments provided from telephone conversations, emails, information from feedback forms, and the Open Day constraints mapping are summarised below.

#### 2.3.1 Existing Traffic Congestion and Safety Issues

- Congestion at the Maunganui Girven Road roundabout causing lengthy queues particularly around peak times and during rail crossings was a major concern to respondents. Local residents (particularly the elderly) choose not to travel during these peak times as a result.

- The roundabout is perceived as being dangerous with 'frequent accidents'. Of particular note was concern over how right turning traffic from Girven Road to the Mount use the incorrect left hand lane. Another difficult manoeuvre at the intersection involves trying to get into the right lane traveling from the Mount to Girven Road immediately after the roundabout. There was a general desire for the intersection to be monitored during peak times to reduce the number of potential accidents.
- There is concern that congestion and accidents will get worse with an increasing population and an increasing amount of heavy traffic (e.g. logging trucks) being used.
- The queue into/out of the Owens Place carpark was also identified as an issue and Owens Place commercial operators suggested that people avoid the area because of the issues described above.

### 2.3.2 Pedestrian and Cyclist Crossing Issues

- Respondents advised that safe pedestrian crossing points are needed. The main pedestrian movement across the intersection appears to be between Bayfair and Owens Place shopping area. Respondents noted that residents from Matapihi park their car at Owens Place and walk to Bayfair. While there is an underpass between the Golf Course and Bayfair people need to cross Matapihi Road and the railway to access Owens Place. Concern was raised by respondents about pedestrian safety issues crossing the railway line, the speed of traffic on Matapihi Road and Maunganui Road for elderly people to negotiate, and the pedestrian underpass not being safe particularly at night. Trucks were also said to block pedestrian access to Owens Place.
- There is currently no link between the footpath and the pedestrian underpass.
- At the Open Day attendees were asked their preference for a pedestrian underpass or an at-grade crossing. The predominant response recorded in the constraints mapping was in favour for the retention of the pedestrian underpass. Other respondents suggested a pedestrian over bridge. A public meeting was recommended to discuss this matter further. There was also a desire to extend the underpass under the railway line.
- Respondents also highlighted that there is no current provision for cyclists around the roundabout.

### 2.3.3 Through and Local Traffic conflicting with Bayfair shopping Traffic

A number of respondents identified that general traffic conflicts with Bayfair shopping traffic, creating a bottleneck on Girven Road. Potential solutions raised by respondents included restricting Bayfair traffic from turning right onto Girven Road and utilising the Gloucester access instead. Other respondents noted that access to Bayfair in the vicinity of the Maunganui Girven Road roundabout is difficult.

### 2.3.4 Preferred Options and Solutions

Although feedback wasn't sought on potential solutions respondents suggested a range of options to resolve the current intersection problem including signalisation, an overpass either along Maunganui Road or between Matapihi Road and Girven Road; or an underpass or a combination. One popular combination was a roundabout with lights in the short term and a flyover in the long term.

There was also a strong demand from respondents for dedicated left slip lanes for all intersection quadrants, into/ out of Maunganui, Girven, and Matapihi Roads.

Other respondents suggested relocating the railway line to the corridor behind Owens Place, undergrounding or lowering the railway line or changing the train timetables to avoid peak traffic.

One respondent sought a separate service lane for properties on Maunganui Road and a better bus service.

There is also concern raised by a respondent that once the Maunganui Girven Road intersection is resolved then the traffic issue would shift to Te Maunga.

Several Girven Road commercial property owners are concerned that a flyover option would block the visibility of, and perhaps access to, their commercial properties and Home Zone businesses.

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Appendix A

## Consultation Plan

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Report

# Maunganui-Girven Road Intersection Improvements Project – Consultation Plan (Investigation Phase)

Prepared for New Zealand Transport Agency (Client)

By Beca Infrastructure Ltd (Beca)

18 January 2011

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A	s 9(2)(a)	Draft	11/01/11
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Prepared by	s 9(2)(a)	s 9(2)(a)	11/1/11
Reviewed by	s 9(2)(a)	s 9(2)(a)	17/2/11
Approved by	s 9(2)(a)	s 9(2)(a)	22/2/11
on behalf of	Beca Infrastructure Ltd		

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# 1 Introduction

## 1.1 Purpose

The purpose of this document is to provide a consultation plan for this Investigation and Research (I & R) stage of the Maunganui-Girven Road Intersection Improvements project. This project aims to identify an improved intersection design to ease congestion and improve safety for all road users.

In developing this plan consideration has been given to the consultation requirements of the Resource Management Act 1991 (RMA) and the NZTA's Stakeholder Relationship Management System (SRMS).

This plan provides direction to undertaking consultation for the duration of the project. In so doing it identifies and describes the consultative principles, process and mechanisms to be used for the project but recognises that alternatives may be necessary and used in response to issues identified through consultation.

This plan will enable the key stakeholders and the local community to be accurately informed about the project so that their interests can be considered as the project progresses. The strategy may enable the resolution of issues raised through consultation prior to or outside of the statutory processes provided for under the RMA that will be required to consent the project.

## 1.2 Consultation Plan Structure

This Consultation Plan is structured as follows:

- Section 1 – Introduction
- Section 2 – Legislative and Policy Context
- Section 3 – Consultation Objectives and Outcomes
- Section 4 – Key Stakeholders
- Section 5 – Immediately Adjoining Landowners and Occupiers
- Section 6 – Public
- Section 7 – Consultation Information and Reporting Protocol
- Section 8 – Key Project Team Participants
- Section 7 – Consultation Methods & Process
- Section 8 - Consultation Programme

## **2 Legislative and Policy Context**

### **2.1 Resource Management Act 1991**

The purpose of the RMA is to “promote the sustainable management of natural and physical resources.” While there is no statutory requirement to undertake consultation for projects (Section 36A of the RMA), it is considered good practice to provide communities and relevant stakeholders with information and the opportunity to respond to proposals. In addition, the Fourth Schedule of the RMA requires an applicant to identify those persons interested in or affected by proposed works, and to outline any consultation that has been undertaken before lodgement with Council (including any outcomes).

### **2.2 Stakeholder Relationship Management System (SRMS)**

The SRMS is defined as an NZTA consultation project management system for Maori consultation and management of Statement of Identified Maori Interests (SIMI) deliverables. The SIMI, which will form part of the Scheme Assessment Report will provide an assessment of the potential impacts of the project on particular Maori interests and helps manage relationships with those interests.

The consultation plan provided includes information required to assess any potential impacts of the project specifically relating to Maori issues.

### **3 Consultation Objectives & Outcomes**

#### **3.1 Consultation Objectives**

The consultation objectives are as follows:

- Comply with the principles and requirements for consultation of NZTA and the RMA;
- To support the communications team in providing stakeholders and the community with timely information on the project;
- To make available opportunities for stakeholders and the community to provide feedback and identify any key issues in regards to the Notice of Requirement and Resource Consent applications;
- To receive, consider and respond to any feedback received from stakeholders and/or the community with an open mind and to document responses to any feedback and, within the Scheme Assessment Report, show how such feedback may or may not have contributed to the project.

##### **3.1.1 Consultation Principles**

A number of principles that help define the meaning of good consultation have emerged from case law under the RMA and are a useful starting point in establishing the principles for the consultation. These are as follows:

- Early – consult as soon as possible with key stakeholders/influencers when the details of your project are less ‘set in concrete’ and you have more flexibility to make changes to address issues raised by interested and affected persons.
- Transparent – be open about what you want to achieve, what scope you may have to change certain aspects of your project and why there might be elements that you may not be able to change.
- Open mind – keep your views open to the response people may make and the benefits that might arise from consultation.
- Two-way process – consultation is intended as an exchange of information and requires both you and those consulted to put forward their points of view and to listen to and consider other perspectives.
- Not a means to an end – while consultation is not an open-ended, never-ending process, it should not be seen merely as an item on a list of things to do that should be crossed off as soon as possible.
- Ongoing – it may be that consultation – or at least ongoing communication – will continue after your application has been lodged or even after a decision has been made.
- Agreement not necessary – consultation does not mean that all parties have to agree to a project, although it is expected that all parties will make a genuine effort. While agreement may not be reached on all issues, points of difference will become clearer or more specific.

This consultation plan is to provide for targeted stakeholder and wider public consultation in the context of these principles.

### 3.2 Consultation Outcomes

Overall, the consultation outcomes sought from the process set out in this Plan are:

Outcome	Objective Achieved
<ul style="list-style-type: none"><li>Stakeholders and the community will be informed about the project and its purpose</li></ul>	Inform/Reaction
<ul style="list-style-type: none"><li>Any updates, where applicable, will be confirmed with key stakeholders and the wider public;</li></ul>	Inform/Reaction, Participation, Involvement
<ul style="list-style-type: none"><li>Feedback will be received from key stakeholders and the wider public in a manner and within timeframes sufficient to contribute to the Scheme Assessment Report documentation which may shape subsequent design revisions</li></ul>	Participation, Involvement, Collaboration,
<ul style="list-style-type: none"><li>Consultation processes and the feedback from consultation will be documented in a manner that stakeholders and the community can understand</li></ul>	Inform/Reaction, Participation
<ul style="list-style-type: none"><li>Ongoing consultation post-lodgement, of the Notice of Requirement and resource consent will assist in reducing the risks associated with the post-lodgement Council process.</li></ul>	Involvement, Participation

### 3.3 Communication Outcomes

Communication outcomes sought from the RMA process set out in this Plan are:

Outcome	Objective Achieved
<ul style="list-style-type: none"><li>Stakeholders and the community will be informed about the project and its purpose</li></ul>	Inform/Reaction
<ul style="list-style-type: none"><li>Any updates, where applicable, will be confirmed with key stakeholders and the wider public;</li></ul>	Inform/Reaction, Participation, Involvement



## 4 Key Stakeholders

A workshop was held on 19<sup>th</sup> January 2011 to identify the key stakeholders for the project. The workshop was attended by representatives of NZTA (Greig Stephen, Kevin Reid, Philippa Ross – James, Kate Irvine) and Beca (s 9(2)(a), s 9(2)(a), s 9(2)(a)).

The following key stakeholders have been identified as groups that may be affected by or interested in the Maunganui-Girven Road Intersection Improvements project:

- Ngaiterangi Iwi, Ngai Tukairangi hapu, Ngati Tapu hapu
- Tauranga City Council (stormwater engineering and roading staff)
- Kiwirail
- Tauranga Airport Authority
- AMP Property (Bayfair Shopping centre)
- Owens Place businesses
- Baypark
- Cycle Action Tauranga/Cycling Advocates
- Tauranga Western Bay of Plenty Motorcycle Group
- Utility providers (PowerCO, Telecom, Vodafone, Vector, TelstraClear)

The key stakeholders will be consulted as a group at the milestones of the project.

## **5 Adjoining Landowners and Occupiers**

Adjoining land owners and occupiers include those located along Maunganui, Matapihi and Girven Roads. These parties may be affected by access restrictions and possibly land-take.

This group will be communicated with by newsletter, personal letter and a Cottage meeting will be held prior to the second Open Day.

Personal meetings will be conducted with landowners whose land is required.

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## 6 Public

The public (local community and road users) will be communicated with through media releases, newsletters and open days. The public will have an opportunity to provide feedback on the problems at the intersection, the constraints and opportunities, the initial options identified and then later in the study, provide feedback on the assessment of environmental effects of the favoured options.

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## **7 Consultation Information and Reporting Protocol**

### **7.1 Consultation Information**

Beca will prepare any wording or plans for communication (media releases and newsletters) regarding or impacting on the RMA process linked to consultation. This will be sent as a draft to Greig Stephen and Philippa Ross-James for finalising, compliance with NZTA's communication and style policies, and for printing and distribution.

Information for the NZTA Website will be provided to NZTA for approval for Philippa Ross-James to place on the website.

An internal verification process is to be used for the production of any material for distribution for consultation. All consultation materials will be reviewed by s 9(2)(a) [REDACTED], Technical Director - Planning, and released to NZTA on behalf of Beca by the Team Leader, s 9(2)(a) [REDACTED].

### **7.2 Record of Consultation**

All correspondence, telephone conversations and meetings for the project will be recorded.

Written minutes, attendee(s) and agreed action shall be recorded for all consultation meetings and made available to all attendee(s) within three working days. These will be placed on Teamview.

At the conclusion of the consultation rounds the Consultation Team will analyse the responses to consultation and the issues and options that have been identified in the SIMI and SRMS. The Notice of Requirement and Resource Consent applications will include a specific section on consultation undertaken for the project.

### **7.3 Consultation Summary Report**

Following the consultation process, a consultation summary report will be prepared to document and summarise any feedback received and action taken. Outstanding issues or matters that need to be further addressed by the project team will be directed to the appropriate avenues for consideration.

In general the consultation summary report will include:

- Key parties involved in the consultation process;
- A summary of issues identified during the consultation process;
- A record of how the project team have responded to the consultation feedback received.

## 8 Key Project Team Participants

The key Project Team participants are:

Personnel	Organisation	Role
Rod James	NZTA	Public/Political/Key Stakeholder
Greig Stephen	NZTA	Project related inquiries
Philippa Ross-James	NZTA	Communications Guidance and Approvals
§ 9(2)(a)	Beca	Project Related Technical Inquiries
§ 9(2)(a)	Beca	Project Related Technical Inquiries
§ 9(2)(a)	Beca	Iwi/Hapu Consultation and RMA Inquiries
§ 9(2)(a)	Beca	Community Consultation, Affected Parties and RMA Inquires
§ 9(2)(a)	Beca	Community Consultation, Affected Parties and RMA Inquires

## 9 Consultation Methods and Processes

As required, NZTA will lead formal consultation meetings, unless other arrangements are agreed. Where agreed with NZTA, Beca may meet with groups or directly affected persons.

A range of consultation methods are proposed throughout the course of the project. The following table outlines the proposed consultation methods, their purpose, their target audience and stages of the project in which they will be used. Some of the methods below are also implemented for communications purposes and are referred to in the Communications Strategy.

As the project progresses, not all of these tools may be required and alternative ones may need to be adopted in order to facilitate successful delivery.

Method and Purpose	Audience	Stage(s)
<p><b>Consultation database</b></p> <p>Key issues (including risks) identified through consultation, along with all communications undertaken, including details of all of the mechanisms used, comments received and responses to these will be recorded through a database.</p>	Beca & NZTA	Throughout project
<p><b>Press Releases by NZTA</b></p> <p>Press releases will be strategically employed at key stages of the project informing the community of important dates and opportunities for input into the project and of project progress and milestones.</p>	Stakeholders, affected landowners, Tangata Whenua and wider community	Released at key stages of the project
<p><b>Internet Sites</b></p> <p>Internet sites will be made available (e.g. <a href="http://www.nzta.govt.nz">www.nzta.govt.nz</a>) for the public to access information, progress and key dates of the project.</p>	All stakeholders and wider community	Throughout project
<p><b>Project Newsletter</b></p> <p>Develop and distribute a project newsletter informing key stakeholders and the community of the project.</p>	Key stakeholders and the wider community.	Distributed at key stages of the project
<p><b>Public Open Days</b></p> <p>Organisation and attendance at three open days fronted by project team members and displaying key information about the project. This is also an opportunity for key stakeholders and the community to gain a better understanding about the project.</p>	Key Stakeholders and the wider community	Preliminary Option Selection and the Preferred Option Selection

Method and Purpose	Audience	Stage(s)
<p><b>Letter/Meetings</b></p> <p>Key Stakeholders will be sent a covering letter with the project newsletter which will offer individual meetings if desired. Follow up phone calls will be made to arrange these meetings where desired.</p> <p>Post lodgement and public notification of the consent applications, meetings will be held with those Key Stakeholders who have made submissions to assist in resolving any matters prior to the Council Hearing,</p>	<p>Identified Key Stakeholders and Identified landowners &amp; occupiers.</p>	<p>Throughout project</p>
<p><b>One-on-One Meetings / Hui</b></p> <p>One-on-One hui are proposed with Ngaiterangi Iwi, Ngai Tukairangi hapu and Ngati Tapu hapu.</p> <p>Also, as a result of any contact/feedback from the project newsletter or Information Day, one on one meetings may need to be held with individuals who have raised specific issues</p>	<p>Key Stakeholders / The Community</p>	<p>Throughout project</p>
<p><b>VMS Signage</b></p> <p>Display signage advising of Open Day</p>	<p>Passing motorists</p>	<p>Prior to Open Days</p>

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## 10 Consultation Programme

Consultation on the project will start in January 2011 and will run for the course of the project. The programme and timing of the consultation is set out in the following Table:

It is also anticipated that the design of the project will be progressing at the same time as the consultation programme.

Action	Frequency	When	Who	Responsible
Consultation database maintenance	Throughout project	Throughout project	All stakeholders and the wider community.	Beca
Project Newsletter	Distribution at key stages	Before Information Days and at key stages: Newsletter 1 7/3/11 Newsletter 2 1/8/11 Newsletter 3 9/1/12	Key stakeholders and the wider community	Beca/NZTA
Public Open Day	Preliminary and preferred option selection stages	Day 1: 22/3/11  Day 2: 26/8/11  Day 3: 27/1/12	All stakeholders and the community	Beca
Key Stakeholder letter and one-on-one meetings during the first round. The second round will involve a collective meeting	Throughout project	Round 1: 4 weeks beginning 11/1/11  Round 2: 6 weeks beginning 18/07/11	Key Stakeholders	Beca with support from NZTA
Iwi	Throughout project		Tangata Whenua	Beca with support from NZTA
One-on-One Meetings	Once land-take		Landowners affected by land-take	Beca with support from



Action	Frequency	When	Who	Responsible
	requirements are clear			NZTA
Cottage Meetings	Before the second Open Day		Landowners affected by land-take	

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Appendix B

Newsletter

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## Maunganui-Girven intersection improvements



The intersection at Maunganui Road (State Highway 2) and Girven Road is the site of some of Tauranga's worst congestion.

The NZ Transport Agency (NZTA) is investigating ways to improve the intersection. We are looking at how we can reduce congestion and travel time as well as improve safety for all road users, including pedestrians and cyclists. All previously identified options (a signalised roundabout, a tunnel and a two-lane or four-lane flyover) will be considered.

As part of its investigation, the NZTA wants to know how you use the intersection (eg drive, cycle, bike or bus) and what's important to you when you're travelling through the area.

So we're holding an open day to explain and discuss issues and to hear your thoughts:

**When:** Tuesday 22 March 2011  
4-7pm

**Where:** Hillier Centre  
31 Gloucester Road  
Mount Maunganui

See you at the open day!

# Current problems

So far, we know the intersection suffers:

- high traffic flows – more than 35,000 vehicles pass through the intersection each day and 2200 of those are heavy commercial vehicles
- severe congestion and delay – particularly bad in the evenings and on Saturday at peak shopping times, while the proximity of the railway line also contributes to problems as vehicles queuing at the barrier arms often block the roundabout
- a high crash rate – since 2005, there has been 82 reported crashes, including a number of fatalities, in the vicinity
- conflict between local and through traffic – increasingly, the mix of local traffic, heavy commercial vehicles, pedestrians and cyclists, and nearby freight trains causes traffic conflict that needs to be eased before the predicted increase in traffic volume becomes a reality.



## The investigation project

The investigation includes considering several potential options for the intersection. Each option will be reviewed for its impact on traffic flow and safety, as well as any design constraints and environmental effects it might present. Geotechnical testing, traffic modelling and preliminary designs will also be completed for each option.

Consulting affected and interested people is an integral part of any investigation.

Another open day will be held later in the year to discuss potential options. An update on the project schedule will be provided at that time.

Following consultation and technical work, the most appropriate option will be selected. A detailed design of the preferred option will be developed to the point where a reliable estimate of the construction cost can be determined. A more detailed assessment of the environmental effects of the preferred option will also be carried out.

The investigation is expected to be completed by March 2012.



### Our contact details

**Greig Stephen**

§ 9(2)(a)

§ 9(2)(a)

§ 9(2)(a)

§ 9(2)(a)

§ 9(2)(a)

or check out

[www.nzta.govt.nz/network/projects](http://www.nzta.govt.nz/network/projects)

Appendix C

## Stakeholder Meeting Minutes

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## Minutes of Meeting

### Maunganui-Girven Road Intersection Improvements Project: Meeting with Kiwirail

Held 19 January 2010 at 2.00pm

at Beca Office, 32 Harrington Street

**Present:** § 9(2)(a) (TH), Kiwirail; Grieg Stephen (GS), NZTA; § 9(2)(a) (GO), § 9(2)(a) (CR), § 9(2)(a) (BH); § 9(2)(a) (AT), Beca

**Apologies:** None

**Distribution:** All

Item	Action
<b>1 Purpose of Project</b> <ul style="list-style-type: none"><li>To identify a long-term solution for the Maunganui-Girven Road intersection.</li></ul>	
<b>2 KiwiRail</b> <ul style="list-style-type: none"><li><b>General</b><ul style="list-style-type: none"><li>The existing rail line is to be used more frequently, with potentially up to approximately 20 train movements per day. There may be a need to double track a section of the northern designation to provide for this.</li><li>No intentions at present to track the southern designation. Intend to keep this designation, even if the northern designation is double tracked.</li><li>No intention at present to relocate the existing track to the southern designation.</li><li>Designation likely to be road over rail but these needs to be investigated.</li></ul></li><li><b>Potential for land take</b><ul style="list-style-type: none"><li>Not opposed to the principle for a land take but any option needs to protect the potential for a future double tracking of the rail line.</li><li>TCC lease some of the Kiwirail land (i.e. the general area where the pedestrian underpass is provided). Other landowners (on Owens Place) have leases over other parts of Kiwirail land. TH to investigate and confirm whether the lease agreements include any 'show stoppers' in terms possible land take, and the term of the leases.</li></ul></li><li><b>Intersection</b><ul style="list-style-type: none"><li>Existing intersection arrangement is generally acceptable. However, a minimum 25m vehicle clearance from the intersection is required. This comprises 22m (truck) plus 3m (clearance). It is unclear whether a 25m clearance is currently provided.</li><li>Pedestrian crossing is very tight. Pedestrian crossing should be a minimum 2m width. Grade separation for the pedestrian crossing is the preferred option.</li><li>Rail warning light on the intersections central medians is preferred.</li><li>A barrier to deflect pedestrian movements towards a formed rail line crossing point, similar to that that already exists would be required in any new design.</li></ul></li><li><b>Rail line</b><ul style="list-style-type: none"><li>Current rail line speed is 55km/hr</li><li>If the rail line requires realignment then a geometric design can be proposed</li></ul></li></ul>	<p>TH</p> <p>TH</p>

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by NZTA. It would need to protect the double tracking of the northern designation. Key design parameters include a minimum 5m clearance between the road kerb and the railway boundary or track.	
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Minuted by: s 9(2)(a)

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## Minutes of Meeting

### Maunganui-Girven Intersection Improvements Project Meeting with Tauranga City Council Rooding

Held 17 February 2011 at 9am

at Beca Tauranga

**Present:**           § 9(2)(a) (TV) Tauranga City Council  
                   Greig Stephen (GS)           NZTA  
                   § 9(2)(a) (GO)               Beca  
                   § 9(2)(a) (NP)               Beca

**Apologies:**

**Distribution:**     All Above plus § 9(2)(a) ,  
                           § 9(2)(a) and § 9(2)(a)  
                           █

Item	Action
<p><b>1 Project Overview</b></p> <ul style="list-style-type: none"> <li>■ NP &amp; GO explained the investigation project, the projects status and timeline.</li> <li>■ The aim of this meeting is to brief Council on the project and to understand what Council's plans are in the area to determine any opportunities and constraints that need to be considered.</li> <li>■ GO advised that a number of preliminary options were being investigated which included grade separation, signalisation and network changes. The intersection will be designed to cater for 2031 traffic and aims to provide a "B" level of service for SH traffic. The aim for local roads is a level C &amp; D. TV advised that for the local roads a design of level D or even E would be acceptable to Council.</li> <li>■ In terms of timing Council confirmed that it would be good to get this project and the Te Maunga intersection and TEL all opening at the same time.</li> </ul>	
<p><b>2 Tauranga City Council Projects in the Area</b></p> <p>The following are Tauranga City Council (Council) projects occurring in the area:</p> <ul style="list-style-type: none"> <li>■ Relocation of bus stops. Tauranga City Council (Council) are investigating options to relocate the bus stops currently in front of Bayfair elsewhere. The favoured option is to shift the parks onto Farm Street, which would require bus route changes.</li> <li>■ Girven Road Form Investigation. The development of Sandhurst Drive (which provides another link between Te Maunga Road and Maranui Road) has been bought forward to 2015. Council had plans to four lane Girven Road and some of the relevant land has been purchased, however this may no longer be necessary given the eminent establishment of Sandhurst Drive. Council are now investigating the future form and function of Girven Road, including a review of the Girven Road /Gloucester &amp; Grenada Road intersections. GO to check the timing of the investigations with Tim Haig (Beca).</li> <li>■ Sandhurst Road has been designed by Council. Council are awaiting a confirmed TEL opening date to enable the start of property purchases.</li> <li>■ Council and TDG are working on the sports and exhibition centre near Baypark. This project aims to provide better pedestrian links from the</li> </ul>	<p><b>GO</b></p>



<p>residential area to the exhibition centre across the SH. Possible options include a new pedestrian walkway along the west side of Maunganui Road and a crossing to the east of Maunganui Road.</p> <ul style="list-style-type: none"> <li>■ Council Settlement Review project is being undertaken and involves investigating where the additional 10,000 people (as a result of a lower density at Wairaki) may be disbursed to e.g. Te Puke, Paeangaroa, Te Puna and Omokoroa.</li> </ul>	
<p><b>3 Other Development/Activity in the Area/Projects</b></p> <ul style="list-style-type: none"> <li>■ Earthworks associated with the Grenada Road through connection have been completed. Council are in negotiations with the developer to complete the link.</li> <li>■ NZTA TEL Project</li> <li>■ NZTA Te Maunga Interchange</li> <li>■ Owens Place sought rezoning as part of the district plan review.</li> <li>■ For information on future land use at Matapihi discuss with s 9(2)(a) or s (Council).</li> <li>■ NZTA Central Ring Road Study (Michael Seabourne NZTA).</li> </ul>	
<p><b>4 Cycle Paths/Links</b></p> <ul style="list-style-type: none"> <li>■ Council are developing a cycle track which includes a Matapihi Road connection across to and along Girven Road. The cycle track will then continue through to Grenada Street. NP to obtain a plan from Sarah Cotterill (Beca). Part of the cycle track will be extended via a new footpath at the Maunganui/Girven Road intersection next year. The key to this cycle track is the connection between Girven Road and Matapihi road (TV).</li> <li>■ Maunganui Girven Road Improvement project is to include an at grade pedestrian crossing. Council advised that they didn't have a preference as to whether an on or off road cycle connection was provided on either side of the at grade crossing.</li> <li>■ The Arataki Community Centre will be built on Girven Road shortly so there will be a lot of pedestrian foot traffic between Bayfair, Baywave and the community centre.</li> <li>■ The Papamoa cycle way information can be obtained from s 9(2)(a) (Council).</li> </ul>	<p><b>NP</b></p>
<p><b>5 Intersection Design</b></p> <ul style="list-style-type: none"> <li>■ GO requested traffic counts on Matapihi Road. TV to provide.</li> <li>■ There is a perceived safety problem with the right turn from Bayfair's closest access to the SH into Girven Road, which needs to be examined (TV).</li> <li>■ TV advised that Council approved Bayfair's last consent with a parking shortfall.</li> <li>■ NZTA &amp; Beca to continue to discuss expansion plans with AMP.</li> <li>■ TTM Checks. TVS advised that the latest version of the TTM has the most current dates for the timing of Sandhurst, Grenada and Gloucester Road openings. The Arataki intensification is included in the TTM model. A review is being undertaken of this mid to late 2011 as growth may be shifted out to greenfield areas.</li> </ul>	<p><b>TV</b></p> <p><b>GO &amp; NP in discussion with AMP</b></p> <p><b>NP</b></p> <p><b>GO</b></p>

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**6 Council Contact**

**NP**

- TV is leaving TCC and s 9(2)(a) (JH) will be the key contact for this project. NP to circulate minutes to JH.

Minuted by: s 9(2)(a)

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## Minutes of Meeting

### Maunganui-Girven Road Intersection Improvements Project - Meeting with TCC Stormwater

Held 11 February 2011 at 3.00pm

at Beca Office, 32 Harrington Street

**Present:** s 9(2)(a) (GD), TCC; Greig Stephen (GS), NZTA; s 9(2)(a) (GO), s 9(2)(a) (CR), s 9(2)(a) (AT), Beca

**Apologies:** None

**Distribution:** All

Item	Action
<b>1 Purpose of Project</b> <ul style="list-style-type: none"><li>To identify a long-term solution for the Maunganui-Girven Road intersection.</li></ul>	
<b>2 Stormwater</b> <ul style="list-style-type: none"><li><b>Capacity</b><ul style="list-style-type: none"><li>GD advised that there is no spare capacity in the existing network.</li></ul></li><li><b>Existing System</b><ul style="list-style-type: none"><li>MGI is drained via a 1200 dia pipe down Matapihi Road which drains to the Golf. GD advised that this was the only option for the state highway. The existing open drain in the Golf Course acts as the treatment device. This ultimately discharges to the harbour. The site is included within the Comprehensive Catchment consent application which is to be lodged soon. The ownership of the drain through the Golf Course needs to be confirmed.</li><li>GD advised that soakage in the area was not good with the water table being quite high.</li><li>TCC have developed a design which drains the Bayfair area back towards the ocean. If Bayfair is to expand it would need to drain to the Golf Course. Leon Kruger at TCC is responsible for this project and should be contacted for detail regarding it. This would include details of the Spur Road discharge quantum.</li><li>GD advised that there is an existing NZTA SW pipe which runs along the Matapihi side of the existing state highway / Maunganui Rd to the east of the MG intersection. This pipe drains back towards the Golf Course. At a point along state highway / Maunganui Rd it then drains back towards Te Maunga. There is an existing asbestos SW pipe on the coastal side of SH2 Girven Road to Te Maunga.</li><li>Overland flowpaths should be identified in any re-design. These would need to be piped due to the railway line.</li></ul></li><li><b>Flooding</b><ul style="list-style-type: none"><li>GD aware of some flooding on the south-western corner of the MG intersection.</li><li>The underpass stores some water in rain events and has a pump which activates to remove it.</li></ul></li></ul>	<p><b>Beca to confirm ownership of drain through Golf Course</b></p> <p><b>Beca to contact Leon Kruger</b></p>

**Minuted by:** s 9(2)(a)

## Minutes of Meeting

### Maunganui-Girven Intersection Meeting with AMP 16 March 2011

Held 15 March 2011 at 10.30am

at Beca Offices

**Present:**

§ 9(2)(a)	AMP Capital
§ 9(2)(a)	Centre Manager, Bayfair
Greig Stephen	NZTA
§ 9(2)(a)	Beca
	Beca

**Apologies:**

**Distribution:**

As Above

Item	Action
<p><b>1 Introduction</b></p> <ul style="list-style-type: none"><li>Christine explained that the purpose of the meeting was to commence consultation with AMP on the project which is anticipated to run all of this year. We regard AMP as a key stakeholder in the project and would like to consult progressively throughout the project to assist in achieving outcomes that are mutually beneficial.</li></ul>	
<p><b>2 Discussion</b></p> <ul style="list-style-type: none"><li>Question – Is this project purely about the intersection, or is it relating to matters further afield, such as the Tauranga Eastern Link/ RON Where does that stop?<ul style="list-style-type: none"><li>Answer – The Tauranga Eastern Link project technically stops at Te Maunga intersection.</li></ul></li><li>Question – What is the time frame for the project?<ul style="list-style-type: none"><li>We don't have a specific timeframe to get the intersection rebuilt – it is subject to funding, but at a regional level. NZTA wants to get it underway before the TEL is completed.</li></ul></li><li>What is the current methodology to get the upgrade?<ul style="list-style-type: none"><li>We are looking at all existing and previous suggestions, analysing the constraints of the environment and coming up with a series of options that have been shortlisted down to six for evaluation.</li></ul></li></ul> <p>AMP advised that they were doing an internal master planning workshop in April to consider the expansion plans going forward. AMP advised that in the last two years there have obviously been changes in the worldwide funding opportunities and that, along with NZ's financial situation, may change the timing of redevelopment.</p> <ul style="list-style-type: none"><li>In the traffic report Beca prepared for AMP and Tauranga City Council, the timing was keyed to 2021 – in other words a 10-year time frame from the District Plan review, and then a further five year extension beyond that to 2026. They have had reports from § 9(2)(a) and § 9(2)(a) that advised Tauranga City on the potential impact of Bayfair expansion, and Mr § 9(2)(a) advised that it proved that the gross floor area was supportable in</li></ul>	

Item	Action
<p>that the local and regional roading hierarchy could accommodate the change.</p>	
<ul style="list-style-type: none"> <li>■ Mr s 9(2)(a) advised that after some research and discussions with s 9(2)(a), they have considered and implemented internal circulation changes – particularly to do with the Girven Road entry at the traffic lights and the entry/exit from the car parking building, and in their opinion it has produced an improvement on site.</li> </ul>	
<p><b>3 Future Expansion</b></p> <ul style="list-style-type: none"> <li>■ Mr s 9(2)(a) advised that there are various plans. There is potential expansion to the north and to the west and upstairs above the complex and also the addition of cinemas in the east. Lost car parking would possibly go on top of the western expansion. The additional land area that AMP now owns is in a northerly direction, exclusive of the Tauranga City reserve, and this takes its land holdings to within 10 titles of Concord Avenue.</li> <li>■ The Beca report for the District Plan Review advised the need to improve the existing Girven Road lights and having new Maunganui Road intersection with lights, but removing the existing right hand turn slip lane out onto Girven and the left in from Maunganui.</li> <li>■ Mr s 9(2)(a) advised that he hopes to confirm a preferred option for AMP's expansion of the Bayfair development by the end of this year.</li> </ul>	
<p><b>4 General</b></p> <ul style="list-style-type: none"> <li>■ Beca advised that by August they will hopefully have three options under detailed study.</li> <li>■ On the basis of the preliminary information provided today, AMP has concerns about the loss of the right-hand turn out to Girven and the loss of the Maunganui left in access. It has to be realised that the loss of these two access points will compound negatively on the site now, and more importantly, significantly when there is the expansion in gross floor area.</li> </ul>	
<p><b>5 Actions</b></p> <ul style="list-style-type: none"> <li>■ AMP would like a copy of the very, very draft concept plans that are under consideration at the moment (i.e. these plans have not had engineering design undertaken).</li> <li>■ It was agreed that a better quality set of plans would be available to AMP in August of the three preferred options.</li> <li>■ It was agreed that more frequent meetings rather than milestone meetings would be agreeable to all parties who wish to work collaboratively to achieve the best outcome for both organisations and it was suggested that the next one be in April.</li> </ul>	<p><b>Beca</b></p> <p><b>Beca</b></p> <p><b>All</b></p>

Minuted by: s 9(2)(a)

## Minutes of Meeting

### Maunganui Girven Intersection - Hapu Engagement (1)

Held 18 February 2011 at 8:30am - 9:30am

at Beca Harrington House Tauranga

<b>Present:</b>	§ 9(2)(a) [NT]	Ngai Tukairangi	
	§ 9(2)(a) [PI]	Ngati Tapu	
	Grieg Steven [GS]	NZTA	Project Manager
	§ 9(2)(a) [GO]	Beca	Job Manager
	§ 9(2)(a) [SR]	Beca	
<b>Apologies:</b>	Kevin Reid	NZTA	
	§ 9(2)(a)	Beca	
<b>Distribution:</b>	As Above		

Item	Action
<b>1 Introduction</b> <ul style="list-style-type: none"><li>SR – Karakia and mihi</li><li>All – introductions</li></ul>	
<b>2 Project Overview</b> <ul style="list-style-type: none"><li>GO – purpose of project is to address congestions at the Maunganui Girven intersection,<ul style="list-style-type: none"><li>TEL set to start construction to be completed by 2016</li><li>intersection important in keeping traffic moving</li><li>Studies have been done previously on the intersection</li></ul></li><li>PI – multiple problems, particularly with Owens Place and Bayfair Estate – elderly</li><li>GO – long-term solution projected through to 2031</li><li>NT – is traffic predicted to increase on TEL?</li><li>GS – Yes, Harbour Link as well</li><li>NT – have discussions started with Kiwi Rail?</li><li>GS – Yes, we need to understand issues and implications</li><li>NT – safety is a big issue at the intersection</li><li>PI – trains block Matapihi Road and traffic blocks the intersection</li><li>GS – we understand the issues – freight movements are predicted to increase</li><li>PI – Is traffic heavy enough to consider a flyover</li><li>GS – flyover was looked at in previous studies – traffic volumes are predicted</li></ul>	

to increase significantly

- NT – how much traffic will there be?
- GO – potentially 40,000 vpd
- NT – is the road capable of taking the traffic load
- GO – yes
- SR – what options are on the table
- GO – All options are on the table – flyover, signalised intersection, signalised roundabout
- PI – issues with Hairini signalised intersection
- GO – there are variations of options, change to network and realignment at Maunganui for Girven, need to consider visual impact of grade separation
- GS – Maunganui Giverven is a strategic freight route
- GO – need to consider provision for pedestrians and cyclists
- PI – flyover is a practical solution, need to consider airport air space
- SR – What are the future development aspirations of the Matapihi community?
- PI – currently 158 homes, increase to 500 homes by 2020
  - Community wish to maintain rural character
- NT issues with roading – not ablt to cater for the increase in population
- SR – need to get a copy of the Matapihi Landuse Plan
- GO – need to get a copy of plan for traffic modelling
- GO – scoping study to refine options
  - Project open day on 22 March – opportunity for public to participate
  - How do you want to be involved
- PI – need to consider other hapu – Ngati Kuku and Nga Potiki
  - Informing them of project
- SR – After open day, project team could present an overview of project to wider hapu at a hui a hapu
- PI – can discuss further and make arrangements
- GO – are there any sites of significance in the proposed development area?
- NT – Omanu urupa, possibly others around the site, but no known/identified sites will be impacted
- GO – Any stormwater issues
- NT – no
- GO – Golf-course drain is used for stormwater discharge – potential to increase
- NT – any reason for not connecting into Bayfair estate?
- GO – Unsure of capacity – need to investigate further

SR

### 3 Close

- Next meeting proposed for April
  - Possible agenda items

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<ul style="list-style-type: none"><li>- Feedback on open day</li><li>- Refinement of options</li><li>■ NT – karakia</li></ul>	
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Minuted by: s 9(2)(a) [REDACTED]

Released under the Official Information Act 1982



Appendix D

## Consultation Feedback

Released under the Official Information Act 1982

## Maunganui-Girven Intersection - Feedback Forms

Use of Intersection/Times per Week					Purpose of Travel	Comments	Important in Area	Constraints to Design	Feel about Project			Email Updates	How did you hear about Open Day?	What did you find most useful today?	Comments?
Car	Bus	Walk	Bike	Other					-ve	0	+ve				
5	2	1/mth	1		Work, shopping, gym	Scary in car. Bus takes risks.	Safety	Financial		✓	✓		Newsletter	Info posters Discussion with team	
7-10					Shopping, visiting	Roundabout very dangerous. Lights urgently needed and flyover ASAP							Newsletter	Constraints mapping Discussion	Urgently required
14					Work, Bayfair		Smooth flowing traffic Safety Flyover exc.				✓	s 9(2)(a)	Other Newspaper	All	Informative, friendly approachable engineers & planners
14					Bayfair, home, visiting	Very dangerous	Safety				✓	s 9(2)(a)	Newsletter Newspaper	Info posters	
14+		✓			Anywhere – live in Russley Drive	Another exit from Matapihi Road needed							Newsletter		
7		7			Home – live in Bayfair Estate Underpass very useful	Going to town/Bayfair/shopping					Very ✓	s 9(2)(a)	Newsletter	Info posters Discussion Feedback form	Ex roading manager Whakatane DC. Happy to provide feedback/other info.
✓					Home, visitors, friends, shopping, to Welcome Bay		Safety and confidence. Taking life in hands sometimes				✓	s 9(2)(a)	Newsletter Radio	Constraints mapping Discussion Feedback form	
20+					Mount to Tauranga	Make something happen soon					✓		Newspaper	Info posters Constraints mapping	Flyover for Girven – Matapihi & rail xing, underpass for Mt to Te Maunga
15-20					Bayfair, town, industrial	Roundabout dangerous. Heavy traffic from Port. Overpass needed to flow down SH2. Congestion denies residents emergency escape route	Safety. Getting to & from home. Emergency egress	Cost. Do it once, right & now.			✓	s 9(2)(a)	Newspaper	Discussion	Congestion affects quality of life for residents – needs urgent resolution. Dangerous.
2	1	✓			Shopping, commuting,		Rapid egress from shore Shopping To Te Puke				✓	s 9(2)(a)	Newsletter		Good luck
5				2	Bayfair, exercise, work	Cut down traffic rail crossings					✓	s 9(2)(a)	Newsletter	Info posters Discussion	
30+		✓			School, shopping, sports	Flyover and another Matapihi exit. Road closure meant unable to get children after school	Safety Rail signal arms fail often. Left from Matapihi to go to Bayfair rather than straight through				✓		Newsletter	Discussion	
5				6	Business & shopping	Flyover, keep heavy traffic moving. Accidents	Work, shopping				✓		Newsletter	Info posters Constraints	

Use of Intersection/Times per Week					Purpose of Travel	Comments	Important in Area	Constraints to Design	Feel about Project			Email Updates	How did you hear about Open Day?	What did you find most useful today?	Comments?
Car	Bus	Walk	Bike	Other					-ve	0	+ve				
						cause whole area to halt							Newspaper	mapping Discussion	
14	12				Work, home. Drive coach return to Rotorua	Flyover	Safety	Noise Disruption			✓		Newspaper	Constraints Feedback	Majority around area would like a flyover
4-6					Shops, sport, to anywhere	Dangerous	Safety				✓		Newsletter		Do something soon
10+					Work/Tauranga CBD		Good traffic flow	Rail line Population growth at Bayfair & between Girven & Domain Roads			✓	s 9(2)(a)	Newspaper NZTA site	Discussion	
7	Sev eral	✓	✓		Bayfair, Tauranga, Mt	Put in road from McDonald St via railway reserve to Baypark	Walk to Bayfair from Russley. Intimidating louts in underpass						Newsletter		
10					Shopping	Bikes should be banned. Flyover from Baypark to Concord & smaller roundabout or lights							Newsletter		
12					To Hewletts Road & Mount		Not wasting time & petrol queuing at roundabout	Cost. How long solutions would last			✓	s 9(2)(a)	Newsletter	Info posters Discussion	Exc to have opportunity to attend, see proposals & talk to staff. Thank you
7		✓			Work, shopping	Traffic lights essential. Policing right-turners in left lane from Girven	Trying to get to work without sitting wasting petrol								
14					Bayfair, Mount, Tauranga, Papamoa	Traffic very heavy most of day. Long wait to get out of Matapihi	Getting to destination without many delays				✓		Newsletter	Info posters Discussion	Traffic lights quickest & best solution. Don't want to wait for years
14			✓		Work		Going to work					s 9(2)(a)	Newsletter	Discussion	
6	1	6			Bayfair, Tauranga, Papamoa Mount	Choices – 1 Flyover, 2 traffic lights, 3 underground rail	Ease of access				✓	s 9(2)(a)	Newsletter	Info posters Constraints mapping Feedback form	
10-12		6			Meetings, shopping, pleasure	Held up by long log trains. Redirect rail across golf course & come out around Concord Ave	Underpass from Girven Road to Bayfair				✓	s 9(2)(a)	Newsletter	Info posters Constraints mapping	Good presentation. Team most helpful in answering questions
25+	2	2	1		Bayfair, gym (Baywave), business, swimming, school, Owens Place	Dangerous. Train congestion bad. Peak times nightmare. Concord/Maunganui closure causes more congestion at roundabout and side streets.	Getting kids to Baywave; getting to gym; speedway; Papamoa; work				✓		Newsletter	Constraints mapping Discussion Feedback form	Noise of engine braking of trucks of major concern. Wish to discuss further please. Have previously approached departments but no real response.
✓					Work, shopping	Lengthy queues, heavy traffic	Safety, slower traffic speed	Railway line, physical, ownership of surrounding land			✓		Newspaper	Info posters Discussion	
16+		6+			Work, leisure, exercise		Arriving at destination without accident at this roundabout				✓	s 9(2)(a)	Newsletter		Too late. Need something now. Cars in left lane on Girven turning right. Signage now saying no

Use of Intersection/Times per Week					Purpose of Travel	Comments	Important in Area	Constraints to Design	Feel about Project			Email Updates	How did you hear about Open Day?	What did you find most useful today?	Comments?	
Car	Bus	Walk	Bike	Other					-ve	0	+ve					
															right turn in this lane.	
14					Work, school, sports	Access/egress from Bayfair horrific. Girven Road traffic using 2 lanes to get to Mount. Death trap	Getting through roundabout without accident			✓			Newspaper	Info posters Discussion		
30				20	To/from work, working	Overbridge only option	Safety									
8-10					Golf Club & Owens Place	Right turning from Girven to Mt using left lane. Lots more accidents if wait till 2016. Overbridge and lights long term				✓			Newspaper	Discussion Feedback form	People listened. Another exit from Matapihi so accessible in emergencies if train passing. Baypark or golf course boundary to McDonald Street	
4	2	1			Tauranga, Mount, Bayfair Estate	Peak traffic slow.	Patience and safety									
14					Work, sports, shopping	Right turn Girven to roundabout needs to be two lanes. Left lane goes left, straight & right. Need safer Matapihi exit	Getting to and from work easily in decent time frame	Railway line			✓	s 9(2)(a)	Radio		Improvement/ease of flow bonus.	
3-4					Shopping, work	Many cars turn into Girven to go to Papamoa. Another Papamoa access is needed.	Keeping out of way of mad men on roads	Many elderly/disabled crossing Girven Road – need more safety from cars					s 9(2)(a)	Newspaper	Discussion Being able to put comments on map	
✓					General, Matapihi resident	Traffic and difficulty leaving Matapihi increasing. Left lane from Girven traffic turning right into Maunganui rather than to Matapihi.							Newsletter Radio			
16-20+		2-6	2-10		Work, elsewhere, exercise	Difficult to exist Matapihi between 7.30 and 9am	Roundabout only access to Bayfair Estate. Safety			✓			s 9(2)(a)	Newsletter Word of mouth Newspaper	Constraints mapping Discussion	
3		✓	2		Tauranga/Mount, exercise	Speed and disregard of road rules by other drivers	Safety	Physical Environmental			✓		Newsletter Newspaper	All		
10-30					Work, shopping, general	Bottleneck on Girven with traffic exiting Bayfair. From Mt to Girven difficult to get into right-turn lane into Gloucester.				✓			s 9(2)(a)	Newspaper	Constraints mapping Discussion	Thanks for process.
4-5					Bayfair, town	Railway line is problem – stops traffic flow					✓		Newsletter	Info posters Discussion		
20		✓			Work, shopping		Safety. Left lane being used for right turns out of Girven. Very dangerous for those coming from Matapihi. Signage needed. Road signs hidden by vehicles.				✓		Newsletter	Info posters Feedback form		

Use of Intersection/Times per Week					Purpose of Travel	Comments	Important in Area	Constraints to Design	Feel about Project			Email Updates	How did you hear about Open Day?	What did you find most useful today?	Comments?
Car	Bus	Walk	Bike	Other					-ve	0	+ve				
10					Mount, Bayfair, Tauranga		Patience	Railway line & Matapihi Rd crossing			✓	s 9(2)(a)	Newsletter Newspaper	Discussion	Bayfair Estate resident. Need traffic lights. Railway crossing a problem.
2		1			Tauranga, Mount, Bayfair	Heavier road use with increasing logging industry and population	Safety	Visual (overbridges unslightly)			✓	s 9(2)(a)	Newsletter	Discussion	Traffic lights helpful on larger roundabout
15			3		Bayfair, beach, Mt	Overpass preferred but still want pedestrian underpass	Safety No delays				✓		Newsletter	Info posters Discussion	
14+					Work, home	Four-lane flyover would improve access for emergency vehicles	Improved traffic flow	Budget			✓	s 9(2)(a)	Newspaper Radio	Discussion	Go for it!
5		2	1		Bayfair, work, home, exercise		Safety	Railway line. Can't set timing for lights when trains are frequent			✓	s 9(2)(a)	Newsletter	Discussion	
						Reroute railway back to original. Could provide 3 north & 3 south lanes.-									
7		7	7		Bayfair, town	Traffic increasing daily.	Minimising stress	None			✓	s 9(2)(a)	Newsletter	Discussion	Project is urgent
2	1				Shopping		Take out railway crossing, put rail yards in Tauranga. POT to build Tga/Mt bridge.								Port to become branch & cut out rail line from Port to Te Maunga. No crossing Totara Street.
10					Work/home		Not sitting in queue wasting fuel	Train line			✓		Newspaper	Discussion	
14		✓			Mount, Bayfair										
14		✓			Anywhere, Matapihi resident		Flyover needed						Newsletter	Info posters	
14			7		Bayfair, city	Cannot get in/out of Matapihi Road if blocked by accident. Should be taken into consideration.	Like free flow	Only 1 entrance to Matapihi Road. Need other access for emergencies			✓		Newsletter	Info posters Feedback form	Cycling provisions are adequate
2	1				Bayfair, shopping		Only entrance/ exit to Matapihi. Dangerous				✓		Newspaper	Info posters Discussion	
12					General	Retired, so don't use at peak times. Drivers could avoid intersection and use other roads	Allow extra time or use alternative roads	No traffic lights		✓		s 9(2)(a)	Newsletter	Info posters Constraints maps Feedback forms	If it ain't broke – don't try and fix it. Not much problem at present. Accidents & fatalities minimal. Can't legislate against stupidity, which causes most accidents.
14	2	1	1		Bayfair, work, Mount, Tauranga, visiting	Removal all straight through SH traffic.	Going anywhere	Funding – lowest cost may not be best option.			✓		Newsletter Newspaper		Flyover good option – also provides a strong, high point in case of tsunami
14		3	2		Work, exercise	Trains are problem if heading south and turning right to Matapihi	Flyover from Te Puke to Mount						Newsletter	Discussion	

Use of Intersection/Times per Week					Purpose of Travel	Comments	Important in Area	Constraints to Design	Feel about Project			Email Updates	How did you hear about Open Day?	What did you find most useful today?	Comments?
Car	Bus	Walk	Bike	Other					-ve	0	+ve				
30			6		Commuting, recreation	Footpath-underpass not linked. Very small gap separation required. Trucks from Owens Place create backlog. Internal queue in Owens car park.		Relocation of rail			✓	s 9(2)(a)	Newsletter		Grade separation – underpass
20+					Shopping, Mount, Tauranga		Shopping Owens Place, travel to Mount & Tauranga	None					Newsletter	Info posters Discussion	Install traffic lights immediately while decision being made
10+	4	2	3		Mount, Tauranga, Matapihi, Owens Place, fitness	Overpass is a must. Pleased planning is happening	Safety Minimal delays				✓	s 9(2)(a)	Newsletter Newspaper	Info posters Discussion Feedback form	
8	5	4	2		Mount, Tauranga, fitness		Safety								
10				20	Work, sports	Overpass would solve problems	Dangerous for all users	Rail			✓	s 9(2)(a)	Word of mouth Other	Info posters Constraints mapping Feedback form Others	
14					Mount, Tauranga, marae		Safety. No other roads out. Crossing hazardous	Rail crossing. Matapihi residents want it gone. Flyover or tunnel engineers' call			✓		Newsletter Newspaper Radio	Discussion	Updates to Joe Briggs, 234 Matapihi road, RD5, Tauranga 3175. 07 578 5997
2					Bayfair, Papamoa	Retired, can choose to travel times outside peaks		Delaying tactics should not prevent completion of essential projects			✓		Newspaper	All	Well organised open day. Mrs Ralph efficient & friendly. Engineers well presented, easily approachable & credit to Beca & all those involved. Venue was ideal.
18					Bayfair, gym, entertainment		Getting places on time. Avoids peak times.	Overpass preferred. No underpass – high water table. No lights – wouldn't work in power failure.			✓		Newsletter Newspaper	Info posters Discussion Feedback form	In case of civil defence emergency Bayfair/Matapihi residents wouldn't be able to get out. Overpass best option.
14+		2			Messages, interests, sports	Concerned about existing Matapihi if rail line blocked	Safety				✓		Newsletter	Discussion	
11					Bayfair, Papamoa, Mount		Safety				✓	s 9(2)(a)	Newsletter	Discussion	Flyover best long term
25					Shopping, visiting, medical		Safety. Traffic lights cheapest? Can't afford fly-overs & tunnels on rates	Railway crossing			✓	s 9(2)(a)	Newsletter	Discussion Feedback form	Approaching traffic too fast. Change speed limit to 50k
3		1			Shopping		Safety. No delays				✓	s 9(2)(a)	Newsletter	Info posters Constraints mapping Discussion	Support overpass on Maunganui Rd with exit ramps for Owens Place & Girven. 4-lane overpass for future

Use of Intersection/Times per Week					Purpose of Travel	Comments	Important in Area	Constraints to Design	Feel about Project			Email Updates	How did you hear about Open Day?	What did you find most useful today?	Comments?
Car	Bus	Walk	Bike	Other					-ve	0	+ve				
14		6			Shopping, exercise, general	Don't use in peak times	Safety. Extreme vigilance always.	Financial. Nothing insurmountable.			✓		Newsletter	Feedback form	Hard to digest info. because of crowd. Larger venue next time.
2			4		Bayfair, doctor, church		Safety				✓	s 9(2)(a)	Newsletter	Constraints mapping Discussion	Flyover at Hewletts should also work on Girven. Leave underpass.
14		2			Work, shopping		Get over railway lines safely. Risk lives daily to travel through roundabout. Area has become very dangerous				✓		Newsletter Newspaper		Like to see traffic lights and road layout similar to Welcome Bay. Fix or consequence is loss of life.
3		✓			Golf, shopping	Nervous using roundabout and try to avoid it. Sometimes park at Bayfair and use walkway.	Choose travel times. Use back streets to get to Mount shops.	Elderly and so try not to use main roads at busy times.			✓		Newspaper	Info posters Discussion	Traffic lights as at Welcome Bay. Trains cause traffic to bank up. Widen left-hand lane to make 3 lanes for south-bound traffic. Right-hand turn a flyover may help.
10-12					Work, clubs, shopping		Difficult existing Marlin Street at peak times. Traffic through lights and beyond St John's. Traffic uses Marlin-Farm Street to bypass roundabout in afternoons.	None. Get it fixed ASAP			✓		Newsletter Newspaper	Info posters Constraints mapping Discussion	Flyover should take 60-70% out of area as going north and south. Traffic lights on roundabout could control other traffic esp. when train passing.
✓	✓	✓			Tauranga or north, meetings, Mount	Should be hashed in roundabout (no stopping) so traffic can still use when train passing.	Main access to and from north	Lack of consideration of some drivers			✓	s 9(2)(a)	Newsletter Newspaper	Info posters Constraints mapping Discussion Others	Other ongoing projects/ planned projects/maps. Little mention of Sandhurst over-bridge on SH2 on roundabout traffic flow.
5	3	1	1		Tauranga or Mount, Owens Place	Want to see vast improvement. Long term solution is flyover with lights on existing roundabout. Short-term, lights would help.	Ease of traffic movement.	Railway line. Add to or improve current walkway and signage to advise of existing walkway.			✓	s 9(2)(a)	Newsletter	All	Would have helped to see thoughts and proposals of project planners.
12-15					Business, pleasure	What happened to Matapihi Road junction? Get your act together.	Everything	Railway line	✓				Newsletter	Feedback form	Live on Bayfair Estate, so have to give way to Girven and Te Maunga traffic. Major accident at junctions means no access. More thought needs to go in t this.
5							Safety				✓		Newsletter	Info posters Discussion	Two lane flyover

Use of Intersection/Times per Week					Purpose of Travel	Comments	Important in Area	Constraints to Design	Feel about Project			Email Updates	How did you hear about Open Day?	What did you find most useful today?	Comments?
Car	Bus	Walk	Bike	Other					-ve	0	+ve				
6		2	1		Bayfair or Mount, exercise	Bayfair Estate resident. Underpass for pedestrians a god send.	Safety. Road rules don't apply "see gap and go for it". Trucks having to stop for impatient motorists has caused it to become highly dangerous. Elderly motorists avoid peak times or leave cars in Owens Place and use underpass.	Light traffic tunnel under rail from Owens Place to Bayfair lights on Girven leaves main road and rail free. Heavy trucks should need to stop. Matapihi needs feeder road in case of disasters. If rail from Tga in correct alignment it would solve some issues.			✓	s 9(2)(a)	Newsletter Newspaper	Info posters Discussion Feedback form	No overpass like Hewletts. Have heavy trucks & trains unimpeded. Number of level crossing in Tga and Mount a scandal for amount of traffic. Eliminate them when opportunity arises.
✓		✓		✓	Shopping and work, commercial deliveries to Home Zone.	Own Home Zone retail centre.	Visibility of Home Zone for shoppers from SH2/Girven. Ease of access to Matapihi Road.	Railway needs to be relocated. Alternative land awaits it.			✓	s 9(2)(a)	Word of mouth	Discussion Feedback form	Critical to preserve visibility and easy access. Relocation of rail would improve safety and improve traffic flow.
20-25					Bayfair, Owens Place, Tara, Mt Maunganui	Intersection not performing esp. peak periods. Upgrade is required.	Safety. Drivers become impatient. Speed a problem.	Lights short-term solution. Overpasses long-term. Maunganui Rd should be priority.				s 9(2)(a)	Newsletter	Info posters Constraint smapping	Alternative use models showing possibilities and indication of relative costs between design alternatives.

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## Constraints Mapping

Girven Road – roundabout. Left lane should be left turn, straight and right turn. Right lane should be right turn only.

Double lane roundabout, people don't know how to use it. They cross across the lanes.

Something needs to be done urgently. Traffic lights safest and quickest remedy.

Need 2-lane over bridge from Mount Maunganui towards Te Puke.

Queues of traffic due to trains.

Concerns over cars using left hand lane on Girven and turning right to Mount. Affects Matapihi users – uncertain if they going straight through or turning. Existing problem. Any short term fix. Long term, north-south over bridge.

Flyover with off-ramps to access the four roads. Very costly. Traffic will increase over next decade – plan for the future!

Flyover north-south like at Golf Road. Leave roundabout as is.

Overpass for through-traffic along Maunganui Road would improve flow and safety. Pedestrian underpass great

Flyover at Girven Road and new access road to Maranui road. Girven too busy for pedestrians to cross safely – particularly for elderly.

Maunganui pedestrian underground walkway preferred – concern over train crossing.

No controlled intersection – endless engine braking issues with trucks. Noise at night, all night shocking.

Lights in short-term, over bridge eventually. Only way out from Matapihi is via roundabout.

Lights first then flyover

Underpass under main road for lighter traffic and rail. Allows port traffic straight through without stopping. Feeder lanes if possible.

Flyover open at same time as TEL. Lights with step roads on each **O**.

Lane flyover to keep traffic flowing

Flyover and lights on roundabout. Cost no problem.

Flyover for SH2 traffic. Matapihi and Girven Roads level crossing with slip lanes onto SH2.

Two-lane flyover for Maunganui Rd traffic. All other traffic uses roundabout.

Flyover a must for through-traffic. Leave roundabout for local traffic.

Underpass preferred to at-grade.

Maunganui underpass with overhead pedestrians preferred.

Trucks speed approaching roundabout and others have to give way. Reduce speed.

Support flyover.

Matapihi traffic parks at Owens and walk to Bayfair. Prefer underpass to at-grade crossing. Prefer public meeting for easier discussion. Traffic lights in interim.

Concerned only one road from Matapihi. Can railway corridor be used? Or Matapihi under railway to north.

Lower railway line and put in lights.

Two-lane flyover.

Do not consider widening Girven (used as a through road to Maranui).

Underground pedestrian crossing preferred.

Make left lane left turn only.

Overpass from Girven to Matapihi. Te Maunga Mount traffic underneath.

Extend roundabout and install lights.

Re-route railway to new corridor, rejoining existing past Te Maunga.

Underground railway line.

Traffic on roundabout stops when railway barrier is down.

Trucks block pedestrian access on Owens Place.

Only one access to Matapihi.

Retain pedestrian underpass.

Temporary option – provide left turn lane.

Left slip from Matapihi Road.

Extend underpass under rail line.

Underpass poorly sign posted.

Left slip road into Girven Road.

Flyover for main highway traffic from Hewletts to new bypass.

Make extra left-turning lane for traffic on main highway.

Right turn out is very tight.

Traffic lights for safety. Flyover like Hewletts would be better for travel to Tauranga.

Need free left hand turn.

Flyover – high ground in case of tsunami.

Morning people both lanes from Girven turn right to Mount.

Left slip lanes on all quadrants.

Cars on Maunganui don't stop for flashing lights on railway crossing.

Pedestrian safety issue with people existing underpass at railway going towards Liquor Land. Speed differences – 70kph Maunganui, 50kph Matapihi.

Cycle path north to MacDonald Street.

Ban right turn from Bayfair (come out at Gloucester). Ban left turn in. Needs better control.

Overpass to Te Puke and Mount.

Overpass on main road. Lights only temporary.

Use old rail track Tga side at Matapihi to fertiliser works removes crossing at Matapihi. Three southbound lanes – 1 service, 1 south, 1 for right turn to SH29.

Girven – Matapihi underpass with ramps at surface.

Traffic from Mount on Maunganui into Matapihi other side of fish shop.

Safety concern with only one access to Matapihi.

Use of both lanes in Girven to turn right to Mount is dangerous. Route security in Matapihi.

Overpass north – south on Maunganui. Lifts on Girven and Matapihi.

Free left turns at roundabout.

Separate service lane for properties on Maunganui Road.

Better bus services needed.

“Being in when going around the roundabout needs more supervision”.?????

Lights in the interim and overpass or underpass later. Keep pedestrian underpass.

Shift railway line.

Right turning traffic in left lane Girven to Maunganui dangerous.

Restraint to access Omanu Golf Club. Overbridge each side (rather than centre) of north-south traffic.

Flyover Mount to Te Maunga. Underpass Girven-Matapihi.

Trains hold up traffic and resultant queues block roundabout.

Tunnel to go under railway.

Another exit for Bayfair Estate needed.

Potentially reduces connectivity from Papamoa to reserve on Matapihi.

Internal queue to carpark at Owens Place.

Use railway designation to provide alternate access to Matapihi.

Traffic overpass, rail underpass.

Traffic exiting Bayfair causes delays as they merge – block off traffic on Girven.

Nowhere for cyclists from Te Maunga – road narrows at roundabout.

Flyover at roundabout.

Long queues at peak times in all areas.

Flyover.

Access right into Exeter Street.

Left-hand turn lane from Matapihi to Maunganui should be left turn only.

Tsunami evacuation compromised by limited exits. Gloucester & Grenada not connected. High numbers of heavy traffic. Concern over train collision with Matapihi users.

Safe pedestrian crossing points needed – subway not safe, esp. at night.

Matapihi/Girven flyover may block visibility of commercial properties and Home Zone businesses.

Girven to Mount traffic uses both lanes to turn right.

Entrance to Owens Place further from Maunganui Road.

Flyover similar to Hewletts Road. Third lane from Maunganui to Girven would speed traffic up.

Lanes for the Papamoa cars/people in case of civil emergency.

Flyover. Keep heavy traffic flowing.

More access onto State highway from Papamoa in case of emergency.

Short-term, lights. Long-term underpass. Third – overhead bridge (not attractive). Fourth – shift railway line behind Owens Place to Concord.

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Need road to Papamoia Beach Road from Baypark stadium roundabout.

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Are we just moving problem to Te Maunga?

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## Emails/Letters/Phone calls

Name	Address	Email	Phone	
§ 9(2)(a)	§ 9(2)(a)		§ 9(2)(a)	Letters. Remove roundabout, install lights now.
§ 9(2)(a)		§ 9(2)(a)	§ 9(2)(a)	<ul style="list-style-type: none"> <li>■ People avoid Owens Place because of roundabout</li> <li>■ Dangerous – number of heavy vehicles, speed, using wrong lanes, railway line.</li> <li>■ SH29 traffic to Papamoa has to go through roundabout. TEL solves this?</li> <li>■ TEL should have off-ramp at Bruce Road linking with Gravatt (via Novelle).</li> <li>■ Short-term solution lights.</li> </ul>
§ 9(2)(a)	§ 9(2)(a)		§ 9(2)(a)	Phone call to Greig Stephen <ul style="list-style-type: none"> <li>■ Concerned about bottleneck moving to Te Maunga roundabout if MGI has flyover.</li> </ul>
§ 9(2)(a)		§ 9(2)(a)		<ul style="list-style-type: none"> <li>■ With commercial/industrial development @ Owens Place, Rangiuuru intersection traffic increasing.</li> <li>■ Roundabout cyclists' nightmare.</li> <li>■ Move railway from Te Maunganui to behind Owens Place properties. Frees up large area of land to resolve intersection &amp; provides space for north-south Maunganui Road flyover.</li> <li>■ Provide new free turn left lane Maunganui to Matapihi.</li> <li>■ Move underpass entrance to west of railway line. This can then be used for free turn north from Matapihi.</li> <li>■ Free left turn Maunganui to Girven.</li> <li>■ Purchase properties south of Girven/Maunganui corner for free left Girven to Maunganui and space for flyover.</li> </ul>

Name	Address	Email	Phone	
§ 9(2)(a)	§ 9(2)(a)	§ 9(2)(a)		<ul style="list-style-type: none"> <li>■ Scary. Owens to Girven trickiest action, into Owens difficult too.</li> <li>■ Safety has to be highest priority.</li> </ul>
§ 9(2)(a)			§ 9(2)(a) § 9(2)(a)	<ul style="list-style-type: none"> <li>■ Only one way to northern end of Papamoa via Girven Road.</li> </ul>
§ 9(2)(a)		§ 9(2)(a)		<ul style="list-style-type: none"> <li>■ Use roundabout daily, frequent accidents.</li> <li>■ Flyover or tunnel to keep traffic flowing preferred to lights.</li> </ul>
§ 9(2)(a)		§ 9(2)(a)	§ 9(2)(a)	<ul style="list-style-type: none"> <li>■ Use intersection daily.</li> <li>■ Traffic in left lane of Girven turns right into Maunganui. More lanes to separate turning traffic?</li> <li>■ Traffic lights</li> <li>■ Change train timetables to avoid peak traffic?</li> <li>■ Would flyover on Maunganu over Girven &amp; Matapihi solve congestion?</li> <li>■ Over-bridge for pedestrians.</li> </ul>
§ 9(2)(a)		§ 9(2)(a)		<ul style="list-style-type: none"> <li>■</li> </ul>
				<ul style="list-style-type: none"> <li>■</li> </ul>

Consultation Report

# MGI - Te Maunga Intersection Improvement Consultation Report 2013

Prepared for NZTA

By Beca Ltd (Beca)

1 July 2013

Released under the Official Information Act 1982

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## Revision History

Revision N°	Prepared By	Description	Date
A	s 9(2)(a)	Draft for Internal Review	11/06/2013
B	s 9(2)(a)	Draft for Client Review	1/07/2013
C	s 9(2)(a)	Final	1/07/2013

## Document Acceptance

Action	Name	Signed	Date
Prepared by	s 9(2)(a)		
Reviewed by	s 9(2)(a)		
Approved by	s 9(2)(a)		
on behalf of	Beca Ltd		



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## Appendices

**Appendix A - Consultation Plan**

**Appendix B - Newsletter**

**Appendix C - Meeting Minutes**

**Appendix D - Summary of Public Feedback**

## 1 Introduction

This report documents the feedback gained in the Scheme Assessment stage of the SH2 Maunganui-Girven Road and Te Maunga Intersection Improvement investigation. Consultation has been undertaken in accordance with the Consultation Plan for the project, which is attached as Appendix A.

An initial round of consultation was undertaken between January 2013 and April 2013 to introduce the project and gain information on the issues and opportunities that the study area presents. It included:

- Personal meetings (i.e. one to one) with key stakeholders and directly affected landowners;
- Hui with Ngaiterangi Iwi, Ngai Tukairangi hapu, Ngati Tapu hapu and Nga Potiki hapu.
- A public newsletter dated April 2013 advising of the Open Day and progress on the project investigation. A copy of this newsletter is attached as Appendix B; and
- An information open day was held on the 18<sup>th</sup> April 2013 where the wider community were invited to attend and provide feedback on the project.
- Meeting with key stakeholders group, railway lessees group and service providers.

## 2 Consultation Feedback

### 2.1 Key Stakeholder Organisations

The key stakeholder organisations consulted on the project to date are detailed in the following table:

Key Stakeholder Organisations	
KiwiRail	Automobile Association
Heavy Haulage	Road Transport Authority
Tauranga Airport Authority	Owens Place Retail Representative
Omanu Golf Club	Port of Tauranga
Cycle Action Centre	Tauranga Motorcycle Club
BOPRC Transport	Go Bus Transport Ltd

A key stakeholders meeting was held 16<sup>th</sup> April 2013 at Beca offices. The purpose of the consultation meeting with key stakeholders was to receive technical feedback for each of the options presented based on the knowledge the respective groups have in the area.

It was highlighted that given the predicted increase in Port and heavy vehicle movements consideration for over-height/oversize loads must be taken into account in the design of the options especially in regards to barriers and alternative routes on side roads. Heavy Haulage and Road Transport Authority representatives indicated that Option 3 was their preferred option as it removed the impact of the railway on all state highway traffic and it provided an alternative route from Owens Place. Meeting minutes are included in Appendix C.

## 2.2 Tangata Whenua

There has been early hui with hapu since 2011 which involved review of proposed MGI options and consideration of wider corridor effects. Early hui proposed the approach of a combined hapu hui going forward for the project (hui minutes attached in Appendix C).

Recently a combined hapu hui was held (10 April 2013) with Ngai Tukairangi, Ngati Tapu and Nga Potiki who are the hapu with an interest in the investigation area. The details of the meeting are contained in Appendix C and are summarised below.

Hapu indicated that the split pedestrian crossing with the underpass and signalised crossing would be preferred rather than an underpass alone. One hapu expressed the opinion that the flyovers have poor aesthetic value and hapu queried whether underground options had been investigated. Time frames for the proposed works were sought from hapu.

There is a need to keep Ngaiterangi Iwi, Ngati Kuku and Nga Potiki informed of the project.

Another hapu hui was held 22 May 2013 – meeting minutes attached in Appendix C. Hapu indicated that an advisory group similar to TEL be formed to develop protocols, prepare a CIA to assess cultural impacts of the project and involvement in earthworks and geo-tech monitoring.

## 2.3 Service Providers

Service providers were contacted seeking feedback on the proposed options and the impact that they may have on existing and/or proposed services in the area. Consultation is being undertaken on an individual basis due to the difficulty in getting them together at once. Feedback from service providers is attached in Appendix C and is summarised below.

FX Network: FX cables are located along entire length of the current rail corridor adjacent to SH2 and along Girven Rd to Baywave. FX have an agreement with KiwiRail to locate cables within corridor, therefore FX will relocate cables into the new corridor if the rail is relocated. Existing cable along Girven will either need to be relocated or protected.

Transfield Services: Transfield services are generally located on the northside of SH2 and eastern side of Girven Road/Matapihi Road. It was noted that the jointing manhole located at SH2/Girven will likely be located within new pavement. Relocation of this manhole will have a significant effect on connecting cables and a decision is required if it can remain. It was noted that the cables could possibly be slewed across into a new trench otherwise they would need to be overlaid.

Vector Gas: Vector Gas has network to protect/realign during the course of the proposed project. Where the network is affected by the proposed flyover construction/carrageway, realignment of the gas network would be moved to a designated corridor. The redundant network will remain in situ for removal by others.

The bulk service asset (I.P. Steel) would not require relocation as long as pile placement is strategically reviewed and the pipeline remains unhindered. The Steel network could remain in situ as long as the minimum clearances and cover standards are met with regards to finished levels in accordance to Vector Gas Codes (NZS 5258) and Council requirements. *A meeting is to be held on the 26/06/2013 (minutes attached in Appendix C).*

Vodafone: The proposed road works will not affect the Vodafone site located at the western end of Titoki Place; however, the alternative railway line will run close to the site. Plans were received of the potentially affected Vodafone site.

Transpower: A high level response application form has been sent to Transpower as the pylons within the alternative rail corridor will be affected.

Tauranga City Council: On-going meetings are being held with TCC regarding stormwater, water supply and sewer.

Powerco/ Northpower: *meeting to be held on the 25/06/2013 (minutes attached in Appendix C).*

## 2.4 Directly Affected Landowners

Potentially directly affected landowners and occupiers located along Maunganui Road and Girven Road and Liftan Place/ Matapihi residents not directly affected but in close proximity to the railway line were sent a personal letter and individual meetings were held prior to the public Open Day. The personal meetings were conducted with landowners who are directly adjacent to the alternative rail corridor.

Maunganui Road Landowners: There was a mixed response from landowners regarding land required for Option 1 versus relocating the railway line in Options 2 and 3. Some preferred to be bought out rather than be left living with the adverse effects of the flyovers within close proximity to their property. Other landowners were upset that their properties would be lost and queried the fairness of Public Works Act process should they be required go through that process.

Girven Road Landowners: A mix of commercial and residential properties are located along Girven Road. In all three options, the property frontages will be required for road widening. The main expression of concern was loss of car parking at 8 Girven Road (AMI Insurance) and business operations would be severely restricted.

Owens Place KiwiRail Lessees: A meeting was held with KiwiRail lessees 30 May 2013 at Beca Offices (minutes attached in Appendix C). The lessees agreed that the railway line should be relocated no matter which option is chosen. Concern was expressed at the reduction in usable land. Consideration of B-trains servicing the commercial properties along Owens Place is essential for some businesses. An alternative access route was raised – left in/left out at the end of Titoki Place onto Maunganui Road to create a loop circuit for B-trains and delivery vehicles for Owens Place commercial properties.

Matapihi/ Liftan Place Landowners: Residents indicated that when they purchased the properties they were aware of the alternative railway line corridor. Widespread concern was expressed around the noise and vibration effects the train movements would have in their lives and the adequacy of any mitigation measures proposed.

## 2.5 Public Feedback

A public Open Day was held on 18<sup>th</sup> April 2013 at the ASB Arena, Baypark, Mount Maunganui.

The sign-in forms indicate that at least 365 attended the Open Day. Written feedback was received from 143 people. A significant portion of attendees were local residents, particularly from Matapihi/Bayfair Estate (36%) and from within the immediate vicinity between Concord Avenue, Girven Road and Maranui vicinity (31%). Papamoa attendees made up 11% while others from Mount Maunganui and Tauranga made up 10%. The remaining 12% did not provide address details.

Further feedback was also received through telephone conversations and emails.

The feedback received is summarised in Appendix D and reported below.

### Intersection Use (Feedback Point 1)

Of the 143 respondents 92% use the intersection by car, 38% as pedestrians, 11% by bus and 10% by bike. The majority of respondents (86%) travel through the intersection via side roads (i.e. from Girven Road or Matapihi), while 29% travel straight through from further afield. A number responded that they travel straight through and use side roads.

### Opinion of the Options (Feedback Points 2, 3 and 4)

**Option 1:** The respondents that provided comment on Option 1 (113) made comments predominantly in the following four main themes or categories;

- It is the least disruptive option that provides an immediate improvement to traffic congestion over the current situation and is a good option for Bayfair Estate residents as it keeps the rail corridor away from residential properties (approximately 20% of respondents that commented).
- The option requires substantial housing purchase and displacement of residents along Maunganui Road and affects Maunganui Rd, Exeter St and Eversham Street residents and is socially disruptive (approximately 14% of respondents that commented).
- The option is a short term solution only and does not provide a long term solution for the predicted growth, it is not adequate for the future traffic volumes and is considered a waste of money (approximately 27% of respondents that commented).
- The option does not address the rail crossing issues at MGI intersection both in terms of safety and traffic congestion with the predicted increase in rail movements (approximately 28% of respondents that commented).

**Option 2:** The respondents who commented on Option 2 (107) made reference to the following main points/themes;

- Considers that Option 2 is better than Option 1 in terms of traffic flow but still needs consideration to allow future proofing for population growth (approximately 36% of respondents that commented).
- Approximately 28% of respondents that commented considered that the relocation of the railway line is preferred. However, many noted that there is still an issue with the rail crossing at Te Maunga/ SH29.
- The impact on Bayfair Estate residents was considered significant with the relocation of the railway line (noise and vibration) and traffic congestion further up Matapihi Road (approximately 22% of respondents that commented).
- Approximately 4% of respondents that commented were happy with the reduction in land acquisition and that there is no displacement of households.
- A number of respondents were unsure how the traffic flows would be impacted during Baypark events, suggesting that a connection between Owens Place and Truman Lane should be considered.

**Option 3:** The respondents who commented on Option 3 (121) made reference to the following main points/themes;

- Provides the best long term solution considering the growth potential, full use of available railway land and better traffic flows for SH29/SH2 (approximately 42% of respondents that commented).
- Approximately 15% of respondents that commented approved of the connection between Owens Place and Truman Lane; having better access to Baypark and providing an additional entry/exit point from Matapihi.
- Respondents were concerned with the noise and vibration impact on Bayfair Estate residents associated with the railway line (approximately 14% of respondents that commented).
- Approximately 10% of the respondents that commented were concerned with traffic congestion at Owens Place /Matapihi intersection and the through traffic along Owens Place, given the existing narrowness and limited carparking along this street. Concerned was expressed around traffic flows during Baypark events.
- Approximately 10% of the respondents commented that Option 3 was too expensive and potentially an 'overkill' in terms of providing better traffic flows.
- Two respondents commented how the ramps along Maunagnui Road would adversely affect properties along Maunganui Road and Eversham (Latter Day Saints Church) in terms of land acquisition and noise impact.

#### **Which Option do you prefer? (Feedback Point 5)**

Of the 142 respondents the following preference for each option was given;

- **Option 1:** 20% preferred (29/142)
- **Option 2:** 20% preferred (29/142)
- **Option 3:** 60% preferred (84/142)

#### **Mitigation Measures (Feedback Point 6)**

Of the 43 respondents who provided comment on potential mitigation measures, the following themes were highlighted;

- Relocation of Railway Line to Alternative Corridor Measures (56%);  
Noise and vibration control for Bayfair Estate residents including noise wall/ earth bund (30%), lowering the railway base (12%), welded tracks (9%) and double glazing of houses in the near vicinity (5%).
- Maunganui Road measures (19%);  
Beautification measures along Maunganui Road to create a 'Gateway' feature to the Mount Maunganui (7%), noise mitigation for traffic (12%) including specific measures for the Church on Eversham Road.
- General Mitigation Measures (18%);

Trees and vegetation including creepers and low hedges (14%), however, comments included consideration of maintenance costs associated with vegetation and the type of vegetation to be used on such sandy soil (based on past experience).

Historical visual reminders (2%).

Security measures around pedestrian crossings such as sufficient lighting and security cameras (2%)

- Mitigation Measures During Construction (12%);

Consideration of noise and vibrational effects during construction and adequate traffic management (12%). One comment highlighted the impact of heavy vehicles traveling from Te Puke using Ocean Beach Road/ Papamoa Beach Road as a bypass (2012 congestion after flooding event).

- Sufficient Stormwater Management (5%);

That appropriate stormwater measures are provided to ensure adequate drainage and storage does not contribute to flooding in the area (5%).

### **Opinion of Longer Pedestrian Underpass (Feedback Point 7)**

94 respondents provided comment on the potential longer pedestrian underpass for Option 1. The for/against split is very close; 42% in favour of a longer underpass and 37% against. The majority of those in favour of the longer underpass were conditional upon the provision of a well-lit, safe and secure underpass.

The following themes were highlighted;

- Security safety concerns are an issue highlighted by 28% of those who commented, while 4% highlighted that graffiti/vandalism would be of concern which would contribute to the feel of the underpass being unsafe. The provision of sufficient lighting required for the longer underpass was highlighted by approximately 15% of those who provided comment. There was also a desire to extend the underpass under the railway line.

### **Opinion of Split Underpass and Signalised Pedestrian Crossing (Feedback Point 8)**

90 respondents provided comment on the partial (existing) underpass at MGI combined with the at-grade signalised pedestrian crossing. Of the 90 respondents 47% were for the split option while 50% were against the split option and 3% were unsure.

Of those 50% respondents who were against the split option; 51% preferred an underpass rather than having signals, 42% preferred to have signals instead of an underpass and 7% simply stated 'no'.

Safety of pedestrians at the busy intersection, which is likely to get busier, was the predominant theme while some commented that the existing underpass is too narrow to use. Other respondents suggested a pedestrian over bridge.

### **What are the Most Important Things for NZTA to consider in choosing the Preferred Option? (Feedback Point 9)**

From the 106 respondents who commented on the most important things for NZTA to consider when determining the preferred option, the following key themes were identified from greatest importance to least.

1. Long term solution given the predicted growth in the area (33% commented)
2. Efficient traffic flows Port/SH2/SH29/ Side roads (25% commented)
3. Safety (vehicles and Pedestrian) (20% commented)
4. Least disruptive to residents/ property acquisition and household displacement (14% commented)
5. Cost, value for money (13% commented)
6. Noise (8% commented)
7. Consideration of pedestrian/cyclist/mobility scooter movements and access (8% commented)
8. Impact of railway relocation on residents (5% commented)
9. Public Opinion (5% commented)
10. Timeliness, immediacy of the project (4% commented)
11. Visual impact (2% commented)

#### **Other Comments (Feedback Point 10)**

71 respondents provided further comments. Below are the themes that 3 or more respondents commented on. The themes are listed from most commented to least commented on.

- Timeliness of the project (18%); Many respondents requested that the project be done as soon as possible as congestion at the intersections needs addressing quickly.
- Traffic Design/modelling queries (17%); Respondents sought clarification of the assumptions around traffic routing and the existing design options. Many put forward design modifications for some of the options (see Table 1).
- Open Day Presentations (13%); many respondents provided positive feedback on how well the Open Day was organised. Positive comments were made on the staff's ability to answer questions, the presentation of information and being well informed about the project.
- Mitigation for Rail Noise and Vibration (10%); Respondents expressed concern over the adequacy of mitigation measures required to mitigate the effects of relocation and operation of the railway line on residential properties in the near vicinity.
- Provide Long Term Solution (7%); Respondents reiterated that the best long term solution should be sought given the predicted growth in the area, the increase in traffic and rail movements and further development of the Port of Tauranga.
- Constructional Effects (6%); Respondents expressed concern over the potential construction effects from vibrations (thumping/drilling) and having adequate traffic management during construction in terms of access to side roads and Baypark.
- Consider Public Opinion (6%); Respondents sought assurance that their opinions and feedback would be taken into consideration when determining the preferred option. More public consultation should be undertaken as the project progresses further.
- Better than the Status Quo (4%); Respondents expressed approval of the fact that any of the proposed options would be better than the existing situation.



## General Comments

The comments provided in this new round of consultation reiterate the comments received from the last round of consultation in 2011 with the same issues and concerns raised. General public comments provided from telephone conversations, emails are summarised below.

- Widespread concern was expressed from Bayfair Estate residents regarding the relocation of the railway line and the impact it would have on amenity values in the area.
- Congestion at the Maunganui Girven Road roundabout causing lengthy queues particularly around peak times and during rail crossings continues to be a major concern to respondents and requires addressing as soon as possible.
- Local residents (particularly the elderly) choose not to travel during these peak times as a result. The alternative exit route from Matapihi (Owens Place/ Truman Lane connection) was well accepted but required consideration in terms of level of service given the increase in traffic flows.
- The roundabout is perceived as being dangerous with 'frequent accidents'. A common concern was how right turning traffic from Girven Road to the Mount, and SH2 northbound turning right onto Girven Road, using the incorrect left hand lane. There was a general desire for the intersection to be monitored during peak times or the provision of signage and more prominent lane directions marked to reduce the number of potential accidents.
- The queue into/out of the Owens Place carpark was also identified as an issue and Owens Place commercial operators suggested that people avoid the area because of the congestion issues.
- There was also feedback from respondents for dedicated left slip lanes for all intersection quadrants, into/ out of Maunganui, Girven, and Matapihi Roads.

## 2.6 Responses to Feedback Received

Queries received during consultation and responses;

- 638 Maunganui Road sought feedback on the impacts of Option 1 on their property. Responded with an email dated 24 April 2013, 11:35am.
- 644 Maunganui Road queried airbrake noise down the interchange off ramps. *Response: Beca to follow up - Marshall Day Acoustics to quantify.*
- 645 Maunganui Road (AMP Capital Bayfair PTY Ltd) sought feedback on the impact that the options would have on Bayfair. Responded with a letter (dated 15 May 2013 ref 7396307) that included comment on preliminary land requirements, car parking, access to Bayfair, access to AMP properties at 645, 646, and 647 Maungaui Road, changes to local traffic movements and pedestrian and cyclist movements.
- 719 Maunganui Road (owner in Hokitika) sought further information on the MGI options. We responded with providing detailed plans of the options and a telephone conference and later email.
- Liftan Place residents sought clarification on the potential mitigation measures for the railway noise on the alternative rail corridor and expressed concern that noise would reverberate off the walls of the Owens Place commercial properties. Response –Marshall Day Acoustics provided an explanation of the noise modelling to be undertaken and the potential mitigation measures that could be used. A cottage meeting is planned with this group when noise and vibration assessments are complete.

- 8 Girven Road – sought advice on their inability to provide car parks under their existing resource consent as a result of any proposed road widening at Girven Road. *Response – Beca to follow up by obtaining a copy of the Resource consent conditions from TCC and the way forward.*
- 4 Palliser Place – prospective buyer of the property (currently owned by TCC) sought inclusion in future consultation. Response – individual meeting held with prospective buyer and inclusion on the consultation landowner list.
- 15 Liftan Place – Landowner has written a letter (dated 1 May 2013) detailing her concerns. *Response – Beca and NZTA to follow up with another meeting or letter /email to alleviate/address her concerns with results of noise modelling.*
- 3 Titoki Place (Noghero Holdings Ltd) - sought clarification on the ability of B-trains to turn around for each of the options. *Response – Beca to check effect on truck access and the ability to incorporate into the options (see also KiwiRail Lessees alternative left in/ left out into Maunganui Road option query below).*
- KiwiRail Lessees query regarding an alternative access route for delivery vehicles – left in/left out at the end of Titoki Place onto Maunganui Road to create a loop circuit for B-trains and delivery vehicles for Owens Place commercial properties. *Response – Beca to consider in the assessment phase.*
- An Open Day attendee queried the Term of railway designation in the Operative Tauranga District Plan. Response – research of Tauranga City Council files has revealed the historical order of events regarding the railway designation up to the present.

Table 1: Open Day Feedback Queries on Design

Feedback Queries - Design	Response
<b>Interim Measure</b> – From Girven Road through the MGI roundabout, erect bigger signs or painted lines/arrows on Girven Road for correct lane marking through roundabout.	Forward suggestion to NZTA/TCC maintenance team.
Concerns about deferred traffic effect at Hewletts Road where traffic signals can cause some issues that may impact on flyovers at MGI.	Traffic modelling will consider sensitivity to changing traffic flows.
<b>Interim Measure</b> - Suggests that painted hatching lines around MGI roundabout would help prevent south bound traffic from Maunganui Rd turning into Matapihi when a train has stopped traffic, sitting stationary on the roundabout. This prevents the ability for traffic flow from Girven Road turning northbound onto Maunganui Road to continue while a train is passing.	Forward suggestion to NZTA maintenance team.
Suggests a left in/ left out (or left in only) into Titoki-Owens Place from Maunganui Road	Consider with option assessment.

northbound.	
<b>Option 3-</b> Heavy pressure on Owens Place/Matapihi Intersection and suggests for BayPark traffic to be redirected to the Magatawa Interchange rather than through Owens Place.	Intersection performance based on event traffic to be checked as part of the traffic modelling
Consider a pedestrian overbridge from the east side of Maunganui Road across Truman Lane to Baypark to reduce vehicle congestion during events.	At grade pedestrian signals proposed. No justification for NZTA to consider additional facilities.
Suggest two lanes each way from Hewletts Road through MGI to TEL.	The improvements will be based on catering with forecast traffic demands.
<b>Option 2</b> - Suggests an additional off-ramp between SH29 and Matapihi Road (MGI).	An additional ramp would conflict with the other lanes due to the limited space between intersections.
If a large portion of the traffic use the flyovers-reducing the amount of local traffic at MGI (and the congestion at the rail crossing), why move the rail?	The lane arrangements are designed to cater for forecast traffic flows.

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Appendix A

## Consultation Plan

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Report

# SH2 Maunganui-Girven Road Te Maunga Intersection Improvement Investigation Consultation Plan (Scheme Assessment Phase)

Prepared for NZ Transport Agency (NZTA) - Bay of Plenty

Prepared by Beca Infrastructure Ltd (Beca)

15 March 2013



## Revision History

Revision N°	Prepared By	Description	Date
1	s 9(2)(a)	Draft	11/01/2011
2	s 9(2)(a)	Review Changes	15/02/2011
3	s 9(2)(a)	Include Te Maunga Investigations	15/03/2013
4			
5			

## Document Acceptance

Action	Name	Signed	Date
Prepared by	s 9(2)(a)		
Reviewed by	s 9(2)(a)		
Approved by	s 9(2)(a)		
on behalf of	Beca Infrastructure Ltd		

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This report has been prepared by Beca on the specific instructions of our Client. It is solely for our Client's use for the purpose for which it is intended in accordance with the agreed scope of work. Any use or reliance by any person contrary to the above, to which Beca has not given its prior written consent, is at that person's own risk.

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# 1 Introduction

## 1.1 Purpose

The purpose of this document is to provide a consultation plan for this Scheme Assessment stage of the Maunganui-Girven Road and Te Maunga Intersection Improvements project. It should be noted that a separate Consultation Plan has been implemented in the Investigation and Research phase of the project. This project aims to identify improved intersection designs to ease congestion and improve safety for all road users.

In developing this plan consideration has been given to the consultation requirements of the Resource Management Act 1991 (RMA) and the NZTA's Stakeholder Relationship Management System (SRMS).

This plan provides direction to undertaking consultation for the duration of the project. In so doing it identifies and describes the consultative principles, process and mechanisms to be used for the project but recognises that alternatives may be necessary and used in response to issues identified through consultation.

This plan will enable the key stakeholders and the local community to be accurately informed about the project so that their interests can be considered as the project progresses. The strategy may enable the resolution of issues raised through consultation prior to or outside of the statutory processes provided for under the RMA that will be required to consent the project.

## 1.2 Consultation Plan Structure

This Consultation Plan is structured as follows:

- Section 1 – Introduction
- Section 2 – Legislative and Policy Context
- Section 3 – Consultation Objectives and Outcomes
- Section 4 – Key Stakeholders
- Section 5 – Immediately Adjoining Landowners and Occupiers
- Section 6 – Public
- Section 7 – Consultation Information and Reporting Protocol
- Section 8 – Key Project Team Participants
- Section 7 – Consultation Methods & Process
- Section 8 - Consultation Programme



## 2 Legislative and Policy Context

### 2.1 Resource Management Act 1991

The purpose of the RMA is to “promote the sustainable management of natural and physical resources.” While there is no statutory requirement to undertake consultation for projects (Section 36A of the RMA), it is considered good practice to provide communities and relevant stakeholders with information and the opportunity to respond to proposals. In addition, the Fourth Schedule of the RMA requires an applicant to identify those persons interested in or affected by proposed works, and to outline any consultation that has been undertaken before lodgement with Council (including any outcomes).

### 2.2 Stakeholder Relationship Management System (SRMS)

The SRMS is defined as an NZTA consultation project management system for Maori consultation and management of Statement of Identified Maori Interests (SIMI) deliverables. The SIMI, which will form part of the Scheme Assessment Report, will provide an assessment of the potential impacts of the project on particular Maori interests and helps manage relationships with those interests.

The consultation plan provided includes information required to assess any potential impacts of the project specifically relating to Maori issues.

## 3 Consultation Objectives & Outcomes

### 3.1 Consultation Objectives

The consultation objectives are as follows:

- Comply with the principles and requirements for consultation of NZTA and the RMA;
- To support the communications team in providing stakeholders and the community with timely information on the project;
- To make available opportunities for stakeholders and the community to provide feedback and identify any key issues in regards to the Notice of Requirement and Resource Consent applications;
- To receive, consider and respond to any feedback received from stakeholders and/or the community with an open mind and to document responses to any feedback and, within the Scheme Assessment Report, show how such feedback may or may not have contributed to the project.

#### 3.1.1 Consultation Principles

A number of principles that help define the meaning of good consultation have emerged from case law under the RMA and are a useful starting point in establishing the principles for the consultation. These are as follows:

- Early – consult as soon as possible with key stakeholders/influencers when the details of your project are less ‘set in concrete’ and you have more flexibility to make changes to address issues raised by interested and affected persons.
- Transparent – be open about what you want to achieve, what scope you may have to change certain aspects of your project and why there might be elements that you may not be able to change.
- Open mind – keep your views open to the response people may make and the benefits that might arise from consultation.
- Two-way process – consultation is intended as an exchange of information and requires both you and those consulted to put forward their points of view and to listen to and consider other perspectives.

- Not a means to an end – while consultation is not an open-ended, never-ending process, it should not be seen merely as an item on a list of things to do that should be crossed off as soon as possible.
- On-going – it may be that consultation – or at least on-going communication – will continue after your application has been lodged or even after a decision has been made.
- Agreement not necessary – consultation does not mean that all parties have to agree to a project, although it is expected that all parties will make a genuine effort. While agreement may not be reached on all issues, points of difference will become clearer or more specific.

This consultation plan is to provide for targeted stakeholder and wider public consultation in the context of these principles.

### 3.2 Consultation Outcomes

Overall, the consultation outcomes sought from the process set out in this Plan are:

Outcome	Objective Achieved
<ul style="list-style-type: none"> <li>■ Stakeholders and the community will be informed about the project and its purpose</li> </ul>	Inform/Reaction
<ul style="list-style-type: none"> <li>■ Any updates, where applicable, will be confirmed with key stakeholders and the wider public;</li> </ul>	Inform/Reaction, Participation, Involvement
<ul style="list-style-type: none"> <li>■ Feedback will be received from key stakeholders and the wider public in a manner and within timeframes sufficient to contribute to the Scheme Assessment Report documentation which may shape subsequent design revisions</li> </ul>	Participation, Involvement, Collaboration,
<ul style="list-style-type: none"> <li>■ Consultation processes and the feedback from consultation will be documented in a manner that stakeholders and the community can understand</li> </ul>	Inform/Reaction, Participation
<ul style="list-style-type: none"> <li>■ Ongoing consultation post-lodgement, of the Notice of Requirement and resource consent will assist in reducing the risks associated with the post-lodgement Council process.</li> </ul>	Involvement, Participation

### 3.3 Communication Outcomes

Communication outcomes sought from the RMA process set out in this Plan are:

Outcome	Objective Achieved
<ul style="list-style-type: none"> <li>■ Stakeholders and the community will be informed about the project and its purpose</li> </ul>	Inform/Reaction
<ul style="list-style-type: none"> <li>■ Any updates, where applicable, will be confirmed with key stakeholders and the wider public;</li> </ul>	Inform/Reaction, Participation, Involvement

## 4 Key Stakeholders

A workshop was held on 19<sup>th</sup> January 2011 to identify the key stakeholders for the initial MGI project. The workshop was attended by representatives of NZTA (Greig Stephen, § 9(2)(a) § 9(2)(a), § 9(2)(a)) and Beca (§ 9(2)(a), § 9(2)(a), § 9(2)(a)).

With the additional scope to include the Te Maunga intersections, the following key stakeholders have been identified as groups that may be affected by or interested in the Maunganui-Girven Road and Te Maunga Intersections Improvements project:

- Ngaiterangi Iwi, Ngai Tukairangi hapu, Ngati Tapu hapu ,Nga Potiki hapu – to be consulted separately
- Tauranga City Council (stormwater, engineering, roading, venues and reserves staff)
- KiwiRail
- Automobile Association
- Heavy Haulage
- Road Transport Association
- Tauranga Airport Authority
- AMP Property (Bayfair Shopping centre)
- Truman Lane Properties representative
- Owens Place businesses representative
- Omanu Golf Course
- Port of Tauranga
- Cycle Action Tauranga/Cycling Advocates
- Tauranga Western Bay of Plenty Motorcycle Group
- Utility providers (PowerCo, Telecom, Vodafone, Vector, TelstraClear) – to be consulted by design engineers.

The key stakeholders will be consulted as a group at the milestones of the project except as highlighted above.

## 5 Affected Landowners and Occupiers

Affected land owners and occupiers include those located along Maunganui, Matapihi and Girven Roads. These parties may be affected by access restrictions and possibly land-take.

This group will be communicated with by newsletter, personal letter and individual meetings will be held prior to the Open Days.

Personal meetings will be conducted with landowners whose land is required for the purposes of the project.

## 6 Public

The public (local community and road users) will be communicated with through media releases, newsletters and open days. The public will have an opportunity to provide feedback on the problems at both intersections, the initial six options identified and the three preferred options going forward (April 2013), then later in the study, provide feedback on the assessment of environmental effects of the favoured options (September 2013).

## 7 Consultation Information and Reporting Protocol

### 7.1 Consultation Information

Beca will prepare any wording or plans for communication (public notices and newsletters) regarding or impacting on the RMA process linked to consultation. This will be sent as a draft to Greig Stephen and Kylie Ruegg for finalising, compliance with NZTA's communication and style policies, and for printing and distribution.

Information for the NZTA Website will be provided to NZTA for approval for Kylie Ruegg to place on the website. It is assumed that all media releases will be prepared and despatched by NZTA staff.

An internal verification process is to be used for the production of any material for distribution for consultation. All consultation materials will be reviewed by s 9(2)(a) [REDACTED], Team Leader - Planning, and released to NZTA on behalf of Beca by the project Team Leader, s 9(2)(a) [REDACTED].

### 7.2 Record of Consultation

All correspondence, telephone conversations and meetings for the project will be recorded.

Written minutes, attendee(s) and agreed action shall be recorded for all consultation meetings and made available to all attendee(s) within three working days.

At the conclusion of the consultation rounds the Consultation Team will analyse the responses to consultation and the issues and options that have been identified in the SIMI and SRMS.

### 7.3 Consultation Summary Report

Following the consultation process, a consultation summary report will be prepared to document and summarise any feedback received and action taken. Outstanding issues or matters that need to be further addressed by the project team will be directed to the appropriate avenues for consideration.

In general the consultation summary report will include:

- Key parties involved in the consultation process;
- A summary of issues identified during the consultation process;
- A record of how the project team have responded to the consultation feedback received.

The Notice of Requirement application will include a specific section on consultation undertaken for the project.

## 8 Key Project Team Participants

The key Project Team participants are:

Personnel	Organisation	Role
Greig Stephen	NZTA	Project Related Inquiries
Kylie Ruegg	NZTA	Communications Guidance and Approvals
s 9(2)(a)	Beca	Project Related Technical Inquiries
s 9(2)(a)	Beca	Project Related Technical Inquiries
s 9(2)(a)	Beca	Team Leader – Planning and Consultation
s 9(2)(a)	Beca	Community Consultation, Statutory Planning Assessment
s 9(2)(a)	Beca	Iwi/hapu Consultation and Cultural Assessment

## 9 Consultation Methods and Processes

As required, NZTA will lead formal consultation meetings, unless other arrangements are agreed. Where agreed with NZTA, Beca may meet with groups or directly affected persons.

A range of consultation methods are proposed throughout the course of the project. The following table outlines the proposed consultation methods, their purpose, their target audience and stages of the project in which they will be used. Some of the methods below are also implemented for communications purposes and are referred to in the Communications Strategy.

As the project progresses, not all of these tools may be required and alternative ones may need to be adopted in order to facilitate successful delivery.

Method and Purpose	Audience	Stage(s)
<b>Consultation database</b> Key issues (including risks) identified through consultation, along with all communications undertaken, including details of all of the mechanisms used, comments received and responses to these will be recorded through a database.	Beca & NZTA	Throughout project
<b>Press Releases by NZTA</b> Press releases will be strategically employed at key stages of the project informing the community of important dates and opportunities for input into the project and of project progress and milestones.	Stakeholders, affected landowners, Tangata Whenua and wider community	Released at key stages of the project
<b>Internet Sites</b> Internet sites will be made available (e.g. <a href="http://www.nzta.govt.nz">www.nzta.govt.nz</a> ) for the public to access information, progress and key dates of the project.	All stakeholders and wider community	Throughout project

Method and Purpose	Audience	Stage(s)
<p><b>Project Newsletter</b> Develop and distribute a project newsletter informing key stakeholders and the community of the project.</p>	Key stakeholders and the wider community.	Distributed at key stages of the project
<p><b>Public Open Days</b> Organisation and attendance at two open days (April and Sept 2013) fronted by project team members and displaying key information about the project. This is also an opportunity for key stakeholders and the community to gain a better understanding about the project.</p>	Key Stakeholders and the wider community	Preliminary Option Selection and the Preferred Option Selection
<p><b>Letter/Meetings and Affected Land Owners</b> Key Stakeholders will be sent a letter which will offer meetings if desired. Post lodgement and public notification of the consent applications, meetings will be held with those Key Stakeholders who have made submissions to assist in resolving any matters prior to the Council Hearing.</p>	Identified Key Stakeholders and Identified landowners & occupiers.	Throughout project
<p><b>One-on-One Meetings / Hui</b> One-on-One hui are proposed with Nga Potiki Iwi, Ngai Te Rangi Iwi, Ngai Tukairangi hapu and Ngati Tapu hapu. Also, as a result of any contact/feedback from the project newsletter or Open Day, one on one meetings may need to be held with individuals who have raised specific issues.</p>	Key Stakeholders / The Community	Throughout project
<p><b>VMS Signage and Public Notices</b> Public Notices and display signage advising of Open Day</p>	VMS audience is the passing motorists. Public Notices audience is all householders in the Tauranga urban area.	Prior to Open Days

## 10 Consultation Programme

Consultation on the project started in January 2011 and will run for the course of the project. The updated programme and timing of future consultation is set out in the following table:

Action	Frequency	When	Who	Responsible
Consultation database maintenance	Throughout project	Throughout project	All stakeholders and the wider community.	Beca
Project Newsletters (note there have been 2 newsletters in the I&R phase)	Distribution Pre-Open Days	Before Open Days: Newsletter 3 8/4/13 Newsletter 4 Sept 2013	Key stakeholders and the wider community	Beca/NZTA
Public Open Days	Preliminary and preferred option selection stages	Open Day 1: 18 <sup>th</sup> April 2013 Open Day 2: Sept 2013	All stakeholders and the community	Beca
Key Stakeholder letter meeting prior to Open Day	Throughout project	Round 1: week beginning 8/4/13 Round 2: week beginning Aug 2013	Key Stakeholders	Beca with support from NZTA
Iwi	Throughout project		Tangata Whenua	Beca with support from NZTA
One-on-One Meetings prior to Open Days	Prior to Distribution of Newsletters and Open Days	Round 1: Week beginning 8/4/13 Round 2: week beginning Aug 2013	Landowners affected by land-take	Beca with support from NZTA
Cottage Meetings	Before the second Open Day	Weeks beginning Aug 2013	Landowners affected by project	Beca with support from NZTA

Appendix B

Newsletter

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## Maunganui-Girven intersection improvements

This newsletter provides an update on the NZ Transport Agency's (NZTA) investigation to improve the Maunganui-Girven Road intersection (MGI).

### Progress

Since our last newsletter there has been a great deal of work completed on the options for the Maunganui-Girven Road intersection. As a result of the investigation, it has become clear that safe and efficient designs for the intersection affect the future design of the State Highway 2 (SH2) and State Highway 29 (SH29) intersection at Te Maunga, some 800 metres to the east. Therefore the investigation was expanded to consider both intersections.

The NZTA is investigating options to reduce congestion and travel time, and improve safety for all road users. A number of options have been considered to address the anticipated long-term traffic volumes, including options to move the railway into the Matapihi rail corridor behind Owens Place to free up more land on Maunganui Road.

The NZTA has identified three potential options for further investigation. Before selecting a preferred option, the NZTA seeks your feedback on the three short-listed options. An open day is being held to explain and discuss the options and to hear your thoughts.



### MGI - three options are being investigated

Many options for the Maunganui-Girven Road intersection and SH2/SH29 corridor were developed and six were considered in detail. They were either at-grade (at ground level) or grade separated (above ground level, eg Hewletts Road flyover) and were assessed against their ability to deliver the outcomes expected on this important state highway corridor.

The three best-performing options (see over) are being investigated further as they deliver the following benefits:

- Improved travel time and journey reliability.
- More efficient connections.
- Ease congestion by separating state highway and local traffic.
- Improved safety by reducing conflicting travel movements at intersections.
- Best long-term solution to meet the future needs of the state highway.

### OPEN DAY

When

**Thursday 18 April 2013**

**3-7pm**

Where

**ASB Arena, Baypark,  
ASB Suite 1**

### OPTION 1

Flyover at MGI, flyover at SH2/SH29, railway retained in current Maunganui Road alignment. Road widening on Maunganui Road (eastern side).



### OPTION 2

Flyover at MGI, flyover at SH2/SH29, railway relocated to the alternative existing Matapihi rail corridor behind Owens Place. Road widening on Maunganui Road (western side).



### OPTION 3

Flyover at MGI, SH29 bridge over railway and SH2, railway relocated to the alternative existing Matapihi rail corridor behind Owens Place. Road widening on Maunganui Road (western side).



## What happens next?

### Complete the investigations

Further work is required on the traffic, social, economic and environmental assessments of the above options to determine the overall solution. Of particular importance is the rail and road noise mitigation required through the Maunganui Road area and/or along the Matapihi rail corridor. Other factors

which will be considered include pedestrians, cyclists, and the visual effects of any flyover structure.

### Gain planning approvals

Once a preferred option is selected (anticipated early 2014), a Notice of Requirement will be prepared for the designation.

### What is a Notice of Requirement?

A Notice of Requirement is prepared by the NZTA and submitted to the

Tauranga City Council to include a designation for the new road in the Tauranga City Plan.

Following this process, the NZTA will seek funding for the design phase.

### Your feedback

The NZTA would like to hear your views on the three options by 10 May 2013. You can provide feedback at the open day, by phone or email (see contact details below).



### Our contact details

**Greig Stephen**

s 9(2)(a)

s 9(2)(a)

s 9(2)(a)

s 9(2)(a)

s 9(2)(a)

or check out

[www.nzta.govt.nz/mgi](http://www.nzta.govt.nz/mgi)

Appendix C

## Meeting Minutes

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## Minutes of Meeting

### Maunganui Girven Intersection - Hapu Engagement (1)

Held 17 February 2011 at 8:30am - 9:30am

at Beca Harrington House Tauranga

**Present:**

s 9(2)(a) [NT]	Ngai Tukairangi	
s 9(2)(a) [PI]	Ngati Tapu	
Grieg Steven [GS]	NZTA	Project Manager
s 9(2)(a) [GO]	Beca	Job Manager
s 9(2)(a) [SR]	Beca	

**Apologies:**

Kevin Reid	NZTA
s 9(2)(a)	Beca

**Distribution:** As Above

Item	Action
<p><b>1 Introduction</b></p> <ul style="list-style-type: none"> <li>■ SR – Karakia and mihi</li> <li>■ All – introductions</li> </ul>	
<p><b>2 Project Overview</b></p> <ul style="list-style-type: none"> <li>■ GO – purpose of project is to address congestions at the Maunganui Girven intersection,                             <ul style="list-style-type: none"> <li>– TEL set to start construction to be completed by 2016</li> <li>– intersection important in keeping traffic moving</li> <li>– Studies have been done previously on the intersection</li> </ul> </li> <li>■ PI – multiple problems, particularly with Owens Place and Bayfair Estate – elderly</li> <li>■ GO – long term solution projected through to 2031</li> <li>■ NT – is traffic predicted to increase on TEL?</li> <li>■ GS – Yes, Harbour Link as well</li> <li>■ NT – have discussions started with Kiwi Rail?</li> <li>■ GS – Yes, we need to understand issues and implications</li> <li>■ NT – safety is a big issue at the intersection</li> <li>■ PI – trains block Matapihi Road and traffic blocks the intersection</li> <li>■ GS – we understand the issues – freight movements are predicted to increase</li> <li>■ PI – Is traffic heavy enough to consider a flyover</li> <li>■ GS – flyover was looked at in previous studies – traffic volumes are predicted</li> </ul>	

to increase significantly

- NT – how much traffic will there be?
- GO – potentially 40,000 vpd
- NT – is the road capable of taking the traffic load
- GO – yes
- SR – what options are on the table
- GO – All options are on the table – flyover, signalised intersection, signalised roundabout
- PI – issues with Hairini signalised intersection
- GO – there are variations of options, change to network and realignment at Maunganui for Girven, need to consider visual impact of grade separation
- GS – Maunganui Giverven is a strategic freight route
- GO – need to consider provision for pedestrians and cyclists
- PI – flyover is a practical solution, need to consider airport air space
- SR – What are the future development aspirations of the Matapihi community?
- PI – currently 158 homes, increase to 500 homes by 2020
  - Community wish to maintain rural character
- NT issues with roading – not ablt to cater for the increase in population
- SR – need to get a copy of the Matapihi Landuse Plan
- GO – need to get a copy of plan for traffic modelling
- GO – scoping study to refine options
  - Project open day on 22 March – opportunity for public to participate
  - How do you want to be involved
- PI – need to consider other hapu – Ngati Kuku and Nga Potiki
  - Informing them of project
- SR – After open day, project team could present an overview of project to wider hapu at a hui a hapu
- PI – can discuss further and make arrangements
- GO – are there any sites of significance in the proposed development area?
- NT – Omanu urupa, possibly others around the site, but no known/identified sites will be impacted
- GO – Any stormwater issues
- NT – no
- GO – Golf-course drain is used for stormwater discharge – potential to increase
- NT – any reason for not connecting into Bayfair estate?
- GO – Unsure of capacity – need to investigate further

SR

### 3 Close

- Next meeting proposed for April
  - Possible agenda items

- |   |  |
|---|--|
| <ul style="list-style-type: none"><li>- Feedback on open day</li><li>- Refinement of options</li><li>■ NT – karakia</li></ul> |  |
|---|--|

Minuted by: s 9(2)(a)

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## Minutes of Meeting

### Maunganui Girven Intersection - Hapu Engagement (2)

Held 23 June 2011 at 9:00am

at Ngai Tukairangi Trust Office

<b>Present:</b>	s 9(2)(a)	Ngai Tukairangi
	s 9(2)(a)	Ngati Tapu
	Greig Stephens	NZTA
	s 9(2)(a)	Beca
	s 9(2)(a)	Beca
<b>Apologies:</b>	s 9(2)(a)	Beca
<b>Distribution:</b>	s 9(2)(a)	Beca
	s 9(2)(a)	Beca
	As above	

Item	Action
<p><b>1 General</b></p> <ul style="list-style-type: none"> <li>The purpose of the meeting is to update hapu representatives on progress for the Maunganui Girven Intersection project, in particular:           <ul style="list-style-type: none"> <li>Feedback from the open day held in April; and</li> <li>Review proposed options.</li> </ul> </li> </ul>	
<p><b>2 Open Day</b></p> <ul style="list-style-type: none"> <li>The open day did not present any options to the public, but primarily sought feedback on current issues with the intersection.</li> <li>The open day generated a good response from the community with many older residents attending.</li> <li>Issues raised by the community included: congestion, pedestrian safety, access, and the rail line on Matapihi Road.</li> <li>There was strong support from local residents for something to be done.</li> <li>Other comments from residents included options for a flyover, signalised roundabout, and the retention of the pedestrian underpass.</li> </ul>	
<p><b>3 Options</b></p> <ul style="list-style-type: none"> <li>Subsequent to the open day consideration has been given to 12 options, which were refined to 4 by the project team.</li> <li>All proposed options give priority to Maunganui Road traffic.</li> <li>Pedestrian access across Maunganui Road is maintained by the existing underpass and the project team are investigating an additional crossing via an at-grade option.</li> </ul> <p><b>Option 1 – Signalised Roundabout</b></p> <ul style="list-style-type: none"> <li>This option is considered low cost, but is a lower performance solution</li> </ul>	



compared to the other options.

- Both s 9(2)(a) [NT] and s 9(2)(a) [PI] noted this option would be low cost; however, at grade pedestrian movement across Maunganui Road would be difficult. Consideration needed to be given to residents from Bayfair Estate and the Matapihi Peninsular.

#### Option 2 – Hamburger

- This option is new to New Zealand and provides greater priority to traffic movement along Maunganui Road compared to the signalised roundabout. The hamburger roundabout will be signalised.
- NT noted the option provided more efficiency for vehicles travelling on Maunganui Road, but pedestrian access was more difficult. Education of motorist would be a huge exercise.

#### Option 7 – Flyover with Signalised Roundabout

- This option considers a flyover while maintaining the existing roundabout below. It would need to include traffic signals to enable pedestrians to cross at grade safely.
- Both NT and PI commented that this option takes pressure off the existing roundabout and provides for priority vehicle movements along Maunganui Road; while providing improved access for vehicles travelling on Girven Road and Matapihi Road. The cost of a flyover would be considerably higher than the other options.
- The project team noted the cost of a flyover to be in the vicinity of \$40 million.
- NT suggested NZTA consider potential Public Private Partnerships with local Iwi.

#### Option 3 – Flyover with Signalised Intersection

- This option is similar to option 7. However, the intersection at grade will be fully signalised with no roundabout.
- PI noted pedestrian safety will be improved

#### 4 Next Meeting

- NT and PI requested another meeting prior to the release of options to the public.
- A meeting with hapu representative will be organised by the project team a few weeks before options are publically released.

Minuted by: s 9(2)(a)

## Minutes of Meeting

### Maunganui Girven Intersection - Hapu Engagement (3)

Held 7 February 2012 at 3:00pm

at Ngai Tukairangi Trust Office

**Present:**

§ 9(2)(a)	Ngai Tukairangi
§ 9(2)(a)	Ngati Tapu
Greig Stephens	NZTA
§ 9(2)(a)	Beca
§ 9(2)(a)	Beca

**Apologies:**

**Distribution:**

§ 9(2)(a)	Beca
§ 9(2)(a)	Beca

As Above

Item	Action
<p><b>1 General</b></p> <ul style="list-style-type: none"> <li>The purpose of the meeting is to update hapu representatives on progress for the Maunganui Girven Intersection project, in particular wider corridor effects including the Te Maunga intersection.</li> </ul>	
<p><b>2 Wider Corridor Effects</b></p> <ul style="list-style-type: none"> <li>The project team are investigating the wider corridor effects of MGI options, in particular the Te Maunga intersection. The final solution for MGI must consider the future effects on the Te Maunga intersection and must not limit or restrict opportunities for improvements to the Te Maunga intersection in the future.</li> <li>The options discussed at the previous meeting in June 2011 are still being considered and tested in line with wider corridor effects.</li> <li>§ 9(2)(a) [NT] and § 9(2)(a) [PI] both noted a preference for the two flyover options as their favoured solution (option 3 – Flyover with signalised intersection; and option 7 – flyover with signalised roundabout).</li> </ul>	
<p><b>3 Next Meeting</b></p> <ul style="list-style-type: none"> <li>Shad will send a bundle of November MGI newsletters to NT and PI for their hapu members.</li> <li>A preferred solution for MGI should be identified mid-year. It is intended to meet with hapu representatives before a preferred option is made public. Hapu representatives would also like NZTA and Beca to attend a combined hapu hui (Ngai Tukairangi and Ngati Tapu) to present the preferred option. An opportunity to discuss the option and ask questions will be made available to hapu members.</li> </ul>	<p>Shad</p> <p>Shad</p>

Minuted by: § 9(2)(a)

Released under the Official Information Act 1982

## Minutes of Meeting

### MGI to Te Maunga - Hapu Meeting

Held 10 April 2013 at 4pm

at Ngai Tukairangi Orchard Office boardroom

#### Present:

Greig Stephen

s 9(2)(a)

NZTA

Beca

Beca

Beca

Ngati Tapu

Ngai Tukairangi

Nga Potiki

Ngai Tukairangi

Ngai Tukairangi

#### Apologies:

#### Distribution:

As above c/o s 9(2)(a)

s 9(2)(a)

Item	Action
<ul style="list-style-type: none"><li>- Puhirake welcomed NZTA and Beca and opened the meeting with a karakia</li><li>- Everyone introduced themselves and their roles and responsibilities</li><li>- s 9(2)(a) explained the background particularly the options that were presented at last hui and what's changed since the last meeting, in particular widening the MGI investigation to include the Te Maunga intersection</li><li>- s 9(2)(a) explained the options that have been considered in the last 2 years – MGI then Te Maunga.</li><li>- s 9(2)(a) also explained the RMA consultation process and scheduled open day for 18 April at the ASB Arena/Bay Park.</li><li>- s 9(2) then explained in detail the 3 options followed by pedestrian and cycle links.</li><li>- Q – Can you retain current underpass in option 1?</li><li>- A – The current length is too short.</li><li>- Q – Option 1 MGI can you provide a moderately large pedestrian underpass as well as at grade signalled crossings.</li><li>- A – it may be possible, however, we need to consider the frequency of use and safety issues associated with an underpass</li><li>- Q – How safe is underpass?</li><li>- A – A lot of support for the existing underpass, however people feel unsafe with a longer underpass, we need to do some more work on safety issues associated with underpass</li><li>- They think option 2 MGI could retain the existing have old underpass as well as signalised pedestrian crossings</li><li>- s 9(2) noted under Option 3 pedestrians will have access to Baypark through the use of the off ramp at Te Maunga.</li></ul>	

- s [redacted] noted the poor aesthetic view of flyovers and did NZTA investigate underground options.
- A – Yes it has been considered, but is too costly.
- s 9(2)(a) [redacted] noted that traffic volumes are around 36,000 vehicles per day (vpd) on SH2 and are forecast to increase to nearly 60,000vpd by 2031. The projected growth in traffic volumes is as a result of development in Papamoa East, industrial development at Te Maunga and Rangiuru, increased Port of Tauranga activity, plus diverting/encouraging Papamoa traffic onto the State Highway rather than using local roads. Matapihi is also projected to increase in population.
- Q – What happens at Owens Place on Option 3 – will there be traffic lights?
- A – Traffic analysis is not complete.
- Q – What is the time frame?
- The target construction period will be 2015/2016 to align with the completion of TEL, however it is subject to obtaining funding. The project is expected to take 2-3 years to complete.
- s 9(2) [redacted] raised an issue of a lwi claim on the Golf Course Reserve and Rail Reserve
- s 9(2)(a) [redacted] explained the Golf Course land is owned by Tauranga City Council and the designated rail corridor and reserve land was confirmed in the 1980's.

**Next Steps –**

- NZTA offered to present material as a special collective Hui-a-Hapu if required.
- Each hapu will come back to s 9(2) [redacted] with a possible date and time
- NZTA will support the cost of facilitating a Hui
- A query was raised whether it was possible to calculate walking times for pedestrians to advise the hui attendees

**Beca**

**Three sets of option plans left for each Hapu –**

3933377-C-K043 Rev E, 3933377-C-K033 Rev E, 3933377-C-K032 Rev E

Minuted by: s 9(2)(a) [redacted]

## Minutes of Meeting

### MGI & SH2/SH29 - Hapu Hui

Held 22 May 2013 at 5pm-7pm

at Bay Park Arena

#### Present:

Grieg Stephen [GS]

NZTA

s 9(2)(a)

Beca

Beca

Ngai Tukairangi

Ngai Tukairangi

Ngati Tapu

Ngai Tukairangi, Ngati Tapu, Nga Potiki

Ngati Tapu

Nga Potiki

Ngai Tukairangi

Ngai Tukairangi

Ngai Tukairangi, Ngati Tapu

Nga Potiki

Nga Potiki

#### Apologies:

s 9(2)(a)

Beca

#### Distribution:

Item	Action
<p><b>1 Introductions</b></p> <ul style="list-style-type: none"><li>■ Karakia and mihi performed by Puhirake</li><li>■ SR introduced the project and the purpose of the hui which is to inform the hapu with interests in the area of the proposed options and to obtain their feedback.</li><li>■ Everyone present introduced themselves including the NZTA project team</li></ul>	
<p><b>2 Presentation</b></p> <ul style="list-style-type: none"><li>■ s 9(2)(a) presented the 3 options and received questions from hapu members</li><li>■ Option 1<ul style="list-style-type: none"><li>– flyovers at Maunganui/Girven and SH2/SH29 intersections. Option will require the acquisition of approximately 40 properties along Maunganui Road and side streets in order to increase the road width. The intersection at Maunganui Road and Girven Road will be changes to traffic signals. Similarly at SH2/SH29 the intersection will be changed to traffic signals. The estimated cost of the project is \$85-90 million.</li></ul></li><li>■ Option 2</li></ul>	

- flyovers at Maunganui/Girven and SH2/SH29 intersections. Option will require the railway line to move behind the Owens Place commercial area adjoining the residential area. The intersection at Maunganui Road and Girven Road will be changes to traffic signals. Similarly at SH2/SH29 the intersection will be changed to traffic signals. The estimated cost of the project is \$85-90 million, which includes the relocation of the railway line.
- Option 3
  - Similar to Option 2 with a reconfiguration at SH2/SH29. A flyover at SH29 over SH2 and the railway line is proposed. Owens Place will also be extended to connect with Truman Lane. The estimated cost of this option is \$110-120 million, which includes the relocation of the railway line. The flyover at SH2/SH29 also means the State Highway traffic does not have to stop for trains.
- Questions
  - A question was raise as to the length of the flyover
  - GS responded by noting it will be a similar length to the Hewletts Road flyover.
  - § 9(2)(a) noted all the options needed to manage pedestrian movements around Bay Park and the impacts of stormwater on waterways and air discharges.
  - § 9(2)(a) asked the timeframe for construction
  - GS noted it would take approximately 2-3 years to construct
  - § 9(2)(a) discussed the increase in rail movements to the Port being a concern particularly at Matapihi Road.
  - § 9(2)(a) noted a site of significance near the intersection of SH2/SH29 – Wharawhara block and battle site.
  - § 9(2)(a) noted they'd like to be involved in landscaping during the construction phase of the project.
  - § 9(2)(a) mentioned they'd need to be involved in the preparation of a CIA report to assess the cultural impacts of the project
- Pedestrian Safety
  - TH discussed the pedestrian movements with each of the options particularly the issue of the underpass across Maunganui Road.
  - § 9(2)(a) noted the safety issues with the extended underpass
  - TH responded by saying it's a balance between efficient walking routes, safety of crossing points and personal security
- General feedback
  - § 9(2)(a) requested hapu be involved in the naming of roads or new areas
  - § 9(2)(a) provided her contact details to § 9(2)(a) to ensure she was informed
  - § 9(2)(a) noted the Matapihi community are not aware of the NZTA project and suggested another hui
  - SR – NZTA and Beca are available to discuss the project with hapu groups
  - § 9(2)(a) promoted the formation of an advisory group similar to TEL – develop protocols, prepare CIA, earthworks monitoring etc. § 9(2) suggested § 9(2)(a) be the points of contact for Ngai Tukairangi

- SR – need to work with NZTA and will respond accordingly	SR
- s 9(2)(a) noted they needed to be involved in monitoring of geo-tech testing	
- TH – need to assess and will follow up with s 9(2)(a) and s 9(2)(a) on geo-tech monitoring	TH

Minuted by: s 9(2)(a)

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## Minutes of Meeting

### MGI Te Maunga Key Stakeholders Meeting

Held 16 April 2013 at 12.30pm

at Beca Executive Room

#### Present:

s 9(2)(a)

Greig Stephen (GS)

s 9(2)(a)

#### Apologies:

s 9(2)(a)

Beca  
 Beca  
 NZTA  
 Automobile Association (AA)  
 Tauranga Airport Authority  
 Heavy Haulage  
 Road Transport Authority  
 Owens Place Retail Representative  
 Automobile Association (AA)  
 Beca  
 KiwiRail  
 Omanu Golf Club  
 Port of Tauranga  
 Cycle Action Centre  
 Tauranga Motorcycle Club  
 BOPRC Transport  
 Go Bus Transport Ltd

Item	Action
<p><b>1 Introductions</b></p> <ul style="list-style-type: none"> <li>GS gave a brief welcome and introduction.</li> </ul>	
<p><b>2 Role of Stakeholder Group</b></p> <ul style="list-style-type: none"> <li>CR gave an introduction of the project highlighting the role of stakeholders to provide technical feedback for each of the options presented and to represent their organisation/group and the knowledge the respective groups have in the area.</li> </ul>	
<p><b>3 Background and Project Update</b></p> <ul style="list-style-type: none"> <li>GS presented a PowerPoint presentation (copies of PowerPoint were given to each attendee) on the project and its progression up to now. Highlights include;                             <ul style="list-style-type: none"> <li>The intersections are located on a critical freight route/corridor</li> <li>Long term solution required</li> <li>At-grade options will not provide long term solution</li> <li>Options 1, 2 and 3 features were highlighted</li> <li>Open Day and timeline going forward provided.</li> </ul> </li> </ul>	

- CK asked if any properties had been acquired yet – GS responded that none had been acquired, however, the alternative rail corridor is owned by NZTA.

#### 4 Preferred Options in Detail

- TH introduced each of the three options in detail
- **Option 1. Features highlighted;**
  - Owens Place – Matapihi intersection give way control to be checked
  - Pedestrian facility and cyclist facility, uncertain of underpass justification yet. Signal control provided.
  - Railway movements will affect local roads and SH29 and KiwiRail operations to increase by 50% (increase in train movements over 10 years)
- Question raised – Flyovers have no access off? TH responded; correct
- **Option 2. Features discussed;**
  - Signalised pedestrian and cyclist control provided
  - 6m clearance likely under flyover
- Question (RD) – how high are the light posts on top of the flyovers? TH responded – not clear at his stage of design, but need to be low to allow for airport flight path.
- Question (HM) – what is the clearance under the flyovers? We would like at least 6m and must have an alternative route. What is the standard clearance? TH responded – 6m is the desirable clearance. This is to be investigated further.
- HM indicated that the flyover lanes aligning with Hewletts Rd flyover is good. Rope barrier or median barrier between lanes on the flyovers would be a problem for over size loads. Consideration of height of side barriers needed for oversize loads. Use of side roads for oversize loads consideration required.
- Question (TM) –How do the Liftan Place residents feel about the rail relocation? Responded- from meetings held with those residents, they were aware of the rail corridor, but they are not keen on the railway being relocated.
- **Option 3. Features discussed;**
- Question – Dispensing traffic from Baypark events provided for? Response- Yes, but separated from SH2 and puts pressure on Owens Pl/ Matapihi Rd intersection.
- Question – How does traffic get from Girven Rd to SH29? TH responded via Owens Place.
- HM highlighted that overheight loads would use SH29 to Port.
- CK requested the most recent traffic volume data sets for the intersections including current heavy vehicle counts.
- JN noted- Option 3 provides clearance from railway but also places stress on car parking along Owens Place (more through traffic) currently no parking lines on Owens Place. JN asked whether the link road was necessary and highlighted likely congestion at Owens Pl/ Matapihi Rd intersection.
- **HM and CK would prefer Option 3 by the fact that it removes the railway impact on SH traffic**
- **JN prefers Option 3 as it provides new access to Owens Place**
- Question – would road widening at Owens Place/ Matapihi Rd be required if

TH to provide volumes

traffic signals are installed at this intersection? Responded – Yes

- Question – do KiwiRail have a policy on the frequency of trains using a rail crossing? Responded –No
- Question – for Option 3 is there a median barrier on SH29? How high are the side barriers? Responded – too early for detailed design specifics, will need to consider in detailed design to come.
- Question –what are the proposed noise buffer/mitigation measures for the new rail corridor? Responded - too early for detailed design specifics, will require specialist noise assessment to come.
- GS gave indicative cost for each option to attendees.
- Question – what is the composition of houses along Maunganui Rd? Responded – approximately 50/50 owner/occupier
- JN reported that currently Owens Place takes the overloading from Bayfair carparking with patrons walking to Bayfair from Owens Place. CR noted that any car parking area required from AMP by the options would have to be replaced. It was suggested that the Golf Course land could potentially be used? CR responded – No, not likely.
- Question – will all the options be built to HPMV standards? TH responded – Yes
- **CK and HM reported that consideration for overheight/oversize loads must be taken into account in the design of the options provided – re barriers and alternative routes on side roads.**
- CR invited feedback to be provided from stakeholders to input into AEE for each of the options which will be compared and a preferred option will be determined early next year (2014). RMA notified process likely next year with the ability for stakeholders to get involved in the process.

TH to consider

Minuted by: s 9(2)(a)

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## Minutes of Meeting

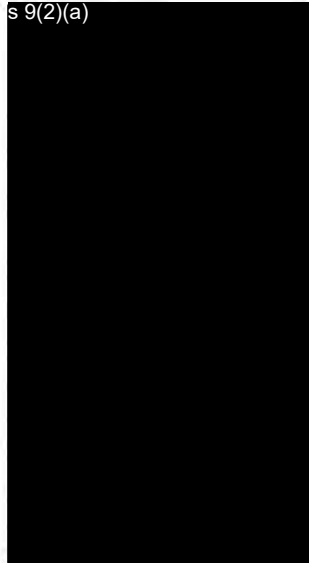
### KiwiRail Leasee Meeting - MGI and Te Maunga Intersection Improvements

Held 30 May 2013 at 4.00pm

at Beca Office - Executive Room

**Present:**

s 9(2)(a)



- Bay Commercial (1 Owens PI)
- Owner (3 Owens PI)
- Animal Antics (Tenant of 3 Owens PI)
- Bayfair Panelworx (7 Owens PI)
- Pacific Toyota (5 Owens Place)
- Beca
- Beca
- Beca
- New Zealand Transport Agency (NZTA)
- KiwiRail
- Tukairangi Investments Ltd
- Sign Creations Ltd
- Owens Place Auto Refinishers
- Golf on the Range Ltd

**Apologies:**

**Distribution:** All of the above

Item	Action
<p><b>1 Introduction</b></p> <ul style="list-style-type: none"> <li>■ CR gave a brief introduction. Attendees gave a brief introduction of who they represented.</li> <li>■ CR asked if anyone attended the Open Day – No one had.</li> <li>■ CR outlined the project from inception through to the three options present on the table for which feedback is now being sought.</li> </ul>	
<p><b>2 Options</b></p> <ul style="list-style-type: none"> <li>■ TH described each option presented through the drawings (Options 1-3 Rev E).</li> <li>■ TH reported that a long term solution is being sought and at-grade (ground level) options do not provide the long term solution.</li> <li>■ Question – are there traffic signals at the intersections under the flyovers? Yes.</li> </ul>	
<p><b>3 Option 1</b></p> <ul style="list-style-type: none"> <li>■ Rail retained in current location, widening occurs on the eastern side (seaward side) of Maunganui Road.</li> <li>■ Attendees reported that there are issues at Owens Place/ Matapihi intersection now.</li> <li>■ TH reported that if traffic signals were to be placed at Owens PI/ Matapihi intersection they would be phased with the Maunganui/Girven intersection</li> </ul>	

signals. However, more traffic modelling is needed to determine if traffic signals are required.

- Question – Has Kiwirail been consulted? Yes, discussion on-going likely 50% increase in rail movements in next 10-20 years (driven by industry and Port).
- Question - Can the rail times be changed? No, the Owens Place intersection and rail movements will be considered in the traffic modelling.
- Attendees noted that Option 1 will retain the Kiwirail lease but will also retain the traffic issues.

#### 4 Option 2

- Rail relocated to alternative corridor behind Owens PI commercial centre. Maunganui Road widening to occur over Kiwirail leased land.
- Question – will all the Kiwirail leased land be required? Yes.
- Question – How close to boundary will the road be if the Kiwirail land is taken? Within 1-2m of boundary. Assessments will be undertaken to determine impact of the road designation boundary adjacent to the properties.
- It was noted that the road barriers likely to be used (adjacent to the commercial properties) will be similar to those along Takitimu Drive near the Judea industrial area.
- It was reported that B-train vehicles will not be able to move around the property at 1 Owens PI (Liquorland). Toyota- off loading occurs on Owens Place roadway. The removal of the Kiwirail land reduces the viability of those properties for the current landuse and reduces employment opportunities.
- It was reported that the 'No parking' along Owens Place is an issue for the industrial operators (provided because of the commercial HomeZone).
- It was noted that the proximity of the road boundary is not an issue for some commercial operators – 'road noise is not that bad'.
- Question – what are the types of housing present at Maunganui/Girven intersection and along Maunganui Road? A mix of residential (rental and ownership) and commercial properties is impacted by noise in all three options.

#### 5 Option 3

- It was noted that the Owens Place extension to Truman Lane would release MGI intersection traffic and increase Owens PI traffic – most likely need to signalise Owens PI/Matapihi Road.
- Attendees preferred Option 3 as the road would be lower than the railway and further away from property but is still concerned with traffic noise if the traffic moves closer (compared to the rail noise).
- Question – what part of Bayfair is impacted? All options impact on Bayfair.
- A few alternative options were suggested by the attendees – Option 1 with Owens Place extended to Truman Lane; relocate rail and widen Maunganui Road on the seaward side.
- Question – How much 'say' or influence do we have? Consideration of all affected parties will be given in the Options assessments to be undertaken; therefore your feedback is important. The feedback provides new ideas from the project team to consider.
- It was commented by the attendees that the rail should be relocated no matter which option is preferred.

#### 6 General Discussion

- Question – Regarding the TEL, are there off ramps at Papamoa for Papamoa residents. Yes, both at Mangatawa and Domain Rd. Traffic modelling will take into account the movements to and from Papamoa.
- Question – will the project be undertaken 'all in one go'? What timeframes? Depending on which option preferred, the rail would be relocated first then the roading. Likely timeframes; Preferred option determined end of 2013, Resource Consents in 2014, Funding sought 2015, Start construction 2016 construction likely to take 3 years.
- Are other alternative Options able to be considered? Yes, if it weighs up against the three options currently on the table. Needs to be a strategic long term option.
- Regarding Option 3 - it was noted that the Owens Place extension to Truman Lane could potentially create a rat-run cut through option between MGI and SH29.
- Regarding Option 2 - potential for left in/left out at the end of Titoki Place onto Maunganui Road should be considered- provides a loop circuit for B trains and delivery vehicles for Owens Place commercial properties.
- It was identified that a signalised intersection and signalised pedestrian crossing would be preferred at the Owens Place/ Matapihi Intersection (crossing Owens Place).
- It was reported that at 1 Owens Place property, the stormwater drain overflows and causes flooding during rainfall events. Stormwater management will need to be considered in all options. The existing stormwater pipeline across the property reduces development potential.
- If KiwiRail leased land is removed from 1 Owens Place property – then no servicing vehicles or parking can be accessed for the existing business and limits the land use for those properties affected by KiwiRail leased land.

TH to consider

Minuted by: s 9(2)(a)



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Appendix D

## Consultation Feedback

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**1.a Side Roads (123)****No Topics (123)**

Sub. #	Pt. #	Point Text	Position
1	1	Side roads	N/A
2	1	Yes uses side roads	N/A
3	1	Yes - side roads	N/A
4	1	use side roads	N/A
5	1	Respondent ticked both side roads and travel straight through the intersections from further afield.	N/A
6	1	Side roads.	N/A
7	1	from side roads	N/A
8	1	from side roads	N/A
10	1	side roads	N/A
11	1	from side roads	N/A
12	1	from side roads	N/A
13	1	Respondent ticked sides roads and travel straight through the intersections from further afield	N/A
15	1	respondent ticked side roads and travel straight through	N/A
16	1	respondent ticked side roads and travel through intersection	N/A
18	1	respondent ticked side roads and travel through	N/A
19	1	side roads	N/A
20	1	side roads	N/A
21	1	ticked side roads and travel through	N/A
23	1	ticked side roads and travel through	N/A
24	1	side roads	N/A
25	1	side roads	N/A
26	1	side roads and travel straight through	N/A
27	1	side roads	N/A
28	1	side roads	N/A
29	1	side roads	N/A
30	1	side roads	N/A
31	1	side roads	N/A
32	1	side roads	N/A
33	1	side roads and travel straight through	N/A
35	1	side roads	N/A



36	1	side roads	N/A
37	1	side roads	N/A
39	1	side roads	N/A
40	1	side roads	N/A
41	1	side roads	N/A
42	1	side roads	N/A
43	1	side roads and travel straight through	N/A
44	1	side roads	N/A
45	1	side road and travel straight through	N/A
46	1	side roads	N/A
47	1	side roads and travel straight through	N/A
48	1	side roads	N/A
49	1	side roads	N/A
50	1	side roads	N/A
52	1	side roads and travel straight through	N/A
53	1	side roads	N/A
54	1	side road and travel straight through	N/A
56	1	side roads	N/A
57	1	side roads	N/A
60	1	side roads	N/A
61	1	side roads	N/A
63	1	side roads and travel straight through	N/A
64	1	side roads	N/A
65	1	side roads	N/A
66	1	side roads and travel straight through	N/A
67	1	side roads and travel straight through	N/A
68	1	side roads and travel straight through	N/A
69	1	side roads and travel straight through	N/A
70	1	side roads	N/A
	1	side roads	N/A
71	1	side roads	N/A
72	1	side roads and travel straight through	N/A
73	1	side roads and travel straight through	N/A
75	1	side roads	N/A
76	1	side roads and travel straight through	N/A
77	1	side roads	N/A

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78	1	side roads	N/A
79	1	Side Roads	N/A
81	1	Side roads used	N/A
82	1	Uses side roads	N/A
84	1	Uses side roads	N/A
86	1	Use side roads	N/A
87	1	Uses side roads	N/A
88	1	Uses side roads	N/A
89	1	Uses side roads	N/A
91	1	use side roads	N/A
92	1	use side roads	N/A
93	1	Uses side roads	N/A
94	1	use side roads	N/A
95	1	Uses side roads	N/A
96	1	Use side roads	N/A
97	1	Use side roads and straight through.	N/A
98	1	Use side roads	N/A
99	1	Use side roads	N/A
100	1	uses side roads	N/A
101	1	From side roads and straight through	N/A
102	1	Use side roads	N/A
103	1	Uses side roads	N/A
105	1	Uses side roads	N/A
106	1	Uses side roads	N/A
107	1	Side roads and straight through	N/A
108	1	Uses side roads	N/A
109	1	Uses side roads	N/A
110	1	Uses side roads	N/A
111	1	Uses side roads	N/A
112	1	uses side roads	N/A
113	1	From side roads and straight through	N/A
114	1	Uses side roads	N/A
115	1	Uses side roads	N/A
116	1	Uses side roads	N/A
118	1	Uses side roads.	N/A
119	1	Uses side roads	N/A





121	1	Uses side roads	N/A
122	1	Uses side roads	N/A
123	1	Uses side roads	N/A
124	1	Uses side roads	N/A
125	1	from side roads and straight through	N/A
126	1	Uses side roads	N/A
127	1	Uses side roads	N/A
128	1	Uses side roads	N/A
129	1	Uses side roads	N/A
130	1	Uses side roads	N/A
131	1	Uses side roads	N/A
132	1	Uses side roads	N/A
133	1	Uses side roads	N/A
134	1	Uses side roads	N/A
135	1	Uses side roads and travels straight through	N/A
136	1	Uses side road	N/A
137	1	Uses side road	N/A
138	1	Uses side roads	N/A
139	1	Uses side roads	N/A
140	1	Uses side roads	N/A
141	1	Uses side roads	N/A

## 1.a Travel Straight Through (42)

### No Topics (42)

Sub. #	Pt. #	Point Text	Position
2	2	Yes - straight through	N/A
13	2	Respondent ticked side roads and travel straight through	N/A
14	1	travel through	N/A
15	2	Respondent ticked side roads and travel straight through	N/A
16	2	respondent ticked side roads and travel through intersection	N/A
18	2	respondent ticked side roads and travel through	N/A
21	2	ticked side roads and travel through	N/A
22	1	travel through	N/A
23	2	ticked side roads and travel through	N/A



26	2	side roads and travel straight through	N/A
33	2	side roads and travel straight through	N/A
34	1	travel through	N/A
43	2	side roads and travel straight through	N/A
45	2	side road and travel straight through	N/A
47	2	side roads and travel straight through	N/A
52	2	side roads and travel straight through	N/A
54	2	side road and travel straight through	N/A
59	1	travel through	N/A
62	1	travel through	N/A
63	2	Side roads and travel straight through.	N/A
66	2	side roads and travel straight through	N/A
67	2	side roads and travel straight through	N/A
68	2	side roads and travel straight through	N/A
69	2	side roads and travel straight through	N/A
72	2	side roads and travel straight through	N/A
73	2	side roads and travel straight through	N/A
74	1	travel through	N/A
76	2	side roads and travel straight through	N/A
80	1	through intersection from further afield	N/A
82	2	Travels through intersection	N/A
83	1	Travels straight through.	N/A
85	1	Tend to travel straight through	N/A
90	1	Straight through intersection	N/A
97	2	Use side roads and straight through	N/A
101	2	From side roads and straight through.	N/A
104	1	Travels straight through	N/A
107	2	Side roads and straight through	N/A
113	2	From side roads and straight through	N/A
125	2	From side roads and straight through.	N/A
127	2	Travels straight through	N/A
128	2	Travels straight through	N/A
135	2	Uses side roads and travels straight through.	N/A

### 1.b.1 Vehicle (132)



## No Topics (132)

Sub. #	Pt. #	Point Text	Position
1	2	Use vehicle	N/A
2	3	Yes	N/A
3	2	Yes Vehicle use	N/A
4	2	use vehicle	N/A
5	2	use a vehicle	N/A
6	2	respondent uses a vehicle AND walks.	N/A
7	2	use a vehicle	N/A
8	2	use a vehicle and a bus	N/A
10	2	use a vehicle	N/A
11	2	use a vehicle	N/A
12	2	use a vehicle	N/A
13	3	use a vehicle	N/A
14	2	use a vehicle	N/A
15	3	use a vehicle	N/A
16	3	respondent ticked all travel options; vehicle, walk, cycle and bus	N/A
18	3	use a vehicle	N/A
19	2	use a vehicle	N/A
20	2	respondent ticked vehicle and walk	N/A
21	3	use a vehicle	N/A
22	2	use a vehicle	N/A
23	3	use a vehicle and cycle	N/A
24	2	use a vehicle and walk	N/A
25	2	use a vehicle	N/A
26	3	use a vehicle	N/A
27	2	use a vehicle	N/A
28	2	use a vehicle	N/A
29	2	respondent ticked vehicle, walk, cycle and bus	N/A
30	2	use a vehicle	N/A
31	2	use a vehicle	N/A
32	2	use a vehicle	N/A
33	3	use a vehicle and walk	N/A
34	2	use a vehicle	N/A
35	2	use a vehicle and walk	N/A



36	2	use a vehicle	N/A
37	2	use a vehicle	N/A
38	1	use a vehicle	N/A
40	2	use a vehicle	N/A
41	2	use a vehicle	N/A
42	2	use a vehicle	N/A
43	3	use a vehicle and walk	N/A
44	2	use a vehicle and walk	N/A
45	3	use a vehicle and walk	N/A
46	2	use a vehicle and walk	N/A
47	3	use a vehicle and walk	N/A
48	2	use a vehicle	N/A
49	2	use a vehicle, walk and bus	N/A
50	2	use a vehicle	N/A
52	3	use a vehicle	N/A
53	2	use a vehicle and walk	N/A
54	3	use a vehicle and walk	N/A
55	1	use a vehicle and walk	N/A
56	2	use a vehicle	N/A
57	2	use a vehicle and walk	N/A
58	1	use vehicle	N/A
59	2	use a vehicle and cycle	N/A
60	2	use a vehicle, cycle and bus	N/A
61	2	use a vehicle	N/A
62	2	use a vehicle and bus	N/A
63	3	use a vehicle	N/A
64	2	use a vehicle	N/A
65	2	use a vehicle	N/A
66	3	use a vehicle, walk and cycle	N/A
68	3	use a vehicle, walk, cycle and bus	N/A
69	3	use a vehicle	N/A
70	2	use a vehicle	N/A
	2	use a vehicle, walk and bus	N/A
71	2	use a vehicle, walk, cycle and bus	N/A
72	3	use a vehicle, walk and bus	N/A
73	3	use a vehicle	N/A



74	2	use a vehicle	N/A
75	2	use a vehicle and walk	N/A
76	3	use a vehicle and walk	N/A
77	2	use a vehicle and walk	N/A
78	2	use a vehicle	N/A
79	2	Use Vehicle	N/A
80	2	Use Vehicle only	N/A
81	2	Use vehicle	N/A
82	3	Uses vehicle	N/A
83	2	Uses vehicle	N/A
84	2	Uses vehicle	N/A
85	2	Uses vehicle	N/A
86	2	Use vehicle	N/A
87	2	Uses vehicle	N/A
89	2	Uses vehicle	N/A
90	2	Use vehicle	N/A
91	2	Use vehicle	N/A
92	2	Use vehicle	N/A
93	2	Use vehicle and walk	N/A
94	2	Uses vehicle and bus	N/A
95	2	Uses vehicle and walks	N/A
96	2	Uses vehicle only	N/A
97	3	Use vehicle only	N/A
98	2	Use vehicle only	N/A
99	2	Use vehicle only	N/A
100	2	Uses vehicle only	N/A
102	2	Use vehicle and walk	N/A
103	2	Uses vehicle and walks	N/A
104	2	Uses vehicle only	N/A
105	2	Uses vehicle only	N/A
106	2	Uses vehicle only	N/A
107	3	Uses vehicle and walks	N/A
108	2	Uses vehicle only	N/A
109	2	Uses vehicle and walks	N/A
110	2	Uses vehicle only	N/A
111	2	Uses vehicle, walks, cycles and bus.	N/A



112	2	Uses vehicle only	N/A
113	3	Uses vehicle, walks and bus	N/A
114	2	Uses vehicle, walks and bus	N/A
115	2	Uses vehicle only	N/A
116	2	Uses vehicle only	N/A
118	2	Uses vehicle and walks	N/A
119	2	Uses vehicle and walks	N/A
121	2	Uses vehicle and walks	N/A
122	2	Uses vehicle only	N/A
123	2	Uses vehicle only	N/A
124	2	Uses vehicle only	N/A
125	3	Use a vehicle and walks	N/A
126	2	Uses vehicle only	N/A
127	3	Uses vehicle and walks	N/A
128	3	Uses vehicle and walks	N/A
129	2	Uses vehicle only	N/A
130	2	Uses a vehicle and walk	N/A
131	2	Uses vehicle and walks	N/A
132	2	Uses vehicle and walks	N/A
133	2	Uses vehicle only	N/A
134	2	Uses a vehicle and walks	N/A
136	2	uses vehicle and walks	N/A
137	2	Uses vehicle, walks and cycle	N/A
138	2	Uses vehicle and walks	N/A
139	2	Uses vehicle, walks and bus	N/A
140	2	Uses vehicle only	N/A
141	2	Uses vehicle only	N/A

### 1.b.2 Walk (54)

#### No Topics (54)

Sub. #	Pt. #	Point Text	Position
3	3	Yes Walk	N/A
9	1	Walk	N/A
16	4	respondent ticked all travel options; vehicle, walk, cycle and bus	N/A



20	3	respondent ticked vehicle and walk	N/A
24	3	use a vehicle and walk	N/A
29	3	respondent ticked vehicle, walk, cycle and bus	N/A
33	4	use a vehicle and walk	N/A
35	3	use a vehicle and walk	N/A
43	4	use a vehicle and walk	N/A
44	3	use a vehicle and walk	N/A
45	4	use a vehicle and walk	N/A
46	3	use a vehicle and walk	N/A
47	4	use a vehicle and walk	N/A
49	3	use a vehicle, walk and bus	N/A
53	3	use a vehicle and walk	N/A
54	4	use a vehicle and walk	N/A
55	2	use a vehicle and walk	N/A
57	3	use a vehicle and walk	N/A
66	4	use a vehicle, walk and cycle	N/A
68	4	use a vehicle, walk, cycle and bus	N/A
	3	use a vehicle, walk and bus	N/A
71	3	use a vehicle, walk, cycle and bus	N/A
72	4	use a vehicle, walk and bus	N/A
75	3	use a vehicle and walk	N/A
76	4	use a vehicle and walk	N/A
77	3	use a vehicle and walk	N/A
81	3	Walk	N/A
82	4	Walks through intersection	N/A
86	3	Walks through intersection	N/A
88	2	Walks through intersection	N/A
91	3	Walk through intersection	N/A
93	3	Use vehicle and walk	N/A
95	3	Uses vehicle and walks	N/A
102	3	Use vehicle and walk	N/A
103	3	Uses vehicle and walks	N/A
107	4	Uses vehicle and walks	N/A
109	3	Uses vehicle and walks	N/A
111	3	Uses vehicle, walks, cycles and bus	N/A
113	4	Uses vehicle, walks and bus.	N/A



114	3	Uses vehicle, walks and bus	N/A
118	3	Uses vehicle and walks.	N/A
119	3	Uses vehicle and walks	N/A
121	3	Uses vehicle and walks	N/A
125	4	Uses vehicle and walks	N/A
127	4	Uses vehicle and walks	N/A
128	4	Uses vehicle and walks	N/A
130	3	Uses vehicle and walks	N/A
131	3	Uses vehicle and walks	N/A
132	3	Uses vehicle and walks	N/A
134	3	Uses vehicle and walks	N/A
136	3	Uses vehicle and walks	N/A
137	3	Uses vehicle, walks and cycle	N/A
138	3	Uses vehicle and walks	N/A
139	3	Uses vehicle, walks and bus	N/A

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### 1.b.3 Cycle (15)

#### No Topics (15)

Sub. #	Pt. #	Point Text	Position
2	4	Yes	N/A
16	5	respondent ticked all travel options; vehicle, walk, cycle and bus	N/A
23	4	use a vehicle and cycle	N/A
29	4	respondent ticked vehicle, walk, cycle and bus	N/A
59	3	use a vehicle and cycle	N/A
60	3	use a vehicle, cycle and bus	N/A
66	5	use a vehicle, walk and cycle	N/A
68	5	use a vehicle, walk, cycle and bus	N/A
71	4	use a vehicle, walk, cycle and bus	N/A
81	4	Cycle through intersection	N/A
82	5	Cycles through intersection	N/A
88	3	Cycles through	N/A
91	4	cycles through intersection	N/A
111	4	Uses vehicle, walks, cycles and bus	N/A
137	4	Uses vehicle, walks and cycle	N/A

## 1.b.4 Bus (16)

### No Topics (16)

Sub. #	Pt. #	Point Text	Position
2	5	Yes	N/A
16	6	respondent ticked all travel options; vehicle, walk, cycle and bus	N/A
29	5	respondent ticked vehicle, walk, cycle and bus	N/A
49	4	use a vehicle, walk and bus	N/A
60	4	use a vehicle, cycle and bus	N/A
62	3	use a vehicle and bus	N/A
68	6	use a vehicle, walk, cycle and bus	N/A
	4	use a vehicle, walk and bus	N/A
71	5	use a vehicle, walk, cycle and bus	N/A
72	5	use a vehicle, walk and bus	N/A
88	4	Uses bus through intersection	N/A
94	3	Uses vehicle and bus	N/A
111	5	Uses vehicle, walks, cycles and bus	N/A
113	5	Uses vehicle, walks and bus.	N/A
114	4	Uses vehicle, walks and bus	N/A
139	4	Uses vehicle, walks and bus	N/A

## 10.0 Other Comments (71)

### No Topics (71)

Sub. #	Pt. #	Point Text	Position
1	12	As a resident of MT Maunganui for 50 years beleives it is an opporunity to create a gateway to the Mt. Beleives it would be a mistake to relocate the rail as house values and amenity value would decrease in the Bayfair estate.	N/A
3	7	Concerned about the cladding on their house and the effects of vibration - who takes responsibility of this? And how long does it take to recoup the money spent.	N/A
5	10	If you do not feel a fast transport corridor can be done, put a light rail corridor down the median strip of what we look at today.	N/A
7	9	Get on with it.	N/A
11	10	All 3 options are great but option 3 is the best.	N/A
14	7	the project needs to move quickly and not drag on	N/A
16	10	more cycling lanes off road	N/A



19	5	That a pedestrian underpass should be included now for the people crossing SH 2 heading to Bay Park instead of having to dodge the traffic.	N/A
20	11	Would not like to see noise control walls at Matapihi as it would attract graffiti which is already a problem.	N/A
21	12	Would have preferred railway lowered to underground from Te Maunga to just past Hull Rd - similar to the Auckland western railway line.	N/A
23	12	The sooner the better	N/A
26	11	anything that could improve the existing intersection has to be better than the status quo. Intersection as it is now is deadly.	N/A
29	11	do it quickly - too much hold up of traffic making it unsafe.	N/A
30	10	Would like it done ASAP. The Matapihi crossings from Girven Rd are very dangerous - perhaps need bolder signs put up in the interim re. turning for people in left lane indicating wrong way or in the wrong lane.	N/A
31	11	great PR involving the community. dynamic displays more engaging than static. appreciated presence of those who know and understand.	N/A
36	8	you have to look at the future, i.e. heavy traffic, bigger events - if people can't get in and out of the area easily they won't visit.	N/A
44	12	why can't railway line be moved to come across harbour straight to Port? Line from Whakatane - have line from Maungatapu Bridge and along harbour to join up with lines in Totaroa St area.	N/A
48	11	any option is better than what is there now	N/A
49	11	Until alterations happen please have more painted arrows on Girven Rd - too many get into left lane marker but ignore and go right which is very dangerous.	N/A
51	1	Don't agree with any of the options	N/A
52	11	get it done soon.	N/A
54	13	people need to realise that they have to wait for trains etc but they need to feel safe crossing intersections in vehicles and be able to make turns with their own lane going in that direction. Plan needs to ensure that Mount residents can easily get to and from Bay Park. Is Girven Rd still going to get widened?	N/A
57	11	because we live so close to the railway line the noise and vibration are quite concerning.	N/A
59	10	options appear to have been thoroughly canvassed. clearly laid out and understandable.	N/A
60	13	overhaul is overdue	N/A
61	10	concerns about push on effect at Hewletts Rd where the lights can already cause some issues. However understand this may also be looked at and addressed.	N/A
65	8	Short term problems at MGI will decrease hugely when the Maungatawa / Sandhurst interchange opens. Traffic from Maungatawa that currently turns left at the stadium and right at MGI will turn right at the stadium and then use Maungatawa.	N/A
67	10	In what time frame would a decision be made and how long before project starts? Should coincide with new road being finished otherwise the Bayfair intersection will be even more congested than before.	N/A
68	13	Have meetings with local people to get their opinions, advice and recommendations.	N/A
70	10	Presentation and information given at the Open Day has been excellent. Well organised and very informative.	N/A



	13	Suggest that the area around MGI should have hatching lines painted on them to stop vehicles from Mt Maunganui direction turning into Matapihi Rd and stopping on the roundabout when a train has stopped the traffic. Hatching would prevent traffic from Girven Rd turning north along Maunganui Rd from proceeding thereby concentrating traffic flows.	N/A
71	13	My only suggestion would be to request consideration to having a left only turn off the Maunganui ground level of the MGI into Titoki-Owens Place to reduce traffic having to go to the underpass and return. This will also give Matapihi residents an alternative.	N/A
72	10	Separating traffic flow over and under flyovers must improve the situation.	N/A
74	9	Moving railway is a good idea.	N/A
76	12	Would like to think that the input of the local people is taken seriously and the final decision will be made taking their opinions into consideration.	N/A
81	14	Heavy pressure on Owens Place/ Matapihi Rd intersection which needs to be monitored.  It may be better if Baypark traffic is redirected to the Mangatawa Interchange.	N/A
82	14	Excellent opportunity to discuss the issues. Good work. Thanks	N/A
83	12	While option 3 is most expensive it will give the best cost/benefit in the long term and supply the most efficient traffic flows for both local, SH and Port traffic. The planning is already in place for the relocation of the rail.	N/A
84	10	How many more years contemplating options? A meeting was had some 3 years ago for the same intersection.	N/A
88	12	Needs to happen as soon as possible.	N/A
91	13	Ensure adequate cycle lanes are provided. Consider pedestrian overbridge from the east side of Maunganui Rd across Truman Lane to Baypark - result in less vehicle congestion during events.	N/A
92	12	Congratulates the project team on providing information and progress being made on the project. All options are excellent - but all are not necessary.	N/A
93	10	Attached information that formed part of the LIM report for the property located at 35 Matapihi Rd brought in March 2001. Questioned term of rail designation in the then proposed district plan.	N/A
96	10	Listen to the will of the people.	N/A
98	11	Thanks for the time and effort in presenting the displays and to those answering questions and providing guidance at the Open Day.	N/A
99	10	This is a fine well engineered project - we are fortunate to be the beneficiaries, as the Government considers the project as being of national importance.	N/A
100	8	Would like to see two lanes of traffic each way from Hewletts Rd flyover to Whakatane turn off (TEL)	N/A
102	11	Cater for 50yr term not 5yrs. Do not build any houses before the roads are in place. Bayfair Estate resident - questions why left turn lanes at the roundabouts have not been implemented to date? Why use the word 'mitigation' when 80% - 90% of attendees would not understand its meaning?	N/A
104	11	When will it be done?? - Just do it.	N/A
108	11	As traffic flows increase is there any proposed mitigation to dampen traffic noise for residents?	N/A

109	13	<i>My house has been on the market since early last march. Your visit to me was a bombshell and has caused no end of stress. No one is interested in buying my property because of the uncertainty of the rail line position. I am in limbo until a decision is made. I want to move to a retirement village but you have thrown a spanner in the works. My neighbour at 21 Liftan Place is in the same position - prospective sales have dried up for both of us.</i>	N/A
111	13	Looking forward to this massive development.	N/A
113	13	Don't push the problem elsewhere. Hewlett's road flyover works well. If option 2 or 3 chosen then expect a rates drop as compensation for Matapihi residents. Need local perspective in the consideration of option development.	N/A
114	10	Refer to attached letter (92 year old Thelma Kemp living at 15 Liftan Place).	N/A
118	8		N/A
119	13	If rail relocated - adequate noise mitigation must be implemented. The recent removal of the tree barrier (along gas line in Matapihi reserve) and subsequent replanting has been a dismal failure - soil type, drought, wrong species planted - any use of trees for MGI mitigation would likely be unsuccessful if the same approach is used.	N/A
121	11	Will be interested in further findings due to proximity to proposed relocation of railway.	N/A
122	11	Has concerns around construction and the driving of the columns into the ground and the potential impact/damage on houses in the near vicinity.	N/A
123	4	Concerned about potential damage to houses during construction of flyovers with drilling and driving of columns into ground (thumping/ vibration).	N/A
124	11	See additional photocopied map of option 2 with the additional ramp off SH2 between SH29 and Matapihi Rd.	N/A
127	13	Compensation for any damage to houses in the area during construction should be provided. Any compensation provided for the devaluation of houses due to flyovers? For trucks - no engine braking between 8pm and 5am.	N/A
128	14	Lived in Tga 28 years, moved 4 times and Matapihi is last move as the area is perfect. Play golf at Omanu course and not happy with rail moving into course.	N/A
129	9	Would there be any reimbursements for movement in my home from train vibrations.	N/A
133	12	Presumably a large portion of the traffic will use the flyovers reducing the amount of local traffic at MGI and congestion at the rail crossing. Why move the rail?	N/A
134	12	Commendations on the Open Day - impressed with the presentations	N/A
135	13	Will be great to see much needed relief of congestion in this area into the future.	N/A
136	13	Respondent doesn't want to put up with more noise from closer train track as already noise issues from Baypark, airport, and contractors working behind Owens Place.	N/A
138	11	What would be the time frame and effects on Bayfair Estate residents that have no other way out to SH2 during construction?	N/A
139	13	Future increase in road and rail traffic to and from the city and the Port.	N/A
140	11	Displays and computer generation was excellent at the Open Day. Open Day staff dealt with all questions with excellent knowledge- people can go to these quite negative as they don't like change but your staff handled these people well.	N/A
141	11	Something needs to be done at MGI - good to see planning underway.	N/A

## 2.0 Opinion of Option 1 (113)

## No Topics (113)

Sub. #	Pt. #	Point Text	Position
1	3	Supports Option 1 - Most straight forward option which would function similar to Hewletts Rd intersection which works very well at all times	Support
3	4	Less costly - considers that too much money is spent on roading - should make use of the railway more. eg Rail car from Mt and Te Puke for passengers	N/A
4	3	Would affect owner's property at 2 Exeter St taking back part of the section - the road would then be very close to bedroom window. Would want total property purchase is this option was selected.	N/A
5	3	waste of money to half fix	N/A
7	3	Ok but option 3 is better	N/A
10	3	not adequate	N/A
11	3	Good but not the best option.	N/A
13	4	railway is still a problem for traffic	N/A
15	4	Large number of houses and land will be required.	N/A
17	1	Only a part solution	N/A
18	5	rail still a problem	N/A
20	4	benefits the value of our property.	N/A
21	4	not suitable, still have issue of railway crossing state highway	N/A
22	3	railway still in the same place. Bay Park traffic still affected.	N/A
23	5	still have railway problem. Bay Park traffic exit still a problem	N/A
25	3	flyover is a good idea but more is needed	N/A
26	4	railway line continues existing problem of access to Matapihi Rd and exit to SH2.	N/A
27	3	too costly with the houses needing to be removed	N/A
28	3	do not like the idea of moving houses	N/A
29	6	too much disruption to too many properties	N/A
30	3	feel the railway line will still cause heavy congestion from Girven Rd	N/A
31	3	not preferred. removal and relocation of housing is of major concern as it is socially disruptive	N/A
32	3	prefer if railway moved	N/A
34	3	No, must remove railway corridor from road corridor.	N/A
35	4	Provides a short term solution only - population is predicted to increase.	N/A
36	3	waste of time and money	N/A
37	3	short sighted option. after 5-10 years will need to be changed to accommodate additional traffic. Railway line needs to be removed for ease of congestion.	N/A
39	2	good but too short sighted for the future	N/A
40	3	it is of value in the short term but not as a long term option	N/A
41	3	too short sighted for the future	N/A



42	3	doesn't leave enough of a safety zone for vehicles stopped by trains.	N/A
43	6	preferred option but concerned about safety of length of underpass	N/A
44	4	very good	N/A
46	4	buying houses on Maunganui Rd could be difficult if one owner does not want to sell - will there be 'forced' sales?	N/A
48	3	will sort out issues with the roundabouts though do not like thought of rail crossing still near Girven Rd intersection.	N/A
49	5	Great	N/A
50	3	don't like this option because I think you should move the railway line	N/A
52	4	option 1 does not disperse traffic enough	N/A
53	4	Railway needs to be moved. Regularly see trucks coming out of Owens Place who have stopped at intersection to roundabout and the tail end of the truck is still hanging over the railway line.	N/A
54	5	Good, simpler. Will it really be possible to turn right to get from Bay Park stadium, across SH29 to get back to Mt Maunganui?	N/A
55	3	too cheap and would need to be upgraded later	N/A
56	3	preferred	N/A
57	4	would prefer the railway line to stay where it is.	N/A
59	4	OK but short term. Suits respondent but leaves issues with MGI, particularly rail crossing.	N/A
60	5	Don't like railway staying so close to the highway. Still congestion when trains come and traffic will stop in the middle of the intersection as happens at present.	N/A
61	3	short term fix and railway will still cause issues particularly as train volumes increase over the next few years.	N/A
62	4	Affects too many properties on Maunganui Rd	N/A
64	3	good but option 3 is better	N/A
65	3	Involves a lot of disruption to 40 houses and the rail crossing at Matapihi still remains a potential problem. Less disruption to the Bayfair Estate re. noise.	N/A
66	6	Not a good idea. Want to keep my house No. 743	N/A
67	3	Preferred option	N/A
68	7	does not appeal. haven't taken into account area for breakdowns and it would detrimental to the environment. NZ cannot afford to maintain the proposed railway and flyovers. Chose other destinations for traffic improvements.	N/A
69	4	Would be best option for all.	N/A
70	3	Least preferred. Improvement over current situation. Does not address Matapihi / rail crossing issues. Requires substantial housing purchase & relocation of properties. Long term forecasts suggest improvements would be required to solve increase in road / rail use in relatively near future.	N/A
	5	Least favoured Option due to railway's proximity to intersection interrupting local traffic.	N/A



71	6	Option 1 does not solve the problem of congestion when a train occupies the intersection.	N/A
73	4	Not forward planning enough	N/A
74	3	Option 1 will become obsolete in 10-12 years.	N/A
75	4	Best option. Leaves the railway as is which makes more sense than moving it.	N/A
76	5	Option 1 is the best option.	N/A
77	4	Would ease traffic coming out and in of Bayfair Estate.	N/A
78	3	No to Option 1. Keep rail in the same place.	N/A
80	3	Would not sustain increase in traffic flows over longer period - only helps SH2 traffic through to the Port. Will not relieve congestion for SH29 traffic	N/A
81	5	Don't like it - half measure	N/A
82	6	Option 1 adequate for immediate future but problems will persist	N/A
83	3	Little gain from congestion with local roads and existing rail line.	N/A
84	3	Best Immediate Option	N/A
85	3	Rail will still cause delays	N/A
86	4	Rail would still cause congestion	N/A
87	3	Too many houses are taken out and still leaves the problem of trains vs cars at Girven/Matapihi Road.	N/A
88	5	Put the rail line in a cutting to go below Matapihi Road.	N/A
90	3	Too much social cost - having to purchase many houses. No provision for future rail station in the future and associated parking.	N/A
91	5	Not good - it does not remove the two rail crossings at ground level.	N/A
92	3	Concerned with replacement of roundabout with lights as the flyover will reduce traffic going through the intersection and considers the roundabout would perform better than traffic lights (with the reduced traffic flows).	N/A
93	4	Does not satisfy the 50yr plus term	N/A
94	4	Not really an option.	N/A
95	4	Preferred option as respondents reside on Matapihi side of works and is considered the best option for them.	N/A
96	3	This is respondents first choice	N/A
97	4	The railway still clashes with traffic causing delays and frustration which is going to get worse - safety should be paramount	N/A
98	3	Road widening on eastern side of Maunganui Road would move traffic closer to a densely built housing area. Owners of houses to be removed and/or demolished could delay works through process.	N/A
99	3	Does not provide a long term solution.	N/A
100	3	Does not like the railway crossings on two busy roads as rail movements will only increase in the future.	N/A
101	3	I think its good, do not have to move railway tracks.	N/A
102	4	Option 1 is not practicable	N/A
103	4	Option 1 is not practicable	N/A





104	3	Although cheapest, Option 1 does not allow for future growth and development of the area.	N/A
105	3	This is a short term fix only and causes disruption to property owners on the eastern side of Maunganui Road. Does not fix problems at Te Maunga especially with events on at Baypark.	N/A
108	3	Respondent doesn't like this option at all.	N/A
109	4	The least disruptive and no-one will lose value on properties ( <i>at Bayfair Estate</i> ). Consider Owens Place extension with Option 1 to take traffic off SH2 travelling from Matapihi.	N/A
111	6	Still a problem with the rail crossing	N/A
112	3	Good plan, but for me, not the best.	N/A
115	3	Not preferred. Removes a large section of the Latter Day Saints chapel and the entire teaching block and leaves the remainder unusable. Would seek full compensation for 79 Eversham Rd property.	N/A
116	3	My preferred option	N/A
118	4	Best option	N/A
119	4	Keeps the rail corridor away from residential houses. The existing corridor is mainly parks, reserves, and industrial/commercial properties.	N/A
121	4	Least disruption - but necessitates removal of houses along Maunganui Rd.	N/A
122	3	It wont improve the intersection - as traffic gets heavier in the future the intersection will get worse.	N/A
124	3	It is an improvement from the existing situation but still has awkwardness of rail proximity to the MGI intersection.	N/A
125	5	Good - as it keeps SH2 traffic away from local traffic.	N/A
126	3	Rollercoaster - flyovers too close to each other	N/A
127	5	Traffic flow is good but MGI will still get congested with access to Matapihi held up by trains	N/A
128	5	preferred option - the Options 2 and 3 will degrade the Matapihi area and ruined by noise, vibration and visual amenity.	N/A
129	3	Preferred for Bayfair and Matapihi Residents	N/A
131	4	Should help traffic flows	N/A
132	4	Prefer option 2 as rail line causes a lot of traffic hold ups.	N/A
133	3	Preferred Option 1	N/A
134	4	Does nothing to relieve congestion when leaving Matapihi but SH2 traffic using flyovers would reduce volumes passing through intersection.	N/A
135	3	The flyovers are great bu the rail line should be moved as leaving it still leaves a problem	N/A
136	4	Most practical and least disruptive option for residents in the Bayfair estate. Most cost effective method of dealing with increased traffic flow at MGI	N/A
137	5	Only option	N/A
139	5	Does not account for future traffic growth from Papamoa and Ocean Beach Road and still leaves a problem with the proximity of the Rail line to Maunganui Road.	N/A
140	3	Having the two flyovers is excellent. Still having access to Truman Lane- OK. Not shifting the rail is not a good idea as the trains are increasing and cause congestion.	N/A
141	3	Too many houses require to be bought, but a simpler option.	N/A



### 3.0 Opinion of Option 2 (107)

#### No Topics (107)

Sub. #	Pt. #	Point Text	Position
1	4		In Part
5	4	Better than option 1	N/A
8	3	good second choice - prefer option 3.	N/A
10	4	not adequate	N/A
11	4	Good but not the best option.	N/A
13	5	Still a problem at Te Maunga crossing	N/A
14	3	move the railway line	N/A
15	5	better than option 1 - railway line needs to be moved to the railway land already designated behind owens place.	N/A
17	2	Better option than option 1	N/A
18	6	rail still a problem at Te Maunga	N/A
21	5	not suitable, still have issue of railway crossing state highway. Don't want railway to impose on the state highway.	N/A
22	4	best option available as no displacing of home owners along the motorway	N/A
23	6	like railway relocation. better for Owens Place businesses. SH29/SH2 still messy and Bay Park traffic exit still a problem.	N/A
25	4	this is better than option 1	N/A
26	5	relocating rail line it frees up the intersection problems but will impact majorly on people in Russley Drive and Lifton Place to a huge extent.	N/A
27	4	half way	N/A
30	4	For crossing to Matapihi Rd, the railway line moved will not cause so much congestion. Owens Place traffic would find it easier.	N/A
31	4	satisfactory adequate	N/A
34	4	Better but not ideal.	N/A
35	5	provides a short term solution only.	N/A
36	4	waste of time and money	N/A
37	4	short sighted option	N/A
38	2	does not change the road	N/A
39	3	Option 2 is an improvement on Option 1 but is not totally future proof.	N/A
41	4	Good idea but still short sighted for traffic in the future	N/A
42	4	Preferred option. respondent doesn't live in the Bayfair Estate	N/A
43	7	prefer not to move railway	N/A



44	5	not much	N/A
46	5	Will railways be willing to shift the railway? Residents close to Owens Place will have problems with noise from the railway. Shifting the railway line will still cause traffic to back up in Matapihi Rd.	N/A
48	4	Good option and covers all the bases. Would be easier to move the railway than the houses.	N/A
49	6	Don't want rail moved	N/A
50	4	Better than option 2	N/A
52	5	Option 2 carries major traffic on flyovers over worst intersections - rail traffic is diverted from trouble spots	N/A
53	5	Better than option 1 but still prefer option 3.	N/A
54	6	Unnecessary to move the railway line if most traffic is on the new SH/eastern link.	N/A
55	4	too cheap and would need to be upgraded later	N/A
56	4	huge impact on the local area	N/A
57	5	just ok	N/A
59	5	OK but still does not address railway crossing issue. still congestion at MGI	N/A
60	6	Prefer this option. traffic would flow more smoothly and also less expensive.	N/A
61	4	much better option although appreciate the impact on home owners if railway lines moved. But option would help reduce problems and hold ups when trains come through.	N/A
62	5	Moving the railway line has some adverse effects on Bayfair Estate residents but improves entry / exit to Matapihi Rd.	N/A
64	4	good but option 3 is better	N/A
65	4	Disruptive to through traffic on SH2.	N/A
67	4	It does not change the road	N/A
69	5	No	N/A
70	4	Better than Option 1. Relocation of railway line causes noise issues for Matapihi residents but improves situation for Maunganui Rd and east residents. SH29 traffic still have a rail crossing to contend with as well as local stadium traffic. Girven Rd / Matapihi intersection improved by removal of railway to far side of Owens Place.	N/A
	6	Better than Option 2 as less interruption to local traffic due to railway being moved but does nothing to reduce local traffic using intersection.	N/A
71	7	My preferred option. This attends to the vast majority other than encountering trains on SH29 but better than at Owens Place.	N/A
73	6	with the option, the extra cost involved in option 3 is far better	N/A
74	4	Better but congestion in 10 years with Option 2.	N/A
75	5	Houses adjacent to Owens Place would be severely affected.	N/A
76	6	Has the noise and vibration for those living in the house with the huge concrete walls?	N/A
77	5	Feel changing railway line would be unsettling for neighbourhood.	N/A
78	4	Option 2 is the best.	N/A
80	4	Only helps SH2 traffic through to the Port. Will not relieve congestion for SH29 traffic	N/A



81	6	Better than Option 1 but creates other problems.	N/A
82	7	Much prefer option 2 with rail relocation - provides much clearer through way for SH2 traffic and for local traffic.	N/A
83	4	Some gains for local traffic with rail crossing relocated but still congestion on SH29 rail crossing.	N/A
84	4	Can't see the rail being shifted after living here 50 years.	N/A
85	4	Not future proofed	N/A
86	5	Option 2 is <u>better</u> than Option 1	N/A
87	4	Approve of relocating the rail - my preferred option.	N/A
88	6	Put the railway in a cutting to assist noise abatement	N/A
90	4	Most preferred with relocating the rail rather than houses. Railway reserve exists for possible future station and associated parking. Cheaper than Option 3.	N/A
91	6	Better with the rail relocated but level crossing still exists at Te Maunga - questions whether a bottleneck would occur at SH29/Maunganui Rd.	N/A
92	4	Best long term solution but unsure about replacement of roundabout with traffic lights in terms of performance and efficiency.	N/A
93	5	Does not satisfy the 50yr plus term.	N/A
94	5	Not really an option.	N/A
97	5	No significant long term advantage for relocating the rail.	N/A
98	4	Flyover access between Maunganui Road and SH29 will be essential.	N/A
99	4	Acceptable ONLY if the funding is at capacity or limited.	N/A
100	4	Railway crossing at SH29 not preferable.	N/A
102	5	Option 2 will not solve the long term problem	N/A
103	5	Option 2 will not solve long term problem.	N/A
104	4	Medium Option 2, but still does not allow for future growth and development.	N/A
105	4	Avoids disruption to property owners on Maunganui Road but doesn't fix issues at Te Maunga when events are held at Baypark.	N/A
108	4	Option 2 is the most practicable option as it keeps easy access to Baypark and recycling center. Relocating railway is a good idea making it safer for traffic turning to and from Maunganui Road	N/A
109	5	Bad idea - concerned with rail noise, vibrations and loss of property value at Bayfair estate. Respondent asks whether sound barriers will be erected if rail relocated.	N/A
110	3	Supportive of the rail being relocated. Suggests that the Owens Place extension can be applied to Option 2 as well.	N/A
111	7	A very good plan and probably my preference over option 3 because the Owens Place extension may get too busy.	N/A
112	4	Like this plan - moving the rail crossing away from the intersection much improves safety and traffic flow.	N/A
113	6	Will have further bottlenecks along Matapihi Road	N/A
114	5	Does not want the rail relocated - noise, vibration, from trains and signals is a concern.	N/A
115	4	Possible option. Least impact from land acquisition. Flyover will be noisy and impact on church services.	N/A
116	4	Too expensive to move railway	N/A



118	5	Not suitable	N/A
119	5	Would require top notch noise mitigation and rail bed construction. Trees would not be successful.	N/A
121	5	Better placement of rail crossing on Matapihi Road	N/A
122	4	The best option for the future - only concern is potential bottleneck at Owens Pl and Driving Range with the Rail line being so close.	N/A
124	4	Best option. cheaper than Option 3 and moves rail away from MGI. HOWEVER, could a second exit off SH2 be included between SH29 and Matapihi Rd as shown in Option 3. This would reduce congestion at the SH29/Maunganui Rd intersection.	N/A
125	6	Very good- keeps SH2 traffic away from local traffic and with wider Maunganui Road having better traffic flows.	N/A
126	4	Supports the relocation of the rail away from the Maunganui Road	N/A
127	6	Good flows from TEL and MGI should flow better with rail relocated	N/A
128	6	Definitely no.	N/A
129	4	A complete disaster for residents, visitors and golfers - 6 entrances and 6 exits within approx 300m of proposed train tracks - Owens Place, service lane, driving range and pedestrian crossing.	N/A
130	4	Relocating rail crossing would be a big improvement on traffic flows. Would like to see the underpass remain.	N/A
131	5	Does not want to see rail relocated.	N/A
133	4	Industrial pollution of residential and reserve areas i.e. Liftan Place/ Russely Drive and Bayfair Reserve	N/A
134	5	Small advantage for traffic with relocation of the rail crossing, but not so good for residents behind Owens Place with Rail noise.	N/A
135	4	Much improved on Option 1 with the relocation of the rail line.	N/A
136	5	Option 2 would create more problems for all concerned -Golf Club members, residents, commercial owners would be affected to a greater degree than people with houses on Maunganui Rd between Te Maunga and Girven Rd.	N/A
137	6	Strongly oppose	N/A
138	4	Not keen on rail being relocated closer to residential area, but may mean less disruption during construction.	N/A
139	6	The relocation of the rail removes some of the problems with Option 1.	N/A
140	4	Having the 2 flyovers are excellent. Still having access to Truman Lane is OK. The railway is moved is excellent for traffic flow, but being aware of the changes required for the Matapihi residents to be safe.	N/A
141	4	Relocating rail is good as no houses need to be bought and there is already an existing rail corridor provided.	N/A

#### 4.0 Opinion of Option 3 (121)



## No Topics (121)

Sub. #	Pt. #	Point Text	Position
1	5	Does not address traffic issues rather focuses on local development which will increase local traffic.	Oppose
2	6	This is the best option - full use of the railway land that has been set aside for some 45 years.	N/A
5	5	Excellent	N/A
6	3	This would be the better choice. Like the idea of another entrance / exit into Owens Place.	N/A
8	4	Prefer this option even with the cost. It allows the most growth potential. Best for the railway and transporting. Only move it around ONCE.	N/A
10	5	Expensive but best option in the long run.	N/A
11	5	Option 3 is preferred choice.	N/A
13	6	Would be the best for all future services	N/A
15	6	This option is best for separating local and through traffic and access to Bay Park	N/A
16	7	Prefer this option	N/A
17	3	Best option. Do it right and do it once.	N/A
18	7	this is the best solution	N/A
19	3	option 3 should be adopted	N/A
20	5	Option 3 best option but it will devalue our mothers property - the noise and vibration and the bells outside her house, fumes from cars waiting and crossing. Cars will not be able to get out of Russley Drive.	N/A
21	6	preferred option as railway goes under, traffic flows more freely. also great idea to extend Owens Place to join Trumans Lane.	N/A
23	7	best option. SH29/SH2 intersection better. Bay Park exit traffic not such a problem after events. railway relocation best option.	N/A
25	5	Preferred option	N/A
27	5	the only way to go	N/A
29	7	best option	N/A
30	5	too expensive. Option 2 would be adequate for turning towards Bay Park Stadium	N/A
31	5	preferred as optimum solution	N/A
32	4	beneficial long term with improved flow of traffic. railway not obstructing major traffic routes	N/A
33	5	this would be the best option but it will create a problem with the Owens Place / Girven Rd intersection.	N/A
34	5	By far the best option, should be pursued.	N/A
35	6	Gives the best option long term for population growth and providing better connection to Bay Park and better traffic flow.	N/A
36	5	think it is the best way to go. look at the bigger picture - traffic in the future. bigger events at Bay Park. It will work out cheaper in the longer run by not having to modify.	N/A



37	5	preferred option. all contingencies appear to be covered and thought given to future traffic congestion.	N/A
38	3	leave train track as it is.	N/A
39	4	good future proof option even though it's costly.	N/A
40	4	Should proceed with option 3 as soon as possible. It may be slightly more expensive but will be a much safer option particularly in moving the railway line.	N/A
41	5	Best option and gives better access for roading for Bay Park residents - i.e. 2 ways out of the area.	N/A
42	5	might be best option but at 50% more cost it is too expensive.	N/A
43	8	prefer not to move railway	N/A
44	6	access road is a very good idea. Living in the Bayfair Estate have one exit in and emergency (i.e. tsunami) and would not be able to get out.	N/A
46	6	Gives an extra option for Bayfair residents going to Bay Park or Tauranga.	N/A
47	5	Option 3 is the best as it separates vehicles from trains around Bayfair intersection and seems safer.	N/A
48	5	best option overall	N/A
49	7	don't want rail moved	N/A
50	5	Like the option of easy access to Owens Place even though this option is more expensive	N/A
52	6	Option 3 is over-kill	N/A
53	6	with more and more trucks and trains heading for the port it is no use taking easier options. Need to do a complete job once and for all. Only concern would be where driving range and fish shop entrance is on Matapihi Rd may need to be changed.	N/A
54	7	potential problems and using Owens Place - narrow, lots of parked cars, will be a huge volume getting from Bay Park after events back to the Mount.	N/A
55	5	best option cost wise as it should not have to be upgraded.	N/A
56	5	adverse impact on the local area	N/A
57	6	an excellent option but drawback is noise, vibration, loss of value to some existing properties.	N/A
59	6	Best option. Improves traffic flow, particularly if rail traffic builds up.	N/A
60	7	not so keen on option 3. when there are events at Bay Park it would cause a lot of congestion at Owens Place and at intersection of Girven Rd still. As a cyclist respondent would find the long underpass intimidating.	N/A
61	5	best option of the lot - like the idea of another route through to and from Truman Lane as well	N/A
62	6	Best option from a local roading point of view. It provides two exits from Bayfair Estate.	N/A
63	4	Best option	N/A
64	5	best option as it makes the existing roundabout adjacent to Bay Park safer as it removes a significant amount of traffic.	N/A
65	5	Probably a more comprehensive solution.	N/A
66	7	By far the best option for the future	N/A
67	5	Not to move railway - it is not necessary.	N/A
69	6	No	N/A

70	5	First choice - best option. Best option providing long term benefit to users of both SH2 and SH29 and separation for local traffic. Stadium traffic isolated from SH29.	N/A
	7	Favoured option. Reduces local traffic using roundabout by extension of Titoki Place to SH29. Reduces traffic also on Te Maunga intersection thereby providing the best solution to cope with long term growth of traffic.	N/A
71	8	Not preferred option. although I like the idea of access in and out of Owens Place the reduced access to Bay Park is counter productive when considering more will have to be installed at the Te Maunga flyover.	N/A
72	6	Will take headache away from built up area and separate traffic from trains and hopefully lessen accidents. Traffic lights on Girven Rd and widening 40 years in planning will make a difference.	N/A
73	7	although the most expensive - long term must be the best option	N/A
74	5	Most practicable system. More free flowing for SH2 and SH29.	N/A
75	6	Overkill and makes access to Truman Lane very difficult especially sports at ASB arena.	N/A
76	7	Planning too far ahead and too expensive.	N/A
77	6	Changing the railway line would be unsettling for the neighbourhood.	N/A
79	3	Best option for the future - if either of the other options were chosen the rail line at Te Maunga would need to be dealt with. Bite the bullet now.	N/A
80	5	Preferred option - traffic will be a nightmare during construction but will definitely relieve all of the issues creating congestion. Please plan construction carefully in terms of traffic management.	N/A
81	7	A great improvement - flyovers at both intersections would be ideal.	N/A
82	8	Option 3 futureproof's in the long term for traffic from SH29. But is unsure of the Owens Place extension and the provision for pedestrian access to Baypark.	N/A
83	5	Best gain for local and through traffic by moving any rail congestion to local roads.	N/A
84	5	Best long term solution.	N/A
85	5	Best Option	N/A
86	6	Preferred Option	N/A
87	5	Approve of relocating rail, but it is 20 million dollars dearer.	N/A
88	7	Preferred choice - SH29 going over SH2 works well as in the North Shore over Auckland Motorway. Suggests to put the railway in a cutting to lower the train movements both north and west.	N/A
90	5	OK, but expensive. Distinct advantage of having railway level crossing removed from SH29.	N/A
91	7	Only one level crossing but in new location will be quieter and not have Owens Place traffic crossing. Approves of SH29 elevated ramps as access off SH29 should be better. Unsure of access to/from Baypark.	N/A
92	5	Considers Owens Place extension and SH29 over SH2 as advantageous but are 'add-ons' that are not needed now or in the medium term but rather could be done later if required.	N/A
93	6	Option 3 provides for 50yr plus term. Helps reduce congestion at MGI, the SH29 flyovers eliminate the bulk of traffic using the rail crossing at Te Maunga. On Matapihi Road only local traffic is affected - those beyond Owens Place.	N/A
94	6	Considers that Option 3 is the most preferred for them.	N/A



95	5	Supports the extension of Owens Place to SH29 - advantageous to Matapihi residents and trucks servicing Owens Place commercial area.	N/A
96	5	No - most expensive option	N/A
97	6	Looking long term and access to SH29 via Owens Place traffic distributes better from ASB Arena and provides truck access to and from Owens Place and Trumans Lane commercial areas.	N/A
98	5	The potential Owens Place extension to SH29 needs to be included while land is still available.	N/A
99	5	Best long term solution.	N/A
100	5	Best option as railway not crossing busy roads and giving better access to all areas.	N/A
102	6	Preferred Option 3	N/A
103	6	Option 3 is preferred option.	N/A
104	5	The best way forward. Allows for future growth and development. Expensive today - but cost saving for the future.	N/A
105	5	Preferred option. Best long term solution. More expensive now but cheaper in the long term. Traffic flows will increase in future and Options 1 and 2 will require upgrades in the future.	N/A
106	3	In the long term Option 3 would be better as the growing population continues and the Port continues to expand creating a lot more heavy traffic.	N/A
107	5	Best solution to keep traffic flows moving.	N/A
108	5	Respondent considers that Option 3 makes it too hard to get to SH29, Baypark and Truman lane which will deter people from accessing Truman Lane. However, moving the rail line is a good idea.	N/A
109	6	Bad idea - concerned with rail noise, vibrations and loss of property value at Bayfair estate. Respondent asks whether sound barriers will be erected if rail relocated.	N/A
110	4	Considers Option 3 the best option for the long term and the most sensible.	N/A
111	8	All the activity with waste disposal trucks to the Recycle Centre and Baypark sports activities would be a problem with the Owens Place extension.	N/A
112	5	Not sure about this option - access to Baypark is reduced and increases cars on Owens Place.	N/A
113	7	Definitely not- will have further bottlenecks along Matapihi Road.	N/A
114	6	Does not want the rail relocated due to noise and vibration impacts on property at Bayfair Estate.	N/A
115	5	Removes sizable section of land from Latter Day Saints Church. The ramp wall will be butted very close to church building at 79 Eversham Rd and noise from overpass may impact church services.	N/A
116	5	Too expensive to move railway.	N/A
118	6	Not suitable	N/A
119	6	very expensive, would require top notch noise mitigation and rail bed construction. Trees would not be successful.	N/A
121	6	Greater disruption with extra access road and additional roundabout.	N/A
122	5	Respondent thinks Option 3 is <i>a bit too much</i> .	N/A
124	5	Good, but the extra traffic forced down to the Bayfair mall area when an event is on at ASB Arena is a drawback (congestion around Bayfair).	N/A
125	7	By the far the best option	N/A



126	5	The SH29 overbridge better than a Maunganui Rd Flyover as in Option 2 and Option 1	N/A
127	7	Unsure of traffic flows from Mount to SH29 and SH29 to TEL if this is a viable option especially with more people moving to Papamoa.	N/A
128	7	Definitely no	N/A
130	5	Prefers not to have the access road making Owens Place a busy thoroughfare.	N/A
131	6	Does not want to see rail relocated.	N/A
132	6	Better than Option 1 but would prefer not to have the Truman Lane extension access road.	N/A
133	5	Industrial pollution of residential and reserve areas with the relocation of the rail.	N/A
134	6	This option provides the second access for Matapihi residents, although still have to wait for trains at Te Maunga	N/A
135	5	Prefer option 3 as it sorts out the whole area very well. Having another exit from Bayfair Estate is a big positive.	N/A
136	6	undesirable option for similar reasons as Option 2 and the added problem of more rail traffic at Te Maunga end of Bayfair Estate.	N/A
137	7	Strongly oppose	N/A
138	5	Truman lane extension provides potential for growth in commercial development. Relocation of rail would move noise very close to existing residential area.	N/A
139	7	Seems the best alternative even if the completion period is longer.	N/A
140	5	Having the 2 flyovers is excellent. Still having access to Truman Lane - OK and railway moved is excellent. All aspects are well thought out, having the additional access from Truman lane is good.	N/A
141	5	Seems too complicated. Helps SH29 with no rail interference but I travel every morning to work across this rail crossing and only have to stop for 3-4 mins every couple of weeks which doesn't bother me. Still requires houses to be bought on Maunganui Rd.	N/A

## 5.1 Reasons for Opinion (52)

### No Topics (52)

Sub. #	Pt. #	Point Text	Position
1	7	Existing railway location accepted by Maunganui Rd residents. Greatly devalues quality houses in Bayfair estate, cause vibration damage and noise nuisance. Elderly in Bayfair estate want peaceful lifestyle. Environmental impact on farmland and swamp areas not favourable.	N/A
2	8	Do it once and use the best option	N/A
80	7	Diverts traffic to Baypark away from SH traffic. No waiting for trains if you are on SH. No waiting at roundabouts - less chance of accidents, Pedestrians will have separate access - not crossing a SH on their way to and from Baypark.	N/A
81	9	Best option for safety and convenience - need to keep underpass.	N/A
82	10	Option 2 is the best option for satisfying SH2 flow, rail movement and also local traffic. 'Moving the rail is really good.' Has reservations for Option 3 around the extension to Owens Place.	N/A



83	7	While the cost for Option 3 is greater, the gains are far higher for both local roads and SH traffic and traffic flows to the Port creating a safer environment for local traffic.	N/A
84	7	Have waited 50 years for rail to be relocated. If Papamoa traffic take another form of getting onto SH this would help relieve the congestion at Bayfair roundabout	N/A
85	7	Option 3 best as it is future proofed.	N/A
87	7	Option 1 has too many impacts on houses being removed and leaves the rail vs car at MGI, while Option 3 is too expensive.	N/A
88	9	SH2 will flow from TEL better	N/A
89	4	Railway line <u>must</u> be moved.	N/A
90	7	All port traffic will be on TEL. Clear intersection for local traffic only. Port traffic from Waikato should go through Route K and Harbour Link leaving Te Maunga intersection with less heavy traffic - making expense of Option 3 unnecessary.	N/A
91	9	It covers all options and looks further to the future .	N/A
92	7	Option 2 seems to have all necessary components for the present and immediate future.Considers the rail relocation is a good idea but the additional features of Option 3 are unnecessary at this stage.	N/A
93	8	Option 3 provides for 50yr plus term. Helps reduce congestion at MGI, the SH29 flyovers eliminate the bulk of traffic using the rail crossing at Te Maunga. On Matapihi Road only local traffic is affected - those beyond Owens Place.	N/A
94	8	1. Railway is relocated which is good. 2. Optional exit for Bayfair Estate residents through Owens Place to SH29 is provided. 3. Not as many houses need to be brought up for widening Maunganui Rd. 4. Great to have the two flyovers - as the flyover works well at Hewletts Road.	N/A
95	7	Personal preference and least dislocation.	N/A
96	7	The respondents retain the use of Bayfair Reserve for walking their dog and other dog walkers, a railway on the boundary would endanger the safety of the animals. The bird life around the reserve will not be disturbed.	N/A
97	8	Prefer a long term solution rather than a shorter term solution.	N/A
98	7	Even though Option 3 is the most expensive, it appears to be the best action to create reasonably smooth access for both road and rail traffic to and from the ever growing Port of Tauranga.	N/A
99	7	Growth in the area is increasing and will continue to grow at pace. Option 3 provides the best long term solution.	N/A
100	7	Removes rail traffic from vehicle traffic (except from Maunganui Rd to Baypark stadium). Would like to see two lanes of traffic each way from Hewletts Rd flyover to Whakatane turn off (TEL).	N/A
104	7	Although initially expensive the Option 3 is the best long term solution.	N/A
105	7	Option 3 is the best long term solution. More expensive now but cheaper in the long term. Traffic flows will increase in future and Options 1 and 2 will require upgrades in the future.	N/A
106	5		N/A
107	7	Best long term benefit to meet future needs.	N/A
108	7	Option 2 is the most practicable option as it keeps easy access to Baypark and recycling center. Relocating railway is a good idea making it safer for traffic turning to and from Maunganui Road.	N/A
109	8	Noise and vibration concerns with Options 2 and 3 associated with rail relocation. Loss of property values at Bay fair estate would be considered devastating.	N/A



110	6	Best long term solution and most sensible.	N/A
111	10	If the Owens Place extension could be further developed (widened) - Option 3 would be preferred.	N/A
112	7	Option 2 has better traffic flow and safety aspects. Considers Option 3 as unnecessary now or in the future.	N/A
113	9	Options 2 and 3 - Those entering Matapihi from side streets (i.e. Russely, Balmacewan, Bayfair Drive, Golf Course) and exits from houses will still have trouble with train crossing further up Matapihi. The Owens Place extension will push problem elsewhere. Therefore option 1 preferred.	N/A
114	8	Significant noise and vibration effects from train movements and signals located outside property at Bayfair Estate (15 Liftan Pl) if rail is located. Therefore option 1 preferred.	N/A
115	7	Option 2 has less land taken. Option 1 leaves church building useless, while Option 3 may have greater noise impact due to closeness of the ramps to the building.	N/A
116	6	Option 1 is least expensive and simplest solution.	N/A
119	8	Option 1 maintains the status quo and protects the existing Russley Pl subdivision and established park which is well used. Respondent cannot see noise mitigation being properly done .	N/A
121	8	Takes rail crossing away from Maunganui Rd in crucial area. Does not eliminate the inability of emergency services to Bayfair Estate in case of emergency.	N/A
122	7	Respondent thinks Option 3 is the best option for now and in the future.	N/A
124	7	Easier and faster exiting of traffic from a function at the stadium (not having to contend with traffic around the Bayfair Mall that Option 3 would cause for people who live in the Te Puke direction). The rail relocation is an improvement over Option 1.	N/A
125	9	Separates SH2 from local traffic and Truman lane extension will reduce traffic through MGI intersection (from Matapihi and Owens Place).	N/A
127	9	Option 2 better flow of traffic - relocation of rail will help traffic flow through MGI	N/A
128	9	Option 1 because - noise, vibrations and visual impacts on properties if rail relocated. Relocation of the rail will devalue properties in Matapihi.	N/A
131	8	All three options are to have flyovers- why relocate rail?	N/A
133	7	Mental stress of residents unable to consider shifting because of considerable probable drop in house price affected by Options 2 and 3. Physical stress - living alongside a rail line with probable traffic of 30#43; trains a day; this is not the norm!	N/A
134	8	Option 3 is the best long term option with increase volume of traffic and increase in Port and rail activity.	N/A
135	7	Living in the area and using the present roundabout - would really appreciate Option 3.	N/A
136	8	Keeping rail line where it is means less home owners being affected by noise, vibration, stress and property devaluation. The existing peace and quiet presently enjoyed by many elderly home owners will be removed.	N/A
137	9	The unfair property devaluation and change of ambiance to a zoned passive area.	N/A
138	7	Keeps rail in present position.Gives people on Maunagnui Road opportunity to move as access to Maunganui Rd will only become more difficult and dangerous.	N/A
139	9	Option 3 provides an additional exit from the Bayfair Estate in the event of a major incident either at the flyover or MGI intersection.	N/A
140	7	Option 3 preferred as if all this work is to be done why not do it all at once. Disrupts the least amount of housing, Owens Place traffic flow would need further consideration. Gives traffic 2 options to access Truman Lane.	N/A



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141	7	A cheaper option and no houses need to be bought. Rail moves away from MGI and considers SH2/SH29 is not too much of an issue especially with SH2 traffic not involved at intersection.	N/A
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**5.a - Option 1 preferred (29)****No Topics (29)**

Sub. #	Pt. #	Point Text	Position
1	6	Support	Support
38	4	flyover is the best thing to do as 70% last time had flyovers on the table.	N/A
43	9	Take some of the housing on Maunganui Rd. Prefer not to move railway line.	N/A
44	7	Would not be as disruptive as options 2 and 3. House values adjacent to park would drop if railway is moved.	N/A
49	8	no need to move railway if you have lights instead of roundabout	N/A
54	8	There is little point moving the railway.	N/A
56	6	Less impact on the local area. noise and visual impact would be adverse to the area.	N/A
57	7		N/A
67	6	Seems it will elevate the traffic and should flow well.	N/A
69	7	Flyover would be the best option	N/A
76	8	Less disruption with Option 1.	N/A
77	7		N/A
84	6	Option 1 preferred	N/A
95	6	Option 1 preferred	N/A
96	6	Option 1 preferred	N/A
101	4	Option 1 preferred	N/A
109	7	Option 1 preferred option	N/A
113	8	Option 1 preferred.	N/A
114	7	Option 1 preferred.	N/A
116	8	Option 1 preferred	N/A
118	7	Option 1 preferred	N/A
119	7	Option 1 preferred.	N/A
128	8	Option 1 preferred	N/A
129	5	Option 1 preferred	N/A
131	7	Option 1 preferred	N/A
133	6	Option 1 preferred	N/A
136	7	Option 1 preferred.	N/A
137	8	Option 1 preferred	N/A
138	6	Option 1 preferred	N/A



## 5.b - Option 2 preferred (29)

### No Topics (29)

Sub. #	Pt. #	Point Text	Position
4	5	Keeps traffic flow for Bay Park as well as Matapihi and doesn't affect owner's house at 2 Exeter St.	N/A
14	4	too much congestion	N/A
22	5		N/A
30	6	more straight forward than Option 3 for Bay Park. It serves the Matapihi intersection well	N/A
42	6	Option 2 provides best value for money.	N/A
52	7	carries major traffic on flyovers over worst intersection and rail is diverted from trouble spots	N/A
60	8	less complicated. less expensive. take rail line away from SH and Girven Rd intersection. shorter cycle underpass. takes rail away from commercial area.	N/A
68	8	does not appeal. haven't taken into account area for breakdowns and it would detrimental to the environment. NZ cannot afford to maintain the proposed railway and flyovers. Chose other destinations for traffic improvements.	N/A
71	9	Attends to the vast majority concerning safety and congestion at both intersections other than encountering trains on SH29.	N/A
78	5	Rail out of the way and two flyovers.	N/A
82	9	Option 2 Preferred	N/A
87	6	Option 2 preferred.	N/A
89	3	Option 2 preferred.	N/A
90	6	Option 2 preferred	N/A
92	6	Option 2 preferred	N/A
96	4	No	N/A
108	6	Option 2 preferred.	N/A
111	9	Option 2 preferred.	N/A
112	6	Option 2 preferred.	N/A
115	6	Option 2 preferred.	N/A
121	7	Option 2 preferred	N/A
122	6	Option 2 preferred.	N/A
123	3	Option 2 preferred.	N/A
124	6	Option 2 preferred.	N/A
127	8	Option 2 preferred	N/A
130	6	Option 2 preferred	N/A

132	5	Prefer rail to be relocated	N/A
132	7	Option 2 preferred	N/A
141	6	Option 2 preferred.	N/A

### 5.c - Option 3 preferred (84)

#### No Topics (84)

Sub. #	Pt. #	Point Text	Position
2	7	Supports Option 3	Support
4	4	Traffic from Bay Park would be congested going down Owens Place onto Maunganui Rd with Owens Place only being a 2-lane road.	N/A
5	6	Do the job properly to provide a longer lasting option. It will still be congested in 20 years so other options need considering i.e. plan for a reduction in people movement on the main highway. We will need more people transport.	N/A
6	4	Living in the area, option 3 would reduce some of the traffic into Matapihi Rd.	N/A
7	4	Likes this option best but still have a problem with the train.	N/A
7	5	Easier to get out of Matapihi Rd from Bayfair Estate	N/A
8	5	Railway is an integral part of here and our economic growth. Move the railway line at the start and build flyovers etc to add capacity. No patch up jobs later.	N/A
10	6	In the future options 1 and 2 will not be big enough to cope with predicted volumes of rail and road traffic especially logging trucks. Do it once, do it big and do it right.	N/A
11	6	It removes the pedestrian underpass which is a community trouble spot for the teenage youth loitering and harassing residents - the police are often called to incidents there. Moving the railway tracks brings the retail areas of Owens Place closer to Bayfair (which will make it more convenient to move between them).	N/A
12	3	There will still be queues of cars delayed by having to cross the railway line at Baypark intersection.	N/A
13	7	Lives in Bayfair estate and travel through these intersections and would appreciate the safety in these changes.	N/A
15	7	The rail corridor behind Owens Place was put there for this very reason.	N/A
16	8	Less congestion	N/A
17	4	Best long term solution	N/A
18	8	this option provides the best safest route for all	N/A
19	4	this provides the answers to the existing problems.	N/A
20	6	Long term benefits but it will devalue our home and others in the Bayfair Estate because of the rail noise.	N/A
21	7	Want to do the job once and do it well. Rail will get busier. no point in the other two options to save money. Should chose the most expensive option now.	N/A
23	8	better as railway disturbance minimised. Exit event traffic from Bay Park. Opens up end of Owens Place for future business. Better pedestrian access to Bay Park events	N/A





24	4	this is the best option as we need another exit from this housing estate in case of emergencies.	N/A
24	5	Lives in Russley Drive and have limited mobility and am concerned should there be a tsunami that the only one existing exit will become clogged.	N/A
25	6	better way of getting into and out of Bayfair Estate is anything happened on the rail line. At present there is no way an ambulance or fire engine into the Estate in a serious emergency.	N/A
26	6	will make things 100% easier for access to/from Gloucester. prefer this as access to SH2 easier than the other options	N/A
26	7	ease of access to normal routes and appears safer.	N/A
27	6	accesses to Matapihi	N/A
28	4	appears to provide better flow of traffic	N/A
29	8	effects least amount of home owners	N/A
31	6	appears to be the most logical choice taking into account the following: 1) roading needs in light of future projections 2) design function in accommodating those needs 3) minimise social / community disruption	N/A
32	5	consideration of light passenger rail should be included as population increases may enable use of rail corridor through railway station at owens places with new alignment of railway	N/A
33	6	it will provide a solution for the future whereas options 1 and 2 are shorter term solutions.	N/A
34	6	Railway removed from road corridor. No level crossing on corner of TEL and SH29. Shouldn't move bottleneck to another side. Does the job for a good period of time into the future.	N/A
35	7	Best option for long term for population growth and better connection to Bay Park and better traffic flow. However it is possible to do the connections (2 bridges) in two stages to spread the extra cost.	N/A
36	6	best way to go. looks at bigger picture re. traffic flows and bigger events at Bay Park. save having to modify in the future.	N/A
37	6	Additional flyovers and on/off ramps will make motoring much easier and traffic lights at Girven Rd / Maunganui Rd intersection is a much better option than a roundabout.	N/A
39	5	Option 3 will give the best future needs for transport which will increase over the years also the rail line will be future proof by getting it away from Maunganui Rd.	N/A
40	5	Should proceed with option 3 as soon as possible. It may be slightly more expensive but will be a much safer option particularly in moving the railway line.	N/A
41	6	It is better to look towards the future of traffic now than to find 10 years down the line we chose the wrong option and the intersections are no longer coping with the extra traffic. Options 2 and 3 also get the railway away from the Matapihi / Girven Rd intersection.	N/A
46	7	Gives an extra option for Bayfair residents going to Bay Park or Tauranga	N/A
47	6	safety and gets a better flow of traffic.	N/A
48	6	removes both roundabouts and removes both rail crossings from near the highway	N/A
50	6	Like the option of getting into and out of Owens Place without going on the main road. having the railway line moved further back also the best option. Avoids stoppages and is much safer.	N/A
53	7	it is a complete job	N/A



55	6	will help with traffic	N/A
58	2	option 3 would give residents of Bayfair Estate another exit.	N/A
59	7	All options will improve respondents daily travel into and out of the Mount. Option 3 is the best solution for the longer term - mainly because it should successfully address the railway crossing issue on SH29.	N/A
61	6	will make it much easier for through traffic from the TEL and reduction of traffic will ease congestion at Girven Rd/Maunganui Rd.	N/A
62	7	best from local roading point of view as it provides two exits from Bayfair Estate.	N/A
63	5	Keep SH29 moving	N/A
64	6	makes existing roundabout adjacent to Bay Park safer as it removes a significant amount of traffic.	N/A
65	6	Offers a more long term and overall solution albeit at the expense of increased noise in Bayfair Estate.	N/A
66	8	Lives at 743 Maunganui Rd and wants to remain.	N/A
68	9	does not appeal. haven't taken into account area for breakdowns and it would detrimental to the environment. NZ cannot afford to maintain the proposed railway and flyovers. Chose other destinations for traffic improvements.	N/A
70	6	Long term benefits for both residential and commercial traffic Isolation of stadium traffic Matapihi railway crossing relocated Safer option for pedestrian and cyclists Highway traffic able to proceed without need for controlled intersections by lights. Go for it!	N/A
	8	Favoured option. Reduces local traffic using roundabout by extension of Titoki Place to SH29. Reduces traffic also on Te Maunga intersection thereby providing the best solution to cope with long term growth of traffic.	N/A
72	7	Safety first and traffic flow is paramount.	N/A
73	8	Do the best long term, cost effective option. Option 3.	N/A
74	6	As the BOP has a very quick growth rate Option 3 us the better flow rate.	N/A
79	4	Preferred Option 3	N/A
80	6	Preferred option	N/A
81	8	Option 3 preferred	N/A
83	6	Option 3 preferred	N/A
85	6	Option 3 preffered	N/A
86	7	Option 3 preferred	N/A
88	8	Option 3 preferred	N/A
91	8	Option 3 preferred	N/A
93	7	Option 3 preferred	N/A
94	7	Option 3 preferred	N/A
97	7	Option 3 preferred	N/A
98	6	Option 3 preferred	N/A



99	6	Option 3 preferred	N/A
100	6	Option 3 preferred	N/A
102	7	Option 3 preferred	N/A
103	7	Option 3 preferred	N/A
104	6	Option 3 preferred	N/A
105	6	Option 3 preferred.	N/A
106	4	Option 3 preferred.	N/A
107	6	Option 3 preferred.	N/A
110	5	Option 3 preferred.	N/A
125	8	Option 3 preferred	N/A
126	6	Option 3 preferred	N/A
134	7	Option 3 preferred	N/A
135	6	Option 3 preferred.	N/A
139	8	Option 3 preferred	N/A
140	6	Option 3 preferred	N/A

## 6.0 Mitigation Measures (43)

### No Topics (43)

Sub. #	Pt. #	Point Text	Position
1	8	Earthbund and the beautification on both sides of Maunganui Rd. Wall along Owens Place commmercial deflecting locomotive noise.	N/A
4	6	None	N/A
5	7	Concrete fence along each side of rail behind Owen Place shops and houses. Dig out a deeper base for this rail deviation and make no vibration.	N/A
15	8	Noise from the rail line next to Bay Park Estate.	N/A
17	5	You will not please everyone.	N/A
20	7	Want compensation for 15 Lifton Place (1st house on Matapihi) or property purchase.	N/A
21	8	Mitigation to public on disruption to travel and local residents and other factors i.e. noise etc.	N/A
30	7	houses close to the railway in streets off Russley Dr should have consideration to noise, i.e. a wall put up. Also consideration given to movement in ground of houses.	N/A
31	7	design and construction should as much as possible compensate for the essential stark and utilitarian aspect of the project e.g. vegetation, green swathes, intrinsic decoration reflecting the natural environment and ambience of the location - historical visual reminders.	N/A
33	7	The underground walkway through both sides of the road is a must.	N/A
34	7	standard measures used on other projects.	N/A

44	8	tree planting, fences (high) with creepers growing over them. Sufficient drainage as water table is high in that area.	N/A
48	7	noise walls	N/A
54	9	Concerns with traffic crossing SH29 - could a roundabout still be used here, rather than lights stopping the SH traffic to cross either to Bay Park from Tauranga or from Bay Park to the Mount.	N/A
60	9	as much as feasible. Ok with barrier walls that can be vegetated. plant low trees and hedges.	N/A
62	8	Noise mitigation for residents of Bayfair Estate due to the railway moving.	N/A
64	7	ensure minimal disruption to Omanu Golf Club	N/A
68	10	Security, lighting, accident access, health and safety areas for ambulance and fire engines etc.	N/A
70	7	Noise control for Matapihi residents. Visual barriers - trees, plantings, embossed concrete.	N/A
	9	noise dampening for housing neighbouring railway in Bayfair Estate and along Maunganui Rd towards te Maunga - especially near flyovers.	N/A
80	8	Traffic management during construction- consideration of trucks from Te Puke. Especially not to use Beach Road for heavy traffic - lesson learnt form 2012 congestion after floods.	N/A
81	10	Sound barriers for rail relocation	N/A
83	8	Screening by native planting to reduce noise and reduce tagging on the major traffic corridors	N/A
85	8	Nil. In particular landscaping becomes an ongoing maintenance cost with the associated traffic disruption caused by the temporary traffic management required to access it.	N/A
87	8	Lowering the rail line or building embankments to minimise the noise factor for Matapihi residents.	N/A
88	10	Lower railway into a cutting	N/A
90	8	Connection between Owens Place and Truman Lane with Option 2.	N/A
92	8	Planned plantings will be good and provides opportunity to make the area more attractive and potentially absorb some traffic noise.	N/A
94	9	Noise barriers for houses next to relocated rail line	N/A
109	9	The beautification of the entry to the Mount with trees and gardens with natives and design features as 'a gateway' to the Mount for tourists and visitors.	N/A
114	9	If option 2 or 3 chosen then - double glazed windows, heavy curtains. Does not want noise barriers as will attract graffiti.	N/A
115	8	79 Eversham Rd (church) being a place of worship would require double glazing and air conditioning throughout to combat the increase in noise and lack of air circulation.	N/A
119	9	Full length acoustic noise wall between Matapihi and Titoki similar to ones used on Auckland motorway. Continuously welded rail track. Double depth rail bed. Noted taht trees are not likely to be successful due to sandy soil and drought conditions.	N/A
121	9	Take into consideration the elderly as the majority of residents in the Bayfair area regarding access to Bayfair shopping.	N/A
123	5	Concerned about potential damage to houses during construction of flyovers with drilling and driving of columns into ground (thumping/ vibration).	N/A
126	8	Road noise will be a problem - both Bayfair/ Girven Road and Matapihi and Owens Place and residential at Matapihi.	N/A



127	10	Monitoring of noise, dust safety to pedestrians during construction. Compensation to homeowners for any damage to houses in the area caused during construction. Stormwater runoff is adequately provided.	N/A
128	10	Do it quickly with as little disruption as possible	N/A
133	8	This is up to the experts to determine. The option to be able to move away and a means to mitigate rail noise away from residential area.	N/A
135	9	Ensure safe access to and from Bayfair Estate is provided during construction.	N/A
136	9	If options 2 or 3 are used then earth bunds or noise barriers should be provided to mitigate noise impacts on residents. Vibration effects should also be mitigated.	N/A
139	10	Noise abatement measures along the new rail corridor.	N/A
140	8	Advanced notice to residents. Noise controls for machinery during construction and clear traffic management.	N/A

## 7.0 - Longer Pedestrian Underpass? (94)

### No Topics (94)

Sub. #	Pt. #	Point Text	Position
1	9	Not in favour of a long underpass Currently not a pleasant experience walking through it would be made worse if longer	N/A
2	9	Great	N/A
3	5	Is OK Now	N/A
4	7	Being used for the wrong purposes.	N/A
5	8	Make it wide so people do not feel restricted	N/A
7	6	Ok if there is lighting to guide pedestrians.	N/A
10	7	ok	N/A
11	7	The underpass is already a trouble spot. Graffiti and vandalism is a common now and would be worse in a longer underpass.	N/A
15	9	Get rid of the underpass and use pedestrian crossing lights	N/A
17	6	not my preferred option but security always a problem	N/A
18	9	not really safe because of the weight	N/A
20	8	unsafe and would not like to use it.	N/A
21	9	Provided it is well lit and monitored by CCTV it would be ok	N/A
23	9	should be extended to either past the railway line or right across.	N/A
24	6	not sure but as it is at the moment it is fine.	N/A
25	7	would not be any better for older people.	N/A
26	8	not in favour. It has many unredeeming features, i.e. safety, lighting etc as it is now but would like to see huge improvement.	N/A
31	8	concerns about user safety - existing underpass dirty, poorly lit and smells.	N/A
34	8	Option 1 is not an option	N/A



37	7	not impressed. shorter underpass preferred.	N/A
38	5	yes a larger and longer underpass	N/A
39	7	longer length is a concern but good design and lighting may overcome the concern.	N/A
40	6	have never used the underpass but if it gives users greater safety then agree with it.	N/A
41	7	No. don't feel safe walking through the underpass.	N/A
42	7	could have significant safety issues unless it is monitored closely by CCTV	N/A
43	10	big concern with safety.	N/A
44	9	maybe an overpass should be considered	N/A
46	8	would be a good idea if it could be patrolled by security / police to prevent vandalism.	N/A
48	8	If underpass too long can become intimidating as long as the lights allow pedestrians to cross quickly enough it may not be needed.	N/A
49	9	if needed ok	N/A
52	8	not in favour of option 1	N/A
54	10	Security issues will be much greater. Pedestrian lights probably preferable - above ground crossing.	N/A
55	7	great for people and wheelchair access	N/A
56	7	would need good security measures	N/A
57	8	very viable as it is used daily	N/A
60	10	not as keen. would like the rail moved away from the intersection and highway.	N/A
61	7	would worry about safety and therefore good lighting would be needed - could become a place for undesirables to hang out.	N/A
62	9	public safety issues.	N/A
64	8	Would need to have good lighting.	N/A
66	9	yes	N/A
67	7	This obviously would have to be part of the project.	N/A
68	11	This will create shelter for homeless people. No good. Tagging.	N/A
69	8	Too dangerous	N/A
	10	It is vital.	N/A
71	10	Prefer keeping pedestrians out of the mix with traffic but with the underpass being 100m long the majority of people will not use it, particularly at night.	N/A
72	8	Absolutely fantastic as long as it will be safe for motorised scooters and the like who have problems with wheels being stuck in rails.	N/A
73	9	Probably short term.	N/A
75	7	Would not use it.	N/A
76	9	OK as long as it works. At times like Christmas many park in Owens Place to go shopping in Bayfair due to lack of sufficient car parking at Bayfair.	N/A
77	8	Lights are more effective.	N/A
80	9	Fantastic- but has to be well lit at night	N/A
81	11	Better than at-grade signalised pedestrian crossing	N/A



82	11	Not favored at all.	N/A
83	9	Pedestrian movements would be improved but the security risk would also increase.	N/A
84	8	Good Idea	N/A
85	9	No, not safe.	N/A
86	8	Likes the existing underpass but any longer may cause problems	N/A
87	9	Not needed with pedestrian lights - but unconcerned if longer one is built.	N/A
88	11	Need easy to see and use underpass and needs cycle-ways.	N/A
90	9	Necessary	N/A
91	10	Doesn't like the existing underpass as it is unwelcoming. New underpass should cross rail line for safety and needs to be more user friendly.	N/A
92	9	Considers it essential to give pedestrian access.	N/A
95	8	Would be necessary as many access Bayfair on foot and cycle from Owens Place and Matapihi.	N/A
96	8	No objection	N/A
97	9	Not good for safety reasons but would prefer underpass instead of at-grade signalised pedestrian crossing	N/A
98	8	Good Idea	N/A
101	5	No - leave it as is.	N/A
102	9	Yes - longer underpass, but do not consider Option 1.	N/A
104	8	Not a problem, but must be well lit to ensure safety.	N/A
105	8	Undesirable. Staged signalised pedestrian crossing preferred.	N/A
106	6		Support
108	8	Too dangerous as will likely attract undesirables	Oppose
109	10	Not very safe - prefer the signalised pedestrian crossing. Haven for undesirables.	N/A
113	10	No - retain existing underpass	N/A
116	7	Would be OK	N/A
118	9	Underpass must be retained for consideration of mobility scooters travelling from Bayfair Estate to Bayfair shopping complex.	N/A
119	10	The existing underpass is dirty and has safety concerns at night. A longer one would be worse.	N/A
122	8	Respondent doesn't like a longer underpass. Prefers pedestrian crossing controlled by lights.	N/A
124	8	Respondent has no problem making the underpass longer - make it well lit.	N/A
126	9	OK	N/A
127	11	As long as it is well lit with easy access for mobility scooters and enough room for cyclists.	N/A
128	11	Respondent uses the underpass all the time and cant see any reason against a longer underpass.	N/A
129	6	OK as long as access for mobility scooters, has good lighting and security cameras, cyclists to walk signage	N/A
130	7	Would increase safety risk	N/A



131	9	Already use the underpass on a weekly basis - suits me fine	N/A
132	8	Would prefer not to have the longer underpass unless saturated with lights and security cameras that could not be vandalised.	N/A
133	9	Not safe for elderly or children - why cant the partial underpass and signals design be used in Option 1?	N/A
134	9	Would make a safe journey for pedestrians from traffic but could have unsavory effects	N/A
135	10	The underpass works extremely well and keeps pedestrians away from traffic.	N/A
136	10	it would mean increased inconvenience to pedestrians.	N/A
138	8	Not a good idea. It wont feel safe with youth meeting there.	N/A
139	11	Would not appear to cause any problems.	N/A
140	9	The length of the underpass is not a problem but safety is a priority - requires to be clean and well lit, perhaps murals to brighten it up. More safety signage would be good. People using it need to feel safe in a well lit and clean underpass.	N/A
141	8	Not bothered, however the length could defer people from using it making a hazard at the intersection.	N/A

## 8.0 - Partial Existing Underpass (90)

### No Topics (90)

Sub. #	Pt. #	Point Text	Position
1	10	The existing underpass is acceptable but pedestrian signals would be better for the local aged residents	N/A
4	8	Highly visible, no problems foreseen.	N/A
7	7	Like the ground level pedestrian crossing better than the underpass	N/A
10	8	Underpass is a mess now. Do away with it.	N/A
11	8	Underpass is a trouble spot - graffiti and vandalism.	N/A
14	5	Good as is.	N/A
15	10	Get rid of the underpass	N/A
18	10	this could work well and save the underpass	N/A
20	9	Prefer ground level crossing	N/A
21	10	preferable option as people would feel safer	N/A
23	10	shouldn't be necessary if railway line is and signalised crossing.	N/A
24	7	OK	N/A
25	8	Better	N/A
26	9	agree with this	N/A
29	9	good	N/A
30	8	would underpass be necessary	N/A
31	9	ok. gives pedestrians a choice and safety	N/A





33	8	No way	N/A
35	8	This would be a waste - any underpass should go underneath the railway line.	N/A
37	8	better option.	N/A
38	6	not a lot different and leave the rail track and underpass. no crossing at all.	N/A
39	8	this option would interrupt traffic flow.	N/A
40	7	Good if it gives greater safety to pedestrians.	N/A
42	8	ok	N/A
44	10	quite good but we need more consultation	N/A
47	7	safety	N/A
48	9	wouldn't be easier to have the whole crossing at-grade?	N/A
52	9	only an extension of existing	N/A
54	11	Good idea.	N/A
55	8	great until you get to rail lines, would like to see underpass lengthened.	N/A
56	8	underpass has become unsafe in recent years - people, smell, rubbish and graffiti	N/A
57	9	excellent but safety must be the foremost consideration	N/A
59	8	should be ok though the existing underpass with no signals to wait for works well.	N/A
60	11	option 2 - acceptable option 3 - too long, unsafe	N/A
61	8	That would work a lot better.	N/A
62	10	better	N/A
64	9	Prefer full length underpass - all issues associated with mixing pedestrians and cars / trucks is removed. Not having to wait for pedestrian signals would speed up traffic through the area.	N/A
65	7	All that is required.	N/A
67	8	No should be underpass	N/A
69	9	Signalised crossing.	N/A
70	8	Underpass may be useful only for cyclists. Of doubtful benefit unless use means maintenance costs are worthwhile. As a pedestrian I would rather use lights than an underpass.	N/A
	11	Do not agree as an extended pedestrian underpass would interrupt traffic and long term would have less effect on movement around the intersection. would be safer for both pedestrians and cyclists.	N/A
71	11	This is the best way round the current situation.	N/A
73	10	Prefer status quo	N/A
74	7	Safer and 24-hour friendly.	N/A
75	8	Unnecessary.	N/A
76	10	OK as long as it works. People park at Owens Place and go shopping at Bayfair.	N/A
77	9	Both are not required.	N/A
80	10	Seems to be a good idea that will work well.	N/A



81	12	Doesn't like the idea of a partial underpass.	N/A
82	12	If the pedestrian access above ground is adequate, safe and satisfactory, then remove the underpass.	N/A
83	10	The split option would be OK	N/A
85	10	May be used by the less physically able. Alternative to crossing across the lights should be provided.	N/A
86	9	Existing underpass is OK. This split option looks OK.	N/A
89	5	Needs to be undertaken - both underpass and signals	N/A
90	10	Get pedestrians away from what will be a very busy intersection.	N/A
91	11	A ground level signalised crossing should be sufficient	N/A
92	10	underpass only - no traffic signals.	N/A
95	9	Would be OK	N/A
97	10	No - not good with dense traffic.	N/A
98	9	Respondent considers that underground access to the far side of traffic movement strongly supports road safety practices.	N/A
99	8	Prefer to maintain the existing pedestrian underpass.	N/A
102	8	No signals - just extend the underpass	N/A
104	9	Underpass better than signals.	N/A
105	9	Best idea. Elderly do not like long tunnels which " <i>may possibly encourage unsavory characters to hang around.</i> "	N/A
106	7	prefers the underpass.	N/A
108	9		Support
109	11	Get rid of underpass. Often very smelly to go through and attracts graffiti and undesirables.	N/A
110	7	Likes the underpass for safe crossing but a signalised crossing may put time pressure on elderly who cannot move as fast and feel rushed - depends on phasing of the signals.	N/A
111	11	Good	N/A
112	8	Supports the use of signalised pedestrian crossings and the removal of the underpass.	N/A
113	11	Work around the existing underpass.	N/A
116	9	Existing underpass caters for cycles and fast traffic but path is too narrow for both on Matapihi side.	N/A
118	10	Prefer retention of underpass than signals.	N/A
119	11	Prefers signalised control intersection for pedestrians.	N/A
122	9	This is a good option.	N/A
124	9	Longer underpass is preferable over partial underpass.	N/A
125	10	The underpass should be provided with Option 3 as traffic will get heavier and will mean less interruption to traffic flow if underpass provided.	N/A
126	10	Good idea	N/A
128	12	satisfactory - but if extension needed then OK	N/A
129	7	No problem - As long as it caters for the many invalids who live in the area	N/A



130	8	Cyclists should be considered with tracks for safety	N/A
132	9	Prefers this option rather than longer underpass.	N/A
133	10	Yes OK - but use in Option 1.	N/A
134	10	Should work providing all abide with the law	N/A
135	11	This may work but prefer the safety of an underpass.	N/A
136	11	Prefer this option than longer underpass.	N/A
138	9	Prefer the ground level pedestrian crossing	N/A
139	12	May result in bottleneck at the junction of the underpass and signalised crossing.	N/A
141	9	Good	N/A

## 9.0 - Most Important to Consider (106)

### No Topics (106)

Sub. #	Pt. #	Point Text	Position
1	11	Creating more efficiency traffic flows like Hewletts Rd and SH2. Safety is an issue to consider especially for Bayfair residents currently hesitant at roundabout.	N/A
3	6	Consideration of Money spent -	N/A
4	9	Least disruption to the most people with access ways clearly outlined.	N/A
5	9	Doing the best that will satisfy the purpose for the longest time. Do not cut back because of cost today it will be more tomorrow to fix.	N/A
7	8	Safety at all times	N/A
8	6	Environment v Economy. Then personal and cost.	N/A
10	9	Long term view.	N/A
11	9	The Arataki area is growing rapidly and foresight now should bear this growth potential in mind.	N/A
14	6	Noise	N/A
15	11	Separating through traffic from local traffic. Make sure Bay Park is still easily accessible.	N/A
16	9	make room and a path for cyclists	N/A
17	7	do it properly and right from the beginning	N/A
18	11	The people that are affected by the rail	N/A
20	10	Bayfair Estate properties which will devalue. No way of getting ambulance or fire engine into Bayfair Estate if the crossing at Matapihi gets blocked by faulty bells.	N/A
21	11	any option be future proofed for the maximum growth over time	N/A
22	6	displacement of people	N/A
23	11	long term planning. best option for less disturbance to traffic flows from railway traffic and Bay Park event traffic	N/A



26	10	Impact on peoples homes. Safety.	N/A
29	10	public opinion	N/A
30	9	The effect on people if their houses are taken by NZTA. Noise, shaking of ground of nearby residences.	N/A
31	10	safe traffic flow. safe pedestrian access. minimise traffic noise using all design possibilities.	N/A
32	6	Increase public transport -bus lanes, light rail. age related needs - older population increase use of electric scooters with pedestrian corridor	N/A
33	9	The age of the population in Bayfair Estate	N/A
34	9	The life of the new option built, the extra spent now will be savings in the long term. Do it once, do it right.	N/A
35	9	whatever the option has to be for the long term and not go back and revisit it in 20 years.	N/A
36	7	road safety.	N/A
37	9	consider additional traffic volume for the future.	N/A
38	7	wide roads from Bayfair and underpass in.	N/A
39	9	Future proofing of option 3 is the major factor. Build it once.	N/A
40	8	Is it going to give motorists and pedestrians a long term solution to two very dangerous roundabouts.	N/A
42	9	long term efficiency - what will serve the population of this area most effectively for the longest time - to reduce the likelihood of having to readdress this congestion issue.	N/A
43	11	cost and long term decision making	N/A
44	11	noise control for residents safety. Appearance.	N/A
46	9	Which option will have the longest lifespan with the growing amount of both road and rail traffic. Do it once, do it right.	N/A
47	8	least property loss and separation between large traffic to port.	N/A
48	10	travel time, safety, value for money	N/A
49	10	cost and time	N/A
50	7	Safety and make sure pedestrians are taken care of also.	N/A
52	10	diverting major through-traffic from residential traffic	N/A
53	8	to do a complete job now	N/A
54	12	Best traffic flow from the Mount to Te Puke, yet access to all side roads around the Mount in this area.	N/A
55	9	disable crossing	N/A
56	9	impact on local residents	N/A
57	10	what the majority of affected people prefer	N/A
59	9	Think long term - to avoid having to do it again in another 10-20 years.	N/A



60	12	smooth flow of traffic / safety. cost. inconvenience to locals. long term solution.	N/A
61	9	Ease of congestion at MGI, ease for traffic coming through from TEL.	N/A
62	11	Flow of traffic throughout the networks and Matapihi Rd.	N/A
64	10	What is best for the users, not necessarily which is cheapest.	N/A
66	10	residents' houses	N/A
67	9	That traffic in all directions flows	N/A
68	12	Consider the views of local people who live here.	N/A
69	10	Cost of railway	N/A
70	9	Long term benefit to area compared to costs of future improvements if cheaper option 1 or 2 is chosen. Growth forecasts for Port of Tauranga and commercial activity. Population growth forecasts, especially for Papamoa East area.	N/A
	12	Long term effects of decisions on future growth in traffic that will inevitably occur.	N/A
71	12	Ease of operation. Safety. Less congestion thus less frustration.	N/A
72	9	Safety first and the sooner the better and combine it all with road works.	N/A
73	11	Future traffic volumes.	N/A
74	8	Arterial routes have more free flow with little congestion.	N/A
75	9	Cost. Traffic flow efficiency.	N/A
76	11	Those who's properties will be devalued and will they be given any compensation?	N/A
79	5	Future Traffic and Rail Volumes	N/A
80	11	The future - long term	N/A
81	13	Safety, heavy freight movements must be separate from local traffic and pedestrians	N/A
82	13	1. Traffic flow on SH2, 2. Local traffic flows, 3. Pedestrian movements and access.	N/A
83	11	Good traffic flow to the Port and for through traffic on the SH's. Safe, high volumes on the local road and the major intersection at MGI	N/A
84	9	Needed now! Speed up the process - get on with the job. Time.	N/A
85	11	Make a decision fast and get on with it.	N/A
87	10	Safety - relocate the rail so no one else is hurt by turning in front of a train.	N/A
89	6	Safety of pedestrians as well as motorists	N/A
90	11	Common sense, don't complicate things.	N/A
91	12	Do not take the cheaper option which would require more expense to change in the future (difficult and expensive)	N/A
92	11	Safety and convenience	N/A
93	9	Take into account the extent of the Port expansion and the significant increase in the associated vehicle and rail traffic over time.	N/A



94	10	Do not procrastinate - this needs to be done ASAP.	N/A
96	9	Noise control and cost	N/A
97	11	Traffic Flow, Safety, Long Term, Efficiency - less time delays and frustration on the road.	N/A
98	10	Is this value for money? How will it affect the lives of nearby residents? Will it provide smooth traffic flows for at least the next 30 years?	N/A
99	9	Now is the best time to spend the money ahead of the projected growth. Go for the highest reasonable standard possible.	N/A
102	10	Timely completion of whichever option is chosen - preferably before the TEL is completed.	N/A
104	10	Future development!!!	N/A
105	10	Costs	N/A
106	8	Look beyond 10 years rather than an immediate fix for now.	N/A
108	10	Easy access to everything and safety of traffic and pedestrians.	N/A
109	12	The impact on surrounding residents of the rail relocation and the smooth flow of traffic through the area.	N/A
111	12	Keep public informed on progress and safety first - always	N/A
112	9	Safety - both traffic and pedestrian, and traffic flows.	N/A
113	12	Flow of traffic, but consider improving the situation for the 500&#43; houses in the Matapihi - Bayfair Estate areas.	N/A
115	9	Noise and further consultation	N/A
116	10	What's best value long-term.	N/A
118	11	Keep underpass.	N/A
119	12	Noise mitigation for railway line. Safety for cycles and mobility scooters.	N/A
121	10	Growth of Port traffic, growth of residential traffic, noise mitigation -both road and rail.	N/A
122	10	The impact on people, the flow of traffic and noise.	N/A
124	10	Traffic flow - (minimising hold ups). Try modelling twice the existing traffic density to identify what impedes traffic flow.	N/A
126	11	Get it right	N/A
127	12	Population growth in Papamoa	N/A
128	13	Residents opinion affected by options.	N/A
129	8	Residents who live in the area and the golf club members	N/A
133	11	People and the progress of the region, but also - people in the residential and reserve areas affected by Options 2 and 3.	N/A
134	11	Best option to meet long term needs.	N/A
135	12	The best option is selected with the future growth of the area taken into account.	N/A
136	12	Local home owners quality of life - peace and quiet and safety.	N/A
138	10	Safe vehicle access from side roads onto Maunganui Road. Safe pedestrian access from Bayfair shopping complex to Home Zone (Owens Place).	N/A
140	10	Doing the right option the first time - not having to amend in the future. Traffic flow during construction. Cost - but cheapest is not always best.	N/A
141	10	Try not to take away peoples houses.	N/A



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**None (6)**

**No Topics (6)**

Sub. #	Pt. #	Point Text	Position
18	4		N/A
39	6		N/A
43	5		N/A
73	5		N/A
126	7		N/A
135	8		N/A

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Report

# Baypark to Bayfair (B2B) Consultation Report 2014

Prepared for NZ Transport Agency (NZTA)

Prepared by Beca Ltd (Beca)

10 September 2014





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2			
3			
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### Document Acceptance

Action	Name	Signed	Date
Prepared by	s 9(2)(a)		
Reviewed by	s 9(2)(a)		
Approved by	s 9(2)(a)		
on behalf of	Beca Ltd		

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### Appendix A

Newsletter #5

### Appendix B

Meeting Minutes

### Appendix C

Summary of Public Feedback

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# 1 Introduction

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This report documents the feedback gained in the later part of the Scheme Assessment stage of the SH2 Maunganui-Girven Road and Te Maunga Intersection Improvement investigation now called Baypark to Bayfair (B2B). It relates to the feedback received on the preferred option in July /August 2014.

An initial round of consultation was undertaken in 2011 to introduce the project and to obtain community feedback on the issues and options. After the expansion of the project from the Girven Road / Matapihi Intersection to also include the state highway 2/29 intersection newsletters were sent out in April 2013.

Consultation was undertaken on the options being considered in the early part of 2013 and the NZ Transport Agency's preferred option was conveyed to the public in July 2014 and consultation undertaken. This report summarises the feedback received.

This round of consultation was undertaken to provide information on the preferred option and to gain feedback on any project related issues and concerns. It included:

- Personal meetings (i.e. one to one) with key landowners/operators and directly affected landowners and occupiers and railway lessees
- Hui with Ngaiterangi Iwi, Ngai Tukairangi hapu, Ngati Tapu hapu and Nga Potiki hapu.
- A public newsletter dated July 2014 advising of the Open Day and the preferred option. A copy of this newsletter is attached as Appendix A
- An information open day was held on the 15th July 2014 where the wider community were invited to attend and provide feedback on the preferred option
- Meeting with key stakeholders group Cottage Meetings with Maunganui Road landowners with changed access, Liftan Place residents and a selection of Eversham Road landowners (note that none of the last group attended).

The social assessment also provides more detail on the effects of the proposal on residents.

## 2 Consultation Feedback

### 2.1 Key Stakeholders

The key stakeholder organisations consulted on the project to date are detailed in the following table:

Key Stakeholder Organisations		
KiwiRail	Tauranga Airport Authority	TCC Reserves
Automobile Association	Omanu Golf Club	Rowe Motors
NZ Heavy Haulage	Port of Tauranga	Snappers Golf Driving Range
Road Transport Association	Owens Place Properties Ltd	Baypark
Bay of Plenty Regional Council (Buses)	HomeZone Shopping Centre (Owens Place)	Bay Commercial Holdings Ltd
Go Bus Transport Limited	St John Ambulance Service	

A key stakeholders meeting was held 2<sup>nd</sup> July 2014 at Beca offices. The purpose of the consultation meeting with key stakeholders was to receive technical feedback on the preferred option (Option 3a) based on the knowledge the respective groups have in the area.

As in the previous round of consultation it was highlighted that heavy vehicle movements and over-height/oversize loads must be taken into account in the design of the preferred option especially in regards to barriers and alternative routes on and off SH29 and through MGI intersection.

Screen net fencing on the golf course along the railway alignment was considered appropriate. The boundary of the rail corridor within the golf course was to be surveyed and marked out to help ascertain the rearrangement of the 13<sup>th</sup> fairway.

The HomeZone exit onto Matapihi Road near the proposed level crossing was discussed and the potential for cars queuing at the crossing may block the exit from HomeZone. Traffic modelling did not raise any issues here, however, further detail design will be available once further refined which may include hatching the right turn exit.

Meeting minutes are included in Appendix B.

### 2.2 Tangata Whenua

The project team met with the hapū advisory group in early 2013 to discuss how their cultural values might inform the investigation and selection of a preferred option for B2B. Given the scope change of the project to include the intersection of SH2/SH29 the hapū group Nga Potiki were included into the advisory group. Two hapū/community meetings were convened to discuss proposed options.

It was agreed by hapū and NZ Transport Agency that a Cultural Impact Assessment was the best way to assess the cultural effects. The advisory group decided that each hapū would gather and collect hapū specific information and to provide that information to a report writer who would coordinate the preparation of the report. The report was finalised and submitted to NZ Transport Agency in September 2013. Two hapū groups indicated a preference for Option 1 and the third hapū, Nga Potiki were not able to provide a view on the options.

NZ Transport Agency presented a preferred option to the advisory group on the 10<sup>th</sup> October 2013 and subsequently sought an addendum to the CIA to assess the cultural effect. Nga Potiki has been engaged and will submit a full assessment of all options. Ngai Tukairangi and Ngati Tapu will prepare a joint CIA report on the preferred option.

Minutes of meeting are attached in Appendix B.

## 2.3 Directly Affected Landowners

Directly affected landowners and occupiers located along Maunganui Road and Liftan Place/ Matapihi Road not directly affected but in close proximity to the railway line were sent a personal letter and individual meetings were held prior to the public Open Day. A combined cottage meeting for the Liftan Place residents was held on the Open Day between sessions.

Maunganui Road Landowners and Lessees: The majority of properties affected by land requirement for the preferred option along Maunganui Road are owned by Housing NZ Corporation (10 out of 13 properties). Individual meetings were held with each tenant of the affected properties. Most HNZ tenants and residents were well established within the local community and would wish to relocate and re-establish within nearby areas.

The Church of the Latter Day Saints (LDS) expressed concern over operational vibration from trucks, traffic noise from the SH29 access ramps and the reduced distance to their boundary (from approximately 9.5m to 2m) along Maunganui Road and the associated impact of noise. (Response provided - CR email 23 June 2014 and 29 July 2014).

The Salvation Army site loses its legal access to Maunganui Road in the project. This access is currently used for collection/drop-off vehicles that deliver items received from the other Salvation Army depots. The closure of this access is not considered by them an issue as the main entry to and from this site is from Eversham Road. The main access from Eversham Road can be used for collection and drop off vehicles as per the existing access from Maunganui Road that will be closed.

Owens Place KiwiRail Lessees:

Another meeting was held with KiwiRail lessees 2<sup>nd</sup> July 2014 at Beca Offices (minutes attached in Appendix C). The lessees highlighted the potential traffic safety issue regarding the HomeZone service lane exit and its proximity to the new rail level crossing. The service lane would be primarily be used by vehicles moving to and from Maunganui Road and not west down Matapihi Road.

It was agreed that the removal of the existing pedestrian underpass of Maunganui Road to the Bayfair shopping centre was a good idea given the anti-social behaviour issues encountered lately.

The proposal for an 'exit only' out of Titoki Place onto Maunganui Road for vehicles particularly from the Owens Place industrial operations was raised again and it was reiterated that the highway upgrade proposal would not pass a safety audit due to the limited space for weaving between lanes on the highway.

The subject of boundary fencing and who would pay for the boundary fence reinstatement was raised. Access by construction personnel to businesses during construction was also queried in terms of how this would be undertaken. Lessees were reassured that communication between tenant and contractors would occur regularly during construction. The KiwiRail property division would also be in contact closer to the construction time on the matter of terminating the lease of the lands behind their operations.

Matapihi/ Liffan Place Landowners: During the individual meetings residents reconfirmed that they were aware of the adjacent alternative railway line corridor when they purchased the properties. Widespread concern was expressed around the noise and vibration effects of the train movements and the impact it would have in their lives. Concern was expressed about the adequacy of any mitigation measures proposed. Refer to the Social section for further detail

Responses from the respective noise and vibration specialists were provided at the combined cottage meeting with the Liffan Place residents (minutes attached in Appendix B). The vast majority of Liffan Place residents preferred that the walkway is left open.

Omanu Golf Club/ Driving Range/ TCC Parks Department: Meetings have been held jointly with the Omanu Golf Club, the Driving Range and TCC Parks and Reserves (minutes attached in Appendix B). Matters that arose included; adjustment to the 13<sup>th</sup> Fairway tee off point's and replacement of trees, course irrigation line across the 13<sup>th</sup> fairway requires ducting. Course net fencing of rail alignment along the 13<sup>th</sup> fairway removal of practice chipping area and driving fairway and its access was discussed. All aspects including consequential adjustments to the lease agreements will be discussed and confirmed during final design.

Access to the practice area and TCC pump station is to be discussed further with TCC. Continued consultation and discussion with these parties is required.

TCC Stormwater: Numerous meetings have been held jointly since 2011 with TCC Stormwater, and Bayfair (AMP) to discuss stormwater management for both the project and how it relates to the planned stormwater upgrade of the residential catchment and the planned Bayfair expansion (minutes attached in Appendix B).

Stormwater modelling for the project has been completed. Stormwater modelling for the TCC catchment work is on-going. There has been considerable discussion on the potential solutions for the three parties including new pipes in Girven Road crossing to Matapihi Road and the possible location of new stormwater pipes within the existing pedestrian underpass. AMP is investigating a rain garden for their new development areas and a stormwater management plan.

Sequencing of construction and connection needs of stormwater is being discussed between the parties.

## 2.4. Key landowners/operators

Bayfair (AMP Capital): Numerous meetings have been held with Bayfair (AMP) since 2011. More recently, since the last Open Day in April 2013, four further meetings have been held with AMP (7<sup>th</sup> July 2014, 2<sup>nd</sup> April 2014, 10 March 2014, 22 Aug 2014 - minutes are not provided due to commercially sensitive subject matter). Issues raised were that the B2B construction will likely occur at a similar time of AMP expansion which is proposed to start in 2017 with completion by June 2018. Continued discussion with TCC is required for stormwater management.

Baypark/Arena: The Baypark regional stadium and arena is a major facility with operational traffic management plans applied on major event days. Their key interest during the meeting (minutes in Appendix B) is how access will be provided to the complex particularly on major event days. The current exit from the car park onto State Highway 29 maybe moved or split and this will be further discussed at the final design stage of the project.

## 2.5 Public Feedback

A public Open Day was held on 15<sup>th</sup> July 2014 over two sessions during the day at the ASB Arena, Baypark, Mount Maunganui.

The sign-in register indicated that at least 420 attended the Open Day. Written feedback was received from 40 people. A significant portion of attendees were local residents, particularly from Matapihi/Bayfair Estate (48%) and from within the immediate vicinity between Concord Avenue, Girven Road, Maranui and Papamoa vicinity (45%). Other attendees from Tauranga made up 7%. Further feedback was also received through telephone conversations and emails.

The feedback received from the Open Day is summarised in Appendix C and reported below.

### How will the new layout affect you in your future activity in the area? (Feedback Point 1)

The respondents (26) provided comment in the following categories:

1. Positive response to new layout (65% of respondents) typical comments included *“Much easier and safer to moving out of Girven Road and especially during peak periods”, “Will be a better place to live and easier to travel (Maunganui Rd resident).”*
2. Concern over single access point to Matapihi and Bayfair Estate (approximately 11% of respondents); *“I have grave concerns that access to residents of the Bayfair Estate requiring emergency services, should the railway intersection with Matapihi Road be blocked, has been overlooked.”, “We will still have the same problem with emergency services not being able to get in and out of Matapihi Road should the railway line be blocked – i.e. train stuck.”*
3. Respondents expressed concern over loss of house value (11% of respondents)
4. Questions were raised over ability to cycle to and from Owens Place/Matapihi onto Maunganui Road (8% of respondents).

### Comment on the road noise mitigation measures (Feedback Point 2)

**2a. Quiet Road Surface Seal** (23 respondents)– 87% of the respondents provided positive comments on the use of quiet road surface seal; including *“Excellent proposal”, “This is the very best option”, “Ideal and important that it is kept as quiet seal in the future”*. One respondent (property owner) had concerns over privacy and noise for the properties located at **§ 9(2)(a)** near Te Maunga intersection.

**2b. Noise walls and road side barriers** (26 respondents) – 79% of respondents provided positive feedback including; *“Essential for those living close to the new road”, “Most definitely needed”, “Only if the nearest houses request it”*. Two respondents were concerned about the noise from the flyovers especially at Te Maunga for Eversham Road residents **§ 9(2)(a)**

**2c. Pedestrian crossings on signals** (27 Respondents)– 59% of respondents were favourable towards the signalised pedestrian crossings at MGI while 22% would prefer the extension of the pedestrian underpass;

*“Would still prefer an extended pedestrian underpass between Bayfair and Matapihi Road.”, “I understand the security concerns about a longer underpass but it would remove road related risk from pedestrians and cyclists. Good lighting and security cameras would reduce the security concerns.”*

Another group of respondents (15%) were positive about the signalised pedestrian crossings but conditional on the design and operation of the crossings to cater for older people and shared users; *“Cyclists, mobility scooters, pedestrians, pushchairs, skateboards sharing – it will need to be much wider than the current shared access from underpass past the golf range/fish shop”, “Remember lots of mobility scooters, pushchairs, cyclists and golf carts as well as unaccompanied minors and retired people (partially sighted and limited), must be user friendly”, “Must cater for aging population like ourselves and easy access for pedestrians and wheel chairs.”.*

### **Comment on mitigation measures to reduce the effects of the relocation of the rail line (Feedback Point 3)**

**3a. Noise walls** (23 respondents) – the vast majority of respondents (83%) gave positive feedback on the proposed railway noise wall mitigation; *“Certainly needed, especially for houses close to rail line.”, “Local residents will want to know these measures will be effective”, “Noise will impact on me greatly as I live further down Matapihi Road – but you do get used to it and is minor compared to the benefits of this design.”*

Two respondents (9%) expressed that more mitigation should be provided; *“Submitter seeks double glazing to be installed at NZ Transport Agency expense – we were here first before line gets shifted closer to us at s 9(2)(a)”, “Stick the rail in the ground”.*

**3b. Ballast mat** (14 respondents) – 71% of the respondents thought the ballast mat was a good mitigation measure if it is effective; *“Great idea”, “Whatever is the best”, “I hope this works as vibration can be felt at the existing rail line”.* One respondent requested a review of the proposed vibration mitigation.

**3c. Net screening of the 13<sup>th</sup> fairway on the golf course** (17 respondents) – Unanimous agreement by respondents for the provision of net screening along the railway alignment through the golf course; *“A very good idea, this would protect all concerned”, “Not a golfer, but important factor - A must.”*

### **Matapihi Road/ Bayfair Reserve Walkway (Feedback Point 4)**

Of the 29 respondents (out of the 40 feedback forms) (for this feedback point) the following preference for the walkway to remain open or closed was given;

- **Stay Open:** 76% preferred (22/29)
- **Close the walkway:** 10% preferred (3/29)
- **No preference:** 7% (2/29)

The main response theme is that the walkway is extensively used and very popular with Bayfair Estate residents and is considered a high use corridor; *“So many use people use this walkway”, “This is a very popular walkway for Bayfair Estate residents.”, “I like walking through that way, it will be quite exciting when a train goes past.”*

Two respondents (2/29) were unsure and suggested measures such as lighting and planting to be incorporated into the walkway should it remain left open.

### **Other comments about the proposed design and mitigation measures (Feedback Point 5)**



18 respondents provided comment on the proposed design and mitigation measures presented at the Open Day. Below are the themes that respondents commented on. The themes are listed from most commented to least commented on.

- Positive response (22%); many respondents reaffirmed the project as follows “well done”, “The best option and design”, “The project looks very impressive and seems to have thought of everything”.
- Matapihi access (11%); there remains concern at the limited vehicle access to Matapihi and Bayfair estate should the rail line and/or MGI be blocked; “I am concerned that while all this money is being spent (which is good) the residents of Bayfair still do not have another exit in the event of civil emergency”.
- Cyclist provision (5%); there was an expression for cyclist provision between Exeter Street and Owens Place; “Please make it safe for trips between Exeter and Owens place for cyclists”, this came through feedback in Point 1 also.
- Event parking (5%); a respondent was pleased with the walkway from Owens Place to Baypark but was concerned that there is still no provision for parking along Owens Place; “Parking congestion at Owens Place when event is on at Baypark. New walkway, but no provision for extra vehicles in already narrow road.”

Below are other additional comments

Single Respondent Comments	
<i>There are still too many exits/entrances onto Matapihi Road (Owens Place, HomeZone, Truck entrance at rear of building fish shop entrance).</i>	<i>Walkway - Escape route for shoplifters/graffiti writers. Unsafe for unaccompanied women. Main use short cut from Russely Drive to shops.</i>
<i>I think there is a definite need for a flyover despite the noise this will cause. But the railway lines should be left in place.</i>	<i>Keep underpass.</i>
<i>Seeing as TCC is good at rezoning land use, long term what is to stop them from re-zoning golf course /bayfair park land between SH29 and Matapihi peninsular into housing new lots of lifestyle blocks?</i>	<i>It would help people to locate where things are if you included the original ‘Sandhurst Interchange’ name. When can we access Tauranga route via Sandhurst, it will help considerably. In the meantime, new road layout should be a vast improvement.</i>
<i>Only excess noise by the new Chinese engines and increased train numbers.</i>	

The following queries, requiring responses, were received on this design and mitigation feedback point 5;

Table 1: Open Day Feedback Queries on Design and Mitigation Measures

Respondent Query/ Comment	Response
<i>Will there be post-construction measurements published to show if noise and vibration predictions have been met?</i>	Post construction surveys of transport noise is usually completed as part of the contractors requirements.
<i>Free left turns at all intersections. Declaration lanes on Maunganui Road at all minor intersections.</i>	At Te Maunga the intersections on the flyover are signalised but on the Matapihi/Girven intersection the left hand turns are on give-way terms. However the final layout is subject to detailed design which may change the layout.
<i>Why is a deep trench or underground not considered feasible for the rail line from Te Maunga to Bayfair and beyond?</i>	Trenching the railway line under Matapihi Road was considered early in the project and rejected because the long length of line at the correct grade coupled with the ground conditions created a cost prohibitive option.

**Comments on construction noise, vibration, and dust and traffic effects related to earthworks and construction will be managed through compliance with NZ Standards and Management Plans (Feedback Point 6)**

A total of 20 respondents commented on the NZ standards for constructional effects (5 of which provided 'No comment'). Seven respondents provided positive comments such as; "All sounds good", "If consideration is given to those who it might affect and safety is paramount, no problem at all." Two respondents were positive but conditional; "No, I trust you will monitor to ensure standards are met." and "As long as they are controlled and work during daylight hours."

Another five respondents commented specifically on vibrational concerns (see Table 2);

Table 2: Vibration during Construction Comments

Vibrational Effects Comments Received
<i>Yes, our house is on piles and we are worried about vibration to the house</i> s 9(2)(a)
<i>Start and finish times of piling?</i> s 9(2)(a)
<i>Having experienced the impact of Hewletts Road flyover in my previous residence off Golf Road, I am very aware of the impact of pile driving on the structure of my property thus the reason for delayed renovations till after finished.</i> s 9(2)(a)
<i>There will never be enough noise/vibration mitigation to compensate for the increase in noise especially at night.</i> s
<i>Living so close and my daughter will be working some nights and will need sleep. Please could we ask when this</i>

## Vibrational Effects Comments Received

*happens?* (17 Liffan Place)

One respondent asked: “Do we have any redress to complain if conditions are bad!” s 9(2)(a)

### General Comments

General public comments provided from telephone conversations and emails from this 2014 round of consultation are summarised below.

- Bayfair estate resident agreed with the overall project but had a ‘*deep concern that the underpass for pedestrians and cyclists is to be revamped into road level access.*’ The safety aspect of a signalised pedestrian crossing was questioned with the multimodal use of the pedestrian crossing having to cross dual carriageway lanes on both sides of Maunganui Road. (Response provided – GS email 21 July 2014).
- Owner of 93B, C and D Eversham Road congratulated the team for a good result. However, expressed concern about privacy, security and noise (both during construction and operational). ‘*Dust, heavy machinery noise and construction noise and workers able to ‘see in’ could scare off my tenants and make re-letting the home very difficult.*’ The owner sought a solution to work together with NZ Transport Agency. (Response provided – GS email 4 August 2014).
- Feedback provided via NZ Transport Agency website; respondent sought modification to the operation of the existing Bayfair roundabout at MGI with specific lanes for turning right only on Girven Road and hatched no stopping lines. (Response provided – GS email 31 July 2014).
- Owner of s 9(2)(a) (not affected by land requirement) sought clarification on; the design of the preferred option, the extent of the Girven road flyover relative to the location of her property and possible routes on how to exit her property. The owner expressed her views on the potential issues which included road noise, vibration, environmental pollution and effect on property values. (Response provided – CM email 15 August 2014).
- Feedback provided via email in response to Open Day attendance. Respondent expressed that the *new road layout should be a vast improvement* but sought clarity on the naming and reference to the Sandhurst interchange. They sought assurance that there would be sufficient time to cross the signalised pedestrian crossing at Girven Road intersection from Bayfair to Owens Place. (Response provided – CM email 15 August 2014).

### Summary of the Preferred Option Feedback;

The vast majority of respondents from the Open Day were very pleased with the proposal. The main concern noted was the single vehicle access point to Matapihi should emergency service be required if Matapihi Road was blocked (as per the existing situation).

Key stakeholders highlighted the consideration for large load vehicles into the design aspects of the proposal and alternative routes. HomeZone exit onto Matapihi Road will be considered and refined further in design detail which may include hatching the right turn exit.

The Tangata Whenua advisory group will provide an addendum to the CIA to assess the cultural effect of the preferred option. Nga Potiki has been engaged and will submit a full assessment while Ngai Tukairangi and Ngati Tapu will prepare a joint CIA report on the preferred option.

Directly affected landowners, wish to relocate and re-establish within nearby areas. The LDS Church expressed concern over vibration and traffic noise from the SH29 access ramps that are in close proximity.

Owens Place KiwiRail lessees noted the HomeZone service lane exit will be in close proximity to the rail level crossing and were supportive of the removal of the pedestrian underpass. Boundary fence reinstatements (who would pay) and access during construction were also highlighted.

Liftan Place residents are concerned about the adequacy of any rail noise and vibration mitigation measures and the vast majority prefer the adjacent walkway to be left open.

Omanu Golf Club access to the practice area and TCC pump station on the golf course are to be discussed further with TCC and will be confirmed during final design.

The Bayfair expansion is likely to occur at the same time of B2B construction and continued discussion with TCC is required for stormwater management.

Baypark access onto SH29 may be required to move or split. This will be discussed further and confirmed at the final design stage of the project.

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Appendix A

Newsletter #5

Act 1982

## Final option given approval

The investigation phase for the project, formally known as Maunganui-Girven intersection improvements, is now complete.

After thorough analysis and consideration of the public feedback the NZ Transport Agency has confirmed that Option 3A is the desired solution for the project. This option is a modification of Options 2 and 3 which were presented at the Open Day in April 2013. It will provide improvements from Baypark (State Highway 2 / State Highway 29 intersection at the Te Maunga roundabout) to Bayfair (Maunganui Road / Girven Road / Matapihi Road intersection).

Option 3A presents the best long term solution to managing traffic congestion, reducing travel time and addressing safety through this area.

This option will now proceed through the approvals process under the Resource Management Act (RMA). The Transport Agency will apply for design funding which is likely to happen after the RMA approvals have been attained.

## Come and find out more

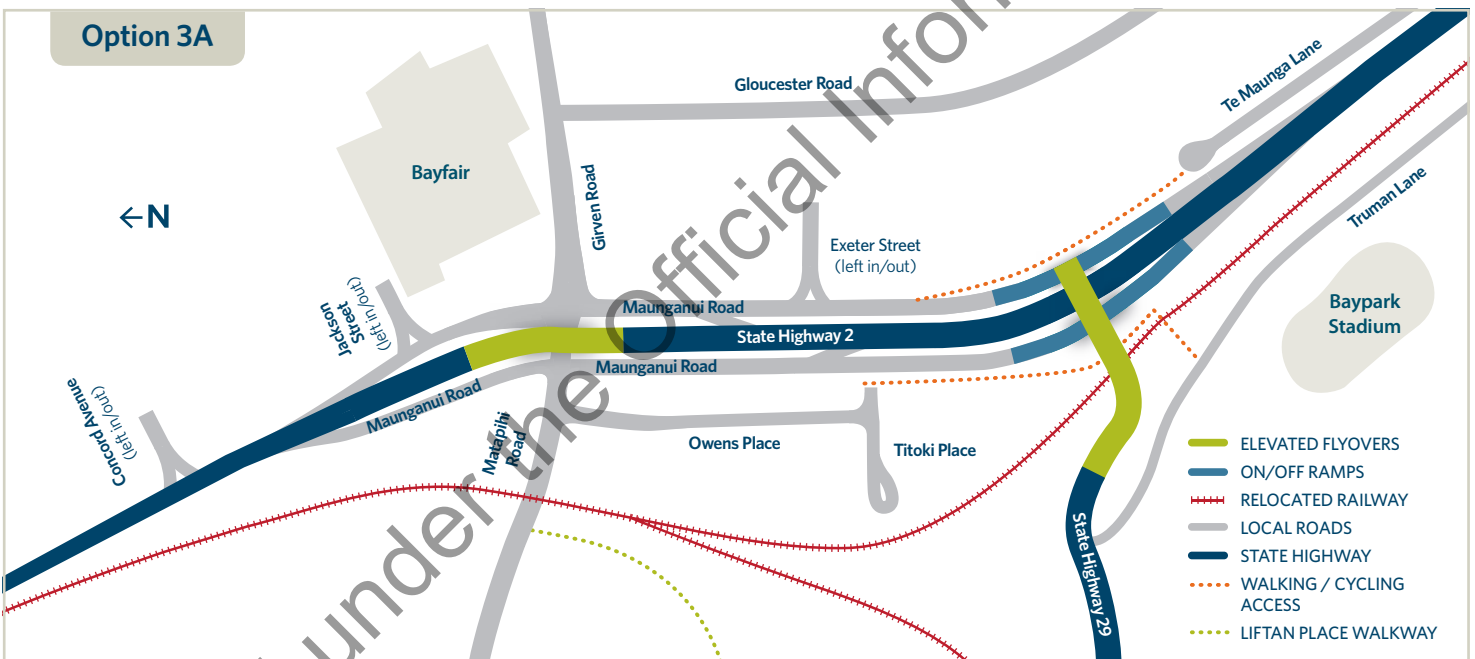


**When:**  
Tuesday 15 July 2014.

**Where:**  
ASB Arena, Baypark, Truman Lane.

**Two sessions will be held:**  
11.30am - 1.30pm or 4.00pm - 7.00pm.

At the Open Day the project team will be available to discuss the option in more detail; the construction timings, earthworks and stormwater effects, and the future use for the Liftan Place walkway.



## What will the solution provide?

- A flyover will take SH2 over the Maunganui-Girven intersection.
- A flyover will take SH29 over the railway line and the Te Maunga intersection.
- There will be direct access from SH29 to Baypark and Truman Lane.
- The East Coast Main Trunk railway line will be relocated to behind Owens Place.
- A shared pedestrian and cycle path from Owens Place to Baypark.
- Pedestrian and cycling facilities will be placed at road level at the Maunganui-Girven intersection, to replace the current underpass.

## The overall project benefits

- Reduced congestion on Maunganui Road, Girven Road and at Te Maunga roundabout.
- Improved safety for motorists, cyclists and pedestrians.
- An improved route to the Port of Tauranga.
- Separated local and state highway traffic.

## Contact details



**Greig Stephen, NZ Transport Agency** phone s 9(2)(a) email s 9(2)(a)  
s 9(2)(a), Beca phone s 9(2)(a) email s 9(2)(a)

**or check out**  
[www.nzta.govt.nz/b2b](http://www.nzta.govt.nz/b2b)

Appendix B

Meeting Minutes

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### B2B (MGI) - Hapu Meeting Schedule

#### MGI – Hapu Advisory Group

Date	Venue	Ngai Tukairangi	Ngati Tapu	Project Team
18 February 2011 8:30am – 9:30am	Ngai Tukairangi Office	s 9(2)(a)	Puhirake Ihaka	Greig Stephen s 9(2)(a)
23 June 2011 9:00am – 10am	Ngai Tukairangi Office		Puhirake Ihaka	Greig Stephen s 9(2)(a)
8 February 2012 3:00pm – 4pm	Ngai Tukairangi Office		Puhirake Ihaka	Greig Stephen s 9(2)(a)

#### B2B – Hapu Advisory Group

Date	Venue	Ngai Tukairangi	Ngati Tapu	Nga Potiki	Project Team
10 April 2013 4pm – 5pm	Ngai Tukairangi Office	s 9(2)(a)	Puhirake Ihaka	Maire Duncan	Greig Stenhen s 9(2)(a)
22 May 2013 5pm – 7pm	ASB Stadium				Greig Stephen s 9(2)(a)
19 June 2013 6:15pm – 7:15pm	Ngai Tukairangi Office		Puhirake Ihaka	Maire Duncan	
8 July 2013 3pm – 4:30pm	Waikari Marae		Puhirake Ihaka		Greig Stephen s 9(2)(a)
12 August 2013 3:30pm – 5pm	Hungahungatoroa Marae		Puhirake Ihaka		Greig Stephen s 9(2)(a)



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Date	Venue	Ngai Tukairangi	Ngati Tapu	Nga Potiki	Project Team
10 October 2013 5pm – 6pm	Ngai Tukairangi Office	§ 9(2)(a)	Puhirake Ihaka	§ 9(2)(a)	Greig Stephen
27 June 2014 3:30pm – 4:30pm	Beca Offices		Puhirake Ihaka		§ 9(2)(b)(i), § 9(2)(a)

B2B – Nga Potiki

Date	Venue	Nga Potiki	Project Team
17 March 2014 10am – 11am	Beca Offices	§ 9(2)(a)	Greig Stephen
2 April 2014 12pm – 1pm	Beca Offices		Greig Stephen
29 July 2014 10am – 11:30am	Beca Offices		Greig Stephen
15 October 2014 2pm – 3:30pm	Nga Potiki a Tamapahore Office		Greig Stephen

## Minutes of Meeting

### Maunganui Girven Intersection - Hapu Engagement (1)

Held 18 February 2011 at 8:30am - 9:30am

at Beca Harrington House Tauranga

<b>Present:</b>	s 9(2)(a)	Ngai Tukairangi	
	Grieg Steven [GS]	NZTA	Project Manager
	s 9(2)(a)	Beca	Job Manager
		Beca	
<b>Apologies:</b>	Kevin Reid	NZTA	
	s 9(2)(a)	Beca	
<b>Distribution:</b>	As Above		

Item	Action
<p><b>1 Introduction</b></p> <ul style="list-style-type: none"> <li>■ SR – Karakia and mihi</li> <li>■ All – introductions</li> </ul>	
<p><b>2 Project Overview</b></p> <ul style="list-style-type: none"> <li>■ GO – purpose of project is to address congestions at the Maunganui Girven intersection, <ul style="list-style-type: none"> <li>– TEL set to start construction to be completed by 2016</li> <li>– intersection important in keeping traffic moving</li> <li>– Studies have been done previously on the intersection</li> </ul> </li> <li>■ PI – multiple problems, particularly with Owens Place and Bayfair Estate – elderly</li> <li>■ GO – long-term solution projected through to 2031</li> <li>■ NT – is traffic predicted to increase on TEL?</li> <li>■ GS – Yes, Harbour Link as well</li> <li>■ NT – have discussions started with Kiwi Rail?</li> <li>■ GS – Yes, we need to understand issues and implications</li> <li>■ NT – safety is a big issue at the intersection</li> <li>■ PI – trains block Matapihi Road and traffic blocks the intersection</li> <li>■ GS – we understand the issues – freight movements are predicted to increase</li> <li>■ PI – Is traffic heavy enough to consider a flyover</li> <li>■ GS – flyover was looked at in previous studies – traffic volumes are predicted</li> </ul>	

to increase significantly

- NT – how much traffic will there be?
- GO – potentially 40,000 vpd
- NT – is the road capable of taking the traffic load
- GO – yes
- SR – what options are on the table
- GO – All options are on the table – flyover, signalised intersection, signalised roundabout
- PI – issues with Hairini signalised intersection
- GO – there are variations of options, change to network and realignment at Maunganui for Girven, need to consider visual impact of grade separation
- GS – Maunganui Giverven is a strategic freight route
- GO – need to consider provision for pedestrians and cyclists
- PI – flyover is a practical solution, need to consider airport air space
- SR – What are the future development aspirations of the Matapihi community?
- PI – currently 158 homes, increase to 500 homes by 2020
  - Community wish to maintain rural character
- NT issues with roading – not ablt to cater for the increase in population
- SR – need to get a copy of the Matapihi Landuse Plan
- GO – need to get a copy of plan for traffic modelling
- GO – scoping study to refine options
  - Project open day on 22 March – opportunity for public to participate
  - How do you want to be involved
- PI – need to consider other hapu – Ngati Kuku and Nga Potiki
  - Informing them of project
- SR – After open day, project team could present an overview of project to wider hapu at a hui a hapu
- PI – can discuss further and make arrangements
- GO – are there any sites of significance in the proposed development area?
- NT – Omana urupa, possibly others around the site, but no known/identified sites will be impacted
- GO – Any stormwater issues
- NT – no
- GO – Golf-course drain is used for stormwater discharge – potential to increase
- NT – any reason for not connecting into Bayfair estate?
- GO – Unsure of capacity – need to investigate further

SR

### 3 Close

- Next meeting proposed for April
  - Possible agenda items

- |   |  |
|---|--|
| <ul style="list-style-type: none"><li>- Feedback on open day</li><li>- Refinement of options</li><li>■ NT – karakia</li></ul> |  |
|---|--|

Minuted by: [REDACTED] s 9(2)(a)

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## Minutes of Meeting

### Maunganui Girven Intersection - Hapu Engagement (2)

Held 23 June 2011 at 9:00am

at Ngai Tukairangi Trust Office

**Present:**

s 9(2)(a)  
[Redacted]  
Greig Stephens

Ngai Tukairangi

Ngati Tapu

NZTA

Beca

Beca

Beca

**Apologies:**

**Distribution:**

s 9(2)(a)  
[Redacted]

Beca

Beca

As above

Item	Action
<p><b>1 General</b></p> <ul style="list-style-type: none"> <li>■ The purpose of the meeting is to update hapu representatives on progress for the Maunganui Girven Intersection project, in particular:               <ul style="list-style-type: none"> <li>- Feedback from the open day held in April, and</li> <li>- Review proposed options.</li> </ul> </li> </ul>	
<p><b>2 Open Day</b></p> <ul style="list-style-type: none"> <li>■ The open day did not present any options to the public, but primarily sought feedback on current issues with the intersection.</li> <li>■ The open day generated a good response from the community with many older residents attending.</li> <li>■ Issues raised by the community included: congestion, pedestrian safety, access, and the rail line on Matapihi Road.</li> <li>■ There was strong support from local residents for something to be done.</li> <li>■ Other comments from residents included options for a flyover, signalised roundabout, and the retention of the pedestrian underpass.</li> </ul>	
<p><b>3 Options</b></p> <ul style="list-style-type: none"> <li>■ Subsequent to the open day consideration has been given to 12 options, which were refined to 4 by the project team.</li> <li>■ All proposed options give priority to Maunganui Road traffic.</li> <li>■ Pedestrian access across Maunganui Road is maintained by the existing underpass and the project team are investigating an additional crossing via an at-grade option.</li> </ul> <p><b>Option 1 – Signalised Roundabout</b></p> <ul style="list-style-type: none"> <li>■ This option is considered low cost, but is a lower performance solution</li> </ul>	

compared to the other options.

- Both s 9(2)(a) and s 9(2)(a) noted this option would be low cost; however, at grade pedestrian movement across Maunganui Road would be difficult. Consideration needed to be given to residents from Bayfair Estate and the Matapihi Peninsular.

#### Option 2 – Hamburger

- This option is new to New Zealand and provides greater priority to traffic movement along Maunganui Road compared to the signalised roundabout. The hamburger roundabout will be signalised.
- NT noted the option provided more efficiency for vehicles travelling on Maunganui Road, but pedestrian access was more difficult. Education of motorist would be a huge exercise.

#### Option 7 – Flyover with Signalised Roundabout

- This option considers a flyover while maintaining the existing roundabout below. It would need to include traffic signals to enable pedestrians to cross at grade safely.
- Both NT and PI commented that this option takes pressure off the existing roundabout and provides for priority vehicle movements along Maunganui Road; while providing improved access for vehicles travelling on Givern Road and Matapihi Road. The cost of a flyover would be considerably higher than the other options.
- The project team noted the cost of a flyover to be in the vicinity of \$40 million.
- NT suggested NZTA consider potential Public Private Partnerships with local Iwi.

#### Option 3 – Flyover with Signalised Intersection

- This option is similar to option 7. However, the intersection at grade will be fully signalised with no roundabout.
- PI noted pedestrian safety will be improved

#### 4 Next Meeting

- NT and PI requested another meeting prior to the release of options to the public.
- A meeting with hapu representative will be organised by the project team a few weeks before options are publically released.

Minuted by: s 9(2)(a)

## Minutes of Meeting

### Maunganui Girven Intersection - Hapu Engagement (3)

Held 8 February 2012 at 3:00pm

at Ngai Tukairangi Trust Office

#### Present:

s 9(2)(a)

Ngai Tukairangi

Ngati Tapu

Greig Stephens

NZTA

s 9(2)(a)

Beca

Beca

#### Apologies:

#### Distribution:

s 9(2)(a)

Beca

Beca

As Above

Item	Action
<p><b>1 General</b></p> <ul style="list-style-type: none"> <li>The purpose of the meeting is to update hapu representatives on progress for the Maunganui Girven Intersection project, in particular wider corridor effects including the Te Maunga intersection.</li> </ul>	
<p><b>2 Wider Corridor Effects</b></p> <ul style="list-style-type: none"> <li>The project team are investigating the wider corridor effects of MGI options, in particular the Te Maunga intersection. The final solution for MGI must consider the future effects on the Te Maunga intersection and must not limit or restrict opportunities for improvements to the Te Maunga intersection in the future.</li> <li>The options discussed at the previous meeting in June 2011 are still being considered and tested in line with wider corridor effects.</li> <li>s 9(2)(a) [NT] and s 9(2)(a) [PI] both noted a preference for the two flyover options as their favoured solution (option 3 – Flyover with signalised intersection; and option 7 – flyover with signalised roundabout).</li> </ul>	
<p><b>3 Next Meeting</b></p> <ul style="list-style-type: none"> <li>Shad will send a bundle of November MGI newsletters to NT and PI for their hapu members.</li> <li>A preferred solution for MGI should be identified mid-year. It is intended to meet with hapu representatives before a preferred option is made public. Hapu representatives would also like NZTA and Beca to attend a combined hapu hui (Ngai Tukairangi and Ngati Tapu) to present the preferred option. An opportunity to discuss the option and ask questions will be made available to hapu members.</li> </ul>	<p>Shad</p> <p>Shad</p>

Minuted by:

s 9(2)(a)



Released under the Official Information Act 1982

## Minutes of Meeting

### MGI to Te Maunga - Hapu Meeting

Held 10 April 2013 at 4pm

at Ngai Tukairangi Orchard Office boardroom

#### Present:

Greig Stephen

s 9(2)(a)

NZTA

Beca

Beca

Beca

Ngati Tapu

Ngai Tukairangi

Nga Potiki

Ngai Tukairangi

Ngai Tukairangi

#### Apologies:

#### Distribution:

s 9(2)(a)

Item	Action
<ul style="list-style-type: none"><li>- s 9(2)(a) welcomed NZTA and Beca and opened the meeting with a karakia</li><li>- Everyone introduced themselves and their roles and responsibilities</li><li>- s 9(2) explained the background particularly the options that were presented at last hui and what's changed since the last meeting, in particular widening the MGI investigation to include the Te Maunga intersection</li><li>- s 9(2)(a) explained the options that have been considered in the last 2 years – MGI then Te Maunga.</li><li>- s 9(2)(a) also explained the RMA consultation process and scheduled open day for 18 April at the ASB Arena/Bay Park.</li><li>- Tim then explained in detail the 3 options followed by pedestrian and cycle links.</li><li>- Q – Can you retain current underpass in option 1?</li><li>- A – The current length is too short.</li><li>- Q – Option 1 MGI can you provide a moderately large pedestrian underpass as well as at grade signalled crossings.</li><li>- A – it may be possible, however, we need to consider the frequency of use and safety issues associated with an underpass</li><li>- Q – How safe is underpass?</li><li>- A – A lot of support for the existing underpass, however people feel unsafe with a longer underpass, we need to do some more work on safety issues associated with underpass</li><li>- They think option 2 MGI could retain the existing have old underpass as well as signalised pedestrian crossings</li><li>- Tim noted under Option 3 pedestrians will have access to Baypark through the use of the off ramp at Te Maunga.</li></ul>	

- Riri noted the poor aesthetic view of flyovers and did NZTA investigate underground options.
- A – Yes it has been considered, but is too costly.
- s 9(2)(a) noted that traffic volumes are around 36,000 vehicles per day (vpd) on SH2 and are forecast to increase to nearly 60,000vpd by 2031. The projected growth in traffic volumes is as a result of development in Papamoa East, industrial development at Te Maunga and Rangiuru, increased Port of Tauranga activity, plus diverting/encouraging Papamoa traffic onto the State Highway rather than using local roads. Matapihi is also projected to increase in population.
- Q – What happens at Owens Place on Option 3 – will there be traffic lights?
- A – Traffic analysis is not complete.
- Q – What is the time frame?
- The target construction period will be 2015/2016 to align with the completion of TEL, however it is subject to obtaining funding. The project is expected to take 2-3 years to complete.
- s 9(2)(a) raised an issue of a Iwi claim on the Golf Course Reserve and Rail Reserve
- s 9(2)(a) explained the Golf Course land is owned by Tauranga City Council and the designated rail corridor and reserve land was confirmed in the 1980's.

**Next Steps –**

- NZTA offered to present material as a special collective Hui-a-Hapu if required.
- Each hapu will come back to Shad with a possible date and time
- NZTA will support the cost of facilitating a Hui
- A query was raised whether it was possible to calculate walking times for pedestrians to advice the hui attendees

Beca

Three sets of option plans left for each Hapu –

3933377-C-K043 Rev E, 3933377-C-K033 Rev E, 3933377-C-K032 Rev E

Minuted by: s 9(2)(a)

## Minutes of Meeting

MGI & SH2/SH29 - Hapu Hui

Held 22 May 2013 at 5pm-7pm

at Bay Park Arena

**Present:** Grieg Stephen [GS] NZTA  
 s 9(2)(a) Beca  
 Beca  
 Ngai Tukairangi  
 Ngai Tukairangi  
 Ngati Tapu  
 Ngai Tukairangi, Ngati Tapu, Nga Potiki  
 Ngati Tapu  
 Nga Potiki  
 Ngai Tukairangi  
 Ngai Tukairangi  
 Ngai Tukairangi, Ngati Tapu  
 Nga Potiki  
 Nga Potiki

**Apologies:** s 9(2)(a) Beca

**Distribution:**

Item	Action
<p><b>1 Introductions</b></p> <ul style="list-style-type: none"> <li>■ Karakia and mihi performed by s 9(2)(a)</li> <li>■ SR introduced the project and the purpose of the hui which is to inform the hapu with interests in the area of the proposed options and to obtain their feedback.</li> <li>■ Everyone present introduced themselves including the NZTA project team</li> </ul>	
<p><b>2 Presentation</b></p> <ul style="list-style-type: none"> <li>■ s 9(2)(a) presented the 3 options and received questions from hapu members</li> <li>■ Option 1           <ul style="list-style-type: none"> <li>– flyovers at Maunganui/Girven and SH2/SH29 intersections. Option will require the acquisition of approximately 40 properties along Maunganui Road and side streets in order to increase the road width. The intersection at Maunganui Road and Girven Road will be changed to traffic signals. Similarly at SH2/SH29 the intersection will be changed to traffic signals. The estimated cost of the project is \$85-90 million.</li> </ul> </li> <li>■ Option 2</li> </ul>	

- flyovers at Maunganui/Girven and SH2/SH29 intersections. Option will require the railway line to move behind the Owens Place commercial area adjoining the residential area. The intersection at Maunganui Road and Girven Road will be changes to traffic signals. Similarly at SH2/SH29 the intersection will be changed to traffic signals. The estimated cost of the project is \$85-90 million, which includes the relocation of the railway line.
- Option 3
  - Similar to Option 2 with a reconfiguration at SH2/SH29. A flyover at SH29 over SH2 and the railway line is proposed. Owens Place will also be extended to connect with Truman Lane. The estimated cost of this option is \$110-120 million, which includes the relocation of the railway line. The flyover at SH2/SH29 also means the State Highway traffic does not have to stop for trains.
- Questions
  - A question was raise as to the length of the flyover
  - GS responded by noting it will be a similar length to the Hewletts Road flyover.
  - s 9(2)(a) noted all the options needed to manage pedestrian movements around Bay Park and the impacts of stormwater on waterways and air discharges.
  - s 9(2)(a) asked the timeframe for construction
  - GS noted it would take approximately 2-3 years to construct
  - s 9(2)(a) discussed the increase in rail movements to the Port being a concern particularly at Matapihi Road.
  - s 9(2)(a) noted a site of significance near the intersection of SH2/SH29 – Wharawhara block and battle site.
  - s 9(2)(a) noted they'd like to be involved in landscaping during the construction phase of the project.
  - s 9(2)(a) mentioned they'd need to be involved in the preparation of a CIA report to assess the cultural impacts of the project
- Pedestrian Safety
  - TH discussed the pedestrian movements with each of the options particularly the issue of the underpass across Maunganui Road.
  - s 9(2)(a) noted the safety issues with the extended underpass
  - TH responded by saying it's a balance between efficient walking routes, safety of crossing points and personal security
- General feedback
  - s 9(2)(a) requested hapu be involved in the naming of roads or new areas
  - s 9(2)(a) provided her contact details to s 9(2) to ensure she was informed
  - s 9(2)(a) and s 9(2)(a) noted the Matapihi community are not aware of the NZTA project and suggested another hui
  - SR – NZTA and Beca are available to discuss the project with hapu groups
  - s 9(2)(a) promoted the formation of an advisory group similar to TEL – develop protocols, prepare CIA, earthworks monitoring etc. s 9(2) suggested s 9(2)(a) be the points of contact for Ngai Tukairangi

<ul style="list-style-type: none"> <li>- SR – need to work with NZTA and will respond accordingly</li> </ul>	<p><b>SR</b></p>
<ul style="list-style-type: none"> <li>- s 9(2)(a) noted they needed to be involved in monitoring of geo-tech testing</li> </ul>	
<ul style="list-style-type: none"> <li>- TH – need to assess and will follow up with s 9(2)(a) on geo-tech monitoring</li> </ul>	<p><b>TH</b></p>

Minuted by: s 9(2)(a)

Released under the Official Information Act 1982

Released under the Official Information Act 1982

# Minutes of Meeting of Ngai Tukairangi, Ngati Tapu and Nga Potiki

Ngai Tukairangi Trust

Thursday, 19 June 2013 at 6.15pm

Present: Section 9(2)(g)(i)

Karakia: s 9(2)(a)

Apologies: s 9(2)(a)

The key matters for discussion centred on the CIA and Earthworks Protocols

## Cultural Impact Assessment

A draft CIA was circulated for consideration and the sum proposed of \$8000 for the work. s 9(2)(a) outlined he would need to seek approval from NZTA to this sum and that if any further additional information was needed for the CIA it should be added. It was also considered that a report writer be provided; but that each hapu had the opportunity to provide their own information and to interview their own koroua. s 9(2)(a) was suggested as the report writer; and the three representatives present would coordinate and put forward the research they collate and the interviews. The sums confirmed for each component were \$1500 for hapu input x 3 and and \$3500 for the report writer.

**Resolved:** That Ngai Tukairangi Trust would be the umbrella organisation for the CIA project and that s 9(2)(a) would be the report writer.

If she wasn't available, would look for an alternative.

## Monitoring Protocols

Geotech testing is due to start and a protocol is required. s 9(2)(a) drafted a protocol for hapu to review.

s 9(2)(a) provided some guidelines on how those worked; and both s 9(2)(a) commented on the rate for the monitors, where the list would be inserted into the protocols and how they would be trained. s 9(2)(a) discussed that there were already confirmed trained monitors and that they are normally rostered to sites when needed. All representatives did not have an issue with this protocol proceeding, but wished to add comment. The rate for the monitors was \$40 per hour, but that was not updated for some time. The representatives wished to see that changed and updated.

**Action:** Meeting on 26 June regarding the completion of the protocols for the geotech testing and signing off of the CIA scope. Advisory Group members to attend.

**Action:** s 9(2)(a) to provide additional comment on the protocols and advisory committee meeting to be held to complete the protocols.

## Advisory Group

s 9(2)(a) noted that this hui was not an advisory group meeting. It was also confirmed that each hapu group would invoice directly NZTA for their contributions to the Advisory Group. The sum confirmed was \$400.00 per hapu.

## Community Hui

At the TECT Hui it was mentioned that the community would be interested in a hui. It was proposed that s 9(2)(a) consider this proceeding with s 9(2)(a)

Karakia: s 9(2)(a)

Meeting Closed at 7.15pm



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## Minutes of Meeting

MGI & SH2/SH29 Advisory Group 8 July 2013

Held 8 July 2013 at 3pm-4:30pm

at Waikari Marae

**Present:** Greig Stephen NZTA  
 s 9(2)(a) Beca  
 Beca  
 Ngati Tapu  
 Ngai Tukairangi  
 Ngai Tukairangi

**Apologies:** Nga Potiki  
 Ngai Tukairangi

**Distribution:** All above

Item	Action
<p><b>1 Introductions</b></p> <ul style="list-style-type: none"> <li>Karakia by s 9(2)(a)</li> </ul>	
<p><b>2 CIA Scope</b></p> <ul style="list-style-type: none"> <li>s 9(2)(a) explained the scope and feedback received by hapu members and NZTA</li> <li>s 9(2)(a) noted the tight timeframes to complete the report</li> <li>The meeting agreed for s 9(2)(a) to have a draft CIA report prepared and circulated to NZTA and hapu groups by the end of July. A final report will be completed by 18 August 2013.</li> <li>s 9(2) will discuss the timetable with s 9(2)(a) to ensure the timelines can be met.</li> <li>The meeting agreed for Hungahunga Toroa Marae Trust to manage the contract on behalf of the 3 hapu. However, Beca received correspondence and communications noting a decision had been made at a previous meeting for the CIA contract to be managed by the Ngai Tukairangi Trust and Advisory Group remuneration to be arranged directly by the hapu groups.</li> <li>NZTA principally require an entity/organisation to manage a contract</li> <li>The scope will be finalised for signing by the administration entity</li> </ul>	<p>s 9(2)(a)</p> <p>s 9(2)(a)</p>
<p><b>3 Protocol</b></p> <ul style="list-style-type: none"> <li>s 9(2)(a) explained the feedback received on the protocol and a revised monitoring rate.</li> <li>It was agreed the monitoring rate would be considered closer to the construction period.</li> </ul>	

<p><b>4 Advisory Group</b></p> <ul style="list-style-type: none"> <li>■ s 9(2)(a) explained the role of the advisory group and how they've been applied for other projects.</li> <li>■ The Advisory Group is remunerated for their advice - \$400 per meeting, irrespective of how many hapu representatives attend and length of meeting</li> <li>■ NZTA require a letter confirming the appointment of hapu members to the Advisory Group. It would be advisable to have 2 nominated representatives.</li> <li>■ Hapu are remunerated directly not Advisory Group individuals</li> <li>■ This is the first convened Advisory Group meeting</li> <li>■ s 9(2)(a) will send a revised version of the Protocol which includes an invoice template.</li> </ul>	<p style="text-align: center;"><b>Advisory Group</b></p> <p style="text-align: center;">s 9(2)(a)</p>
<p><b>5 Project Update</b></p> <ul style="list-style-type: none"> <li>■ The meeting discussed the opportunity for a Matapihi Community hui</li> <li>■ NZTA and Beca will be available to present the options</li> <li>■ A meeting will be organised for Tuesday 16 July 4:30pm at Waikari marae</li> </ul>	<p style="text-align: center;">s 9(2)(a)</p>
<p><b>6 Conclusions</b></p> <ul style="list-style-type: none"> <li>■ The Advisory Group will meet again in early August to discuss the draft CIA report</li> <li>■ Closing karakia by s 9(2)(a)</li> </ul>	

Minuted by s 9(2)(a)

Released under the Official Information Act 1982

## Minutes of Meeting

MGI Hapu Meeting - 12 August 2013

Held 12 August 2013 at 3:30

at Hungahungatoroa Marae

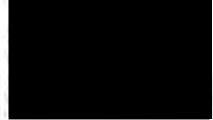
Present:

Section 9(2)(g)(i)



Greig Stephen

s 9(2)(a)



Ngai Tukairangi

Ngai Tukairangi

Ngai Tukairangi

Ngai Tukairangi

Ngati Tapu

NZTA

Beca

Beca

Nga Potiki

Apologies:

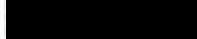
Distribution:

All above

Item	Action
<p><b>1 Discussion</b></p> <ul style="list-style-type: none"><li>The hapū presented the draft CIA report. s 9(2)(a) was awaiting final comments and amendments from s 9(2)(a). The report identified the cultural values of individual hapū and the associated relationship to the development area. The report then assessed the options against the hapū values to determine possible impacts of options.</li><li>Ngai Tukairangi and Ngati Tapu worked together on determining potential impacts of proposed options.</li><li>s 9(2)(a) noted the CIA report will assist NZTA in determining a preferred option for the Maunganui Girven Road intersections and the SH29/SH2 intersections.</li><li>s 9(2)(a) mentioned the protocol is under development and is necessary during the construction phase of the project.</li><li>The hui following the meeting is with the wider Matapihi community to seek feedback on proposed options.</li></ul>	

Minuted by:

s 9(2)(a)



Released under the Official Information Act 1982

## Minutes of Meeting

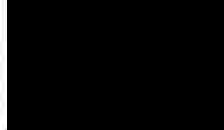
### Maunganui Girven Intersection - Hapu Advisory Meeting

Held 10 October 2013 at 5pm-6pm

at Ngai Tukairangi Office

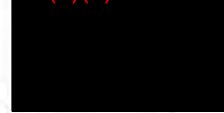
**Present:**

s 9(2)(a)



Greig Stephens

s 9(2)(a)



Ngati Tapu

Nga Potiki

Ngai Tukairangi

NZTA

Beca

Beca

Beca

**Apologies:**

**Distribution:**

All above

Item	Action
<p><b>1 Introduction</b></p> <ul style="list-style-type: none"> <li>Purpose of meeting is to discuss a new option, Option 4</li> <li>s 9(2)(a) presented an overview of Option 4 and the rationale for NZTA considering another option</li> </ul>	
<p><b>2 General Feedback</b></p> <ul style="list-style-type: none"> <li>Option 4 was considered better than Option 3</li> <li>s 9(2)(a) raise pedestrian issues and safety of school children gaining access to school from Truman Lane</li> <li>s 9(2)(a) noted further work is required to determine the best option to address pedestrian safety</li> <li>s 9(2)(a) also indicated interest in surplus NZTA land after the completion of project</li> </ul>	
<p><b>3 General Discussion</b></p> <ul style="list-style-type: none"> <li>The meeting discussed what constituted a general consultation meeting and an advisory meeting</li> <li>s 9(2) noted that NZTA generally don't pay for consultation, however, where there is specialist advice sought by NZTA or an output is required (CIA, protocol meetings are reimbursed</li> <li>s 9(2)(a) noted that most meetings require advice from tangata whenua and therefore meetings should be traded as advisory meeting</li> <li>s 9(2) will clarify the arrangements NZTA have applied for other projects and get back to the members</li> </ul>	
<p><b>4 Conclusions</b></p> <ul style="list-style-type: none"> <li>NZTA and Beca will confirm the pedestrian arrangements for Option 4 and will meet with the hapū groups to confirm Option 4</li> </ul>	

Minuted by: s 9(2)(a)

Released under the Official Information Act 1982

## Minutes of Meeting

### MGI to Te Maunga - Hapu Advisory Meeting

Held 27 June 2014 at 3:30pm - 4:30pm

at Beca

**Present:**

s 9(2)(a)

Ngati Tapu

Beca

Beca

**Apologies:**

Greig Stephen

NZTA

s 9(2)(a)

Beca

Nga Potiki

Ngai Tukairangi

Ngai Tukairangi

**Distribution:**

All above

Item	Action
<p><b>1 Introduction</b></p> <ul style="list-style-type: none"> <li>SR – Karakia</li> </ul>	
<p><b>2 Project update</b></p> <ul style="list-style-type: none"> <li>TH – presented a project update</li> </ul>	
<p><b>3 Option 3A</b></p> <ul style="list-style-type: none"> <li>TH – presented Option 3A and sought feedback</li> </ul> <p>Option 3A was discussed at the last Hapu Advisory Meeting in October 2013</p> <ul style="list-style-type: none"> <li>PI – indicated Option 3A affects Nga Potiki interests more than the Matapihi community and Ngati Tapu.</li> </ul> <p>Option 3A at the Bayfair intersection is similar to Option 2.</p> <p>The Ngati Tapu and Ngai Tukairangi CIA preference was for Option 1.</p> <p>Ngati Tapu are neutral on Option 3A.</p> <ul style="list-style-type: none"> <li>SR – Beca will contact the other hapū to assess their views on Option 3A</li> </ul>	SR – contact other hapū
<p><b>4 CIA Addendum</b></p> <ul style="list-style-type: none"> <li>TH – in order to understand any cultural issues associated with Option 3A, would the hapū like to prepare a CIA addendum to assess any cultural effects of Option 3A</li> <li>PI – From a Ngati Tapu perspective, Nga Tapu don't see a need to prepare an assessment given the configuration at the Bayfair intersection is the same as Option 2.</li> </ul> <p>NZTA would need to discuss with Ngai Tukairangi to assess their views on preparing a CIA addendum.</p> <ul style="list-style-type: none"> <li>SR – Beca will follow up with the other hapū</li> </ul>	SR – contact other hapū



**5 Monitoring Protocols**

- SR – we have a draft protocol prepared, we will work with the hapū closer to the time of construction to finalise

**6 Conclusion**

- SR - Karakia

Minuted by: [Redacted] s 9(2)(a)

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## Minutes of Meeting

### MGI - Nga Potiki Hui - Minutes (1)

Held 17 March 2014

at Beca

Present:

s 9(2)(a)

s 9(2)(a)

Greig Stephens (NZTA)

Apologies:

s 9(2)(a)

s 9(2)(a)

Distribution:

As above

Item	Action
<p><b>1 Background</b></p> <ul style="list-style-type: none"> <li>■ s 9(2)(a) described the background of MGI, interdependence with SH2/29, and bringing Nga Potiki into discussions when the SH2/29 intersection was added</li> <li>■ s 9(2)(a) described the 4 options and the high traffic volume that they serve.</li> <li>■ s 9(2)(a) advised that when Nga Potiki agreed to TEL they didn't know that SH2/29 would need upgrading. It was agreed, people weren't aware. Only traffic modelling in 2013 explained the need to upgrade SH2/29.</li> <li>■ CR explained no consultation on Option 4 yet, will be in April/May.</li> <li>■ Traffic Modelling Report –to be provided to Nga Potiki</li> <li>■ Not discussed any option publically</li> <li>■ Confidentially Option 4 preferred</li> <li>■ s 9(2)(a) does have a copy of the cultural assessments</li> <li>■ The project storm water solutions are under investigation and further hui will advise of the findings.. CR confirmed that the stormwater ponds are permitted under existing TCC Regional catchment consent)</li> </ul>	<p>Beca to provide in 3-4 weeks</p>
<p><b>2 Nga Potiki Situation</b></p> <ul style="list-style-type: none"> <li>■ VK – advised, when consultation was underway for the project in the 2011 – 2013 period ., Nga Potiki were in Waitangi Tribunal negotiations and negotiating the return of Truman Lane lands. Nga Potiki RMU reserved its position on the NZTA options in the CIA report .. The Nga Potiki Settlement Trust formed late 2013 was not consulted during this process. Nga Potiki will get Truman Lane land – they want it to achieve its highest and best use.</li> <li>■ VK -noted that she does not represent MPBI in these discussions and MPBI have aspirations for the industrial zoned land at the Mangatawa Interchange on Truman Lane</li> </ul> <p>[REDACTED]</p> <p>[REDACTED]</p>	

s 9(2)(a)

- Have another meeting in 2weeks
- VK confirmed that , the Nga Potiki RMU will continue to attend the project Advisory Group meetings as they take care of any cultural issues. They are under the (Treaty Settlement Trust).
- CR confirmed they will continue consultation with the are in a process with the respective Resource management units for Ngai Tukairanga, Ngati Tapu and now Ngati He. VK confirmed they should continue their discussions with Nga Potiki RMU and at some point we should all ( RMU and Trust representatives of Nga Potiki ) meet together.
- The Settlement Trust is now the property owner of the lands adjacent to the western end of Truman Lane. Land owner meeting will be with property arm of the Treaty Settlement Trust

Minuted by s 9(2)(a)

Released under the Official Information Act 1982

## Minutes of Meeting

### MGI - Nga Potiki Hui - Minutes (2)

Held 2 April at 12:00pm - 1:00pm

at Beca

Present:

s 9(2)(a)

s 9(2)(a)

Greig Stephens (NZTA)

Apologies:

s 9(2)(a)

Distribution:

As above

Item	Action
<p><b>1 Meeting minutes</b></p> <ul style="list-style-type: none"><li>GS – asked VK to clarify changes in March minutes about stormwater</li><li>VK – Nga Potiki need to understand all the effects of options including stormwater issues</li><li>CR – stormwater solution for the project is under investigation and we don't have all the detail,</li><li>VK – MPBI have not been consulted on the project</li><li>CR – MPBI is not a directly affected landowner for this project and has been consulted like all other landowners. In addition the MPBI cultural interests have been conveyed through the hapu representatives in the Nga Potiki RMU.</li><li>Other aspects of the minutes were clarified and new minutes will be issued.</li></ul>	<p>s 9(2)(a)</p>
<p><b>2 CIA</b></p> <ul style="list-style-type: none"><li>Discussion occurred on the way to incorporate the new cultural land ownership interests in to the existing CIA from Nga Potiki</li><li>Agreed that the Trust is to send in a scope , Table of Contents and fees and time frames</li></ul>	<p>s 9(2)(a)</p>
<p>[REDACTED]</p>	<p>s 9(2)(a)</p>

[Redacted]

Next meeting postulated for the 16<sup>th</sup> /17<sup>th</sup> April or when the Trust is ready with responses and information on the service centre proposal

Minuted by: s 9(2)(a) [Redacted]

Released under the Official Information Act 1982

## Minutes of Meeting

### B2B (MGI) - Nga Potiki hui - Minutes (3)

Held 29 July 2014 at 10am - 11:30am

at Beca Offices

**Present:** [Redacted] s 9(2)(a) Nga Potiki  
 [Redacted] Nga Potiki  
 Greig Stephen [GS] NZTA  
 [Redacted] s 9(2)(a) Beca  
 [Redacted] Beca  
 [Redacted] Beca  
 [Redacted] Nga Potiki

**Apologies:** [Redacted] Nga Potiki

**Distribution:** All above

Item	Action
<p><b>1 Introduction</b></p> <ul style="list-style-type: none"> <li>SR – Mihi and karakia</li> </ul>	
<p><b>2 CIA</b></p> <ul style="list-style-type: none"> <li>GS – confirmed commissioning of CIA (14 July) but wanted to clarify the scope of work based on email of 15 July from VK. The Scoping report, Visual and Noise assessment were handed to TH. The Traffic and Options assessment will be available next week.</li> <li>TH – Nga Potiki need to understand how NZTA came to a preferred option and what assessment was given to the cultural effects.</li> <li>SR – Engagement with Nga Potiki started in January 2013 when scope of project was widened to include improvements to the SH2/29 (Te Maunga) intersection. Engagement with Ngai Tukairangi and Ngati Tapu started earlier, when project was just focussed on improvements to MGI. Once Nga Potiki were engaged, NZTA presented 3 options and sought feedback. Hapu prepared a CIA to assess cultural effects as part of the Advisory Group CIA received 4 September 2013. The project team then asked all hapū to update their CIA with commentary on Option 3A.</li> <li>TH – the CIA prepared with MD input reserved a Nga Potiki position on the B2B options and a full assessment of options was not complete. Nga Potiki were awaiting information (now received) and confirmation of the CIA scope to complete the assessment.</li> <li>VK – now the Nga Potiki report writer has suggested that the timeframes are too short and the fee is not sufficient to cover the work. Nga Potiki could have a report 80%-90% complete within four weeks and a final within six weeks.</li> <li>GS – Discussion covered hours required and 80 hours was considered. VK to confirm ASAP. Agreed that we meet in four weeks to review the draft CIA. Nga Potiki to forward through a breakdown of the number of hours and timeframes and who the name of the report writer. It was agreed to use the TCC CIA template to breakdown hours and costs, and forward through for NZTA within a week.</li> <li>TH – What is the NZTA view on commissioning an independent peer review</li> </ul>	<p><b>THaig – Traffic and Options Assessment Reports to Nga Potiki</b></p> <p><b>GS – Traffic Assessment</b></p>

<p>of the Traffic Assessment?</p> <p>GS – NZTA have already undertaken that work as part of its process. The Traffic Assessment peer review report is available.</p> <ul style="list-style-type: none"> <li>▪ TH – it's unfortunate NZTA have confirmed a preferred option without the addendum to the Nga Potiki CIA. Can the Nga Potiki CIA influence the preferred NZTA option?</li> </ul> <p>GS – Yes, the CIA will identify additional possible issues and make recommendations. NZTA will need to carefully consider how to manage the issues and recommendations of the CIA.</p> <ul style="list-style-type: none"> <li>▪ The next meeting is set for 1 September 2014 at a Nga Potiki venue, 10am is suggested. SR will liaise with MD to confirm arrangements.</li> </ul>	<p><b>peer review report</b></p>
<p><b>3 Conclusion</b></p> <ul style="list-style-type: none"> <li>▪ SR – Karakia</li> </ul>	

Minuted by s 9(2)(a)

Not agreed minutes

Released under the Official Information Act 1982

## Minutes of Meeting

### B2B (MGI) - Nga Potiki hui - Minutes (4)

Held 15 October 2014 at 2pm-3:30pm

at Nga Potiki a Tamapahore Office - Papamoa

**Present:**

s 9(2)(a)	Nga Potiki
	Nga Potiki
	Nga Potiki
Greig Stephen [GS]	NZTA
s 9(2)(a)	Beca
	Beca

**Apologies:**

**Distribution:** All above

Item	Action
<p><b>1 Introduction</b></p> <ul style="list-style-type: none"> <li>SR – Mihi and karakia</li> </ul>	
<p><b>2 Project update</b></p> <ul style="list-style-type: none"> <li>THa – investigation nearing completion. Project should move into design phase later this year which will take 12-18 months. Relocation of the railway line could commence as early as next year, with the state highway improvements following afterwards.</li> <li>The contract will be a design and construction contract, preceded by the development of a specimen design and principals requirements.</li> <li>MD – what's the timing of the construction tender?</li> <li>THa – late 2015, subject to funding</li> <li>VK – timeframe for specimen design?</li> <li>GS – approximately 12 months</li> <li>TH – will tangata whenua participate in the design process?</li> <li>THa – we have allowed for the Tangata Whenua Advisory Group inputs in the design process</li> <li>Project will relocate the railway line as part of advanced works. NZTA are awaiting approvals and confirmation of funding.</li> </ul>	
<p><b>3 CIA Report</b></p> <ul style="list-style-type: none"> <li>SR – thanks to Nga Potiki for providing a full report</li> <li>TH – important part of process and record</li> <li>THa – We will go through the report recommendations</li> </ul> <p><b>At Grade Options</b></p> <p>All at grade options have an effect on the performance of the corridor. At grade options will cost \$40m-80m and have a life span of 15 – 20 years (from 2016). NZTA understand the proposal doesn't meet Nga Potiki expectations.</p>	



### Lowering Train Track

- TH – what about trenching of the rail tracks
- THa – the gradient of the track would need to extend 1km in either direction to get to the appropriate 6m-7m below the ground surface. Adjoining tracks to the Mount and Tauranga and parallel passing loop would also have to be lowered as a result increasing the cost significantly. The high water-table also presents some challenges.
- TH – we would like to see the detail on how NZTA came to its conclusions about the rail trenching.

### Pedestrian and Cycling

- THa – we would like to understand any pedestrian and cycling issues and feedback Nga Potiki may have.
- VK – Nga Potiki consists of 3 distinct communities – Te Manga, Kairua and Mangatawa (marae). The connectivity between the communities is important. An underpass has been suggested by some from their community
- THa – we need to understand where the demand for pedestrian and cycling services might be. Any additional information would be helpful. There are 3 areas we need to consider from a pedestrian and cycling perspective – B2B, Mangatawa and Truman Lane. There is a need to work closely with TCC particularly for Truman Lane.
- VK – Pedestrian and cycle solutions at the Mangatawa interchange only service Papamoia to Mangatawa and not to Te Maunga. There is a lack of connection to Te Maunga.
- THa – we will circulate a plan showing the pedestrian access.

### Moving the Interchange West

- THa – moving the interchange west will require more land from properties that front Maunganui Road to accommodate the change and the reducing separation of the interchanges at Bayfair and Baypark.
- TH – how many properties will be affected?
- THa – we would need to undertake an assessment. There are also safety issues to consider.
- VK – we need to understand how many properties are affected and the safety issues.
- THa – it would be useful from our perspective to understand how far the interchange would need to move
- TH – the visual and physical impact of the interchange is a concern. The further west the better. Has there been any visual assessment done?
- THa – we'd need approval from NZTA to do that extra work. We need to balance the performance, safety aspects and constructability in order to optimise the placement of the interchange. There are two further design phases.

### Surplus Land

- THa – there is a property disposal process to follow.
- TH – surplus land may assist from a mitigation perspective.
- GS – NZTA are open to exploring opportunities.
- TH – we're interested in any surplus lands not subject to an offer back (to land owners)
- THa – We'd need to identify any surplus land for possible transfer. We'd also

THa to provide rail information

THa to provide pedestrian access plans

GS to review visual assessment information

need to consider the interests of all hapū.

#### Design Elements

- THa – the specimen design phase will need to include design elements which will be agreed in the protocol
- TH – what's the timing
- THa – planning applications lodged by the end of the year or early next year. In parallel, the specimen design phase will commence.

#### Eco-plants

- THa – NZTA has procurement policies
- GS – for the Hairini Link project the possible supplier was introduced to the tenderers
- THa – this will link to the Landscape Plan. We need to consider the types of plants and their performance
- TH – Nga Potiki seek input into the Landscape Plan

#### Protocol

- THa – agreeing a protocol is important in recognising the relationship with NZTA. As with all projects this will be progressed with Tangata Whenua in the next phase.
- TH – NZTA need to accommodate hapū collectively and individually.
- THa – we need to get acknowledgement from other hapū on the structure of the protocol
- VK & TH – agree

#### Industrial and Residential Traffic

- THa – the CIA recommendations comment on traffic separation. We are unclear what that means.
- TH – Nga Potiki have concern about traffic conflicts – industrial and marae/residential traffic
- VK – there is planned residential growth around the marae. We would like to avoid traffic conflicts, by maintaining good access at the Te Maunga end of Truman Lane. Our concern is that if access at Te Maunga is poor, then more industrial traffic will use the Mangatawa Interchange which will increase the conflicts with our community.
- TH – we need to look at the performance levels for traffic.
- VK – pedestrian and cycle movements also need to be considered.

#### Valuations

- THa – valuation are not generally provided for property not directly affected (e.g. acquisition). [REDACTED]

- TH – valuation is an indicator of effect
- VK – Property was provided to nga Potiki as part of our Treaty Settlement, the NZTA proposal directly affects our lands
- GS – we need to discuss this issue with our property team.

#### Ramp Option

- THa – we provided information on a ramp but didn't receive any feedback.
- TH – the options in order of preference are "at grade" then moving the interchange further west. Any bridging option will require an off ramp onto

GS to follow  
up

<p>Truman Lane.</p> <ul style="list-style-type: none"> <li>■ THa – the cost of any additional ramp to Truman Lane needs to be justified to NZTA in terms of roading functionality and private benefit.</li> <li>■ TH – the off ramp is mitigation</li> <li>■ VK – the off ramp provides for efficient access</li> </ul>	
<p><b>4 Minutes</b></p> <ul style="list-style-type: none"> <li>■ SR – previous minutes are not yet agreed and there are differences, statements made are disputed</li> <li>■ TH – minutes are clear from our perspective</li> <li>■ GS – possible misinterpretation of statements made at previous meeting, particularly comments about “Nga Potiki not having an opinion” the original CIA released in September 2013 does not state that Nga Potiki reserved their opinion/recommendations on the proposed options, or that any subsequent change in their position would be forthcoming.</li> <li>■ SR – original CIA mentions “not able to provide ... views on 3 options”. SR will send a copy of the original CIA report.</li> </ul>	<p><b>SR CIA report</b></p>
<p><b>5 Other Matters</b></p> <ul style="list-style-type: none"> <li>■ GS – need to include the CIA in the AEE</li> <li>■ TH – there are sensitive elements in the CIA that need revision. A revised copy will be provided to NZTA</li> <li>■ GS – we also need to ensure the CIA scope aligns with the contract scope.</li> <li>■ TH – we will review</li> </ul>	

Minuted by: s 9(2)(a)

Released under the Official Information Act 1982

## Minutes of Meeting

### MGI SH2/29 - Tauranga Airport Meeting

Held 5 May 2014 at 10:30am

at Tauranga Airport

**Present:** Greig Stephen NZTA  
s 9(2)(a) Tauranga Airport  
s 9(2)(a) Beca  
s 9(2)(a) Beca

**Distribution:** As above

Item	Action
<p><b>1 Update on Option 3A</b></p> <ul style="list-style-type: none"><li>s gave an update on the project.</li><li>We have a new Option 3A, only real change is:<ul style="list-style-type: none"><li>Owens Place connection lost</li><li>New SH29 roundabout and shorter bridge.</li></ul></li><li>Left plan CK 088 Rev C with s 9(2)(a) .</li></ul>	
<p><b>2 Stormwater Management</b></p> <ul style="list-style-type: none"><li>s described that stormwater management is similar for all options. There is a detention pond for the project at the driving range by the golf course.</li><li>A 'wet' pond desired.</li><li>s commented that if swans inhabit wet pond, then there will be issues for the planes. Can put netting over it to stop birds.</li><li>s explained that there is another pond by SH29. s advised that this is ok by airport.</li><li>Airport already employs windmills and other bird-scaring devices to reduce bird strike about the harbour edges of the airport.</li><li>s advised he is happy with wet pond concept. If that becomes an issue then you firstly remove swans or add netting over the pond – it is manageable.</li></ul>	
<p><b>3 Construction Clearance to Flight Path during Construction Period</b></p> <ul style="list-style-type: none"><li>s advised there is no update on previous information.</li><li>s 9(2) is to get s 9(2)(a) to decide clearance of cranes etc, especially for the smaller planes whose pilots aren't familiar with the runway approach.</li><li>s 9(2) advised that construction of flyovers likely in 2017 (maybe 6 month period)</li></ul>	
<p><b>4 Other Business</b></p> <ul style="list-style-type: none"><li>s 9(2) also advised that there would be a formal announcement in the next 6 weeks of the preferred option through the newsletter and public open day.</li></ul>	

Minuted by: s 9(2)(a)

## Minutes of Meeting

### OGC/TCC Rail Tie in NOR

Held 30 September 2014 at 4.00pm

at Omanu Golf Club

<b>Present:</b>	§ 9(2)(a)	OGC
	§ 9(2)	OGC
	§ 9(2)(a)	OGC
	§ 9(2)(a)	TCC
	§ 9(2)(a)	TPG
	Greig Stephen	NZTA
	§ 9(2)(a)	Beca
	§ 9(2)(a)	Beca
<b>Apologies:</b>	§ 9(2)(a)	TCC
	§ 9(2)(a)	TCC
	§ 9(2)(a)	TCC
	§ 9(2)(a)	Beca
<b>Distribution:</b>	All the above	

Item	Action
<p><b>1 Introductions and Purpose of Meeting</b></p> <ul style="list-style-type: none"> <li>TH outlined the purpose of the meeting - lodge NOR in October 2014 post Kiwirail review, need written sign off from TCC and OGC for non-notified process. Meeting to agree issues and provide documents to OGC and TCC for review and sign off.</li> </ul>	
<p><b>2 Background</b></p> <ul style="list-style-type: none"> <li>TH gave brief overview of the B2B project for Kiri Pope who has taken over from § 9(2)(a). Detailed timing of works including Outline Plan for the Rail to be provided next year when detailed design has been completed.</li> </ul>	
<p><b>3 Outcome of Last OGC Meeting</b></p> <ul style="list-style-type: none"> <li>BP confirmed that the OGC preferred access option is Option B. <ul style="list-style-type: none"> <li>need to make course changes associated with Option B</li> </ul> <p>There are three potential course changes that require club members input these include;</p> <ol style="list-style-type: none"> <li>13<sup>th</sup> Tee and Green shifts to the north (retains Par 5)</li> <li>12<sup>th</sup> Green moves west, 13<sup>th</sup> Tee moves west (retains Par 5)</li> <li>13<sup>th</sup> Tee shifted north to make Par 4, and make the 18<sup>th</sup> Par 5</li> </ol> <ul style="list-style-type: none"> <li>OGC will go out to members in Oct/Nov to discuss 3 course options.</li> </ul> </li> <li>GS confirmed that Option B is accepted by NZTA as the preferred access option.</li> <li>TH noted that the proposed safety fence design standards are yet to be</li> </ul>	

<p>confirmed and these will include consideration of maintenance requirements.</p> <ul style="list-style-type: none"> <li>■ PWA – OGC sought clarity as to whether the course modifications would be covered by compensation under the PWA. DK confirmed that course modification will be compensated.</li> <li>■ Agreement to provide fencing and access road will be covered under the RMA process. Details to be developed during detailed design. Reconfiguration of golf course will be under the PWA.</li> <li>■ TCC to deal with the land and lease agreements to be agreed between the parties – TCC, OCG, Kiwirail, Driving Range. TPG will work with all parties on this.</li> <li>■ Legal costs will be covered under the PWA</li> <li>■ Once designation alteration has been confirmed, lease agreements can then be formalised. Land and lease agreements to be sorted prior to construction.</li> </ul>	
<p><b>4 New OGC Issues</b></p> <ul style="list-style-type: none"> <li>■ OGC sought clarity on when/if funding will be available – early next year or 2016 to allow construction of course modifications to begin ASAP. GS tentatively suggested that funding may be in place/available early 2015 to draw from.</li> <li>■ OGC to confirm by the end of November 2014 the agreed course arrangement. Associated costs and building requirements can then be determined.</li> <li>■ OGC advised that the golf course changes should be completed before the railway line is relocated.</li> <li>■ OGC confirmed that the growing period for grass is spring and autumn therefore construction of course changes is required about 6 months prior to this period.</li> <li>■ For efficiency the NES consent is to accommodate on-course changes for all three potential course arrangements.</li> <li>■ OGC to mark up all 3 options for s 9(2)(a) NES consent</li> <li>■ Query on tree removal. CM confirmed there are no scheduled trees on the golf course (under the Tauranga City Plan). OGC to contact TCC arborist to confirm tree removal requirements.</li> <li>■ OGC to mark up trees that may need to be changed for all 3 course arrangement options.</li> <li>■ Driving Range silver of land that is over the Kiwirail owned land to be land swapped with land further to the north. To be covered under the lease arrangements between Driving Range, OGC and TCC.</li> <li>■ TH confirmed that access is still required on Kiwirail land north of the tie in point to the practice area. OGC agreed.</li> <li>■ OGC agreed there were no other issues identified – all internal processes now.</li> </ul>	<p>BP</p> <p>BP</p> <p>BP</p>
<p><b>5 TCC Issues</b></p> <ul style="list-style-type: none"> <li>■ A new access arrangement to the pumpstation is to be provided to s [redacted] at TCC.</li> <li>■ Stormwater upgrade (to reduce flooding in Eversham Rd area) is a TCC project which is still working through options. At present all options require works on the golf course.</li> <li>■ OGC need to know the width of the proposed open drain that is currently a piped drain. s 9(2)(a) [redacted] (TCC Parks) to provide information to OGC. This</li> </ul>	<p>CM</p> <p>KP</p>

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<p>will help OCG in the course layout arrangements.</p> <ul style="list-style-type: none"> <li>■ KP noted that the Bayfair Reserve walkway memo from s 9(2)(a) has been provided to Beca. CM and TH confirmed that it had been received. CM advised that s 9(2)(a) (TCC) needs to be aware that the Outline Plan will come after the NOR is confirmed.</li> </ul>	<b>KP</b>
<p><b>6 Close out</b></p> <ul style="list-style-type: none"> <li>■ Draft NOR document was provided to the OCG and TCC for their review and the written approval affected party form with attached LRP.</li> <li>■ CM will follow up later next week for the signed written approval form.</li> <li>■ Schedule of mitigation attached.</li> </ul>	<b>BP, KP</b>

Minuted by: s 9(2)(a)

### Schedule of Mitigation and Compensation

RMA Rail Mitigation and Project Cost	<ul style="list-style-type: none"> <li>■ Remove trees in or near rail corridor at the north, and at 13<sup>th</sup> tee. Club would like hedging at tee points and occasional trees in the rough but not high trees. Native evergreens.</li> <li>■ Matapihi/Maunganui Road reserve corner: replace two trees and cluster of trees in north?</li> <li>■ Safety Fence from 13<sup>th</sup> fairway gold tee to end of driving range and past practice green agreed as per KiwiRail instructions.</li> <li>■ Height of fence – likely as per driving range, subject to CAA rules at final design.</li> <li>■ Driving Range Chipping area to be moved for the stormwater pond. The option of replacement of chipping area depends on security and access; Rob prefers to the east of driving range.</li> <li>■ Driving Range access – might move 5-10m past current area, maybe combined with stormwater pond access.</li> <li>■ Driving range truck access for net maintenance and golf course needs mower access of Matapihi Road.</li> <li>■ It is noted that there is a need to adjust the TCC lease at the stormwater pond area, and where the current practice green is.</li> </ul>
PWA compensation	<ul style="list-style-type: none"> <li>■ Other aspects will need to be considered for Public Works Act assessment in the light on the compensation already provided for the course redesign and land acquisition. Settlement was April 1982.</li> <li>■ Access road to practice fairway and new green and the consequential changes in tee-off's and greens yet to be determined.</li> </ul>
Unclear which Jurisdiction	<ul style="list-style-type: none"> <li>■ There is across the 13<sup>th</sup> fairway and the driving range (put in 15 years ago) an 80mm PVC pipe – needs s 9(2)(a) from KiwiRail with hopefully no relocation required.</li> </ul>

## Minutes

### MGI: South Mount Maunganui Stormwater Catchment Mitigation Options

Held week of 5 December 2013 at 9:00am at Beca Offices, Tauranga

<b>Attendees:</b>	Greig Stephen	Transport Agency
	s 9(2)(a) (GJ)	Tauranga City Council
	s 9(2)(a) (GD)	Tauranga City Council
	s 9(2)(a) (HS)	Tauranga City Council
	s 9(2)(a) (DK)	Tauranga City Council
	s 9(2)(a) (CJ)	DHI
	s 9(2)(a) (DC)	AMP
	s 9(2)(a) (PM)	Lysaghts
	s 9(2)(a) (CR)	Beca
	s 9(2)(a) (GL)	Beca
	s 9(2)(a) (GJL)	Beca
	s 9(2)(a) (TH)	Beca
	s 9(2)(a) (SI)	Beca

Item	Action
<p><b>1 Introduction</b></p> <ul style="list-style-type: none"> <li>■ GJL provided an overview of stormwater discussions to date, the stormwater requirements for each organisation and the programme of works (MGI, Bayfair Expansion, TCC Pipe Upgrades).</li> <li>■ GJL summarised the scope of the MGI project, which includes upgrading the Maunganui/Girven and SH2/SH29 intersections by grade separating SH2 from other roads and widen the existing carriageway.</li> <li>■ Due to the site constraints a collaborative approach between NZTA, TCC and AMP has been adopted to resolve stormwater issues. The Omanu Golf Course has been identified as the most appropriate location for stormwater mitigation</li> <li>■ GJL advised the current programme for the MGI project consists of the following key dates:           <ul style="list-style-type: none"> <li>- Consult with golf course regarding stormwater in Jan 2014</li> <li>- Public open day to announced preferred option in April 2014</li> <li>- Lodge Resource Consents in May 2014</li> <li>- Construction starts in financial year 2015/16</li> </ul> </li> <li>■ GD confirmed that the TCC pipe upgrades are programmed for 2015/16 and 2016/17 to coincide with the MGI construction works.</li> <li>■ DC advised that the Bayfair Complex expansion is currently programmed to start in 2016.</li> <li>■ CR noted that the MGI Options discussed within the workshop are confidential as the preferred option will not be announced to the public until the project Open Day.</li> </ul>	



## 2 Modelling Undertaken to date

- GJL advised that the original stormwater model for the South Mount Maunganui catchment has been updated by DHI to include the lower catchment area, including Golf Course and Airport. The infrastructure layout from Links Ave was also updated. The following modelling stages have been completed to date.
  - Validation against the April 2013 storm event and the larger 2005 storm event.
  - Pre-development model (50 year-2hour storm, 2055 rainfall figures, 10 year tide with Most Probable Development) to understand the current stormwater effects within the catchment.
  - Post-development model (50 year-2hour storm, 2055 rainfall figures, 10 year tide with Most Probable Development) to understand the stormwater effects of the MGI project and Bayfair expansion within the catchment.
  - Model results for the pre and post development scenarios have been made available to all parties for consideration and response.
- GJL stated that the focus of the workshop was to develop mitigation options for the additional stormwater volume from the MGI project, Bayfair expansion and TCC pipe upgrades. Mitigation options are to be focussed within the open drain that runs through the Omanu Golf course and Tauranga Airport.

## 3 Stormwater Mitigation Strategy

- DC and PM advised that onsite stormwater mitigation has previously been considered for Bayfair extension, however the preference is to provide stormwater mitigation offsite and further downstream.
- GD/CR advised that the main concern from the Golf Club will be aesthetics, in relation to having clear water, keeping the drain clean and free from weed so that golf balls can be easily retrieved. All parties agreed that altering the cross section and/or lowering invert levels of drain along its length are appropriate options for improving conveyance.
- GD/GJ advised that upgrading of the stormwater pipes from Links Ave is proposed within the next 10 years.
- TCC suggested that a target flood level of 300mm below existing floor level for properties within Eversham Road. TCC advised that they will need to confirm this parameter as it may not be economical to provide the pipe upgrades to achieve it.
- At previous meeting, BoPRC had advised GJL/CR/GD that the consenting process would be focussed on stormwater treatment. Attenuation of stormwater was not considered to be the main issue due to the Golf Course being located within the lower part of the catchment and the consequence of flooding was minor in relation residential/commercial properties.
- All parties agreed that mitigation options within the golf course are to be centred on improving conveyance within the open drain. Due to the minimal head available within pipes between Golf Course and Eversham Road the pipe upgrades will have to be centred around increasing capacity rather than improving conveyance, i.e. there is little scope to improve pipe gradients etc.

TCC

## 4 Stormwater Quantity

- GL and CJ advised flooding problems within Eversham Road could be caused by conveyance restrictions within the Main Drain rather than in the Side Drain. The Main Drain runs along the boundary between the Golf Course and Tauranga Airport and the Side Drain runs through the Golf course from Matapihi Road. It

was considered that modifications to the Main Drain rather than the Side Drain would be more effective for improving conveyance.

Flooding issues could also be related to a lack of capacity within the existing pipe infrastructure between the outlet into the Golf Course and Eversham Road. Head loss could also be exacerbated by the existing silt trap that is located at the outlet into the Golf Course.

- GD noted that there are numerous pipes/services and pedestrian/vehicle access bridges that cross the open drain within the Golf Course, which would require modification to accommodate a wider drain. Also stabilisation of the modified drain banks may be required as they are currently susceptible to erosion during storm events.
- All parties agreed that the following modifications can be applied to the stormwater model, to test if the post development catchment stormwater can be accommodated:

- 1) Update model to include upgrades to the Main Drain. GJL and GD agreed to undertake a walk over survey of the golf course drain to identify areas where it would be suitable to modify the existing drain cross section. GJL to advise DHI of cross section modifications and locations.
- 2) Removal of the existing sediment trap (currently included in the models) at the existing outlet into the side drain going through the golf course. GD to advise if the sediment trap is required
- 3) Introduce a hold point to allow the above results to be considered and determine if pipe upgrades between the golf course outlet and Eversham Road are required. If pipe upgrades are considered necessary utilise the GHD Design Options Report as a reference for pipe sizing.

- All parties agreed that the 3 stages are to be added to the model sequentially so that the accumulative effects of the changes can be determined
- The current DHI modelling programme shows the mitigation options to be complete by 18<sup>th</sup> December; however this is dependant on providing DHI with drain modification details.
- Following completion of the mitigation modelling the output data is to be made available to all parties.

**TCC/DHI/  
Beca**

**TCC/DHI**

**TCC/DHI/  
Beca**

**TCC/DHI/  
Beca**

**Beca/TCC**

**DHI**

## **5 Stormwater Quality**

- GD advised that monitoring undertaken at the outlet into Tauranga Harbour indicates that water quality is within acceptable limits. TCC consider that treatment of the additional stormwater flows generated by the pipe upgrades will not require treatment as the land usage will not change i.e. will continue to be zoned as residential.
- GL advised that BoPRC requires the treatment of the difference in flows between the pre and post development scenarios. On other projects only the additional pavement areas, such as the flyover structure, have been directed through a treatment device. Existing areas of pavement can be drained directly to the existing discharge points. Consideration to be given to separating NZTA and AMP stormwater from the main catchment flow so that it can be treated prior to discharging into the Golf Course drain. This means that only water that requires treatment is treated, i.e. results in a smaller treatment device.
- PM suggested that weir/overflow system could be installed within the Bayfair site

<p>to direct first flush stormwater flows into a treatment device that is located outside the Bayfair site. Higher flows would be directed into an upgraded pipe that connects into the current TCC stormwater system.</p> <ul style="list-style-type: none"> <li>■ Three options were discussed for stormwater treatment <ul style="list-style-type: none"> <li>- Onsite treatment to treat stormwater at source (catchpit interceptors). Not preferred by AMP due to the ongoing maintenance costs. This is also an issue for NZTA particularly when traffic management will also be required along SH2 to enable maintenance.</li> <li>- Floating wetlands/treatment devices to be installed within the Golf Course drain, not preferred as this requires treatment of the catchment wide stormwater.</li> <li>- Grassed swale with NZTA land along Matapihi Road or within the rail corridor adjacent to SH2 to provide treatment prior to discharge into the open drain. Preferred option as stormwater treatment can be targeted where required.</li> </ul> </li> <li>■ GL confirmed that the stormwater treatment options can be developed with hand calculations; there is no need to develop options through the stormwater model.</li> <li>■ NZTA and AMP to undertake calculations to size the treatment device require to mitigate first flush stormwater flows from the two developed sites.</li> <li>■ AMP to determine fall can achieved between their carpark and proposed swale location adjacent to Matapihi Road</li> </ul>	<p>NZTA/TCC AMP</p>
<p><b>6 Consultation</b></p> <ul style="list-style-type: none"> <li>■ Following completion of the mitigation options modelling the stormwater effects on the Omanu Golf Course can be determined. Consultation will be undertaken with and possibly Tauranga Airport. This was agreed to be undertaken in January 2014.</li> </ul>	<p>NZTA/ Beca</p>
<p><b>7 Memorandum of Understanding</b></p> <ul style="list-style-type: none"> <li>■ TCC to advise on the Cost Share Agreements with NZTA and AMP for the stormwater modelling work. s 9(2)(a) to advise NZTA and AMP individually</li> <li>■ TCC to send an example MOU document to AMP for consideration and comment.</li> </ul>	<p>TCC TCC</p>

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## Minutes of Meeting

### KiwiRail Leasee Meeting - MGI and Te Maunga Intersection Improvements

Held 30 May 2013 at 4.00pm

at Beca Office - Executive Room

<b>Present:</b>	§ 9(2)(a)	Bay Commercial (§ 9(2)(a))
	§ 9(2)(a)	Owner (§ 9(2)(a))
	§ 9(2)(a)	Animal Antics (§ 9(2)(a))
	§ 9(2)(a)	Bayfair Panelworx (§ 9(2)(a))
	§ 9(2)(a)	Pacific Toyota (§ 9(2)(a))
	§ 9(2)(a) (CR)	Beca
	§ 9(2)(a) (TH)	Beca
	§ 9(2)(a)	Beca
<b>Apologies:</b>	Greig Stephen	New Zealand Transport Agency (NZTA)
	§ 9(2)(a)	KiwiRail
	§ 9(2)(a)	Tukairangi Investments Ltd
	§ 9(2)(a)	Sign Creations Ltd
		Owens Place Auto Refinishers
		Golf on the Range Ltd
<b>Distribution:</b>	All of the above	

Item	Action
<p><b>1 Introduction</b></p> <ul style="list-style-type: none"> <li>■ CR gave a brief introduction. Attendees gave a brief introduction of who they represented.</li> <li>■ CR asked if anyone attended the Open Day – No one had.</li> <li>■ CR outlined the project from inception through to the three options present on the table for which feedback is now being sought.</li> </ul>	
<p><b>2 Options</b></p> <ul style="list-style-type: none"> <li>■ TH described each option presented through the drawings (Options 1-3 Rev E).</li> <li>■ TH reported that a long term solution is being sought and at-grade (ground level) options do not provide the long term solution.</li> <li>■ Question – are there traffic signals at the intersections under the flyovers? Yes.</li> </ul>	
<p><b>3 Option 1</b></p> <ul style="list-style-type: none"> <li>■ Rail retained in current location, widening occurs on the eastern side (seaward side) of Maunganui Road.</li> <li>■ Attendees reported that there are issues at Owens Place/ Matapihi intersection now.</li> <li>■ TH reported that if traffic signals were to be placed at Owens Pl/ Matapihi intersection they would be phased with the Maunganui/Girven intersection</li> </ul>	

signals. However, more traffic modelling is needed to determine if traffic signals are required.

- Question – Has Kiwirail been consulted? Yes, discussion on-going likely 50% increase in rail movements in next 10-20 years (driven by industry and Port).
- Question - Can the rail times be changed? No, the Owens Place intersection and rail movements will be considered in the traffic modelling.
- Attendees noted that Option 1 will retain the Kiwirail lease but will also retain the traffic issues.

#### **4 Option 2**

- Rail relocated to alternative corridor behind Owens PI commercial centre. Maunganui Road widening to occur over Kiwirail leased land.
- Question – will all the Kiwirail leased land be required? Yes.
- Question – How close to boundary will the road be if the Kiwirail land is taken? Within 1-2m of boundary. Assessments will be undertaken to determine impact of the road designation boundary adjacent to the properties.
- It was noted that the road barriers likely to be used (adjacent to the commercial properties) will be similar to those along Takitimu Drive near the Judea industrial area.
- It was reported that B-train vehicles will not be able to move around the property at 1 Owens PI (Liquorland). Toyota- off loading occurs on Owens Place roadway. The removal of the Kiwirail land reduces the viability of those properties for the current landuse and reduces employment opportunities.
- It was reported that the 'No parking' along Owens Place is an issue for the industrial operators (provided because of the commercial HomeZone).
- It was noted that the proximity of the road boundary is not an issue for some commercial operators – 'road noise is not that bad'.
- Question – what are the types of housing present at Maunganui/Girven intersection and along Maunganui Road? A mix of residential (rental and ownership) and commercial properties is impacted by noise in all three options.

#### **5 Option 3**

- It was noted that the Owens Place extension to Truman Lane would release MGI intersection traffic and increase Owens PI traffic – most likely need to signalise Owens PI/ Matapihi Road.
- Attendees preferred Option 3 as the road would be lower than the railway and further away from property but is still concerned with traffic noise if the traffic moves closer (compared to the rail noise).
- Question –what part of Bayfair is impacted? All options impact on Bayfair.
- A few alternative options were suggested by the attendees – Option 1 with Owens Place extended to Truman Lane; relocate rail and widen Maunganui Road on the seaward side.
- Question – How much 'say' or influence do we have? Consideration of all affected parties will be given in the Options assessments to be undertaken; therefore your feedback is important. The feedback provides new ideas fro the project team to consider.
- It was commented by the attendees that the rail should be relocated no matter which option is preferred.

#### **6 General Discussion**

- Question – Regarding the TEL, are there off ramps at Papamoa for Papamoa residents. Yes, both at Mangatawa and Domain Rd. Traffic modelling will take into account the movements to and from Papamoa.
- Question – will the project be undertaken 'all in one go'? What timeframes? Depending on which option preferred, the rail would be relocated first then the roading. Likely timeframes; Preferred option determined end of 2013, Resource Consents in 2014, Funding sought 2015, Start construction 2016 construction likely to take 3 years.
- Are other alternative Options able to be considered? Yes, if it weighs up against the three options currently on the table. Needs to be a strategic long term option.
- Regarding Option 3 - it was noted that the Owens Place extension to Truman Lane could potentially create a rat-run cut through option between MGI and SH29.
- Regarding Option 2 - potential for left in/left out at the end of Titoki Place onto Maunganui Road should be considered- provides a loop circuit for B trains and delivery vehicles for Owens Place commercial properties.
- It was identified that a signalised intersection and signalised pedestrian crossing would be preferred at the Owens Place/ Matapihi Intersection (crossing Owens Place).
- It was reported that at 1 Owens Place property, the stormwater drain overflows and causes flooding during rainfall events. Stormwater management will need to be considered in all options. The existing stormwater pipeline across the property reduces development potential.
- If KiwiRail leased land is removed from 1 Owens Place property – then no servicing vehicles or parking can be accessed for the existing business and limits the land use for those properties affected by KiwiRail leased land.

**TH to consider**

Minuted by: § 9(2)(a)

## Minutes of Meeting

### Liftan Place Residents Cottage Meeting (2)

Held 15 July 2014 at 2pm

at ASB Arena - Suites 1 and 2

<b>Present:</b>	§ 9(2)(a)	Beca
	§ 9(2)(a)	Beca
	§ 9(2)(a)	Beca
	§ 9(2)(a)	KiwiRail
	Greig Stephen	Transport Agency
	§ 9(2)(a)	TCC Reserves & Parks
	§ 9(2)(a)	§ 9(2)(a)
	§ 9(2)(a)	§ 9(2)(a)
	§ 9(2)(a)	§ 9(2)(a)
	§ 9(2)(a)	§ 9(2)(a)
	§ 9(2)(a)	§ 9(2)(a)
	§ 9(2)(a)	§ 9(2)(a)
	§ 9(2)(a)	§ 9(2)(a)
	§ 9(2)(a)	§ 9(2)(a)
	§ 9(2)(a)	§ 9(2)(a)
	§ 9(2)(a)	§ 9(2)(a)
<b>Apologies:</b>	§ 9(2)(a)	§ 9(2)(a)
	§ 9(2)(a)	§ 9(2)(a)
<b>Distribution:</b>	As Above	

Item	Action
<p><b>1 Introductions</b></p> <ul style="list-style-type: none"> <li>The project team and the residents introduced themselves.</li> <li>§ 9(2)(a) advised that the purpose of the meeting was to provide answers to questions that had been raised in the individual meetings and to provide the opportunity for the residents to discuss the project.</li> </ul>	
<p><b>2 Noise Evaluation Experts Responses</b></p> <ul style="list-style-type: none"> <li>§ 9(2)(a) read out the answers that had been received from the advisers:            Can we have double glazing instead of the 2.5 m boundary fence? The advice is <i>that standard thermal double glazing has relatively poor acoustic performance (similar or sometimes worse than single double glazing) due to the resonance of the cavity and two glass panes of the same thickness having a weakness at the same frequency.</i>            Why is there no Matapihi Road Rail noise mitigation? The advice is <i>as trains cross the golf course they are at a greater distance from the properties (but one is very similar) and therefore noise levels are reduced (compared to when they are immediately adjacent to properties on Liftan Place). Therefore, mitigation is not required to achieve reasonable noise levels. There is also a limitation on noise barriers on the road boundary due to visual and access constraints.</i></li> </ul> <p>Discussion also occurred on what sound reduction double glazing could provide</p>	

Since the meeting, advice has been received from acoustic specialists who have advised that reductions in sound energy are possible with double glazing products. A 50% reduction in sound energy is equivalent to a 3 dBA reduction in noise level. A 3 dBA change is just discernible. ( a change of 5-10 dBA is definitely discernible) It should be noted that sound also travels through house wall and roof cladding and any glazing product would have to consider the performance of the rest of the house and would therefore be case by case.

Will houses along Liftan Place built in the 1980's have foundations that can withstand the vibration from trains? What about brick houses – will they crack? The advice is No; the houses are not expected to crack. The vibration criteria used for people feeling vibration are an order of magnitude below vibration criteria for damage to buildings. I.e. people are much more sensitive to vibration than buildings. The predicted vibration levels are significantly below threshold levels for damage to houses. The Tauranga City Council (TCC) building consent manager, Laurie Hubbard agreed.

What about crossing bell noise? The advice is where level crossing bells are considered to be a nuisance by local residents electronic 'bells' are now available which include a facility to adjust the sound level of the bells below the **normal standard of 85-105 dBA to an absolute minimum of 75 dBA**. This reduced sound level is still in keeping with internationally accepted safety standards for "quiet" level crossing bells.

An additional benefit of the electronic bells is that their sound radiating pattern is more localised than traditional electro-mechanical bells. It is therefore current KiwiRail safety policy to replace time clocks that switch bells off at night with new style "quiet" bells whenever significant work is being carried out at a level crossing.

Quiet bells are not provided at any crossing unless agreed by the local roading authority. This is because reducing the normal sound level of the bells represents a reduction in safety for pedestrians. In some circumstances the local authority may be aware of a particular circumstance, e.g. periodic high level of background noise or level crossing used by visually impaired persons that would make quiet bells more dangerous than usual.

### 3 Questions in Response to Expert Responses

- Q – Will we physically feel vibration? (crockery in cabinets shaking?)  
A – May do, yes but the building foundation will be ok.
- Q – Will pre & post construction evidence of house foundations (photo evidence) be undertaken?  
A – Yes
- Q - What about post construction (over a period of time) to assess accumulation effect?  
A – Post construction vibration monitoring is not proposed. Once constructed, KiwiRail will continue to conduct normal rail operations on the new alignment. KiwiRail do not anticipate that conducting its lawful operations will result in vibration effects from rail operations causing damage to adjacent buildings.
- Q – Will pile driving methods be used during construction?  
A – Not for the construction of the railway, but they will be used for the road flyovers.
- Q – If there is damage to properties due to vibration 'what then?'  
A – Assess on a case by case basis if and when this occurs. This is current practice on other projects, and is the reason for pre-inspections.
- Q – Tauranga City Council is responsible for allowing our houses to be located here next to the rail corridor. Where are they (TCC) to answer our questions?  
A – Reviews of the District Plan over the years have provided the opportunity for residents submissions on the land use in the area to be considered Permits required

TH  
(KiwiRa  
ii)

CLR



for building foundations have been granted by Council with regard to structural soundness of building foundations

§ 9(2)(a) has provided the name of TCC contact to the § 9(2)(a).

- Q – Can we have no bells at night?

A – No, there will be bells at night especially given the safety record at this location.

C – 'If there are bells at night, we will all hear it.'

#### 4 Noise Levels

- Q – Were actual noise levels recorded at this location? And why weren't peak noise levels used vs average noise levels?

A – Yes, actual noise levels were undertaken at the site. The average noise level (Leq) is the noise standard that the acoustic specialists use.

– We can provide the Lmax levels recorded at this location if needed. However, they could be associated with planes overhead or a noisy road bike for example.

##### **We have been advised the following**

*Maximum noise levels measured at the monitoring sites ranged between 67 and 73 dB L<sub>AFmax</sub>. Audible noise at the time of the surveys included industrial activity and aircraft, as well as trains on the existing line. These are likely to be the cause of these maximum noise levels.*

*The average noise level is used in acoustic assessments throughout NZ and overseas, and for transportation noise in particular because it closely correlates with peoples annoyance reactions. By doing so, controls on the number of events are also inherently included.*

- Q – Will the train whistle/horn continue to be used at this location?

A – A risk assessment will need to be undertaken to assess if the whistle/horn is not required. At the moment they do use the whistle (which saves lives).

- Q – What is the decibel rating of a train passing a point?

**We have been advised that the maximum noise level experienced from a train passing will depend on the distance that the receiving environment is from the train. The locomotive noise could be approximately 85 dBA (with windows closed it could be 70 dBA)**

C – the existing noise environment at this location is considered 'Moderate' with existing trains, the airport and traffic noise contributing to this environment.

- Q – How high is the top of the train exhaust?

A – Less than 3.5m high.

- Q – Has the pollution effect on the neighbourhood been looked at? If not, then can it be looked at?

A – The pollution effect of the trains has been looked at during the options assessment phase.

The DL locomotive engines are compliant to emission standard tier 3A. The emission standard is an EU standard for non-road and specifically rail traction engines. These

KiwiRail

do align closely with US standards.

There have been very few studies on the air quality effects of rail transport in New Zealand and there is no national guidance on undertaking such assessments<sup>1</sup>. However, for the purposes of the MCA, it will be sufficient to consider the relative sensitivity of the receiving environment for the three options.

Table 1 summarises the number of sensitive receptors within 200 metres of each option between MGI and the SH2 / SH29 intersection.

**Table 1:** Proximity of rail alignments to sensitive receptors

Distance from alignment (metres)	Number of sensitive receptors				
	Do minimum	Option 1	Option 2	Option 3	Option 3a
<50	21	0	11	11	11
50 – 100	70	36	16	16	16
100 - 200	70	70	45	45	45
<b>Ranking</b>	<b>5</b>	<b>4</b>	<b>1=</b>	<b>1=</b>	<b>1=</b>

Based on the proximity of sensitive receptors to the rail alignments, there will be no difference between the overall air quality effects of Options 2, 3 and 3a, while the overall effects of both these options are likely to be less than those of Option 1 or the Do Minimum.

- **Q** – Is the exhaust smoke from the diesel engine the same as trucks? Or do the trains use different diesel?  
**A** – Yes, it is the same diesel used by trucks.
- **Q** – Noise modelling actually undertaken onsite?  
**A** – Yes.
- **Q** – Why can we not get double glazing instead?  
**A** – The acoustic specialists have advised us that the standard double glazing is not effective. Comment from resident; *‘I would like a second opinion on that’*.  
 See above
- **Q** – Can NZTA assist in double glazing? e.g. Gas filled double glazing which we have been advised can reduce vibration and sound levels.  
**A** – NZTA are happy with the modelling undertaken which suggests double glazing is not required and is ineffective.  
 If there is less than a 3db reduction as a result of installing double glazing then you won’t notice any difference.  
 We will go back to the noise specialist to ascertain the difference in noise level as a

<sup>1</sup> Beca has undertaken monitoring of fine particulate matter at New Lynn and Grafton stations in Auckland (*Results of Air Quality Monitoring in the New Lynn Rail Trench*, Beca, 2010). However, the Project only involves the realignment of running lines and does not incorporate any stations where trains may be stopped.

result of double glazing.

See above

- **C** – Value of our houses will drop.
  - Railway corridor has been there since 80's and has had a valuation effect for 30 years.
  - Train volumes depend on port demands.
  - Future valuation will reflect the actual train effect with the rail mitigation in place. RMA does not deal with valuation directly but does deal with the mitigation of effects and this is what the proposed mitigation measures are about.
- **C** – Walkway should be left open – the majority of Liftan Place residents indicated this preference.
- **Q** – Is it possible to leave the walkway as grass and will there be lights?
  - A** – No lights recommended for the walkway for safety reasons; to deter use of the walkway at night. The walkway is likely to remain as grass with a footpath in the middle.
- **Q** – Will the wall cut out sunlight?
  - A** – No. Refer to the diagram on the posters showing height to boundary.
- **Q** – Can/will a property valuation pre & post construction be undertaken?
  - A** – The RMA does not deal with valuation. The RMA is the legislation the project is working under which is environmental effects based. The RMA will help with mitigation of the effects.
- **Q** – Can the railway line be a tunnelled through here?
  - A** – The cost to do so is overwhelming due to the long length of line that would need to be constructed to achieve the necessary change in height and the existence of a relatively high water table levels at this location, making this option unfeasible
- **Q** – Will the new railway be elevated above property level?
  - A** – No, it will be close to the existing ground level – tracks are to be at ground level.
- **Q** – Has finance been approved?
  - A** – No, not yet – the Transport Agency will seek funding at stages – design, construction, etc.
- **Q** – The noise mitigation measures are understood – however, after construction and operation, are NZTA prepared to do anything further to mitigate noise?
  - A** – Noise modelling was undertaken at forecast 2031 train movements so it is conservative. On completion of construction a noise monitoring survey will assess the modelling predictions. If the noise is found to be more than expected then the Transport Agency will reconsider the situation. (after discussions with KiwiRail )**C** – The noise modelling basis and assumptions are arguably misleading but concede it is difficult to model as there are no existing tracks.
- **C** – More concerned in construction of flyovers in pile driving than construction of the railway line.
  - Pile driving methodology/process and associated mitigation measures from past project experiences will be used.
- **Q** – What will the noise wall look like?
  - A** – poster reference
    - Graffiti guard possible but nothing at this design stage on the 3.5m Rail fence (fence design type is not optional but treatment on the fence is).
    - The 2.5m boundary fence – type, style, design is open to ideas.

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– Can creepers be used on the wall? – Unlikely as they generate a maintenance issue and potential hiding place .

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Minuted by: s 9(2)(a)

Released under the Official Information Act 1982

## Minutes of Meeting

### Golf Course Meeting - 18 August 2014

Held 18 August 2014 at 2.30pm at Omanu Golf Course

**Present:**

§ 9(2)(a)	OGC
§ 9(2)(a)	OGC
§ 9(2)(a)	OGC – Caretaker
§ 9(2)(a)	OGC – Caretaker
Greig Stephens	NZTA
§ 9(2)(a)	Beca
§ 9(2)(a)	Beca
§ 9(2)(a)	Property Group

**Distribution:** OGC via § 9(2)(a) and as above

Item	Action
<p><b>Discussion of Options for Alternative Access to Practice Driving Fairway &amp; Green</b></p> <ul style="list-style-type: none"> <li>■ <b>Option A</b> current route plus underpass – needs truck access = \$ 6 figures</li> <li>■ <b>Option B</b> along fence. Would cause issues at fairway. 2 option B scenarios identified:               <ol style="list-style-type: none"> <li>1. 13<sup>th</sup> tee and 12<sup>th</sup> green move to the west to keep 13<sup>th</sup> as Par 5.</li> <li>2. Make the 13<sup>th</sup> a Par 4 and make 18<sup>th</sup> Par 5.                   <ul style="list-style-type: none"> <li>– Cost of new tee approximately \$7k, new green \$25k.</li> </ul> </li> </ol> </li> <li>■ <b>Option C</b> between 5<sup>th</sup> &amp; 10<sup>th</sup> is a soft damp gravel <u>not</u> as desirable going between fairways. Cars in danger from stray shots.</li> <li>■ <b>Option D</b> from Aviation Street. Noted long drive from clubhouse – if players want to practise before commencing game.</li> <li>■ <b>Option E</b> needs KiwiRail lease similar to what they have now for current access</li> <li>■ <b>Option F (new option)</b> use of rail corridor from industrial zone.</li> <li>■ Access needed to screen fence for maintenance of the screen which rips. TCC use padlock system for fuel deliveries. Security guards locks gate to current access – could continue with that in Options D &amp; E. Practice green and bunker can move to pump shed area.</li> </ul>	
<p><b>Actions</b></p> <ul style="list-style-type: none"> <li>■ <b>Tabular Report</b> on Option B(i) &amp; (iii) or D for Golf Course for feedback by mid-September               <ul style="list-style-type: none"> <li>– formation is gravel, not seal</li> <li>– types of trees in planting programme to be advised by TCC and Golf Course</li> </ul> </li> <li>■ <b>Fencing</b> along railway line               <ul style="list-style-type: none"> <li>– driving range maintenance screen – frequently e.g. couple of weeks</li> <li>– Beca to ask § 9(2)(a) what maintenance is like</li> </ul> </li> <li>■ Issue draft schedule of mitigation measures &amp; PWA measures for clarity</li> </ul>	<p><b>TH</b></p> <p><b>CR</b></p> <p><b>CR</b></p>

**Minuted by:** § 9(2)(a)

**Schedule of Mitigation and Compensation measure subject to further discussion**

<p>RMA Rail Mitigation and Project Cost</p>	<ul style="list-style-type: none"> <li>■ Remove trees in or near rail corridor at the north, and at 13<sup>th</sup> tee. Club would like hedging at tee points and occasional trees in the rough but not high trees. Native evergreens.</li> <li>■ Matapihi/Maunganui Road reserve corner: replace two trees and cluster of trees in north?</li> <li>■ Safety Fence from 13<sup>th</sup> fairway gold tee to end of driving range and past practice green agreed as per KiwiRail instructions.</li> <li>■ Height of fence – likely as per driving range, subject to CAA rules at final design.</li> <li>■ Driving Range Chipping area to be moved for the stormwater pond. The option of replacement of chipping area depends on security and access; s [redacted] prefers to the east of driving range.</li> <li>■ 9(2)(a) Driving Range access – might move 5-10m past current area, maybe combined with stormwater pond access.</li> <li>■ Driving range truck access for net maintenance and golf course needs mower access of Matapihi Road.</li> <li>■ It is noted that there is a need to adjust the TCC lease at the stormwater pond area, and where the current practice green is.</li> </ul>
<p>PWA compensation</p>	<ul style="list-style-type: none"> <li>■ Other aspects will need to be considered for Public Works Act assessment in the light on the compensation already provided for the course redesign and land acquisition. Settlement was April 1982.</li> <li>■ Access road to practice fairway and new green and the consequential changes in tee-off's and greens yet to be determined.</li> </ul>
<p>Unclear which jurisdiction</p>	<ul style="list-style-type: none"> <li>■ There is across the 13<sup>th</sup> fairway and the driving range (put in 15 years ago) an 80mm PVC pipe – needs s 9(2)(a) [redacted] from KiwiRail with hopefully no relocation required.</li> </ul>

Released under the Official Information Act 1982

## Minutes of Meeting

### MGI Housing Corporation Meeting

Held 11 June 2014 at 2pm

at Grey Street

**Present:**

§ 9(2)(a)	Housing NZ Corporation
§ 9(2)(a)	Housing NZ Corporation
	Housing NZ Corporation
§ 9(2)(a)	Beca
§ 9(2)(a)	Beca
Greig Stephen	NZTA

**Distribution:** As above

Item	Action
<p><b>1 Background</b></p> <ul style="list-style-type: none"><li>GS gave background of 2013 work 3 options then 4<sup>th</sup> preferred option is 3A.</li><li>Affects 10 houses of Housing Corp on Maunganui Road.</li></ul>	
<p><b>2 Option 3A</b></p> <ul style="list-style-type: none"><li>§ described option 3A: 2 lanes on flyover straight through plus 2 lanes for local traffic.</li><li>SH2 ramp and retaining wall.</li><li>Ramp means no access to Housing Corporation homes.</li><li>Consultation with landowners, then Open Day in June. Confidential up until July.</li><li><b>Issues / Questions:</b><ol style="list-style-type: none"><li>Properties remaining – left in left out only access and turn arounds at intersections.</li></ol></li></ul>	
<p><b>3 Timing / Process</b></p> <ul style="list-style-type: none"><li>§ 9(2) described process from now on:<ul style="list-style-type: none"><li>– Consultation then lodge NoR. September / October 2014.</li><li>– Property discussions after that under PWA.</li><li>– 2015 specimen design and property acquisition – road construction 2017.</li></ul></li><li><b>Issues / Questions:</b><ol style="list-style-type: none"><li>Timing of land acquisition is an issue relating to rental properties.</li><li>Personal need of tenants is long term lease.</li><li>Need to find alternatives. Tenants will want this same area, will have doctors &amp; schools all set up.</li></ol></li></ul>	
<p><b>4 Challenges / Next Steps</b></p> <ul style="list-style-type: none"><li>Waiting list for housing in the hundreds in Tauranga, now under Ministry of Social Development administration.</li></ul>	

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- Getting land very challenging – affordable land.
  - Team should look at NZTA/Crown property portfolio, maybe opportunities, (any 2ha site for 10 houses. No drainage issues.
  - Wouldn't necessarily build the 10 houses, could be joint venture.
  - Could NZTA retain or reshape access from Evesham Road?
  - Preference for houses to go, as difficult to re-let the property.
  - Cottage meeting regarding access from Evesham and what those residents will see.
    - We can send letter to these householders and invite to cottage meeting.
  - Would you move the house on the site? Could do.
  - Agreed personal meetings with tenants will be undertaken with Housing Corp staff.
- 

Minuted by: § 9(2)(a)



## Minutes of Meeting

### Omanu Golf Club Meeting

Held 8 July 2014 at 10am

At Omanu Golf Club

<b>Present:</b>	§ 9(2)(a)	Driving Range
	§ 9(2)(a)	Omanu Golf Club
	§ 9(2)(a)	Omanu Golf Club
	§ 9(2)(a)	Omanu Golf Club
	§ 9(2)(a)	Omanu Golf Club
	§ 9(2)(a)	Tauranga City Council (parks)
	Greig Stephen	NZTA
	§ 9(2)(a)	Beca
	§ 9(2)(a)	Beca
	§ 9(2)(a)	Property Group

#### Apologies:

**Distribution:** § 9(2)(a) and § 9(2)(a), NZTA and Beca

Item	Action
<p><b>1 Introduction</b></p> <ul style="list-style-type: none"> <li>■ § 9(2)(a) gave an introduction on the purpose of the meeting. § 9(2) confirmed that Beca had pegged the rail alignment and the committee had looked at that the previous night. It has helped their thinking. OGC advised:           <ul style="list-style-type: none"> <li>- No need to change 12 &amp; 13 fairways.</li> <li>- Removal of trees in TCC lease need approval from TCC.</li> <li>- Keep driving range line of trees.</li> <li>- Lose gold tee so relocate by Matapihi Road.</li> <li>- Blue tee – widen the tee.</li> <li>- Ladies tee unaffected.</li> </ul> </li> <li>■ We were advised it takes 6 months to create a new green and 3-4 months for a tee off block therefore decisions need to be made by the autumn of 2015.</li> </ul>	<p><b>Note that since the meeting Beca have now suggested the responsibility for rehabilitation and timing of actions as listed below</b></p>
<p><b>2 Course Removal/Replacement of Trees (RMA project cost)</b></p> <ul style="list-style-type: none"> <li>■ Rail trees in corridor or near corridor at the north, and at 13<sup>th</sup> tee.</li> <li>■ Matapihi /Maunganui road reserve corner: replace two trees and cluster in north.</li> <li>■ It is understood that this will all be agreed during the final design.</li> </ul>	<p><b>Beca to itemise at final design stage</b></p>
<p><b>3 Course Irrigation Line to be investigated</b></p> <ul style="list-style-type: none"> <li>■ There is across the 13<sup>th</sup> fairway and the driving range (put in 15 yrs ago) a 400mm PVC pipe. There is a plan available.</li> </ul>	<p><b>Beca to discuss with Kiwirail</b></p>

<ul style="list-style-type: none"> <li>Agreed it needs ducting and a Deed of Grant with KiwiRail,.</li> </ul>	
<p><b>4 Course Fencing Of rail alignment along 13<sup>th</sup> fairway (RMA project cost)</b></p> <ul style="list-style-type: none"> <li>Safety Fence from <b>gold tee CHECK</b> to end of driving range and past practice green agreed.</li> <li>Height of fence – likely as per driving range, subject to CAA rules at final design.</li> </ul>	<p><b>Beca to investigate height with CAA</b></p>
<p><b>5 Course Visual Affect of Screen fencing</b></p> <ul style="list-style-type: none"> <li>Club would like hedging at tee points and occasional trees in the rough but not high trees. Native evergreens.</li> </ul>	
<p><b>6 Driving Range (RMA project cost)</b></p> <ul style="list-style-type: none"> <li>Chipping area to be removed for the stormwater pond.</li> <li>The option of replacement of chipping area depends on security and access Rob prefers to the west of driving range .</li> </ul>	
<p><b>7 Access off Matapihi to Driving Range (RMA project cost)</b></p> <ul style="list-style-type: none"> <li>Might move 5-10m past current area, maybe combined with stormwater pond access.</li> <li>Driving range and golf course needs mower and truck access for net maintenance off Maunganui Road – project preference is to come off Matapihi Place.</li> </ul>	<p><b>Beca to detail at final design</b></p>
<p><b>8 Access Road to Practice Area and TCC pump station</b></p> <ul style="list-style-type: none"> <li>Club suggested that they want an underpass of rail line to keep access to practice area. Beca advised on the basis of the TEL experience the cost would be prohibitive.</li> <li>Alternatively take access vehicles along 18<sup>th</sup> then between 5 &amp; 16 (low point, wet in between).</li> <li>Truck access desired to storage area in the north by TCC pump station.</li> <li>Look at rail corridor at McDonald Street – use swipe card at road.</li> <li>Beca will also discuss with TCC.</li> </ul>	<p><b>Beca to investigate alternative access routes in from local roads</b></p>
<p><b>9 Lease Adjustments (RMA project cost)</b></p> <ul style="list-style-type: none"> <li>It is noted that there is a need to adjust the lease at the stormwater pond area and where the current practice green is.</li> </ul>	
<p><b>10 Golf Course Compensation</b></p> <ul style="list-style-type: none"> <li>§ 9(2)(a) advised that Beca had found evidence of compensation in the 1980s in the Council files.</li> <li>Some of the matters raised above will be dealt with under the RMA.</li> <li>Other aspects will need to be considered for Public Works Act assessment in the light of the compensation already provided for the course redesign and land acquisition. Settlement was April 1982.</li> </ul>	<p><b>Beca to send copy to Golf Club</b></p>
<p>Left copies of the preferred option plan 3933377-C-G008 Rev D and the plan of the Alteration to Designation in the north with the OGC.</p>	

Minuted by: § 9(2)(a)

Released under the Official Information Act 1982

## Minutes of Meeting

### KiwiRail Leasee Meeting - MGI and Te Maunga Intersection Improvements

Held 2 July 2014 at 1:00pm

at Beca Offices

**Present:**

§ 9(2)(a)	(Bay Commercial Holdings Limited)
§ 9(2)(a)	
§ 9(2)(a)	(Bayfair Panelworx Limited)
§ 9(2)(a)	(Pacific Toyota)
§ 9(2)(a)	(KiwiRail)
§ 9(2)(a)	Tukairangi Investments
Greig Stephen	(NZTA)
§ 9(2)(a)	(Beca)
§ 9(2)(a)	(Beca)
§ 9(2)(a)	(Beca)

**Apologies:**

**Distribution:** As above

Item	Action
<p><b>1 Introduction</b></p> <ul style="list-style-type: none"><li>All were given a copy of drawing 3933377-C-G008 Rev C by GS.</li><li>Overview of Option 3a plus possible staging scenario. If funding approved, then NZTA would commence with construction in 2016 of rail then 2017 onwards for the road.</li></ul>	
<p><b>2 Questions, Answers and Comments</b></p> <p><b>Q.</b> How will people get out of Owens Place Homezone shopping centre exit and stop with railway crossing queue?</p> <p><b>A.</b> Modelling showed no issues. 4-5 cars allowed for queuing at barrier before exit. Potential for hatched no stopping road marking to be installed if an issue.</p> <p><b>C</b> Like the removal of the pedestrian underpass as issues encountered lately.</p> <p><b>Q.</b> Why can't we get left in, left out of Titoki Place?</p> <p><b>A.</b> Te Maunga interchange with northern bound on ramp has traffic deciding route and weaving before Matapihi intersection - so not enough room. Design wouldn't pass safety audit.</p> <p><b>Q.</b> Are the B Trains able to get around corner of Owens Place?</p> <p><b>A.</b> Geometry will allow this in final design stage.</p> <p><b>Q.</b> There is a parking issue in Owens Place. How is this to be resolved?</p> <p><b>A.</b> TCC were notified of this at last meeting and it is their responsibility.</p>	

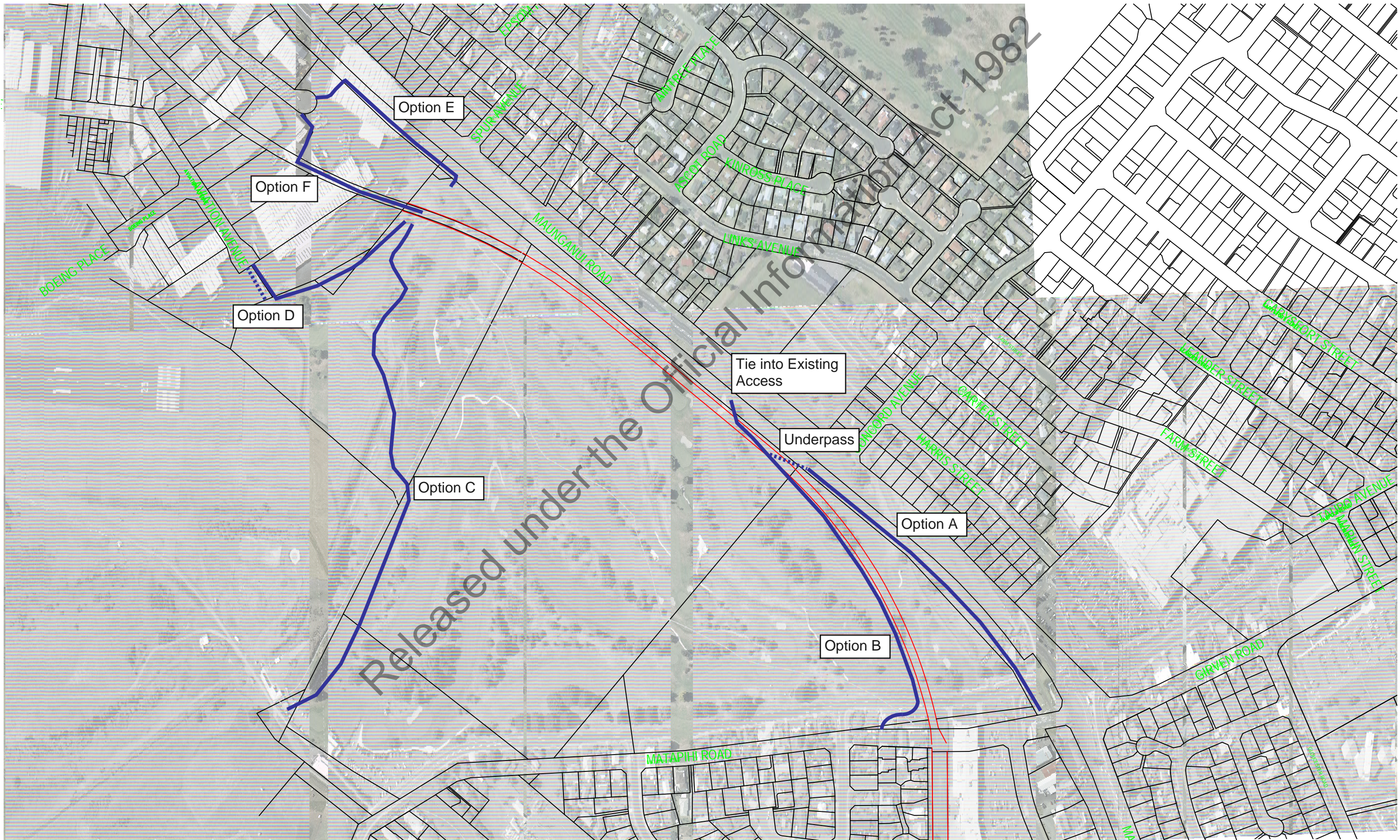
- Q. Will Security Fences to be maintained for the tenants and properties along the new highway boundary? (removed and restoration) – Who pays?
- A. They will be reinstated, 2017 will be the earliest.
- C. Footpath to BayPark means more rubbish in our street.
- C. s 9(2)(a) advised that KiwiRail Property people will communicate with all Leasees.
- Q. Could we stop lease early? Will rental go up, regardless of long term?
- A. Rent review time is when rent may change.
- Q. Any interim measures on Girven Road intersection – such as traffic lights?
- A. No. The issue is too significant and the benefit of lights wouldn't justify the costs.
- Q. Will NZTA /KiwiRail need access to the leased land?
- A. Likely survey work on site that would need permission.
- Q. Can KiwiRail alter the train timetable?
- A. No. It relates to the demand from the Port.
- Q. Ground level and flooding in Owens Place.
- A. TCC is doing a stormwater up-grade and this will likely result in a positive effect.
- Q. Will access to our businesses be affected during construction?
- A. Construction sequence will be provided at final design stage when effects can be determined. Regular communication with the tenants and contractor will occur during construction.
- Q. Who is responsible for fencing to road?
- A. NZTA would reinstate fencing as part of the project and "separation strip" along boundary would stop vehicle access to highway and discourage pedestrians who should use signalised crossing. A crash barrier will likely be installed at this location.
- Q. Space to boundary from road to property?
- A. 2-3metres needed for services and gas in road verge subject to final design.
- Q. s 9(2)(a) – leased area, building over the boundary?
- A. Check Lease agreement, should be temporary building? s to send the Trust an aerial photo - complete.

s 9(2)(a)

Minuted by: s 9(2)(a)

Omanu Golf Course - Practice Area Access Options Assessment				
Option	Description	Length of new access (m)	Issues to Consider	Recommended action
A	Existing corridor with underpass. As suggested by OGC.	500	Track access for TCC and OGC required. Underpass extremely expensive. Preferable for OGC but they recognise there is a high cost.	No further action
B1	Adjacent new railway alignment	600	Adjacent to 13 fairway and tee. Would need to change 13th tee and 12th green to west, shift ladies tee to fit road. R.O.C. approx. 25k for green replacement and 7k for tee replacement.	<b>OGC to consider changes necessary to holes.</b>
B2	Adjacent new railway alignment	600	Make 13th a Par 4 and 18th a Par 5. This requires extra tee +2. Provides maintenance access for screen fencing via cherry picker.	<b>OGC to consider changes necessary to holes.</b>
C	Clubhouse along 18th fairway	740	Soft ground, hazard from 18th and 5/16th fairways need to cross 16th tee. OGC has advised that this route is undesirable as it goes through the course and not around. It is also a high risk route for vehicles.	No further action
D	Aviation Ave	280	Need easement from private landowner - OGC has advised that this option has a negligible impact on the course. Access security - OGC has advised that the padlock system under operation now should be manageable. This is a long route from the clubhouse to the practice area for the players.	<b>Potential option second to Option B. Beca to discuss with land owner.</b>
E	MacDonald Street to existing rail corridor	250	Requires KiwiRail easement - no long term security. Difficult terrain. OGC - Similar outcome to Option D.	No further action
F	MacDonald Street to alternative rail corridor	270	Access through private carpark difficult. Consider option D first.	No further action

**Omanu Golf Course  
Practice Area Access Options  
18 August 2014**



## Minutes of Meeting

### TCC Meeting Minutes March 2014

Held 14 March 2014

at Beca

**Present:**                    § 9(2)(a) (Beca)                    § 9(2)(a) (TCC)  
                                  Greig Stephen (NZTA)                    § 9(2)(a) (TCC)  
                                  § 9(2)(a) (Isthmus)

**Apologies:**                    § 9(2)(a) (Beca)

**Distribution:**                    Above as well as:

§ 9(2)(a) and § 9(2)(a)

Item	Action
<p><b>1 Introductions</b></p>	
<p><b>2 Discussion</b></p> <ul style="list-style-type: none"> <li>■ § 9(2) provided explanation of his CPTED report.</li> <li>■ House setbacks approx. 2-3m to boundary.</li> <li>■ Query about whether daylighting applies on the reserve zone, to be checked.</li> <li>■ 2.5m wall only in 2 house boundaries, then all just their current fence.</li> <li>■ Council worried about 135m corridor – Safety and maintenance of noise fence with graffiti. Preference for closure of walkway area to avoid issues.</li> <li>■ If the walkway was to stay Council would want formed pathway through walkway and over the reserve to Rusley Drive so it's clear how to safely get out of the area.</li> </ul>	<p><b>Beca</b></p>
<p><b>3 Suggestions</b></p> <ul style="list-style-type: none"> <li>■ Can the rail land between 3.5m noise wall by the rail embankment and the rail reserve boundary, be part of the public reserve to open it up at southern end?</li> <li>■ Consider value of Perspex noise wall at northern end to provide visibility from the road into the area</li> <li>■ Try a mural on the noise wall at Matapihi end. § 9(2)(a) of TCC has the contacts for Owen Dippie ("OD") and Mr G. § 9(2) has provided examples of wall treatments as attached.</li> <li>■ Vegetation by wall to stop graffiti.</li> <li>■ Investigate whether NZTA can do maintenance on rail land for project in the future.</li> <li>■ Can we close walkway with vegetation filling it in? Choose medium-high trees.</li> </ul>	<p>§ 9(2) to ask <b>Kiwi Rail</b></p> <p><b>CR to call</b> § 9(2)(a)</p> <p>§ 9(2)</p>
<p><b>4 Actions</b></p> <ul style="list-style-type: none"> <li>■ § 9(2) to report back to team on ownership maintenance responses then preferred outcomes to be decided at next meeting possibly 27<sup>th</sup> March in the afternoon. Please advise if you can attend.</li> </ul>	

**Minuted by:** § 9(2)(a)



## Minutes of Meeting

### MGI Stormwater Modelling Meeting

Held 20 February 2014 at 10:15

at Beca

**Present:**                s 9(2)(a) (TCC)                s 9(2)(a) (Beca)  
                                  s 9(2)(a) (TCC)                s 9(2)(a) (Beca)  
                                  s 9(2)(a) (TCC)                s 9(2)(a) (Beca)  
                                  s 9(2)(a) (DHI)                s 9(2)(a) (Beca)  
                                  s 9(2)(a) (DHI)

**Apologies:**            s 9(2)(a) (Beca)

**Distribution:**        All above and Greig  
                                  Stephen (NZTA)

Item	Action
<p><b>1 Work to Date</b></p> <ul style="list-style-type: none"> <li>DHI have modelled the increase in pipe size, as described in the GHD report. The model has included twin 1800mm pipes along Matapihi Road (from golf course) to the Bayfair manhole (node 3216) on Girven Road.</li> <li>DHI have provided the outputs on the upstream catchment effects, from the model.</li> </ul>	
<p><b>2 Conclusions</b></p> <ul style="list-style-type: none"> <li>The additional twin 1800mm dia. pipes have significantly reduced the flood levels on the upstream catchment, including AMP and Eversham Road.</li> <li>Eversham Road still has a flooding issue, although much reduced. There seems to be an issue with stormwater from the road being able to reach the 750mm dia. pipe on Eversham Road.</li> <li>There may be an issue with node 3165 at the MGI roundabout that could be address to reduce head loss and improve flow.</li> <li>TCC need to review the modelling outputs and consider what is an acceptable flood level in the Eversham Road area. This will inform the decision on whether further modelling of the catchment is required.</li> <li>TCC will not be looking to construct a new stormwater line across Maunganui Road, going through Owens Place. TCC would rather look at stormwater upgrades along Maunganui Road and Matapihi Road.</li> </ul>	TCC
<p><b>3 Actions</b></p> <ul style="list-style-type: none"> <li>DHI to send through information on the downstream effects in the golf course of including the twin 1800mm dia pipes.</li> <li>DHI to prepare and issue the modelling report to TCC and Beca.</li> <li>Modelling report to be issued to AMP, including summary of requirements</li> <li>Statement of Intent to be prepared by NZTA and AMP (separately), for TCC to agree and approve. The purpose is to clarify the stormwater philosophy for the quantity and quality of water entering the TCC system.</li> <li>TCC to review and confirm additional information required for resource consents.</li> </ul>	<p>DHI</p> <p>DHI</p> <p>TCC</p> <p>NZTA/AMP</p> <p>TCC</p>

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**4 AOB**

- s 9(2)(a) will be taking over the project from TCC, from this point forward.
- TCC consenting meeting on Wed 26<sup>th</sup> Feb. s 9(2)(a) to attend.

**CR**

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Minuted by: s 9(2)(a)

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Appendix C

Summary of Public Feedback

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# Points per Reference

## 1. How will layout affect you (27)

### 2014 Open Day (1)

Sub. #	Pt. #	Point Text	Position
4	1		Support

### No Topics (26)

Sub. #	Pt. #	Point Text	Position
1	1	Positive	Support
2	10	Better traffic control to get to work	N/A
6	1	24/7 as i live on Maunganui Road. Will be a better place to live and easier to travel.	N/A
9	1	A resident up Russely Drive the movement of the rail links will impact directly on a) personal - noise/vibration especially at night also on (?) value of property.	N/A
11	1	Access from Bayfair Estate to Mount/Tauranga and Bayfair Mall/Papamoa.	N/A
13	1	Considerably	N/A
14	1	Looks very good	N/A
15	1	I have grave concerns that access to residents of the Bayfair Estate requiring emergency services should the railway intersection with Matapihi Road be blocked has been overlooked. An incident such as this occurred some 18 months to 2 years ago leaving the subdivision completely isolated.	N/A
16	1	Currently when i cycle up Maunganui Road (right from Exter St) to Owens Place , I can't turn right into Maunganui Rd so i cycle on footpath to almost roundabout then use pedestrian island to cross to (?) side. on way back, cycleway/pedestrian crossing path stops and i find it dangerous getting across to cycle back towards Exter street, but new plan does not let me cycle from Exter Street up Maunganui to Owens Place.	N/A
18	1	OK	N/A
19	1	guess it won't	N/A
21	1	We will still have the same problem with emergency services not being able to get in and out of Matapihi Road. Should the railway line be blocked I.e. train stuck. My major worry is we are moving the problems associated with the rail way line approx 200m down Matapihi road with still issues of traffic congestion - what happens when barrier arms stick down - long term 30,40,50 years down the track wouldn't it be best to put (a) road beneath railway line. I realise water table is a prob. what happens when area grows - it <u>WILL</u> i.e Matata rail/road bridge - has big water table.	N/A
22	1	Make it much more convenient as a motorist	N/A
23	1	Resale value - Loss of revenue in resale for retirement. Excess noise	N/A
24	1	Loss of value to property	N/A
25	1	Ease to rental property in Exter St and also in and out at Baypark	N/A
26	1	Much easier and safer moving out of Girven Road and especially during peak periods	N/A
27	1	Hopefully speed up access from Girven onto Maunganui	N/A
28	1	OK	N/A
30	1	I use the intersection to and from work and considerably at the weekend so improvement will be wonderful!	N/A
31	1	Improve it greatly as the current congestion has reached a very dangerous point	N/A



# Points per Reference

35	1	I shall enjoy the overpass heaps. But will be very sad if tunnel goes as i i walk to doctors and Bayfair often	N/A
36	1	Should relieve the serious traffic congestion at present	N/A
37	1	I am a little concerned about cycling from Matapihi onto Maunganui Rd (turning left). I understand that there will not be a dedicated cycle lane on the (?) road	N/A
38	1	It will make coming in and going out of Bayfair Estate so much easier and safer	N/A
39	1	As i am 82 years old this progress will delight me, make me feel much safer when negotiating the roundabout	N/A

## 2a. Comment on road surface (23)

### No Topics (23)

Sub. #	Pt. #	Point Text	Position
1	2	I own s 9(2)(a) [REDACTED]. I think the off ramp heading east will effect our privacy and noise (once complete).	N/A
2	11	The road surface needs to be the same grade as Maunganui Road. Quiet	N/A
6	2	Yes - just do it.	N/A
9	2	Most definitely quiet road seal	N/A
11	2	Yes	N/A
13	2	Good	N/A
14	2	Will help my property for road noise	N/A
16	2	Great Idea	N/A
22	2	Yes	N/A
23	2	If it works this will be great as volumes increase	N/A
24	2	Council has history of using one roading surface to get project done, then using cheaper alternative as repairs are required	N/A
25	2	Ideal and important that is kept as quiet seal in future	N/A
26	2	Excellent proposal	N/A
27	2	Great	N/A
28	2	OK	N/A
30	2	Very important for local residents and also when driving on the surface	N/A
31	2	No real comment here	N/A
34	1	This is a priority	N/A
35	2	Yes	N/A
36	2	Very important. Plateau Heights has recently been resurfaced with chip rather than the existing hotmix and most of the residents are unhappy with the noise level.	N/A
37	2	Good idea - all roads should be done this way	N/A
38	2	Very good idea	N/A
39	2	This is the very best option	N/A

# Points per Reference

## 2b. Comment on road noise walls/barriers (26)

### No Topics (26)

Sub. #	Pt. #	Point Text	Position
1	4	I would like consideration during consultation and allow possible commercial signage (billboards) erected (my cost) to mitigate the above (Resource Consent)	N/A
2	12	I will need a back gate put in to access the walkway	N/A
6	3	Yes - just do it.	N/A
9	3	Most definitely needed	N/A
11	3	Yes	N/A
13	3	Good	N/A
14	3	Needed to keep noise down	N/A
16	3	Great Idea	N/A
17	1	Extend railway wall at back of Owens Place	N/A
19	2	Only if the nearest <u>houses</u> request it	N/A
22	3	Yes	N/A
23	3	Believe there should be trees planted in the track from TGA - Mt M to reduce noise	N/A
25	3	Not affecting but pleased to see	N/A
26	3	Excellent Proposal	N/A
27	3	Essential for those living close to the new road	N/A
28	3	OK	N/A
30	3	again, important for local residents	N/A
31	3	Reduced road noise a must	N/A
33	1	Worried about noise level of Te Maunga Flyover	N/A
34	2	As above especially at Maunganui Road Exter Street because of the elevation to the Girven Road flyover	N/A
35	3	Yes	N/A
36	3	Must have	N/A
37	3	essential	N/A
38	3	A must as with the railway being moved closer to our residences it will cut down noise of the trains	N/A
39	3	Will suit those in close proximity	N/A
42	1	Yes for noise walls - but when trains cross Matapihi Road and Golf Course, noise will come straight at us just down from the new line.	N/A

# Points per Reference

## 2c. Comment on Ped Crossing Signals (27)

### No Topics (27)

Sub. #	Pt. #	Point Text	Position
1	5	I think one pedestrian overpass between Te Maunga and Bayfair over SH2 additional to what is already proposed.	N/A
2	13	Good idea to have lights for pedestrian crossing	N/A
11	4	Existing subway extended with lighting and security cameras for safe access to Bayfair Mall for elderly people and mobility scooters	N/A
12	1	Must be placed at a correct distance to allow free flow of traffic. Roundabout is too close to railway line now but won't be located at correct distance	N/A
13	4	Good but not sufficient	N/A
14	4	Very essential	N/A
16	4	Cyclists, mobility scooters, pedestrians, pushchairs, skateboards sharing - it will need to be much wider than current shared access from underpass past golf range/fish and chip shop.	N/A
18	2	Make underpass longer. For cycling and pedestrian - oldies on wheelchairs and school children walking to school	N/A
19	3	prefer the underpass but realise it would not be possible	N/A
21	2	remember lots of mobility scooters, pushchairs, cyclists and golf carts as well as unaccompanied minors and retired people (partially sighted and limited leaving). these must be user friendly.	N/A
22	4	(?) that less traffic is using Maunganui road. Traffic lights seem to be sufficient	N/A
23	4	Must cater for aging population like ourselves and easy of access for pedestrians and wheel chairs	N/A
24	3	Good to see problematic tunnel removed	N/A
25	4	Very important for controlled intersection	N/A
26	4	Good idea - many people especially women and children are afraid of longer tunnels, more so after dark	N/A
27	4	I ride a bike so this will be great	N/A
28	4	OK	N/A
30	4	Safety is of paramount importance	N/A
31	4	We are cyclists (social) and look forward to being able to cross from Girven to Matapihi road safely	N/A
34	3	Awesome!!	N/A
35	4	Keep tunnel. But need barriers and lights across pedestrian paths	N/A
36	4	Would still prefer an extended pedestrian underpass between Bayfair and matapihi Road. If no underpass NZTA must accept responsibility for any resultant injuries or deaths.	N/A
37	4	I understand the security concerns about a longer underpass but it would remove road related risk from pedestrians and cyclists. Good lighting and security cameras would reduce the security concerns	N/A
38	4	Probably the only way to go	N/A
39	4	Beautiful	N/A
40	2	Please ensure sufficient time for Mums with buggies and toddlers and less able people to cross. It will also be slow with so many crossings to use from Bayfair to Owens etc. Bear in mind Tauranga wants to become an age-friendly city! Most traffic light crossings change too quickly for slower people to get across.	N/A
42	2	Yes	N/A



## Points per Reference

### 2d. Other Comments (road mitigation) (5)

#### No Topics (5)

Sub. #	Pt. #	Point Text	Position
13	5	Suggestion - Put underground pedestrian tunnel across eastern end of SH2 in the project construction zone and railway line at Te Maunga to have access to Baypark Stadium and ASB Arena. parking access to streets Gloucester Road etc	N/A
16	5	How can i safely travel from Owens place down Maunganui Road to Exter St?	N/A
25	5	Very important for controlled intersections at Girven Rd underpass and also overpass at Te Maunga told but not slowing on (?)	N/A
27	5	?? dual lanes over the flyover? 'futureproofing' looks good now but remember the Akld harbor bridge is (?)	N/A
34	4	Make greater use of Hopper buses between Bayfair and Stadium & or ASB event centre on route to Maungatapu	N/A



# Points per Reference

## 3a. Comment on RAIL noise walls/barriers (23)

### No Topics (23)

Sub. #	Pt. #	Point Text	Position
1	6	Positive	N/A
5	1	Stick the rail in the ground!	N/A
9	4	Not enough - rail lines don't need to be moved as the main hinderance to traffic flow is the roundabout itself which is too small for the volume of traffic it needs lights to control the traffic flow. Also its the trucks that move along Maunganui road that cause most of the traffic flow problems. This will be alleviated by the flyover (increase in noise to residents). Also widen road to provide 'parking' lanes for cars going across railway lines would prevent traffic build-up but once flyover in place like hewletts road (which has railway lines in worse position meaning cars actually park on the railway line whilst waiting for traffic to pass) the amount of traffic that will be backed up should be reduced to a decent level similiar to hewletts road roundabout)	N/A
11	5	Installed	N/A
13	6	Ok	N/A
14	5	Noise control looks good	N/A
16	6	Great Idea	N/A
21	3	Sounds good to me - noise will impact on me greatly as live further down matapihi road - but you do get used to it and is minor compared to benefits of this design	N/A
23	5	Important to Liftan Place and review once in place	N/A
24	4	Not sure figures quoted on signs (propaganda?) for estimated noise predictions will be very accurate. Just ask people living in Golf Road area	N/A
25	6	VI	N/A
26	5	Very good	N/A
27	6	Attractive side barriers i.e. photos. Battle timber walls e.g as in some construction sites	N/A
28	5	OK	N/A
30	5	Local residents will want to know these measures will be effective	N/A
31	5	Doenst affect us but people living in Bayfair Estate close to the line will be requesting some form of noise control	N/A
34	5	The land has been available since '80s gives the train visibility improved at crossing from SH29	N/A
35	5	Yes	N/A
36	5	Certainly needed, especially for houses close to the rail line	N/A
37	5	As above	N/A
38	5	Good idea same as question 2	N/A
39	5	A very good choice	N/A
42	3	Submitter seeks double glazing to be installed at NZTA expense - 'we were here first before line gets shifted closer to us at § 9(2)(a) .'	N/A



## Points per Reference

### 3b. Comment on RAIL ballast mat (14)

#### No Topics (14)

Sub. #	Pt. #	Point Text	Position
2	14	I hope this works as a vibration can be felt at the existing rail line.	N/A
11	6	Installed	N/A
13	7	Ok	N/A
16	7	Great idea	N/A
23	6	Measurability by way of decibels. Review again	N/A
25	7	VI (very important?)	N/A
26	6	Very good	N/A
27	7	dont know	N/A
28	6	OK	N/A
35	6	Yes	N/A
36	6	Good idea	N/A
37	6	No comment	N/A
38	6	Same as question 2	N/A
39	6	What ever is the best	N/A



# Points per Reference

## 3c. Comment on Net Screening Golf Course (17)

### No Topics (17)

Sub. #	Pt. #	Point Text	Position
1	7	Positive	N/A
6	4	Firm netting of course	N/A
11	7	Yes	N/A
13	8	good Idea	N/A
14	6	Keep screening up as a safety measure	N/A
16	8	great idea	N/A
23	7	Not a golfer but important safety factor. A must	N/A
25	8	VI	N/A
26	7	very good	N/A
27	8	this is required for safety of vehicles but may not be seen once access in place	N/A
28	7	OK	N/A
31	6	Agree	N/A
35	7	Yes	N/A
36	7	Unsure	N/A
37	7	Fine	N/A
38	7	Good thinking	N/A
39	7	A very good idea, this would protect all concerned	N/A

## 3d. Other Comments (RAIL) (1)

### No Topics (1)

Sub. #	Pt. #	Point Text	Position
35	8	Keep tunnel underpass	N/A

# Points per Reference

## 4. Reserve Walkway Comment (29)

### No Topics (29)

Sub. #	Pt. #	Point Text	Position
2	15	Positive. I live in Liftan Pace and need access to park	N/A
6	5	Positive. Claustrophobia and those with intent. Especially hand bags etc (snatchers)?	N/A
10	1	Yes. Access through park no need to walk on footpaths and breath in exhaust fumes..	N/A
11	8	Yes. Usage by Bayfair Estate residents when walking to Bayfair Mall	N/A
12	2	No. Should be closed off - there is access along Russely Drive which is more than adequate	N/A
13	9	Yes. Blend	N/A
14	7	Yes. Open areas are necessary in a subdivision	N/A
16	9	Not sure - it will depend how well walkway is planted and effect of wind between proposed barriers. Will it be damp/icy in winter?	N/A
17	2	No. Use Russely Drive as pedestrian way as there are concrete paths between both sides of the road. Close the walkway behind Liftan Place from reserve to Matapihi road.	N/A
18	3	yes	N/A
19	4	Yes. i like walking through that way. Will be quite exciting when train would go past! and before you would enter that small area you would be able to hear the bells and wait until train had gone before entering	N/A
20	1	Convenience	N/A
21	4	Yes. Off no benefit to me personally but will help alot of elderly/parents with limited mobility/time	N/A
22	5	It's part of the park, lots of people use it as park access and its a shortcut to Bayfair. Lighting may help it feel less enclosed	N/A
23	8	Yes. Dont provide a situation for the undesirables as the Girven Rd one.	N/A
24	5	Yes. should stay open. Turn it in to a proper cycle link. There should be able to be a safe cycle circuit linking TGA - Mt via Matapihi, Maunganui Rd, Hewletts Rd, Downtown Tauranga	N/A
25	9	Should be some protection to stop crossing on uncontrolled areas	N/A
26	8	Yes. Women and children fear for safety in enclosed areas especially after dark	N/A
27	9	A/A	N/A
28	8	No. Close it	N/A
29	1	Yes. So many people use this walkway	N/A
31	7	Yes. we seem to have enough problems with the Bayfair Underpass	N/A
35	9	Yes. As we walk through to Bayfair that way thru park - shortcut. lever and smaller	N/A
36	8	Yes. this is a very popular walkway for Bayfair Estate residents	N/A
37	8	It looks preferable to the proposed alternative	N/A
38	8	Yes. Doesn't worry me too much but some people don't like the idea of it being enclosed. Safety issue	N/A
39	8	Yes. Would make people feel safer	N/A
41	2	I have mixed views on the walkway, but if it is kept open I would suggest that that the entrance is well lit (based on some observations of the current Bayfair underpass at night, and a tendency for people to loiter there at times at night in summer.	N/A
42	6	Walkway should stay open.	N/A

# Points per Reference

## 5. Other Comments on Design and Mitigation Measures (23)

### No Topics (23)

Sub. #	Pt. #	Point Text	Position
6	6	Well done	N/A
7	1	Will there be post-construction measurements published to show if noise and vibration predictions have been met?	N/A
9	5	I think there is a definite need for flyover despite the noise this will cause. But the railway lines should be left in place	N/A
12	3	there are still too many exits/entrances on to Matapihi Road (Owens Place/Home Zone entrance/exit to parking area; Truck entrance at rear of building, fish shop entrance)	N/A
13	10	No	N/A
16	10	Please make it safe for trips between Exter St and Owens place for cyclists. Can you please also seriously consider safer access for cyclists between Maunganui road and Hocking street? It's really unsafe.	N/A
20	2	Free left turns at all intersections. Declaration lanes on maunganui road at all minor intersections	N/A
21	5	Seeing as tauranga City Council is goot at rezoning land usage i.e Owens place from commercial - retail (this causing alot of these probs) long term what is to stop them rezoning golf course/bayfair park land between SH29 and Matapihi Peninsular into housing now lots of lifestyle blocks heavy trucks already impacting on roadway	N/A
22	6		N/A
23	9	Only excess noise by the new Chinese engines and increase train numbers	N/A
24	6	Parking congestion Owens Place when event is on at Baypark. New walkway but no provision for extra vehicles in already narrow road	N/A
25	10	Not a resident but some form of emergency access to Matapihi road particularly with train as level crossing	N/A
28	9	Escape route for shoplifters/graffitti writers. Unsafe for unaccompanied women. Main use shortcut from Russely drive to shops	N/A
30	6	think this is the best option and design	N/A
32	1	Current operation of roundabout (Bayfair) is wrong left lane should be marked for left straight and right turn movements and right hand lane - right turn movements <u>only</u>	N/A
35	10	Keep underpass	N/A
36	9	Why is a deep trench or underground considered feasible for the rail line from Te Maunga to Bayfair and beyond.	N/A
37	9	No	N/A
38	9	I am concerned that while all this money is being spent (which is good) the residents of Bayfair still do not have another exit in event of Civil Emergency	N/A
39	9	The present programme seems to fit all of my requirements and hopefully others also	N/A
40	1	It would help people to locate where things are if you included the original Sandhurst Interchange name. When we can access Tauranga route via Sandhurst it will help considerably. In the meantime, new road layout should be a vast improvement.	N/A
41	1	The project looks very impressive and seems to have thought of everything!	N/A
42	4	No	N/A



# Points per Reference

## 6. Comment on NZ Standards (20)

### No Topics (20)

Sub. #	Pt. #	Point Text	Position
1	8	Financial compensation to adjacent residents a possibility but prefer a beautiful completion. Well done!	N/A
2	16	Living so close and my daughter will be working some nights and will need sleep. please could we ask when this happens	N/A
6	7	Was here for the last flyover on maunganui road. Just do it. Now! Need new improvements (overdue)	N/A
9	6	There will never be enough noise/vibration mitigation to compensate for the noise especially at night	N/A
12	4	Do we have any redress to <u>complain</u> if conditions are bad.	N/A
13	11	No	N/A
14	8	As long as they are controlled and work during daylight hours	N/A
16	11	No i trust you will monitor to ensure standards are met.	N/A
21	6	Having experienced the impact of Hewletts road flyover in my previous residence off Golf road, i am very aware of the impact of pile driving etc on the structure of my property thus the reason for delayed renovations till after finished.	N/A
22	7	No	N/A
23	10	Start and finish times of piling	N/A
27	10	If we want the changes we have to suck up the inconvenience of noise, dust etc. It will all be a bad memory in a few years time. Remember Hewletts road!	N/A
28	10	OK	N/A
31	8	No comment as long as it is pleasant to look at	N/A
33	2	Yes, our house is on Piles and are worried about vibration to house	N/A
35	11	Just got to live with it for progress to get our much needed overpass. Can't wait to safely get across the road again!	N/A
37	10	No	N/A
38	10	All sounds good	N/A
39	10	If consideration is given to those who it might affect and safety id paramount no problem at all	N/A
42	5	No	N/A

## None (1)


### No Topics (1)

Sub. #	Pt. #	Point Text	Position
24	7	Main Concerns. Property value impact residential Bayfair Estate has not been addressed at all. Maunganui Rd already very dangerous for cyclists with not enough room. Plenty of space available, should be utilized	N/A

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Ngāti Tapu, Ngāi Tūkairangi and  
Ngā Pōtiki

**CULTURAL IMPACT ASSESSMENT**

Prepared for New Zealand Transport Agency  
Regarding investigated intersection improvements

Prepared by § 9(2)(a) [REDACTED], through information provided by § 9(2)(a) [REDACTED],  
§ 9(2)(a) [REDACTED] and § 9(2)(a) [REDACTED].

On behalf of Ngāti Tapu, Ngāi Tūkairangi and Ngā Pōtiki



(Photo by NZTA)

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## 1.0 EXECUTIVE SUMMARY

Representatives of the Hapū groups for Ngāti Tapu, Ngāi Tūkairangi and Ngā Pōtiki carried out a series of meetings with the New Zealand Transport Agency (NZTA) and Beca Consultants to discuss 3 potential options to reduce congestion and travel time and to improve travel safety for all road users. The location of the proposed road changes are along SH2, from the Girven Road intersection in Mount Maunganui to the SH2/SH29 (Te Maunga) intersection.

Based on traffic growth predictions for the next 15-20 years and the completion of the Tauranga Eastern Link, in-depth investigations, feasibility studies and public consultation on the existing issues and constraints narrowed down 3 options out of 6 since the investigation started in 2010 (Figure 1).

The 3 grade-separated options were presented for public feedback. Tangata whenua including Ngāti Tapu, Ngāi Tūkairangi and Ngā Pōtiki whom have a collective cultural and historical interest over both Maunganui-Girven Road Intersection and the Te Maunga-SH29 intersections were given an additional opportunity to submit a report outlining their specific issues and needs.

The NZTA timeframe is to have the preferred option confirmed in early 2014 following further design work, environmental investigations and consideration from public feedback. Following approval for the preferred option NZTA will seek planning approvals for any land requirements. Construction of the preferred option will start in 2015/16 once funding and tender is approved.

It was ascertained that Ngāti Tapu Ngāi Tūkairangi and Ngā Pōtiki would carry out a Cultural Impact Assessment (CIA). The CIA shows that NZTA has consulted with the three Hapū with regard to the impact and adverse effects that this works project will have on the potential disruption to the archaeological and heritage sites of the whenua. A description of mana whenua whenua or in this case, the particular cultural overview of Ngāti Tapu, Ngāi Tūkairangi and Ngā Pōtiki upon the area in which the roadway expansion is occurring is provided in this assessment to show the significance of the area to each Hapū.

The Assessment of Environmental Effects (AEE) is currently being carried out by Beca consultants. This assessment is therefore conservative in feedback regarding environmental impacts from the proposed works.

The CIA provides NZTA with information that signifies that the associated Hapū groups wish to be fully informed of all matters relating to any works in the proposed area.

As a result of this work, it was confirmed that representatives of hapū demonstrate the differences with the options, and that whilst neither Ngāti Tapu, Ngāi Tūkairangi nor Ngā Pōtiki were opposed to the extension of the roadway. On this occasion it is clear that the changes will proceed whether we agree, or not. Therefore, and understandably there is an undercurrent of reluctance that goes with providing an option for the project herein outlined.

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Option 1: Flyover at MGI, flyover at SH2/SH29, railway retained in current Maunganui Road alignment. Road widening On Maunganui Road (eastern side)



Option 2: Flyover at MGI, flyover at SH2/SH29, railway relocated to the alternative existing Matapihi rail corridor behind Owens Place. Road widening on Maunganui Road (western side)



Option 3: Flyover at MGI, SH29 bridge over railway and SH2, railway relocated to the alternative existing Matapihi rail corridor behind Owens Place. Road widening on Maunganui Road (western side).



Figure 1 The 3 Options that are being investigated (NZTA Project Update Issue 3 April 2013)

## 2.0 METHODS

### MEETINGS

A limited, though crucial series of meetings were held between Ngāti Tapu, Ngāi Tūkairangi, Ngā Pōtiki, New Zealand Transport Agency (NZTA) and Beca Consultants to discuss the investigation into Maunganui Girven Intersection & SH2/SH29 Improvements. Information was also considered from community meetings.

### SCOPE OF SERVICES

The Scope of Services relates to the preparation of a Cultural Impact Assessment (CIA) on behalf of Ngāti Tapu, Ngāi Tūkairangi and Ngā Pōtiki Hapū for NZTA to determine the cultural impacts of the 3 options.

### HAPŪ COORDINATORS

Each of the hapū coordinated their own inputs into the preparation of this report. Hapū coordinators collected and gathered cultural information in relation to the project area. A review of historical or relevant literature, and interviews of key informants was also undertaken. It is noted that some of the information is not referenced or partially referenced as it has been provided directly from the sources of the Hapū Coordinators. This information was not altered by the Report Writer. The Hapū coordinators were; Ngāti Tapu: s 9(2)(b)(i), s [redacted], Ngāi Tūkairangi: s 9(2)(a) [redacted] and Ngā Pōtiki: s 9(2)(a) [redacted].

### REPORT WRITER

The report writer, s 9(2)(a) [redacted] prepared this report for consideration of the 3 Hapū based on the information provided by the Hapū Coordinators and the NZTA technicians. The report writer liaised with the Hapū Coordinators by meetings, email and phone calls throughout the development of the report.

The report was finalised based on the final review of the Hapū Coordinators before presentation to NZTA.

### 3.0 NGĀI TŪKAIRANGI & NGĀTI TAPU

For the purposes of this report Ngāi Tūkairangi and Ngāti Tapu wished to provide a collective view of the actual and potential impacts upon the Matapihi community, traditional lands and environment. Therefore this chapter provides the feedback of both Hapū from a collaborative viewpoint. Both Hapū have agreed that the actual and potential issues are of the same nature and seek to present collaborative solutions. Cultural information for this chapter was provided by Puhirake Ihaka and Hayden Henry.

#### 3.1 WHAKAPAPA

*Ko Mataatua te Waka*

*Ko Mauao te Maunga*

*Ko Tauranga te Moana*

*Ko Ngāi Te Rangi te Iwi*

*Ko Ngāi Tūkairangi rāua ko Ngāti Tapu ngā Hapū*

*Ko Hungahungatoroa rātou ko Whareroa, ko Waikari ngā Marae*

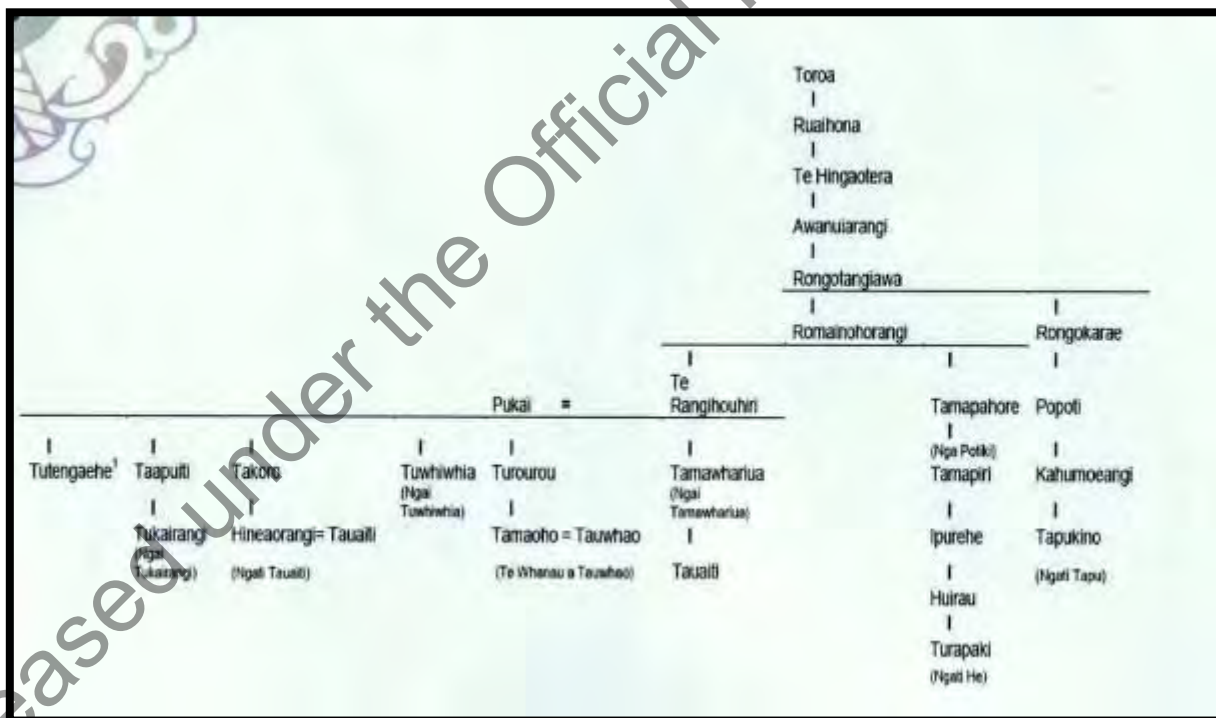


Figure 2 Whakapapa chart that links Te Rangihouri and his descendents to the Mataatua waka and the captain, Toroa.



Figure 2 provides the ancestry of Te Rangihouhiri from Toroa, the captain of the Mataatua waka which arrived in Aotearoa amidst the great migration from Hawaiiiki. The descendants of Te Rangihouhiri now form various Hapū within the Ngāi Te Rangi tribe of Tauranga Moana.

Ngāi Tūkairangi descend from the grandchild of Te Rangihouhiri and following the Ngāi Te Rangi heke to Tauranga, they settled around Mauao, Whareroa, Matapihi, Ōtūmoetai and Otamataha (Te Papa), although their interests now centre around Whareroa and Matapihi (Figure 5). Their lands of interest also access to resources at Ongare, Taumata and Poripori (Waitangi Tribunal, 2004).

Ngāti Tapu are the direct descendants of Rongotangiawa through the line of descent of Rongokarae (Figure 2). In Matapihi, the lands of Ngāti Tapu are interwoven with the genealogical links of Ngāi Tūkairangi (Figure 5).



Figure 3 Taapuiti, Te Whare Tūpuna o Hungahungatoroa Marae, est.1975



Figure 4 Tapukino, Te Whare Tūpuna o Waikari Marae, est. 1880



Figure 5 Interest areas of Ngāi Te Rangi hapū in area of consideration for flyer-over

### 3.2 SIGNIFICANT SITES

The mana whenua, rohe (area deemed under the jurisdiction) of the two Hapū lies directly within the lands of the proposed activity.

All environmental resources within this rohe are considered of high cultural value. There are numerous special places within the rohe that are deemed wāhi tapu or particularly significant to Hapū. Horoipia, Wharawhara, Otumoko, Arataki, Omanu and Ohuki are some areas among the immediate area affecting the fly-over proposal (Figure 6).

#### **Horoipia:**

Horoipia is located between Ohuki and the sea, situated between Omanu (western side) and Wharawhara (eastern side). Meaning 'the washing of the spears'. This name was given because warriors of Ngāi Te Rangi who were returning from battle used this place to rest and wash their weapons. This was a freshwater stream that ran towards the sea from Matapihi. Therefore as a historical encampment it is of archaeological significance. It was also used as an urupa as they would often stop there and bury tūpāpaku in the swamp areas. This place is of great historical significance and considered Wāhi Tapu. The area was also plentiful with tuna; however stocks have become substantially depleted now.

#### **Wharawhara:**

Located on the eastern side of Horoipia. This had outposts of kainga and there were battles fought here also. Battles took place between Ngāi Te Rangi and Te Arawa and Ngāti Pūkenga. It was used as a 'buffer zone' between Ngāi Te Rangi and Te Arawa quite regularly and an inlet to the Rangataua Harbour, which was a prominent and bountiful pātaka kai for our people.

#### **Otumoko:**

Located along Matapihi Road adjacent to Ohuki land blocks. This is an area where our kainga were located, where productive land for produce was located and where our urupa is located.

#### **Arataki:**

Arataki was a kainga area within Wharawhara.

#### **Omanu:**

Omanu is adjacent to Horoipia on the western side from the sea to Ohuki. It is a significant site for kainga settlements and was strategically placed near the harbour.

#### **Ohuki:**

Located at the southern end of Omanu and Horoipia. This place contains significant sites including pā and kainga at Opoutea and Otumoko.

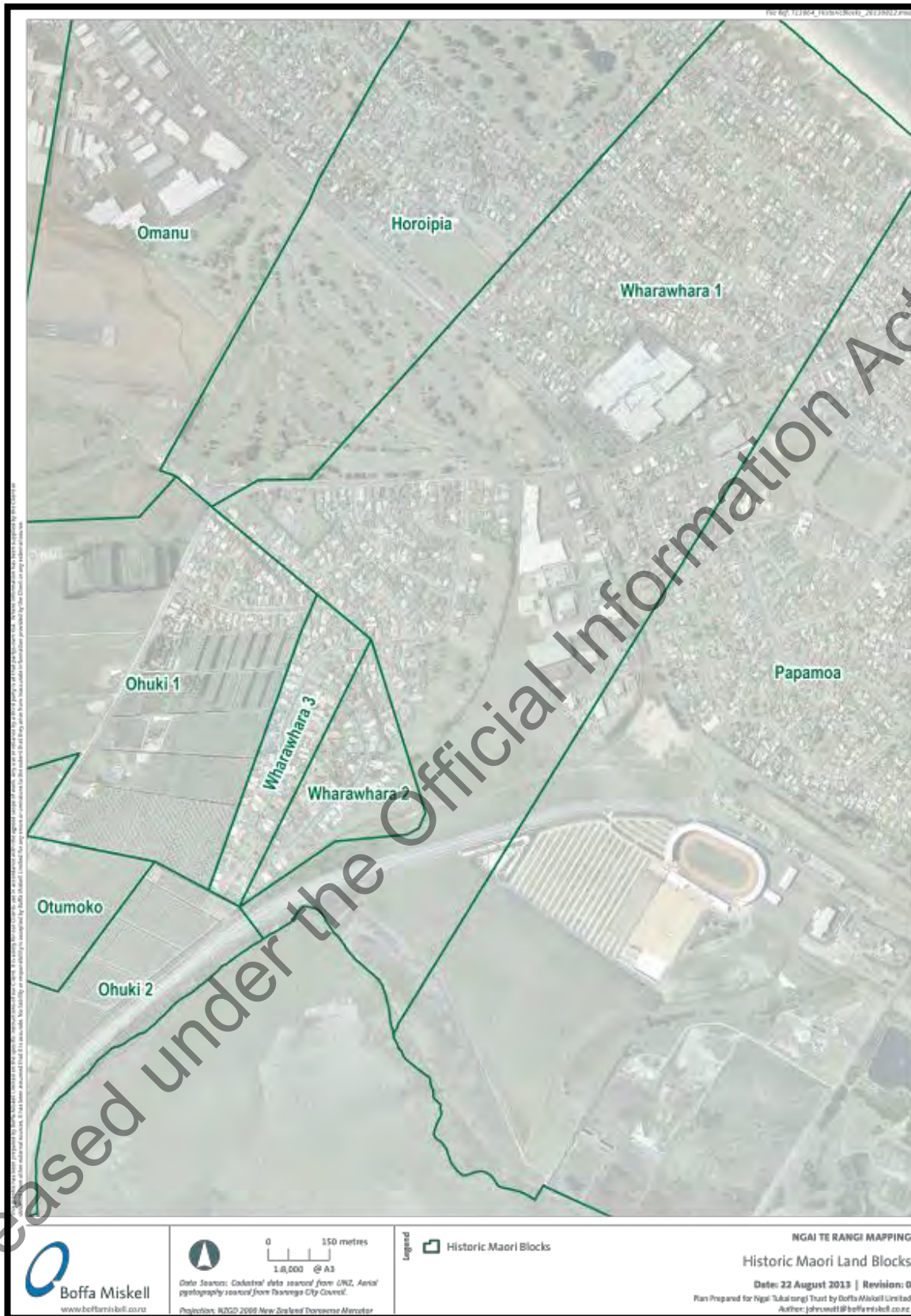


Figure 6 Associated land of Ngāi Tūkairangi and Ngāti Tapu

This entire area was part of a corridor that Ngāi Te Rangi used to travel east and then return. Travel was for various purposes such as trade, battle, seasonal harvesting, visiting whānau, etc.

### **Waipu:**

The community of Matapihi are particularly interested in maintaining and improving land management practices to ensure that the impact of the proposed arterial routes are positive. The pātaka kai – customary harvesting area of Waipū Estuary include kai moana such as; titiko (mudsnail), tuangi (cockle), pātiki (flounder), tāmure (snapper). Maintaining sustainability of the pātaka kai is important (Figure 7).



Figure 7 Waipū Estuary

### **3.3 POTENTIAL IMPACTS**

#### **Cultural Way of Life - Matapihi**

The major and most debilitating issue for both Ngāi Tūkairangi and Ngāti Tapu, is the severe impact the proposed development will have upon the current way of life on the peninsular of Matapihi. This issue is not a historical issue, nor is it about waahi tapu, and kainga, which is articulated in other cultural impact assessments. On this occasion, and with this project, the cultural impact of most significance is the contemporary impact this project for the flyover will have on our way of life. It is severe and piercing and this emotional, physiological and social impact will visually, and physically will be impaled. This may be the single most significant issue.

#### **Urban Development Pressure**

The proposed works, in particular, Option 3 will increase the urban development pressures on the Matapihi community. Much work has been done since the 1970's

by elders such as Turirangi Te Kani to ensure that Matapihi remains a rural community that is actively protected.

“Matapihi whānau with the help of people like Turirangi Te Kani and his sheer perseverance and vision to progress the development of land for the benefit of whānau and hapū resulted in Matapihi maintaining its status as a preserved green belt area. This preservation was an active strategy” Ngaiterangi Iwi Runanga (2006).

The Matapihi Land Use Plan also acknowledges that “Matapihi must keep its rural character”.

Increased traffic flow through Matapihi is not an option that supports this view. It would in fact impact greatly on the Matapihi Community and its way of life. For these reasons, *Option 3 is adamantly opposed by Ngāti Tapu and Ngāi Tūkairangi.*

### Stormwater Discharge

Waterways that feed in to Te Tāhuna o Waipū can have significant impact on the water quality that supports both freshwater and saltwater organisms of awa (stream) and tāhuna (estuary). It is important that the proposed works has an effective storm water plan that enhances the life supporting capacity of these.

Discharges of stormwater into Te Awanui increases sediment loads and stormwater is often contaminated by metals<sup>1</sup> and oils from roading, rubbish and street litter, chemical fertilisers, car wash detergents and accidental spills or dumping into stormwater drains.

The two main objectives relating to stormwater discharge that are highlighted in the Te Awanui, Tauranga Harbour, Iwi Management Plan are;

1. To ensure that stormwater discharges do not compromise the mauri of the harbour and its tributaries.
2. To achieve high environmental standards regarding the discharges of stormwater into the harbour and its tributaries.

The presence of vegetated roadside drains minimises the direct conveyance of materials to the streams and potentially reduces contaminant loads. Impervious surfaces increases the total volume of stormwater being discharged and the frequency of water being discharged. This increases instability of the streams physical nature which can impact on the streams biological health through increased stream

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<sup>1</sup> Stormwater sediments around Tauranga has shown high levels of copper, lead and zinc and have potential to cause high levels in settlement areas of the harbour (McIntosh & Deely, 2001)

disturbance via substrate movement and streambed scouring (Shaver, Suren & Reller, 2011).

It is important to Ngāi Tūkairangi and Ngāti Tapu that stormwater effects are mitigated and improved through riparian planting along all waterways relating to the project. Through good land management and replanting of waterways, increased impervious surfaces should not be required for stormwater drainage. There is potential for tangata whenua to be part of this process in relation to the planning process and the replanting of riparian margins.



**Figure 8 Stormwater drain discharging into Waipū Estuary, adjacent to Omanu Urupa**

The above figure is a stormwater drain that runs through the Omanu Golf Course meeting the Waipū Estuary behind Omanu Urupa. As shown in Figure 8, this stormwater drain is not supported by riparian growth. Riparian planting which would assist with stream stability and support the biological habitat of the stream. Planting of the freshwater margins would also assist with the filtration of contaminants entering Waipū Estuary.

It is recommended that consultation is made with Ngāti Tapu and Ngāi Tūkairangi regarding stormwater mitigation. Both Hapū are working on an Environmental Hapū Management Plan and would like to be involved with projects that support enhancement of the lands and waterways of Matapihi.

## Earthworks

Protocols have been developed in conjunction with NZTA, Ngāti Tapu, Ngāi Tūkairangi and Ngā Pōtiki to guide this process. The protocol sets out the particular procedures that NZTA and its consultants and contractors will follow during the road construction works within the area of interest of said Hapū.

The protocols recognise and provides for the relationship of Ngāti Tapu, Ngāi Tūkairangi and Ngā Pōtiki in regard to their land, water, sites, wāhi tapu and other taonga. The protocols reflect the minimum requirements of NZTA in accordance with statutory obligations under the Historic Places Act 1993 and the Protected Objects Act 1975.

The protocols outline the process for any discovery of kōiwi, artefacts, taonga and taonga tuturu and that any discoveries of this nature are made with direct consultation with nominated Hapū representatives.

## Visual

Ngāti Tapu and Ngāi Tūkairangi accept that flyovers are an inevitable development in Tauranga due to the rapid population and industrial growth of the region. This has an impact on the rural character that the Matapihi community continues to uphold.

The aesthetic view of the flyovers has been frequently commented on as an issue. It is recommended that the design of the flyovers fits with the natural character of its surroundings as far as practicable.

## Air Pollution

Air pollution relating to car exhaust fumes is highlighted as an issue. The Clean Air Task Force made a review of published studies that showed that diesel exhaust can cause heart disease, stroke and various respiratory illnesses, as well as asthma, bladder, colon and lung cancer. Major roadways regularly expose people to high levels of exhaust fumes (FitzGerald, 2013).

This is an issue that is likely to be dealt with under the AEE which is currently being dealt with by Beca. Discussion should be undertaken to mitigate the effects on community health as a result of air pollutants caused by the proposed options.

## Noise

Noise volume is very likely to increase in areas nearest to road-works and new roads. Increased traffic volume particularly around residential areas is likely to impact upon the local community. Roadside planting is a good way to buffer noise whilst fitting the natural character of the area. It is recommended that this is mitigated as far as practicable.



## Pedestrian

Pedestrian activity will be much more complicated than what was previously encountered at Matapihi Road and Girven Road intersection. This will be an additional signalised stop for Matapihi commuters. It is recommended that pedestrian crossings are constructed in a way that is safe for both pedestrians and motorists.

## Public Works

The Matapihi community are uncomfortable with choosing an option that has the potential to have people removed from their homes if they do not agree with Option 1. The Working Group were initially advised that 'all' home owners were willing to sell their properties. However, during the NZTA Community Hui presentation on 13 August 2013 this was stated by NZTA as 'some' were willing to sell their properties.

Another issue that came to light during the Community Hui was that some of the houses on Maunganui Road were Housing New Zealand Corporation (HNZC) owned, homes owned by Bayfair Estate and Rental Properties. Should Option 1 be applied, it is recommended that assistance be provided to occupants of HNZC and rental properties to ensure that those occupants are provided with accommodation should there be difficulty finding new homes within the timeframe required.

### 3.4 THE THREE OPTIONS

At the outset, the opinion of Ngāi Tūkairangi and Ngāti Tapu is that the core preference is that the fly-over does not proceed. However, the Hapū groups have been provided with 3 options to consider in light of the traffic control need in Tauranga.

#### OPTION 1

##### MAUNGANUI / GIRVEN FLYOVER & TE MAUNGA FLY OVER

To build fly-overs at Mt Maunganui/Girven Road and SH2/SH29 intersections (Figure 7). This option would require the acquisition of approximately 40 properties between Girven Road and Te Manga to enable widening of the road. There would be changes to traffic signals at the intersection at Maunganui and Girven Roads. Similarly at the intersection at SH2/SH29 there would be changes to traffic signals. Estimated cost \$85-90 million.

Option 1 has been identified by Ngāti Tapu and Ngāi Tukairangi as a recommendation most preferred. This option is the most preferred by both Ngāi Tūkairangi and Ngāti Tapu working group members. However this requires further consultation regarding the impact to people dwelling in State Homes and Rental

Properties as both Hapū are uncomfortable with supporting this option should the Public Works Act be applied to acquire the land.

This option will involve less disruption of traditional and cultural areas of Ngāti Tapu and Ngāi Tūkairangi and is viewed as more manageable for better traffic control. For example, this will not contribute extra traffic through Owens Place and will mean less traffic lights and changes for the Matapihi community.

## **OPTION 2**

### **MAUNGANUI / GIRVEN FLYOVER & TE MAUNGA FLY OVER**

To build fly-overs at Mt Maunganui/Girven Road and SH2/SH29 intersections (Figure 7). This option would require the railway line to be moved behind Owens Place commercial area adjoining the residential area. There would be changes to traffic signals at Maunganui Road and Girven Road. Similarly at the intersection at SH2/SH29 there would be changes to traffic signals. Estimated cost \$85-90 million (including relocation of the railway line).

Option 2 is the next preferred option of Ngāti Tapu and Ngāi Tūkairangi. This option would cause more disruption to undisturbed traditional areas than Option 1. The railway line and Bayfair roundabout currently works simultaneously. Moving the railway line South-West would then create an additional intersection area that may cause further delays in traffic coming to and from Matapihi Road. The railway line would be dissecting the industrial businesses of Owens Place and the residential area of Bayfair Estate. This would have the potential to reduce land value in Owens Place of which hapū do have some ownership.

## **OPTION 3**

### **MAUNGANUI / GIRVEN FLYOVER & TE MAUNGA DIAMOND INTERCHANGE**

Similar to Option 2 with a reconfiguration at SH2/SH29 (Figure 7). A fly-over at SH29 over SH2 and the railway line is proposed. Owens Place would be extended to connect with Truman Lane. The fly-over at SH2/SH29 would mean that State Highway traffic does not have to stop for trains. Estimated cost \$110-120 million (including relocation of the railway line)

Option 3 is the least preferred option for Ngāti Tapu and Ngāi Tūkairangi for the following reasons. The relocation of the railway line causes disruption to the traditional lands of these hapū. The conversion of Owens Place to a through road would majorly increase traffic and congestion for the Matapihi community. It would create an additional major traffic signal controlled intersection where Owens Place meets Matapihi Road. It would require road widening for the entire length of Owens

Place. Relocation of the railway line would also cause considerable delays and or costs to the companies transporting products to and from the Port of Tauranga.

Option 3 would create further urban growth into Matapihi which is strongly opposed by the Matapihi Community. This would greatly impact on the way of life for people living there.

### **PEDESTRIAN UNDERPASS**

The underpass would need to be extended to approximately twice its current distance to walk from Matapihi Road to Bayfair Shopping Centre. This has the potential to be a safety and security issue for pedestrians particularly at night. Ngāti Tapu and Ngāi Tūkairangi is recommending that the underpass is removed and that signals are applied for pedestrians to make required crossings safely.

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## 4.0 NGĀ PŌTIKI

Ngā Pōtiki envisage that this report documents the Hapū, whānau, marae, ahi kaa, hau kainga, mana whenua and tangata whenua of Ngā Pōtiki and how their values are inextricably linked with this area and provides for appropriate measures to avoid, remedy or mitigate any adverse effects on those values. The potential impacts and adverse effects on cultural and heritage sites is a loss of cultural and heritage. Cultural information for this chapter was provided by s 9(2)(a)

s 9(2)

(a)

Ngā Pōtiki supports the proposal in principle however there are issues identified that will need special consideration in terms of conditions placed on the resource consent and Historic Places Trust applications, and ongoing consultation by means of an advisory forum.

The Ngā Pōtiki perspectives on natural resource and environmental management are based on a series of cultural values recognising and protecting the mauri, or life supporting capacity, of air, land and water, and ensuring that the relationship between people and the environment is characterised by respect and reciprocity. Underpinning these perspectives is the long and sometimes often unpleasant experience engaging with local and central government as well as developers.

## 4.1 WHAKAPAPA

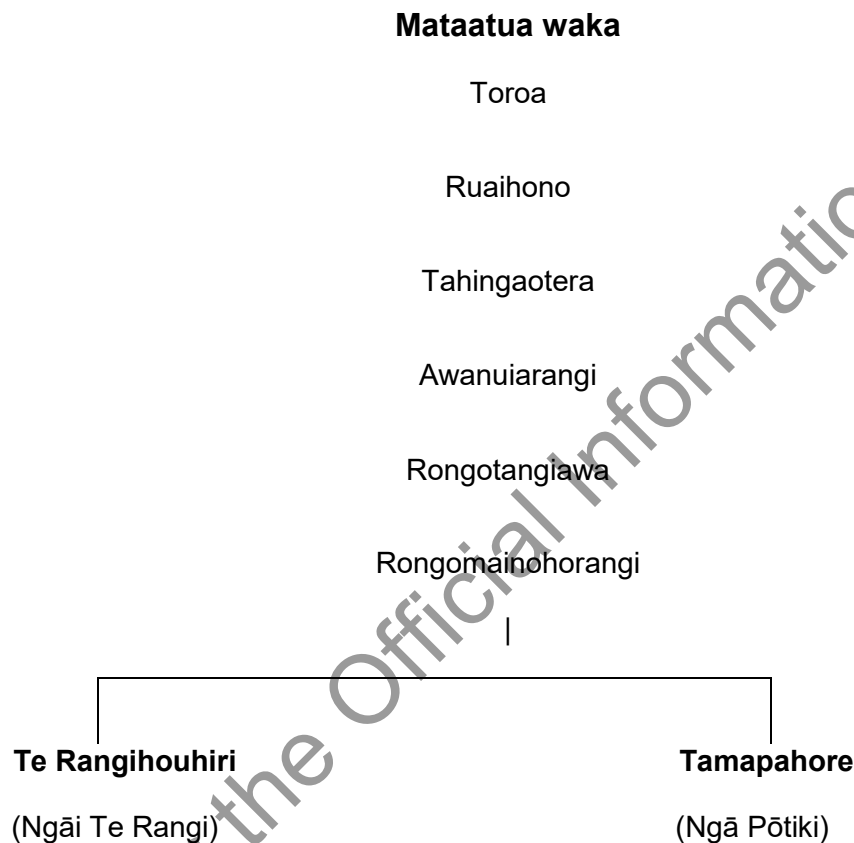
Ngā Pōtiki is an abbreviation for Ngā Pōtiki a Tamapahore, the descendants of Tamapahore. Ngā Pōtiki mana whenua and mana moana confer customary authority or kaitiakitanga. Ngā Pōtiki exercises kaitiakitanga derived comes from continuous land use, and occupation and active protection of its cultural landscape and seascape.

The ancestors of Ngā Pōtiki were part of a group with origins from Mataatua waka which migrated from eastern Bay of Plenty, led by Rangihouhiri the elder brother of Tamapahore, the eponymous ancestor of Ngā Pōtiki and Ngāti He. Torohangataringa a sister to Tuwairua, and the mother of Tamapahore married Ruangutu of Tapuika, who had Ngakohua. It was through Torohangataringa why the group came to Maketu. Ngakohua gave Owara pa to Te Heke o Rangihouhiri (Kahotea, 2013).

It was on the death of Rangihouhiri at Poporohuamea (Maketu) that Tamapahore comes to prominence and indeed the movement of the group, now calling themselves Ngāi Te Rangi, in memory of Rangihouhiri, from Maketū into the Tauranga area referred to as Te Heke o Tamapahore (Kahotea 2013).

The assault on Mauao and its Ngāti Ranginui occupants under their leader Kinonui, is known as 'Kokowai'. The incident is also remembered for Tamapahore's reluctance

if not outright refusal to actively participate in the violence. This incurred the wrath of his nephew, Kotererua (son of the late Rangihouhiri), who played a leading role in the assault. The aging Tamapahore and his family were subsequently refused living space on Mauao and forced to shift to firstly to Karamuramu and Hikutawatawa. It was Tamapahore's sons and grandchildren who called themselves Ngā Pōtiki a Tamapahore (the sons of Tamapahore) and through them his mana extended across Rangataua, Papamoa, Otawa and Maketū.



The whakapapa demonstrates the inextricable relationship between the descendants of Rangihouhiri and Tamapahore, and yet distinguishes both as distinct tribal entities with their own mana. This unique relationship is evident in kōrero recorded in the Crown Commissioners Hearing into the Mangatawa Block 1901 and submissions to the Waitangi Tribunal in 1999 held at Tamapahore Marae, where it was pointed out that Ngā Pōtiki is not a hapū of Ngāi Te Rangi in the 'true sense', as Tamapahore was a half-brother of Rangihouhiri and not a descendant. Hapū are kin based groupings based on descent from a common tūpuna.

The tauparapara below, associates the three most significant tūpuna of Tauranga moana namely Ranginui (Ngāti Ranginui), Ngāi Te Rangi (Rangihouhiri) and Tamapahore (Ngā Pōtiki) with specific areas, and explains the traditional and present day settlement patterns of their descendants;

Kia marama taku titiro ki Tauranga  
Ko Rangihouhiri, Ko Ranginui  
Kei Rangataua, Ko Tamapahore  
Ngā Pāpaka o Rangataua  
He paruparu te kai  
He taniwha ngā Tangata

Keenly I look across to Tauranga  
Where dwells Te Rangihouhiri and Ranginui  
And over at Te Tāhuna o Rangataua dwells Tamapahore  
The crabs of Rangataua  
They eat mud, and have the boldness of demigods

The traditional rohe or Ngā Pōtiki tribal boundary follows the Papamoa coast from Parakiri (Omanu) to Wairākei and follows the Crown's 1865 confiscation line inland to Otawa joining up to the Waitao stream and into Te Tāhuna o Rangataua, taking in Oruamatua and back to Parakiri.

There are two Ngā Pōtiki marae namely; Mangatawa, which over look's the Papamoa area of intense subdivision and development and Tahuwhakatiki located at Waitao.



Figure 9 Map of rohe for Ngā Pōtiki

## 4.2 NGĀ PŌTIKI PARTITIONED

From approximately 1886 Ngā Pōtiki lands were partitioned into 6 blocks by the Crown and as time went on Papamoa 2 and Mangatawa were again partitioned from 1900 onwards (Figure 9).

- Papamoa Part 1
- Papamoa Part 2
- Papamoa Part 3
- Mangatawa
- Hikutawatawa
- Karamuramu

The land in question that is to be developed for the proposed project lies within Papamoa Part 2.

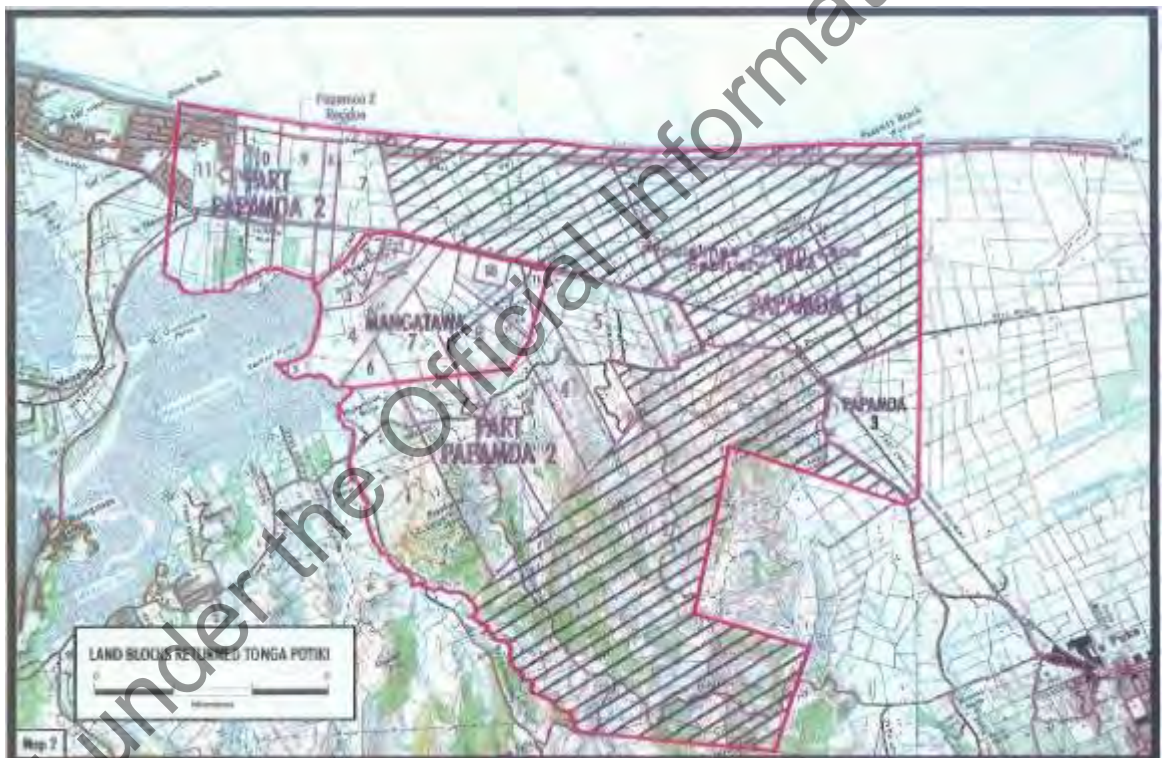


Figure 10 Ngā Pōtiki Estate



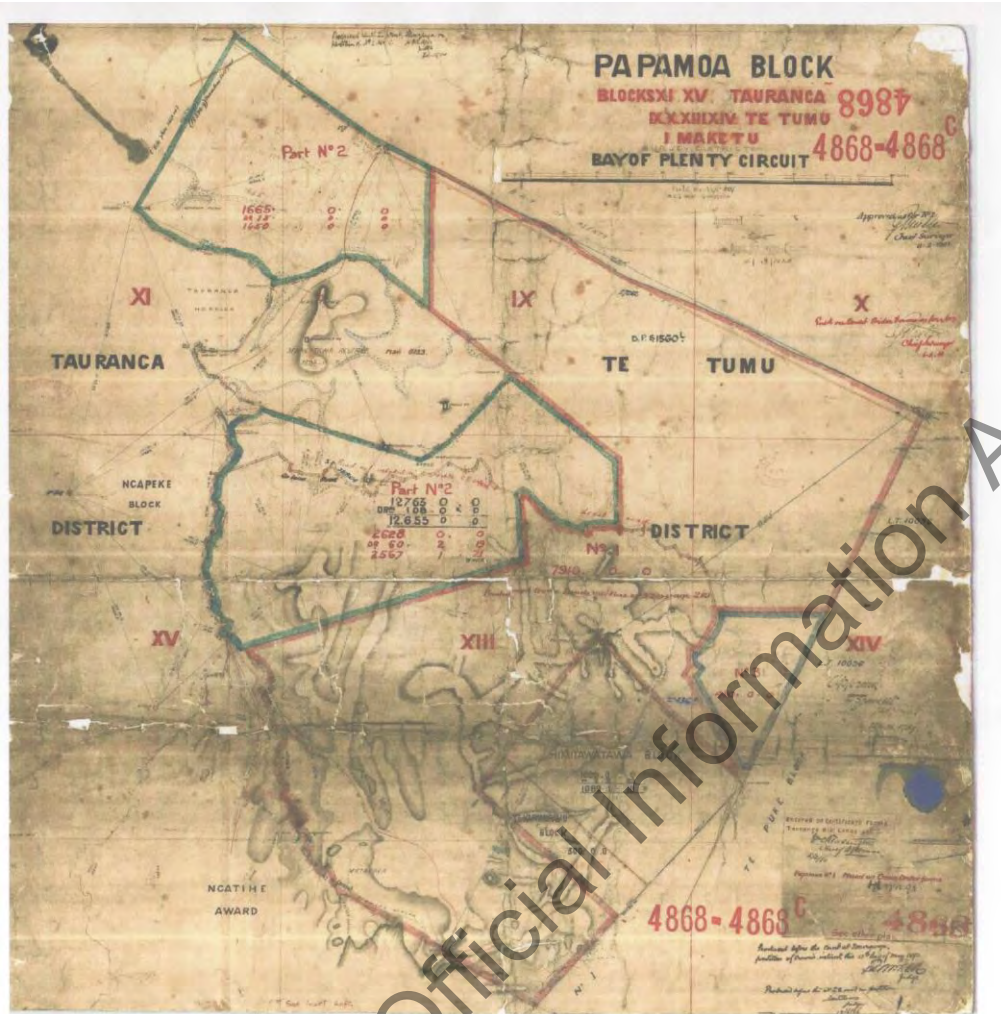


Figure 11 Before partition of the Ngā Pōtiki Estate in the 1800's.

### 4.3 POTENTIAL IMPACTS

This is a professionally prepared assessment of the potential impacts of the proposed future option 1, 2 & 3 will have on environmental resources and cultural values of importance to Ngā Pōtiki.

Ngā Pōtiki cultural values inform our decisions. These values determine the parameters as to how Ngā Pōtiki interacts with the natural resources within its rohe and how they are managed.

The passing onto future generations of tamariki mokopuna of an environment and cultural landscape in a better condition than the one our current generation received is central to our thinking. Our tamariki mokopuna are our greatest resource. The question that is clear in our minds is “what will the impact of this activity be on those that come after us?”

The natural features and landscapes that are; clearly special or widely known and influenced by their connection to the cultural values inherent in and around the designated area.

Many special sites and areas are still in Māori owned or private ownership, making them vulnerable to pressures of development. A lack of awareness about the significance and management of these areas increase the risk to these places.

The following issues are of cultural and environmental natures which have been identified as potential effects. Each environmental issue area is mentioned with a view to provide mitigation measures.

#### Urban Growth

Ngā Pōtiki has a long history of experiencing the impact of urban growth and development in the Tauranga area. Ngā Pōtiki concerns, with respect to the negative impacts of development on Te Tahuna o Rangataua can be traced back to the 1970's and the interventions of Wiremu Ohia, spokesman for the Tauranga District Maori Council. There were also protests by Ngā Pōtiki kaumatua to the enactment of the Mt Maunganui Empowerment and Reclamation Act 1974 that provided for the establishment of sewage oxidation ponds at Te Maunga.

It is clear that Ngā Pōtiki cultural and heritage values continue to be under threat from subdivision, housing developments, roading, increased population pressure and land use change. Cultural sites particularly under threat from development are often intangible (e.g.) wāhi tapu, on private land, and in coastal areas. Significantly, concern expressed over the loss of cultural heritage is not only about the loss of individual sites, it is also about the degradation of cultural landscapes and seascapes, including the links between heritage places and the loss of knowledge and traditional

history. The loss of cultural identity also results through impacts from growth practices, relationships, tikanga and cultural values.

### Earthworks

The area under consideration for the proposal may have unrecorded pre European historic/archaeological features. Ngā Pōtiki has always expressed a desire to preserve the heritage/archaeological features and visual landscape and Ngā Pōtiki do not want any features that would detract from its appearance.

Earthworks or ground disturbance whether it be on a small scale to large scale. Earthworks is a component in a range of activities. In this case the removal of earth to construct the road networks. Earthworks activities that involve ground disturbance often have the potential to unearth cultural materials or disturb urupa (burial site). It is vital that appropriate processes and protocols associated with the accidental discovery of cultural materials be provided for.

Ngā Pōtiki recommends that a set of protocols are developed by the affected Hapū groups and are applied to this project. Ngā Pōtiki will consider and agree on the earthworks monitoring protocols. Protocols for the discovery of taonga and koiwi is an important part of this process. A comprehensive Archaeological Assessment Report is expected.

### Visual

Given that the construction are of huge proportions and these unsightly structures definitely have a visual impact. The structures should try and blend into the landscape and replanting should also be provided to mitigate the visual impact of these structures.

### Te Tāhuna o Rangataua

Te Tahuna o Rangataua is situated near the proposed construction of the Te Maunga/SH 29 (Figure 12). Ngā Pōtiki have serious concerns regarding stormwater runoff (agricultural chemicals, effluent, household and highway run off) into the harbour and would recommend that a mitigation and monitoring programme is addressed. The food sources and land resources that would have been available and accessible from Te Tāhuna o Rangataua was occupied from 1600 are as follows:

Area / site	Description	Species
Rangataua harbour	Fish	Mullet Kahawai Pātiki - Flounder Kingfish Tāmure - Snapper
Rangataua harbour	Shellfish	Titiko - Mudsnail Tuangi – Cockle
Rangataua harbour	Crustacean	Pāpaka - Mudcrab
Mangatawa Drain & auxiliary waterways	Fish	Tuna - Eel Inanga - Whitebait
Mangatawa Drain & auxiliary waterways	Crustacean	Koura - Fresh water Crayfish
Mangatawa Drain & auxiliary waterways	Plant	Watercress



Figure 12 Rangataua Estuary

#### **4.4 RECOMMENDATIONS**

1. Relationship and Monitoring Protocols
2. Visual impact: Landscape programme for the structures to blend into the landscape
3. Stormwater effects mitigated
4. An effective liaising and consultation process by way of an advisory forum between all parties is paramount to ensure the report effectively provides a full understanding of the cultural impacts on tangata whenua.

#### **4.5 THE THREE OPTIONS**

Ngā Pōtiki are not able to provide their views on the 3 options. Prior to the tangata whenua meeting held at the ASB arena Option 3 was the preferred. However, because the Tauranga Eastern Link construction of the Mangatawa Interchange is also in train there will be an increase in traffic movements on Truman Lane.

It is still the view of Ngā Pōtiki that whatever option is preferred there are real concerns about the safety of our kaumatua and school children with any of the options.

## 5.0 KEY ISSUES & RECOMMENDATIONS

### 5.1 OPTION PREFERENCES

Ngāti Tapu and Ngāi Tūkairangi have indicated a preference for Option 1 for reasons identified in Chapter 5. However, this still requires further consultation regarding the impact to people dwelling in State homes and rental properties as both Hapū are uncomfortable with supporting this option should the Public Works Act be applied to acquire the land.

At this stage Ngā Pōtiki are not able to provide their specific views on the 3 options but have concerns for the safety of kaumatua and school children that relates to all 3 options.

### 5.2 EARTHWORKS AND MONITORING

Disturbance of earth in areas of cultural significance is an issue that needs to be managed appropriately. It is recommended that the Earthworks Protocols are applied to ensure that recovery and protection of any cultural and archaeological findings within land disturbance areas are cared for appropriately. Specific training of onsite cultural monitors will need to be applied where required.

### 5.3 STORMWATER MANAGEMENT

#### Assessment of Environmental Effects (AEE)

Beca has advised that an AEE is currently being conducted and is therefore unavailable for review in this assessment. There may be relative environmental effects within the AEE that will need to be taken into account by Hapū particularly concerning earthworks and stormwater planning. It is expected that stormwater is adequately planned to ensure that any discharge to land and waterways is not harmful. It is recommended that further discussion is carried out with this group regarding results of the AEE. It is understood that stormwater planning will be the same for each of the three options proposed.

The CIA Working Group would like assurance that Environment Bay of Plenty Regional Council is regularly monitoring the terms of the consent to ensure that no harmful levels of contaminants or otherwise are discharged to waterways.

#### Stormwater Mitigation

Ngāti Tapu and Ngāi Tūkairangi recommend that both Hapū are involved in stormwater management and that riparian planting of stream margins is applied to stormwater discharge areas resulting from the project. Ngā Pōtiki also expects that stormwater mitigation is provided for.

## 5.4 PEDESTRIAN UNDERPASS

Ngāti Tapu and Ngāi Tūkairangi is recommending that the underpass is removed and that signals are applied for pedestrians to make required crossings safely at Maunganui Road intersection.

## 6.0 CONCLUSION

The CIA Working Group recognises the importance of communication between our entities on all matters that arise within our areas of interest. We recommend that strengthening our working relationship is progressed and that Ngāti Tapu, Ngāi Tūkairangi and Ngā Pōtiki are fully informed on matters occurring within our rohe.

Ngāti Tapu, Ngāi Tūkairangi and Ngā Pōtiki representatives will discuss recommendations further and look forward to maintaining good communication with NZTA in the future.

## 7.0 REFERENCES

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## 8.0 SIGNATORIES

\_\_\_\_\_  
Report Writer

\_\_\_\_\_  
Ngāi Tūkairangi Representative

\_\_\_\_\_  
Ngāti Tapu Representative

\_\_\_\_\_  
Ngāti Pōtiki Representative

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## Appendix C – Options Assessments

Alternatives Considered Table – 2 May 2014

MGI Intersection Options Report – 12 September 2012

MGI Intersection – Te Maunga (SH2/29) Transport Assessment Report – 30 April 2014

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## MGI - Te Maunga Scheme Assessment - Alternatives Considered

ALTERNATIVES (NZTA INTERVENTION HIERARCHY)	STRATEGIC RESPONSE	APPLICATION (INTERVENTION OPTIONS)	TARGET OUTCOME
<p><b>1. Integrated land use / transport planning.</b></p> <p>Alignment of transport planning with growth management and land use.</p>	<p>Smartgrowth 'Live, Work, Play' philosophy that reduces trip length and increases mode choice. Planning mixed use development (residential, commercial and employment based, service and recreational activity) reduces trip length and encourages an increase in walking, cycling and PT mode share.</p>	<p>Plan changes. Re: TUNS – 85% growth effect south of SH29 – look to reallocate or increase commercial / industrial mix with residential to reduce trip length / travel demand and off-set travel demand across wider network.</p>	<p>Reduce trip length. Reduce travel demand. Increase walking / cycling mode share. Increase capacity on wider strategic network through reducing traffic generation as trips are contained locally.</p>
<p><b>2. Manage traffic demand.</b></p> <p>Manage demand to utilise the network more efficiently by e.g. providing improved mode choice, encouraging more efficient trips and encouraging alternatives to travel. Focus on areas under growth pressure and key strategic freight routes.</p>	<p>Stage growth to coincide with network capacity. Increase PT mode share, particularly during peak commuter periods.</p>	<p>Increase service frequency.</p>	<p>Reduce car dependency and car trips during peak – frees up capacity on network.</p>
		<p>Increase service coverage (new service routes).</p>	
		<p>Consider re-routing local service routes into industrial areas either side of SH2 Maunganui Road - Hewletts Road corridor e.g. Hull and Aerodrome – Jean Batten to increase service penetration and</p>	<p>Affords an opportunity to use the Bus Lane for other purposes such as HOV's, heavy vehicles (freight), local property access – frees up capacity on network.</p>

ALTERNATIVES (NZTA INTERVENTION HIERARCHY)	STRATEGIC RESPONSE	APPLICATION (INTERVENTION OPTIONS)	TARGET OUTCOME
		increase catchment and rationalise number of services along SH2 corridor to fewer fast-track 'express' services with fewer stops.	
		Reduce fares such that they offer a cheaper travel alternative to the car.	
		Increase CBD parking pricing to encourage commuter mode shift to PT or other alternatives, including increase peak period parking pricing but reduce off-peak.	
		Reduce or maintain current CBD parking supply rather than increase supply.	Reduced parking availability could increase PT share or disperse peak period traffic across network to other commercial growth areas.
		Introduce Park and Ride services.	Possible locations for P & R could include Bay Park and Blake Park as both have adequate parking facilities with ample capacity during weekdays.
	Increase walking / cycling trips. (Local focus to reduce short length car trips).	Pedestrian / cycle network upgrades and improvements include better connectivity, route extensions, new routes, safety improvements, improved end of journey facilities. Focus on Bayfair – Matapihi – Harbour Rail Bridge link to CBD (possible Park and Walk site if there is an opportunity to provide a car park at end of Matapihi Road for commuters to walk over rail bridge	

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ALTERNATIVES (NZTA INTERVENTION HIERARCHY)	STRATEGIC RESPONSE	APPLICATION (INTERVENTION OPTIONS)	TARGET OUTCOME
	Tolling or other road pricing mechanism.	into CBD from). Peak period tolling or peak / off-peak price differential.	Encourage use of alternative route. Encourage off-peak travel. Reduce car travel and encourage mode shift to alternatives (PT, HOV, walk, cycle).
<p><b>3. Optimise existing road network.</b></p> <p>A OneNetwork approach to manage use of the existing network more efficiently and improve safety. Allocating and sharing road space between users according to appropriate priorities.</p>	Review lane allocation along SH2 corridor.	Consider allowing HOV and freight (heavy vehicles) into Bus lane. Consider peak period only bus lanes. Opportunity to add another lane into existing carriageway by reducing lane width (may require / result in speed reduction).	
	Reduce side friction by rationalising property access	Focus on rationalising property access along Hewletts, (particularly east of Jean Batten).	Investigate possibility of providing a service lane to the rear of these Hewletts Road frontage properties through Bunnings car park (between Jean Batten and Waimarie).
			Consider changing Bus Lane to a separate property access lane with all through traffic allocated to main traffic lanes.
		Consider use of shoulder for property access service road separate from main traffic lanes to reduce 'weaving' effect.	
		Review the need for side road intersections on Maunganui Road between Hewletts and Girven (Spur and Concord).	

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ALTERNATIVES (NZTA INTERVENTION HIERARCHY)	STRATEGIC RESPONSE	APPLICATION (INTERVENTION OPTIONS)	TARGET OUTCOME
	Review cycle lane provision on Hewletts and look to either relocate to alternative on-street route or provide additional link up off-road route(s).		
	Traffic signal optimisation – focus on optimising Port access and through traffic lane green phases.	Review pedestrian crossing provision – look to provide alternative grade separated crossing provisions or consolidate pedestrian crossing provisions where most needed / safest.	
		Consider opportunities for preferential treatment for freight / port access. (Similar to a bus pre-emption system).	
	Transport logistics review.	Review opportunities to review how freight is transported to / from Port and local industrial areas including opportunities to increase truck load capacity, distribute deliveries off-peak, transfer to rail, consolidate deliveries into hubs (opportunity for a central one-site delivery / load point serviced by rail / off-peak trucks.)	
	Rail freight.	Opportunities to increase rail freight. Review effect of Totara level crossings on congestion and delay. Opportunity to provide grade separated road crossings on Totara if effects overspill onto SH2 Hewletts.	

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ALTERNATIVES (NZTA INTERVENTION HIERARCHY)	STRATEGIC RESPONSE	APPLICATION (INTERVENTION OPTIONS)	TARGET OUTCOME
	BayFair Shopping Centre access review	Review impact on MGI – opportunity to increase PT share by creating PT Transport Hub, reduce car park provision, provide alternative focus for access to north into Farm / minimise / consolidate direct access impact onto Girven/Maunganui.	
<p><b>4. Invest in new road infrastructure.</b></p> <p>Match Levels of Service against affordability and realistic need on a whole of network basis. Identify interventions that deliver improvements for specific network functions or add capability according to pre-defined priorities e.g. travel time efficiency, safety, resilience.</p>		New service lane – e.g. Bunnings car park?	
		Opportunity to reconfigure design of MGI upgrade at Te Maunga (SH2 / SH29) intersection to facilitate free-flow between SH29 – SH2 east in order to encourage commuter traffic to use SH29 rather than continue over fly-over to Maunganui - Hewletts.	<p>Aim to encourage Papamoa East / Wairakei commuter traffic to use Ring Road South rather than North.</p> <p>Need to consider effects on SH29 corridor, especially at Hairini – also need ease of link new build as part of Hairini link to facilitate connection between 15<sup>th</sup> – SH29 East of Hairini (Maungatapu).</p>
		Opportunity for additional local industrial access roads parallel to Hewletts / increase connectivity in	

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ALTERNATIVES (NZTA INTERVENTION HIERARCHY)	STRATEGIC RESPONSE	APPLICATION (INTERVENTION OPTIONS)	TARGET OUTCOME
		<p>order to rationalise side road access. Perhaps punch through Te Maire Street to provide link through between Newton and Totara? Or more likely option to build new road link between Newton and Totara via disused (in part) rail corridor.</p>	

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Report

# MGI - SH2/SH29 Intersection Options Report

**Prepared for NZ Transport Agency (NZTA) (Client)**

**By Beca Infrastructure Ltd (Beca)**

12 September 2012

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### Revision History

Revision N°	Prepared By	Description	Date
A	s 9(2)(a)	Draft for Client Review	31 July 2012
B	s 9(2)(a)	Final	12 September 2012

### Document Acceptance

Action	Name	Signed	Date
Prepared by	s 9(2)(a)	s 9(2)(a)	11/9/12
Reviewed by	s 9(2)(a)		11/9/12
Approved by	s 9(2)(a)		12/9/12
on behalf of	Beca Infrastructure Ltd		

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## Appendices

**Appendix A - Workshop Notes and Drawings**

**Appendix B - Te Maunga Intersection Options Study - Scope and Objectives Report**

**Appendix C – MGI/Te Maunga Options Memo**

# 1 Executive Summary

## 1.1 Introduction

The NZ Transport Agency (NZTA) has engaged Beca Infrastructure to undertake a study to identify potential options for future improvements at the Maunganui Road/Girven Road and SH2/SH29 intersections on State Highway 2 in Tauranga. This report covers these investigations.

## 1.2 Purpose of the Study

In the absence of a completed corridor plan or strategy, this study aims to identify options to provide an effective transport solution for the eastern SH2 corridor between Hewletts Road and the Mangatawa Interchange on the Tauranga Eastern Link (TEL)

## 1.3 Background and Description of Problem

The SH2 corridor in Tauranga provides a direct link between the TEL and the Port of Tauranga. Two key intersections along the route, Maunganui Road/Girven Road (MGI) and SH2/SH29 currently experience delays which are forecast to worsen considerably once the TEL opens.

Options for reducing congestion and delays at MGI have been investigated to scoping level, with a preferred option of a two lane SH2-SH2 flyover identified. However a project feasibility investigation into the SH2/SH29 intersection identified that if MGI were improved, the SH2/SH29 roundabout would experience significant delays and congestion when the TEL opened in 2016, even with the minor improvements proposed as part of the TEL. The MGI and SH2/SH29 intersections are located within approximately 800m of each other, and any improvements at one are likely to impact on the operation of the other, with potential weaving issues between the two also expected.

The Mangatawa Interchange is being constructed as part of the TEL and is located approximately 1.7km south of the SH2/SH29 intersection. The close proximity of these two intersections is also likely to result in some weaving issues for SH2 traffic.

The East Coast Main Trunk Line also runs parallel to the corridor, with train movements frequently impacting on the operation of both the MGI and SH2/SH29 intersections.

The corridor is constrained to the south by the East Coast Main Trunk Line (ECMT) and by residential properties to the north. Any options for improvement are likely to impact on one or the other, or possibly even both.

## 1.4 Corridor Options and Assessment

Whilst numerous options for both intersections have been identified in previous studies, recent investigations considering both intersections together have not been undertaken. A workshop was held in February 2012 to identify and assess a number of options for providing an ultimate form for the SH2 corridor from Mangatawa Interchange to MGI. The options generally considered improvements in one of the following three corridors:

- Use of rail designation south of Owens Place for a new road link
- Utilise existing SH2 corridor
- Utilise Truman Lane corridor as a parallel road to SH2

#### 1.4.1 Use of Alternative Rail Designation for new road link

The alternative rail corridor behind Owens Place would cater for an additional road link from SH29 to SH2 west of MGI. A number of sub-options were identified however serious concerns were identified relating to the use of this corridor for road. Insufficient width through the existing rail designation for a two lane road was likely to result in significant land requirements from the properties adjacent to the corridor. An increase in traffic volumes on Matapihi Road and onto MGI were expected to negatively impact on the operation of the intersection, particularly as the SH2/SH29 right turn conflict would be shifted to the smaller Matapihi Road intersection. A planning assessment also raised concerns about the negative impact on the surrounding residential properties, particularly with respect to noise and loss of amenity.

#### 1.4.2 Utilise the existing SH2 corridor

The existing corridor is constrained between the ECMT and residential properties so any improvements would require land take from one of the other, or possibly both. Widening to the south may require relocation of the railway either within its current corridor or into the alternative corridor located south of Owens Place. The proximity of the two intersections to each other restricts the options available and also requires careful attention to prevent weaving issues. Planning wise, this option has the least impact.

#### 1.4.3 Utilise Truman Lane Corridor

Realigning SH29 into Truman Lane via the Mangatawa Interchange would eliminate the need for a grade separated SH2/SH29. Only a left turn slip lane for SH29 to SH2 towards MGI would be required at the existing SH2/29 intersection. There would however be the need for a parallel road through the MPBI industrial zoned land and alongside Truman Lane to maintain access to commercial properties and the Baypark, and the TECT Arena. The section of OTS land between Truman Lane and the ECMT corridor may be required; securing this land could be time consuming and problematic. This option would disrupt the flow of traffic on SH29 as it passes through the Mangatawa Interchange.

#### 1.4.4 Recommendation

Based on the assessment of traffic operation and planning issues, it is recommended that the future options to provide an effective transport solution for this section of SH2 be located along the existing SH2 corridor.

### 1.5 SH2 Options Assessment

Following on from the above assessment, 19 options for improvements at both intersections were considered. These included the combinations of the following layout options:

- MGI:
  - At grade traffic signals (TS)
  - Displaced Right Turn (DRT)
  - Two Lane Flyover (2L F/O)
  - Two Lane "Y" Flyover
- SH2/SH29
  - TEL Roundabout (TEL RAB)
  - Displaced Right Turn (DRT)
  - Traffic signals (TS)

- Two lane flyover (2L F/O)
- Diamond interchange

Of the 19 options, all but four were discarded for a variety of reasons including poor performance, safety concerns and/or high land purchase requirements. The four preferred options were:

- Option 1B – traffic signals at MGI, displaced right turn at SH2/SH29
- Option 3D – 2 lane flyover at MGI, 2 lane flyover at SH2/SH29
- Option 3E – two lane flyover at MGI, diamond interchange at SH2/SH29
- Option 5B – Y flyover at MGI, displaced right turn at SH2/SH29

Options which maintained the existing TEL roundabout configuration at the SH2/SH29 intersection were considered inadequate, as any improvements to MGI will require changes to the SH2/SH29 intersection to cater for the additional traffic generated.

## 1.6 Assessment of Preferred Option

The four preferred options have been further assessed to consider performance, physical impacts, and estimated costs.

### 1.6.1 Option 1B – TS at MGI, DRT at SH2/SH29

This option has been developed as a low cost/reduced performance scheme, on the basis that such a compromise may be required to remain within sustainable funding levels. Traffic modelling of these options has been undertaken on the two intersections separately, and indicates that TS at MGI would have a LOS F by 2031, without taking into consideration the railway line. The SH2/SH29 DRT could operate at LOS C by 2031, again without taking into consideration the impact of the railway line. Further modelling of the intersections is required to determine how these two layouts would perform as a pair.

The cross sectional width of this option is relatively small compared to the other options, and it has a rough order cost of \$25m. Relocating the railway line would enhance the option but would add additional cost.

### 1.6.2 Option 3D – 2L F/O at MGI, 2L F/O at SH2/SH29

Two lane flyovers at both intersections have been considered separately in previous PFRs and give reasonable NPV benefits, however they have not been considered as a pair. Complete segregation of the SH2-SH2 through traffic from at-grade traffic would be required for the entire length between the intersections to remove any potential weaving issues. The cross sectional width of this option would require land take from either residential property or the rail corridor. Relocating the rail to the alternative rail corridor would reduce the need for residential property. The rough order cost estimate of this option is likely to be in the order of \$70-80m, excluding railway relocation costs.

### 1.6.3 Option 3E – 2L F/O at MGI, Diamond Interchange at SH2/SH29

This option is very similar to Option 3D at MGI but also removes the SH29/railway conflict by grade separating the state highway over the railway line. This option has a larger land impact at SH2/SH29 and a larger structure over the railway line would be required. The rough order cost estimate for this option is approximately \$80-100M, excluding railway relocation costs.

#### 1.6.4 Option 5B – “Y” F/O at MGI, DRT at SH2/SH29

Whilst traffic modelling of this option has not been undertaken, it is expected that at MGI it will perform similarly to the 2L F/O at MGI. The width of cross section required is approximately 50m, which would require significant land acquisition, and a substantial structure would also be required. The rough order cost of this option is approximately \$60-70M, excluding railway relocation costs.

This is the only option that provides grade separation at MGI compatible with an at-grade configuration at the SH2/SH29 intersection. If future grade separation of SH2/SH29 is required it is likely that some if not all of the MGI structure would need to be deconstructed to appropriately align SH2.

### 1.7 Conclusion and Recommendations

Of the three corridor options investigated, retaining SH2 within the existing Maunganui Road corridor was identified as the preferred. From this, 19 options for improving both the MGI and SH2/SH29 options were considered, with four preferred options being assessed further. The four options vary in performance, sensitivity to rail movements, cost and land impacts.

It is recommended that all four be taken forward for additional scoping investigations, including traffic modelling, geometric design and developing cost estimates, before a preferred option or options are confirmed for Scheme Assessment level study.

## 2 Introduction

The NZ Transport Agency (NZTA) has engaged Beca Infrastructure Ltd (Beca) to undertake an investigation to identify potential options for future improvements at the SH2/SH29 and Maunganui Road/Girven Road intersections on SH2 in Tauranga. Options for this section of SH2 also need to take into account the interaction with the Mangatawa Interchange on the Tauranga Eastern Link.

## 3 Purpose of this Study

The purpose of this study is to identify options to provide a transport solution for SH2 in the Eastern Corridor between Hewletts Road and the Mangatawa Interchange. This would enable further refinement of the potential options in subsequent studies.

## 4 Background

The SH2 corridor in Tauranga provides a direct link between the Tauranga Eastern Link (TEL) and Port of Tauranga. The TEL is a Road of National Significance, currently under construction with opening programmed for 2015. As part of the TEL, minor improvements are proposed to the intersection of SH2 and SH29. However if the Maunganui/Girven Road intersection is improved there is a concern about the ability for the SH2/29 intersection to cater for the change in traffic flows.

The MGI intersection has been identified as a high priority for improvement by NZTA, and a number of options for improvement have been identified and investigated in both Project Feasibility and Scoping investigations. The preferred option identified in the MGI Scoping Study is a two lane SH2 to SH2 flyover over an at-grade signalised intersection but this was subject to having a better understanding of the effects at the SH2/SH29 intersection.

To investigate options for improvement of the SH2/SH29 intersection, a Project Feasibility Study was undertaken (*SH2/SH29 Te Maunga Intersection – Project Feasibility Report, Beca January 2012*). The PFR identified a number of possible options for the intersection and recommended that these be further investigated in conjunction with the MGI study. It also recommended that the study area include the Mangatawa Interchange and Truman Lane/SH29 roundabout.

A more detailed assessment of options for the SH2 corridor from Hewletts Flyover to Mangatawa Interchange was then undertaken, including consideration of alternative corridors. A number of potential transport solutions have been identified and assessed.

This report covers the findings of these investigations.

### 4.1 Previous Reports/Investigations

#### 4.1.1 Maunganui Road/Girven Road Intersection

- *Girven Road – Maunganui Road Project Feasibility Report – August 2010*
  - Preferred option of 2 lane flyover over either signalised intersection or roundabout
- *Maunganui Road – Girven Road Intersection Improvements Scoping Report – June 2011*
  - 7 options considered, 4 options recommended for further investigation:
    - Signalised roundabout
    - Hamburger intersection

- Flyover with at-grade signalisation
- Flyover with at-grade roundabout
- MGI Scoping Report Addendum – January 2012
  - Further assessment of options including an additional option of at-grade signalisation. Outcome was that the flyover options were the only ones suitable for further investigation, with the remaining options discarded due to issues with performance, safety and ability to deliver on NZTA's performance objectives.
  - It was recognised however that the solution to the capacity issues at the SH2/SH29 intersection may influence the preferred option for the MGI intersection.

#### 4.1.2 SH2/SH29 Intersection

- SH2/SH29 Te Maunga Intersection Project Feasibility Report – January 2012
  - Traffic modelling indicated that with improvements at MG, the SH2/SH29 TEL roundabout configuration would operate at a LOS F in the AM peak when the TEL opens in 2016
  - Considered signalling a displaced right turn and a SH2 – SH2 two lane flyover over a signalised intersection
  - Recommended that NZTA investigate further options in conjunction with MGI and the Mangatawa Interchange

#### 4.1.3 MGI and SH2/SH29 Intersections

- SH2/SH29 Te Maunga Intersection Options Study – Scope and Objectives Report, February 2012
  - Provided an overview of long term options and traffic data for use in an Option Workshop that was to consider wider corridor network changes.

## 5 Description of Problem

### 5.1 Existing Situation

The MGI currently consists of a two lane roundabout which experiences significant delays throughout the day. Delays are generally at their worst during the evening peak on the southbound approach on Maunganui Road, with queues often extending to the Hewletts Road flyover.

The SH2/SH29 intersection consists of an un-signalised two lane, three arm roundabout, located at the north western end of the TEL. Modelling indicates that this intersection is currently operating at a LOS B, with the approaches operating at LOS C or better.

The MGI and SH2/SH29 intersection are located within approximately 800m of each other, therefore any changes or improvements to one intersection are likely to impact on the operation of the other. The proximity of the East Coast Main Trunk Line (ECMT) to both intersections also negatively impacts on the intersection operation. The frequency of trains along this corridor is up to four per hour during the day and this is predicted to increase in the future. Train length is also likely to increase.

The Mangatawa Interchange is 1.7km south of the SH2/SH29 intersection, and will be constructed as a grade separated diamond interchange. Its close proximity to the SH2/SH29 intersection may cause some weaving issues along the SH2 corridor.

The area of influence encompassing all three intersections is shown in Figure 5.1 below.



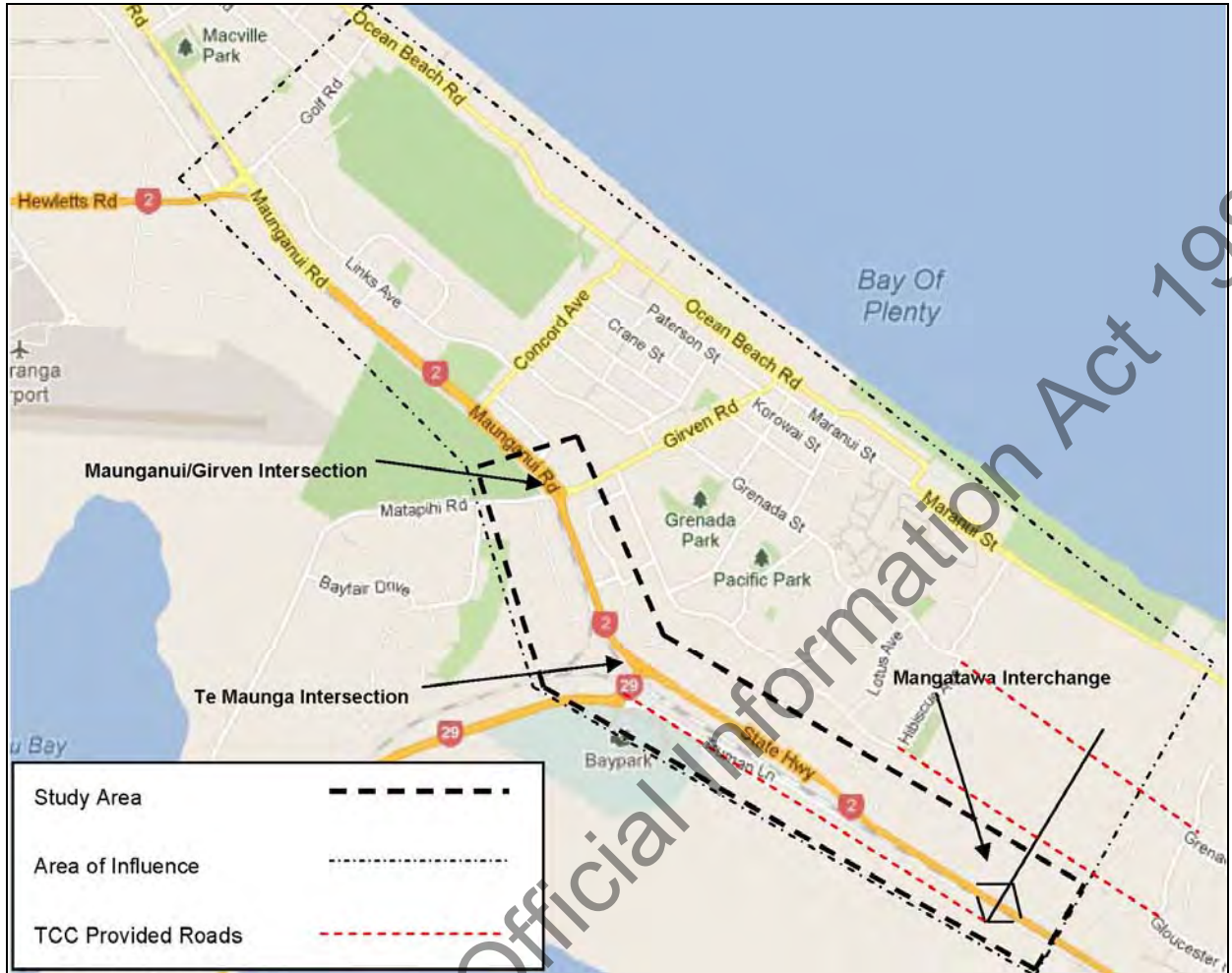


Figure 5.1: Study Area and Area of Influence

## 5.2 Site Constraints

The current land use for the area is shown in Figure 5.2 below. The road corridor between SH2/SH29 intersection and MGI is constrained to the west by the existing East Coast Main Trunk Line rail corridor, and residential property and the Bayfair shopping centre to the east. There is a large area of land designated as an alternative rail corridor designation immediately west of Owens Place. This land was designated as rail corridor in the early 1980s for the purpose of relocating the rail to enable widening of SH2. The designated land is currently owned by NZTA.

The Matapihi Peninsula is currently primarily zoned as rural, with some residential and commercial zoning near the MGI intersection. Matapihi Road provides the single entrance to the peninsula, and demand on this link may increase due to the small scale development potential in this area.

The Baypark Stadium and the Tauranga Event Centre on the corner of the Truman Lane/SH29 roundabout have a capacity of 19,800 and 4,000 respectively, affecting the operation of this roundabout and SH2/SH29 when events are held.

The section of industrial land between the rail corridor and Truman Lane near Baypark is currently under the administration of the Office of Treaty Settlement, which makes securing land to accommodate improvements difficult and time consuming.

The Bayfair Shopping Centre adjacent to MGI is a significant attractor throughout the day. Expansion of the current centre has been included in the current City Plan review, and any future development of the site is likely to have a significant impact on the operation of MGI. A new suburban bus interchange is also proposed on or near the Bayfair site, which will also impact on MGI, particularly with regards to bus movements.

### 5.3 Forecast Performance after TEL Opened

Traffic modelling indicates that the delays at MGI in its current form will worsen in 2016 once TEL is opened. Some movements are predicted to have a LOS F with delays in excess of 5 minutes and up to 3km long queues predicted for the evening peak.

Minor capacity improvements will be made to the SH2/SH29 intersection as part of the TEL project. These will involve the introduction of a left turn slip lane on the SH2 northbound approach and the change from a left lane to a share left-right lane on the SH29 approach. Assuming no improvements are made on the MGI, the TEL layout at SH2/SH29 satisfies the desired performance criteria for the short term. However, recent assessments indicate that if improvements are made at MGI, the proposed SH2/SH29 configuration will be operating at capacity by 2016, with delays in excess of three minutes and queues of approximately 1 km in length.



Figure 5.2: Existing Land Use

## 6 Corridor Identification and Assessment

A workshop with NZTA, TCC, Beca and independent industry experts was held in February 2012 to identify and assess a number of options for the future form of the SH2 corridor between Mangatawa Interchange and the Hewletts Flyover. The compatibility of short term options with these longer term options was also considered. The outcome of the workshop is presented in the minutes provided in Appendix A.

The *SH2-SH29 Te Maunga Intersection Options Study – Scope and Objectives Report*, Beca February 2012 was prepared for use in the workshop and included a summary of the options, recent studies and observations, as well as the outputs from a traffic assessment undertaken on the area. The full report is in Appendix B.

For the purposes of obtaining the most useful traffic flows and comparison of options, an assumed baseline option of 2-lane median divided SH2-SH2 flyovers at both MGI and SH2/SH29, with weaving between the intersections allowed was used. It was assumed that this option was constructed by 2016 at a cost in the order of \$70-80M. Property purchase of at least the frontages of residential properties between SH2/SH29 and MGI to the north side of the corridor would be required.

### 6.1 Corridor Options

In general, three corridors were considered potentially feasible for use as the transport corridors as shown in Figure 6.1 below:

- Use the alternative rail designation south of Owens Place for a new road link;
- Utilise the existing SH2 corridor;
- Utilise the Truman Lane corridor.

A corridor that could minimise land purchase is the alternative rail designation behind Owens Place. This designation is located from SH29 to Matapihi Road behind Owens Place, across the golf course and runs parallel to the existing rail corridor to the west of MGI. This rail designation has been in place since the 1980s, and is located on land owned by NZTA.

The existing SH2 corridor extends between the SH2/SH29 and Maunganui Road/Girven Road intersections. It is constrained to the north by residential property and the south by the ECMT corridor. The corridor currently caters for four traffic lanes, however if widening of the road carriageway is required to accommodate future improvements land purchase would then be necessary.

The Truman Lane corridor runs along Truman Lane parallel to SH2, from the Mangatawa Interchange to SH29. The primary opportunity for utilising this corridor would be to enable separation of SH29 traffic from SH2 traffic along this section, helping to reduce demand on the SH2/SH29 intersection thereby reducing the need for a large intersection at SH2/SH29.



Figure 6.1 Corridor Options

The options considered in the workshop proposed improvements in line with one of the following:

1. Use of Matapihi Corridor rail designation south of Owens Place for an alternative SH29 corridor or a Matapihi link road
2. Utilise the existing Maunganui Road corridor (Maunganui Corridor)
3. Utilise Truman Lane (Truman Corridor)

The key objective of the workshop was to determine the possible future form of the SH2 corridor. An assessment of each option considered issues such as land purchase, cross sections (four or six lanes), weaving issues, planning issues and potential costs.

## 6.2 Use of Matapihi Corridor for new road corridor

The use of this corridor for roading purposes would require the rail designation changed to a road designation.

Introducing a road into the Matapihi Corridor would require a greater width than that currently designated, which would require land purchase. A new road from SH29 to Matapihi Road would divert traffic via the Matapihi Road approach to MGI, which would need to be significantly improved to cater for the additional volumes. It would also shift the right turn conflict at the SH2/SH29 intersection to a straight through conflict with SH2 traffic at MGI. The layout of the Matapihi Road and Owens Place intersections would be challenging, and a new level crossing over the rail from SH29 would be required.

### 6.2.1 Planning Assessment

The land in the rail corridor to the south of Matapihi Road is legally described as SO 52642 (7195M2) SO 53214 ( 2.4010ha plus 84m2 ) and SO 52644 ( 6.0135ha plus 9515m2). The corridor was designated for rail purposes in the Mount Maunganui Borough District Scheme in the early 1980s. The latest gazette notice for that area is dated September 1993 and declares the land "to be set apart for the purposes functioning indirectly of a road and shall remain vested in the Crown".

The Proposed District Plan has this area Designated for *Proposed Railway Purposes*. The land was acquired by the National Roads Board for the relocation of the rail line as a result of proposed widening of Maunganui Road .

It is likely that a new Designation (for road) will get an adverse reaction from the local community due to the following effects;

- The traffic flow and intersection form of the state highway and Matapihi Road is likely to have an adverse effect on the ease of flows into the Owens Place Commercial Zones and into and out of Matapihi.
- The new road will present greater noise and a loss of amenity for the residential sections that adjoin the corridor.
- It is possible that some of the public reserves held under the Reserves Act will be taken and that will also be viewed as a loss of amenity for the local neighbourhood.
- The journey to school for some children may be perceived as more unsafe given the likely mixing of state highway traffic with local traffic over that portion of Matapihi Road.

### 6.3 Utilise the existing SH2 Maunganui Road corridor

The Maunganui Road corridor between the SH2/SH29 intersection and MGI is currently a four lane carriageway restricted by residential property on the northern side and the ECMT rail track on the southern side. Options along the existing corridor are likely to involve significant at-grade changes at each intersection, flyovers, or a combination of both. In order to facilitate these improvements and provide sufficient capacity it is expected that the corridor would need to be widened to approximately six lanes, with additional widening at the intersections and to accommodate structures. This would require land take from either the residential properties or the rail corridor, with land also possibly required from Bayfair. The railway could either be relocated to the western boundary of the existing corridor to release some land for the road widening, or fully relocated to the alternative railway corridor.

The proximity of the two intersections to each other restricts the options available for the existing corridor. If flyovers were to be introduced at either intersection traffic would need to be separated from at-grade traffic for this distance due to a lack of space for safe weaving manoeuvres. This would increase the cross section required due to the need for median and side barriers.

The proximity of the rail to the road corridor has a detrimental effect on the operation of both intersections. Grade separating local traffic from state highway traffic would alleviate this to some extent, however careful consideration would need to be given to the amount of queuing space at-grade to minimise the impact of the railway on local traffic.

Relocating the ECMT into the Matapihi Corridor would provide sufficient additional space for improvements to both intersections without the need to encroach on private residential property or Bayfair. It would also separate the rail a greater distance from the MGI intersection, reducing the impact on the operation. The alternative rail designation is generally of sufficient width to enable at grade rail duplication, subject to some slight widening potentially being required across the golf course land.

#### 6.3.1 Planning Assessment

The planning implications associated with retaining SH2 within the existing Maunganui Road corridor are likely to be relatively manageable when compared to the other options. Social and environmental effects such as the impact of increased noise and light pollution would need to be mitigated as required and potentially adverse effects on the Tauranga City Airport and its flight path should be carefully considered.

If the proposals extend outside of the designated road corridor then a Notice of Requirement for an Alteration to Designation would be required.

The planning implications of relocating the rail into the Matapihi Corridor are likely to be similar to those outlined in Section 6.2.1. The existing designation also traverses the golf course to the north of Matapihi Road, however there is likely to be some opposition to any proposal that affects the golf course and associated driving range. A review of the driving range lease agreement would also be required.

### 6.4 Relocate SH2 – SH29 along Truman Corridor

Relocating State Highway 29 onto Truman Lane, accessing SH2 via the Mangatawa Interchange would remove the need for a major intersection at Te Maunga. A service lane to provide suitable access to commercial properties would be required from the Mangatawa Interchange through the MPBI land and along the existing Truman Lane, joining SH29 at the existing, slightly modified roundabout.

This option would enable a freer flowing SH2 corridor because of the reduced number of intersections on it; however it would negatively impact on the properties along Truman Lane and at the Mangatawa Interchange. It would also mean running SH29 parallel to SH2 for approximately 1km which was previously served by one state highway, which is likely to have asset management implications.

This option may require the use of the OTS land between Truman Lane and the ECMT corridor. The planning implications of this option are outlined below.

#### **6.4.1 Planning Assessment**

##### **a. Use of OTS Lands at SH2/SH29 for Road**

The Office of Treaty Settlements (OTS) land at Te Maunga may be required for some of the roading options. Gaining lands from the OTS is a difficult process that was investigated in the Tauranga Northern Arterial project. The land in question has to be proven as necessary with no other land being able to serve the same purpose.

NZTA would have to obtain agreement of the mandated claimant group to the proposed works and the use of the land-banked land.

All the other lands required for the project must have unconditional sale agreements.

##### **b. Use of the Industrial Zoned lands at Truman Lane for Road**

Realigning SH29 along this corridor would require acquisition of industrially zoned lands owned by Mangatawa Papamoa Block Incorporated (MPBI). This property is to the north of the Tamapahore Marae of Nga Potiki. This hapu has had a significant amount of land taken from them over the past century from numerous government departments and the city council for a range of activities including the state highway, railway line, sewerage treatment plant, refuse station etc.

In that climate any further lands to be taken for a public work will not be greeted well. Whilst MPBI may accept and understand the need and reasoning for the new highway route the local hapu members, particularly those that live on the marae, are likely to provide strong opposition to this option.

#### **6.5 Recommendation**

The above assessment indicates that whilst all of the corridor options described above have engineering and planning challenges, those associated with retaining the use of the SH2 corridor along Maunganui Road are less substantial than relocating the road into the alternative railway designation or along Truman Lane. It is recommended that the existing SH2 corridor is used for providing the primary road transport route and that options for improving the intersection be considered on that basis.



## 7 SH2 Intersection Improvement Options

Based on the assessment described in Section 6, it was apparent that the solution for the road network should focus on intersection improvements within the current SH2 corridor and that further consideration be given to relocating the railway to the alternate corridor. The options summarised below are described in more detail in Appendix C.

### 7.1 MGI – SH2/SH29 Intersection Options

A further option identification process has identified the following potential layouts at each of the intersections and has then considered their compatibility as combined options.

#### 7.1.1 Maunganui Road/Girven Road Layout Options

- Traffic Signals (TS) (Option 1)
  - Fully signalised at-grade intersection
  - Interim solution for future grade separation
  - Performance compromised by rail
  - Limited residential property required
- Displaced Right Turn (DRT) (Option 2)
  - Right turn from Girven Road redirected through Bayfair Carpark onto SH2, improving performance of MGI
  - High land take from Bayfair required
  - Additional stop line on SH2 to the west of MGI required
- Two lane flyover (2L F/O) (Option 3)
  - Two lane flyover over signalised intersection
  - Potential weaving issues with SH2/SH29 intersection
- Two lane “Y” flyover (Option 4 and Option 5)
  - Outer lane – two lane flyover branching out towards SH2/SH29 with eastbound arm over the nearside lane.
  - Requires all property access to be removed.
  - Middle lane – two lane flyover branching out towards SH2/SH29 with eastbound arm over the offside lane.

#### 7.1.2 SH2/SH29 Layout Options

- Tauranga Eastern Link Roundabout (TEL RAB) (Option A)
  - Minor improvements to the existing roundabout consisting of introduction of left turn slip lane from SH2 to SH29 and double right turn from SH29 to SH2 (east)
  - Poor performance if MGI significantly upgraded.
- Displaced Right Turn (Option B)
  - Performance compromised by rail
  - Minimal land take required
  - Poor lane continuity with some MGI options.
- Traffic Signals (Option C)
  - Replacement of roundabout with signalised at-grade “T” intersection
  - Performance compromised by rail
  - Weaving issues with MGI

- Performance no better than TEL roundabout.
- Two lane flyover (2L F/O) (Option D)
  - Two lane SH2 – SH2 flyover over signalised intersection
  - SH29 performance compromised by rail
- Diamond Interchange (Option E)
  - Full diamond interchange
  - Extended bridge to grade separate rail

The options at each intersection were combined to determine their appropriateness for further investigation. All but four were discarded for a variety of reasons including poor performance, safety concerns and/or high land purchase requirements, as summarised in Table 7.1 below:

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Option	MGI					SH2/SH29					Suitable for further analysis	Comments
	TS	DRT	2LF/O	Y F/O OUTER	Y F/O MID	TEL RAB	DRT	TS	2L F/O	DIAMOND I/C		
1A											N	Poor performance
1B											Y	Low cost, at-grade, potentially interim solution
1C											N	Poor performance compared to 1A and 1B
2A											N	High land requirement from Bayfair
2B											N	High land requirement from Bayfair
2C											N	High land requirement from Bayfair
3A											N	Poor lane continuity
3B											N	Poor lane continuity
3C											N	Poor lane continuity
3D											Y	Complete separation and no weaving or lane continuity issues
3E											Y	Complete separation and no weaving or lane continuity issues
4A											N	High land requirement
4B											N	Safety risk and land requirement
4C											N	High land requirement
4D											N	High land requirement
5A											N	Safety concerns
5B											Y	Complete separation, no weaving issues and SH2 unobstructed flow
5C											N	Performance issue and safety concerns
5D											N	Poor lane continuity

Table 7.1: Intersection Combination Options

The assessment of performance has generally been based on the previous PFRs, scoping studies and comparison with other options, rather than specific modelling. Significant land would be required from Bayfair for a DRT at MGI regardless of the proposed layout at SH2/SH29. Purchasing land from Bayfair is likely to be difficult and time consuming, therefore all of the combined options that include the MGI DRT have been discounted from further analysis.

Poor lane continuity has been identified as an issue for a number of options for some of the MGI 2-lane flyover options due to the limited weaving space available between the intersections.

Option 4 consists of a Y flyover at MGI with the nearside lane used for the outer arm, and various arrangements at SH2/SH29. This layout would require purchase of all of the properties on Maunganui Road between Girven Road and SH2/SH29 as their access would be unavailable. Given the high cost and potential planning issues associated with this all Option 4 sub-options have been discarded.

Option 5 consists of a Y flyover at MGI with the outer flyover arm positioned over the middle lane of the eastbound carriageway. The best performing of the sub-options is Option 5B, which consists of the Y flyover at MGI and a DRT at SH2/SH29. The remaining sub-options either perform worse than this option, have poor lane continuity, or a combination of both, and have therefore been discarded.

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## 8 Preferred Option Assessment

The preferred options (1B, 3D, 3E and 5B) have been further assessed as outlined below. All of these options have assumed that the railway line remains in its existing corridor, therefore they assume private property needs to be purchased. However, the performance excludes the negative effect on traffic when the trains cross Matapihi Road and SH29.

### 8.1 Option 1B - TS at MGI, Displaced Right Turn at SH2/SH29

#### 8.1.1 Previous Data/Performance

Previous traffic modelling has been undertaken individually for an at-grade signalised intersection at MGI and for a Displaced Right Turn (DRT) at SH2/SH29. Based on modelling undertaken in 2012 for traffic signals at MGI, the overall LOS is E in the AM and PM peaks under forecast 2031 traffic volumes. However right turn movements from SH2 to Girven Rd are nearly LOS F. This does not factor in the effect of the rail at the Matapihi approach which would drop the overall intersection performance to LOS F.

As outlined in the 2010 MGI PFR, a staged option with traffic signals in 2016 and a flyover in 2026 had NPV benefits of around \$120M.

Based on the 2011/12 Te Maunga PFR, the traffic modelling for the Displaced Right Turn indicates that the intersection may operate at LOS C under 2031 traffic volumes, without taking into account the impact of the railway crossing. Similarly to MGI, this performance will be compromised by rail crossing increments across SH29. The PFR determined NPV benefits of around \$10M.

It is noted that the traffic modelling was undertaken for both intersections in isolation. To gain a better understanding of the combined performance and value of benefits, the intersections would need to be modelled as a pair.

Although the traffic modelling suggests that there is an inadequate LOS in 2031, there is potential for this option to be considered as an interim solution to building a flyover at MGI in the future. However there may not be sufficient queue space for vehicles turning right from SH2 onto SH29 due to the performance of the SH2/SH29 intersection being compromised by the rail.

#### 8.1.2 Physical Impact

The cross sectional width of this option is small relative to the other preferred options. The impact on the adjacent private properties is likely to be small. The proposed road alignment is expected to fit within the existing road corridor with the exception of the two intersections where the road may impede on private property, Bayfair and the rail corridor.

#### 8.1.3 Enhancement Opportunities

The at-grade signalised intersection at MGI was modelled as having as many lanes as geometrically possible; therefore it is not possible to make the intersection larger to improve performance. The performance of both intersections may however be enhanced by shifting the rail to the alternative Matapihi corridor.

#### 8.1.4 Cost Estimate

The expected cost of this option is likely to be in the order of \$25M excluding any rail relocation or property purchase costs.

## 8.2 Option 3D – 2 Lane F/O at MGI, 2 Lane F/O at SH2/SH29

### 8.2.1 Previous Data/Performance

A 2 lane flyover option over a signalised intersection was modelled in the 2010 MGI PFR. Based on the report the 2 lane flyover option had NPV benefits of around \$130M. A 2 lane flyover of the SH2/SH29 intersection was assessed in the 2011 Te Maunga PFR. Based on the report the NPV benefits were around \$30M.

The SH2 traffic would be unaffected by the railway movements but the at-grade elements of the intersections would be. This option does not remove the conflict between SH29 traffic and the railway line, which is likely to become an issue in the future when train frequencies and traffic volumes increase.

### 8.2.2 Physical Impact

The road reserve width required to accommodate this option is approximately 43m for the majority of the length of the alignment. The impact of the proposed road alignment on adjacent properties depends on whether the rail is duplicated within the existing corridor or the alternative Matapihi corridor. If the rail is duplicated within the existing corridor, the proposed road alignment is expected to extend approximately 4m onto adjacent residential properties. Although this generally only affects the frontage of the properties, in some cases the entire property may need to be acquired. If the rail is duplicated in the Matapihi corridor, there will be a very minimal impact on the adjacent properties because the road can be accommodated on the acquired railway land. There is not likely to be any physical impact on Bayfair. However, there are likely to be impacts on the properties adjacent to the alternative rail corridor because of the relocated railway as outlined in Section 6 above.

### 8.2.3 Enhancement Opportunities

The potential property impact could be reduced by locating the rail within the Matapihi corridor. Increased intersection performance is also possible if the existing rail is relocated to the Matapihi corridor.

### 8.2.4 Cost Estimate

The expected cost of this option is likely to be in the order of \$70-80M, excluding railway relocation costs.

## 8.3 Option 3E – 2 Lane F/O at MGI, Diamond IC at SH2/SH29

### 8.3.1 Previous Data/Performance

This option achieves grade separation of local and SH2 traffic at MGI and SH2/SH29 and also grade separates SH29 over the railway, removing the conflict between trains and all state highway traffic. The performance is expected to be similar to Option 3B, with the additional benefit of reduced impact from the railway operation.

Based on the 2010 MGI PFR the 2 lane flyover option had NPV benefits of around \$130M. Based on the 2011 Te Maunga PFR the NPV benefits were around \$30M.

### 8.3.2 Physical Impact

The 2 Lane Flyover at MGI is similar to Option 3D, therefore the land impact of the flyover will be similar. There will likely be private property required for the Diamond Interchange at SH2/SH29. The on/off ramps of the interchange would likely impede on the adjacent properties near the

interchange. This includes the church which is located about 60m north of the existing SH2/SH29 roundabout.

It is noted that if the single railway track adjacent to the highway is relocated to the boundary and the duplication occurs in the alternative corridor then apart from the widening at the SH2/SH29 intersection, the majority of this option may be located on railway land rather than requiring private property.

### 8.3.3 Enhancement Opportunities

Further design would be necessary to determine if the impact on private property at Te Maunga can be reduced, especially if the railway line is relocated.

### 8.3.4 Cost Estimate

The expected cost of this option is likely to be in the order of \$80-100M excluding any rail relocation costs.

## 8.4 Option 5B – Y Flyover at MGI (to middle lane eastbound), DRT at SH2/SH29

### 8.4.1 Previous Data/Performance

There has not been any traffic modelling of the “Y” flyover at MGI, although it is anticipated that it will perform similarly to the 2 lane flyover option that has been modelled in the 2010 MGI PFR. Based on that report the 2 lane flyover option had NPV benefits of around \$130M.

As noted for Option 3E above, based on the 2011/12 Te Maunga PFR, the traffic modelling for the DRT indicates that the intersection would operate at LOS C under 2031 traffic volumes. The PFR determined NPV benefits of around \$10M.

### 8.4.2 Physical Impact

The width of the cross section required for this option is approximately 50m for the majority of the length of the alignment. The impact of the proposed road alignment on adjacent properties depends on whether the rail is duplicated within the existing corridor or the alternative Matapihi corridor. If the rail is duplicated within the existing corridor, the proposed road alignment would extend approximately 11m onto the adjacent properties. All of these properties would need to be acquired. The front row of car parks at Bayfair would also need to be acquired. If the rail is duplicated in the Matapihi corridor, some of the adjacent properties may still require acquisition however there is not likely to be any physical impact on Bayfair.

If the existing rail and any duplication is located in the alternative corridor then the existing 20m railway corridor would be available for the road widening and private property purchase will be reduced.

This is the only option that provides grade separation at MGI compatible with an at-grade configuration at the SH2/SH29 intersection. If future grade separation of SH2/SH29 is required it is likely that some if not all of the MGI structure would need to be deconstructed to appropriately align SH2.

### 8.4.3 Enhancement Opportunities

To reduce the impact of the proposed road alignment on adjacent properties and Bayfair, the rail could be shifted to the Matapihi corridor. This would allow the new road to utilise all of the rail land

minimising the impact on adjacent properties. The relocated of the railway would also improve the performance of the MGI intersection.

#### **8.4.4 Cost Estimate**

The expected cost of this option is likely to be in the order of \$90M-100M excluding any rail relocation costs.

#### **8.5 Summary**

The four options under consideration vary in performance, sensitivity to railway movements and location, cost and land impact. It is expected that the at-grade solution would provide a reduced level of performance and would need to be upgraded within 10-15 years.

Option 1B is a low cost interim solution that minimises land impact. Relocation of the railway reduces the risk of queuing on the highway when the train is operating.

Option 3D is a relatively high cost long term solution. It provides good separation of the SH 2 traffic from local traffic and the SH 2 traffic is unaffected by the railway operation at MGI. The SH 29 traffic would be affected by the railway movements as it does now. Options to grade separate the SH 29 traffic from the railway in the future would be problematic.

Option 3E is a relatively high cost long term solution. It provides good separation of SH 2 traffic from local traffic and also grade separates SH 29 traffic from the railway.

Option 5B is a moderate cost, long term option, although a 50m wide corridor is required to accommodate the additional bridge width. This is the only option that provides grade separation at MGI compatible with an at-grade configuration at the SH2/SH29 intersection. If future grade separation of SH2/SH29 is required it is likely that some if not all of the MGI structure would need to be deconstructed to appropriately align SH2.

Relocating the rail to the Matapihi corridor would reduce the impact of the intersection improvements on the adjacent properties and also improve the performance of the intersection options at MGI. Further analysis is required to determine if the benefits of reduced land impact and improved intersection performance outweigh the cost of relocating the rail to the Matapihi corridor.



## 9 Conclusion and Recommendation

It is recommended that the existing State Highway 2 corridor along Maunganui Road be chosen as the preferred corridor for any improvements at the MGI and SH2/SH29 intersection. Relocating either SH2 or SH29 into an alternative corridor is expected to have significant land purchase and/or planning implications. Relocating the railway line into the alternative designated railway corridor behind Owens Place would enable the current rail corridor to be utilised for the roading improvements rather than requiring significant private property acquisition.

Of the options identified along the existing corridor, four have been deemed suitable for further investigation. These options provide potential solutions that minimise required land acquisition, safety concerns primarily associated with lack of weaving space and optimise performance. It is recommended that further assessment be undertaken on the four preferred options to confirm their feasibility for progressing to scheme assessment. This assessment should also include consideration of the potential future staging of intersection improvements.

It is also recommended that further investigations are made into the feasibility and costs associated with relocating the ECMT into the alternative rail designation.

Appendix A

Workshop Summary and  
Drawings

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## Minutes of Meeting

### Te Maunga Workshop

Held 27 February 2012 at 10am

at Beca, L2 Executive Meeting Room

**Present:** Greig Stephen s 9(2)(a)  
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**Distribution:** All above,

Item	Action
<p>1 Objective of the Study</p> <p>1.1 Scope</p> <ul style="list-style-type: none"> <li>Future proof MGI to accommodate form and function of the network.</li> <li>Base option – best option to date (SH2-SH2), flyover, expensive, no weaving.</li> <li>New options to be tested against these options.</li> <li>Significant property cost due to number of lanes required (\$5-10M).</li> <li>Previously looked at MGI and Te Maunga intersections in isolation.</li> </ul>	
<p>1.2 Purpose of the Workshop</p> <ul style="list-style-type: none"> <li>Identify alternative options for same or less cost and determine likely property impact.</li> <li>Consider possible solutions to both intersections.</li> </ul>	
<p>1.3 Background</p> <ul style="list-style-type: none"> <li>Refer briefing document.</li> <li>Discussed 'area of influence':               <ul style="list-style-type: none"> <li>Intersection changes have potential to change the flows around the network.</li> </ul> </li> <li>Discussed TUNS strategy, looking at the wider network.</li> <li>TEL has a big impact on this area of the network.               <ul style="list-style-type: none"> <li>TEL allows space in median for SH2-SH29 flyover.</li> </ul> </li> <li>MGI options – recommended SH2-SH2 flyover by 2016, but causes problems at Te Maunga.</li> <li>Corridor serving a number of functions.</li> <li>Discussed TTM assumptions for wider network.</li> </ul>	

- Four-laning Maungatapu.
- s 9(2) highlighted that SH2 is given priority over the other roads. What are the assumptions for SH2 four-laning through to Tauriko.
  - Modelling assumed improvements at Barkes Corner, no four laning in some places.
- s 9(2)(a) raised the importance of MGI – national priority.
  - Linkage at Te Maunga identified, need to understand implications at Te Maunga.
  - NZTA require confidence in options moving forward.
  - NZTA require confidence that the base (flyover) or at-grade solutions can provide benefits.

## 2 Option Identification

- Consider a number of options against a baseline option.
- Description provided of what baseline option is.
- s 9(2) (Opus) asked about barriers on the flyover.
  - MGI on its own without median may be okay without median barrier.
  - 1700m of no overtaking requirements is long.
  - Height approximately 8m high over intersections.
  - 200m between flyovers where they'll be at-grade is short.
  - Highlighted property access issues.
- s 9(2)(a) mentioned that Hewletts-SH2 is a flyover.
- s 9(2) (Opus) asked about grades – more detailed design – highlight need for property access.
- s 9(2)(a) mentioned railway line and asked about the possible movement of railway.

### 2.1 Constraints and Assumptions

- s 9(2) went through constraints.
- s 9(2) talked about pink alignment – too tight, KiwiRail previously advised that they wouldn't relinquish current alignment, alternative corridor land owned by NZTA.
  - Designated in 1980s as rail. Keep in consideration with options.
  - Bayfair expansion including Arataki Transport Centre in same locality.
  - Matapihi Road (single entrance)
    - Zoned rural/residential
    - Small scale development potential
  - Owens Place – industrial to commercial swap. Pressure to expand.
  - Baypark and TECT Arena.
  - OTS land.
  - Grenada Park land use increasing.

### 2.2 Table and Discuss Options

- s 9(2) highlighted options identified in internal workshop.

■ Option 1

- Green line elevated over blue and SH2.
- Red ramps over blue – SH2.
- Local traffic – blue goes about red and green and looks to off ramp at Maungatapu.
- MGI – 2 lane flyover.
- s 9(2)(a) asked about cost - > baseline cost.

■ Option 2

- Reduce lane requirement between MGI and Te Maunga – use rail corridor.
- Assumes can get designation and correct width.
- Additional at-grade rail crossings.
- s 9(2)(a) asked about the requirement of houses – identified no need for houses.
- s 9(2)(a) asked about the requirements for the footprint at MGI – changes the movement.
- Identification at risk for accommodating at-grade at MGI.
- NT asked about an indication of land through corridor, tight to fit in four lanes in current designation.
- Still going to have an access problem for properties.
- AS highlight that can potentially fit four lanes, six lanes would definitely need property.
- AM asked about consenting issues with flyovers, noise barriers etc.
- PK mentioned potential impacts on flight paths and sight lines.
- AS asked how much non-structure between intersection.
- AS raised that RT SH2-SH29 is still at grade.
- DT mentioned what strategy of vehicles at level crossing.
- AS asked whether one of the tracks is live.
- AS mentioned the efficiency of SH2 in this option. Key driver is SH2 efficiency, getting rid of RT movements.

■ Option 3

- Railway tracks buried.
- s 9(2)(a) talked about how the option works.
- Discussed local road weaving between the option.
- PK identified that lowering lines is a network issue.
- Expected high cost.
- Rail gets priority over road and already creates problems, only going to get worse.

■ Option 4

- Use of rail corridor instead of the properties.
- Hard sell for KiwiRail.
- s 9(2)(a) asked about the potential of doing something to improve the rail alignment – would require OTS land.

- Roundabout may need to be raised to get over the railway line.
- Improvement of MGI and SH29 as remove conflict with rail line.
- Improved benefits at SH29, what are the benefits on SH2?
- Railway alignment may have constrained width, may have issues with this.
- What is the cost of relocating the rail? Is there room for tracks? May slow MGI process down.
- Question about splitting railways on curves, may need more OTS land.
- PK highlighted Baypark and TECT Arena access issues with this option.
- Option 5
  - Diamond interchange at Te Maunga.
  - Some movements can't be accommodated due to ramp conflicts.
  - Option still takes the land, maybe more. Church at CH1100.
  - Can get rid of the roundabout at Truman Lane.
- Option 6
  - Baseline option dragged over into railway criteria.
  - Potential issues with flight path.
  - May conflict with Hewletts Flyover.
  - Protects SH2 corridor.
  - Likely to cost a little bit more.
  - TCC owns land between MGI and alternative rail corridor.
  - Alternative option of putting it down the existing rail corridor.
- Option 7
  - Intention to get rid of Te Maunga intersection.
  - Roundabout could move location.
  - Truman Lane access issues so can't use as SH29.
  - Issues with routing from Baypark and TECT Arena (DT).
  - Questions how people from Marae will get to Mount (CR).
  - Left in at Te Maunga not included due to issues – high speed traffic from SH2 with railway (TH).
  - Bigger network impact of options.
- Option 8
  - DRT at Te Maunga has a decent LOS, but has stops on high speed road (safety issues). (DT).
  - At-grade at MGI – LOS D/E at 2031.
  - Can get better SH LOS but to detriment at Girven and Matapihi. (DT).
  - Four arm signalised (MGI) going to have low LOS around 2021 (DT).
  - Haven't looked at the weaving between MGI and Te Maunga, people can weave between, PT routing may be a problem at MGI.
  - Te Maunga ok, MGI likely to still be a problem.
  - Big land requirement.

- Question of life of options.
- Rail line still at-grade.
- Option 9
  - Signalled T at MGI, maybe acceptable for at-grade at Te Maunga (DT/TH).
  - Same number of railway crossings.
  - Questions about travel times.
  - Potential for extension of pedestrian underbridge.
  - Talk about rail movements on Matapihi Bridge (potentially 100 movements a day) – no desire to invest money in this (no plans to do anything). (PK).
- Option 10
  - TEL ultimate scheme (TH).
  - SH2 traffic outside lane at Te Maunga – shifts over to right hand lanes at MGI.
  - Identify if trucks will use left lane and would need to change lanes to the right hand lane to use flyover.
  - Allowing weaving and priority for SH29 to SH2.

### 2.3 Discuss New Options Identified on the Day

- AS talked about SH2 efficiency.
  - Look at removing the RT conflict movement to increase efficiency of straight through on SH2.
- Option to merge Option 2 and Option 7 (AS).
  - Lowering classification of SH29 may justify this option.
  - Ban RT at Te Maunga, no conflict movement.
- Question about the queues and effects on SH2 when trains along Te Maunga. (NT).
- Question about identifying the requirements at it (eg. ECMT grade separated, SH2 priority (NT)).
- URS modelling under TEL project showed LH turn long on SH2.
- AS identified if there may be scope for saving cost at Mangatawa to reinvest money elsewhere, could have left in left out and use a two lane bridge, reasons for investment at Mangatawa have moved on.
- AM talked about change at Route K may not have any effect on SH29 flows.
- AM talked about the possible increased importance of SH29 in the future, asked questions about what if both highways have equal importance.
- Option 11
  - DT identified that there is going to be at-grade intersections on SH2 along Hewletts Road at-grade.
  - GL identified that increased rail capacity on ECMT will make at-grade solutions at Te Maunga challenging.
  - Talk about the long term outcomes of the network.
  - Alternative routes, reduce the need for four lanes, conflicting RT at Te Maunga.

- MGI flyover could be put in but would need to be moved to accommodate a Te Maunga flyover.
  - Talk about leaving the flyover elevated for the whole alignment but is that less than the cost of properties and there will be issues with designation and consenting.
  - Talked about the implications of not buying the land.
  - Narrow option may not work due to lanes required for turning movements. (GL).
  - S 9(2) talked about urban area LOS requirements and what is acceptable target - a lot of traffic not going to port.
  - AS talked about getting a balanced network and not over investing.
  - Question raised how much port traffic is SH29, answered that it is unlikely that any is going this way.
- Option 12
    - Potential other options – removing RT from Girven Road around to the back of Bayfair.
  - Option 6A – one flyover from MGI past Te Maunga with lanes underneath.
    - Clearance at airport still the same.
    - Wouldn't preclude improvements for a flyover at SH29.
    - May need to purchase land for future proofing.
    - Don't want to compromise future at Te Maunga.
  - Identify a solution for short term at MGI that has potential to accommodate for Te Maunga.
  - Talked about the amount of lanes at-grade at the intersections at Te Maunga.
  - Trading off purchase of land with cost of extra structure and placing extra land under road.

### 3 Option Assessment

- S 9(2) talked through the possible assessment criteria.
- AS suggested flow chart option decision process.
- AM asked if it's justified to not buy land now.
- AS asked what are the long term objectives of Te Maunga and long term consequences of four laning MGI.
- Questions:
  - Issues with four lane option at MGI (consequences of a 'cheaper' option).
- Land not required at MGI – Option 6, 6A, 7, 9, 11 and 12.
- Option 2:
  - SH29 connection required.
  - By moving traffic onto Matapihi, making more railway movement interactions but overall reduced exposure, changing it to busier leg of railway.
  - Difficult to resolve Matapihi/Owens Place/MGI performance.
  - Need to understand what these consequences will be – consenting, traffic, understanding of the effect of loading up MGI.
  - Going to be signage and designation issues.



- Cost higher than baseline.
- AM raised that the issues at Te Maunga is not the objective for this and just highlight what they are/
- Option has the potential to be staged with MGI constrained.
- Potential show stoppers – can't get designation through Owens Place and capacity through MGI.
- PK talked about tying into existing intersection.
- Option 4 is reliant on railway line being moved.
  - Removing the railway alignment means space becomes available (instead of taking houses).
  - Challenges – need to allow dual tracking at Matapihi.
  - Consenting issues at Matapihi. Unknown cost of these.
  - Owens Place alignment south ability to use OTS land to improve alignment.
  - Timeline to achieve outcome.
- TH asked if can park options that look at relocating rail alignment.
- Answer needed before confirming if relocation is best option then can get pushed politically, cost is the big question.
- Option 6/6A
  - (AS) good option but limits future.
  - 6A has limited staging ability.
  - 6 – Matapihi corridor is inadequate, issue to get a highway through there.
  - 6 – unlikely compared to 6A due to grade separating cost.
  - It dictates what solution will be put at SH29 (AS).
  - Large upfront cost and limited staging ability (TH).
  - Better as offline construction.
  - Dictates that Te Maunga – SH2-SH2 flyover only.
  - SH29 at-grade only – most likely. Need to understand before excluding.
  - Trade-off between property and structure, still issues with designation.
- Option 7 – (Yes, not consider, still required 6 lanes).
  - Re-routing towards Harbour Link, therefore an increase in RT movements at MGI (DT).
  - AM asked about how we can traffic wise reduce down to four lanes.
  - Would require Owens Place connection to reduce 6 lanes to 4 lanes (part of Option 2).
  - AM asked if we can cost this work.
  - Is there capacity, as effectively can get 1400veh/km around about 2500veh/hr, need four lanes.
  - Improvements on intersections mean more vehicles on this section of the network.
  - On base case have traffic both at-grade and grade separated due to weave.
  - Probably need two NB lanes and 3 SB lanes. Need to evaluate whether

6 lanes are necessary if Te Maunga removed (5 lanes?).

- Option 8
  - Still required 6 lanes, queuing and flaring lanes.
  - Need to consider it as it is still cheap.
  - Talk about what are the assessment criteria. Is there potential for more capacity if get more land (what is the required LOS in 2031?).
  - Potential interim stage.
  - Check performance if only 4 lanes provided.
  - There will be delays on SH2.
  - Can six lanes fit with existing corridor.
- Option 9
  - Issues with designation.
  - PK asked if Matapihi removed, will it actually be down to 4 lanes (needs further investigation).
  - Need to confirm if 4 lanes is all that is needed.
  - Performance with MGI (moderately confident it could work).
  - PK asked for compilation of Option 9 and 8. T-intersection (MGI) and DRT (Te Maunga).
  - Check combined with Option 8 at Te Maunga.
- Option 11
  - Property effects at MGI.
  - Bayfair access.
  - Other issues at Matapihi and Owens Place.
  - Traffic signals on SH2.
  - Accommodating transport interchange.
- Option 12
  - Improve MGI intersection to reduced lane requirements between MGI-Te Maunga.
  - Local traffic through Bayfair or Concord.
  - PT asked whether it's worth looking at at-grade if they were never going to be accepted.
- Option 15
  - Have a RT out of Eversham Road.
  - Use Gloucester Road, have T-intersection there.
- Extension to Option 8 – various variations of at-grade solutions, using other parts of the local network.
  - Potential there are variations to layouts by displacing right turns to reduce footprint on SH2. Using Eversham, Concord, Jackson.
  - Option of connecting Matapihi southern elsewhere.

#### 4 Actions

- Use SH29-Matapihi designation for road achievability.
- Designated corridor – cost.

CR

- OTS land, planning, ownership.
- Achievability of relocating railway.
- Ability to use alternate railway.
- Ability to use alternate railway corridor for road (footprint, designation, width).
- SH29-Matapihi – form of connection to Matapihi Road, Owens Places, MGI intersection.
- Acceptability of at-grade rail crossings (major issue with KiwiRail).
- Option 6A affordability - check out cost of structure vs land.
- Option 7 – check no. of lanes required 4,5,6 if Te Maunga intersection remained.
- Option 8 – check footprint/performance for at-grade options. Consider 4, 5, 6 lanes.
  - Achievability to direct movements around Bayfair or similar DRT.
- Option 9 – check only 4 lanes necessary for SH2.. consider with Option 8.
- Option 11 – Check property effect. Bayfair access changes – designation issues.
- Check all against transport interchange movements. (How much is this a compromise?)
- Option 8 – can 6 lanes fit within the existing corridor.
- Option 9A – issues as noted.
- KiwiRail reaction to changing at-grade crossing.
- Option 9A
  - Link Matapihi to Eversham over SH2.
  - Close Matapihi to SH2.
  - DRT – from Girven to SH2, DRT at Te Maunga.
  - Issues with performance. Big right turns at intersection. Physical size of Matapihi flyover, connection to Owens Place, has the potential to work.

- s 9(2) – likes the idea of keeping longer term ultimate options for the future and identifying that can be some benefits for at-grade.
- AM – concerned about base not looking at SH29.
- s 9(2) – likes the idea of non-conflicts. Likes ideas for MGI, doesn't want SH29 forgot about, ECMT creates issues for Tauranga.
- s 9(2) – likes the at-grade solutions.
- s 9(2) – good process, right thing to do and get that process sorted – right sort of process to go through. Big trade off with what is happening now.
- s 9(2) – still thinks baseline option is the best.
- DT – came in thinking at-grade is right way, fear that we can see the solution now and not use the right solution. Matapihi is likely to be developed into the solution grade separated, don't have the options to do at-grade.
- PK – appreciated thoughts about Truman Lane and Owens Place and the conflicts and issues that there are. Good to look at the local network, shouldn't lose track of what is going to happen at SH29 in the future, issues with Hewletts and Harbour Link.
- s 9(2) – bit of a life cycle to go through but there are a range of options,

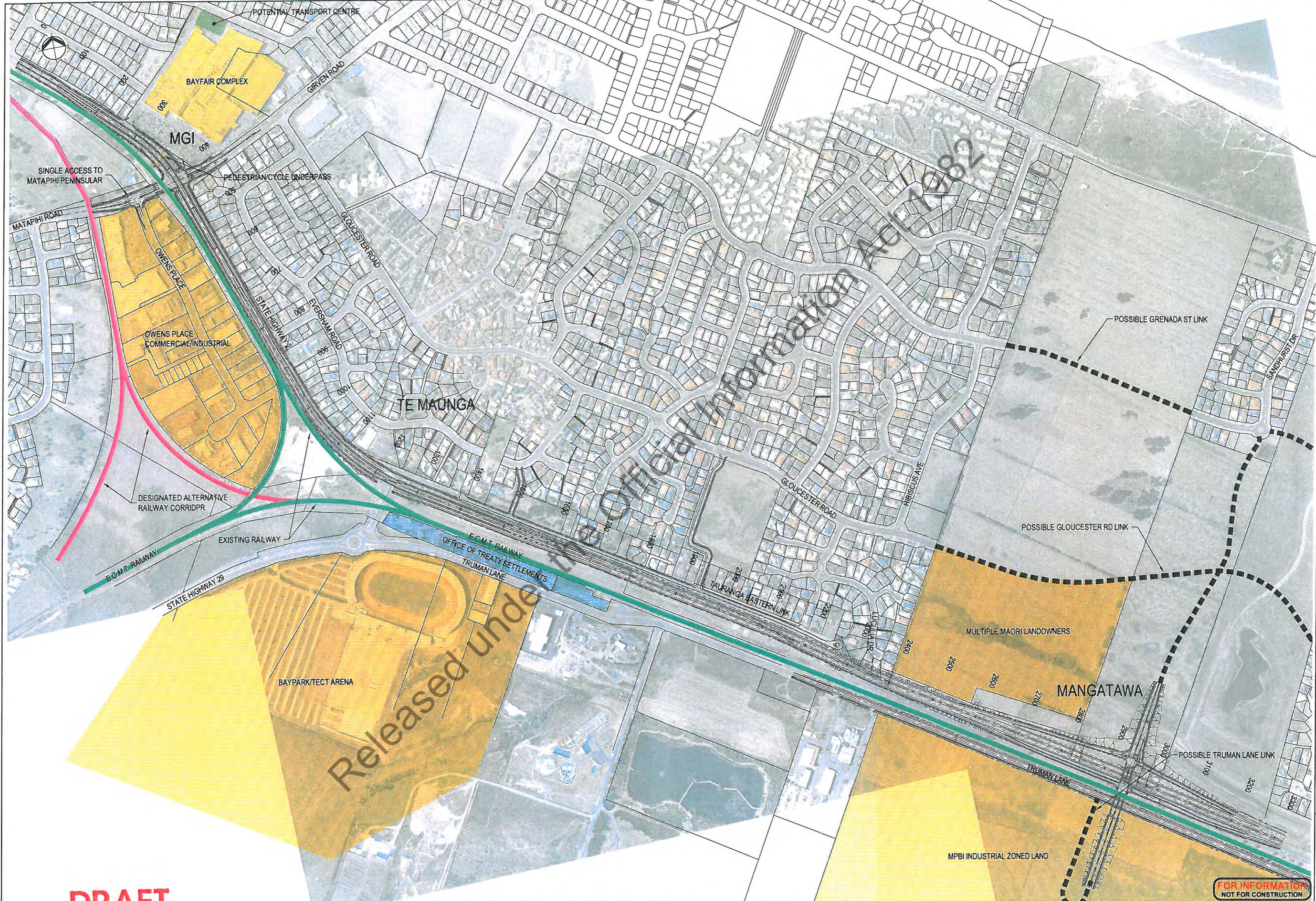
---

consider changes in SH29 and SH2.

- AS – solutions are available – taken forward to national office. Can show the requirements for buying and for future proofing the network, have a decision to take forward. Workshop got some options going forward.

Minuted by: s 9(2)(a)

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**DRAFT**

No.	Revision	By	Chk	Appr	Date
A	FOR INFORMATION				22.02.12

Design Originator:  
**Beca**

Original Scale (A3)	Design	Approved for Construction?
1:2500	Drawn	22.02.12
	Checked	
	Design	
	Drawn	
	Checked	

\*Take as Issued - for Original Signatures

Client:  
**NZ TRANSPORT AGENCY**  
 WAKA KOTAHAKI

Project:  
**MAUNGANUI & GIRVEN ROAD INTERSECTION IMPROVEMENTS**

Site:  
**MGI-TE MAUNGA-MANGATAWA CONSTRAINTS & SITE ISSUES**

Discipline: **CIVIL**  
 Drawing No: **3933377-C-K025**  
 Date: **22.02.12**

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MGI SH2/SH2  
FLYOVER, WITH  
AT GRADE INTERSECTION

OPTION 1  
TE MAUNGA SYSTEM  
INTERCHANGE

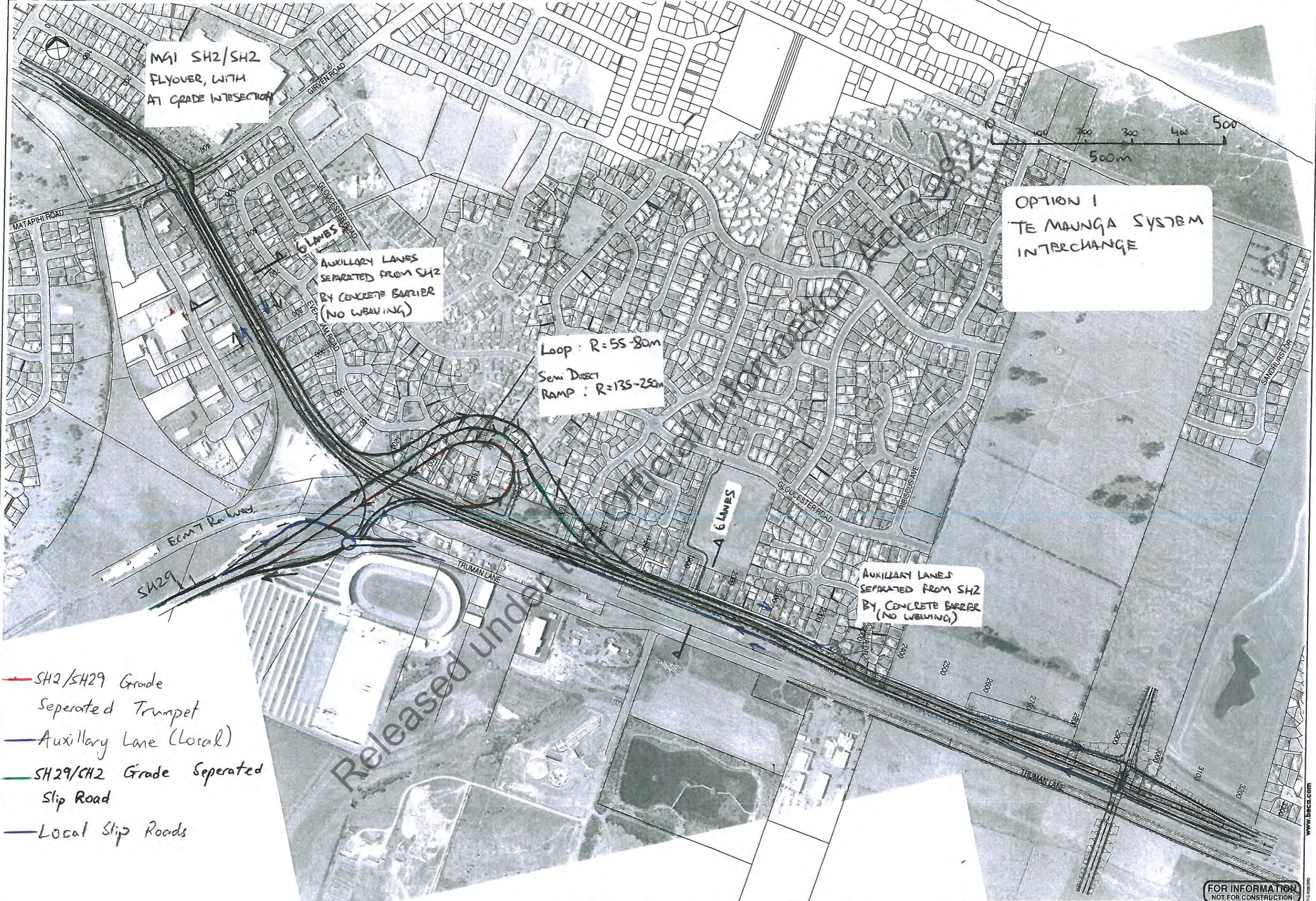
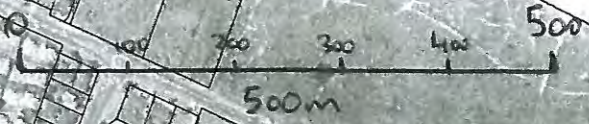
6 LANES  
AUXILIARY LANES  
SEPARATED FROM SH2  
BY CONCRETE BARRIER  
(NO WEAVING)

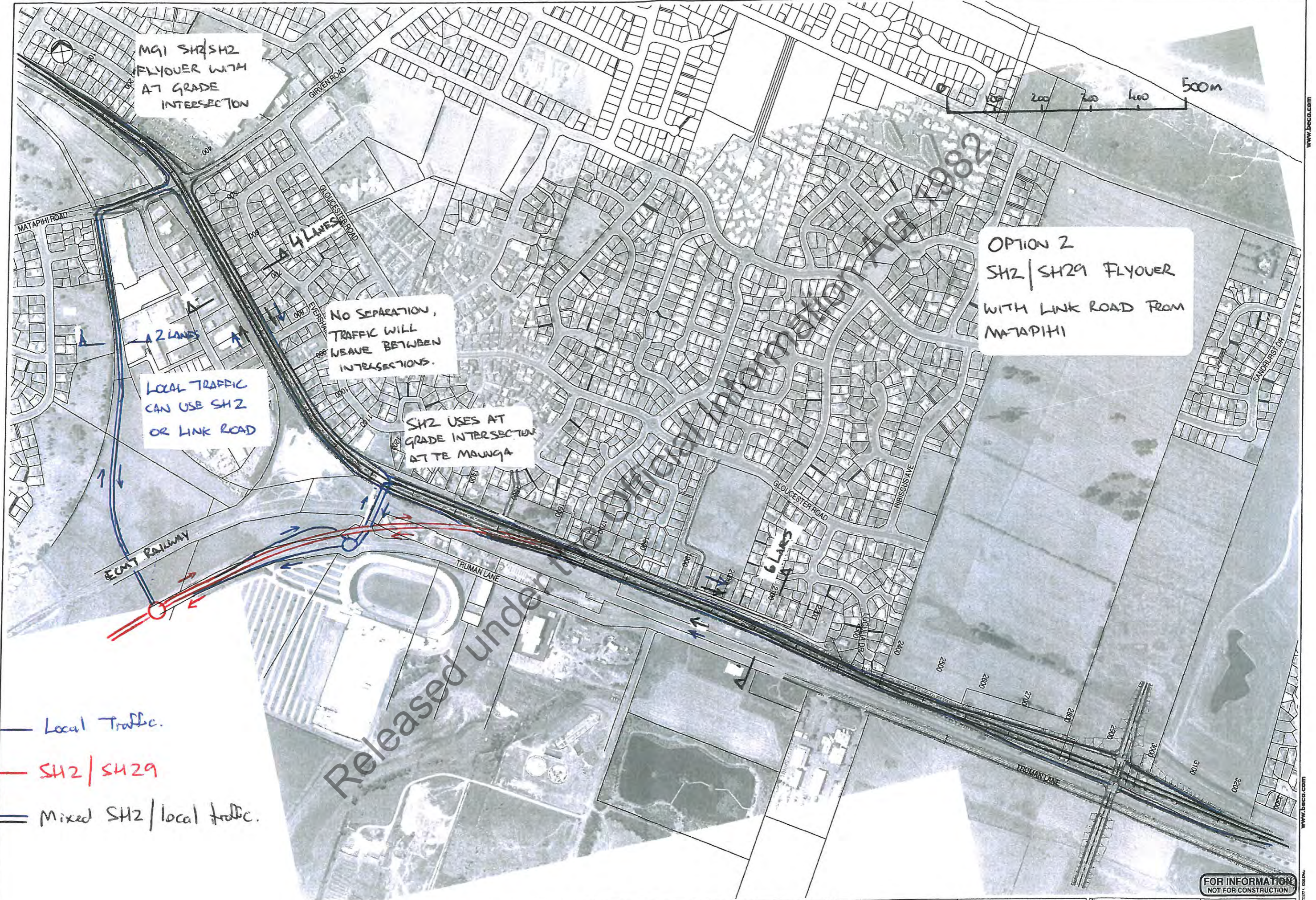
Loop : R=55-80m  
Semi DIRECT  
RAMP : R=135-250m

AUXILIARY LANES  
SEPARATED FROM SH2  
BY CONCRETE BARRIER  
(NO WEAVING)

- SH2/SH29 Grade Separated Trumpet
- Auxiliary Lane (Local)
- SH29/SH2 Grade Separated Slip Road
- Local Slip Roads

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MGI SH2/SH2  
FLYOVER WITH  
AT GRADE  
INTERSECTION

OPTION 2  
SH2/SH29 FLYOVER  
WITH LINK ROAD FROM  
MATAPIHI

NO SEPARATION,  
TRAFFIC WILL  
WEAVE BETWEEN  
INTERSECTIONS.

LOCAL TRAFFIC  
CAN USE SH2  
OR LINK ROAD

SH2 USES AT  
GRADE INTERSECTION  
AT TE MAUNGA

- Local Traffic.
- SH2/SH29
- = Mixed SH2/local traffic.

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MGI SH2/SH2  
FLYOVER WITH  
AT GRADE  
INTERSECTION



OPTION 3  
AT GRADE ROUNDABOUT  
(RAIL RELOCATED)

POTENTIALLY THE  
NUMBER OF LANES  
COULD BE REDUCED

NO SEPARATION,  
TRAFFIC WILL  
WEAVE BETWEEN  
INTERSECTIONS

RAIL TO BE  
RELOCATED INTO  
A TRENCH

ECMT Railway  
SH29  
1/2  
1/2

Local Traffic —





Mixed SH2/Local Traffic —

Rail in Trench/Tunnel + + + + +

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-  Mixed SH2 / Local Traffic
-  Local Traffic
-  SH29
-  Relocated EMT

MGI SH2/SH2  
FLYOVER WITH  
AT GRADE  
INTERSECTION

6 LANES

NO SEPARATION,  
TRAFFIC WILL WAIVE  
BETWEEN INTERSECTIONS

OPTION 4  
REALIGN AT GRADE  
INTERSECTION AND  
RELOCATE RAIL LINE

RELOCATE RAIL.  
KIWI RAIL TO CONFIRM  
DESIGN STANDARDS

BRIDGE  
OVER RAIL

4 LANES

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A. FOR INFORMATION		22.02.12
Rev	Desc	By

**Beca**

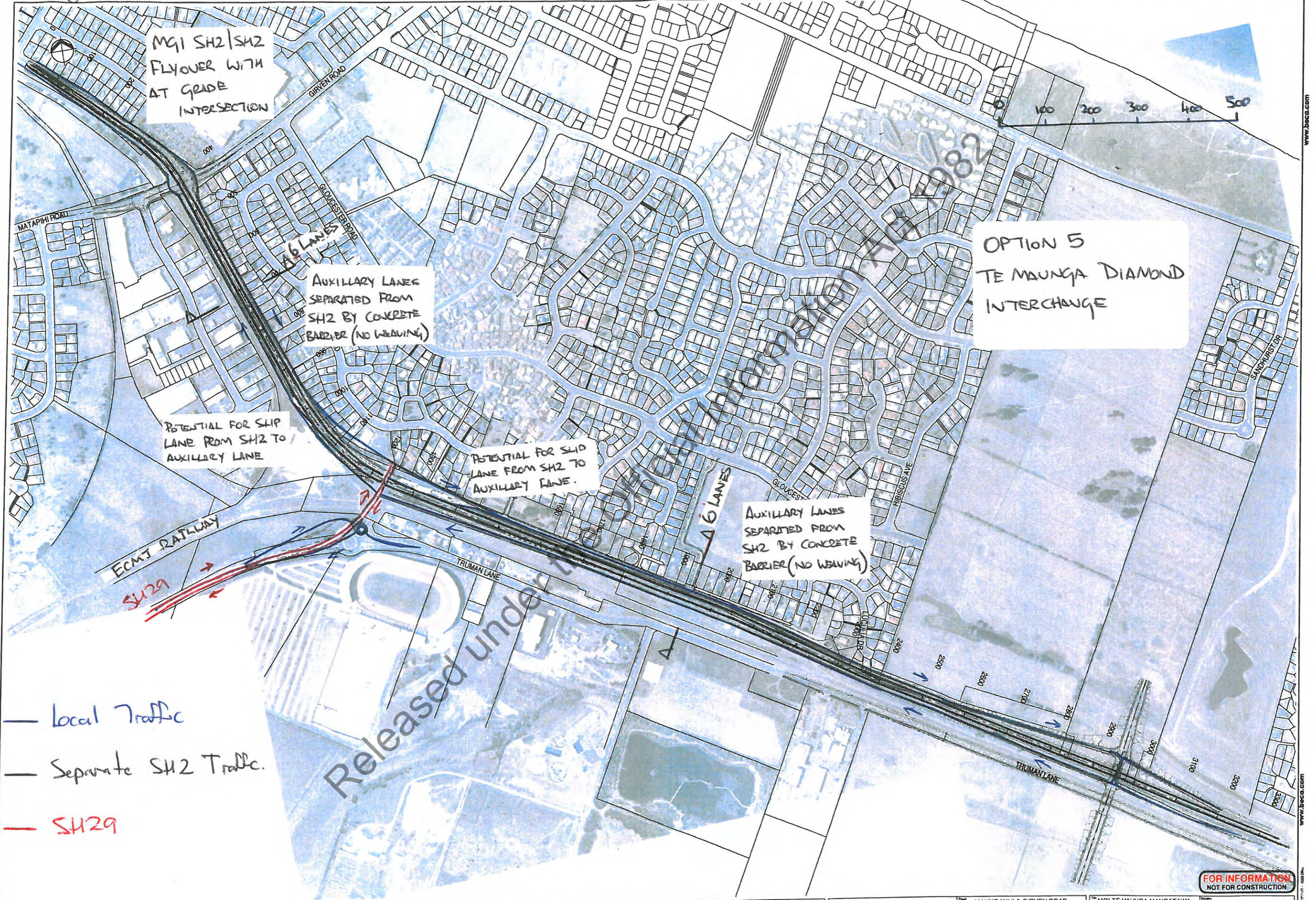
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 Date 21.02.12  
 Drawn by [Name]  
 Checked by [Name]

**NZ TRANSPORT AGENCY**  
 WAKA KOTAHU

MAUNGANUI & GIRWEN ROAD  
 INTERSECTION IMPROVEMENTS

MGI-TE MAUNGA-MANGATAWA  
 OPTIONS

CIVIL  
 A



MGI SH2/SH2  
FLYOVER WITH  
AT GRADE  
INTERSECTION

AUXILIARY LANES  
SEPARATED FROM  
SH2 BY CONCRETE  
BARRIER (NO WEAVING)

OPTION 5  
TE MAUNGA DIAMOND  
INTERCHANGE

POTENTIAL FOR SHIP  
LANE FROM SH2 TO  
AUXILIARY LANE

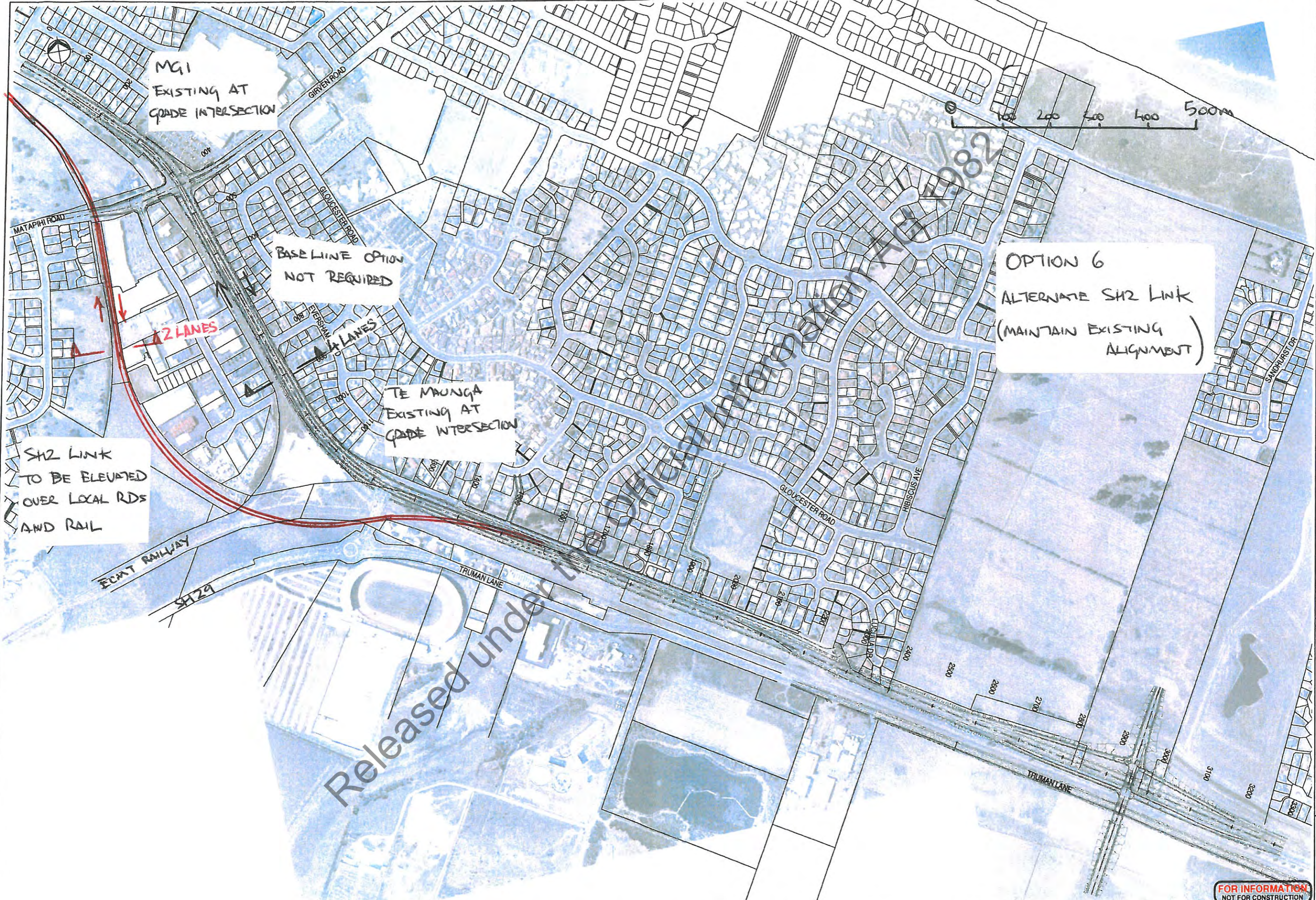
POTENTIAL FOR SHIP  
LANE FROM SH2 TO  
AUXILIARY LANE.

AUXILIARY LANES  
SEPARATED FROM  
SH2 BY CONCRETE  
BARRIER (NO WEAVING)

- Local Traffic
- Separate SH2 Traffic.
- SH29

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SH2 LINK  
TO BE ELEVATED  
OVER LOCAL RDS  
AND RAIL

MGI  
EXISTING AT  
GRADE INTERSECTION

BASELINE OPTION  
NOT REQUIRED

OPTION 6  
ALTERNATE SH2 LINK  
(MAINTAIN EXISTING  
ALIGNMENT)

TE MAUNGA  
EXISTING AT  
GRADE INTERSECTION

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Date	22.02.12
Author	...
Checker	...
Drawn	...



Client	NZ Transport Agency
Project	Maungani & Girven Road Intersection Improvements
Sheet	1 of 1



MAUNGANI & GIRVEN ROAD  
INTERSECTION IMPROVEMENTS

MGI-TE MAUNGA-MANGATAWA  
OPTIONS

Discipline	CIVIL
Sheet	A

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MG1 SH2/SH2  
FLYOVER WITH  
AT GRADE  
INTERSECTION

OPTION 7  
REALIGNMENT OF SH29  
ALONG TRUMAN LANE

POTENTIAL TO  
REDUCE NUMBER OF  
LANES BETWEEN MG1  
AND TE MAUNGA

NO INTERSECTION  
AT TE MAUNGA  
AS SH29 REALIGNED  
ALONG TRUMAN LANE.

OTS LAND TO BE  
REQUIRED TO ENABLE  
SH29 REALIGNMENT

SERVICE LANE TO  
PROVIDE ACCESS TO  
COMMERCIAL  
PROPERTIES

PROPERTY FRONTAGE  
REQUIRED TO  
ACCOMMODATE  
SERVICE LANE

Mixed SH2/Local Traffic

Local and SH29 Traffic

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MGI AT GRADE  
SIGNALISED  
INTERSECTION

OPTION 8  
AT GRADE OPTION  
TE MAUNGA DISPLACED  
RIGHT TURN.

TRAFFIC WEAVES

NO SEPARATION  
BETWEEN SH2  
AND LOCAL  
TRAFFIC

TE MAUNGA  
AT GRADE  
DISPLACED RIGHT  
TURN

TRAFFIC WEAVES

— Mixed SH and local traffic  
— Local Traffic.

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A FOR INFORMATION		Rev	Chg	Date



Original Scale 1:25000	Drawn	21/02/12
Checked		
Design		



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INTERSECTION IMPROVEMENTS

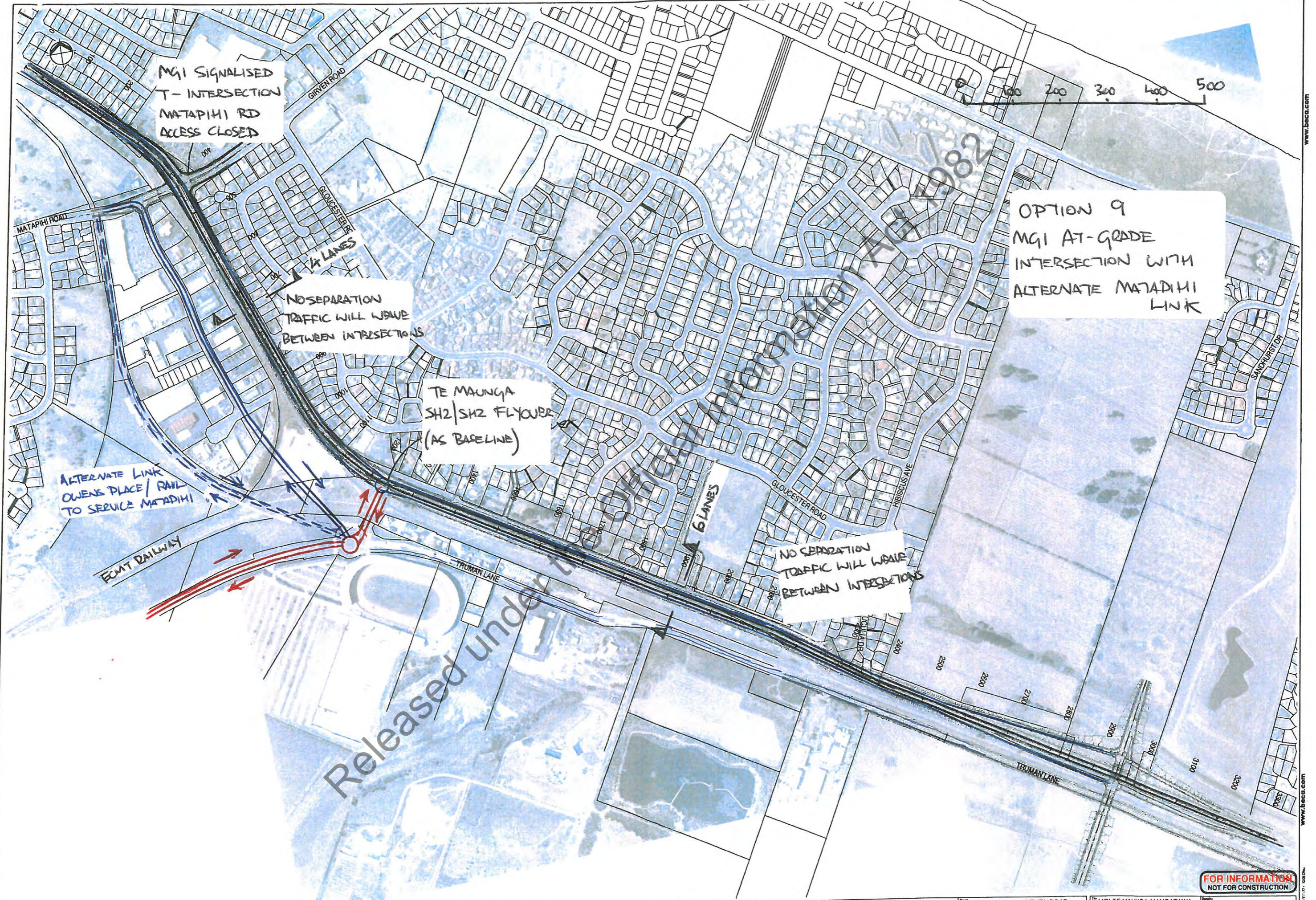
MGI-TE MAUNGA-MANGATAWA  
OPTIONS

CIVIL

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MGI SIGNALISED  
T-INTERSECTION  
MATAPIHI RD  
ACCESS CLOSED

OPTION 9  
MGI AT-GRADE  
INTERSECTION WITH  
ALTERNATE MATAPIHI  
LINK

NO SEPARATION  
TRAFFIC WILL WAIVE  
BETWEEN INTERSECTIONS

TE MAUNGA  
SH2/SH2 FLYOVER  
(AS BASELINE)

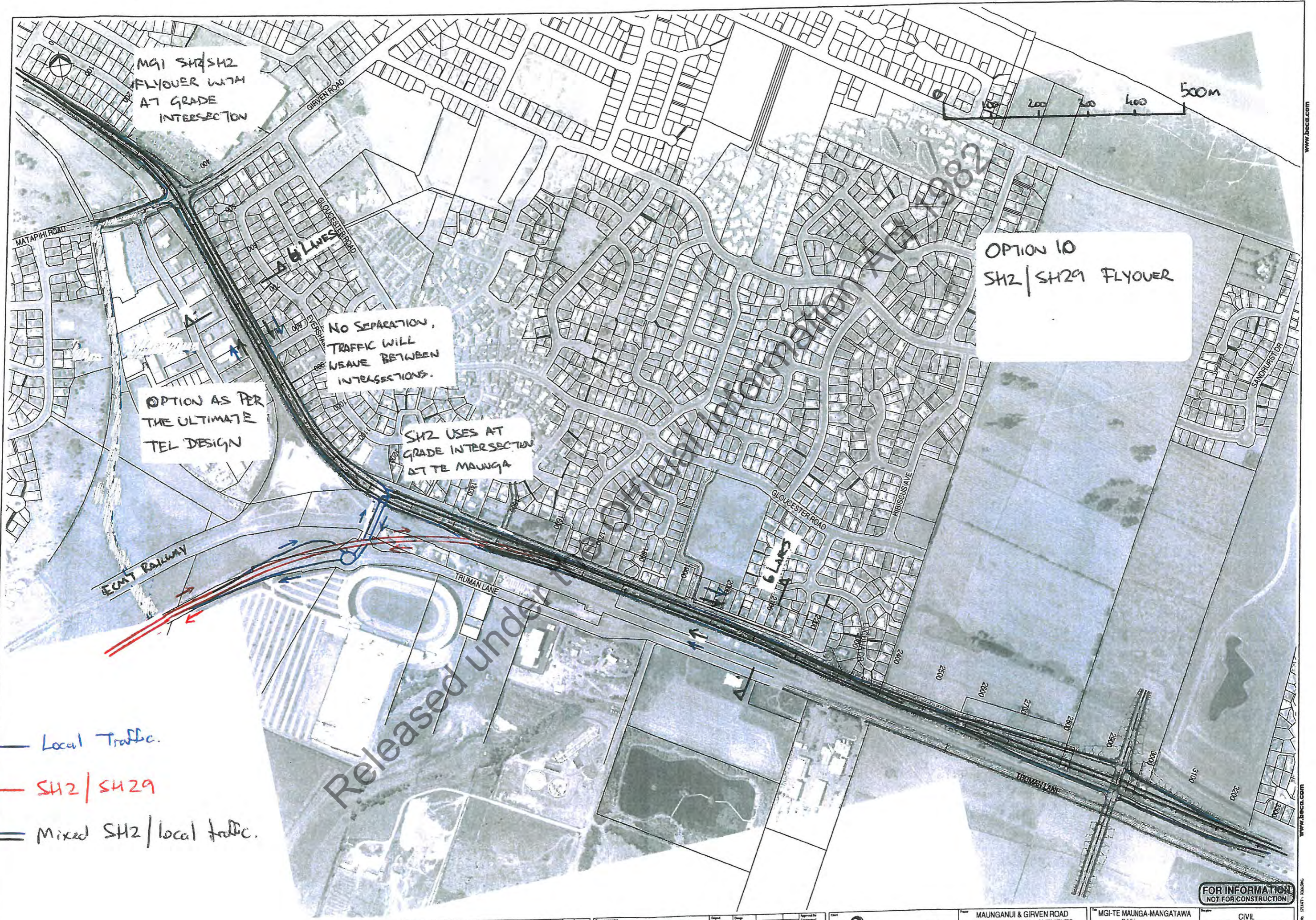
ALTERNATE LINK  
OWENS PLACE / RAIL  
TO SERVICE MATAPIHI

NO SEPARATION  
TRAFFIC WILL WAIVE  
BETWEEN INTERSECTIONS

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		Project: MAUNGANUI & GIVEN ROAD INTERSECTION IMPROVEMENTS Client: NZ TRANSPORT AGENCY WAKA KOTAHU Date: 22.03.12	Drawing No: MGI-TE MAUNGA-MANGATAWA OPTION 9 Scale: CIVIL
Project: MAUNGANUI & GIVEN ROAD INTERSECTION IMPROVEMENTS Client: NZ TRANSPORT AGENCY WAKA KOTAHU		Drawing No: MGI-TE MAUNGA-MANGATAWA OPTION 9 Scale: CIVIL	Project: MAUNGANUI & GIVEN ROAD INTERSECTION IMPROVEMENTS Client: NZ TRANSPORT AGENCY WAKA KOTAHU

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MGI SH2/SH2  
FLYOVER WITH  
AT GRADE  
INTERSECTION

OPTION 10  
SH2/SH29 FLYOVER

OPTION AS PER  
THE ULTIMATE  
TEL DESIGN

NO SEPARATION,  
TRAFFIC WILL  
WEAVE BETWEEN  
INTERSECTIONS.

SH2 USES AT  
GRADE INTERSECTION  
AT TE MAUNGA

- Local Traffic.
- SH2/SH29
- = Mixed SH2/local traffic.

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Appendix B

Te Maunga Intersection  
Options Study - Scope and  
Objectives Report

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**SH2/SH29 Te Maunga Intersection Options  
Study – Scope and Objectives Report**

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This disclaimer shall apply notwithstanding that the report may be made available to other persons for an application for permission or approval or to fulfil a legal requirement.

#### Quality Assurance Statement

Project Manager: Greig Stephen

Prepared by: Aaron Washington

Reviewed by: Tim Haig

Approved for issue by: Greig Stephen

#### Revision Schedule

Rev. No	Date	Description	Prepared by	Reviewed by	Approved by
A	3/2/12	Draft for Client Review	Aaron Washington	Tim Haig	Greig Stephen
B	21/2/12	Final	Aaron Washington	Tim Haig	Greig Stephen

# NZ Transport Agency

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3. Identification of Study Area and Area of Influence.....	6
4. SH2 Performance Objectives and Priorities.....	6
5. Recent Studies, Options and Objectives.....	6
6. Moving Forward.....	6
7. Conclusions.....	6

## Appendices

- Appendix A - Recent Options, Studies and Observations
- Appendix B - Traffic Flow Information
- Appendix C - TTM Network Assumptions
- Appendix D - Drawings

## 1. Introduction

The NZ Transport Agency (NZTA) engaged Beca Infrastructure Ltd (Beca) to investigate capacity improvement options for the Maunganui/Girven Intersection (MGI) on State Highway 2 (SH2). As part of these investigations it was identified that the future form of the SH2/SH29 intersection at Te Maunga could have a significant influence on the form of the MGI solution. This is largely due to the relatively short distance (800m) between the SH2/SH29 intersection with MGI. The Mangatawa Interchange, which is being constructed as part of the Tauranga Eastern Link (TEL) project, is located approximately 1.7km south of the SH2/SH29 intersection which also results in the intersection options influencing each other.

Therefore it has been identified that the solution for this section of SH2 needs to take into account the interaction between the three intersections.

### 1.1 Purpose of this Study

The purpose of this study is to identify the most likely long term options to SH2 from the Matapihi Road/Girven Road intersection to the Mangatawa Interchange and its connection to SH29 so that the improvements to the MGI intersection can accommodate the agreed long term requirements.

## 2. Description of Problem and Confirmation of Required Elements

The SH2/SH29 intersection consists of an un-signalised two lane, three arm roundabout, located at the boundary of the TEL, located on a Road of National Significance (RoNS) and due for completion in 2016. Minor capacity improvements to the intersection are to be undertaken as part of the TEL project.

The SH2/SH29 intersection configuration proposed as part of TEL was investigated in 2008 and deemed to provide adequate capacity at the intersection in 2016, which coincides with the opening of TEL. A reassessment of the intersection configuration to incorporate changes in landuse within the network, as well as changes to the form of MGI, indicates that the TEL intersection configuration will be operating at capacity by 2016.

Previous investigations carried out on the SH2/SH29 intersection have identified a number of key considerations to consider when assessing options for the intersection. These considerations are:

- The intersection is located approximately 800 metres south of MGI and 1700 metres north of the Mangatawa Interchange, resulting in limited/restricted weaving space between successive intersections;
- The Truman Lane intersection is located approximately 100m west from the SH2/SH29 intersection on the SH29 approach. Any modifications to the SH2/SH29 intersection will need to consider the effect on the Truman Lane intersection;
- BayPark Stadium (Capacity: 19,800), TECT Arena (Capacity: 4,000) and the Bayfair Shopping Centre are all located with close proximity to the study area, although not specifically considered within the design process, event day traffic is likely to have impacts on the network;
- The East Coast Main Trunkline (EMCT) railway line runs parallel to the intersection and crosses the SH29 approach, the rail designation is to remain unchanged and is expected to have a 50% increase in rail movements ;
- Train movements at the intersection can last for as long as 90 seconds, causing turning vehicles towards and from the SH29 approach to wait at the approaches, influencing the efficiency of other flows at the intersection; and
- Latest modelling indicates that the modifications to be performed as part of TEL will be performing at its operational capacity when MGI is opened; with the intersection arrangement predicted to have delays in excess of 3 minutes and queues of approximately 1km in length on some of the approaches.

In the course of investigations, a number of assumptions that may influence the outcome of the study were identified. These assumptions include:

- No change to the Hewletts Road flyover;
- Priority given to SH2 traffic, identified as national strategic high volume state highway;
- Matapihi growth outside of SmartGrowth is excluded;

- Girven Road to remain two-lanes;
- SmartGrowth landuse assumptions used;
- Mangatawa Interchange to be constructed as per TEL design, with the Truman Lane connection constructed;
- Tauranga City Council (TCC) local roads constructed (Gloucester Road and Grenada Street);
- Wider area network changes assumed to be TTM standard (refer to attached report in Appendix C);
- Access retained for Bayfair Shopping Centre, BayPark Stadium and TECT Arena; and
- Unimpeded operation of the ECMT railway and allowance for the future duplication within the rail designation.

## 2.1 Baseline Option for Comparison

The baseline option that has been assumed for MGI and Te Maunga is a 2-Lane median divided SH2-SH2 flyover at each intersection, with weaving between the intersections disallowed.

The options identified within the workshop process will be evaluated against this baseline option. In particular they will be assessed on the amount of land required compared to the baseline plan.

A layout of the baseline option is shown in Appendix D.

## 2.2 Site Constraints

The particular constraints within the study area are shown in the Appendix D. These include:

- Existing ECMT rail line running parallel with SH2 and SH29 and crossing SH29 and Matapihi Road;
- Bayfair Shopping Centre and its growth plans, as well as a potential on-site transport centre;
- Owens Place Commercial/Industrial area, with potential future expansion;
- Baypark Stadium and TECT Arena and ability to cater for day to day and event day traffic;
- Office for Treaty Settlement (OTS) land situated between Truman Lane and SH2 at Te Maunga; and
- MPBI Industrial Zoned land, as well as multiple Maori landowners land located along Truman Lane and the Mangatawa Interchange.

### 3. Identification of Study Area and Area of Influence

Recent investigations have indicated the need for the study area to include the SH2/SH29 intersection in conjunction with the Truman/SH29 Intersection, MGI and the Mangatawa Interchange, as indicated in Figure 3.1.



Figure 3.1: Study Area and Area of Influence

This is the extent of the area that needs to be considered when assessing options for the SH2/SH29 intersection as they will have direct impacts on these other intersections. The study area is identified as the areas of the network where changes to the current configuration are proposed.

Figure 3.1 also indicates the area of influence of the study area. This is the wider area of the network that the project team predicts may be influenced by changes within the study area. These influences are predominately associated with potential rerouting of vehicles in the network due to physical constraints implemented as part of improvements to the intersection forms. The purpose of the area of influence is to assess the extent of the impact to the network resulting from changes within the study area.

## 4. SH2 Performance Objectives and Priorities

Investigations being undertaken as part of the Tauranga Urban Network Study (TUNS) have identified a number of key objectives and priorities for the State Highway network within the Tauranga urban area. The objectives are targeted at meeting the NZTA's long term vision for the State Highway corridor being supporting:

- Economic Development;
- Environmental Sustainability;
- Land use and transport integration;
- Safety and personal security;
- Access and Mobility; and
- Public Health.

The objectives and priorities identified by the TUNS for this study area are:

- Network Efficiency;
- Land use;
- Balancing the Network;
- Freight;
- People's Travel;
- Network Resilience;
- Accessibility; and
- Safety.

A workshop conducted with key stakeholders for the Mount Corridor Plan (MCP), including the Beca Project Team, NZTA, TCC and Bay of Plenty Regional Council (BOPRC) representatives, identified the three key objectives that are considered most critical to the MCP. The following key (in order of preference) objectives and priorities are:

- People's Travel;
- Network efficiency; and
- Balancing the network.

As this is a high level assessment of potential options, a traffic light assessment following the criteria described in Table 4.1 is proposed.



Table 4-1: Traffic Light Scoring System

<b>Worse</b>	The option is assessed to have potential negative effects
<b>Neutral</b>	The option is assessed to have potential neutral effects
<b>Better</b>	The option is assessed to have potential positive effects

The options will be assessed against a number of criteria that are related to the TUNS objectives and priorities of the study. The scoring of these options will be assessed against a measure of the effectiveness of an option in addressing the criteria, compared to the baseline option.

Table 4.2 shows the criteria to be measured against the baseline options.

Table 4-2: Multi Criteria Analysis Criteria

People's Travel, Accessibility, Supports Multimodal Travel	Transport solution that allows for the efficient and reliable movement of people within the city and provides a range of modal choices.
Network Balance	Solutions minimise upstream and downstream effects.
Safety	Relative complexity compared to baseline options. Consistency with safe system philosophy.
Performance – SH2	Allows efficient and reliable movement of people and goods consistent with the expectations of a RoNS.
Performance – Other Roads	Allows efficient and reliable movement of people.
Land Effects / Social	Relative number of properties affected.
Achievability	Relative difficulty expected to obtain a designation/stakeholder approval.
Cost Range	Cost relative to baseline option.
Effective Transport Solution	Assessment of likelihood to achieve an effective transport solution for Eastern Corridor.
Land Requirement at MGI	Does it require effectively 6 lanes between MGI and Te Maunga, as required by the Base Option.

## 5. Recent Studies, Options and Objectives

A number of studies have previously been undertaken for the SH2/SH29 intersection, a list of these, as well as the options and key outcomes of the studies is provided in Appendix A.

To provide information for assessing the potential options for this area the following scenarios were investigated:

- Scenario 1: MGI Flyover – SH2/SH2 Flyover (2 laned flyovers), with No Weaving Allowed;
- Scenario 2: MGI Flyover – SH2/SH2 Flyover (2 laned flyovers), with Weaving Allowed; and
- Scenario 3: SH29 Realignment to Matapihi Road

The traffic flow information from these scenarios is provided within Appendix B.

A list of the network assumptions used within TTM 5.8 is provided in Appendix C.

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## 6. Moving Forward

Progressing forward, workshops will be conducted with the intention to use the Multi Criteria Analysis (MCA) process to assess options identified previously and any potential new ones identified within the workshop process.

To aid in this assessment process, the information summarised within this report from previous studies will provide background information on the problem, design constraints and previously considered scheme options.

The objective of this study is to identify the most likely options that will provide an effective transport solution for the Eastern Corridor, to enable the Scheme Assessment investigations for MGI to be completed.

The first external workshop will be attended by:

- NZTA representatives;
- TCC Representatives; and
- Beca Project Team.

The intended aim of this workshop is to discuss the previously identified options, identify new options and then use the MCA process to assess the options. If possible, the workshop team will determine the most likely long term options and then assess the relative risks to accommodating them within MGI, compared to the Baseline option. A second workshop has been programmed to enable further information to be obtained and assessed, if needed.

## 7. Conclusions

The primary objective of this report is to provide background information on the SH2/SH29 intersection and nearby network to aid in the investigation of possible long term options for the MGI intersection. It is intended to establish what influences the possible solutions will have on the MGI intersection, and the form that the MGI intersection may need to take in order to accommodate the potential changes to the SH2/SH29 intersection.

Information and options from a variety of previous studies has been collated, to support a MCA of potential options within a workshop process.

The MCA will use criteria and measures established as part of the TUNS. The criteria considered for assessment for the initial include:

- People's Travel, Accessibility, Supports Multi-Modal Travel;
- Network Balance;
- Safety;
- Performance – SH2;
- Performance – Other Roads;
- Land Effects / Social;
- Achievability;
- Cost Range;
- Effective Transport Solution; and
- Land Requirement at MGI.

The MCA process will make a high level assessment of the options and their ability to meet the future needs of the network, with the objective of determining the most likely options that could provide an effective transport solution for the Eastern Corridor. This will then inform the scope of the improvements necessary for the MGI intersection.

Appendix A  
Recent Options, Studies and  
Observations

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**Table A-1: Summary of SH2/SH29 Intersection Studies**

Year	Option	Study	TTM Version	Key Observations
2007	<ul style="list-style-type: none"> <li>A) SH2 – SH29: 2 lane flyover, weaving allowed between Flyover and Mangatawa Interchange;</li> <li>B) SH2 – SH29: 2 lane flyover, with barriers to prevent weaving between Flyover and Mangatawa Interchange;</li> </ul>	<ul style="list-style-type: none"> <li>Tauranga Eastern Motorway Te Maunga/Sandhurst/Girven Option Study; and</li> <li>Te Maunga Flyover Scoping Review Memorandum</li> </ul>	4.0	<ul style="list-style-type: none"> <li>Both options assumed roundabout changes to signalised T-intersection;</li> <li>Estimated cost &gt; \$50 Million;</li> <li>Weaving issues between Te Maunga and Mangatawa;</li> <li>Removes interaction with railway; and</li> <li>Does not fit in with strategic objective of network, namely TEL to provide access to the Port of Tauranga.</li> </ul>
2008	<ul style="list-style-type: none"> <li>Roundabout At-grade</li> </ul>	<ul style="list-style-type: none"> <li>Te Maunga At-Grade Intersection Review Memorandum</li> </ul>	5 5.4 & 5.8	<ul style="list-style-type: none"> <li>Low cost solution that initially provided adequate capacity at the opening of Tel in 2016, Subsequent modelling indicates that has insufficient capacity for 2016 demand flows;</li> <li>All movements have equal preference; and</li> <li>Ability to tie in with MGI improvements and Mangatawa interchange</li> </ul>
2010	<ul style="list-style-type: none"> <li>DM) Existing Roundabout and Southbound Slip-lane along SH2</li> <li>1) Signalisation (Not modelled)</li> <li>2) Single lane northbound flyover (SH2 – SH2), while retaining the existing at-grade southbound slip lane at</li> </ul>	<ul style="list-style-type: none"> <li>Te Maunga Flyover Scoping Review Memorandum</li> </ul>	5.8	<ul style="list-style-type: none"> <li>Provides preferential treatment to SH2 – SH2 Traffic;</li> <li>Estimated cost &gt;\$25 Million;</li> <li>Provide enduring benefits to the network;</li> </ul>

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	<p>the roundabout; and</p> <ul style="list-style-type: none"> <li>3) Dual lane – 2 way flyover (SH2 – SH2) replacing the at-grade southbound slip lane at the roundabout.</li> </ul>			<ul style="list-style-type: none"> <li>At grade interaction with the ECMT rail line;</li> <li>Options incorporate current intersection arrangement;</li> <li>Low to Medium Range preliminary BCR's; and</li> <li>Issues with weaving between MGI and Mangatawa.</li> </ul>
2011	<ul style="list-style-type: none"> <li>DN) No Changes to the existing arrangement at MGI and Te Maunga;</li> <li>DM) Current Arrangement at MGI and TEL improvements to SH2/SH29 Intersection;</li> <li>1) Signalised Roundabout at MGI and TEL improvements to SH2/SH29 Intersection;</li> <li>2) Option 1, without Grenada/Gloucester &amp; Mangatawa/Truman connections; and</li> <li>3) SH2 – SH2, 2 Lane Flyover with at-grade signalised signals at MGI and TEL improvements to SH2/SH29 intersection.</li> </ul>	<ul style="list-style-type: none"> <li>TE Maunga PFR Workshop</li> <li>Te Maunga At-Grade Intersection Review Memorandum</li> </ul>		<ul style="list-style-type: none"> <li>Provides preferential treatment to SH2 – SH2 Traffic;</li> <li>Meet strategic objectives of the network;</li> <li>At-grade interaction with the ECMT rail line;</li> <li>Removal of the current intersection; and</li> <li>Issues with weaving between MGI and Mangatawa.</li> </ul>
2011	<ul style="list-style-type: none"> <li>DM) At-grade intersection at MGI and TEL improvements to the SH2/SH29 intersection;</li> <li>1) At – grade intersection at MGI and Displaced Right Turn at SH2/SH29 Intersection; and</li> <li>2) At-grade intersection at MGI and 2-lane Flyover (SH2</li> </ul>	<ul style="list-style-type: none"> <li>SH2/SH29 Te Maunga Intersection – Project Feasibility Report</li> </ul>		<ul style="list-style-type: none"> <li>Provides preferential treatment to SH2 – SH2 Traffic;</li> <li>Meet strategic objectives of the network;</li> <li>At-grade interaction with the ECMT rail line;</li> <li>Removal of the current intersection;</li> </ul>

	– SH2) over signalised T-intersection at SH2/SH29.			<ul style="list-style-type: none"> <li>• Option 1 Estimated Cost &gt; \$6Million &amp; Option 2 Estimated Cost &gt;\$38 Million;</li> <li>• Low to Medium Range BCR's; and</li> <li>• Issues with weaving between MGI and Mangatawa.</li> </ul>
2011	<ul style="list-style-type: none"> <li>• Railway Designation Layout (as shown in Figure 5-1)</li> </ul>	<ul style="list-style-type: none"> <li>• TUNS</li> </ul>		<ul style="list-style-type: none"> <li>• Places additional strain on MGI and the Mangatawa Interchange;</li> <li>• Removes at-grade interaction with the ECMT rail line at Te Maunga, but will place additional traffic along the Matapihi Road at-grade crossing;</li> <li>• No issues with weaving between successive intersections within the study area;</li> <li>• Provides preferential treatment to SH2-SH2 traffic.</li> </ul>

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To provide information for accessing the Area of Influence for the potential impact of weaving between the successive intersections within the study area and the potential rerouting of SH29 along the rail corridor, the following scenarios were investigated:

- Scenario 1: MGI Flyover – SH2/SH2 Flyover (2 lane flyovers), with No Weaving Allowed;
- Scenario 2: MGI Flyover – SH2/SH2 Flyover (2 lane flyovers), with Weaving Allowed; and
- Scenario 3: SH29 Railway Realignment.

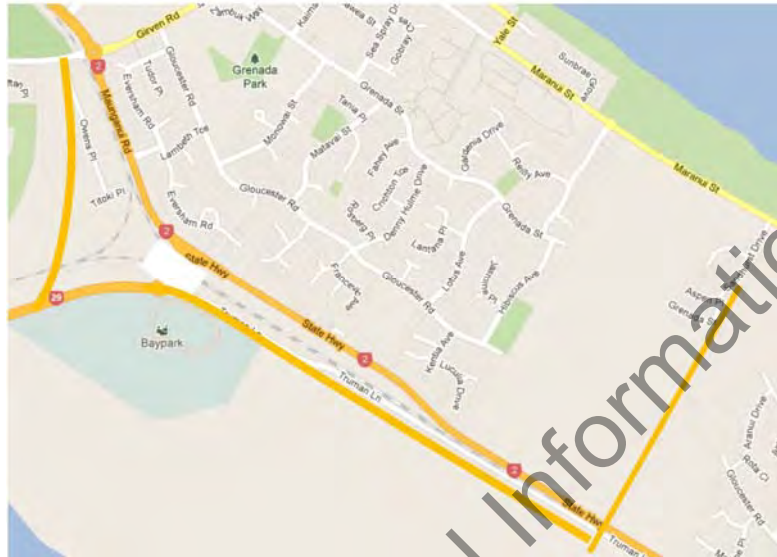


Figure A-1: SH29 Railway Realignment Layout

TTM Version 5.8 ADT flow data, as well as AM and PM peak flows were extracted for each of the scenarios. Additionally, an assessment of the extent of rerouting due to these three scenarios was assessed using the study cordon shown in Figure A-2.



Figure A-2: OD Cords for Study Area

A summary of the expected proportion of vehicular routing is provided in Tables A-2 to A-7.

**Table A-2: Vehicular Routing Scenario 1 (AM/PM)**

	A	B	C	D	E
A	-	10% / 15%	9% / 13%	75% / 63%	6% / 10%
B	80% / 66%	-	11% / 18%	8% / 16%	0% / 0%
C	27% / 12%	18% / 18%	-	47% / 47%	8% / 23%
D	61% / 54%	9% / 4%	24% / 25%	-	7% / 17%
E	26% / 22%	0% / 0%	30% / 29%	44% / 49%	-

**Table A-3: Vehicular Routing Scenario 2 (AM/PM)**

	A	B	C	D	E
A	-	11% / 12%	12% / 16%	72% / 61%	6% / 10%
B	78% / 63%	-	12% / 19%	10% / 18%	0% / 0%
C	30% / 14%	17% / 17%	-	46% / 46%	8% / 23%
D	59% / 48%	10% / 10%	24% / 26%	-	7% / 15%
E	24% / 22%	0% / 0%	31% / 29%	44% / 49%	-

**Table A-4: Vehicular Routing Scenario 3 (AM/PM)**

	A	B	C	D	E
A	-	19% / 20%	9% / 11%	66% / 56%	6% / 13%
B	53% / 40%	-	25% / 25%	21% / 35%	1% / 1%
C	32% / 14%	19% / 24%	-	38% / 36%	11% / 26%
D	63% / 49%	11% / 13%	21% / 26%	-	6% / 13%
E	40% / 28%	0% / 0%	24% / 32%	36% / 39%	-

**Table A-5: Vehicular Routing Scenario 1 (AM/PM)**

	A	B	C	D	E
A		129 / 286	123 / 258	992 / 1232	75 / 187
B	524 / 514		75 / 137	54 / 122	0 / 0
C	328 / 131	221 / 191		562 / 505	92 / 248
D	1301 / 1158	190 / 94	505 / 547		148 / 365
E	189 / 88	0 / 0	203 / 112	312 / 196	

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**Table A-6: Vehicular Routing Scenario 2 (AM/PM)**

	A	B	C	D	E
A		144 / 241	164 / 315	975 / 1203	77 / 198
B	564 / 570		89 / 169	69 / 158	0 / 0
C	369 / 150	212 / 185		561 / 511	93 / 257
D	1259 / 1008	205 / 215	521 / 542		144 / 322
E	168 / 90	0 / 0	208 / 115	310 / 198	

**Table A-7: Vehicular Routing Scenario 3 (AM/PM)**

	A	B	C	D	E
A		300 / 482	134 / 266	1017 / 1324	101 / 305
B	407 / 408		187 / 257	162 / 358	6 / 9
C	374 / 149	220 / 256		434 / 374	129 / 268
D	1348 / 1012	228 / 264	450 / 537		129 / 269
E	321 / 101	0/0	198 / 114	292 / 139	

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Appendix B  
Traffic Flow Information

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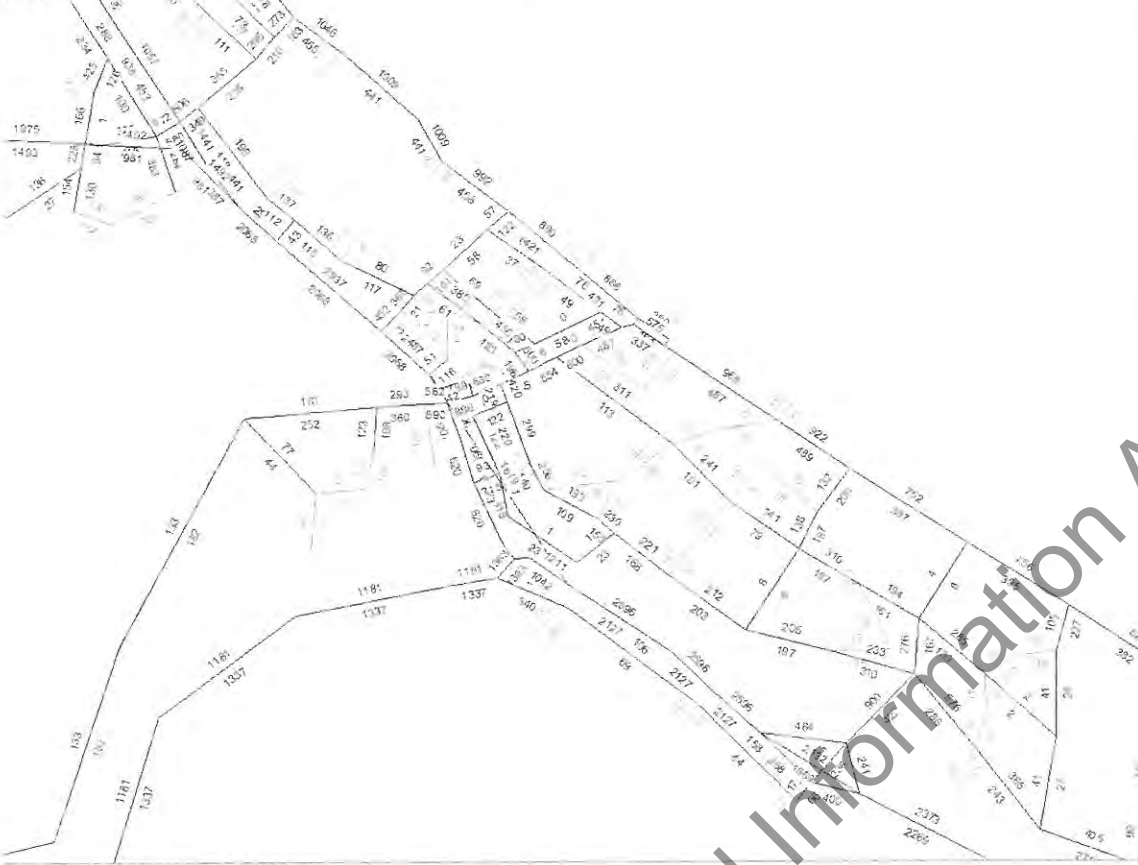
**Average Flow for 2031 MGI TeMaunga Flyovers - No Weaving (1 hour)**  
**AM Peak**



**Average Flow for 2031 MGI TeMaunga Flyovers - No Weaving (1 hour)**  
**AM Peak**



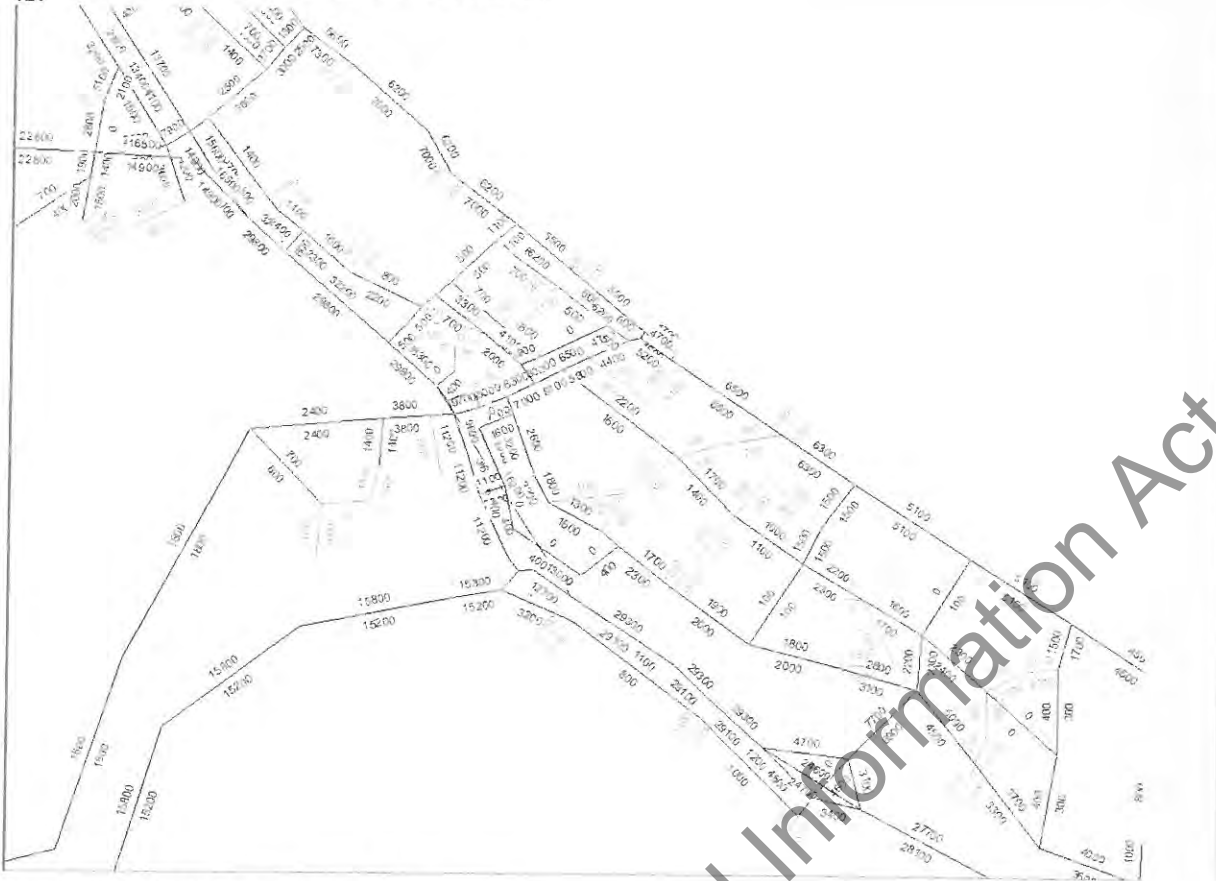
**Average Flow for 2031 MGI TeMaunga Flyovers - No Weaving (1 hour)  
PM Peak**



**Average Flow for 2031 MGI TeMaunga Flyovers - No Weaving (1 hour)  
PM Peak**



**Average Flow for 2031 MGI TeMaunga Flyovers - No Weaving (1 hour)**  
ADT



**Average Flow for 2031 MGI TeMaunga Flyovers - No Weaving (1 hour)**  
ADT



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**Average Flow for 2031 MGI TeMaunga Flyovers - Weaving (1 hour)**  
**AM Peak**

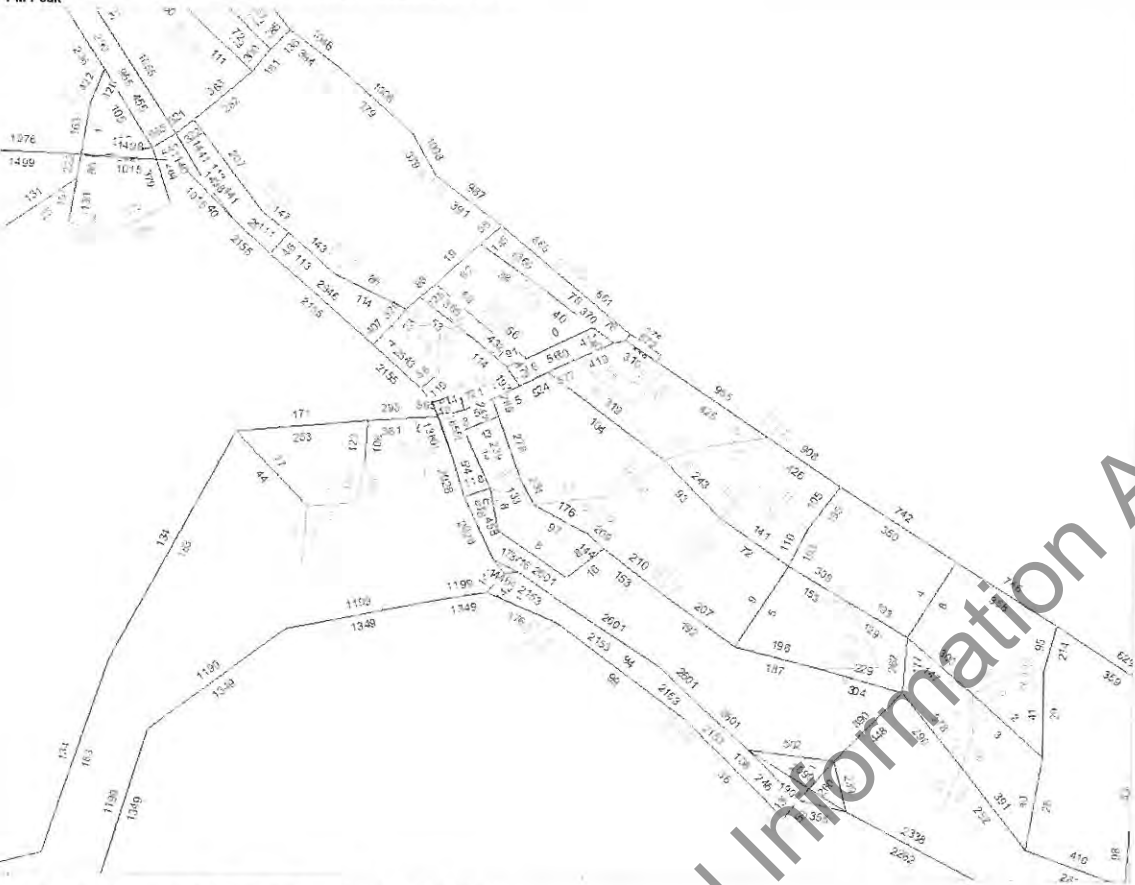


**Average Flow for 2031 MGI TeMaunga Flyovers - Weaving (1 hour)**  
**AM Peak**





**Average Flow for 2031 MGI TeMaunga Flyovers - Weaving (1 hour)**  
**PM Peak**

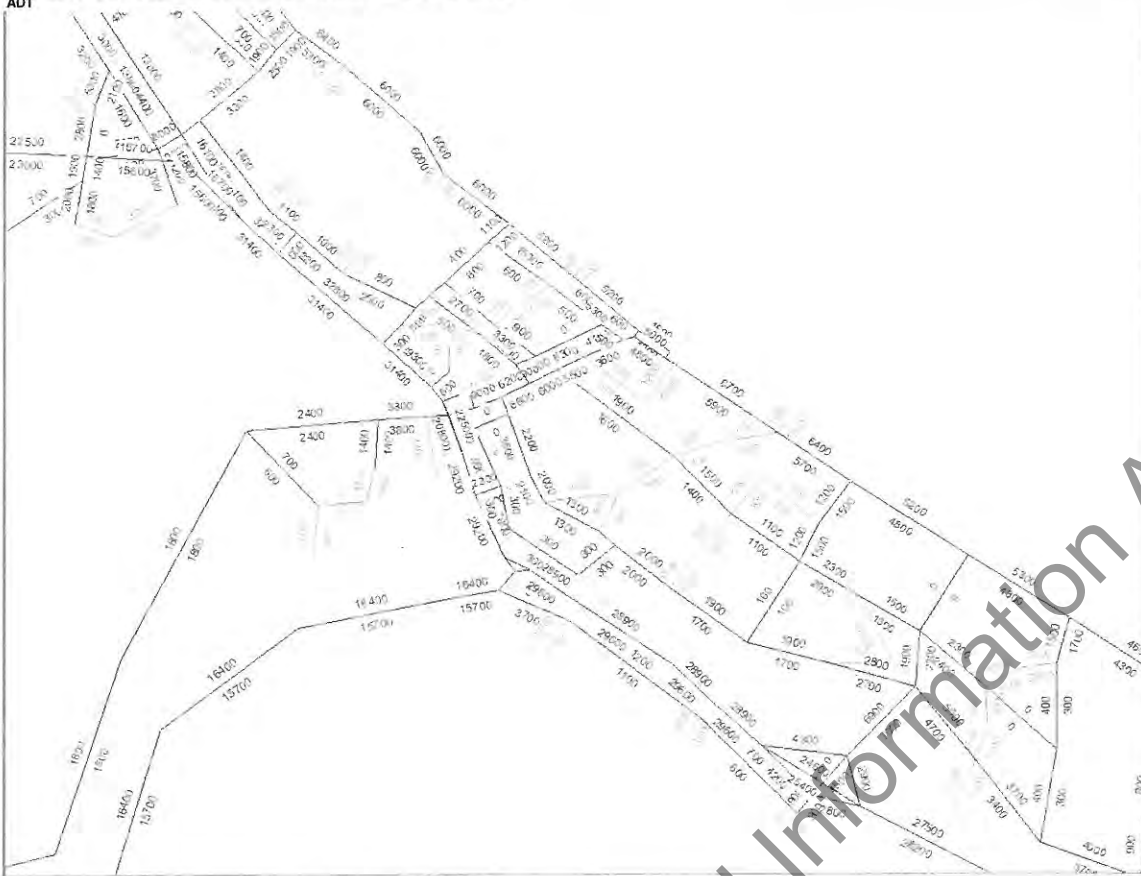


**Average Flow for 2031 MGI TeMaunga Flyovers - Weaving (1 hour)**  
**PM Peak**



**Average Flow for 2031 MGI TeMaunga Flyovers - Weaving (1 hour)**

ADT



**Average Flow for 2031 MGI TeMaunga Flyovers - Weaving (1 hour)**

ADT



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**Average Flow for 2031 Railway Alignment (1 hour)**  
**AM Peak**

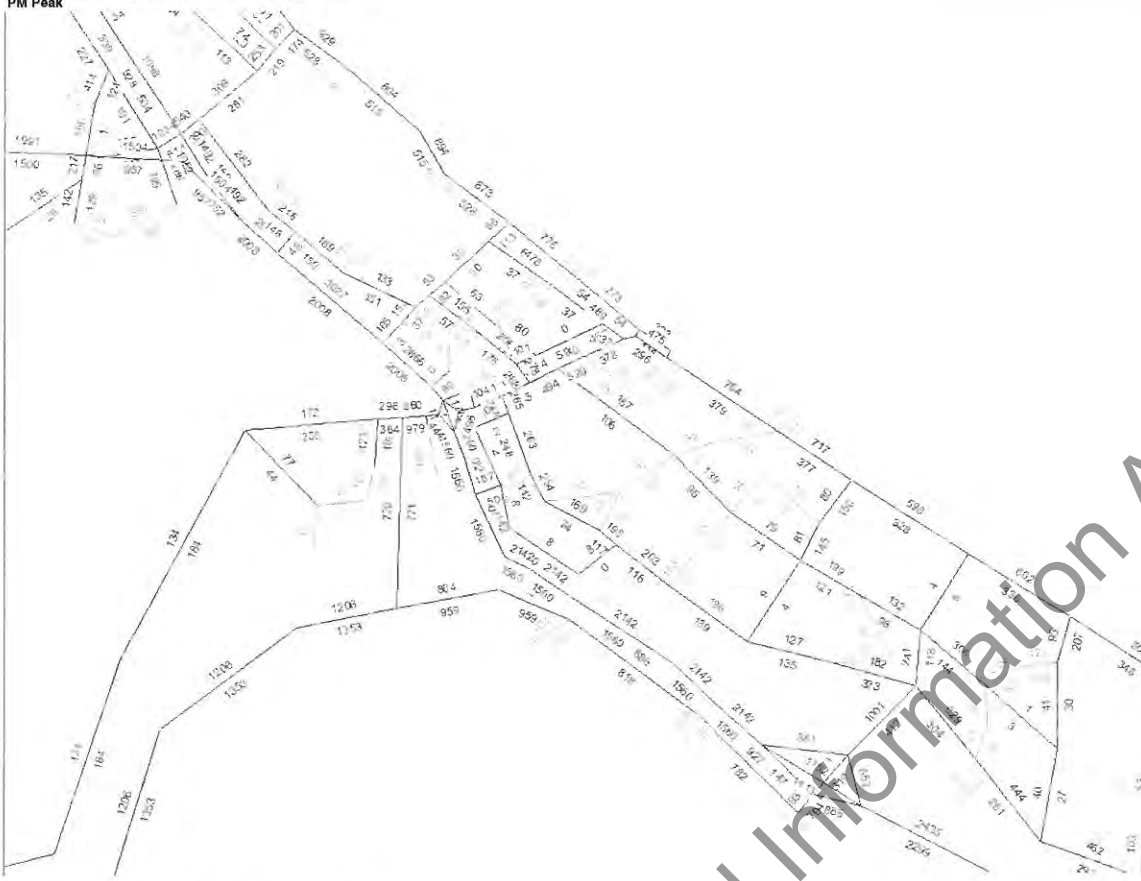


**Average Flow for 2031 Railway Alignment (1 hour)**  
**AM Peak**



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**Average Flow for 2031 Railway Alignment (1 hour)**  
**PM Peak**

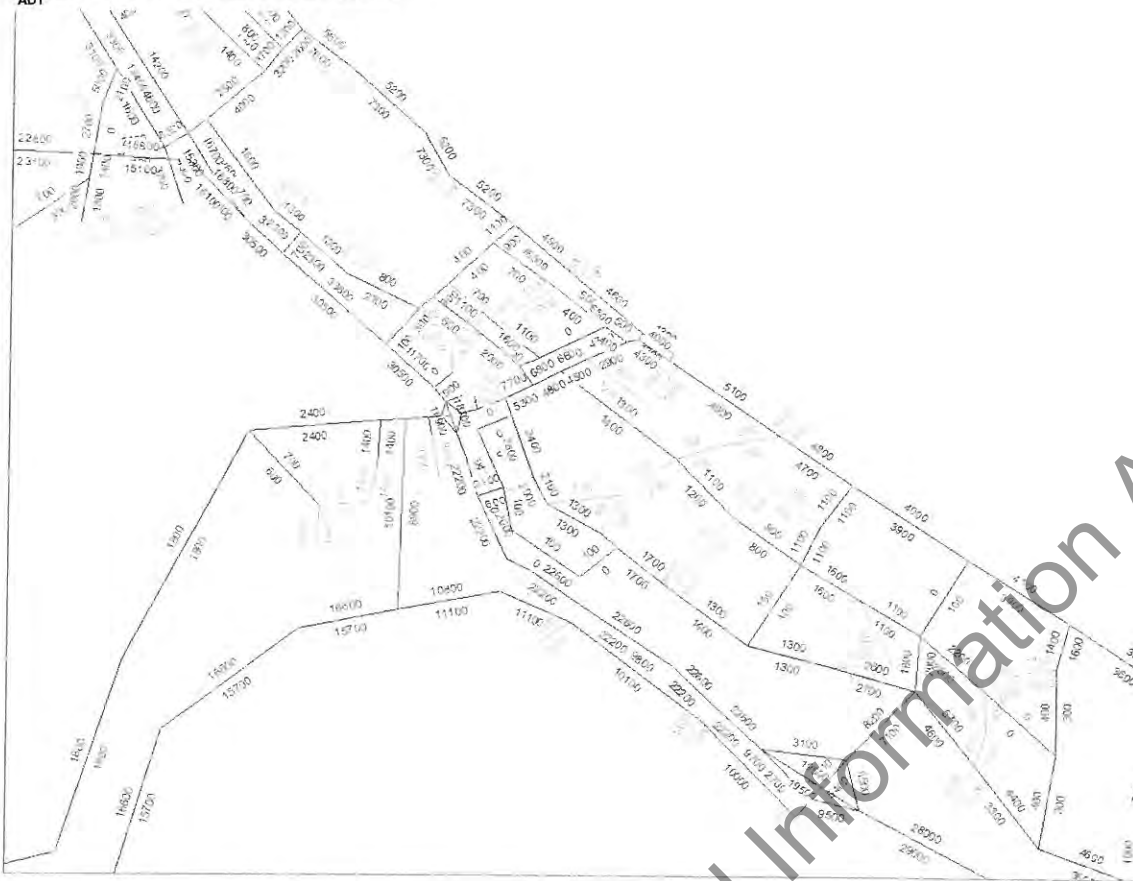


**Average Flow for 2031 Railway Alignment (1 hour)**  
**PM Peak**



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**Average Flow for 2031 Railway Alignment (1 hour)**  
ADT



**Average Flow for 2031 Railway Alignment (1 hour)**  
ADT



Appendix C

TTM Network Assumptions

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## File Note

**By:** s 9(2)(a)  
**Subject:** MGI & Te Maunga Future Years Model Assumptions

**Date:** 13 June 2011  
**Our Ref:** 3816370

This file note documents the list of State Highway and Local Road “planned” network improvement to be included for the modelling of the Maunganui & Girven Intersection (MGI) Improvement SAB and Preliminary Investigation at the Te Maunga roundabouts (see **Table 1**). In addition, it summarises the proposed Bayfair shopping centre expansion based on two sources - the Tauranga District Plan and the Smart Growth assumption (see **Table 2**), and the industrial development around the Truman Lane area (see **Table 3**).

The purpose of this note is to obtain an general agreement on the assumptions on the **form and timing of projects and the future development plans for Bayfair and Mangatawa Industrial block**, such that they can be included as part of the above projects. While options at Maunganui/Girven and Te Maunga will be independently tested, the following key assumptions need to be reviewed, in particular:

- Girven Road four-laning
- SH2A/SH29 Hairini to Maungatapu Bridge 4-laning
- Bayfair expansion plan (suggest to adopt the approved plan change as per District Plan)
- Mangatawa Industrial Block

Table 1 – Proposed Form and Timing of Network Improvements (✓ = inclusion year)

Project	Description	2010	2011	2016	2021	2026	2031
<b>State Highway Network</b>							
SH2 – 15th Avenue/Turret Road including Fraser Street intersection	<p>Hairini Stage 2:</p> <ul style="list-style-type: none"> <li>Widening of the 15th Avenue approaches at the 15th Avenue / Fraser Street intersection (additional westbound through lane and eastbound right turn into Fraser St).</li> </ul> <p>Hairini Stage 3<sup>1</sup>:</p> <ul style="list-style-type: none"> <li>Four-laning of 15<sup>th</sup> Avenue and Turret Road between Cameron Road and Maungatapu roundabout;</li> <li>Convert the existing one-way direction of Turret Road north of 15<sup>th</sup> Avenue from southbound to northbound only</li> </ul>			✓			
SH2 – Hewletts Road four laning	<ul style="list-style-type: none"> <li>Widening of Hewletts Road from 2 to 4 lanes between Totara Street and Maru Street;</li> <li>Upgrading Hewletts Road / Tasman Quay, Hewletts Road / Totara Road intersections from roundabout to traffic signals; and</li> <li>Upgrading Hewletts Road / Waimarie Street intersection from priority to signal.</li> </ul>	✓					
SH2 – Harbour Link	<ul style="list-style-type: none"> <li>Duplication of the Harbour Bridge to provide 4 lanes on the causeway;</li> <li>Connecting Takitimu Drive to Harbour Bridge with 4 lane grade separated flyover;</li> <li>New full diamond interchange at Chapel Street; and</li> <li>East facing ramps and a single eastbound off-ramp at Mirrielees Road.</li> </ul>	✓					

<sup>1</sup> This project is currently under investigation and the final design is yet to be confirmed.



Project	Description	2010	2011	2016	2021	2026	2031
SH2 – Maunganui / Girven Intersection upgrade	<ul style="list-style-type: none"> <li>■ This is to be investigated as part of this study for various at-grade and grade-separated upgrades.</li> <li>■ For this investigation, it will assume the Te Maunga roundabouts be upgraded with 2-lane flyover for traffic along SH2.</li> </ul>						
SH2 - Takitimu Drive / Elizabeth Street - interim upgrade (signals)	Upgrade the existing roundabout to a signalised roundabout.			✓			
SH2 - Takitimu Drive / Elizabeth Street - grade separation	Grade separation of the southbound through movement and removal of the signalisation at the at-grade roundabout.						✓
SH2 – Tauranga Eastern Link (TEL) (Phase 1)	<ul style="list-style-type: none"> <li>■ An interim at-grade upgrade at the Te Maunga roundabout (to be investigated as part of this study);</li> <li>■ Widening of SH2 from Te Maunga roundabout to Domain Road from 2 to 4 lanes;</li> <li>■ New 4-lane divided motorway from Domain Road to SH2/SH33 intersection in Paengaroa;</li> <li>■ Connect Sandhurst Drive to SH2 via a new full diamond interchange with connection to Truman Lane (to be sensitivity tested as part of this study);</li> <li>■ Upgrade the Domain roundabout to a full diamond interchange;</li> <li>■ New 3-legged interchange<sup>2</sup> at Rangiuuru connecting to the business park;</li> </ul>			✓			

<sup>2</sup> Although the Rangiuuru Interchange is not part of the Phase 1 project, it has been included (albeit as developer funded), as it is a pre-requisite for full development of the Rangiuuru Business Park. This alternative 3-legged layout of the Interchange (without the southbound on-ramp) was assumed for SH2 Rangiuuru Intersections Improvement Study carried out by GHD and will be included as part of the standard assumptions unless otherwise advised by the study group.

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Project	Description	2010	2011	2016	2021	2026	2031
	<ul style="list-style-type: none"> <li>■ Upgrade the intersection of SH2 / SH33 to a roundabout connecting to TEL;</li> <li>■ Grade separation of Parton Road from TEL;</li> <li>■ Realignment of Te Tumu Road north-west of TEL to connect to Maketu Road; and</li> <li>■ Tolls will be applied – current strategy is all day toll at \$2 for light vehicles and \$5 for heavy vehicles.</li> </ul>						
SH2 – Tauranga Eastern Link (Ultimate)	Phase 1 plus: New full diamond interchange connecting to Papamoa East.					✓	
SH29 – Tauriko Bypass <sup>3</sup>	<ul style="list-style-type: none"> <li>■ 2-lane link connecting SH29 (south of Omanawa Road) to Takitumu Drive (Pyes Pa Bypass) with priority given to Tauriko Bypass;</li> <li>■ Northbound traffic on Pyes Pa Bypass will have to make a left turn at the Kennedy Road and make a right turn onto Tauriko Bypass; and</li> <li>■ Roundabout connection at Belk Road and Kennedy Road.</li> </ul>						✓
SH2 – Te Puke Intersections upgrade	<ul style="list-style-type: none"> <li>■ Realign Te Puke Quarry Road;</li> <li>■ Relocate the SH2 / Te Puke Quarry Road intersection north of current location and upgrade to a roundabout; and</li> <li>■ Upgrade the SH2 / No. 3 Road intersection to traffic signals (assumed to be).</li> </ul>			✓			
SH2 – Te Puke local (internal) bypass	<ul style="list-style-type: none"> <li>■ A 4-lane local link bypassing the Te Puke town centre between King Street and Jocelyn Street; and</li> <li>■ Treatment to Te Puke town centre to discourage vehicle movements.</li> </ul>				✓		

<sup>3</sup> This project is currently under investigation and the final design is yet to be confirmed.

Project	Description	2010	2011	2016	2021	2026	2031
SH29 / Route K and Taurikura / Lakes Boulevard – roundabout upgrade <sup>4</sup>	<ul style="list-style-type: none"> <li>Proposed at-grade intersection improvement.</li> </ul>						✓
SH29 – Route K to Barkes Corner four laning	Widening of SH29 from 2 to 4 lanes between Route K and Barkes Corner.					✓	
SH29 – Route K to Barkes Corner – grade separation	2-lane grade separated link bypassing the Barkes Corner on SH29.					✓	
SH29 – Oropi Road Intersection – minor upgrade	Minor improvement of capacity.			✓			
SH2A/SH29 – Hairini to Maungatapu Bridge four laning	Widening of SH2/SH29 from 2 to 4 lanes from Maungatapu roundabout including Maungatapu bridge.					✓	
SH2A/SH29 – Hairini Welcome Bay/SH29 upgrade - interim upgrade (signals)	Hairini Stage 1: Signalisation of the Welcome Bay Road / SH29 roundabout.	✓					
SH2A/SH29 – Welcome Bay/SH29 upgrade - grade separation	Hairini Stage 4 <sup>1</sup> : 2-lane grade separated link between Welcome Bay Road and Turret Road (bypassing both Welcome Bay and Maungatapu roundabouts)					✓	
SH2/SH29 – Te Maunga/Maunganui Intersection upgrade	<ul style="list-style-type: none"> <li>This is to be investigated as part of this study for various at-grade and grade-separated upgrades.</li> <li>For this investigation, It will assume Maunganui / Girven intersection be upgraded with 4-lane flyover for traffic along SH2.</li> </ul>						
SH36 – Pyes Pa Bypass (Phase 1)	<ul style="list-style-type: none"> <li>2-lane link connecting SH36 (north of Keenan Road) to Taurikura Drive; and</li> <li>Extension of Kennedy Road that connects to the</li> </ul>		✓				

<sup>4</sup> This project is currently under investigation and the final layout is yet to be confirmed.

Project	Description	2010	2011	2016	2021	2026	2031
SH36 – Pyes Pa Bypass (Phase 2)	bypass via a new roundabout. Phase 1 plus: <ul style="list-style-type: none"> <li>■ Widening of the bypass from 2 to 4 lanes (where the southern Tauriko Bypass joins PPB and Lakes roundabout); and</li> <li>■ Widening of the Takitimu Drive (between Lakes roundabout and SH29) from 4 lanes to 6 lanes.</li> </ul>						✓
<b>Local Road Network – Central</b>							
Cameron Road / 2nd Avenue – signals	Upgrade the priority intersection to traffic signals			✓			
Cameron Road / 3rd Avenue - minor upgrade	Minor upgrade allowing dedicated right turn from 3 <sup>rd</sup> Avenue and dedicated left turn into 3 <sup>rd</sup> Avenue.			✓			
Cameron Road / 11th Avenue – signal upgrade	Introduce right turn from 11 <sup>th</sup> Ave into Cameron Road northbound. Close right turn from Christopher Street to Waihi Road.		✓				
Cameron Road / 15th Avenue - signal upgrade	Widening of the 15 <sup>th</sup> Avenue approaches.			✓			
Cameron Road / 18th Avenue - signals	Upgrade the priority intersection to traffic signals.			✓			
Cameron Road / Spring Street - signals	Upgrade the priority intersection to traffic signals.			✓			
Chadwick Road / Fraser Street - roundabout upgrade	Widening of the approach lanes to the roundabout.			✓			
Elizabeth Street / Cameron Road - signal upgrade	Widening of western Elizabeth Street approach to allow two dedicated right turn lanes.				✓		
Fraser Street / Merivale Road - roundabout	Upgrade the priority intersection to roundabout.				✓		
Hasting Road	Closure of existing access onto SH29 and realign to join Lakes Boulevard.			✓			
Grasshopper Development Network	Internal road network with Lakes Boulevard as the major spine road through the residential development.	✓					

Project	Description	2010	2011	2016	2021	2026	2031
Route K Tolling Strategy <sup>5</sup>	For 2011: All day toll at \$1.5 for cars, \$2 for MCV and \$5 for HCV. Manual transaction. From 2016: All day toll at \$1.5 for cars, \$3.75 for MCV and HCV. Electronic transaction. Tolls escalate at CPI.		✓				
Tauriko Crossing (Retail) Network	Access to the retail provided via the Whiore Avenue and a midblock roundabout on Taurikura Drive	✓					
Tauriko IMF Industrial Development Network (north)	Internal road network with Taurikura Drive as the major spine road through the industrial development.	✓					
Tauriko IMF Industrial Development Network (south)	Extension of Taurikura Drive to Kennedy Road extension and to Belk Road via a roundabout.				✓		
<b>Local Road Network – East</b>							
Tara Road four laning	Widening from 2 to 4 lanes.					✓	
	Upgrade the priority intersection with Parton Road to a roundabout.			✓			
Doncaster Road link to Tara Road	Extension of Doncaster Road to connect with Tara Road.	✓					
Domain Road four laning	Widening from 2 to 4 lanes between Tara Road and Papamoa Beach Road.			✓			
Domain Road / Gravatt Road - signals	Upgrade the priority intersection to traffic signals.		✓				
Girven Road four laning	Widening from 2 to 4 lanes between Gloucester Road to Maranui Street.				✓		
Gloucester Road / Grenada Street connections	Connect the western and eastern ends of Gloucester Road and Grenada Street (to be			✓			

<sup>5</sup> The current Route K study will confirm the preferred or final tolling strategy to be implemented. These assumptions in the table are agreed with TCC to be used for TTM5.8.

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Project	Description	2010	2011	2016	2021	2026	2031
<b>in Papamoa</b>	<b>sensitivity tested as part of this study)</b>						
Golf Road / Oceanview Road intersection – signals	Upgrade the priority intersection to traffic signals.	✓					
Kaituna Link (beyond 2031, included in the 2031 Plus scenario)	New 2-lane link connecting Te Tumu Road across the Kaituna River to the Te Tumu residential development.						
Papamoa East Stage 1 Structure Plan Network	Internal road network for the residential development in Wairakei.			✓			
Papamoa East Stage 2 Structure Plan Network	Internal road network for the residential development in Te Tumu.					✓	
Papamoa Beach Road traffic calming	Lower speed environment (50-60km/h) assumed in the model.			✓			
Papamoa Beach Road / Domain Road - signals	Upgrade the priority intersection to traffic signals.				✓		
Rangiuru Business Park Local Road Network (prior to full development)	<ul style="list-style-type: none"> <li>■ New roundabout access on SH2 (at Affco site);</li> <li>■ SH2 / Pah Road intersection remains open; and</li> <li>■ Roundabout at the 3-legged Rangiuru Interchange.</li> </ul>			✓			
Rangiuru Business Park Local Road Network (full development)	The above plus: <ul style="list-style-type: none"> <li>■ Closure of SH2 / Maketu Road intersection</li> </ul>						✓

Table 2 – Bayfair Expansion Assumptions

	2010	2016	2021	2026	2031
<b>DISTRICT PLAN</b>					
Total Gross Leasable Floor Area (m <sup>2</sup> )	34,000	Not specified	54,000	61,000	Not specified
Estimated Vehicle Trip Rate (per 100m <sup>2</sup> GLA) <sup>6</sup>	6.5	Not specified	5.62	5.32	Not specified
<b>Estimated PM Shopping Peak Vehicle Trips (veh/hr)</b>	<b>2,210</b>	<b>Not specified</b>	<b>3,035</b>	<b>3,245</b>	<b>Not specified</b>
<b>SMARTGROWTH<sup>7</sup></b>					
Households	27	27	37	37	37
No. of Employees	703	820	895	914	928
<b>Modelled PM Typical Peak Trips (veh/hr)</b>	<b>~1,900</b>	<b>~2,100</b>	<b>~2,300</b>	<b>~2,400</b>	<b>~2,500</b>

Table 3 – Mangatawa Land Use Assumptions

	2010	2016	2021	2026	2031
Development size = 41ha, Daily trip rate per ha = 220					
% Developed	As per Current	35%	57%	79%	100%

Karen Cheung

<sup>6</sup> Interpolated based on traffic generation estimates as reported in *Beca's Bayfair Expansion Traffic Analysis Report*, Dated 9<sup>th</sup> July 2009.

<sup>7</sup> As modelled in TTM including only the Bayfair meshblock.

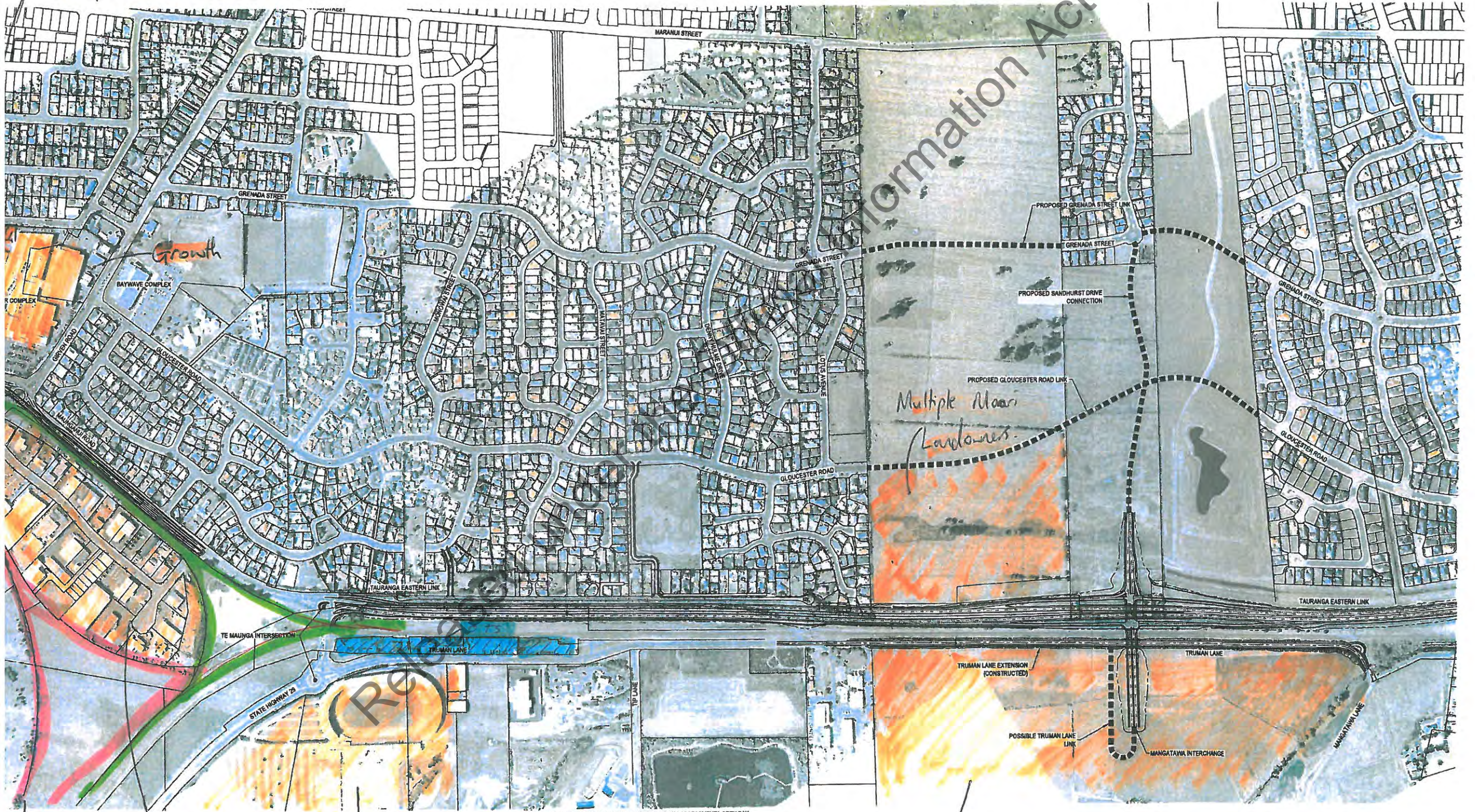
Appendix D  
Drawings

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# Constraints and Site Issues.

Potential Transport Centre



Information Act 1982



Fluor to include central barrier

Indication of land requirement

At grade portion of intersection to be determined.

Barriers to be continuous between MGI and Te Maunga

At grade portion of intersection is to be determined.

MGI - Te Maunga - Mangatana  
Baseline Option

21/2/12

Appendix C

MGI/Te Maunga Options  
Memo

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## Memorandum

**To:** s 9(2)(a) **Date:** 8 May 2012  
**From:** s 9(2)(a) **Our Ref:** 3933377  
**Copy:**  
**Subject:** MGI/Te Maunga Options April 2012

### 1 Introduction

This memorandum outlines the issues/benefits all of the proposed options for MGI/Te Maunga. There is a shortlist of four options from all of the proposed options which will be investigated further. The other options will not be investigated further due to poor lane continuity, increased safety risk and high land impact. The Do Minimum option is to keep the existing MGI roundabout and to construct the TEL roundabout at Te Maunga.

### 2 All proposed options

#### Overview

Following the workshop which was undertaken on February 27 2012, there were 19 proposed options. The options have been numbered based on the intersection type at either of the intersections. The option number refers to the intersection type at MGI. The option letter refers to the intersection type at Te Maunga.

#### Option 1A – TS at MGI, TEL RAB at Te Maunga

This is a low cost At Grade Solution which could form an interim solution for a Grade Separated intersection in the future. However the Te Maunga PFR showed that the TEL Roundabout had poor performance based on 2031 traffic volumes. This option will not be investigated further due to its poor performance.

#### Option 1B - TS at MGI, DRT at Te Maunga

This is a low cost At Grade solution which could form an interim solution for a Grade Separated intersection in the future. It will be considered further because it performs better than Option 1A and 1C.

#### Option 1C – TS at MGI, TS at Te Maunga

This is a low cost At Grade solution which could form an interim solution for a Grade Separated intersection in the future. However it will not be considered further because it has poor performance compared to Option 1A and 1B.

#### Option 2A – DRT at MGI, TEL Roundabout at Te Maunga

The benefit of this option is that it removes the heavy right turn from Girven Road onto Maunganui Road allowing the intersection to perform better. However there is a high land requirement from Bayfair. Due to this reason, this option will not be investigated further.

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### **Option 2B – DRT at MGI, DRT at Te Maunga**

As in Option 2A.

### **Option 2C – DRT at MGI, TS at Te Maunga**

As in Option 2A.

### **Option 3A – 2 Lane F/O at MGI, TEL RAB at Te Maunga**

This option offers grade separation at MGI but has the southbound flyover lane going into the roundabout at Te Maunga. The close proximity of MGI and Te Maunga means that there will be weaving at Te Maunga. Due to poor lane continuity, this option will not be considered further.

### **Option 3B – 2 Lane F/O at MGI, DRT at Te Maunga**

This option offers grade separation at MGI but has the southbound flyover lane going into the DRT at Te Maunga. The close proximity of MGI and Te Maunga means that there will be weaving at Te Maunga. Due to poor lane continuity, this option will not be considered further.

### **Option 3C – 2 Lane F/O at MGI, TS at Te Maunga**

This option offers grade separation at MGI but has the southbound flyover lane going into the Traffic Signals at Te Maunga. The close proximity of MGI and Te Maunga means that there will be weaving at Te Maunga. Due to poor lane continuity, this option will not be considered further.

### **Option 3D – 2 Lane F/O at MGI, 2 Lane F/O at Te Maunga**

This option offers complete separation of local and SH2 traffic at both MGI and Te Maunga. This removes the weaving issue mentioned above. Therefore this option will be considered further.

### **Option 3E - 2 Lane F/O at MGI, Diamond IC at Te Maunga**

This option offers complete separation of local and SH2 traffic at both MGI and Te Maunga. There is no potential for weaving between At Grade and Grade Separated traffic. Therefore this option will be considered further.

### **Option 4A – Y F/O at MGI (outer lane), TEL RAB at Te Maunga**

This option offers complete separation of local and SH2 traffic at both MGI and Te Maunga providing no opportunity for weaving between local and SH2 traffic. However due to the flyover going into the outer lane, all properties between Girven Road and Te Maunga would require acquisition as access is unachievable from Maunganui Road. Therefore this option will not be considered further.

### **Option 4B – Y F/O at MGI (outer lane), DRT at Te Maunga**

This option offers complete separation of local and SH2 traffic at MGI. However At Grade traffic is forced to merge with flyover traffic from the right. This is a significant safety issue. As in Option 4A, all properties between Girven Road and Te Maunga would require acquisition. This option will not be considered further due to the increased safety risk and land requirement.

### **Option 4C – Y F/O at MGI (outer lane), TS at Te Maunga**

This option offers complete separation of local and SH2 traffic at MGI and Te Maunga. This option does not have weaving between local and SH2 traffic. However all of the properties between Girven Road and Te Maunga would require acquisition. Therefore this option will not be considered further.

### **Option 4D – Y F/O at MGI (outer lane), NB F/O at Te Maunga**

This option offers complete separation of local and SH2 traffic at MGI and Te Maunga. This option does not have weaving between local and SH2 traffic. However all of the properties between Girven Road and Te Maunga would require acquisition. Therefore this option will not be considered further.

### **Option 5A – Y F/O at MGI (middle lane), TEL RAB at Te Maunga**

This option offers complete separation of local and SH2 traffic at MGI. There is no opportunity for weaving between flyover traffic and At Grade traffic however the flyover goes straight into the Te Maunga roundabout. This is a safety issue so therefore this option will not be considered further.

### **Option 5B – Y F/O at MGI (middle lane), DRT at Te Maunga**

This option offers complete separation of local and SH2 traffic at MGI and Te Maunga. This option is better than Option 5A because there is no interaction between the flyover and the DRT. Flyover traffic can bypass the Te Maunga intersection and continue towards TEL without stopping. Therefore this option will be considered further.

### **Option 5C – Y F/O at MGI (middle lane), TS at Te Maunga**

This option offers complete separation of local and SH2 at MGI however there is the potential for weaving between flyover traffic and At Grade traffic at Te Maunga. There are also performance issues with the traffic signals at Te Maunga as found in the Te Maunga PFR. Option 5B has better performance and safety so it will not be considered further.

### **Option 5D – Y F/O at MGI (middle lane), 2 Lane F/O at Te Maunga**

This option offers complete separation of local and SH2 traffic at both MGI and Te Maunga however it has extremely poor lane continuity. For this reason, it will not be considered further.

## 3 Options to be considered further

### **Overview**

All of the options listed below will be investigated further. These options were preferred over others because they had one or more of the following; better safety, better lane continuity, better performance, lower land impact or lower cost.

### **Option 1B - TS at MGI, Displaced Right Turn at Te Maunga**

#### **Previous Data/Performance**

There has been previous traffic modelling undertaken individually for Traffic Signals at MGI and for a Displaced Right Turn (DRT) at Te Maunga.

Based on modelling undertaken in 2012 for Traffic Signals at MGI, the overall LOS is E in the AM and PM peaks under forecast 2031 traffic volumes. However right turn movements from SH 2 to Girven Rd are nearly F. This does not factor in the effect of the rail at the Matapihi approach which would drop the performance to LOS F.

Based on a PFR undertaken in 2010 the option with traffic signals in 2016 and a flyover in 2026 had NPV benefits of \$127M.

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Based on the 2011/12 Te Maunga PFR, the traffic modelling for the DRT indicates that the intersection operates at LOS C under 2031 traffic volumes. Similarly, this will be compromised by the rail. The PFR determined NPV benefits of \$9M.

It is noted that the traffic modelling was undertaken for both intersections in isolation. To gain a better understanding of the combined performance and value of benefits, the intersections will need to be modelled as a pair.

Although the traffic modelling suggests that there is an inadequate LOS in 2031, there is potential for this option to be considered as an interim solution to building a flyover in the future. However they may not be sufficient queue space for vehicles turning right from SH2 onto SH29 due to the performance of the intersection is compromised by the rail.

### Physical Impact

The cross sectional width of this option is small relative to the other options. The impact on the adjacent private properties will be small, if any. The entire road alignment will fit within the existing road corridor with the exception of the two intersections where the road may impede on the rail corridor. Where this is the case it is recommended that the rail land will be purchased in order to accommodate the road.

### Enhancement Options

The Traffic Signals at MGI were modelled as having as many lanes as possible therefore it is not possible to make the intersection larger to increase to improve the performance. The performance of both intersections is compromised by the rail. The performance of both intersections can be enhanced by shifting the rail to the Matapihi corridor. An economic evaluation would show if the improved performance of the intersection outweighs the cost of relocating the rail to the Matapihi corridor.

### Cost Range

The expected cost of this option is likely to be in the order of \$25M excluding the rail relocation costs.

### Option 3D – 2 Lane F/O at MGI, 2 Lane F/O at Te Maunga

#### Previous Data/Performance

A 2 lane flyover option over a signalised intersection was modelled in the 2010 PFR.

Based on the PFR the 2 lane flyover option had NPV benefits of \$138M.

A 2 lane flyover of the Te Maunga intersection was assessed in the 2011 Te Maunga PFR. Based on the PFR the NPV benefits were \$28M.

The SH 2 traffic would be unaffected by the railway movements but the at grade elements of the intersection would be.

### Physical Impact

The width required to accommodate of the cross section is 43m for the majority of the length of the alignment. The impact of the proposed road alignment on adjacent properties depends on whether the rail is duplicated within the existing corridor or the Matapihi corridor. If the rail is duplicated within the existing corridor, the proposed road alignment would extend approximately 4m onto the adjacent properties. Although this only affects the frontage of the property, the entire property may

## Memorandum

need to be acquired in some cases. If the rail is duplicated in the Matapihi corridor, there will be a very minimal impact on the adjacent properties because the road can be accommodated on the land acquired railway land. There is not likely to be any physical impact on Bayfair.

### Enhancement Options

The property impact can be reduced by locating the rail duplication within the Matapihi corridor. Increased intersection performance can be achieved if the existing rail is relocated to the Matapihi corridor.

### Cost Range

The expected cost of this option is likely to be in the order of \$70-80M, excl railway relocation costs.

### Option 3E – 2 Lane F/O at MGI, Diamond IC at Te Maunga

#### Previous Data/Performance

This option achieves grade separation of local and SH2 traffic at MGI and Te Maunga and also grade separates SH 29 over the railway.

The performance is expected to be similar to Option 3, with the additional benefit of reduced impact from the railway operation.

Based on the 2010 MGI PFR the 2 lane flyover option had NPV benefits of \$138M. Based on the 2011 Te Maunga PFR the NPV benefits were \$28M.

#### Physical Impact

The 2 Lane Flyover at MGI is similar to Option 3, therefore the land impact of the Flyover will be similar. There will likely be private property required for the Diamond Interchange at Te Maunga. The on/off ramps of the interchange would likely impede on the adjacent properties near the interchange. This includes the church which is located about 60m north of the existing Te Maunga roundabout.

It is noted that if the single railway track adjacent to the highway is relocated to the boundary and the duplication occurs in the alternative corridor then apart from the widening at the Te Maunga intersection, the majority of this option could be located on railway land rather than requiring private property.

### Enhancement Options

Further design would be necessary to determine if the impact on private property at Te Maunga can be reduced.

### Cost Range

The expected cost of this option is likely to be in the order of \$70-80M excluding rail relocation costs.

### Option 5B – Y Flyover at MGI (middle lane), DRT at Te Maunga

#### Previous Data/Performance

There has not been any traffic modelling of the “Y” flyover at MGI, although it is anticipated that it will perform similarly the 2 lane flyover option that has been modelled in the 2010 PFR.



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Based on a PFR undertaken in 2010 the 2 lane flyover option had NPV benefits of \$138M.

As noted above, based on the 2011/12 Te Maunga PFR, the traffic modelling for the DRT indicates that the intersection operates at LOS C under 2031 traffic volumes. The PFR determined NPV benefits of \$9M.

### Physical Impact

The width of the cross section is 50m for the majority of the length of the alignment. The impact of the proposed road alignment on adjacent properties depends on whether the rail is duplicated within the existing corridor or the Matapihi corridor. If the rail is duplicated within the existing corridor, the proposed road alignment will extend 11m onto the adjacent properties. All of these properties would need to be acquired. The front row of car parks at Bayfair would also need to be acquired. If the rail is duplicated in the Matapihi corridor, the adjacent properties would still require acquisition however there will not be any physical impact on Bayfair.

If the existing rail and any duplication is located in the alternative corridor then the existing 20m railway corridor would be available for the road widening and no private property would be required.

### Enhancement Options

To reduce the impact of the proposed road alignment on adjacent properties and Bayfair, the rail could be shifted to the Matapihi corridor. This will allow the new road to utilise all of the rail land minimising the impact on adjacent properties. This will also improve the performance of the MGI intersection.

It may be difficult to match the MGI flyover with future grade separation of the Te Maunga intersection.

### Cost Range

The expected cost of this option is likely to be in the order of \$45M excl rail relocation costs.

## 4 Summary

The four options under consideration vary in performance, sensitivity to railway movements, cost and land impact.

Option 1B is a low cost interim solution that minimises land impact. Relocation of the railway is important in order to reduce the risk of queuing on the highway when the train is operating.

Options 5B is a moderate cost, long term option. Either significant land purchase would be necessary or the railway would need to be located in the Matapihi corridor.

The performance of the Te Maunga intersection is significantly influenced by the railway operation.

It may be difficult to match the MGI flyover with future grade separation of the Te Maunga intersection.

Option 3D is a relatively high cost long term solution. It provides good separation of the SH 2 traffic from local traffic and the SH 2 traffic is unaffected by the railway operation. The SH 29 traffic would be affected by the railway movements. Options to grade separate the SH 29 traffic from the railway would be problematic.

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Option 3E is a relatively high cost long term solution. It provides good separation of SH 2 traffic from local traffic and also grade separates SH 29 traffic from the railway.

Relocating the rail to the Matapihi corridor will reduce the impact of the intersection improvements on the adjacent properties and also improve the performance of the At-Grade intersections. At this stage it is unknown if the benefits of reduced land impact and improved intersection performance outweigh the cost of relocating the rail to the Matapihi corridor.

Regards,

§ 9(2)(a)

Civil Engineer

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Report

# Maunganui/Girven Intersection (MGI) - Te Maunga (SH2/29) Transport Assessment Report

Prepared for NZ Transport Agency (NZTA) (Client)

By Beca Ltd (Beca)

16 April 2014

Released under the Official Information Act 1982

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on behalf of	Beca Ltd		

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### Appendices

Appendix A: Transport Modelling and Economic Evaluation Memo

Appendix B: Peer Review, Flow Transportation Specialists, Dec 2013

# 1 Introduction

The NZ Transport Agency (NZTA) has engaged Beca Ltd (Beca) to undertake an investigation of options for future improvements at the Maunganui/Girven (MGI) and Te Maunga (SH2/29) intersections, on SH2 in Tauranga.

The primary objective of these investigations is to identify an effective long term transport solution for the SH2 corridor between the Mangatawa Interchange and the Hewletts Road flyover.

Currently the MGI Intersection consists of a four arm, two lane roundabout, connecting SH2 with Girven Road to the north and Matapihi Road to the south. The SH2/29 intersection consists of a two lane, three arm roundabout, located at the western end of the Tauranga Eastern Link (TEL).

These two intersections are located within approximately 800m of each other on the SH2 corridor, with the Mangatawa Interchange 1.7km south of the SH2/29 Intersection. Given this close proximity, it is imperative that investigations consider the interactions of both intersections with the operation of the Mangatawa Interchange and the Hewletts Road flyover. The study area and area of influence are shown in **Figure 1-1**.

There is a large area of land designated as rail corridor in the 1980s to the west of Owens Place; this land is currently owned by the NZTA and its purpose was to allow the rail to be relocated to enable widening of the SH2 corridor.



Figure 1-1: Study Area and Area of Influence

## 1.1 Purpose of Report

The purpose of this report is to conduct a comprehensive investigation of improvement options that have developed through studies. It also conveys the story of how the options got to their current configurations. The report then provides the economic analysis and a safety assessment of the options.

## 1.2 Project Development

The Tauranga Eastern Link Network Plan provides the integrated planning context for the Tauranga Eastern Link (TEL), Maunganui/Girven Intersection (MGI) and Te Maunga (SH2/29) Intersection. The Network Plan has identified this corridor as of key importance in the efficient delivery of freight to and from the Port of Tauranga (PoT). The corridor also provides a key commuter link between Papamoa and the Tauranga City Centre.

As part of the Tauranga Eastern Link (TEL) project, minor improvements to the current roundabout at Te Maunga were proposed. These improvements involved the introduction of a left turn slip lane from State Highway (SH) 2 towards SH29, in the westbound direction from TEL. These improvements were intended to improve efficiency of movements between SH2 and SH29. Additionally, the improvements would separate these left turn movements from the straight through traffic travelling along SH2.

### 1.2.1 Maunganui / Girven PFR (2010)

In 2010, Beca was commissioned by the NZTA to undertake a feasibility study of improvement options for MGI. This study developed six potential improvement options. These options included:

- Option 1: Low cost “Quick Win” roundabout improvements, consisting of a combined south approach with two through lanes and an exclusive right turn lane, and an exclusive right turn on the north approach;
- Option 2: Signalised, at-grade intersection with minimal land take;
- Option 3: Two lane flyover over signalised intersection with residential property purchase minimised;
- Option 4: Two lane flyover over existing roundabout;
- Option 5: Signalised at-grade followed by a two lane flyover at a later date; and
- Option 6: Underpass under signalised intersection.

The *Girven Road/Maunganui Road Project Feasibility Report, Beca, August 2010*, provides further details on the performance of each of the options. Options 1, 2 and 6 were discarded due to operational and safety concerns. As such, it was recommended within the study that Options 3, 4 and 5 justified further investigations at the Scheme Assessment Phase.

### 1.2.2 Maunganui Scoping Report (2011)

Discussions with the NZTA in regard to outcomes from the 2010 report resulted in further investigations of improvement options for the intersection. In June 2011, Beca was commissioned to investigate alongside the previously identified options, additional potential improvement options as part of a scoping exercise. The options investigated within this study included:

- Option 1: Signalised roundabout;
- Option 2: Hamburger arrangement;
- Option 3: Two lane flyover over signalised intersection;
- Option 4: Intersection underpass;

- Option 5: Grade separated bridge roundabout;
- Option 6: Grade separated signalised diamond interchange; and
- Option 7: Two lane flyover over existing roundabout.

Options within this study were evaluated through the use of a multi-criteria analysis (MCA), concentrating on transportation, social/cultural and environmental factors. The *Maunganui Road/Girven Road Intersection Improvements Scoping Report, Beca, June 2011* and the subsequent *MGI Scoping Report Addendum, Beca, January 2012*, provides further details in regards to the assessments performed. It was determined within this project that the only suitable options for MGI were options 3 and 7. Issues around performance, safety and the ability to achieve the NZTA's objectives dictated that grade-separation was the only viable solution for MGI.

### 1.2.3 SH2/SH29 Te Maunga PFR (2012)

Investigations at MGI indicated that improvement options, as well as changes to land use growth within the areas is expected to generate additional traffic demand at the Te Maunga (SH2/29) intersection. This increased demand indicated that the modifications proposed as part of the TEL were unlikely to have the ability to cater for this additional traffic generated. As such Beca was commissioned to investigate potential improvement options for the SH2/29 intersection, incorporating local land-use changes and improvements at MGI. Initially, a number of "low cost" improvements were evaluated. These options included:

- Modified TEL Roundabout – TEL roundabout with the addition of a dedicated left turn bay on the SH29 approach;
- Signalised T Intersection, Layout One; and
- Signalised T Intersection, Layout Two.

Testing of the options described above was found to have insufficient ability to provide any notable performance advantages over the original TEL roundabout. Therefore, it was decided that the TEL roundabout would be carried through as the base "Do Minimum" options. Additional information is detailed within the *SH2/29 Te Maunga Intersection Project Feasibility Report, Beca, January 2012*. Following from the initial low-cost assessment, two options were evaluated as part of these investigations. The options assessed included:

- Option 1: Displaced Right Turn – an at-grade intersection arrangement that separates the right turn from SH2 to SH29 from the straight through SH2-SH2 Traffic; and
- Option 2: SH2 – SH2 two lane flyover over a signalised T intersection.

The study indicated that although the options generated relatively low economic efficiencies (i.e. BCR between 1.0 and 2.0), the locality and level of interaction with MGI dictated that subsequent studies evaluate the intersections in unison. As such both were assessed as justifying further investigation.

### 1.2.4 Scope & Objectives Report (2012)

Following on from the outcomes of the Te Maunga study and the recommendation of investigating the MGI and Te Maunga intersections in unison, an Options Workshop was undertaken. The goal of this workshop was to develop corridor improvement options along this section of SH2.

### 1.2.5 Intersection Options Report (2012)

From this workshop, Beca was commissioned to investigate further potential options for the SH2 corridor. Studies focused on whether the current SH2 corridor should be retained or whether there were benefits in locating the road within another corridor. The corridor options identified included:



- Existing SH2 Corridor;
- Alternative railway corridor (Matapihi Corridor); and
- Truman Lane Corridor.

The outcomes of the study concluded that the existing SH2 corridor should be retained and that improvements to the MGI and Te Maunga intersections be investigated on that basis. Further information in regard to the outcomes of this study are detailed in the *MGI – SH2/29 Intersection Options Report, Beca, July 2012*.

The corridor workshop also identified a total of 19 potential improvement options to the combined MGI – SH2/29 corridor. Of these 19, all but four were discarded due to a number of reasons; including: poor operational performance, continuity and weaving issues, safety concerns and/or high land purchase requirements. A key consideration for the majority of these options was the ability to be able to weave between the two intersections. The four options identified for further investigation include:

- Option 1B: At-grade traffic signals at MGI, displaced right turn at SH2/29;
- Option 3D: Two lane flyover at MGI, two lane flyover at SH2/29;
- Option 3E: Two lane flyover at MGI, diamond interchange at SH2/29; and
- Option 5B: “Y” flyover at MGI, displaced right turn at SH2/29.

These options were recommended to be further evaluated as part of Scoping Study. It was also decided that a study be conducted to determine the feasibility of relocating the East Coast Main Trunk (ECMT) rail line into the alternative corridor running adjacent to Liftan Place. Further details of the outcomes of this feasibility study are contained in the *MGI – SH2/29 Intersection Study – ECMT Railway Relocation Comparison Report, Beca, January 2013*. The outcome of this study identified that the relocation of the railway was feasible and would offset potential land acquisition costs along the SH2 corridor.

A parallel study was commissioned by the NZTA to investigate the safety of a number of at-grade intersections at the SH2/29 intersection. The at-grade options evaluated as part of these investigations include:

- Grade Separation (SH2);
- Displaced Right Turn (DRT);
- Signalised roundabout – 3 east-west approach lanes; and
- Signalised roundabout – 4 east-west approach lanes.

The outcomes of this investigation concluded that the DRT options were likely to result in a higher occurrence of crashes when compared to a standard T-Intersection. It also found that the signalised roundabout options performed better than all other signalised intersections. Further details are contained in the *Te Maunga and Truman Intersection Option Safety Assessment, Beca, October 2012*.

These reports, as well as those conducted prior formed the basis for the scoping study of the four options identified for the SH2 corridor between MGI and SH2/29. The aim of the scoping exercise was to investigate the options that provide an efficient long term solution for SH2. The main outcomes of this study were:

- At-grade intersection improvements do not provide achieve the strategic objectives of the corridor and should not be investigated further;
- Not possible to stage grade separation of SH2/29 as flyover at MGI for at-grade SH2/29 would not tie-in with SH2/29 grade separation in the future; and

- Grade separation of SH2 traffic only option that provides enduring benefits.

This study recommended that Options 3D and 3E be progressed for further investigations. The *MGI-SH2/29 Intersection Study – Scoping Report, Beca, February 2013* provides additional information of the studies done to date and the options recommended for further assessment.

It was these options which have been further refined, and are discussed in detail within this report.

### 1.3 Other Reports

As discussed in Section 1.2, there have been a number of reports produced in the lead up to this study. The reports that form the basis for prior investigations and which should be used in conjunction with this study include:

- Girven Road/Maunganui Road Project Feasibility Report, Beca, August 2010;
- Maunganui Road/Girven Road Intersection Improvements Scoping Report, Beca, June 2011;
- MGI Scoping Report Addendum, Beca, January 2012;
- SH2/29 Te Maunga Intersection Project Feasibility Report, Beca, January 2012;
- SH2/29 Te Maunga Intersection Options Study – Scope and Objectives Report, Beca, February 2012;
- MGI – SH2/29 Intersection Options Report, Beca, July 2012;
- Te Maunga and Truman Intersection Option Safety Assessment, Beca, October 2012;
- MGI – SH2/29 Intersection Study – ECMT Railway Relocation Comparison Report, Beca, January 2013;
- MGI – SH2/29 Intersection Study – Scoping Report, Beca, February 2013; and
- Maunganui Girven and Te Maunga Intersections – 2012 Microsimulation Model Calibration and Validation Report, Beca, March 2013.

### 1.4 Report Structure

The remainder of this report is structured as follows:

- Chapter 2: Background of the project and how it meets both National and Regional objectives and strategies, as well as the SH2 corridors role within the Tauranga state highway hierarchy;
- Chapter 3: Description of the study, this details the options that will be investigated further and provides background on the key project considerations;
- Chapter 4: Safety Assessment Summary;
- Chapter 5: Economic Evaluation;
- Chapter 6: Sensitivity Tests

## 2 Tauranga Eastern Link Corridor Network Plan (TELNP)

The TELNP has identified the SH2 corridor as of key importance to deliver efficiently of freight to the Port of Tauranga (PoT). The connectivity to and from the TEL is essential. The TEL not only supports a significant investment in transport infrastructure, but supports the existing and future, local and regional strategic roading network, which it forms part of.

The Network Plan recognises the need to integrate and optimise the local network, activities and infrastructure surrounding the TEL. The three options develop are consistent with the Network Plan.

The Network Plan divides the eastern corridor into four sections which consider key works, development and planning that needs to occur in conjunction with the TEL. The map in **Figure 2-1** shows Section 1, which identifies MGI and SH2/SH29 intersection upgrades as being key elements of the Network Plan.



Figure 2-1: TEL Network Plan Section 1

## 2.1 Tauranga Urban Network Study 2011-2041

The Tauranga Urban Network Study (TUNS) provides the long-term direction for development of Tauranga's urban arterial road network over the next 30 years. This includes the state highways operated by NZTA, and local arterial corridors operated by TCC. It also promotes the role of rail in conveying freight, and in doing so managing the demands and impacts on the road network.

TUNS has been developed to support the national direction of the GPS on Land Transport Funding (2012/13 – 2021/22) and its focus on national economic growth and productivity. The study has also taken into account other national, regional and district direction such as the Bay of Plenty RLTS and SmartGrowth.

The Ring Road North corridor (as shown in **Figure 2-2**) function, which MGI and SH2/29 intersections are located within, is to provide road freight access to the Port of Tauranga for import and export of primary products:

- to/from the Waikato via State Highway 29 (SH29), 'Route K' and SH2
- to/from the Coromandel and Hauraki Plains via SH2 (through Bethlehem)
- to/from the central North Island (e.g. Taupo) via SH2 (to Paengaroa) and SH33.

The key objectives of TUNS, which are supported by this project are set out below:

- Bring together the key stakeholders in the planning and delivery of land transport solutions in order to integrate the development of all land transport modes and land-use planning
- Identify and quantify existing and future challenges for arterial corridors in the Tauranga urban network
- Determine desired strategic functions and roles of the arterial transport network in the Tauranga urban area, based on the Optimised Transport System approach
- Identify options that deliver desired functions given future challenges and undertake qualitative analysis to determine a preferred approach
- Develop clear statements about future network performance and identify potential strategic network forms.

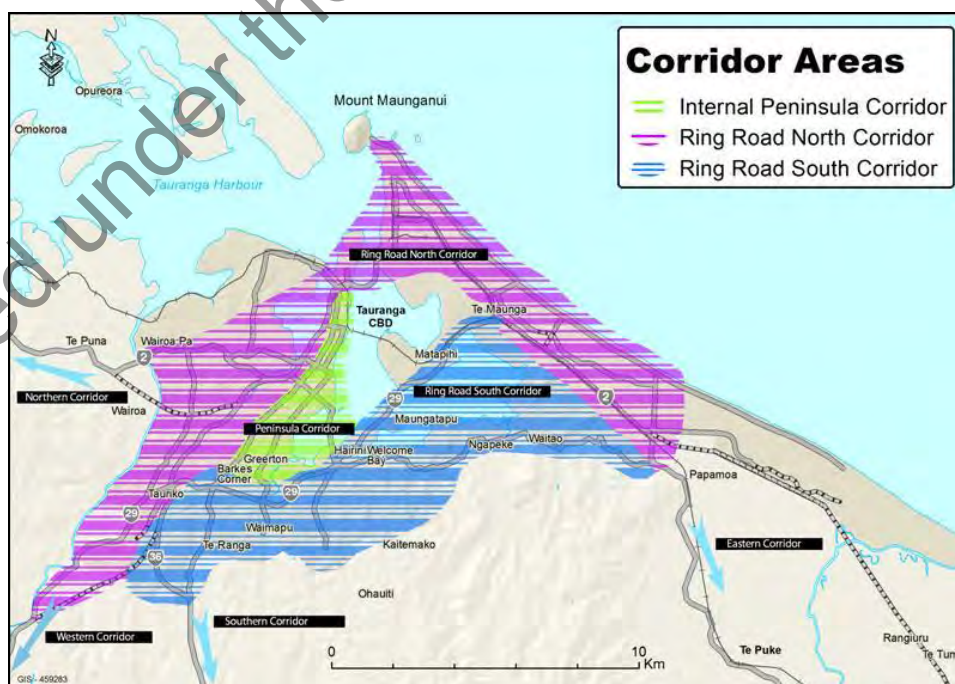


Figure 2-2: TUNS Strategic Transport Corridors

### 3 Description of the Project

This section of the report details the options that were investigated as part of this phase of the study. It establishes the development of the options and presents the transport context in which they reside. This forms the basis for comparing the options against the objectives and desired outcomes of SH2 corridor. The extent of the project area is shown in **Figure 3-1** below.



**Figure 3-1: Project Area**

#### 3.1 Project Considerations

Previous investigations for the MGI and SH2/29 Intersections have identified a number of key considerations that have directed the option development. These considerations have provided the basis for the options that are being investigated as part of this study. This report will focus solely on Transportation considerations, with other option drivers including social/environmental impacts and geometric considerations detailed reports accompanying the overarching Business Case for Implementation document. Aspects considered within this Transport Assessment include:

- Roading considerations;
- Local road connectivity;
- Land use considerations;
- Railway considerations;
- Pedestrian and cycling considerations; and
- Passenger transport considerations.

##### 3.1.1 Roading Considerations

The previous investigations into improvement options at the MGI and SH2/29 intersection have identified a number of roading aspects that have influenced the option development process. The

options being investigated as part of this study will be analysed on their ability to address the identified roading considerations.

a. Tauranga Eastern Link (TEL)

The Tauranga Eastern Link (TEL) is one of the Government's seven Roads of National Significance (RoNS). These projects have been identified within the Government Policy Statement (GPS) as projects that facilitate economic growth on a national perspective. One of the key drivers for the TEL project is the efficient movement of freight between the Eastern Bay of Plenty and the Port of Tauranga (PoT) along the SH2 corridor. The TEL is predicted to deliver 12 minute time savings between Paengaroa and the Te Maunga (SH2/SH29) intersection. The MGI and SH2/29 intersections are located along this part of the SH2 corridor.

TEL is scheduled to be completed in 2015/16, with forecast modelling indicating increased demand along the SH2 eastern corridor. As such the investigations performed to date have indicated that the MGI and SH2/SH29 intersection in their current arrangement will have insufficient ability to cater for this induced demand. As such significant delays are anticipated within the MGI – SH2/29 corridor.

The timing for opening of TEL is such that improvements options proposed as part of this study will not be implemented by then. This is likely to result in the MGI and SH2/29 intersections being a major constraint on the SH2 corridor, affecting the efficiency of freight movements to and from the PoT.

There is also however the opportunity for improvements proposed as part of this study for the SH2 corridor to support the overarching strategic objectives of the SH2 Eastern Corridor. The ability to provide the benefits associated with an efficient transport route to the PoT are to be enhanced as part of the proposals for the MGI – SH2/29 corridor.

b. Mangatawa Interchange

Located approximately 1700 metres to the east of the SH2/29 Intersection is the Mangatawa Interchanges, which is being built as part of TEL. The Mangatawa Interchange will be a Diamond Interchange over SH2, providing connections to Truman Lane and Sandhurst Drive. Both of these roads will be commissioned and administrated by the Tauranga City Council (TCC). On-going discussions between the TCC and NZTA are occurring in regard to the timings of these connections.

Truman Lane runs parallel to SH2 to the east of the SH2/29 Intersection. It connects at one end to SH29, directly south of the SH2/29 intersection, with a proposed connection to Mangatawa Interchange at the other end. A key driver for the connection to the Mangatawa Interchange is the inclusion of the MPBI development that is proposed along Truman Lane, which will be discussed further in Section 3.1.3.

Recent investigations have centred around the impacts on the wider network, namely the SH2/29 intersection if this link were not to be provided. These highlighted that without the connection to Mangatawa, Truman Lane traffic would need to travel through the SH2/29 intersection to access the SH2 Corridor. The high level assessments conducted concluded that this additional traffic will be detrimental to the overall performance of the SH2/29 intersection. In particular, increased delays and queuing are predicted for the SH29 approach when TEL opens in 2016.

#### c. Weaving

The distance between the MGI and SH2/29 intersections is approximately 800 metres. Approach lanes and exit lengths for grade separation of either of the intersections dictates that the distance available for weaving between the intersections is sufficiently reduced. This combined with high traffic volumes through the corridor indicates that weaving between the intersections cannot be performed safely or efficiently.

The inability to provide weaving between the intersections has played a significant role in the direction of the project and ultimately the options to be assessed within this study. Prior investigations have shown that the inability to be able to weave has meant that if grade separation is provided at MGI, with an at-grade intersection at SH2/29, the lane configurations are such that vehicles are unable to be in the correct lanes at the SH2/29 intersection (travelling eastbound). The only way that this combination could occur in unison is if a split flyover structure is constructed at MGI (Option 5B). This then inhibits the ability to grade separate SH2/29 in the future, without completely rebuilding the MGI grade-separation. Therefore, this effectively meant that each of the intersection have to be grade separated in unison.

With the grade separation of both the MGI and SH2/29 intersections, the approach and exit length of the grade-separation structures means that there is insufficient weaving space available. Weaving between the two intersections is restricted by the extension of side barriers between the two flyovers.

#### d. Safety

The primary driver for improvements to the SH2 corridor between MGI and SH2/29 is to provide capacity improvements to create a long term effective and efficient network. There is however the need to ensure that this is not achieved at the detriment to road safety.

As mentioned in Section 2 of this report, the SH2 corridor which incorporates the study area between MGI and SH2/29 is classified as a Nationally Strategic (High Volume) State Highway. It is desired that routes with this classification achieve a 4 star KiwiRap safety rating; in addition to having a lower risk of head on and other serious crashes. While it is recognised that the KiwiRAP classification has only been developed for rural state highways at this stage and MGI is located in an urban environment, the option development process focused on ensuring that the treatments implemented achieve a corresponding level of safety.

Investigations as part of the *Te Maunga and Truman Intersection Option Safety Assessment, Beca, October 2012*, indicated that the at-grade intersection options suggested for the corridor were unlikely to achieve safety aims for the corridor. In some instances, it was predicted that the frequency of high severity (fatal and serious injury) crashes would likely increase as a result of the improvements. The grade-separation of the intersections is likely to achieve the corridors safety ambitions.

The NZ Transport Agency High Risk Intersection Guide (HRIG) contains a methodology for the assessment of personal and collective risk at an intersection. This provides an alternate way of considering crash safety and is more suited to quantifying risk from a customer perspective. MGI has high collective risk and high personal risk, when assessed in accordance with the HRIG methodology, refer to **Table 5-7**.

#### e. ODV Routes

The SH2 corridor between MGI and SH2/29 is currently used as part of a number of Over-dimensional vehicle (ODV) routes. These routes that use this part of the SH2 corridor include:

- The entire length of SH2 from Hewletts Road to Domain Road;
- A further route along Domain Road, Papamoa Beach Road, Maranui Street and then along Girven Road to SH2 (Maunganui Road) for the MGI to Domain Road section; also
- Welcome Bay Road just south of Domain Road on SH2 to the Maungatapu and Welcome Bay intersections along SH29.

Further details in regard to ODV routes through the SH2 corridor are detailed in the *MGI – SH2/29 Intersection Investigations – Over Dimensional Route Design Considerations*.

Discussions between the New Zealand Heavy Haulage Association (NZHHA) and NZTA are ongoing. Initial indications are that improvement options for the corridor will have the ability to cater for ODV's. ODV dimensions for the MGI – SH2/29 corridor will adopt those used as part of TEL, these being dimensions of 6.1 metres high by 10.0 metres wide.

### 3.1.2 Local Road Connectivity

Previous investigations into improvement options at the MGI – SH2/29 Intersection have identified considerations related to local road (TCC) connections that have influences on the option development process. The options evaluated as part of this study will evaluate the ability for the scheme options to address influences from local road connectivity.

#### a. Relationship between Strategic and Local Road Traffic

Currently, the volume of local traffic and high amount of turning movements at the MGI and SH2/29 intersections restricts the flow of strategic inter-regional traffic travelling along SH2. The opening of TEL in 2015/16 will further exacerbate this conflict between strategic and local road traffic. As discussed in section 3.1.1, delay to SH2 strategic traffic may compromise the ability to achieve the benefits associated with the TEL.

As previously mentioned, SH2 along this corridor is classified as a Nationally Strategic (High Volume) State Highway and as such, in regard to strategic SH2 movements, the following aims have been identified:

- Speed: accommodate travel at consistently high speeds;
- Freight Facilities: provide frequent access to or from facilities that promote efficient freight carriage;
- Reliability: Provide for reliable journey time; and
- Junctions: Infrequent connections to only other State Highways and Major ArterialsK will be unimpeded by traffic at junctions.

This study has evaluated the ability of the options to achieve the above aims. A key factor in this is the effectiveness to separate the strategic SH2 traffic from local road movements.

#### b. Owens Place Intersection

Land-use changes as well as connections implemented as part of the scheme options will potentially increase the traffic demands along Owens Place. Currently the Owens Place/Matapihi Roundabout operates as a priority controlled T-Intersection, located approximately 70 metres south of MGI.

There is the potential for induced traffic on Owens Place due to changes in the SH2 corridor. This would be likely to impact the performance of the Owens/Matapihi Intersection. Due to the proximity of MGI to Owens Place, increased demand on the Matapihi approach will have implications on the performance of MGI.



### c. Gloucester/Granada Connections

The timing of Gloucester and Granada Road connections to Sandhurst Drive, which connects to the Mangatawa Interchange, is dependent on when developers provide the infrastructure. If the infrastructure is not provided, then this is likely to place increased demand on the Girven Road approach to MGI.

### d. Frontage Access Connectivity

Currently, full frontage access is provided for private properties and land-uses running along the SH2 corridor. Roads classified as National Strategic (High Volume) State Highways, the aim in regard to frontage access are:

- Frontage Access: aim to achieve no private access (e.g. driveways) except for highway service centres.

The option development proceeded on the basis that strategic SH2 traffic would be unimpeded from movements in and out of private access points that are currently located within the study area.

### 3.1.3 Land Use Considerations

The land adjacent and to the north of the study corridor is zoned as either residential or as a special Bayfair retail zone within the Tauranga City Plan. To the south there is the Baypark special leisure zone (Stadium and Arena), an area of reserve, and the Owens Place industrial and retail units.

The existing residential to the north is medium / high density, and the City Plan proposes the future intensification of that residential density. This density increase has the potential to increase the local residential traffic rates to an extent, although the local trips within the study corridor are a relatively small proportion of trips and so this is unlikely to have a significant bearing on the corridor traffic conditions.

#### Bayfair

The existing Bayfair retail was subject to an expansion of the retail area in 2011/2012. The City Plan makes provision through a specific zone for the further expansion of the retail which would incorporate an area of current residential properties to the west of the site. The expansion of the site is allowed for under the City Plan Rules, subject to further consideration of the site parking provision and the traffic effects on the network.

The existing Bayfair Centre retail is currently some 34,000sqm of GLFA. This is proposed to increase to 45,000sqm in 2016 and to 63,000sqm by 2026. The site currently has access and egress to both Maunganui Road and Girven Road, and this is likely to continue in the future. As such there is a significant interaction between the form of intersection at MGI, the Bayfair parking layout and the traffic demands at MGI. The site generates some 2500-3500 vehicles per hour in the PM peak.

The site also provides a significant bus interchange, and is the second busiest location in the city for passengers boarding and alighting (Wharf Street in Tauranga CBD is the highest). There is a proposal for the facilities at this location to be upgraded in the future, and this will include the construction of the Arataki Public Transport Interchange.

The current bus network in Tauranga results in some through routes using the current site, and some routes turning at the site. As such there may be some specific movements which are required to be provided at the interchange to facilitate the public transport network as it stands.

Whilst it is likely there will be further development of the bus network in the future, potentially including park and ride sites, the routing for those are not yet defined and so it would not be reasonable to assume all movements are required to be provided for possible future bus routes, and using the existing network as a basis for design is considered appropriate.

#### Owens Place

There are two distinct elements to the Owens Place activities. At the Matapihi Road end (northwest) the properties are largely retail, predominantly selling large household goods (white goods, furniture, home furnishings etc). Beyond the retail the land use changes to industrial.

Whilst there have been attempts to convert some of the industrial area to retail, the increased traffic generation could not be accommodated within the MGI intersection, and this conversion has not proceeded.

#### Matapihi

The long term development of the Matapihi peninsular was reviewed in Matapihi Land Use Plan prepared in 2008 by TCC in consultation with a range of stakeholders. This plan looks to manage the increase in the residential dwellings on Matapihi, but also shows that this would require an additional connection to SH29 to be able to deliver this growth. As there is no scheme programmed to provide this additional connection in the foreseeable future, it is considered reasonable to assume that there will not be significant change to the traffic demand on Matapihi Road for the purposes of the design and assessment of this scheme.

#### Baypark

The ASB Stadium and Arena at Baypark are also defined as a specific zone in the Tauranga City Plan. The nature of the stadium activities due to their leisure nature results in the majority of movements occurring outside of the peak times. However, there are some rugby games that attract large crowds at the tail end of the evening peak hour. These only occur 2-3 times a year, and the events operate under an approved temporary traffic management plan (TMP).

It is likely that any of the proposed alterations at Te Maunga under this study will result in amendments to the form of the TMP.

The Arena has a different pattern of visitor arrivals and departures. The Arena is used on a daily basis for participation activities, although these activities occur over a wider period that results in significantly lower traffic volumes and without the tidal peak flows of the stadium. There are additional spectator events at the Arena that do have some degree of tidal peak loading, but the spectator capacity is significantly lower than at the stadium and so with these events occurring outside of the network peaks they are not a significant capacity issue for the project.

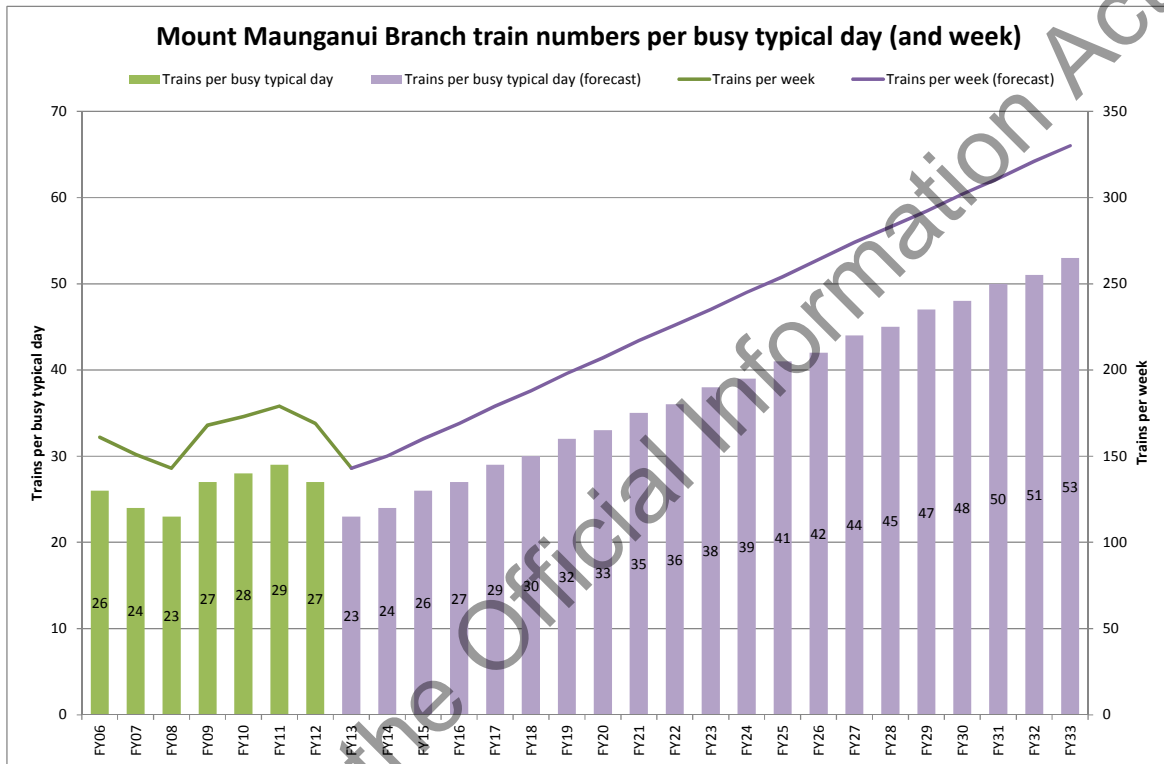
However, it is accepted that both venues do attract significant trips over the course of the year, by car and by foot. And as such whilst it may not be appropriate to design for the peak stadium loading capacity, the accessibility in terms of vehicle routes and safe cycling and walking facilities is important.

#### **3.1.4 Railway Considerations**

The East Coast Main Trunk (ECMT) runs parallel along the western part to the SH2 corridor between the MGI and SH2/29 intersections. Further details in regard to the railway corridor can be found in the *MGI – SH2/29 Intersection Study – ECMT Railway Relocation Feasibility Report*. The level crossing locations are currently controlled by a signal and barrier system. At MGI, the crossing point is located approximately 10m away from the intersection on the Matapihi Road approach. At

the SH2/29 Intersection, the crossing is located approximately 20m away from the intersection on the SH29 approach.

Train scheduling along the corridor is variable, as is the level crossing closure durations, which can be as long as four minutes. On-going discussions between the NZTA and KiwiRail have indicated that during a typical weekday, approximately 30 trains cross the Matapihi crossing and 12 cross the SH29 crossing. Indications from KiwiRail are that train frequencies are expected to increase by 50% over the next 10 years, as shown in **Figure 3-2** below (as provided by KiwiRail). Future rail operations are driven by global and local economic conditions, especially in relation to the forestry industry, and so beyond 10 years there is no reliable estimate of future movements.



**Figure 3-2: Train Frequencies**

The proximity of the rail to the SH2 corridor, the variable scheduling of trains and the potential lengths of barrier closures all influence the operation of the SH2 corridor. Current observations are the traffic approaching the intersection on all arms experience extensive queuing and delay as a consequence of railway movements. As traffic demands increase, placing strain on the current infrastructure, the increased frequency of the use of the level crossing by trains will exacerbate the performance of the SH2 corridor.

### 3.1.5 Pedestrian and Cycling Considerations

Current pedestrian and cyclist facilities that are located along the SH2 corridor between MGI SH2/29 include:

- Pedestrian footpaths located along the northern side of the SH2 corridor along the full length of the study area, except between Jackson St and Girven Rd;
- Pedestrian footpaths on both sides of the road corridor on Matapihi and Girven Roads;
- Pedestrian underpass between Bayfair and Matapihi Road, dimensions of 2.5m high x 3.0m high x 27.5m long;

- Underpass used as part of the TCC's Route A cycle link between surrounding areas and the Tauranga CBD;
- No dedicated pedestrian facilities are provided between the SH2 corridor and BayPark Stadium; and
- No on-road cycling facilities are provided along the SH2 and SH29 extent of the study area.

At MGI, the locality of Owens Place, the Bayfair shopping centre and the Omanu Golf Course, indicates that there is and will continue to be a pedestrian desire to cross SH2 at the intersections. Improvement options developed in prior studies and examined within this study are going to impact the current underpass. Therefore, there is a need as part of the option development to provide pedestrian facilities across SH2.

There also appears to be a desire for pedestrian access along and across the SH2 corridor to BayPark which may currently be suppressed by the lack of facilities. Options will evaluate the practicalities of providing this link.

The current form of intersections located at MGI and SH2/29 typically perform poorly in regard to cyclist movements. Options will seek to maintain the connectivity of the TCC's Route A cycle link across the SH2 corridor. There is an opportunity as part of improvements to the corridor to provide enhanced facilities for cyclist, which may enable enhanced mode share of trips using this part of the network.

Figure 3-3 below shows the TCC cycle network.



Figure 3-3: TCC Cycle Network

### 3.1.6 Passenger Transport

The SH2 corridor between MGI and SH2/29 is currently utilised by a number of both intra and inter-regional passenger transport services. A bus stop in the Bayfair carpark accommodates a number of high frequency bus routes that operate within the wider Tauranga Network. The frequent intra-regional services that travel along the SH2 corridor and stop at the Bus Stop include:

- Route 2: Windermere – Greerton – City – Bayfair – Mount;
- Route 30: Papamoa – Bayfair – Mount;
- Route 33: City – Bayfair – Papamoa; and
- Route 36: City – Mangatapu – Bayfair – Papamoa.

**Figure 3-4** provides an overview of the bus routes operating, as well as the facilities within the study area.



**Figure 3-4: Bus Transport Routes and Facilities**

Indicated on **Figure 3-4** are the location of the current Bayfair bus stopping facilities, as well as the potential location of the new bus interchange along the Farm Street side of Bayfair. Changes to the bus stop locations may impact the routing shown in **Figure 3-4**. On-going discussions with the TCC are occurring to ensure alignment between the passenger transport infrastructure proposed by the Arataki Interchange scheme and the scheme options for this study.

### 3.1.7 Existing Crash Records

A review of existing crash records of the area encapsulated within the study area has been undertaken. The crashes were obtained from the NZTA's Crash Analysis System (CAS). Within the study area, incorporating both the MGI and SH2/29 intersections, there have been a total of 28 Injury crashes over the 5 year period between 2007 and 2012. Of these crashes, two resulted in fatalities and five in serious injuries. Both of the fatalities involved interactions between vulnerable road users and heavy vehicles. One involved a truck hitting an elderly person on a motorised scooter and the other involved a cyclist riding into the path of an oncoming truck. **Figure 3-5** below shows the location and types of injury crashes that have occurred within the MGI – SH2/29 corridor. It can be seen that the most frequent accident type is from vehicles failing to give way when entering the roundabout. It should also be noted that another fatal incident occurred at the Matapihi rail level crossing between a train and cyclist. This was not reported in CAS, as it did not involve a motorised vehicle.

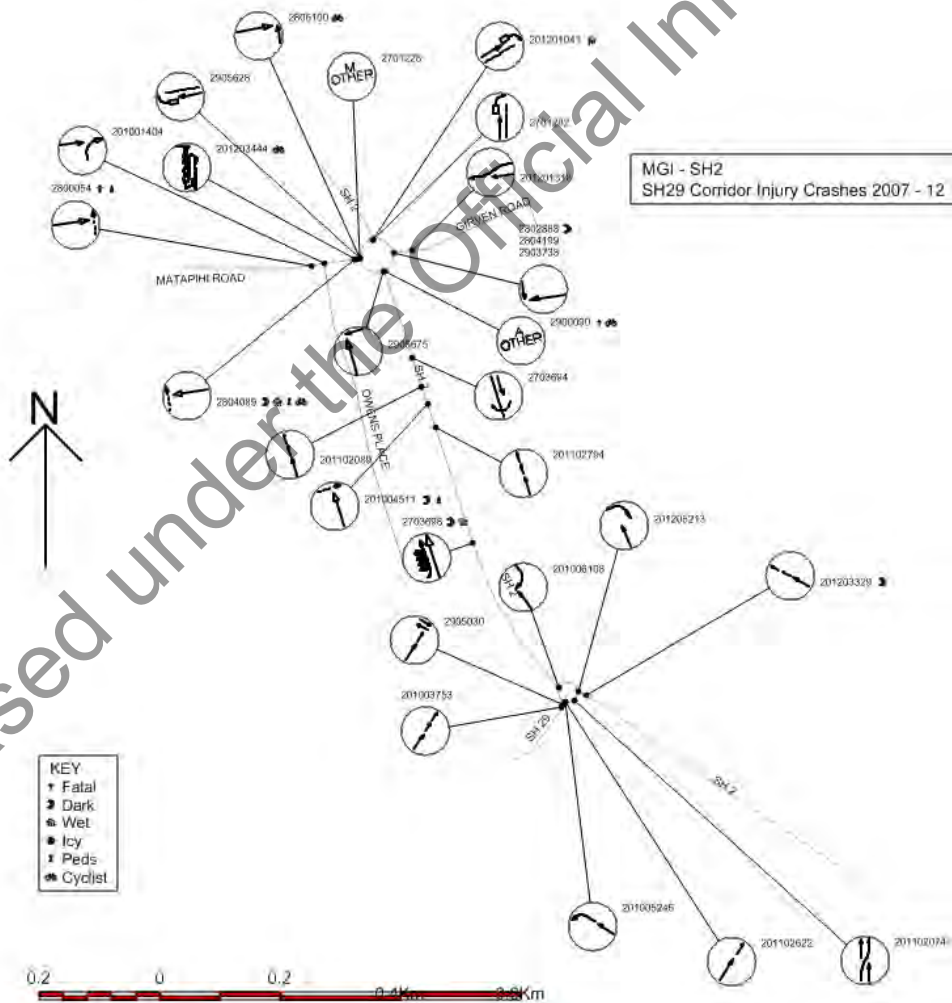


Figure 3-5: MGI – SH2/29 Corridor Injury Crashes 2007 – 12

### 3.2 Problem Statement

The four primary problems that the MGI and SH2/29 Intersection project sets out to address relate to congestion, journey time efficiency and reliability for state highway traffic including freight, resilience of the state highway network and road safety. These are important problems that need to be resolved to support future growth and development of the wider Tauranga urban area. The four primary problems are described below;

- Congestion – current Level of Service F
- Journey time – current average delays of over 4 minutes/vehicle in the morning and evening peaks for traffic travelling along SH2 between Hewletts Road and TEL. Moving forward to 2016 this increases to around 5 minutes in 2016 and up to 8 minutes in 2031
- Reliability – trains every 15 minutes in 2031
- Road Safety – MGI rated as one of the 120 riskiest intersections nationally in terms of collective risk

Several key opportunities have been identified and considered in terms of influencing the project development, including:

- the realignment of the ECMT railway line to reduce traffic disruption, improve reliability and network resilience
- design features for MGI and SH2/29 intersections supports growth and demands beyond 2031, maintaining a resilient and sustainable future network
- appropriate design options that factor in key uncertainties and potential risks on the network and offer flexibility in maintaining the resilience of both SH2 and SH29
- flexibility of the project, and in particular the SH29 approach, against future local growth beyond 2031, rail operations beyond 2023 and potential rail infrastructure changes.

The project development has also been guided by a number of environmental constraints and issues which have been identified. The areas considered include noise and vibration of the road and rail, visual and urban design, social, cultural, archaeological, air quality and land contamination.

### 3.3 Option 1

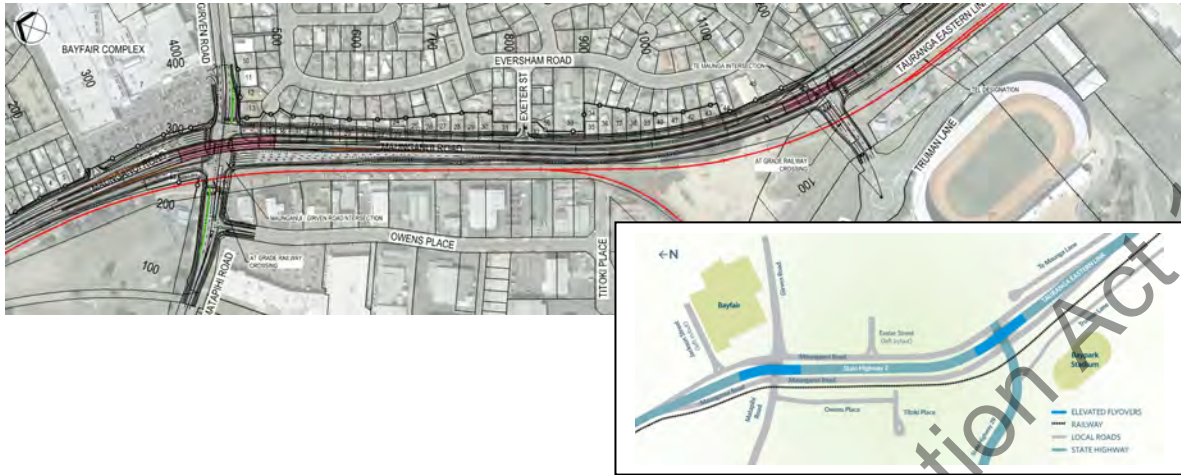


Figure 3-6: Option 1 general layout

Option 1 incorporates a 2 lane SH2 to SH2 Flyover over both the MGI and SH2/29 Intersections. The option also involves changing the current two lane roundabouts to signalised intersections. Other features associated with this scheme include:

- Two traffic lanes in each directions between the two intersections, directional traffic separated by a median barrier, with lanes utilising the flyover separated from the at-grade intersections with side barriers;
- Signalisation of the SH29/Truman Lane Intersection;
- Approach and auxiliary lanes for approaches to both the MGI and SH2/29 intersection developed through on-going optimisation of intersection performance and social/environmental impacts;
- Introduction of on-road cycling facilities at the Girven Road and Matapihi Road approaches to the MGI intersections;
- Introduction of at-grade pedestrian crossing at the signalised intersections at both MGI and SH2/29;
- Potential for an extended underpass to replace the current underpass which is to be removed as part of the scheme (implementation still to be decided); and
- ECMT rail line to be maintained within current corridor adjoins the SH2 corridor, widening of road corridor achieved through removal of properties along the east of the corridor.

The features of this option have been developed through a refinement process that has concentrated on the key considerations as identified in Section 3.1.

#### 3.3.1 Roading Proposals

As discussed in Section 3.1.1, roading considerations identified in previous investigations have directed the option development process. These considerations include:

- Tauranga Eastern Link (TEL);
- Mangatawa Interchange;
- Weaving;
- Safety; and
- ODV route provision.



a. Tauranga Eastern Link

Previous investigations have identified that the opening of TEL in 2015/16 is expected to increase the traffic demand at both the MGI and SH2/29 intersections. The intersections in their current configurations will have limited ability to cater for this induced demand.

The improvements proposed to the SH2 corridor between MGI and SH2/29 as part Option 1 will have the ability to cater for this increased growth once TEL is built. The separation of SH2 through traffic onto the flyovers will place less demand on the at-grade intersections.

This option will also have the ability to differentiate between strategic movements along the SH2 corridor (i.e. travelling to the PoT), enabling the potential travel benefits specifically for routes to the Port associated with the TEL to be realised. Additionally, the introduction of the grade-separation will fit within the context of the SH2 corridors at each end of the study area.

b. Mangatawa Interchange

If a Truman Lane link to the Mangatawa Interchange does not occur, then there will likely be an increased traffic demand from Truman Lane on both the SH2/29 and SH29/Truman Lane Intersections. This increased demand on the SH29 approach to the SH2/29 intersection would impact its performance, due to increased signal timings to accommodate additional traffic.

Option 1 proposes that the SH29/Truman Lane Intersection will continue to operate as a two-lane, three arm roundabout. The intersection configuration does not allow the ability to control individual movements. The performance on SH29 may be negatively impacted by the increased demand on Truman Lane, associated with not providing a link to the Mangatawa Interchange.

c. Weaving

Previous investigations have determined that the level of traffic demand along the SH2 corridor, in combination with the short distances between the MGI and SH2/29 intersection dictates that there is inadequate ability to weave safely and efficiently between lanes.

As such Option 1 proposes that weaving between the MGI and SH2/29 Intersections will be prohibited through the use of barriers, separating at-grade traffic from that using the flyovers. Prohibiting weaving within the corridor means that travel decisions by users will need to be made in advance of the intersections, placing greater emphasis on appropriate road marking and signage.

The inclusion of barriers to prohibit weaving also has the added benefit of separating strategic and local traffic through the corridor. The benefits of this will be discussed further in subsequent sections.

d. Safety

The road features proposed as part of Option 1 are predicted to enhance the safety performance of the SH2 corridor between MGI and SH2/29, compared to the current intersection and roading configurations.

The inclusion of grade separation at both the MGI and SH2/29 intersection reduces the number of conflict points at the at-grade intersections. This in combination with reduced conflict movement volumes reduces crash risk. Also, the inclusion of median and side barriers lowers the risk of fatal and serious injury crashes.

Option 1 maintains the level railway crossings at both the MGI and SH2/29 intersections. This means that both vehicles and pedestrians interact with train movements. These interactions have potential safety concerns associated with them. The concerns in regard to safety are no different to the current situation. However, the expected increase of both vehicular and pedestrian demand, in conjunction with expected train frequency changes will increase the level of exposure to the hazards associated with the level crossings.

e. ODV routes

Currently the SH2 corridor between MGI and SH2/29 intersections accommodates a number of Over-dimensional Vehicle (ODV) routes. These routes are to be maintained as part of scheme options for improvements to the intersections.

Flyover structures at both intersections will be designed and built to accommodate an unobstructed clearance of 6.1 metres between the finished road level and the bottom of bridge structures. Discussions are on-going whether ODV routes will use the at-grade or grade separated parts of the corridor. Regardless of what ultimate decisions are made, a 10m horizontal clearance is required, which will mean that street furniture and other associated obstacles are located outside this envelope or have the ability to be moved if needed.

### 3.3.2 Local Road Connectivity

As discussed in Section 3.1.1, local road connectivity considerations identified in previous investigations have directed the option development process. These considerations include:

- Relationship between Strategic and Local Road Traffic;
- Owens Place Intersection;
- Gloucester/Granada Connections; and
- Frontage Access

a. Relationship between Strategic and Local Road Traffic

As discussed in Section 3.1.2, the SH2 corridor encompassing the study area is classified as a Nationally Strategic (High Volume) State Highway. Highlighted were key aims for the SH2 corridor. The ability for Option 1 to achieve these aims is discussed below:

- Speed: The average speed of SH2 inter-regional traffic is relatively high as it is unimpeded by intersections and effects of local traffic;
- Freight Facilities: Provides frequent and efficient access to and from the Port of Tauranga and associated industrial and commercial areas;
- Reliability: Provides improved journey time reliability for SH2 inter-regional traffic through the grade separation over MGI and SH2/29. Reliability for the inter-regional traffic is largely unaffected by local traffic, railway crossing movements, Baypark events and holiday peak traffic flows; and
- Junctions: No intersections on SH2

Improvements proposed within Option 1 have separated the strategic SH2 traffic from non-strategic local traffic. The inclusion of grade-separation at both the MGI and SH2/29 intersection has the ability to achieve the aims of a Nationally Strategic (High Volume) State Highway. This ability would be significantly reduced if SH2 inter-regional traffic were to mix with local trips at at-grade intersections.

#### b. Owens Place Intersection

The physical attributes of Option 1 are not expected to alter the traffic flows or the operation of Owens Place. As such the Owens Place/Matapihi Road intersection is proposed to remain as a priority controlled T-intersection.

#### c. Gloucester/Granada Connections

If the Gloucester/Granada Connections were not connected to the Mangatawa Interchange, via the Sandhurst Drive Connection then this is likely to increase the demand on the Girven Road Approach to the MGI Intersection. This has potential implications on the performance of the intersection, as increased demand places additional strain on the capacity of the signals at the intersection.

#### d. Frontage Access

The removal of residential properties along the eastern side (travelling west towards Tauranga) of the corridors means that all private property access has been removed from the State Highway.

This accommodates the aims associated with a Nationally Strategic (High Volume) State Highway. In particular the aim of:

- **Frontage Access:** aim to provide no private access (e.g. driveways) except for highway service centres.

Option 1 would result in the need to remove some frontage properties. However there are some properties to the northwest of Jackson Street which would remain that would have their access affected. Currently it is possible to turn right into the houses from SH2, and whilst not desirable, turn right out across the flush median. An alternative option for the egress is to turn left and then U-turn at the MGI roundabout.

With Option 1 there will be a solid median due to the bridge structure, and so no right turn access or egress will be possible. In addition, the provision of the at-grade pedestrian crossing will require U-turn ban at the signals at MGI for traffic approaching from the north. As a result to access those properties from the south, drivers will need to turn into Girven Road and then access Concord road and turn left into their property. When egressing and wishing to travel north, vehicles will need to turn left and left again into Girven Road, then use Links Avenue. This affects 12 properties.

Whilst the access to the frontage properties between Girven Road and SH29 is also restricted to left in – left out, the U-turn is available at MGI signals for the approach and Te Manga for the egress and so the access effects are relatively minor. Exeter Road also provides an alternative route.

### 3.3.3 Landuse Considerations

This option has minimal effect on Bayfair, Owens Place or Matapihi with the routes and access largely unaffected. However, to the north of SH2 there are more significant changes as a result of the alignment. The retention of the rail in the existing corridor and the provision of both the flyover and the additional turning lanes at the intersection at MGI results in there being a need for land take on the northern kerbline.

This includes several residential properties on Maunganui Road to the north-west of Bayfair, and also within the area currently used as Bayfair surface car park. As a result there may be some loss of land which may inhibit some of the development configurations for the expansion of the Bayfair Centre. In addition, on egress from Jackson Street it will not be possible to enter the flyover, but

vehicles will need to travel through the at-grade intersection. A further consideration is that to provide the required capacity at signals for an at grade intersection then U-turns will be prohibited, meaning that to egress Bayfair towards Hewletts Road drivers would be required to either exit onto Girven Road and turn right, or use the TCC local road network. Whilst a routing issue, this may have some bearing on the future expansion proposals for the site.

### 3.3.4 Forecast flow changes

The expected traffic flow differences at key locations are as shown in **Table 3-1** below.

**Table 3-1: Comparison of DM and Option 1 Average Daily Traffic**

Location	Year	DM (ADT)	Option 1 (ADT)
TEL	2016	36,300	40,700
	2026	46,300	55,100
	2031	48,800	59,400
Maranui Street	2016	18,200	14,700
	2026	17,100	12,500
	2031	18,800	13,400
Maunganui Road	2016	51,200	55,200
	2026	52,800	63,300
	2031	53,800	66,500
Ocean Beach Road	2016	11,100	9,600
	2026	14,600	10,400
	2031	16,300	11,200
Maungatapu Bridge	2016	25,900	25,000
	2026	32,900	31,000
	2031	33,900	32,600

The table above shows that Option 1 would result in approximately 20-25% more traffic on SH2 and a reduction of some 30% on the parallel local road network by 2031. The flows over SH29 would decrease slightly as a result of the reassignment of trips via the SH2 and the Harbour Bridge in preference to SH29.

### 3.3.5 Railway Proposals

Option 1 proposes that the ECMT railway line will remain in its current alignment, running parallel to SH2 to the west (travelling towards Hewletts Road) on the corridor. The current road designation along SH2 within the study areas is constrained by both the rail line and residential properties running along the eastern edge. The ability to widen the road designation to accommodate the physical infrastructure as proposed in Option 1 dictates that the properties along the east will be acquired.

Option 1 will retain the current level crossings at each of the intersections. The distance from the intersections is predicted to be similar to the current roundabout arrangements. As discussed in Section 3.1.4, train arrivals and closure durations are variable, with closure periods predicted to be as long as four minutes. Train volumes are predicted to increase across both approaches by approximately 50% over the next 10 years. The at-grade interaction with trains, in conjunction with the close proximity of the crossings to the intersections means that conflicting traffic is going to be queued as a result as of train barrier closures.

The signalisation of the MGI and SH2/29 intersections as proposed in Option 1 has the added benefit over the current roundabout that movements at the intersections can be controlled. With the current roundabout, there is no control over any movements at the intersections. Therefore, vehicles in conflict with the trains at the level crossing can influence the performance of movements not in conflict with the train movements. The signalisation of the intersection allows for non-conflicting movements to still be performed whilst trains are crossing the level crossing. This in conjunction with actuation of the signals means that the length of time for conflicting movements to recover from train crossings can be improved over the current arrangement.

The ability to tie-in movements at the signalised intersections at both MGI and SH2/29, with train crossings at the level crossings means that the train barrier systems will need to be incorporated in the traffic signals controllers at the intersections. This is a complex arrangement that will need to be investigated further within the traffic signal design within the detailed design phase. In particular, there are potential physical hardware constraints associated with the traffic signal controllers that needs further investigation.

Currently, the signal controller is limited to a single phase during the train closure period; this is likely to be fixed to the straight-through movements. This will result on queuing on other approaches. Recovery phasing can be applied to the signal groups to enable the normal operation of traffic after a railway event.

### 3.3.6 Pedestrian and Cycling Proposals

As highlighted in Section 3.3, Option 1 proposes the following provisions for pedestrian and cyclists within the SH2 corridor:

- Introduction of on-road cycling facilities at the Girven Road and Matapihi approaches to the MGI intersection;
- Introduction of at-grade pedestrian crossings at the signalised intersection at both MGI and SH2/29; and
- Potential for extended underpass to replace the current underpass which is to be removed as part of the scheme (implementation still to be decided).

The inclusion of on-road cycling facilities at the Girven Road and Matapihi Road approaches helps to maintain the TCC's Route A cycle across the corridor. The introduction of the cycle lanes provides a dedicated facility for cyclists. This, in conjunction with the signalisation of the at-grade intersection and removal of SH2 interregional traffic will improve both the safety and functionality of cycle movements across the corridor. These features are an enhancement of the current facilities, which currently do not cater favourably for cycle traffic.

The provision of at-grade pedestrian crossings across the approaches to the MGI and SH2/29 intersections helps to maintain and enhance the provision for pedestrians across key demand lines. At MGI, the current pedestrian underpass is to be removed as part of the works; the provision of pedestrian crossing at the signals maintains a safe and efficient link between Bayfair and Owens Place. On-going discussions are occurring in regard to whether a new pedestrian underpass will be constructed. The lengths and concerns around personal security may dictate that any additional underpass may be underutilised.

The inclusion of a pedestrian link at the SH2/29 intersection between the SH2 corridor and BayPark will provide a safe and direct route for users of the facilities. Currently there are no dedicated facilities, so this will be enhancement of the current situation and will enable more walking trips to and from the stadium.

### **3.3.7 Passenger Transport Proposal**

Currently a number of inter and intra-regional bus services operate within and around the SH2 corridor between MGI and SH2/29. Currently, four high frequency intra-regional routes service the bus stop facilities within the Bayfair carpark. There is the potential for a bus interchange to be constructed within Bayfair, which is likely to result in some services requiring performing U-turns along SH2. With the introduction of traffic signals as part of Option 1, facilities for U-turning vehicles are unlikely to be provided. This will likely impact on the routing of the bus services that operate within the area.

### 3.4 Option 2

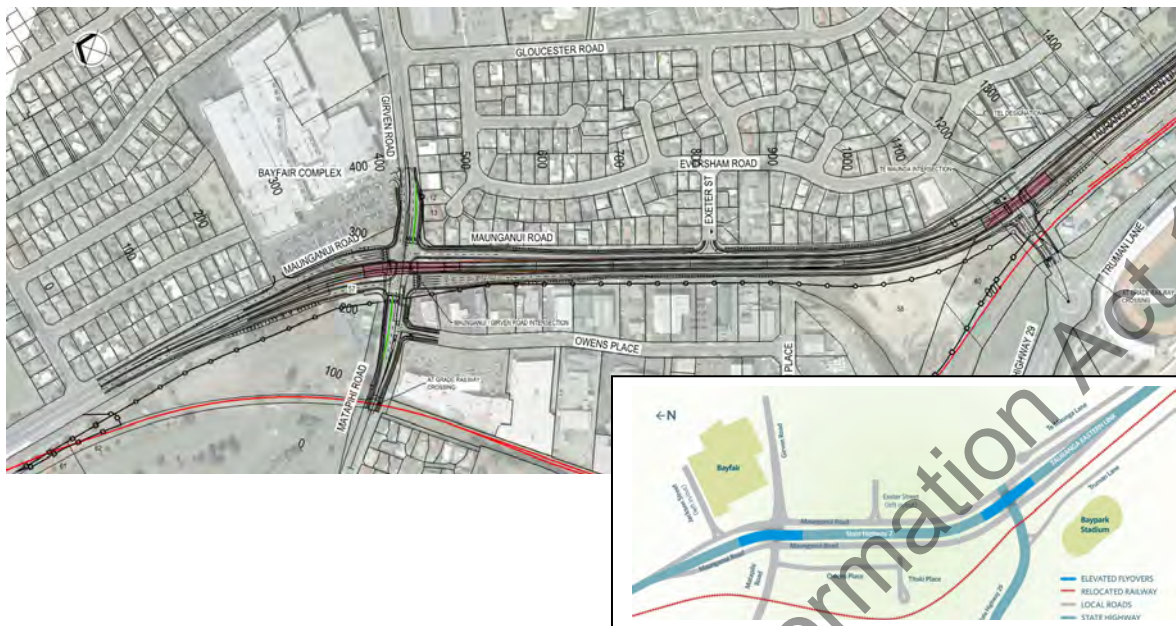


Figure 3-7: Option 2 general layout

Option 2 incorporates a 2 lane SH2 to SH2 Flyover over both the MGI and SH2/29 Intersections. The option also involves changing the current two lane roundabouts to signalised intersections. Other features associated with this scheme include:

- Two traffic lanes in each directions between the two intersections, directional traffic separated by a median barrier, with lanes utilising the flyover separated from the at-grade intersections with side barriers;
- Approach and auxiliary lanes for approaches to both the MGI and SH2/29 intersection developed through on-going optimisation of intersection performance and social/environmental impacts;
- Introduction of on-road cycling facilities at the Girven Road and Matapihi Road approaches to the MGI intersections;
- Introduction of at-grade pedestrian crossing at the signalised intersections at both MGI and SH2/29;
- Potential for an extended underpass to replace the current underpass which is to be removed as part of the scheme (implementation still to be decided); and
- ECMT rail line to be relocated into the alternative corridor adjacent to Liftan Place

The features of this option have been developed through a refinement process that has concentrated on the key considerations as identified in Section 3.1. Option 2 effectively mimics the physical attributes and operational performance of Option 1 under normal traffic conditions. The primary difference between the two options is the relocation of the ECMT railway line to the alternative corridor. The implications of this railway relocation will be discussed further in Section 3.3.3.

#### 3.4.1 Rooding Proposals

Rooding considerations identified within the previous investigations have primarily focused on the key considerations of:

- Tauranga Eastern Link (TEL);
- Mangatawa Interchange;
- Weaving;
- Safety; and
- ODV route provision.

a. Tauranga Eastern Link (TEL)

The investigations performed to date have identified that the opening of TEL in 2015/16 is expected to increase traffic demand at both the MGI and SH2/29 Intersections. The intersections in their current configuration will have limited ability to cater for this induced demand.

Option 2 is effectively identical in regard to geometric alignment and intersection control as Option 1. Therefore, as with Option 1, the separation of SH2 traffic within Option 2 will lower the demand on the at-grade intersections.

The separation of SH2 traffic along the corridor will aid with the ability to differentiate between strategic and non-strategic traffic, aiding the ability for the benefits associated with TEL to be realised. As with Option 1, the grade separation of SH2 through the corridor between MGI and SH2/29 fits within the context of SH2 at each end of the study area.

b. Mangatawa Interchange

If a Truman Lane link to the Mangatawa Interchange does not occur, then there will likely be an increased traffic demand from Truman Lane on both the SH2/29 and SH29/Truman Lane Intersections. This increased demand on the SH29 approach to the SH2/29 intersection would impact its performance, due to increased signal timings to accommodate additional traffic.

As with Option 1, Option 2 proposes that the SH29/Truman Lane Intersection will continue to operate as a two-lane, three arm roundabout. The intersection configuration does not allow the ability to control individual movements. The performance on SH29 may be negatively impacted by the increased demand on Truman Lane, associated with not providing a link to the Mangatawa Interchange.

c. Weaving

Previous investigations have determined that the level of traffic demand along the SH2 corridor, in combination with the short distances between the MGI and SH2/29 intersection dictates that there is inadequate ability to weave safely and efficiently between lanes.

Similarly to Option 1, Option 2 proposes that weaving between the MGI and SH2/29 intersections will be prohibited through the use of barriers, separating at-grade traffic from that using the flyovers. Prohibiting weaving within the corridor means that travel decisions by users will need to be made in advance of the intersections, placing greater emphasis on appropriate road marking and signage.

The inclusion of barriers to prohibit weaving also has the added benefit of separating strategic and non-strategic traffic through the corridor. The benefits of this will be discussed within Section 3.4.2.

d. Safety

Similarly to Option 1, the road features proposed as part of Option 2 are predicted to improve the safety performance of the corridor between MGI and SH2/29.



The inclusion of grade separation at both the MGI and SH2/29 intersections reduces the number of conflict points at the at-grade intersections. This in combination with reduced conflict movement volumes reduces the crash risk. The median and barriers proposed for Option 2 lowers the risk of fatal and serious injury crashes.

Where Options 1 and 2 differ in regard to safety is the relocation of the railway level crossing south of Owens Place on the Matapihi Road approach to MGI. The relocated line will still cross Matapihi Road as a level crossing, interacting with both vehicles and pedestrians. However, with the new location, the vehicle and pedestrian demands are lower, reducing the exposure to the risk. This means that Option 2 will perform slightly better than both the current and Option 1 configuration in regard to the safety concerns with the railway level crossing.

#### e. ODV Routes

Currently the SH2 corridor associated with the MGI and SH2/29 intersections accommodates a number of Over-Dimensional Vehicle routes. These routes are to be maintained as part of the improvements proposed as part of Option 2.

Further refinement of Option 2 is required in the detailed design phase to ensure that the recommended ODV envelope is achieved. That being that Flyover structures at both intersections will be designed to accommodate an unobstructed vertical clearance of 6.1m. This clearance is the distance between the finished road level and the soffit level of the bridge structures.

Discussions are on-going on whether ODV routes will use the at-grade or grade-separated components of the corridor improvements. Regardless of what decisions are ultimately made, a 10m horizontal clearance is required. This will mean that street furniture and other associated obstacles are located outside this 10m envelope or have the ability to be moved if needed.

### 3.4.2 Local Road Connectivity

Local Road connectivity identified within previous investigations has largely directed the option development process. These considerations include:

- Relationship between Strategic and Local Road Traffic;
- Owens Place Intersection;
- Gloucester/Granada connections; and
- Frontage access.

In regard to Local Road Connectivity, Options 1 and 2 are largely very similar in performance, with only minor differences identified.

#### a. Relationship between Strategic and Local Road Traffic

As highlighted in Section 3.1.1, the SH2 corridor encompassing the study area is classified as a Nationally Strategic (High Volume) State Highway. The ability for Option 2 to address the aims of a road of this classification is:

- **Speed:** The average speed of the SH2 inter-regional traffic is relatively high as it is unimpeded by intersections and the effect of local traffic;
- **Freight Facilities:** Provides frequent and efficient access to and from the Port of Tauranga and associated industrial and commercial areas;
- **Reliability:** Provides improved journey time reliability for inter-regional traffic through the grade separation over MGI and SH2/29. Reliability for the inter-regional traffic is largely unaffected by local traffic, railway crossing movements, Baypark events and holiday peak traffic flows; and
- **Junctions:** No intersections on SH2.

Improvements proposed within Option 2 have separated the strategic SH2 traffic from the non-strategic local traffic. The inclusion of grade-separation at both the MGI and SH2/29 intersection has the ability to achieve the aims of a Nationally Strategic (High Volume) State Highway. This ability would be significantly reduced if SH2 inter-regional traffic were to mix with local trips at at-grade intersections.

b. Owens Place Intersection

The physical attributes of Option 2 are not expected to alter the traffic flows or the operation of Owens Place. As such the Owens Place/Matapihi Road intersection is proposed to remain as a priority controlled T-intersection.

c. Gloucester/Granada Connections

If the Gloucester/Granada Connections were not connected to the Mangatawa Interchange, via the Sandhurst Drive Connection then this is likely to increase the demand on the Girven Road Approach to the MGI Intersection. This has potential implications on the performance of the performance on the intersection, as increased demand places additional strain on the capacity of the signals at the intersection.

d. Frontage Access

Option 2 proposes that full access will be provided for property access adjacent to the highway. The aim in regard to a frontage access for a road classified as a Nationally Strategic (High Volume) State Highway are:

- **Frontage Access:** aim to provide no private access (e.g. driveways) except for highway service centres.

The inclusions of barriers separating the inter-regional traffic and the local traffic prevent side friction effects of the inter-regional traffic.

The access issues in relation to the inability to access and egress frontage properties via a right turn manoeuvre are also largely the same as for Option 1. However as there is a lower land take requirement from the northern side of SH2, there are more properties remaining that have their access affected. The key differences are an additional two properties to the north of Jackson Street at MGI and the block of properties to the south of Exeter Street.

Several of the industrial units on Owens Place currently lease land from KiwiRail adjacent to the rail line, and this land is used for parking, storage and vehicle manoeuvring. The Option 2 scheme requires this land, which is understood to prevent the continued operations at some sites as the layout requires the use of the leased rail land.

### 3.4.3 Landuse Considerations

In terms of land use, Option 2 has the following key interactions:

- Relocation of rail allows access to reserve land via Owens Place
- Minimal land requirement from Bayfair / residential properties fronting Maunganui Road
- Existing rail land currently leased to Owens Place industrial would be required for roading
- No significant changes to the access routes for vehicles to Truman Lane

### 3.4.4 Forecast flow changes

The expected traffic flow differences at key locations are as shown in the **Table 3-2** below.

**Table 3-2: Comparison of DM and Option 2 Average Daily Traffic**

Location	Year	DM (ADT)	Option 2 (ADT)
TEL	2016	36,300	40,900
	2026	46,300	55,300
	2031	48,800	59,800
Maranui Street	2016	18,200	14,600
	2026	17,100	12,300
	2031	18,800	13,200
Maunganui Road	2016	51,200	55,300
	2026	52,800	63,700
	2031	53,800	66,500
Ocean Beach Road	2016	11,100	9,400
	2026	14,600	9,900
	2031	16,300	10,800
Maungatapu Bridge	2016	25,900	25,100
	2026	32,900	31,300
	2031	33,900	32,800

The predicted traffic volumes from Option 2 are effectively the same as for Option 1.

### 3.4.5 Railway Proposals

Option 2 proposes the relocation of the ECMT railway line into the alternative rail corridor that runs parallel to Liftan Place, to the south of Owens Place. The removal of the railway line from the SH2 corridor will enable the widening of the road corridor with the vacant land obtained. This will negate the need for the removal of the properties along the eastern edge (travelling westbound towards Tauranga) on the corridor.

The current railway level crossing across the SH29 approach to the SH2/29 Intersection will be maintained as part of Option 2. At the Matapihi Road approach to the MGI, the level crossing will be relocated south of Owens Place, approximately 100 metres away from the intersection.

As discussed in Section 3.1.4, train arrivals and closure durations are variable, with closure periods predicted to be as long as four minutes. Train volumes are predicted to increase across both approached by 50% over the next 10 years. The offset of the railway line from the MGI intersection means that train movements across the level crossing are not going to influence the performance of the intersection. During train closures, there is the ability to have normal signal operations occurring. However, at the SH2/29 intersection, the expected increase in train movements in conjunction with the close proximity of the crossing to the intersection means that train movements are going to influence the intersections performance.

The signalisation of the SH2/29 intersection as proposed in Option 2 has the added benefit over the current roundabout that movements within the intersection can be controlled. With a roundabout configuration, there is no control over any movements at the intersection. Therefore, vehicles in conflict with the train at the level crossing can influence the performance of movements not in conflict with the train movements. The signalisation of the intersection allows for non-conflicting movements to still be performed whilst trains are crossing the level crossing. This in conjunction with the actuation of the signals means that the length of time for the network to recover from train closures is shorter than the current intersection.

The ability to co-ordinate traffic movements at the SH2/29 intersection, with train closures at the level crossing will require the train barrier system controls to be incorporated into the traffic signal controller.

This is a complex arrangement that will need to be investigated further within the traffic signal design within the detailed design phase. In particular, there are potential physical hardware constraints associated with the traffic signal controllers that needs further investigation.

Currently, the signal controllers approved for use in New Zealand are limited to a single phase during the train closure period; this is likely to be fixed to the straight-through movement and will result on queuing on other approaches. Recovery phasing can be applied to the signal groups to enable the normal operation of traffic after a railway event.

### 3.4.6 Pedestrian and Cycling Proposals

As highlighted in Section 3.3, Option 2 proposes the following provisions for pedestrians and cyclists within the SH2 corridor:

- Introduction of on-road cycling facilities at the Girven Road and Matapihi Road approaches to the MGI intersection;
- Introduction of at-grade pedestrian crossing at the signalised intersection at both MGI and SH2/29; and
- Potential for extended underpass to replace the current underpass which is to be removed as part of the scheme (implementation still to be decided).

Similarly to Option 1, the inclusion of on-road cycling facilities in Option 2 at the Girven Road and Matapihi Road approaches to MGI maintains the connectivity to the TCC's Route A cycle path across the corridor. The introduction of cycle lanes provides a dedicated facility for cyclists. This, in conjunction with the signalisation of the at-grade intersection and removal of SH2 interregional traffic will improve both the safety and functionality of cycle movements across the corridor. These features are an enhancement of the current facilities, which currently do not cater favourably for cycle traffic.

Providing at-grade pedestrian crossings at both the MGI and SH2/29 helps to enhance and maintain the connectivity for pedestrians travelling along key desire lines. At MGI, the current pedestrian underpass is to be removed as part of the works; the provision of pedestrian crossings at the signals maintains a safe and efficient link between Bayfair and Owens Place. On-going discussions are occurring in regard to whether a new pedestrian underpass will be constructed. The lengths and concerns around personal security may dictate that any additional underpass may be underutilised.

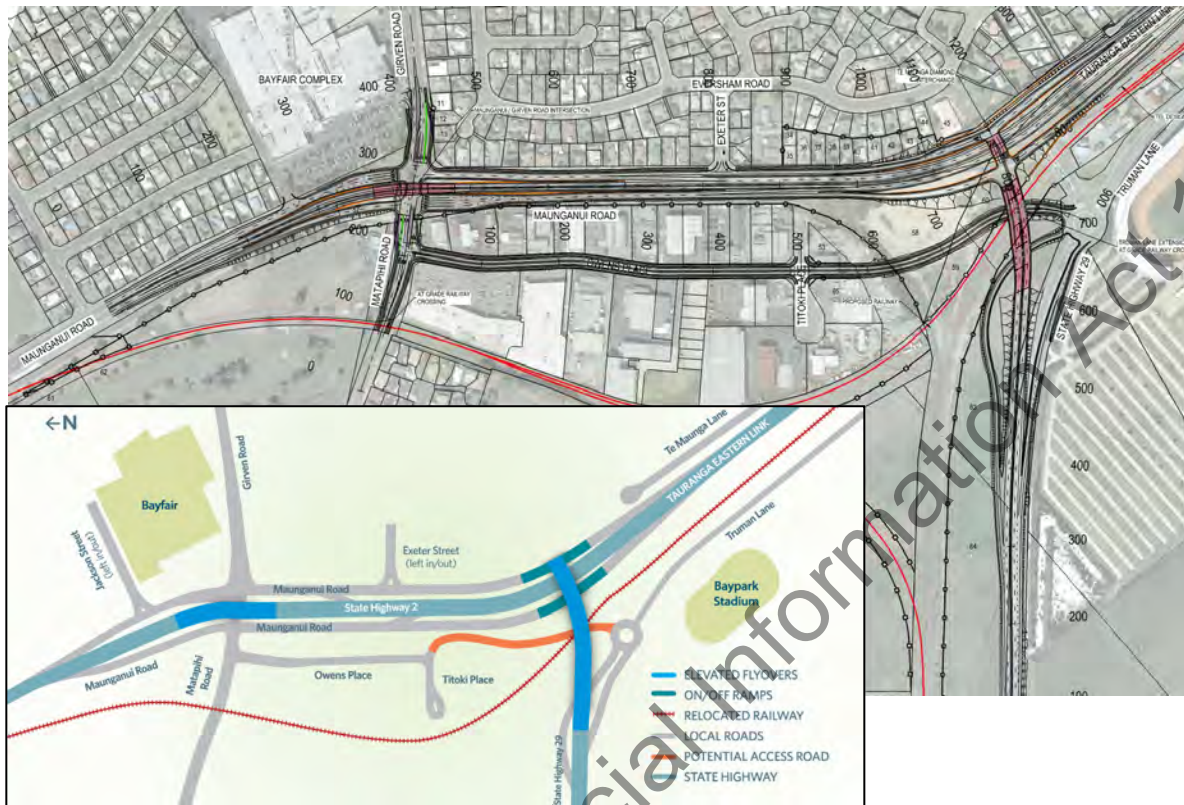
The inclusion of a pedestrian link at the SH2/SH29 Intersection between the SH2 Corridor and BayPark will provide a safe and direct route for users of the facilities. Currently there are no dedicated facilities, so this will be an enhancement over the current situation and will enable more walking trips to and from the stadium.

#### **3.4.7 Passenger Transport Proposal**

In regard to Passenger Transport, Option 2 will have identical attributes to Option 1, which have been discussed in Section 3.3.7 and reiterated below.

Currently a number of inter and intra-regional bus services operate within and around the SH2 corridor between MGI and SH2/29. Four of these higher frequency intra-regional routes service the bus stop facilities within the Bayfair carpark. There is the potential for a bus inter-change to be constructed in Bayfair in the future, which is likely to result in some services requiring the ability to be able to U-turn along SH2. With the introduction of traffic signals as part of Option 2, facilities for U-turning vehicles are unlikely to be provided. This will likely impact on the routing of the bus services that operate within the area.

### 3.5 Option 3



**Figure 3-8: Option 3 general layout**

Option 3 incorporates a two lane SH2 to SH2 flyover of the MGI Intersection, with an at-grade signalised intersection replacing the current 2 lane roundabout. The SH2/29 intersection will involve the creation of a diamond interchange. This places SH29 traffic over 4 lanes of straight through traffic along SH2. Other features associated with this scheme include:

- Two traffic lanes in each directions between the two intersections, directional traffic separated by a median barrier, with lanes utilising the flyover separated from the at-grade intersections with side barriers, gaps in the barriers mid-block will allow limited exiting and entering of SH2 under the SH29 diamond interchange;
- Approach and auxiliary lanes for approaches to both the MGI and SH2/29 intersection developed through on-going optimisation of intersection performance and social/environmental impacts;
- Introduction of on-road cycling facilities at the Girven Road and Matapihi Road approaches to the MGI intersections;
- Introduction of at-grade pedestrian crossing at the signalised intersections at both MGI and SH2/29;
- Potential to retain part of the existing underpass (on-going discussions occurring);
- ECMT rail line to be relocated into the alternative corridor adjacent to Liftan Place

The features of this option have been developed through a refinement process that has concentrated on the key considerations as identified in Section 3.1.

### 3.5.1 Rooding Proposals

Highlighted in Section 3.1.1 are the rooding considerations identified in previous investigations have directed the option development process. These considerations include:

- Tauranga Eastern Link (TEL);
- Mangatawa Interchange;
- Weaving;
- Safety; and
- ODV route provision.

#### a. Tauranga Eastern Link

With the opening of TEL in 2015/16 is expected to increase the traffic demand at both the MGI and SH2/29 intersection. Investigations to date have indicated that the intersections in their current configuration will have limited ability to cater for the induced demand created by TEL.

The improvements proposed for the SH2 corridor between MGI and SH2/29 as part of Option 3 will have an enhanced ability to cater for this increased growth once TEL is built. At the SH2/29, the grade separation of SH29 and the signalised intersections introduced as part of the diamond interchange and the flyover at MGI will place less strain on the intersections.

The proposals as part of Option 3 will have the ability to differentiate between strategic movements along SH2 and local trips within the observed corridor. This enables the benefits associated with the TEL to be realised. Additionally, the introduction of grade separation will fit within the context of the SH2 corridors at each end of the study area.

#### b. Mangatawa Interchange

If a Truman Lane link to the Mangatawa Interchange does not occur, then there will likely be an increased traffic demand from Truman Lane on both the Mapaihi Road/Owens Place and SH2/29 Intersections. This will place increased demand on the current intersections, as well as alter traffic patterns along Owens Place.

Vertical alignments associated with the bridge structures for the SH2/29 Interchange require development lengths which dictate there is the inability to link to the SH29/Truman Lane Intersection. This has dictated that a connection from Truman Lane to Owens Place will need to be constructed, with the new link connecting into the current SH29/Truman Lane Roundabout.

The introduction of this link and the potential for induced traffic if a Truman Lane link to Mangatawa is not provided means that the current priority controlled intersection at Owens Place/Matapihi Road will have insufficient capacity. Option 3 proposes the signalisation of the Owens Place/Matapihi Road Intersection to aid in the ability of catering for this increased traffic demand. It also provides an added level of resilience, particularly if changes in land use changes occur and/or the Mangatawa Link is not provided. The impact effect of increased demand from Owens place will be discussed further in Section 3.5.2.

#### c. Weaving

Previous investigations have raised concerns around the ability to be safely and efficiently provide weaving between the MGI and SH2/29 Intersections. This ability is limited by the short distance between the intersections and the level of traffic demand.

When travelling eastbound (towards TEL) along SH2, users of the Flyover at MGI are unable to weave onto the SH29 interchange off-ramps, which is controlled through the use of barriers. Vehicle travelling eastbound along SH2 (I.e. those from Girven Road and Matapihi Road) have the ability to access SH2 through a break in the barriers where SH2 travels at-grade underneath the SH29 over bridge.

In the westbound direction (towards Tauranga), SH2 traffic has the option of being able to either travel straight-through over the MGI Flyover or travel at-grade through the signalisation intersection. In contrast, vehicles travelling from SH29 do not have the ability to weave onto the MGI flyover and are required to travel at-grade, interacting with local traffic along the length of the corridor.

Improvements proposed for Option 3 will allow enhance weaving ability over Options 1 and 2. The infrastructure provided to control weaving between the intersections and the physical attributes of the road alignment allow for the separation of SH2 strategic traffic.

#### d. Safety

As with Options 1 and 2, the road features proposed as part of Option 3 are predicted to improve the safety performance of the corridor between MGI and SH2/29 intersections.

The inclusion of grade-separation at both the MGI and SH2/29 intersections reduces the number of conflict points at the intersections. This in combination with reduced conflict movement volumes reduces the crash risk. The medians and the barrier proposed for Option 3 lowers the risk of fatal and serious injury crashes.

Safety in regard to interactions with railway level crossings will be improved with the improvements proposed in Option 3. At the MGI intersection, it is proposed that the Matapihi Road level crossing will be moved to the alternative corridor, south of Owens place. At this location, there will still be at-grade conflicts between pedestrian, vehicle and train movements. However, there is expected to be less vehicular and pedestrian demand than the current crossing, lessening the exposure to the risks. The grade separation of SH29 over the ECMT railway line and SH2, removes the interactions between pedestrians, vehicles and pedestrians. This effectively eliminates the risks associated with railway movements.

#### e. ODV Routes

The SH2 corridor accommodates a number of ODV routes. As mentioned Section 3.1.2, turning movements are required at both the MGI and SH2/29 Intersections. These routes are to be maintained as part of the improvements proposed for Option 3.

Further refinement of Option 3 is required in the Detailed Design phase to ensure that the recommended ODV envelope is achieved. This being that the bridge and flyover structures at both intersections achieved the desired vertical clearance of 6.1m. This clearance is the distance between the finished road level and the soffit level of the bridge structures.

Discussions are on-going on whether ODV routes will be at-grade or will utilise the grade-separated components of the schemes. Regardless of what decisions are ultimately made, a 10m horizontal clearance is required. This will mean that street furniture and other associated obstacles located outside this 10m envelope or have the ability to be moved if needed.



### 3.5.2 Local Road Connectivity

Considerations in regard to local road connectivity and interactions have underpinned the option development process within investigations performed to date. The major considerations are:

- Relationship between Strategic and Local Road Traffic;
- Owens Place Intersections;
- Gloucester/Granada connections; and
- Frontage access.

#### a. Relationship between Strategic and Local Road Traffic

The section of SH2 incorporated into the study area is classified as a Nationally Strategic (High Volume) State Highway. The ability for Option 3 to achieve the aims for a road with this classification is:

- **Speed:** The average speed of the SH2 inter-regional traffic is relatively high as it is unimpeded by intersections and the effects of local traffic;
- **Freight Facilities:** Provides frequent and efficient access to and from the Port of Tauranga and associated industrial and commercial areas;
- **Reliability:** Provides improved journey time reliability for SH2 inter-regional traffic through the grade separation at MGI and SH2/29. Reliability for inter-regional traffic is largely unaffected by local traffic, railway crossing movements, Baypark events and holiday peak traffic flows; and
- **Junctions:** No intersections on SH2.

#### b. Owens Place Intersection

As introduced in Section 3.5.1, Option 3 proposes a Truman Lane link to Owens Place. Due to physical limitations at the SH29/Truman Lane intersection, traffic from Truman Lane will access SH2 from Matapihi Road via Owens Place or the Mangatawa Interchange. The Truman Lane link and the potential for a link to the Mangatawa Interchange not being provided will increase demand on the Matapihi Road/Owens Place Intersection.

Investigations into the performance of the current intersection configurations have indicated that it will have limited ability to be able to cater for increased traffic demand. Therefore, Option 3 proposes the introduction of traffic signals at the Matapihi Road/Owens Place Intersection. A left turn auxiliary lane has been included on the Matapihi Approach from MGI. This allows for separation of straight-through traffic travelling along Matapihi Road and that turning left into Owens Place. The stacking distance between the stop-line and MGI is approximately 30 metres, limiting the amount of queuing that can occur. The inclusion of the left turn lane allows pushing of the left turn movement to occur across two phases, enhancing the ability to control queuing on this approach.

The signalisation of the intersection also allows for control of traffic demand to the MGI intersection. The increased traffic demand due to the Owens Place link will place increased demand on the Matapihi Road approach to MGI. This could potentially influence the performance of the intersection due to the increase in green time required in the signal cycle to accommodate the increase demand on movements.

Option 3 also proposes the widening and realignment of Owens Place along its entire length. The road is proposed to be widened by 1m, whilst still remaining within the current road designation. Currently a number of business along Owens Place rely on on-street parking, Option 3 could potentially require this parking be removed. This will influence the ability for these businesses to operate in their current capacity.

Additionally, the realignment of Owens Place will also see the creation of a priority controlled cross-roads intersection where Titoki Place currently resides. The level of traffic demand for this new intersection is predicted to be low, with the priority controlled intersection deemed to be sufficient.

The use of Owens Place as a through route will increase the flows to some 7,000 vpd, and therefore requires a change in the road form to be appropriate for the new function. This change would occur within the existing designation, but would require some widening of the road, and the removal of on street parking over the full length of the road, where at present there is some on road parking available.

The new connection would provide a route for local traffic which does not need to then use the state highway. The importance of this route for local traffic will increase significantly as the development on Truman Lane is delivered. This is particularly beneficial for cyclists and pedestrians where the level of amenity offered will be higher than being alongside SH2. Given the leisure destinations of Baypark and the ASB Arena then this proposed link is a key benefit and supports the 'One network' outcome for the project.

#### c. Gloucester/Granada Connections

If the Gloucester/Granada Connections were not connected to the Mangatawa Interchange, via the Sandhurst Drive Connection then this is likely to increase the demand on the Girven Road Approach to the MGI Intersection. This has potential implications on the performance of the performance on the intersection, as increased demand places additional strain on the capacity of the signals at the intersection.

#### d. Frontage Access

Option 3 proposes that full access will be provided for property access adjacent to the highway. Where access to properties cannot be accommodated, acquisition of these properties will occur. The aim in regard to a frontage access for a road classified as a Nationally Strategic (High Volume) State Highway are:

- **Frontage Access:** aim to provide no private access (e.g. driveways) except for highway service centres.

The inclusions of barriers separating the inter-regional traffic and the local traffic prevent side friction effects of the inter-regional traffic.

The access issues for the properties fronting the northern side of SH2 remain as per Option 2.

### 3.5.3 Landuse Considerations

In terms of land use, the proposal has the following key interactions:

- Relocation of rail allows access to reserve land via Owens Place
- New connection between Owens Place and Truman Lane may result in increased pressure to convert industrial land to commercial use
- Minimal land requirement from Bayfair / residential properties fronting Maunganui Road at MGI
- More land required at Te Maunga requiring several residential properties
- Existing rail land currently leased to Owens Place industrial would be required for roading
- Large change in access routes for Baypark
- Reliance on Mangatawa Interchange connection to Truman Lane for efficient access to MPBI and other properties on Truman Lane.

### 3.5.4 Forecast flow changes

The expected traffic flow differences at key locations are as shown in the **Table 3-3** below.

**Table 3-3: Comparison of DM and Option 3 Average Daily Traffic**

Location	Year	DM (ADT)	Option 3 (ADT)
TEL	2016	36,300	40,200
	2026	46,300	57,300
	2031	48,800	63,000
Maranui Street	2016	18,200	14,600
	2026	17,100	11,000
	2031	18,800	11,800
Maunganui Road	2016	51,200	54,700
	2026	52,800	63,200
	2031	53,800	66,100
Ocean Beach Road	2016	11,100	9,800
	2026	14,600	10,200
	2031	16,300	11,000
Maungatapu Bridge	2016	25,900	25,000
	2026	32,900	32,300
	2031	33,900	34,200

The flows on SH2 are predicted to be slightly lower than for Options 1 and 2, but this difference is well within the model uncertainty, and reflects the small diversion to SH29 due to the removal of the delays associated with the SH29 level crossing. Option 3 has the greatest affect in reducing the flows on Maranui Road and Ocean Beach Road.

### 3.5.5 Railway Proposals

Option 3 proposes the relocation of the ECMT railway line into the alternative rail corridor that runs parallel to Liftan Place, to the south of Owens Place. The removal of the railway line from the SH2 corridor will enable the widening of the corridor within the vacant land obtained. The offset of the railway line from the MGI means that train movements are not going to influence the performance of the intersection.

The grade-separation of SH29 over the ECMT railway line and SH2 means that there will be no interaction with the train movements. Therefore, train movements past the current SH2/29 intersection will not influence the performance of the SH2/29 Diamond Interchange.

### 3.5.6 Pedestrian and Cycling Proposals

As mentioned in Section 3.5, Option 3 proposes the following provisions for pedestrians and cyclists within the SH2 corridor:

- Introduction of on-road cycling facilities at the Girven Road and Matapihi Road approaches to the MGI Intersection;
- Introduction of pedestrian crossing phases at the signalised intersections at both MGI and SH2/29;
- Removal of current pedestrian and cycling underpass at MGI.

As with the previous options analysed, the inclusion of on-road cycling facilities in Option 3 at the Girven Road and Matapihi Road approaches to MGI maintains the connectivity with the TCC;s Route A cycle path across the corridor. The introduction of cycle lanes provides a dedicated facility for cyclists. This, in conjunction with the signalisation of at-grade intersection and removal of the SH2 inter-regional traffic will improve the safety and functionality of cycle movements across the corridor. These features are an enhancement of the current facilities, which currently do not cater favourable for cycle traffic.

Providing crossing points at the signalised intersections of both the MGI and SH2/29 intersections will help to maintain the connectivity for pedestrians travelling along key desire lines. At MGI, the current pedestrian underpass will be removed as part of the works; the pedestrian crossing points at the signals will maintain a safe and efficient link between Bayfair and Owens Place. The removal and decisions to not replace the pedestrian underpass was decided following discussions regarding personal safety and security concerns, identified within the consultation process.

The inclusion of a pedestrian link at the SH2/29 intersection between the SH2 corridor and BayPark will provide a safe and direct route for users of the facilities. Currently there are no dedicated facilities, so improvements as part of Option 3 will be an enhancement over the current situation and will be an enabler of more walking trips to and from the stadium.

### 3.5.7 Passenger Transport Proposal

As with the previous options, Option 3 will have similar concerns regarding passenger transport; which have been discussed in Section 3.3.7 and reiterated below.

Currently a number of inter and intra-regional bus services operate within and around the SH2 corridor between MGI and SH2/29. Four of these higher frequency intra-regional routes service the bus stop facilities within the Bayfair carpark. There is the potential for a bus inter-change to be constructed in Bayfair in the future, which is likely to result in some services requiring the ability to be able to U-turn along SH2. With the introduction of traffic signals as part of Option 3, facilities for U-turning vehicles are unlikely to be provided. This is likely to impact on the routing of the bus services which operate within the area.

### 3.6 Option 3 Enhancement (Option 3a)

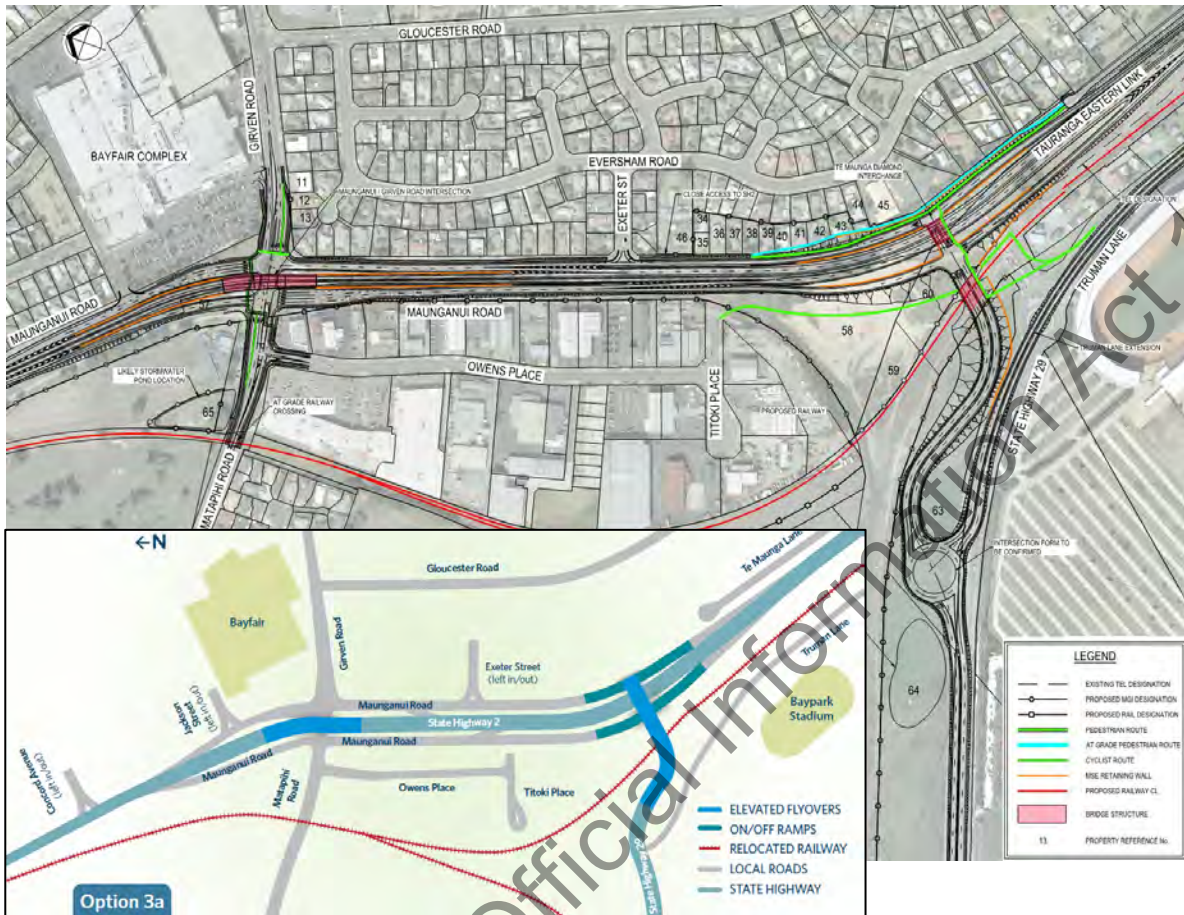


Figure 3-9: Option 3 general layout

Following the initial assessment of the options, detailed above the strategic benefits of the grade separation of SH29 were identified. However, it was recognised that there were a number of cost and social issues in Option 3 related to the connection between Truman Lane and SH29 that were less desirable.

As a result a design process which sought to optimise Option 3 was undertaken and this resulted in the layout referred to as Option 3a. Additional assessments were undertaken on this option, and discussed below.

#### 3.6.1 Option Description

The key features of Option 3A are as follows:-

- Same layout at MGI as Option 2
- Same partial weaving facility between MGI and Te Maunga as Option 3
- Rail relocated to south (as per Option 3)
- Grade separation between SH29 and the rail line
- Similar layout of SH2/SH29 option to Option 3
- Roundabout on SH29 providing same network connections as Option 1 and 2

Option 3A therefore provides a similar level of amenity in terms of the connections on the network as both the existing layout and Options 1 and 2. There is not the need, or provision of, the direct

connection between Truman Lane and Owens Place as provided by Option 3. This results in no change to the function of Owens Place, which remains a Cul-de-Sac serving the industrial and commercial properties located there.

The proposed roundabout on SH29 is an enhancement and relocation of the existing roundabout. The retention of the roundabout acts as a speed reducing feature on the approach to the signalled intersection which is part of the grade separation of SH2/ SH29 at Te Maunga.

Although not a design requirement, consideration was given to the conditions that exist during the major events at Baypark. In the case of Option 3A moving the roundabout to the south potentially had the effect of moving the current SH29 direct access onto the Truman Lane arm. This would potentially have reduced the capacity of the network to cater for the exiting traffic, and so the Option 3A proposal includes the option for relocation of that access to the south of the roundabout retaining the same operational linkages as current. The exact location and form of this access / egress will be designed at a later stage of the scheme development.

The planned connection between the Mangatawa Interchange and Truman Lane will be of benefit for managing traffic during construction and will be of benefit to the network in the longer term, but is not necessary in the short term.

## 4 Traffic Assessment

### 4.1 Methodology

The assessment of the traffic effects of the Options for the grade separation of SH2 at MGI and Te Maunga has utilised 3 tiers of modelling. These models are as follows:-

- Strategic Tauranga Traffic Model
- Aimsun microsimulation model
- Linsig3 intersection model

The Tauranga Traffic Model (TTM) has been used to provide a strategic assessment of the wider effects of the proposed changes, including the diversion effects resulting in the network changes.

The microsimulation model has been used to assess the effects of the rail interactions with the SH2 traffic. These rail interactions have been observed on site to be a key factor in the congestion that is currently being observed, and is expected to increase in both frequency and scale of effect in the future as rail and traffic demands increase.

At the lowest level the Linsig3 model has been used to optimise the signal timings for the intersections. The Linsig models were developed from the models used in the earlier scoping work, and were also used to provide initial flare lengths and reduce the number of iterations required for design.

The link speeds within the TTM models were updated with the outputs from the Aimsun model and then the revised demands from the TTM model input back into the Aimsun model. This process was repeated for each option and each modelled year until flows and journey times in both models were similar.

The Linsig models were used to provide final signal times and optimised cycle timings and to provide the most accurate understanding of the capacity of the intersections and specific approach arms.

Further details of the modelling are discussed in the Memo attached as Appendix A.

The extent of the Linsig and Aimsun modelling is shown in **Figure 4-1** below:



Figure 4-1: Modelled area

#### 4.2 Wider Traffic Effects

The predicted daily traffic flows are extracted from the TTM in all future year models. Figure 4-2 below shows three major screenline and ADT figures are provided in Tables 4-1 to 4-3.

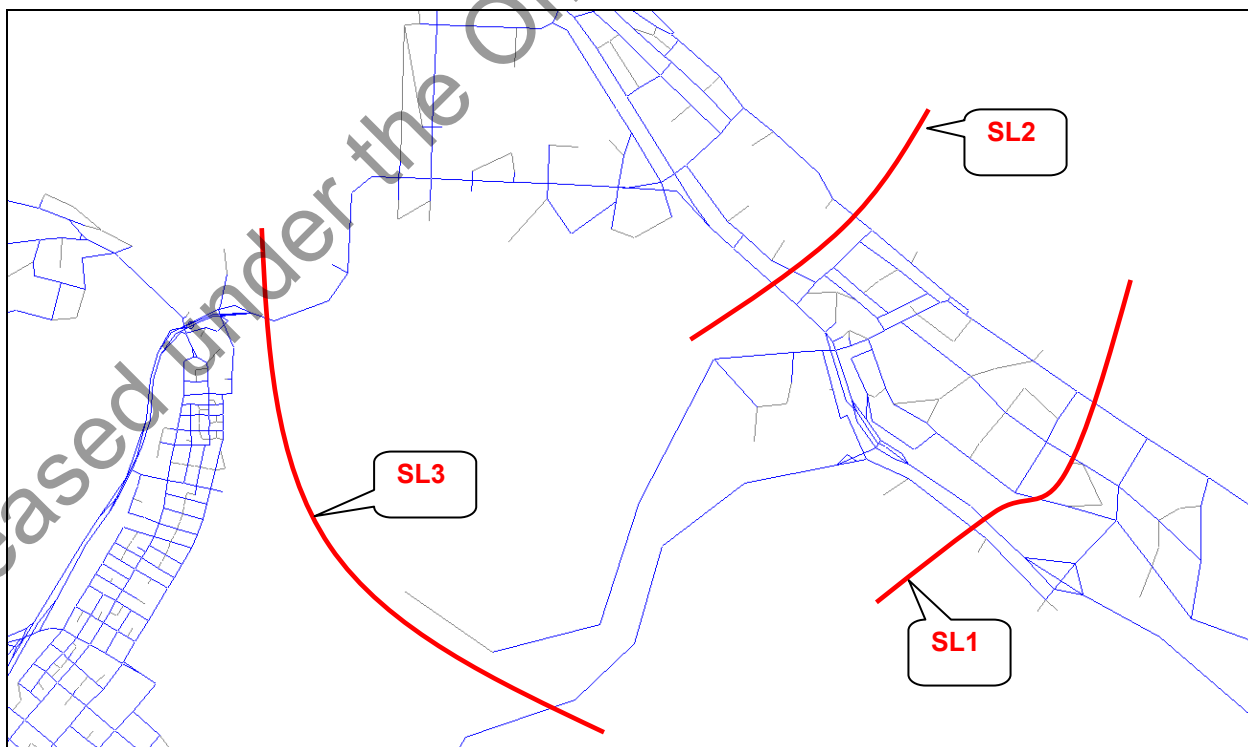


Figure 4-2: Screenline Locations



**Table 4-1: Predicted ADT for Screenline 1**

Locations	Year	DM	Opt 1	Opt 2	Opt 3	Opt 3a
Truman Lane	2016	300	300	300	1,300	1,100
	2026	3,000	2,400	2,400	2,400	1,900
	2031	4,200	3,500	3,500	3,000	2,500
TEL	2016	36,300	40,700	40,900	40,200	39,900
	2026	46,300	55,100	55,300	57,300	57,200
	2031	48,800	59,400	59,800	63,000	62,600
Gloucester Extension	2016	-	-	-	-	-
	2026	3,700	2,900	2,700	2,300	2,400
	2031	4,300	3,000	3,000	2,600	2,600
Grenada Extension	2016	-	-	-	-	-
	2026	2,400	1,800	1,800	1,800	1,800
	2031	2,700	2,000	2,000	2,000	2,000
Maranui St	2016	18,200	14,700	14,600	14,600	14,600
	2026	17,100	12,500	12,300	11,000	11,100
	2031	18,800	13,400	13,200	11,800	11,900
<b>Total Screenline 1</b>	<b>2016</b>	<b>54,800</b>	<b>55,700</b>	<b>55,800</b>	<b>56,100</b>	<b>55,600</b>
	<b>2026</b>	<b>72,500</b>	<b>74,700</b>	<b>74,500</b>	<b>74,800</b>	<b>74,400</b>
	<b>2031</b>	<b>78,800</b>	<b>81,300</b>	<b>81,500</b>	<b>82,400</b>	<b>81,600</b>

**Table 4-2: Predicted ADT for Screenline 2**

Locations	Year	DM	Opt 1	Opt 2	Opt 3	Opt 3a
Maunganui Rd	2016	51,200	55,200	55,300	54,700	54,700
	2026	52,800	63,300	63,700	63,200	63,500
	2031	53,800	66,500	66,500	66,100	66,500
Link Ave	2016	2,500	2,500	2,400	2,500	2,500
	2026	3,300	2,900	2,900	2,900	2,900
	2031	3,300	3,000	3,100	3,100	3,100
Ocean Beach Rd	2016	11,100	9,600	9,400	9,800	9,900
	2026	14,600	10,400	9,900	10,200	10,100
	2031	16,300	11,200	10,800	11,000	10,800
<b>Total Screenline 2</b>	<b>2016</b>	<b>64,800</b>	<b>67,300</b>	<b>67,100</b>	<b>67,000</b>	<b>67,100</b>
	<b>2026</b>	<b>70,700</b>	<b>76,600</b>	<b>76,500</b>	<b>76,300</b>	<b>76,500</b>
	<b>2031</b>	<b>73,400</b>	<b>80,700</b>	<b>80,400</b>	<b>80,200</b>	<b>80,400</b>

**Table 4-3: Predicted ADT for Screenline 3**

Locations	Year	DM	Opt 1	Opt 2	Opt 3	Opt 3a
Maungatapu Bridge	2016	25,900	25,000	25,100	25,000	24,300
	2026	32,900	31,000	31,300	32,300	31,000
	2031	33,900	32,600	32,800	34,200	33,000
Harbour Bridge	2016	52,000	53,300	53,200	53,200	53,500
	2026	56,800	59,800	59,700	59,400	59,900
	2031	59,900	62,900	62,900	62,600	62,900
<b>Total Screenline 3</b>	<b>2016</b>	<b>77,900</b>	<b>78,300</b>	<b>78,300</b>	<b>78,200</b>	<b>77,800</b>
	<b>2026</b>	<b>89,700</b>	<b>90,800</b>	<b>91,000</b>	<b>91,700</b>	<b>90,900</b>
	<b>2031</b>	<b>93,800</b>	<b>95,500</b>	<b>95,700</b>	<b>96,800</b>	<b>95,900</b>

Based on Screenline 1, annual average traffic growth is approximately 3% between 2016 and 2031. Options have higher traffic growth than DM as expected and this is the combination of induced traffic and re-distribution effects. Based on Option 3, an additional 1,300 vehicles per day are predicted to travel across Screenline 1 in 2016. This is expected to increase to 3,600 in 2031. Due to the variable trip matrix modelling methodology, these effects caused by the project are reflected in the modelling and the economic evaluation.

It is noted that the traffic volume on Hewletts Road and Maunganui Road north of Hewletts Road are both predicted to increase, compared to the do minimum, with a reduction on Golf Road. Also it is noticed that provisions of Gloucester Road and Grenada Street connections from 2026 provide alternative routes in DM scenarios which relieve some pressure from the studied intersections. Growth on TEL is predicted to be 2.2% per annum between 2016 and 2031 if the project were not built (i.e. in DM scenarios). This growth would increase to 4.9% per annum in Option 3 (and 3A). Hence this project reduces traffic significantly from local parallel roads and diverts them to TEL.

**Figure 4-3** below shows a daily level flow difference plot between DM and Option 3 scenarios in 2031.

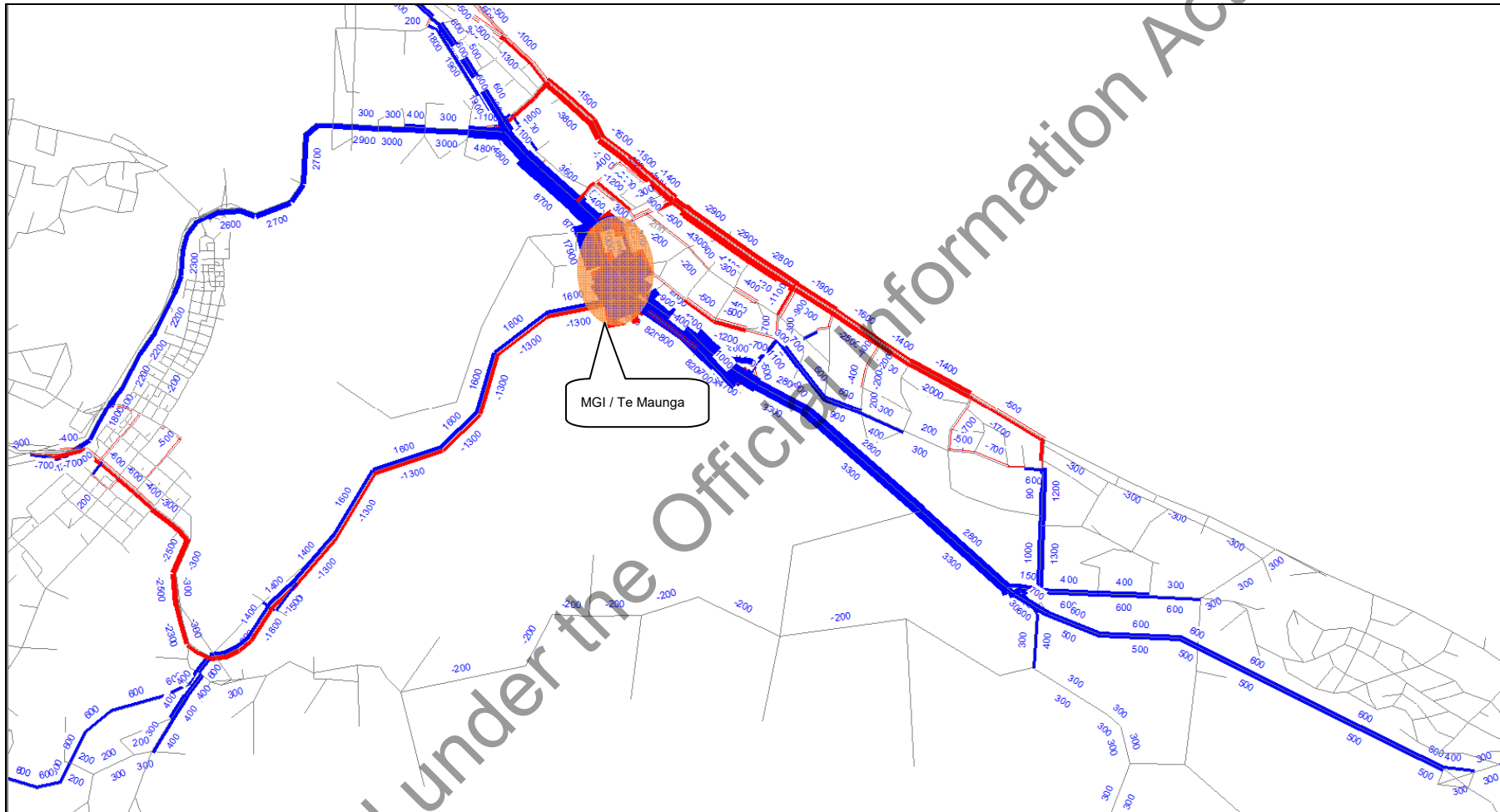


Figure 4-3: ADT Flow Different Plots between DM and Opt 3, 2031

Assessments undertaken as part of the Scoping Study phase of the investigation showed that there was a small sensitivity on the SH29 / Harbour link route choice, meaning that future changes in the network on either Hewletts Road or SH29 were unlikely to result in significant changes to the demands through the study area.

The specific concern was in relation to any scheme that may come forward in the future that would achieve the level of service stated as desirable in the TTS. As that stated desirable LOS is D on SH2, this would potentially attract further traffic through the study area, and there is the risk that the added volume could cause bottlenecks on the infrastructure proposed under this project. However, assessment showed that in order to achieve that LOS D on SH2 through the Hewlett's Road Corridor, this would require an increase of some 50% capacity which would not appear feasible and would require both additional lanes along Hewletts and a replacement / upgrade to 4 lanes of flyover at the Golf / Hewletts intersection.

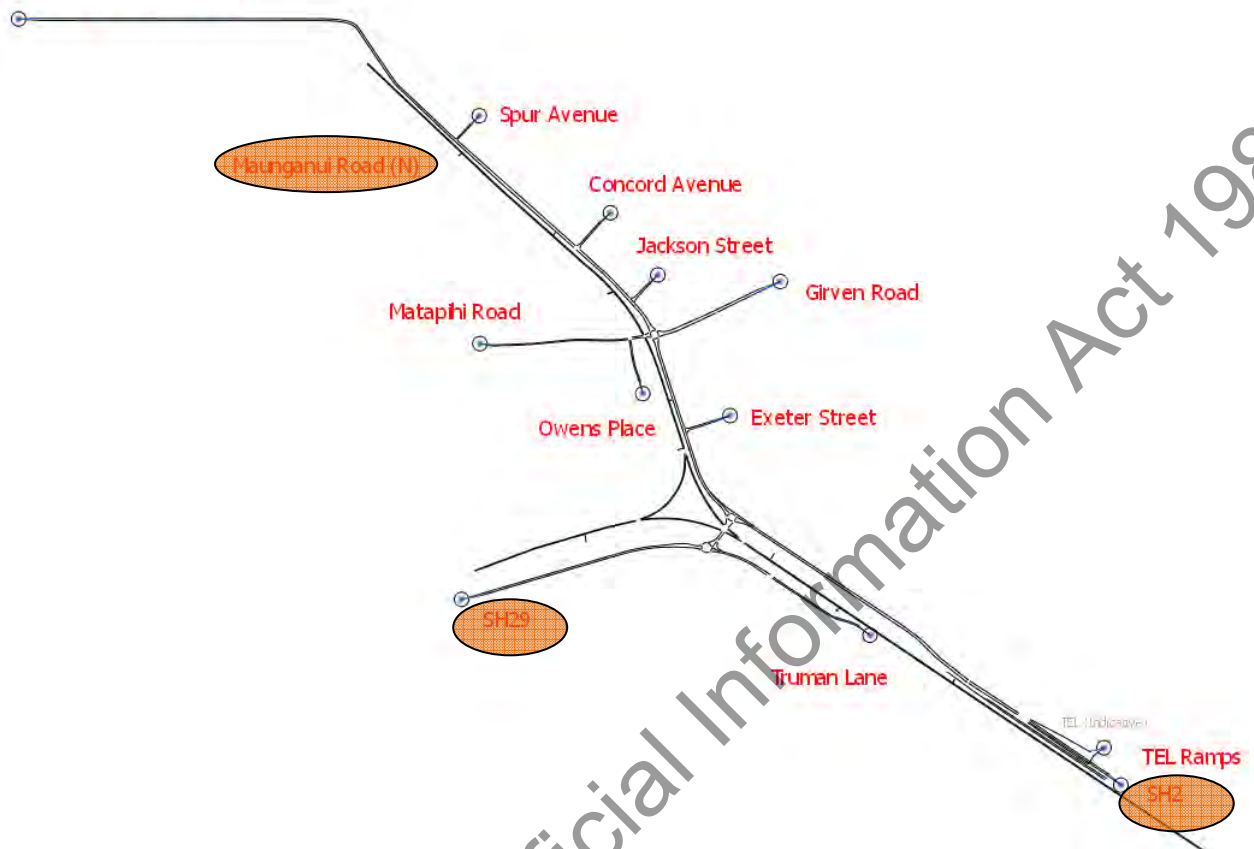
The creation of additional lanes on Maunganui Road to the north of MGI would be likely to create additional weaving issues between the grade separations at MGI and Hewletts Road flyover. However the net increase in flows at MGI / Te Maunga were only some 100 additional vehicles an hour in 2031. As such this suggested that there was no project requirement to specifically take account of during this project to safeguard future capacity and wider network development options.

However, all options were demonstrated to result in reductions in the flow along Papamoa Beach Road. This is as a result of the reduction in the congestion at MGI which allows traffic between the Papamoa residential area to divert onto TEL and through Maunganui Road. This is as opposed to the use of the parallel northern local roads routes to the Mount, or connecting to SH2 at Golf Road.

### **4.3 Intersection Operation**

#### **4.3.1 Travel Times**

Forecast travel time information from the Aimsun models were extracted for all model years. Travel time routes are as below and **Figure 4-4** shows the extent of the Aimsun modelled area.



**Figure 4-4: Aimsun Model Extent**

- Route 1 – Maunganui Road (North) to SH2/TEL (South);
- Route 2 - SH2/TEL (South) to Maunganui Road (North);
- Route 3 – SH29 (West) to SH2/TEL (South);
- Route 4 – SH2/TEL (South) to SH29 (West);
- Route 5 – SH29 (West) to Maunganui Road (North);
- Route 6 – Maunganui Road (North) to SH29 (West);

It should be noted that the Aimsun network covers some parts of Hewletts Road but there is no detailed network representation along this road (e.g. no intersection coding). This 'buffer' network was included to capture full vehicle delay in the DM scenarios as queues extend back to Hewletts Road in some replications of future year models.

Thus Aimsun OD travel times do not capture vehicle delay from intersections and weaving from this buffer network, but represents the delay attributable to the section of SH2 within the project network and provides an accurate assessment of the relative effects of the scheme options. **Figures 4-5 to 4-7** below provide a summary of the peak period travel time savings or increases for the key routes in years 2016, 2026, 2031, based on Option 3a.

**Tables 4-4 to 4-9** below show a more detailed summary of the predicted travel time from Aimsun, averaged across a 2 hour period.

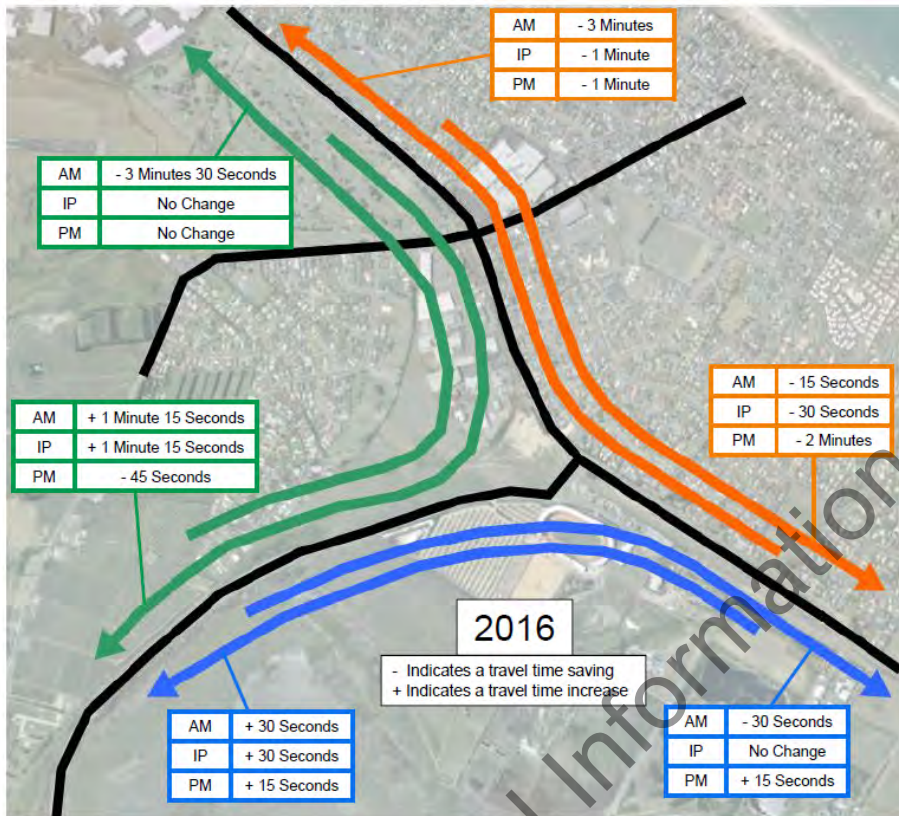


Figure 4-5: Option 3a Year 2016 Travel Time Savings

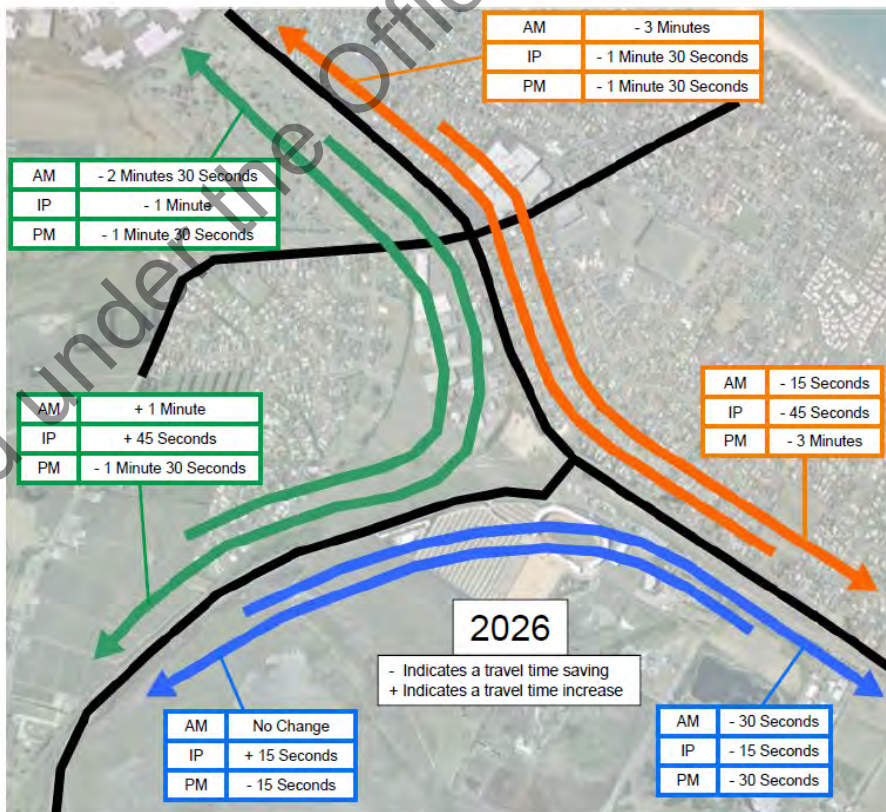


Figure 4-6: Option 3a Year 2026 Travel Time Savings

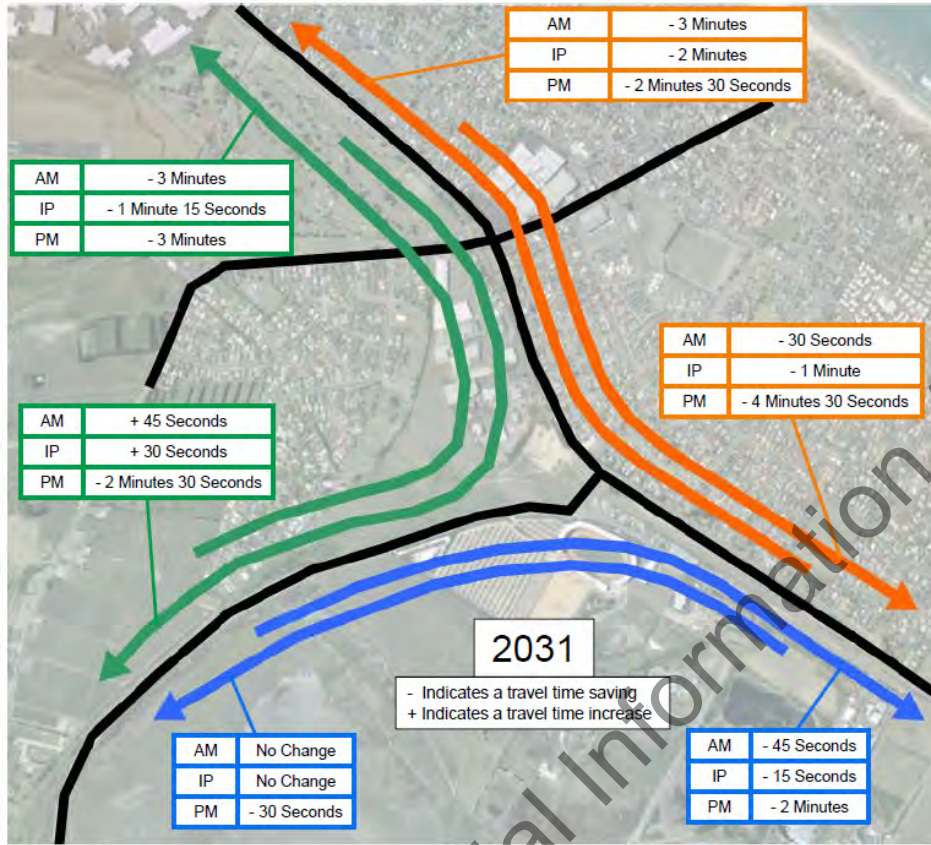


Figure 4-7: Option 3a Year 2031 Travel Time Savings

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**Table 4-4: Predicted Travel Time for Route 1 – Maunganui (North) to TEL (South)**

Peaks	Years	Travel Time (Minutes)					Travel Time Saved (Minutes)			
		DM	Opt1	Opt2	Opt3	Opt3a	Opt1	Opt2	Opt3	Opt3a
AM	2016	4.8	4.6	4.7	4.4	4.5	-0.1	-0.1	-0.4	-0.2
	2026	4.9	4.7	4.7	4.4	4.6	-0.2	-0.2	-0.5	-0.3
	2031	5.0	4.7	4.8	4.4	4.6	-0.3	-0.2	-0.6	-0.4
IP	2016	4.9	4.7	4.7	4.3	4.6	-0.3	-0.3	-0.6	-0.4
	2026	5.3	4.7	4.7	4.4	4.6	-0.6	-0.6	-0.9	-0.7
	2031	5.6	4.7	4.8	4.4	4.6	-0.9	-0.8	-1.2	-1.0
PM	2016	6.9	4.8	4.8	4.4	4.7	-2.1	-2.1	-2.4	-2.2
	2026	7.8	4.9	4.8	4.5	4.7	-2.9	-3.0	-3.3	-3.1
	2031	9.0	4.8	4.8	4.6	4.7	-4.2	-4.2	-4.4	-4.3

**Table 4-5: Predicted Travel Time for Route 2 –TEL (South) to Maunganui (North)**

Peaks	Years	Travel Time (Minutes)					Travel Time Saved (Minutes)			
		DM	Opt1	Opt2	Opt3	Opt3a	Opt1	Opt2	Opt3	Opt3a
AM	2016	7.8	4.7	4.7	4.4	4.6	-3.2	-3.2	-3.5	-3.2
	2026	7.8	4.8	4.7	4.4	4.7	-3.0	-3.0	-3.3	-3.1
	2031	7.8	4.8	4.8	4.5	4.7	-3.1	-3.1	-3.4	-3.1
IP	2016	5.4	4.6	4.6	4.3	4.5	-0.8	-0.8	-1.1	-0.9
	2026	6.3	4.6	4.6	4.3	4.6	-1.6	-1.6	-1.9	-1.7
	2031	6.6	4.7	4.7	4.4	4.6	-2.0	-2.0	-2.3	-2.0
PM	2016	5.6	4.6	4.6	4.3	4.5	-1.0	-1.0	-1.3	-1.1
	2026	6.2	4.8	4.6	4.3	4.6	-1.5	-1.6	-1.9	-1.7
	2031	7.1	4.9	4.7	4.4	4.6	-2.2	-2.4	-2.7	-2.5

**Table 4-6: Predicted Travel Time for Route 3 – SH29 (West) to TEL (South)**

Peaks	Years	Travel Time (Minutes)					Travel Time Saved (Minutes)			
		DM	Opt1	Opt2	Opt3	Opt3a	Opt1	Opt2	Opt3	Opt3a
AM	2016	3.2	2.8	2.7	2.4	2.6	-0.4	-0.5	-0.8	-0.6
	2026	3.3	3.1	3.3	2.5	2.7	-0.3	-0.1	-0.8	-0.6
	2031	3.5	3.4	3.2	2.5	2.8	-0.2	-0.3	-1.0	-0.7
IP	2016	2.5	2.8	2.7	2.4	2.6	0.3	0.2	-0.1	0.1
	2026	2.8	3.4	3.3	2.4	2.6	0.6	0.5	-0.4	-0.2
	2031	2.9	3.1	3.8	2.4	2.7	0.2	0.8	-0.5	-0.2
PM	2016	2.7	2.9	3.0	2.5	2.9	0.2	0.3	-0.2	0.2
	2026	3.9	3.9	4.1	2.6	3.2	0.1	0.2	-1.2	-0.6
	2031	5.3	4.3	4.4	2.7	3.1	-1.0	-0.9	-2.7	-2.2



**Table 4-7: Predicted Travel Time for Route 4 – TEL (South) to SH29 (West)**

Peaks	Years	Travel Time (Minutes)					Travel Time Saved (Minutes)			
		DM	Opt1	Opt2	Opt3	Opt3a	Opt1	Opt2	Opt3	Opt3a
AM	2016	2.5	2.6	2.5	2.7	3.0	0.0	0.0	0.2	0.4
	2026	3.0	2.8	2.7	2.7	2.9	-0.2	-0.2	-0.3	0.0
	2031	3.1	3.1	2.8	2.7	2.9	0.0	-0.2	-0.3	-0.1
IP	2016	2.5	2.5	2.5	2.7	2.9	0.1	0.0	0.2	0.4
	2026	2.8	2.7	2.6	2.8	3.0	-0.1	-0.1	0.0	0.2
	2031	2.9	2.8	2.7	2.9	2.9	-0.1	-0.2	0.0	0.0
PM	2016	2.5	3.1	2.5	2.6	2.8	0.5	0.0	0.1	0.3
	2026	3.1	4.1	2.8	2.7	2.9	1.0	-0.3	-0.3	-0.2
	2031	3.3	4.4	3.0	2.8	2.9	1.1	-0.3	-0.5	-0.4

**Table 4-8: Predicted Travel Time for Route 5 – SH29 (West) to Maunganui Road (North)**

Peaks	Years	Travel Time (Minutes)					Travel Time Saved (Minutes)			
		DM	Opt1	Opt2	Opt3	Opt3a	Opt1	Opt2	Opt3	Opt3a
AM	2016	8.3	5.1	5.0	4.7	4.8	-3.2	-3.3	-3.6	-3.5
	2026	7.6	5.4	5.6	4.7	4.9	-2.2	-2.0	-2.9	-2.7
	2031	7.8	5.7	5.6	4.7	4.9	-2.1	-2.2	-3.1	-2.9
IP	2016	4.7	4.8	4.8	4.7	4.7	0.2	0.1	0.0	0.1
	2026	5.7	5.4	5.3	4.4	4.8	-0.4	-0.4	-1.3	-0.9
	2031	6.1	5.2	5.8	4.6	4.8	-0.8	-0.3	-1.5	-1.2
PM	2016	5.0	5.1	5.1	4.5	4.9	0.0	0.1	-0.5	-0.1
	2026	6.5	6.1	6.4	5.1	5.1	-0.4	-0.2	-1.5	-1.4
	2031	8.5	7.0	6.9	6.1	5.4	-1.5	-1.6	-2.4	-3.1

**Table 4-9: Predicted Travel Time for Route 6 – Maunganui Road (North) to SH29 (West)**

Peaks	Years	Travel Time (Minutes)					Travel Time Saved (Minutes)			
		DM	Opt1	Opt2	Opt3	Opt3a	Opt1	Opt2	Opt3	Opt3a
AM	2016	4.3	5.2	5.1	5.3	5.5	0.9	0.9	1.1	1.2
	2026	4.5	5.5	5.3	5.4	5.6	1.0	0.8	1.0	1.1
	2031	4.6	5.8	6.3	5.3	5.4	1.1	1.7	0.6	0.8
IP	2016	4.4	5.1	5.1	5.1	5.5	0.7	0.8	0.7	1.2
	2026	4.9	5.3	5.4	5.2	5.6	0.4	0.5	0.3	0.7
	2031	5.2	5.5	5.4	5.4	5.6	0.3	0.2	0.2	0.4
PM	2016	6.4	5.5	5.7	5.4	5.7	-0.9	-0.7	-1.0	-0.7
	2026	7.5	6.4	6.4	5.6	5.8	-1.1	-1.1	-1.9	-1.7
	2031	8.9	6.5	6.7	5.9	6.2	-2.4	-2.2	-3.0	-2.7

The tables above show the journey times for the SH2 and SH29 movements are generally significantly improved. In some cases the average journey time remains relatively similar, although, as detailed below the variability is significantly reduced (improved reliability). However, there are

some movements between the local road network which increase as a result of the proposed options, and this is as a result of the signal control proposed rather than the roundabouts and the priority given to state highway movements.

This is partly as the signalisation of the intersections and the need to use the at grade parallel link through both sets of signals results in some delays out of peak, and partly due to the physical constraints at the intersections as a result of the footprint required for the grade separation. The nature of the network results in there still being considerable traffic on the at grade intersections. However, the benefits of an uninterrupted journey for the strategic movements on SH2 are clearly demonstrated in **Tables 4.4 and 4.5** in all time periods. This is in addition to the 12 minute travel time saving resulting from the construction of the TEL resulting in a significant saving for the overall journey along SH2.

The effect of trains crossing SH29 and Matapihi Road create a peak in the delays for Options 1 and 2 when this occurs. Train crossings can block cars for up to 4 minutes, compounding the average expected traffic delays as shown in **Figures 4-8 and 4-9** below.

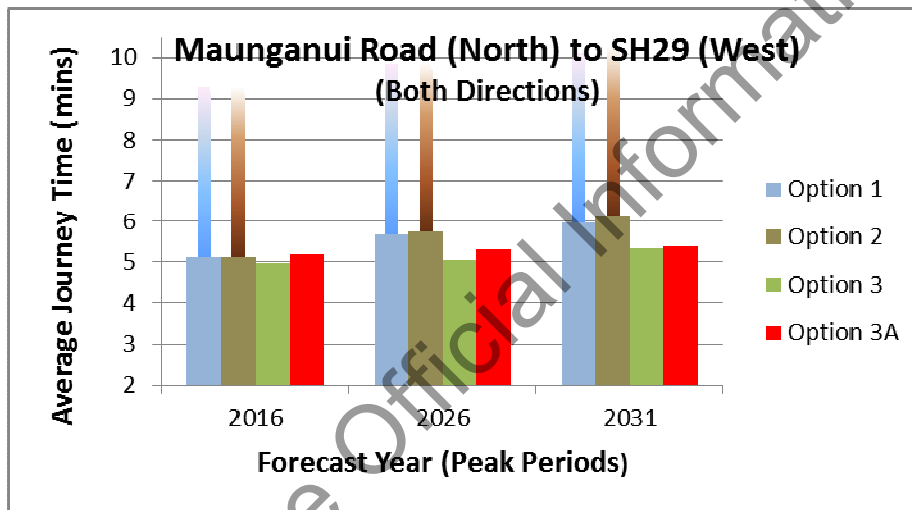


Figure 4-8: Average Journey Time: Maunganui Rd (North) to SH29 (West)

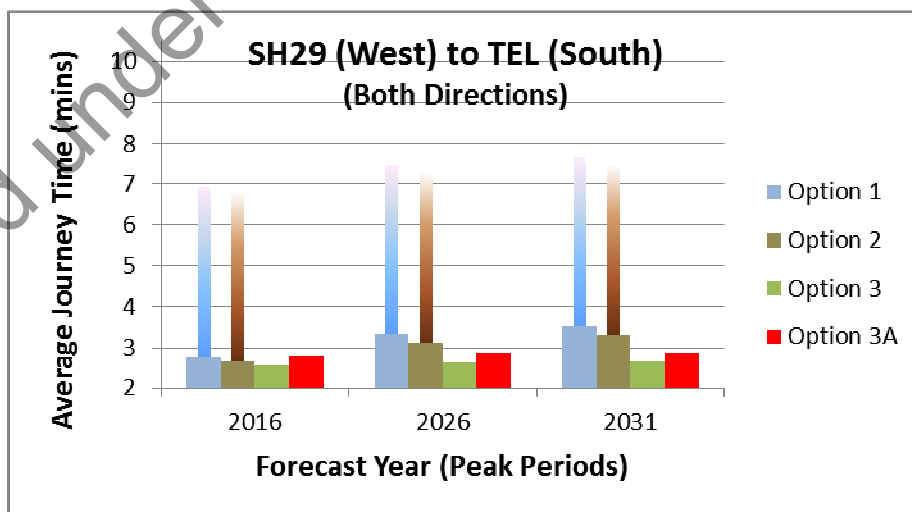


Figure 4-9: Average Journey Time: SH29 (West) to TEL (South)

### 4.3.2 Travel Time Variability

Figures 4-10 to 4-21 below show the travel time variability for the routes (note that "Option 3c refers to Option 3a).

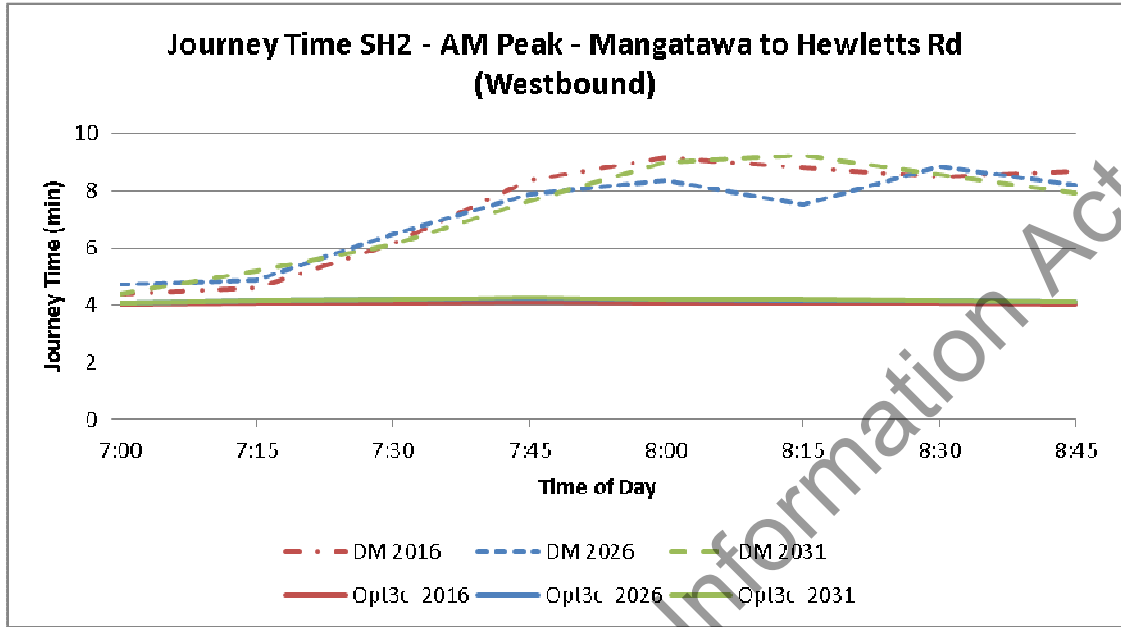


Figure 4-10: Travel Time Variability: SH2 - AM Peak - Mangatawa to Hewletts Rd (Westbound)

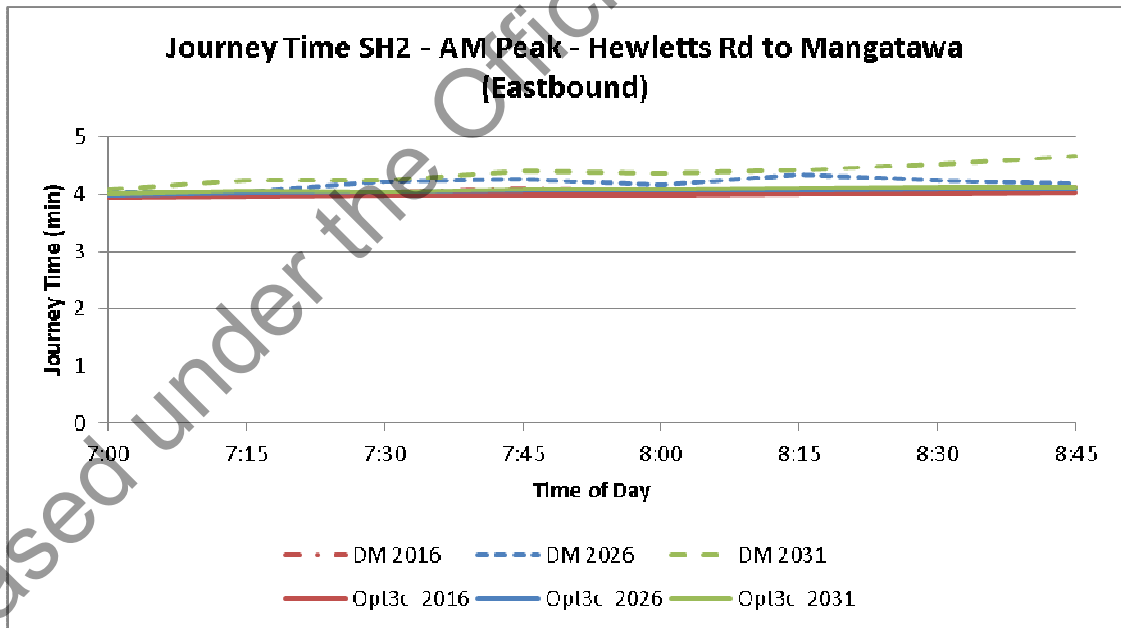


Figure 4-11: Travel Time Variability: SH2 - AM Peak - Hewletts Rd to Mangatawa (Eastbound)

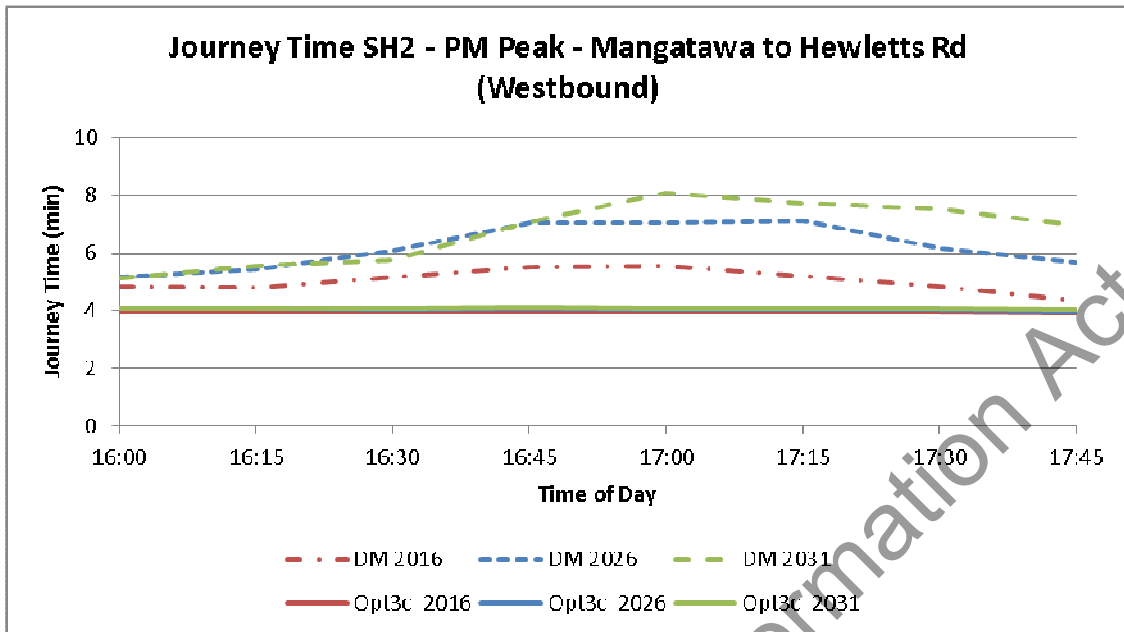


Figure 4-12: Travel Time Variability: SH2 - PM Peak - Mangatawa to Hewletts Rd (Westbound)

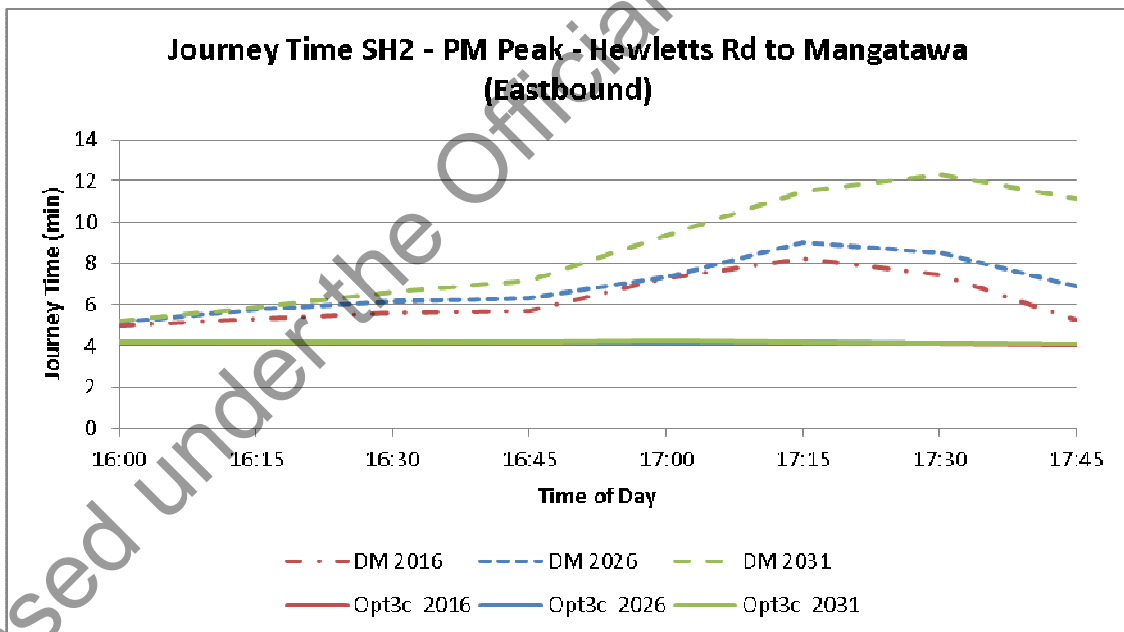


Figure 4-13: Travel Time Variability: SH2 - PM Peak - Hewletts Rd to Mangatawa (Eastbound)

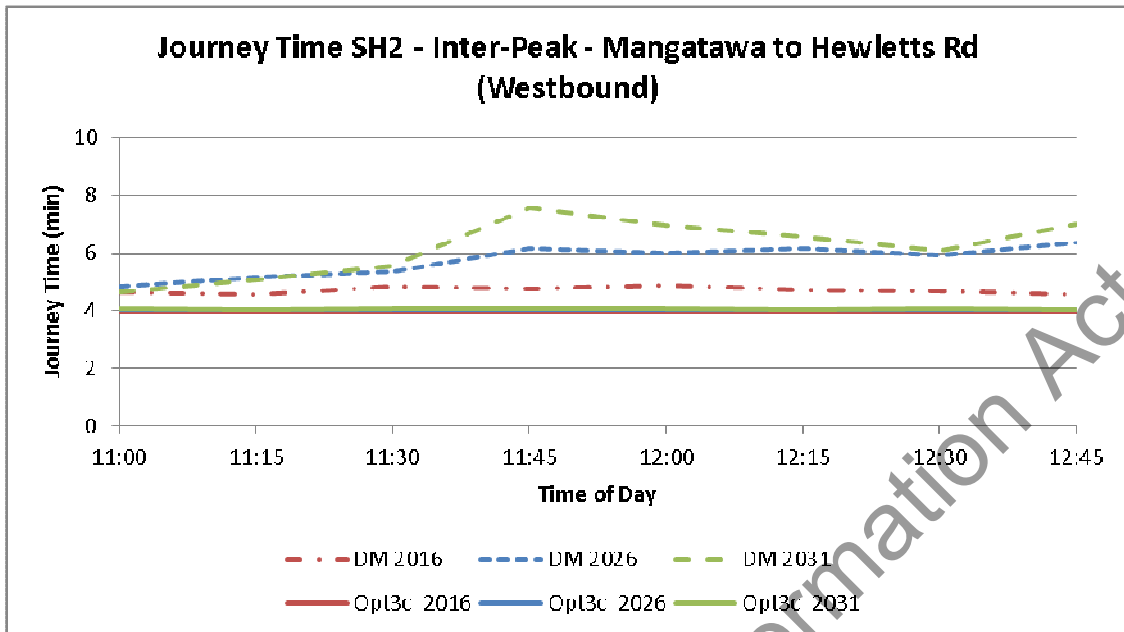


Figure 4-14: Travel Time Variability: SH2 - Inter-Peak - Mangatawa to Hewletts Rd (Westbound)

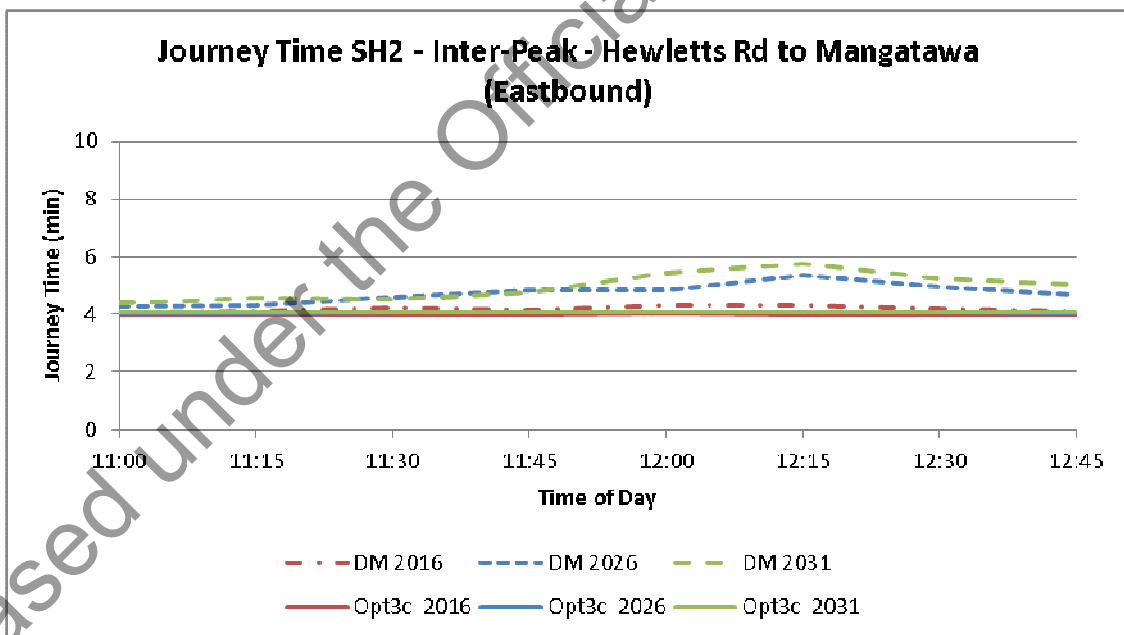


Figure 4-15: Travel Time Variability: SH2 - Inter-Peak - Hewletts Rd to Mangatawa (Eastbound)

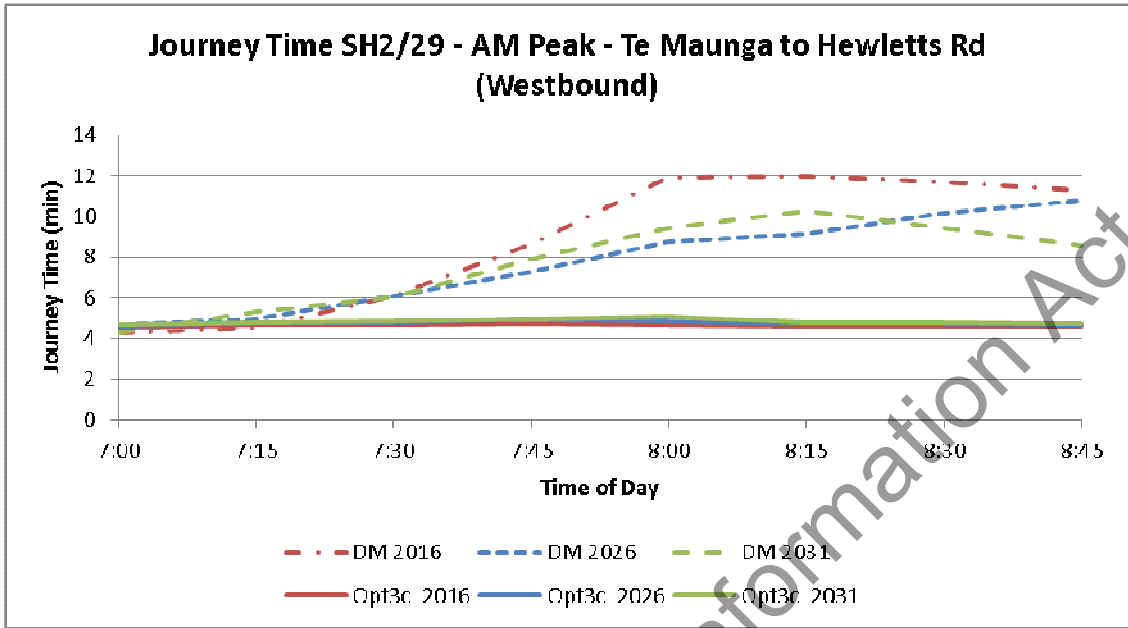


Figure 4-16: Travel Time Variability: SH2/29 - AM Peak – Te Maunga to Hewletts Rd (Westbound)

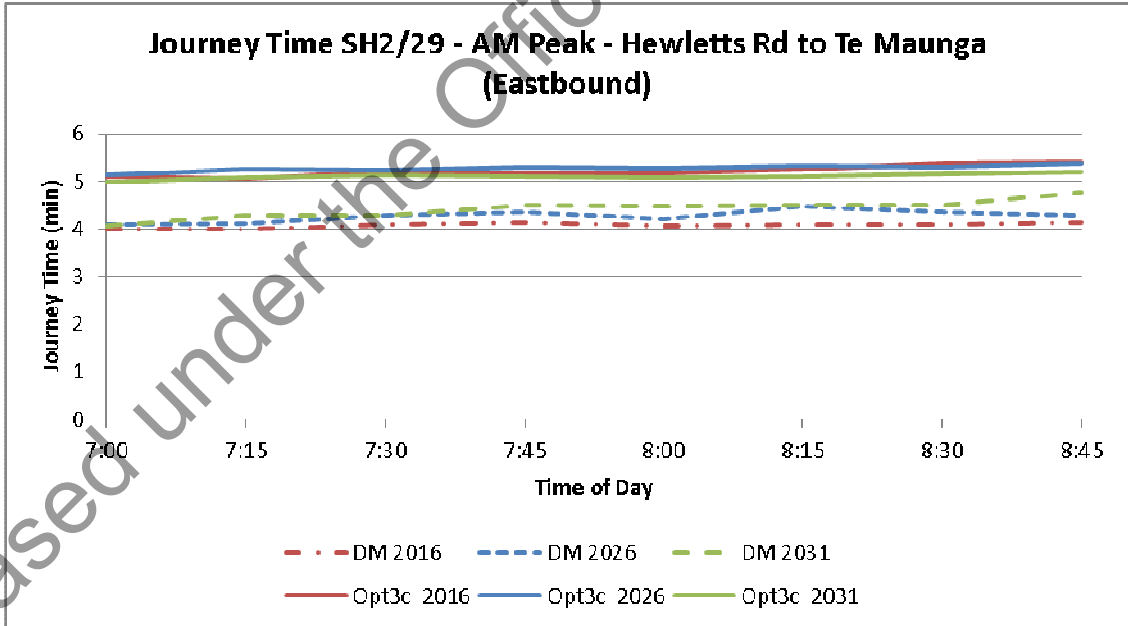


Figure 4-17: Travel Time Variability: SH2/29 - AM Peak –Hewletts Rd to Te Maunga (Eastbound)

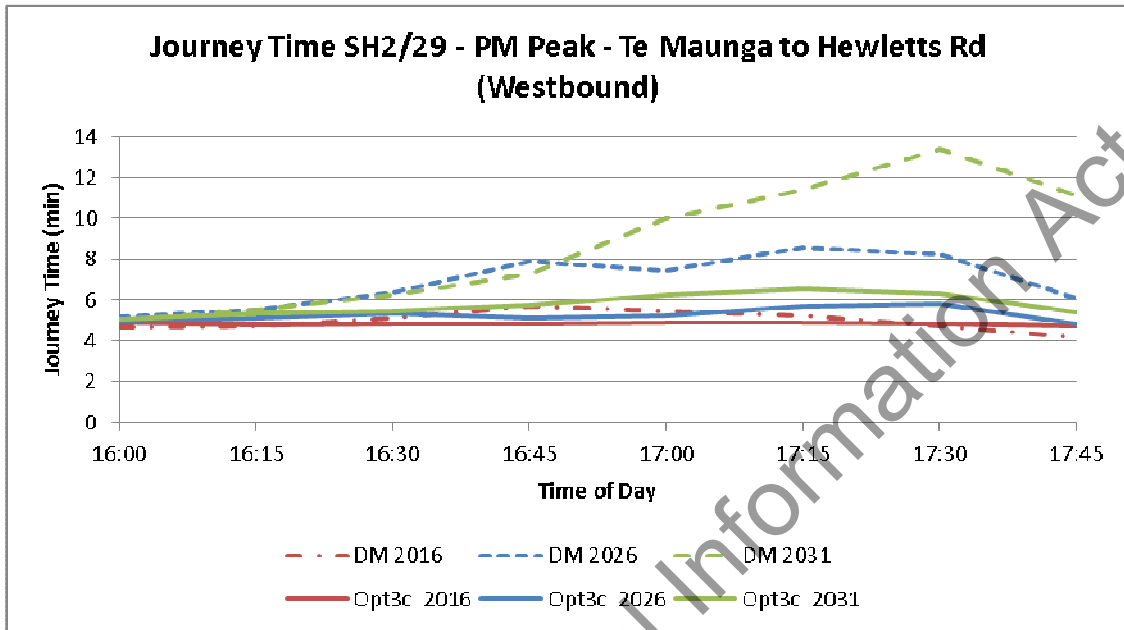


Figure 4-18: Travel Time Variability: SH2/29 - PM Peak – Te Maunga to Hewletts Rd (Westbound)

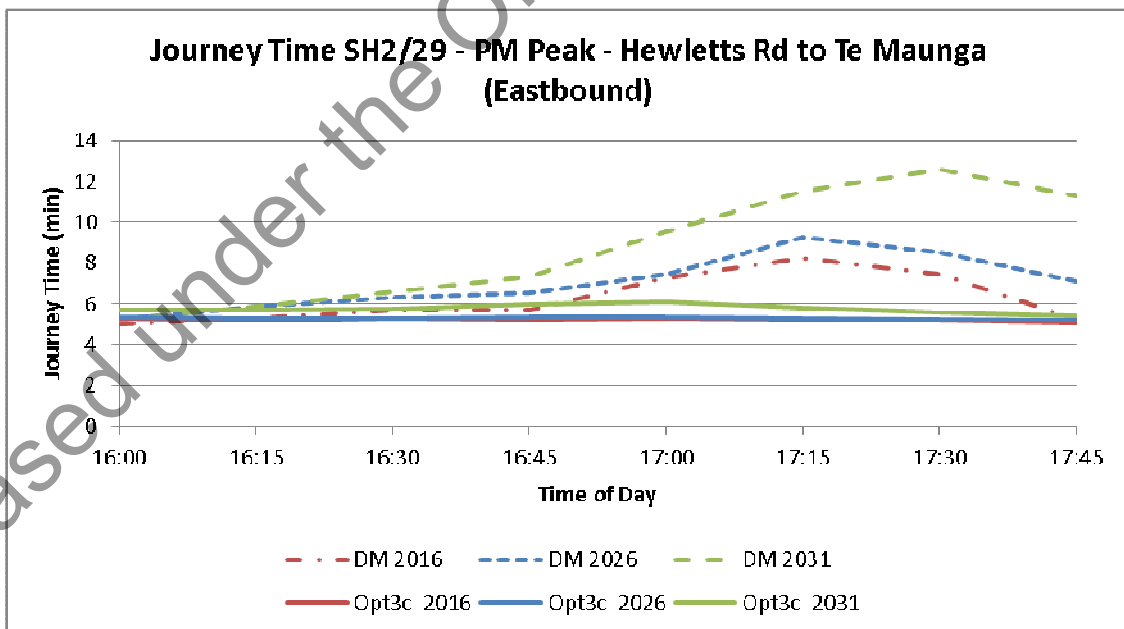


Figure 4-19: Travel Time Variability: SH2/29 - PM Peak – Hewletts Rd to Te Maunga (Eastbound)

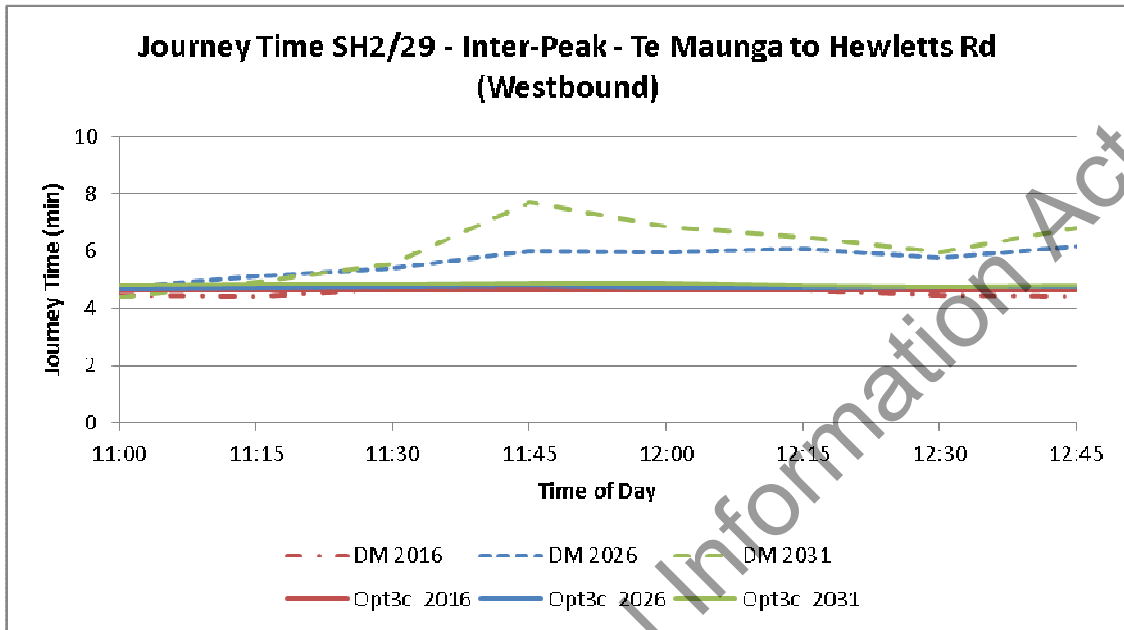


Figure 4-20: Travel Time Variability: SH2/29 - Inter-Peak – Te Maunga to Hewletts Rd (Westbound)

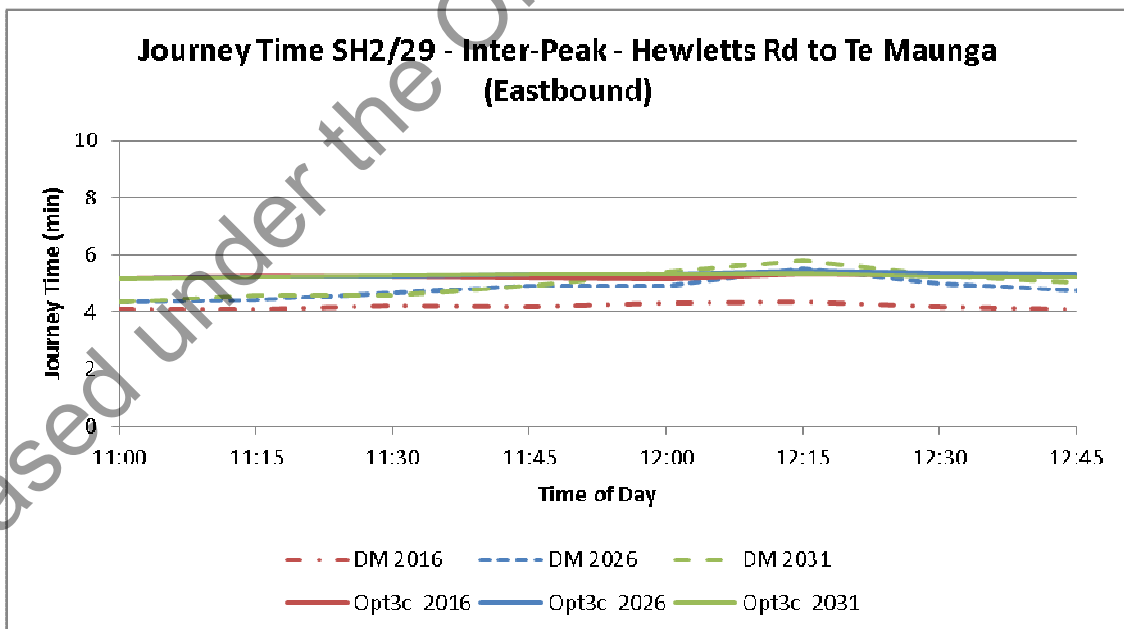


Figure 4-21: Travel Time Variability: SH2/29 - Inter-Peak – Hewletts Rd to Te Maunga (Eastbound)



The figures show that in all cases the Option 3a network provides a consistent journey time throughout the peak periods, and this is of particular benefit to freight movements to and from the Port of Tauranga. The dashed lines in the figures represent the do minimum network journey times and show the significant differences in journey times throughout the modelled peak 2 hour periods.

### 4.3.3 Peak Hour Average Journey Time

The graphs in **Figures 4-22 to 4-25** below show the average journey times based on 1 hour periods for the do minimum and the Option networks (note that “Option 3c and “Option 4” relate to “Option 3a”).

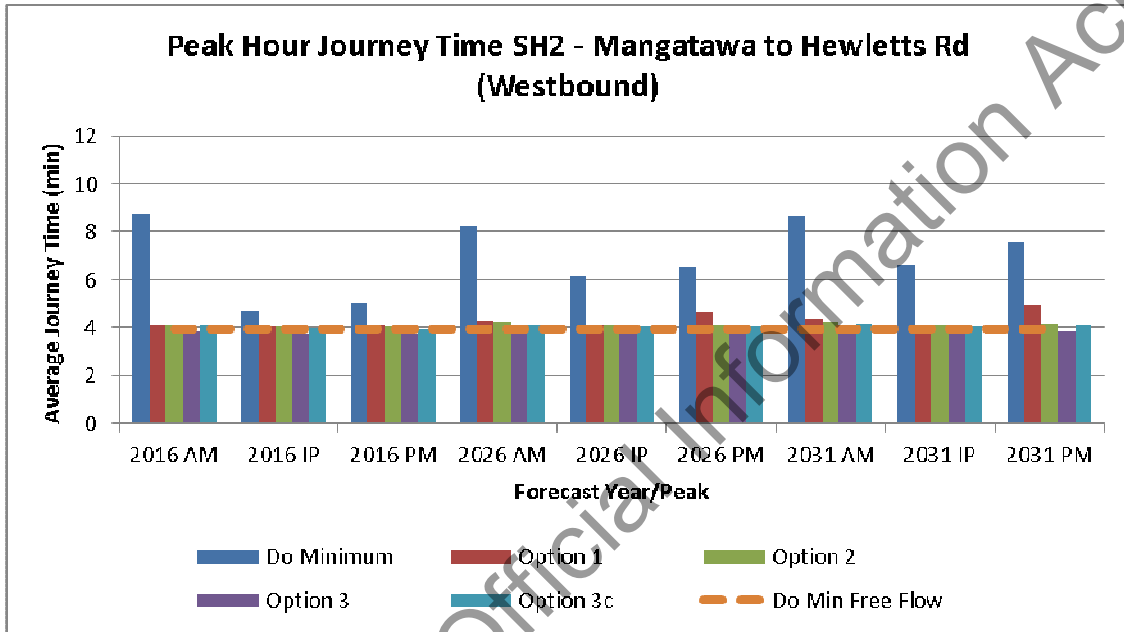


Figure 4-22: Peak Hour Journey Time SH2 – Mangatawa to Hewletts Rd (Westbound)

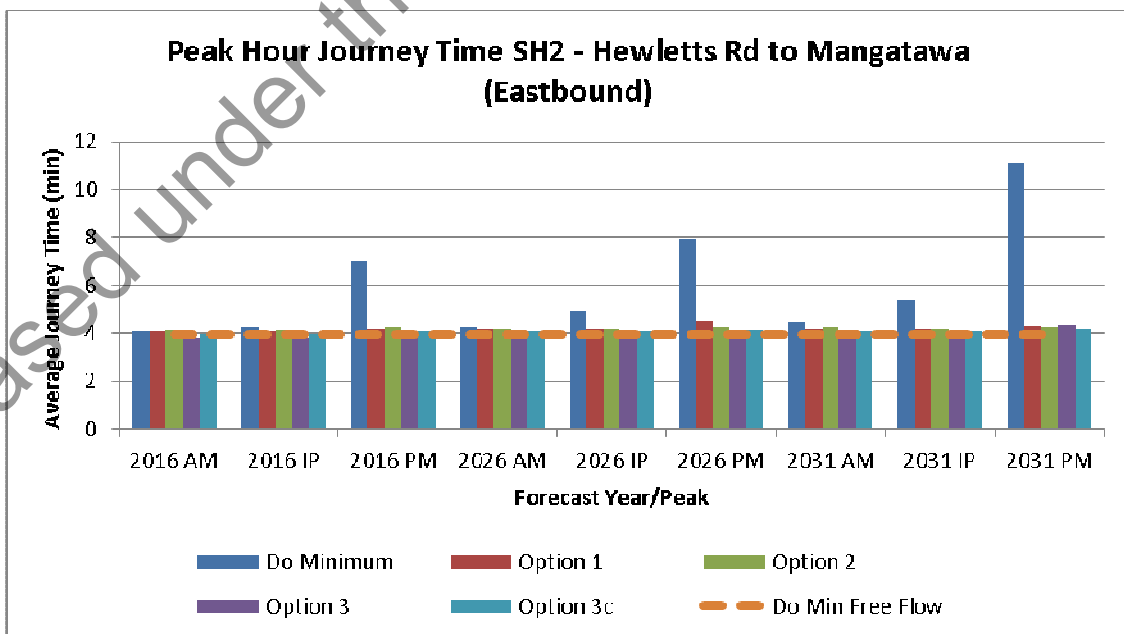


Figure 4-23: Peak Hour Journey Time SH2 –Hewletts Rd to Mangatawa (Eastbound)

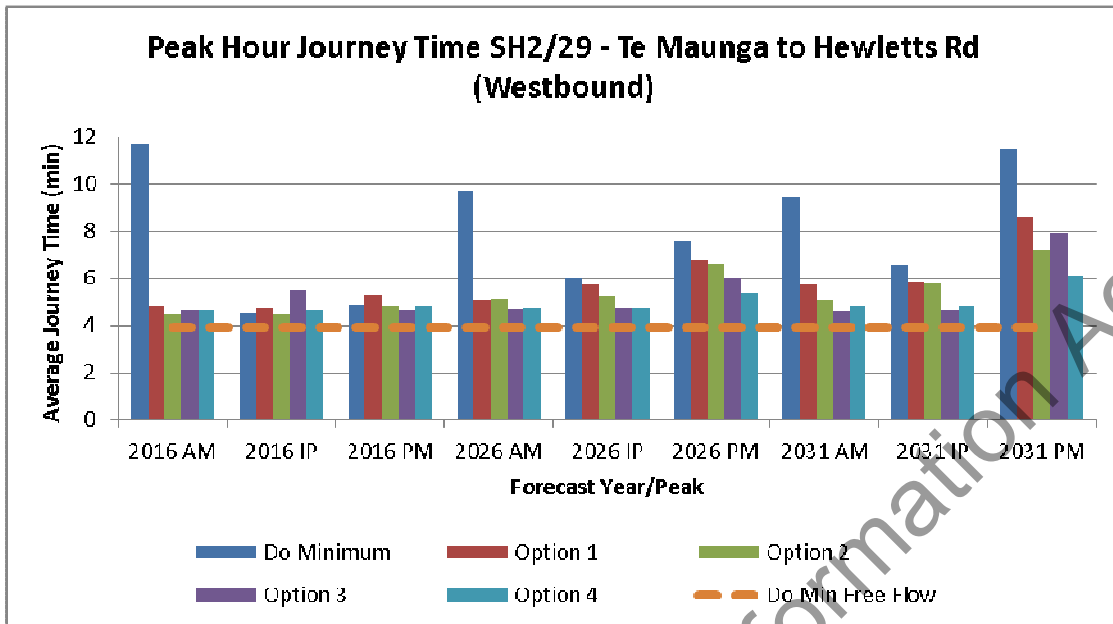


Figure 4-24: Peak Hour Journey Time SH2/29 – Te Maunga to Hewletts Rd (Westbound)

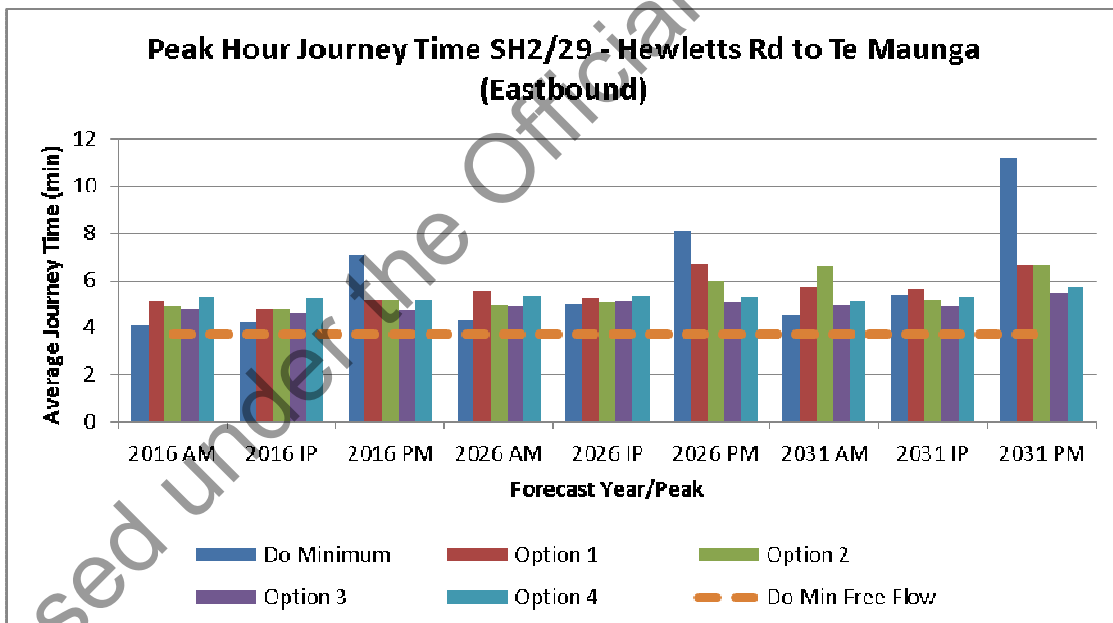


Figure 4-25: Peak Hour Journey Time SH2/29 – Hewletts Rd to Te Maunga (Eastbound)

## 5 Safety Assessment Summary

The existing crash history for the key intersections was extracted from NZ Transport Agency Crash Analysis System (CAS) for the period between 2008 and 2012. This is further discussed in Section 5.1. The safety assessment was then assessed using the High-Risk Intersection Guide (HRIG). The HRIG was published by the NZ Transport Agency in July 2013 and provides the most recent guidance on high-risk urban and rural intersections. The HRIG provides guidance to the identification and treatment of High Risk Intersections. This includes methods to assess risk for both urban and rural intersections in New Zealand based on historic and predicted crash rates.

### 5.1 Crash History

#### 5.1.1 Matapihi Road/Owens Place Intersection

Table 5-1: Reported Crash History: Matapihi Road/Owens Place Intersection

Year	Number of Reported Crashes				Total
	Fatal	Serious	Minor	Non-injury	
2008	1				1
2009				1	1
2010			1		1
2011					
2012					
Total	1		1	1	3

There were three crashes reported at the Matapihi Road and Owens Place intersection between 2008 and 2012. All the reported crashes had a varying range of factors that contributed to them and no trend is evident. The site also has too few crashes to establish whether there is an increasing or decreasing trend in crash severity.

#### 5.1.2 Matapihi Road/Girven Road Roundabout

Table 5-2: Reported Crash History: Matapihi Road/Girven Road Roundabout

Year	Number of Reported Crashes				Total
	Fatal	Serious	Minor	Non-injury	
2008		1	3	12	16
2009	1	1	2	13	17
2010				11	11
2011				14	14
2012			3	9	12
Total	1	2	8	59	70

There were 70 crashes reported at the Matapihi Road and Girven Road roundabout between 2008 and 2012, consisting of one fatal, two serious, eight minor and 59 non-injury crashes. When looking at the data there is general decreasing trend in crash severity, as serious or fatal crash has not reported since 2009. There also appears to be a trend indicating that the total number of reported crashes has gradually decreased.

There are a number of commonalities that link the injury crashes that occurred on the site. A recurring crash type was crossing with no turns, with 6 of the 11 (54%) injury crashes reported for this movement. On the Matapihi Road approach to the roundabout, the crash data revealed that of the 4 injury crashes occurring on the approach, 3 (75%) involved cyclist.

When considering all 70 crashes on the site a number of commonalities become evident. The first of which is the crash locations, which unsurprisingly are centred mostly at the point where the road approach meets the roundabout. The most common type of crash that occurred on site was crossing with no turns, which had 22 of 70 (34%) crashes reported for this movement. Other recurring crash types were turning from left side and a number of merging movements from different directions.

### 5.1.3 SH-2/SH29 Roundabout

Table 5-3: Reported Crash History: SH2/SH29 Roundabout

Year	Number of Reported Crashes				Total
	Fatal	Serious	Minor	Non-injury	
2008					
2009			1	4	5
2010			3	8	11
2011			2	8	10
2012			2	4	6
Total			8	24	32

There were 32 crashes reported at the SH2 and SH29 roundabout between 2008 and 2012. There have been no fatal or serious incidents reported on the site but there have been eight minor injury crashes.

When looking at injury crashes reported, the most common crash type was rear end crashes which make up 5 of the 8 (63%) crashes. Other crashes that occurred on the site that resulted in injury were crossing right turn right side, which was made up 2 of the 8 crashes and changing lanes to the right, which caused one injury crash.

Rear end crashes was the most common crash type of crash, with 16 of the 32 (50%) crashes. This was mostly reported at the southern approach of SH29 which had 10 rear end crashes reported north of the railway line.

No other significant crash commonalities were identified on the site.

#### 5.1.4 SH29-Truman Road Roundabout

**Table 5-4: Reported Crash History: SH29-Truman Road Roundabout**

Year	Number of Reported Crashes				
	Fatal	Serious	Minor	Non-injury	Total
2008				1	1
2009				3	3
2010				4	4
2011				3	3
2012				3	3
Total				14	14

There were 14 crashes reported at the SH29 and Truman Road roundabout between 2008 and 2012. All crashes were non-injury crashes. The number of reported crashes appears to be rather consistent with between three to four crashes reported each year, except in 2008 where there was one crash reported.

At the site there were a variety of crash types. Loss of control contributed to 4 of the 14(29%) and so did crossing right turn right side. The crossing right turn right side crashes mainly occurred where the approaching roads met the roundabout.

Weather conditions and time of day seem to have played a part in the crashes that occurred but there is no obvious trend evident.

## 5.2 Methodology

A comparative assessment of the project options has been undertaken to assess the relative safety of each intersection form within each of the options. Intersection risk is categorised using the personal risk metric, where personal risk is the risk of death or serious injuries to each vehicle entering the intersection. In this assessment, personal risk is calculated from the forecast number of deaths and serious injury equivalents over a 5 year period divided by a measure of traffic volume.

It is important to note that the proximity of railway crossings is not included in the methodology adopted by the HRIG.

The purpose of this HRIG assessment is to quantify any safety benefits and differentiators not previously identified using other methods. For this reason, forecast crash rates and future year traffic volumes are used to estimate the personal risk at each intersection. Personal risk levels are categorised in **Table 5-5**. The collective risk levels are also categorised in **Table 5-6**.

**Table 5-5: Personal risk levels and risk metric values**

Personal risk level	Estimated DSIs per 100 million vehicle kms
High	> 32
Medium-high	16 – <32
Medium	10 – <16
Low medium	6 - <10
Low	< 6

**Table 5-6: Collective risk levels and risk metric values**

Collective risk level	Estimated DSIs per 5 years
High	$\geq 1.6$
Medium-high	1.1 – <1.6
Medium	0.6 – <1.1
Low medium	0.3 - <0.6
Low	< 0.3

Level of safety service (LoSS) typically provides a measure of the historic intersection safety performance relative to similar intersections in New Zealand. In this assessment, a forecast LoSS is derived based on the estimated number of crashes and forecast traffic volumes in future years. This provides a measure of expected performance relative to similar intersections with the same configuration. Intersections classed as LoSS I have the best safety performance, while those in LoSS V have a very poor safety performance.

### 5.3 HRIG Results

The estimated risk ratings for each intersection are shown in **Table 5-7** and **Table 5-8** for the forecast years 2016 and 2026 respectively. Generally, there is little differentiation between options with similar ratings estimated for personal risk and LoSS.

A small change in the personal risk number between Options 2 and 3A at Te Maunga Intersection is due to the reduction in the product of flow, a proxy for the number of potential conflicts between vehicles. In 2026, the personal risk level and LoSS are the same in both Option 2 and 3A.

Table 5-7: HRIG Assessment for 2016

Intersection/Metric	DoMin (Existing Crash Record)	Opt2	Opt3a
<b>Te Maunga Intersection SH2 / SH29 / TEL</b>			
Intersection Form	Roundabout	Signalised T	Signalised T
PoF	1,366	1,223	1,018
Injury Crashes (5yr)	8	2.02	1.75
DSI Equivalentents (5yr)	0	0.28	0.24
Collective Risk Level	Low	Low	Low
Personal Risk	0.0	7.4	7.7
Personal Risk	Low	Low-medium	Low-medium
Level of Safety Service	LoSS I	LoSS II	LoSS II
<b>SH29 / Truman Lane</b>			
	Roundabout	Roundabout	Roundabout
PoF	638	626	538
Injury Crashes (5yr)	0	0.50	0.44
DSI Equivalentents (5yr)	0	0.08	0.07
Collective Risk Level	Low	Low	Low
Personal Risk	0.0	3.9	3.9
Personal Risk	Low	Low	Low
Level of Safety Service	LoSS I	LoSS II	LoSS II
<b>Maunganui / Girven Intersection</b>			
	Roundabout	Signalised X	Signalised X
PoF	2,013	1,594	1,602
Injury Crashes (5yr)	11	3.93	3.94
DSI Equivalentents (5yr)	3	0.63	0.63
Collective Risk Level	High	Medium	Medium
Personal Risk	48.0	12.7	12.7
Personal Risk	High	Medium	Medium
Level of Safety Service	LoSS V	LoSS II	LoSS II
<b>Matapihi / Owens Place Intersection</b>			
	Priority T	Priority T	Priority T
PoF	512	511	512
Injury Crashes (5yr)	2	0.56	0.56
DSI Equivalentents (5yr)	1	0.10	0.10
Collective Risk Level	Medium	Low	Low
Personal Risk	63.0	6.0	6.0
Personal Risk	High	Low-medium	Low-medium
Level of Safety Service	LoSS II	LoSS I	LoSS I
<b>All Sites</b>			
Total Number of crashes (5yr)	21.00	7.01	6.69
Total DSI Equivalentents (5yr)	4.00	1.08	1.04
Personal Risk (weighted by PoF)	28.5	8.8	9.1

Table 5-8: HRIG Assessment for 2026

Intersection/Metric	DoMin (Prediction)	Opt2	Opt3a
<b>Te Maunga Intersection SH2 / SH29 / TEL</b>			
Intersection Form	Roundabout	Signalised T	Signalised T
PoF	1,582	1,421	1,197
Injury Crashes (5yr)	1.20	2.28	1.98
DSI Equivalentents (5yr)	0.18	0.32	0.28
Collective Risk Level	Low	Low-medium	Low
Personal Risk	3.7	7.2	7.5
Personal Risk	Low	Low-medium	Low-medium
Level of Safety Service	LoSS II	LoSS III	LoSS II
<b>SH29 / Truman Lane</b>			
Intersection Form	Roundabout	Roundabout	Roundabout
PoF	794	726	609
Injury Crashes (5yr)	0.63	0.58	0.49
DSI Equivalentents (5yr)	0.09	0.09	0.07
Collective Risk Level	Low	Low	Low
Personal Risk	3.8	3.8	3.9
Personal Risk	Low	Low	Low
Level of Safety Service	LoSS II	LoSS II	LoSS II
<b>Maunganui / Girven Intersection</b>			
Intersection Form	Roundabout	Signalised X	Signalised X
PoF	2,015	1,669	1,688
Injury Crashes (5yr)	1.52	4.03	4.05
DSI Equivalentents (5yr)	0.23	0.64	0.65
Collective Risk Level	Low	Medium	Medium
Personal Risk	3.6	12.5	12.4
Personal Risk	Low	Medium	Medium
Level of Safety Service	LoSS II	LoSS II	LoSS II
<b>Matapihi / Owens Place Intersection</b>			
Intersection Form	Priority T	Priority T	Priority T
PoF	530	533	533
Injury Crashes (5yr)	0.59	0.59	0.59
DSI Equivalentents (5yr)	0.10	0.10	0.10
Collective Risk Level	Low	Low	Low
Personal Risk	6.1	6.1	6.1
Personal Risk	Low-medium	Low-medium	Low-medium
Level of Safety Service	LoSS I	LoSS I	LoSS I
<b>All Sites</b>			
Total Number of crashes (5yr)	3.93	7.47	7.12
Total Number of DSI (5yr)	0.60	1.15	1.10
Personal Risk (weighted by PoF)	3.9	8.5	8.8



## 5.4 Conclusion

Comparing Option 2 and 3A it can be seen that in terms of relative safety performance, there is little difference between each option in terms of crash number, personal risk and LoSS. It is estimated that there will be one additional DSi every 25 years for Option 2. However when the random nature of crashes is considered, with such a small (DSi crash) difference between options it is considered unlikely to be statistically significant.

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## 6 Economic Evaluation

### 6.1 Economic Evaluation and Assumptions

The details of the economic assessment are attached as Appendix A to this transport assessment. The Appendix provides the details of the methodology used in undertaking the economic evaluation. Appendix B contains the Peer Review report undertaken by Flow on behalf of the NZ Transport Agency.

### 6.2 Economic Evaluation Results

The evaluation results are summarised in **Table 6-1**, and the detailed calculations and worksheets are provided in the memo within Appendix A.

**Table 6-1: Economic Evaluation Results**

Items	Option 1	Option 2	Option 3	Option 3a
Capital Cost, \$M	75.9	80.4	113.3	104.6
Discounted Net Capital Cost, \$M NPV	65.8	68.5	97.3	89.9
Discounted Net Maintenance and Operation Costs, \$M NPV	0.0	0.0	0.5	0.5
<b>Total Net Discounted Costs</b>	<b>65.9</b>	<b>68.5</b>	<b>97.7</b>	<b>90.4</b>
Base Travel Time Benefits	153.4	166.8	181.4	184.4
CRV Time benefits	9.7	12.3	17.7	21.2
Trip Reliability	12.3	13.3	14.5	14.8
Vehicle Operating Cost Benefits	-10.6	-12.7	-15.8	-19.9
Crash Benefits	7.1	7.5	11.0	11.1
CO <sub>2</sub> benefits	-0.4	-0.5	-0.6	-0.8
<b>Total Benefits, \$M NPV</b>	<b>171.4</b>	<b>186.8</b>	<b>208.1</b>	<b>210.8</b>
<b>National BCR</b>	<b>2.6</b>	<b>2.7</b>	<b>2.1</b>	<b>2.3</b>
Agglomeration Benefits, \$M NPV	8.0	8.7	9.5	9.6
<b>Total Benefits + Agglomeration, \$M NPV</b>	<b>179.4</b>	<b>195.5</b>	<b>217.6</b>	<b>220.4</b>
Other WEB Benefits, \$M NPV	26.5	28.8	31.3	31.8
<b>Total Benefits + Agglom+ WEB, \$M NPV</b>	<b>205.9</b>	<b>224.3</b>	<b>248.9</b>	<b>252.2</b>
<b>National BCR with Agglomeration</b>	<b>2.7</b>	<b>2.9</b>	<b>2.2</b>	<b>2.4</b>
<b>National BCR with Agglomeration+ WEB</b>	<b>3.1</b>	<b>3.3</b>	<b>2.5</b>	<b>2.8</b>

From the table above, Option 2 has the highest BCR. All BCRs are between 2 and 4, and fit into a Medium economic efficiency profile. WEBs have been calculated based on the NZTA Economic Evaluation Manual methodology for information. NZTA to determine if they are appropriate for this project.

### 6.3 Incremental BCR

An incremental analysis was undertaken to identify the most economically optimal option. There is some guidance in the EEM regarding the target incremental BCR. It recommends minimum incremental BCR of 1.0 (refer to EEM1 A12.4). For a BCR of preferred option greater than 2 but less than 4, it suggests an incremental BCR of 2.0. The EEM also suggests that “*where the selected target incremental ratio differs to the guidance, a detailed explanation supporting the chosen value must be provided*”.

In this study, as per the EEM’s guidance, a target incremental BCR of 2.0 was used. With the considerations of other strategic and non-economic objectives, the target incremental BCR of 1.0 was also considered.

These tests were undertaken with agglomeration benefits, and with and without WEB benefits and the results are provided in **Tables 6-2 and 6-3**.

**Table 6-2: Incremental Analysis Results (with agglomeration only)**

Tests	Options	Incremental Benefits (with agglomeration)	Incremental Costs	Incremental BCRs	Preferred Option
1	Opt2 over Opt1	16.1	2.6	6.2	Opt2
2	Opt3a over Opt2	24.9	21.9	1.1	Opt2/Opt3A
3.1	Opt3 over Opt2	22.1	29.2	0.8	Opt2
3.2	Opt3 over Opt3a	-2.8	7.3	-0.4*	Opt3A

\* The negative incremental is a result of the slightly lower benefits of the more expensive Option 3.

**Table 6-3: Incremental Analysis Results (with agglomeration and WEBs)**

Tests	Options	Incremental Benefits (with agglomeration)	Incremental Costs	Incremental BCRs	Preferred Option
1	Opt2 over Opt1	18.4	2.6	7.1	Opt2
2	Opt3a over Opt2	27.9	21.9	1.3	Opt2/Opt3A
3.1	Opt3 over Opt2	24.6	29.2	0.8	Opt2
3.2	Opt3 over Opt3a	-3.3	7.3	-0.5*	Opt3A

\* The negative incremental is a result of the slightly lower benefits of the more expensive Option 3.

From a pure economic perspective, Option 2 would be the preferred option if the target incremental BCR is 2.0. But Option 3A would be preferred if the target incremental BCR is 1.0.

### 6.4 Economic Analysis Peer Review

A peer review of the economic analysis has been undertaken by Flow Transportation Specialists and is included in Appendix B. There were no outstanding issues from the review.

## 7 Sensitivity Tests

A series of sensitivity tests were performed on a range of factors which included both input assumptions and the methodology used for various aspects of the assessment. The tests undertaken are as follows (main assumption, sensitivity 1, sensitivity 2):-

- Discount Rate (6%, 8%, 4%)
- Benefit Extrapolation (capped 2014, no capping, capping at 2031)
- Value of travel time (65% rural, 100% rural, 35% rural)
- Demand Matrix (VTM, FTM, -)
- Train Frequency ( 4 per hour, 6 per hour, 2 per hour)

**Table 7-1** and **Table 7-2** below shows the range of BCRs across all of the separate sensitivity tests. The individual details of the sensitivity tests are shown in Appendix B.

**Table 7-1: Sensitivity Test Results (without agglomeration and WEBs)**

Tests	Option1	Option2	Option3	Option3a
Base Case	2.6	2.7	2.1	2.3
High	3.8	3.9	3.1	3.4
Low	1.9	2.0	1.5	1.7

**Table 7-2: Sensitivity Test Results (with agglomeration and WEBs)**

Tests	Option1	Option2	Option3	Option3a
Base Case	3.1	3.3	2.5	2.8
High	4.5	4.6	3.6	4.0
Low	2.3	2.4	1.9	2.0

**Figure 7-1** below shows the BCRs for each test in a graphical form. As can be seen, the test with the greatest sensitivity was the discount rate, producing the highest and lowest BCRs for all options. However, there was also a strong sensitivity to the assumptions related to rail movements.

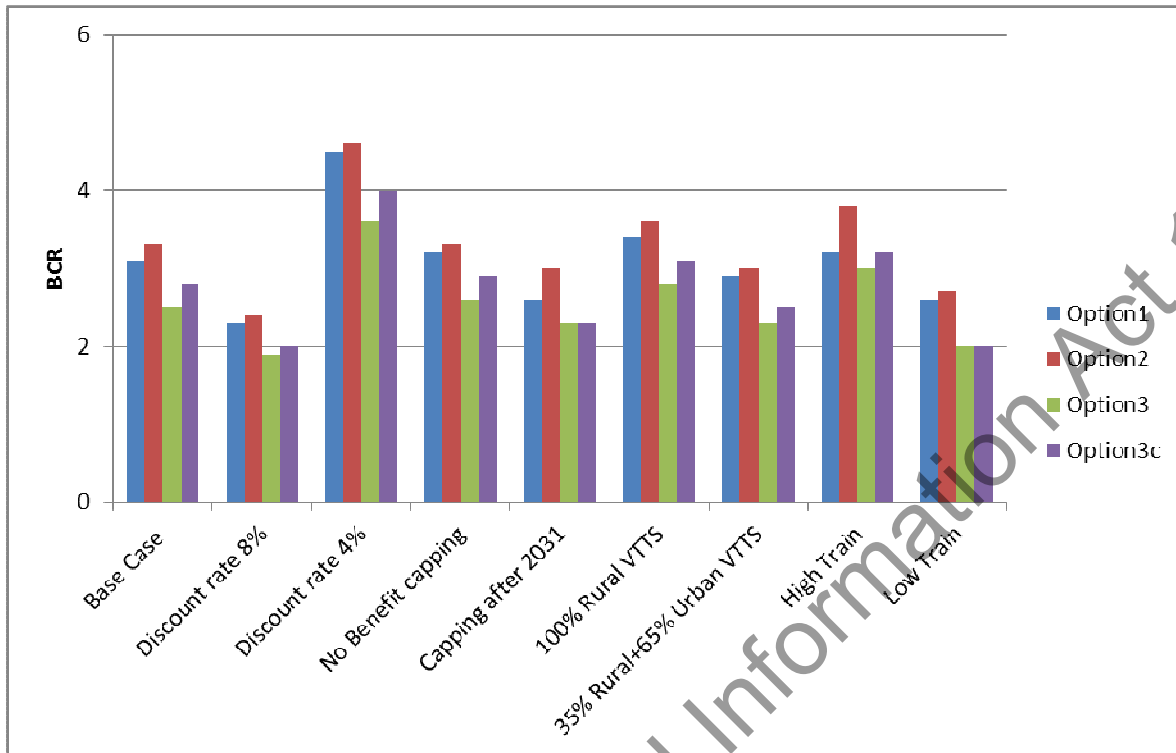


Figure 7-1: Sensitivity Test Results (with agglomeration and WEBs)

### 7.1 Sensitivity to Land Use Growth

This study adopts the standard TTM5.9 land use inputs for traffic forecasts. Sensitivity tests on faster or slower land use growth were undertaken by allocating land use (after 2016) by 5 years earlier or later than the standard TTM5.9 inputs. The results (without agglomeration benefits) are tabulated in **Table 7-3**.

Table 7-3: Discount Rate Sensitivity Test Results (without agglomeration and WEBs)

Tests	Option1	Option2	Option3	Option3a
Base Case (6%)	2.6	2.7	2.1	2.3
Slower Growth	2.1	2.4	1.8	1.9
Faster Growth	3.3	3.2	2.6	3.0

### 7.2 Summary

Whilst the discount rate has a strong effect on the project from an assessment perspective, this is not an operational consideration. However, the NZ Transport Agency has minimal control over the rail usage, and there is a strong likelihood that the rail frequencies will change throughout the assessment period. As such the rail operational response to the variability of the rail operations may be considered to have a higher level of importance.

## 8 Summary

This Transport Assessment has considered the effects of four options for the possible grade separation of the SH2 corridor through Te Maunga and the Maunganui/Girven Intersections. Previous phases of the study have considered alternate intersection forms, including at-grade measures, and these have been documented in earlier reports.

The report identified the key transport issues in the corridor as being:-

- Providing the capacity and appropriate customer journey experience to support the TEL project to immediately adjacent to the study area
- The congestion which arises as a result of rail operations over the level crossings at MGI and Te Maunga
- Journey time reliability which is key to the efficient operations of the Port of Tauranga
- Road safety, with MGI one of the top 120 riskiest intersections nationally ranked by collective risk.

Of the three initial options, Option 1 provided grade separation of SH2 over MGI and Te Maunga, and retained the existing rail alignment. Option 2 was similar in roading infrastructure terms, but relocated the rail which offered additional benefits by reduced interaction between rail operations and road movements. Option 3 also relocated the rail, but differed from the other options by inverting the grade separation at Te Maunga to elevate SH29 and leave SH2 at grade. This provided the advantage of segregating the rail from both state highways, but did result in some wider network changes and increased scheme costs.

A variant of Option 3, named Option 3a was developed with a view to maintaining the majority of the benefits, economic and strategic, but with lower costs. Some of the negative outcomes from the wider network changes required by Option 3 were also addressed by Option 3a.

The economic evaluation of the schemes identified that in pure efficiency terms Option 2 would have the highest BCR, although all 4 options have a BCR in excess of 2.0, and there would be an incremental BCR of between 1.1 to 1.3 for Option 3a over Option 2.

Sensitivity testing showed that the assumed future frequency of rail operations has a major bearing on the economic evaluation. It was noted that the rail frequency is also one of the most variable factors, and one which the NZ Transport Agency has little control over. The train frequency will be driven by national and international economic climate and KiwiRail have no limit to the frequency of movements over the level crossing. Options 3 and Option 3a are the only options which isolate SH2 and SH29 movements from the rail operations and provide the certainty of future journey time on the State Highway Network.

An assessment of the accident risk for the options showed that there was a marginal reduction in collective accident risk with Option 3a over Option 2, but that the reduction was not significant given the overall variability in accidents.

## Appendices

Released under the Official Information Act 1982

Appendix A

Transport Modelling and  
Economic Evaluation Memo

Released under the Official Information Act 1982



## File Note

**By:** s 9(2)(a) **Date:** 7 November 2013  
**Subject:** MGI Te Maunga - Future Year Models and BCR Analysis **Our Ref:** 3933377

### 1 Introduction

This note is to document methodologies/assumptions for future year model forecasting and economic evaluation for the Maunganui/Girven (MGI) and Te Maunga Intersection Improvement Study.

Both the Tauranga Traffic Model (TTM) and the AIMSUN corridor simulation model have been used to assess operational outcomes and to derive the project benefits for this study.

### 2 Options Investigated

Four options were investigated in this study, a description of each option is provided below:

#### Option 1: Maunganui/Girven Flyover & Te Maunga Flyover

- 2 Lane Flyover – SH2 to SH2 at the Maunganui/Girven Intersection (MGI) and Te Maunga (SH2/29) Intersections; over at-grade signalised intersections; and
- East Coast Main Trunkline (ECMT) rail to remain in current corridor along SH2.

#### Option 2: Maunganui/Girven Flyover & Te Maunga Flyover

- 2 Lane Flyover – SH2 to SH2 at Maunganui/Girven Intersection (MGI) and Te Maunga (SH2/29) Intersections; over at-grade signalised intersections; and
- ECMT to be relocated to corridor adjoining Liftan Place

#### Option 3: Maunganui/Girven Flyover & Te Maunga Diamond Interchange

- 2 lane flyover – SH2 to SH2 at MGI over signalised intersection and Diamond interchange over SH2 at Te Maunga (SH2/29) Intersection,
- ECMT to be relocated to corridor adjoining Liftan Place
- Signalisation of Matapihi/Owens place intersection

#### Option 3c: Maunganui/Girven Flyover & Te Maunga Diamond Interchange

- 2 lane flyover – SH2 to SH2 at MGI over signalised intersection and Diamond interchange over SH2 at Te Maunga (SH2/29) Intersection,
- ECMT to be relocated to corridor adjoining Liftan Place
- Relocation of the SH29/Truman Lane roundabout

## File Note

### 3 Methodology

The overall methodology is to use the TTM model for future year demand prediction and economic evaluation for the project. The TTM model is a regional strategic model which takes future land use projections (i.e. households, employment and etc.) and network assumptions to predict future travel pattern changes. Traffic demands are therefore a function of the land use forecasts, network assumptions and tolls. Being a regional strategic model, the TTM does not model individual vehicles and uses volume-delay and intersection capacity functions to estimate vehicle speed and delay. The outputs of the TTM model are predicted traffic volume and speed on individual links and for turns at intersections.

Detailed vehicle interactions such as queuing, weaving and train effects are quite significant in the study area and hence an Aimsun corridor micro-simulation model was used in conjunction with the TTM model. The Aimsun model can assess operational performance of future scenarios in the corridor; however, its modelled area is not big enough to assess the wider diversion and overall project benefit/dis-benefits.

To overcome this issue, three methods were considered to evaluate the overall project benefits:

**Method 1:** To use both model outputs for the economic evaluation. This approach includes using the TTM travel cost for the whole modelled area but replaced with travel costs calculated from Aimsun in its detailed modelling area. This approach sounds appealing but based on previous experience; it can have significant inconsistencies between the two models. Also there is technical difficulty in calculating the Variable Trip Matrix (VTM) approach for the economic evaluation.

**Method 2:** To use TTM model outputs for one option only and then use Aimsun outputs for all other options and pivot against the TTM's option. This approach was used in the scoping study for this project (however using the TTM and LinSig). Again this option requires processing of model outputs from both models. The induced traffic and wider-area network effects would be fully captured in one option assessed in the TTM but these effects could not be effectively captured in other options in the economic evaluation.

**Method 3:** To use only TTM model outputs for the economic evaluation. This approach requires an iteration process between the TTM and Aimsun to reflect delay predictions from the more detailed Aimsun model in the TTM. This process is required to iterate until a reasonable delay convergence was achieved between the two models. The final converged TTM model is then used to calculate future travel costs for all options to assess the project benefits.

After considering the strength and weaknesses of each method, Method 3 was chosen for the following reasons:

- Although it requires an extensive iteration process, it provides consistent and transparent output from a single model;
- The operational effects, as initially determined by Aimsun, are reflected in the TTM;
- It can fully capture the induced traffic and wider-area network effects for all investigated options and enable application of the VTM methodology; and
- Predictions of future traffic in all options are available from the TTM. Hence corresponding demand for each option could be used in Aimsun for the operational assessments;

Similar methods were also used in the recent Hairini Link project (Paramics and TTM) and the Tauriko Bypass Study (Sidra and TTM). Only TTM model outputs were also used in economic evaluations for other major projects in Tauranga (e.g. Tauranga Eastern Link, TEL and Tauranga Northern Link, TNL).

## File Note

### 4 Tauranga Traffic Model (TTM)

The TTM version 5.9 was initially set up for the Tauranga Eastern Link Traffic Forecast Update in March 2012. This TTM 5.9 uses same model parameters as in the previous peer-reviewed version "TTM5.8", but TTM5.9 was updated with revised land use forecasts provided by the Tauranga City Council (TCC) and Western Bay of Plenty (WBoP). There was no review undertaken for employment projection and hence TTM5.8 and TTM5.9 use same employment forecasts (except for specific development areas where different set of assumptions were used for TTM5.8 and TTM5.9). Future network assumptions were agreed with NZ Transport Agency and TCC for the TTM5.9 standard.

#### 4.1 TTM 5.9 Standard Land Use and Network Assumptions

The TTM 5.8 used the revised Smartgrowth projections which reflect the recent economic downturn but it assumes a higher rate of growth after 2016 to match the original Smartgrowth forecast at 2026. The TTM5.9 used the latest version of Smartgrowth (updated in November 2011) which has a slower growth rate now expected.

Figure 4-1 shows the comparison of household between TTM5.8 and TTM5.9.

Figure 4-1 Households Comparison



From the above graphs, TTM5.9 land use growth is slower than that of TTM5.8 from 2011. Generally some 6% reduction in households is noticed in 2031.

It should be noted that the above graphs are raw land use data obtained from TCC and WBoP to be used in the traffic model. There are some specific development areas in TTM where different sets of assumptions for growth rates and development sizes were used. These areas include Tauriko and IMF Retail and Industrial Park, Rangioru Business Park, Mangatawa Industrial Park, Wairakei and Te Tumu developments.

The TTM5.9 specific developments and network assumptions are provided in the **Appendix A**.

## File Note

### 4.2 Project TTM Model

The project version of the TTM model was developed using the TTM5.9 as a base. This modified version (TTM5.9\_MGI) was set up with a local model check, covering from Hewletts Road and Golf Road at the northern end to SH29/SH2 roundabout (Te Maunga roundabout) at the southern end. This includes updates of network coding, zone structures in the vicinity of the study area, adjusting Mangatawa land use and matching Bayfair trip generations in the base and future years (as in the district plan update).

#### 4.2.1 Network Assumptions

For the wider modelled area, the standard TTM5.9 network assumptions had been used (see Appendix A). However the following localised network assumptions had been adopted for this study:

- Connection of Sandhurst Drive and Truman lane to either side of the Mangatawa interchange in 2016;
- Connections of the eastern and western ends of Gloucester Road and Grenada Street with roundabout intersections with Sandhurst Drive in 2026;
- Update of free speed along Ocean Beach Road, Maranui Street and Papamoa Beach Road based on information provided by TCC; and
- No widening on Girven Road;

#### 4.2.2 Project Model Land Use Assumptions

Generally the TTM5.9 land use assumption had been used except for the Mangatawa Industrial development (MPBI) which was reduced in earlier model years (i.e. 2016 and 2026). Also the Bayfair shopping zone had been uplifted to reflect the district plan permissible levels.

##### a. MPBI

The following table compares land use assumptions for MPBI between the standard TTM5.9 and TTM5.9 MGI.

**Table 4-1 Mangatawa Industrial Development Land Use Assumption**

Versions	2016	2026	2031
Standard TTM5.9	35%	79%	100%
TTM5.9 MGI	6%	71%	100%

##### b. Bayfair Expansion

For future years, the Bayfair traffic generation in the TTM model have been checked and adjusted against the District Plan update.

## File Note

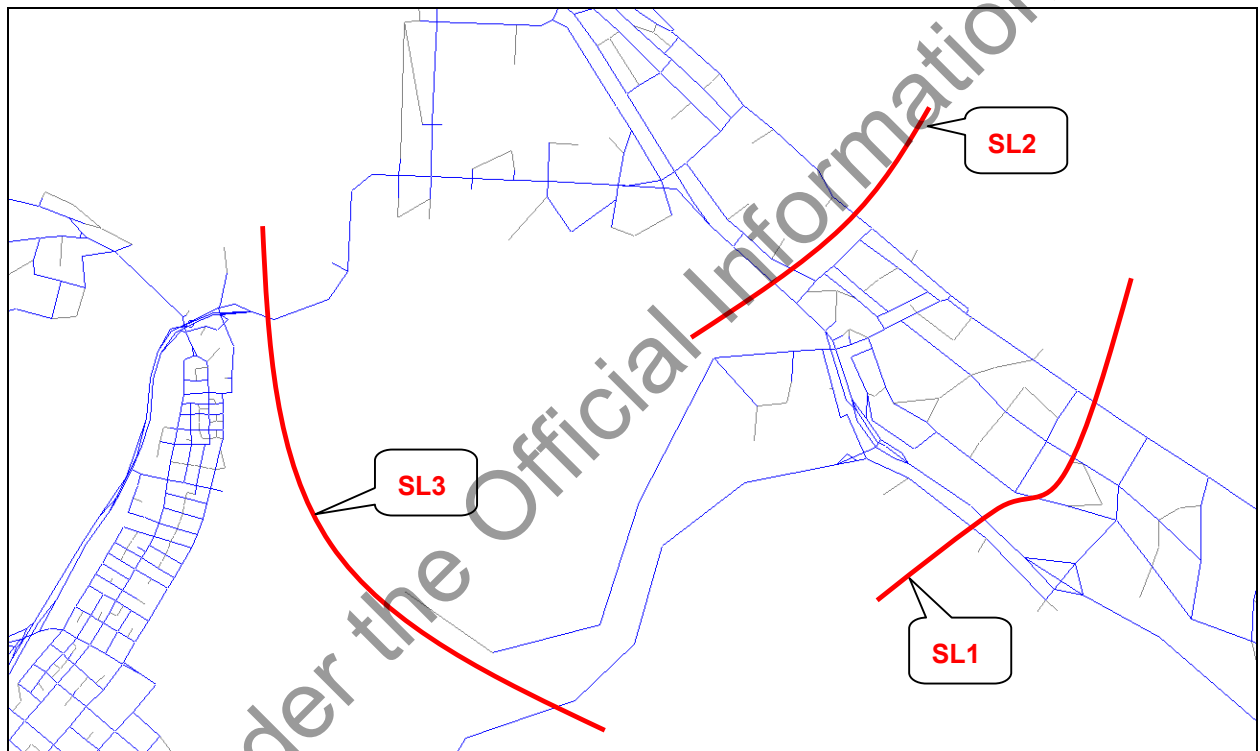
**Table 4-2 Trip Generations Assumptions for Bayfair Zone**

	Existing (2007)	Future (2016)	Future (2026)
Gross Leasable Floor Area	34,000	45,000	63,000
Vehicle Trip Rate (per 100 m <sup>2</sup> GLA)	6.50	5.94	5.26
PM Peak Hour Vehicle Trips	2,209	2,673	3,314

### 4.3 TTM Model Flow Predictions

The predicted daily traffic flows are extracted from the TTM in all future year models. **Figure 4-3** below shows three major screenline and ADT figures are provided in **Table 4-3 - Table 4-5**.

**Figure 4-2– Screenline Locations**



**Table 4-3 Predicted ADT for Screenline 1**

Locations	Year	DM	Opt 1	Opt 2	Opt 3	Opt 3c
Truman Lane	2016	300	300	300	1,300	1,100
	2026	3,000	2,400	2,400	2,400	1,900
	2031	4,200	3,500	3,500	3,000	2,500
TEL	2016	36,300	40,700	40,900	40,200	39,900
	2026	46,300	55,100	55,300	57,300	57,200
	2031	48,800	59,400	59,800	63,000	62,600
Gloucester Extension	2016	-	-	-	-	-
	2026	3,700	2,900	2,700	2,300	2,400
	2031	4,300	3,000	3,000	2,600	2,600

## File Note

Locations	Year	DM	Opt 1	Opt 2	Opt 3	Opt 3c
Grenada Extension	2016	-	-	-	-	-
	2026	2,400	1,800	1,800	1,800	1,800
	2031	2,700	2,000	2,000	2,000	2,000
Maranui St	2016	18,200	14,700	14,600	14,600	14,600
	2026	17,100	12,500	12,300	11,000	11,100
	2031	18,800	13,400	13,200	11,800	11,900
<b>Total Screenline 1</b>	<b>2016</b>	<b>54,800</b>	<b>55,700</b>	<b>55,800</b>	<b>56,100</b>	<b>55,600</b>
	<b>2026</b>	<b>72,500</b>	<b>74,700</b>	<b>74,500</b>	<b>74,800</b>	<b>74,400</b>
	<b>2031</b>	<b>78,800</b>	<b>81,300</b>	<b>81,500</b>	<b>82,400</b>	<b>81,600</b>

Table 4-4 Predicted ADT for Screenline 2

Locations	Year	DM	Opt 1	Opt 2	Opt 3	Opt 3c
Maunganui Rd	2016	51,200	55,200	55,300	54,700	54,700
	2026	52,800	63,300	63,700	63,200	63,500
	2031	53,800	66,500	66,500	66,100	66,500
Link Ave	2016	2,500	2,500	2,400	2,500	2,500
	2026	3,300	2,900	2,900	2,900	2,900
	2031	3,300	3,000	3,100	3,100	3,100
Ocean Beach Rd	2016	11,100	9,600	9,400	9,800	9,900
	2026	14,600	10,400	9,900	10,200	10,100
	2031	16,300	11,200	10,800	11,000	10,800
<b>Total Screenline 2</b>	<b>2016</b>	<b>64,800</b>	<b>67,300</b>	<b>67,100</b>	<b>67,000</b>	<b>67,100</b>
	<b>2026</b>	<b>70,700</b>	<b>76,600</b>	<b>76,500</b>	<b>76,300</b>	<b>76,500</b>
	<b>2031</b>	<b>73,400</b>	<b>80,700</b>	<b>80,400</b>	<b>80,200</b>	<b>80,400</b>

Table 4-5 Predicted ADT for Screenline 3

Locations	Year	DM	Opt 1	Opt 2	Opt 3	Opt 3c
Maungatapu Bridge	2016	25,900	25,000	25,100	25,000	24,300
	2026	32,900	31,000	31,300	32,300	31,000
	2031	33,900	32,600	32,800	34,200	33,000
Harbour Bridge	2016	52,000	53,300	53,200	53,200	53,500
	2026	56,800	59,800	59,700	59,400	59,900
	2031	59,900	62,900	62,900	62,600	62,900
<b>Total Screenline 3</b>	<b>2016</b>	<b>77,900</b>	<b>78,300</b>	<b>78,300</b>	<b>78,200</b>	<b>77,800</b>
	<b>2026</b>	<b>89,700</b>	<b>90,800</b>	<b>91,000</b>	<b>91,700</b>	<b>90,900</b>
	<b>2031</b>	<b>93,800</b>	<b>95,500</b>	<b>95,700</b>	<b>96,800</b>	<b>95,900</b>

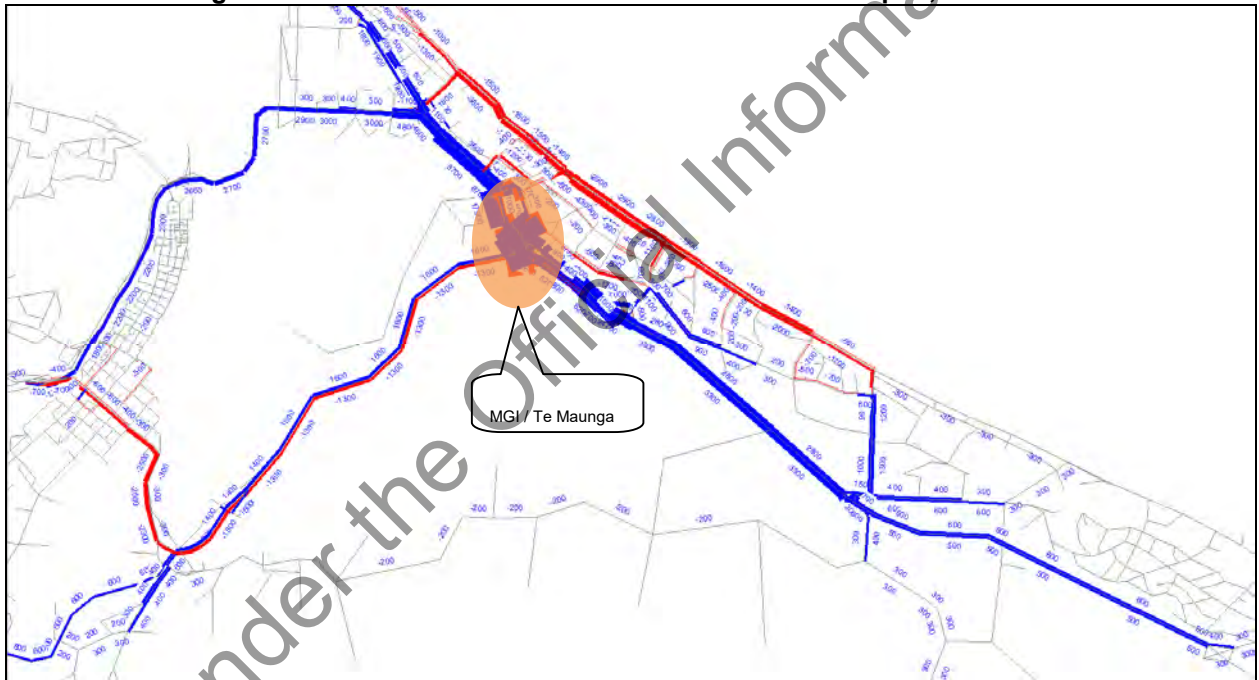
## File Note

Based on Screenline 1, annual average traffic growth is approximately 3% between 2016 and 2031. Options have higher traffic growth than DM as expected and this is the combination of induced traffic and re-distribution effects. Based on Option 3, additional 1,300 vehicles per day are predicted to travel across Screenline 1 in 2016. This is expected to increase to 3,600 in 2031. Due to the variable trip matrix modelling methodology, these effects caused by the project are reflected in the modelling and the economic evaluation.

Also it is noticed that provisions of Gloucester Road and Grenada Street connections from 2026 provide alternative routes in DM scenarios which relieve some pressure from the studied intersections. Growth on TEL is predicted to be 2.2% per annum between 2016 and 2031 if the project were not built (i.e. in DM scenarios). This growth would increase to 4.9% per annum in Option3. Hence this project reduces traffic significantly from local parallel roads and diverts them to TEL.

**Figure 4-3** below shows a daily level flow different plot between DM and Option 3 scenarios in 2031.

**Figure 4-3 ADT Flow Different Plots between DM and Opt 3, 2031**



## 5 Aimsun Corridor Model

The Aimsun base model was calibrated and validation to 2011/2012 traffic conditions. This process was documented in 'Maunganui Girven and Te Maunga Intersections - 2012 Microsimulation Model Calibration and Validation Report, Beca, March 2013'.

### 5.1 Aimsun Future Year Models

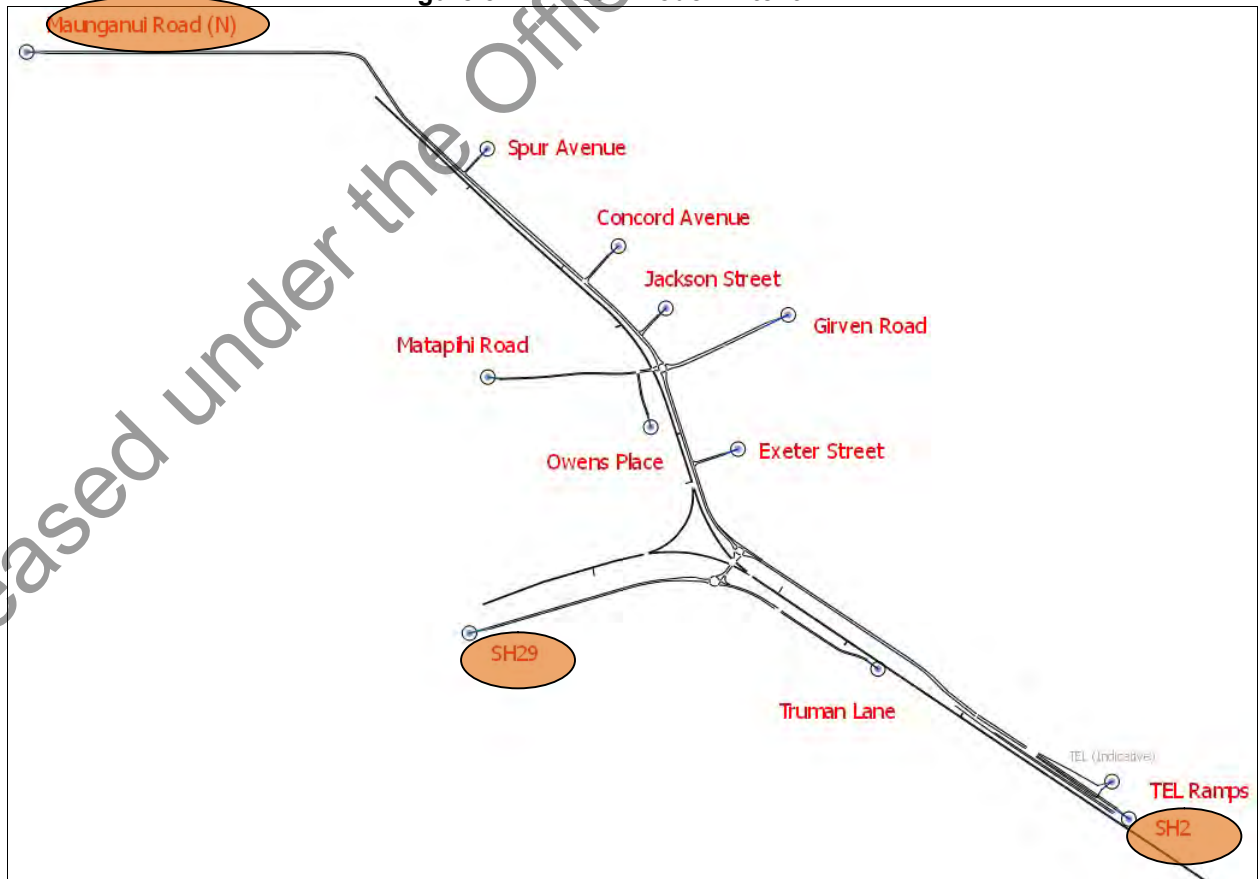
The Do Minimum future year model layout was updated to reflect the proposed layout at the Te Maunga roundabout after completion of TEL. Only the eastern link approach (from TEL) is updated by having an extra approach lane to the roundabout. Also the sections of SH2 east of the Te Maunga roundabout were widen to four lane sections.

Rail assumptions for future years are checked with Kiwirail and it has been advised that frequencies and train lengths will be increased over time. In the existing Aimsun base model, there is 1 train per hour at the MGI and 1 train per every two hour at Te Maunga. In 2031, these will be increased to 4 trains per hour at MGI and 2 trains per hour at Te Maunga. Intermediate frequencies were used in the 2016 and 2026 model years. Sensitivity tests around train frequencies were undertaken in the BCR assessment.

### 5.2 Aimsun Predicted Travel Time

OD travel time information from Aimsun model was extracted from all model years. Travel time routes are as below and **Figure 5-1** shows the extent of the Aimsun modelled area.

Figure 5-1 Aimsun Model Extent





## File Note

- Route 1 – Maunganui Road (North) to SH2/TEL (South);
- Route 2 - SH2/TEL (South) to Maunganui Road (North);
- Route 3 – SH29 (West) to SH2/TEL (South);
- Route 4 – SH2/TEL (South) to SH29 (West);
- Route 5 – SH29 (West) to Maunganui Road (North);
- Route 6 – Maunganui Road (North) to SH29 (West);

It should be noted that the Aimsun network covers some parts of Hewetts Road but there is no detailed network representation along this road (e.g. no intersection coding). This part of network was extended to capture full vehicle delay in the DM scenarios as queues extend back to Hewetts Road in some replications of future year models. Thus Aimsun OD travel times do not capture vehicle delay from intersections and weaving from this part of the model.

To be comparable with the DM, all option networks cover the same extent as in DM. The tables below show a summary of the predicted travel time from Aimsun.

**Table 5-1 Predicted Travel Time for Route 1 – Maunganui (North) to TEL (South)**

Peaks	Years	Travel Time (Minutes)					Travel Time Saved (Minutes)			
		DM	Opt1	Opt2	Opt3	Opt3c	Opt1	Opt2	Opt3	Opt3c
AM	2016	4.8	4.6	4.7	4.4	4.5	-0.1	-0.1	-0.4	-0.2
	2026	4.9	4.7	4.7	4.4	4.6	-0.2	-0.2	-0.5	-0.3
	2031	5.0	4.7	4.8	4.4	4.6	-0.3	-0.2	-0.6	-0.4
IP	2016	4.9	4.7	4.7	4.3	4.6	-0.3	-0.3	-0.6	-0.4
	2026	5.3	4.7	4.7	4.4	4.6	-0.6	-0.6	-0.9	-0.7
	2031	5.6	4.7	4.8	4.4	4.6	-0.9	-0.8	-1.2	-1.0
PM	2016	6.9	4.8	4.8	4.4	4.7	-2.1	-2.1	-2.4	-2.2
	2026	7.8	4.9	4.8	4.5	4.7	-2.9	-3.0	-3.3	-3.1
	2031	9.0	4.8	4.8	4.6	4.7	-4.2	-4.2	-4.4	-4.3

**Table 5-2 Predicted Travel Time for Route 2 –TEL (South) to Maunganui (North)**

Peaks	Years	Travel Time (Minutes)					Travel Time Saved (Minutes)			
		DM	Opt1	Opt2	Opt3	Opt3c	Opt1	Opt2	Opt3	Opt3c
AM	2016	7.8	4.7	4.7	4.4	4.6	-3.2	-3.2	-3.5	-3.2
	2026	7.8	4.8	4.7	4.4	4.7	-3.0	-3.0	-3.3	-3.1
	2031	7.8	4.8	4.8	4.5	4.7	-3.1	-3.1	-3.4	-3.1
IP	2016	5.4	4.6	4.6	4.3	4.5	-0.8	-0.8	-1.1	-0.9
	2026	6.3	4.6	4.6	4.3	4.6	-1.6	-1.6	-1.9	-1.7
	2031	6.6	4.7	4.7	4.4	4.6	-2.0	-2.0	-2.3	-2.0
PM	2016	5.6	4.6	4.6	4.3	4.5	-1.0	-1.0	-1.3	-1.1
	2026	6.2	4.8	4.6	4.3	4.6	-1.5	-1.6	-1.9	-1.7
	2031	7.1	4.9	4.7	4.4	4.6	-2.2	-2.4	-2.7	-2.5

## File Note

**Table 5-3 Predicted Travel Time for Route 3 – SH29 (West) to TEL (South)**

Peaks	Years	Travel Time (Minutes)					Travel Time Saved (Minutes)			
		DM	Opt1	Opt2	Opt3	Opt3c	Opt1	Opt2	Opt3	Opt3c
AM	2016	3.2	2.8	2.7	2.4	2.6	-0.4	-0.5	-0.8	-0.6
	2026	3.3	3.1	3.3	2.5	2.7	-0.3	-0.1	-0.8	-0.6
	2031	3.5	3.4	3.2	2.5	2.8	-0.2	-0.3	-1.0	-0.7
IP	2016	2.5	2.8	2.7	2.4	2.6	0.3	0.2	-0.1	0.1
	2026	2.8	3.4	3.3	2.4	2.6	0.6	0.5	-0.4	-0.2
	2031	2.9	3.1	3.8	2.4	2.7	0.2	0.8	-0.5	-0.2
PM	2016	2.7	2.9	3.0	2.5	2.9	0.2	0.3	-0.2	0.2
	2026	3.9	3.9	4.1	2.6	3.2	0.1	0.2	-1.2	-0.6
	2031	5.3	4.3	4.4	2.7	3.1	-1.0	-0.9	-2.7	-2.2

**Table 5-4 Predicted Travel Time for Route 4 – TEL (South) to SH29 (West)**

Peaks	Years	Travel Time (Minutes)					Travel Time Saved (Minutes)			
		DM	Opt1	Opt2	Opt3	Opt3c	Opt1	Opt2	Opt3	Opt3c
AM	2016	2.5	2.6	2.5	2.7	3.0	0.0	0.0	0.2	0.4
	2026	3.0	2.8	2.7	2.7	2.9	-0.2	-0.2	-0.3	0.0
	2031	3.1	3.1	2.8	2.7	2.9	0.0	-0.2	-0.3	-0.1
IP	2016	2.5	2.5	2.5	2.7	2.9	0.1	0.0	0.2	0.4
	2026	2.8	2.7	2.6	2.8	3.0	-0.1	-0.1	0.0	0.2
	2031	2.9	2.8	2.7	2.9	2.9	-0.1	-0.2	0.0	0.0
PM	2016	2.5	3.1	2.5	2.6	2.8	0.5	0.0	0.1	0.3
	2026	3.1	4.1	2.8	2.7	2.9	1.0	-0.3	-0.3	-0.2
	2031	3.3	4.4	3.0	2.8	2.9	1.1	-0.3	-0.5	-0.4

**Table 5-5 Predicted Travel Time for Route 5 – SH29 (West) to Maunganui Road (North)**

Peaks	Years	Travel Time (Minutes)					Travel Time Saved (Minutes)			
		DM	Opt1	Opt2	Opt3	Opt3c	Opt1	Opt2	Opt3	Opt3c
AM	2016	8.3	5.1	5.0	4.7	4.8	-3.2	-3.3	-3.6	-3.5
	2026	7.6	5.4	5.6	4.7	4.9	-2.2	-2.0	-2.9	-2.7
	2031	7.8	5.7	5.6	4.7	4.9	-2.1	-2.2	-3.1	-2.9
IP	2016	4.7	4.8	4.8	4.7	4.7	0.2	0.1	0.0	0.1
	2026	5.7	5.4	5.3	4.4	4.8	-0.4	-0.4	-1.3	-0.9
	2031	6.1	5.2	5.8	4.6	4.8	-0.8	-0.3	-1.5	-1.2
PM	2016	5.0	5.1	5.1	4.5	4.9	0.0	0.1	-0.5	-0.1
	2026	6.5	6.1	6.4	5.1	5.1	-0.4	-0.2	-1.5	-1.4
	2031	8.5	7.0	6.9	6.1	5.4	-1.5	-1.6	-2.4	-3.1

## File Note

**Table 5-6 Predicted Travel Time for Route 6 – Maunganui Road (North) to SH29 (West)**

Peaks	Years	Travel Time (Minutes)					Travel Time Saved (Minutes)			
		DM	Opt1	Opt2	Opt3	Opt3c	Opt1	Opt2	Opt3	Opt3c
AM	2016	4.3	5.2	5.1	5.3	5.5	0.9	0.9	1.1	1.2
	2026	4.5	5.5	5.3	5.4	5.6	1.0	0.8	1.0	1.1
	2031	4.6	5.8	6.3	5.3	5.4	1.1	1.7	0.6	0.8
IP	2016	4.4	5.1	5.1	5.1	5.5	0.7	0.8	0.7	1.2
	2026	4.9	5.3	5.4	5.2	5.6	0.4	0.5	0.3	0.7
	2031	5.2	5.5	5.4	5.4	5.6	0.3	0.2	0.2	0.4
PM	2016	6.4	5.5	5.7	5.4	5.7	-0.9	-0.7	-1.0	-0.7
	2026	7.5	6.4	6.4	5.6	5.8	-1.1	-1.1	-1.9	-1.7
	2031	8.9	6.5	6.7	5.9	6.2	-2.4	-2.2	-3.0	-2.7

### 5.3 Iteration between the TTM and Aimsun

As discussed in the methodology section, an iterative process was undertaken between the TTM and Aimsun models. This process included comparison of delays between the two models on all approaches at the MGI and Te Maunga intersections. Linsig models were also used in assisting to set up initial signal timing for Aimsun.

The process involved adjusting the intersection capacities in the TTM, not a direct insertion of Aimsun delay. Overwriting of the TTM junction modelling procedure is not preferred and hence the reflection of Aimsun delay in the TTM model is approximation only. Comparison of Aimsun and TTM delays are provided in **Appendix B**.

### 5.4 Manual Matrix Adjustment in Aimsun

Manual matrix adjustments undertaken in the Aimsun base year model were applied to all future year cordon matrices from the TTM model.

## 6 Economic Evaluation Methodology

The economic evaluation was undertaken in accordance with the EEM.

### 6.1 Framework and Assumptions

The key aspects of the economic evaluation include:

- A Variable Trip Matrix (VTM) modelling methodology whereby changes in travel behaviour caused by the project are reflected in the modelling and economic evaluation;
- A base date of costs and benefits of 1 July 2013;
- A time zero date, for commitment to funding of 1 July 2013;
- A 40-year analysis period commencing at the start of major construction;
- Assessment of base and congested (CRV) travel time benefits;
- Estimation of reliability benefit as 8% of base travel time benefit;
- Assessment of base running, fuel at idle and congestion-related vehicle operating costs;
- Assessment of crash saving benefits;
- Wider Economic Benefits;
- A 6% discount rate; and
- Benefits assessed from the TTM AM, inter and PM peaks;
- Modelled years of 2016, 2026 and 2031 with interpolation of intermediate years. Benefits beyond 2031 were extrapolated using the 2026 and 2031 values but the benefit growths are gradually capped after 2041.

### 6.2 Update Factors for Benefits

The factors for updating the benefit values to July 2012 values are provided in **Table 6-1**.

**Table 6-1 Benefit Update Factors**

Benefit	Base Date for EEM Values	Factor to July 2013
Travel time cost savings	July 2002	1.40
Vehicle operating cost savings	July 2008	1.06
Crash cost savings	July 2006	1.22

### 6.3 Consumer Surplus Benefit Calculations

The consumer surplus calculations in Appendix A11 of the EEM have been used to calculate benefits as follows:

$$\text{Benefit} = (R_{DM}T_{DM} - R_{OPT}T_{OPT}) + \frac{1}{2}(U_{DM} + U_{OPT}) \times (T_{OPT} - T_{DM})$$

Where  $T_{DM}$  = Number of trips in the Do Minimum

$T_{OPT}$  = Number of trips in the Option

$U_{DM}$  = User cost of travel in the Do Minimum

$U_{OPT}$  = User cost of travel in the Option

$R_{DM}$  = Resource cost of travel in the Do Minimum

## File Note

$R_{OPT}$  = Resource cost of travel in the Option

Matrix-based calculations were applied to determine the average cost for each origin-destination pair. The total project benefit is then given by the sum of the matrix total for travel time and vehicle operating costs.

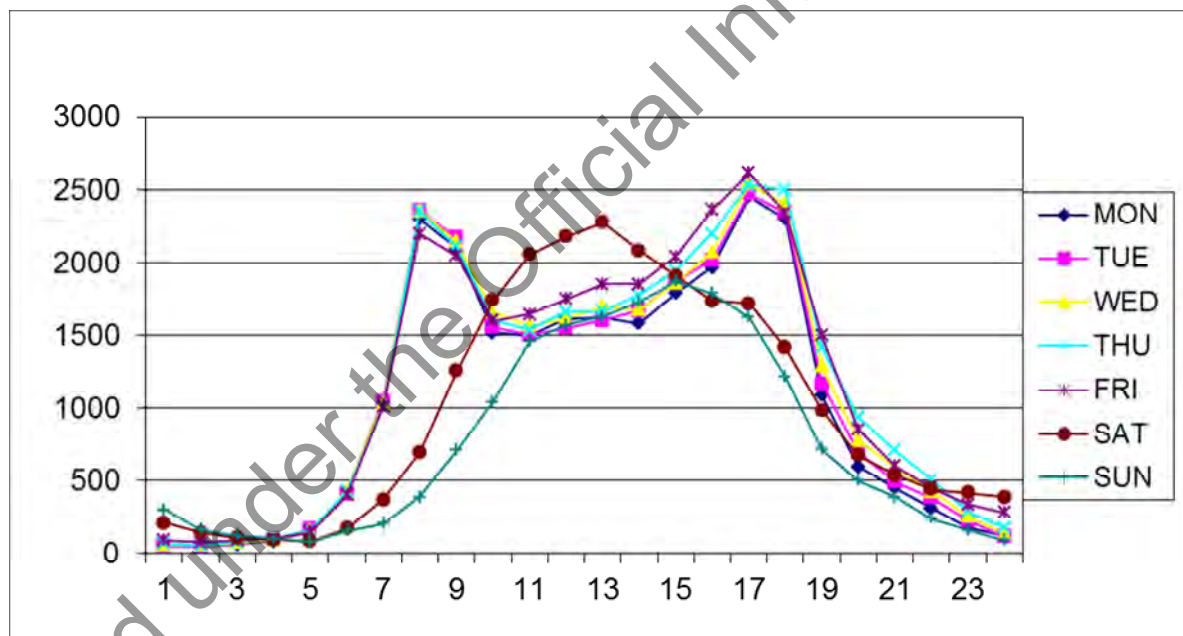
The definition of User and Resource costs are described for each cost item in the subsequent chapters.

### 6.4 Annualisation from Modelled Periods

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 respective 2-hour weekday periods 7:00-9:00am and 4:00-6:00pm. Generally the inter-peak model was used to represent all other periods. In using the inter-peak models to reflect other periods, both the relative flow rates and the non-linear relationship between flow and delays were considered.

An average weekday and weekend hourly flow profiles was created from combination of SH2 counts at Spur Avenue and Exeter Street and SH29 at the Maungatapu Bridge. The combined flow profiles are shown in **Figure 6-1**.

**Figure 6-1 Combined Flow Profiles**



From the graph, the weekday flow profiles are consistent across five days. The pm peak is longer than the modelled period (i.e. 4:00-6:00pm). Due to proximity to the Bayfair shopping centre, Saturday profile is peaked at mid-day and approaching a normal evening peak level. Hence the pm peak model was used to represent the inter-peak (3:00-4:00pm) and Saturday peak (11:00am-1:00pm) with discounting by both the relative flow rates and the non-linear relationship between flow and delays (i.e. similar to the representation of inter-peak model for other periods).

The resulting annualisation factors are summarised in **Table 6-2**.

## File Note

Table 6-2 Annualisation Factors

Period	Model Used	Equivalent Hours per day	Days per year	Factor
Weekday AM	AM	2	245	490
Weekday PM	PM	2.84	245	694.9
Weekday Interpeak	IP	5.75	245	1408.0
Weekday evening/night	IP	2.85	245	699.0
Saturday	PM	1.77	60	106.4
Saturday	IP	11.04	60	662.4
Sunday	IP	10.13	60	607.8

The above factors were applied to the respective model outputs to represent annual vehicle operating costs. For the travel time costs, given that the base time values are different between off-peak and weekends than they are during the weekday inter-peak periods, these differences were considered and a different set of annualisation factors were applied.

### 6.5 Benefits Calculations

The benefits assessed were:

- Travel Time Costs;
- Vehicle Operating Costs;
- Crash Costs;
- Carbon Dioxide Costs; and
- Agglomeration and other WEBs benefits.

#### 6.5.1 Travel Time Costs

Three components of travel time were evaluated:

- Base travel time;
- Congested travel time (defined as 'CRV' in the EEM); and
- Trip reliability.

The base travel time simply applies the Value of Travel Time Saving (VTTS) unit value to the total travel times, where the CRV value is only applied on sections of road deemed congested.

In the evaluation, CRV benefits can only be obtained on sections of road where congestion is expected. CRV benefits were calculated in accordance with the EEM as follows:

- Urban roads in the model used the methodology for urban roads, whereby CRV only applies to links with a Volume/Capacity (V/C) ratio greater than 70%; and
- Rural roads used the appropriate method based on Percent Time Delayed (PTD). The PTD was estimated from the V/C ratios using Table A4.4 of the EEM, assuming generally Rolling terrain, and typically 50% of overtaking sight distance less than 400m.

## File Note

The EEM procedures for determining trip reliability are complex, and require numerous steps, calculations and model runs. From previous experience from other comparable projects, trip time reliability benefits range from 5% to 10% of base travel time saving benefits. Some examples are described below:

- SH20 Extension Western Ring Route Project (EMME): Trip reliability was estimated by EEM full procedure as **8.8%** of base travel time saving benefits;
- Tauranga Eastern Link Project (Voyager): Trip reliability was estimated by EEM full procedure as **6%** of base travel time saving benefits; and
- SH20 A Kirkbride Interchange Project (Saturn): Trip reliability was estimated by an alternative procedure as **10%** of base travel time saving benefits;

For this study, trip reliability benefit was assumed as 8% of the base travel time benefit.

### Values of Travel Time Savings (VTTS)

In undertaking the consumer surplus benefit calculations required when a variable trip matrix approach is used, two cost items are required, namely Resource costs (costs to the national economic) and User costs (costs perceived by the users). Also, the local willingness to pay/VTTS values (from the TEL study) was used rather than use of the National Equity values provided in the EEM.

This means that there are two issues to consider, namely:

- the difference between Local and National Equity values (required to remain consistent with the national equity principles applied to all such transport evaluations)
- The difference between perceived User values and Resource values (both values are required in the VTM calculations)

The assessment of Local User, Resource and National Equity values of time are outlined below.

### Local User and Resource VTTS for the Project

Stated Preference (SP) surveys were undertaken for the TEL project on traffic passing through that corridor in late 2007 by Professor Hensher from Sydney University in late 2007, for the purposes of providing more detailed potential toll road forecasts.

The key aspects of those surveys are as follows:

- Respondents were identified from surveys of vehicles passing through the corridor;
- Three segments of users were surveyed, namely:
  - Commuting
  - Non-commuting
  - Employers Business
- Marginal-productivity methods were used to assess Values of Travel Time Savings (VTTS) for light and heavy commercial vehicles, as well as for Employers Business trips. These values were used directly for commercial vehicles in the models;
- For the Employers Business segment, the results of the SP survey were combined with those from the marginal-productivity method to estimate a VTTS applicable to toll forecasting; and
- The surveys included attributes on free-flow and 'congested' travel time, vehicle operating costs, trip time reliability and tolls.

## File Note

No data is available on local resource values, so the same ratio between User and Resource suggested in Table A11.1 of the EEM was used. This indicates that User costs are the same as Resource costs for working trips, but User costs are 15% higher than resource costs for non-working trips.

These SP values were used as the Local User values, with Resource values factored from these as indicated in **Table 6-3**. The weighted-average Local User value was assessed as **\$15.79**, while the average Local Resource value calculated to be **\$14.13**.

**Table 6-3 - Allocation of Local User VTTS (\$/hr, 2007)**

	% of Total daily Trips	Local User VTTS (Survey)	User/Resource Factor	Local Resource VTTS
Home based work	14%	\$14.25	1.15	\$12.39
Home based shopping	11%	\$9.70	1.15	\$8.43
Home based Other	28%	\$9.70	1.15	\$8.43
Non Home based other	26%	\$9.70	1.15	\$8.43
Non Home based Employers Business	16%	\$38.95	1.0	\$38.95
Medium/Heavy Commercial vehicles	5%	\$22.40	1.0	\$22.40
<b>Weighted-Average VoT</b>	<b>100%</b>	<b>\$15.79</b>		<b>\$14.13</b>

CRV values of time were not identified in the Stated Preference surveys, and subsequently values were derived directly from those in the EEM.

### National Equity Value and Adjustments

As the project is located at the end of Tauranga Eastern Link (TEL), it will mostly serve rural-type long distance and traffic; however some proportion of commuter (Urban nature) traffic from the local area will also use the project. Thus, to calculate the National Equity Value, it was assumed that 65% of the typical Rural Strategic (RS) value and 35% of the typical Urban Arterial (UA) values quoted in the EEM was used. The same proportion of RS and UA values was used in the economic evaluation of TEL Project.

This assumption gives a year 2007, all-purpose National Equity value of **\$23.72**. The benefits calculated using the Local VoT were therefore adjusted by the ratio of the average National Equity value to the average Local Value ( $\$23.72/\$14.13 = 1.68$ ).

The above values were updated from \$2007 to \$2013 by the relative EEM update factors (1.4/1.14=1.23).

### 6.5.2 Vehicle Operating Costs

Three components of vehicle operating costs (VOC) were evaluated:

- Base running costs, as a function of speed and vehicle type;
- Fuel costs at intersections; and
- Additional running costs due to road congestion.



## File Note

Base running costs were calculated on each link based on the average travel speed and vehicle type. These were based on the regression formulas in the EEM and assuming average 0% gradients:

$$VOC_B = a + c.\ln(S) + e.[\ln(S)]^2 + h.[\ln(S)]^3$$

Where  $VOC_B$  = Base running cost in cents/km

S = speed in km/hr

a,c,e,h = coefficients as per **Table 6-4** below.

Coefficients for light vehicles were estimated as a weighted average between those provided for passenger cars and those for light commercial vehicles. Similarly, coefficients for medium (MCV)/heavy commercial vehicles (HCV) were estimated as a weighted average of MCV, HCV-I and HCV-II coefficients.

**Table 6-4 - Coefficients for Base VOC Models**

Coefficient	Light Vehicles	MCV / HCV
a	23.5643	-106.424
c	46.0272	273.5127
e	-22.2258	-100.266
h	2.6959	11.2275

Fuel costs at idle were applied to all intersections that experience delay at a rate of 2.98c/min for light vehicles and 5.95c/min for MCV/HCV.

The additional VOC running costs related to congestion were applied by road type, in accordance with Table A5.21 of the EEM as follows:

$$VOC_{cong} = a + b.\ln(VCR) + c.[\ln(VCR)]^2 + d.[\ln(VCR)]^3 + e.[\ln(VCR)]^4 + f.[\ln(VCR)]^5$$

Where  $VOC_{cong}$  = additional VOC due to congestion in cents/km

VCR = Volume to Capacity Ratio, and

a - f. = coefficients as indicated in **Table 6-5** below.

**Table 6-5 - Coefficients for Congested VOC Models**

Coefficient	Urban	Rural 2-Lane Highway		Motorway
		Other	Strategic	
a	9.216	6.025	6.948	6.392
b	3.159	3.07	1.908	-0.081
c	-101.456	-13.277	-13.172	-219.002
d	-237.202	-1.806	13.97	-619.356
e	-202.631	18.506	42.589	-300.941
f	-60.838	9.948	20.23	327.808

## File Note

### 6.5.3 Vehicle Emission Benefits

As indicated in the EEM, carbon dioxide (CO<sub>2</sub>) benefits have been assessed as 4% of vehicle operating benefits.

### 6.5.4 Crash Analysis

The crash costs for the following sites have been extracted from NZ Transport Agency's Crash Analysis System (CAS) database for the last five year period between 2008 and 2012:

- SH2/Girven Road Intersection
- Matapihi Road/Owens Place Intersection
- SH2/SH29 Intersection
- SH29/Truman Lane Intersection
- SH2 section between Girven Road SH29

The crash costs were derived using the Economic Evaluation Manual (EEM) software using the Full Accident Procedure. For the Do Minimum crash costs, the Accident by Accident Analysis method was used. For the purpose of this analysis, it has been assumed that the 2016 crash costs would be similar to the current crash costs, while the crash costs in 2026 have been derived through factoring the changes in the predicted crash rate between 2016 and 2026. In other words, if an increase in traffic volume in 2026 for a particular site results in 20% increase in predicted crash rate from 2016, then a 20% increase in crash costs would be assumed for 2026.

For the crash costs for Options 1, 2 and 3, a combination of Accident by Accident Analysis and Accident Rate Analysis methods were used. For the sites with fundamental changes, the Accident Rate analysis was used, whereas for non-fundamental changes, the crash costs have been calculated by factoring the changes in predicted crash rates between the option and the Do Minimum. For the purpose of accounting for the crash savings associated with the various railway crossing options, it was assumed that the SH2 section would have a 20% and 10% higher predicted crash costs for Option 1 and Option 2 respectively.

Based on the above approach, the crash cost savings for the options are as summarised in **Table 6-6**.

**Table 6-6 Crash Cost Saving, 2006\$**

Options	2016	2026
Option 1	887,726	673,127
Option 2	899,639	705,501
Option 3	994,256	955,957
Option 3c	855,009	929,594

## 6.6 Capital and Maintenance Costs

### 6.6.1 Capital Costs

The capital cost estimates for the various options are shown in **Table 6-7**. No cost escalation is applied in these figures as per the EEM.

## File Note

Table 6-7 Capital Costs, \$million

Item	Opt 1	Opt 2	Opt 3	Opt 3c
Land Purchase	18.5	5.8	15.1	14.2
Land Disposal	-15.0	-6.3	-9.1	-9.1
Design & documentation	1.5	2.2	2.6	2.6
Construction & supervision	70.8	78.6	104.8	96.9
<b>Total</b>	<b>75.9</b>	<b>80.4</b>	<b>113.3</b>	<b>104.6</b>

### 6.6.2 Maintenance and Operating Cost

For this evaluation, the following maintenance costs were assumed and they are tabulated in **Table 6-8**.

Table 6-8 Maintenance and Operation Costs, \$

Type	DM	Opt 1	Opt 2	Opt 3	Opt 3c
Annual Maintenance	20,000	20,000	20,000	20,000	20,000
Periodic Maintenance <sup>1</sup>	1,913,250	1,941,400	1,928,000	2,502,000	2,502,000

### 6.6.3 Changes in Revenue on TEL

As the project is located at the end of tolled road TEL, it is expected to increase traffic and hence revenue on TEL. However the increase in traffic volume on TEL at the toll gate location (i.e. east of Papamoa East Interchange) is predicted to be some 200 veh/day in 2031. Hence the increase in toll revenue is considered not significant and excluded in this BCR analysis.

## 6.7 Agglomeration and Wider Economic Benefits

The methodology and assumptions to calculate these benefits are provided in the **Appendix C**.

<sup>1</sup> Periodic maintenance is assumed to take place every 10 years.

## File Note

### 7 Economic Evaluation Results

The evaluation results are summarised in **Table 7-1**, and the detailed calculations and worksheets are provided in **Appendix D**.

**Table 7-1 Economic Evaluation Results**

Items	Option 1	Option 2	Option 3	Option 3c
Capital Cost, \$M	75.9	80.4	113.3	104.6
Discounted Net Capital Cost, \$M NPV	65.8	68.5	97.3	89.9
Discounted Net Maintenance and Operation Costs, \$M NPV	0.0	0.0	0.5	0.5
<b>Total Net Discounted Costs</b>	<b>65.9</b>	<b>68.5</b>	<b>97.7</b>	<b>90.4</b>
Base Travel Time Benefits	153.4	166.8	181.4	184.4
CRV Time benefits	9.7	12.3	17.7	21.2
Trip Reliability	12.3	13.3	14.5	14.8
Vehicle Operating Cost Benefits	-10.6	-12.7	-15.8	-19.9
Crash Benefits	7.1	7.5	11.0	11.1
CO <sub>2</sub> benefits	-0.4	-0.5	-0.6	-0.8
<b>Total Benefits, \$M NPV</b>	<b>171.4</b>	<b>186.8</b>	<b>208.1</b>	<b>210.8</b>
<b>National BCR</b>	<b>2.6</b>	<b>2.7</b>	<b>2.1</b>	<b>2.3</b>
Agglomeration Benefits, \$M NPV	8.0	8.7	9.5	9.6
<b>Total Benefits with Agglomeration, \$M NPV</b>	<b>179.4</b>	<b>195.5</b>	<b>217.6</b>	<b>220.4</b>
Other WEB Benefits, \$M NPV	26.5	28.8	31.3	31.8
<b>Total Benefits with Agglomeration+ WEB, \$M NPV</b>	<b>205.9</b>	<b>224.3</b>	<b>248.9</b>	<b>252.2</b>
<b>National BCR with Agglomeration</b>	<b>2.7</b>	<b>2.9</b>	<b>2.2</b>	<b>2.4</b>
<b>National BCR with Agglomeration+ WEB</b>	<b>3.1</b>	<b>3.3</b>	<b>2.5</b>	<b>2.8</b>

From the table above, Option 2 has the highest BCR. All BCRs are between 2 and 4, and fit into a Medium economic efficiency profile.

#### 7.1 Incremental BCR

An incremental analysis was undertaken to identify the most economically optimal option. There is some guidance in the EEM regarding the target incremental BCR. It recommends minimum incremental BCR of 1.0 (refer to EEM1 A12.4). For a BCR of preferred option greater than 2 but less than 4, it suggests an incremental BCR of 2.0. The EEM also suggests that “*where the*

## File Note

selected target incremental ratio differs to the guidance, a detailed explanation supporting the chosen value must be provided'.

In this study, as per the EEM's guidance, a target incremental BCR of 2.0 was used. With the considerations of other strategic and non-economic objectives, the target incremental BCR of 1.0 was also considered.

These tests were undertaken without agglomeration and WEB benefit and the results are provided in **Table 7-2**.

**Table 7-2 Incremental Analysis Results (without agglomeration and WEBs)**

Tests	Options	Incremental Benefits (with agglomeration)	Incremental Costs	Incremental BCRs	Preferred Option
1	Opt2 Vs Opt1	15.4	2.7	5.8	Opt2
2	Opt3c Vs Opt2	24.0	21.8	1.1	Opt2/Opt3c
3.1	Opt3 Vs Opt2	21.3	29.2	0.7	Opt2
3.2	Opt3 Vs Opt3c	-2.6	7.4	-0.4	Opt3c

From a pure economic perspective, Option 2 would be the preferred option if the target incremental BCR is 2.0. But Option 3c would be preferred if the target incremental BCR is 1.0.

## 7.2 Sensitivity Tests

### 7.2.1 Discount Rate Sensitivity Test

Sensitivity tests on reducing the discount rates to 6% and 4% were undertaken and the results (without agglomeration benefits) are provided in **Table 7-3**.

**Table 7-3 - Discount Rate Sensitivity Test Results (without agglomeration and WEBs)**

Tests	Option1	Option2	Option3	Option3c
Base Case (6%)	2.6	2.7	2.1	2.3
8%	1.9	2.0	1.5	1.7
4%	3.8	3.9	3.1	3.4

**Table 7-4 - Discount Rate Sensitivity Test Results (with agglomeration and WEBs)**

Tests	Option1	Option2	Option3	Option3c
Base Case (6%)	3.1	3.3	2.5	2.8
8%	2.3	2.4	1.9	2.0
4%	4.5	4.6	3.6	4.0

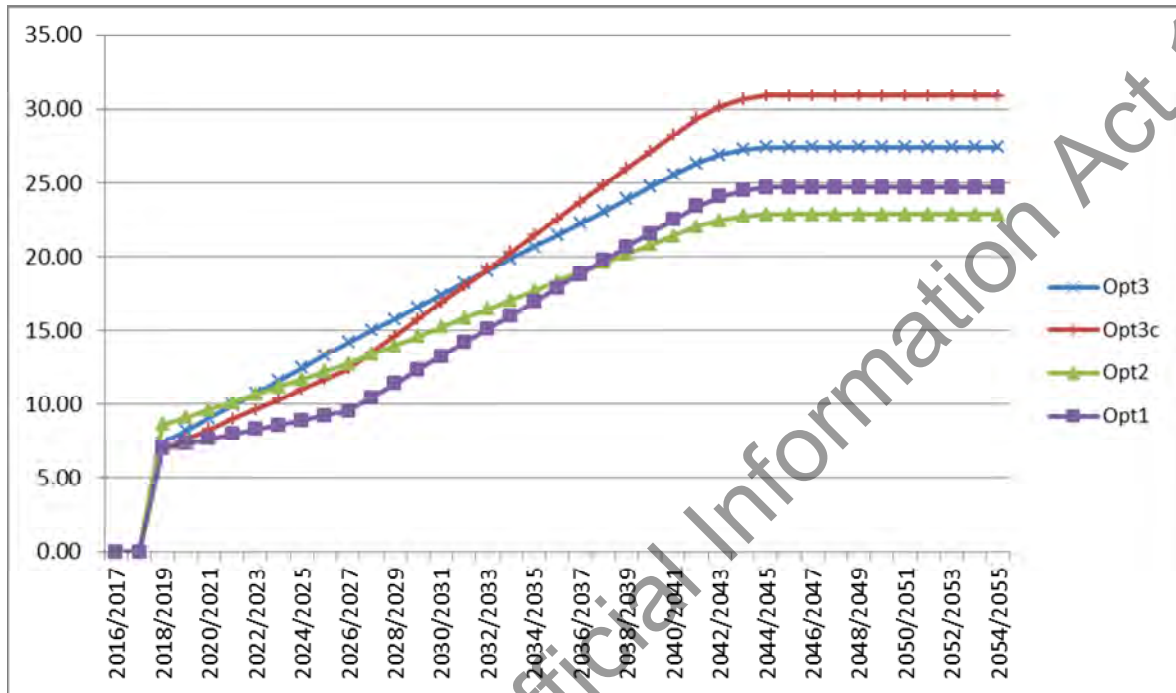
As expected, using lower discount rates increase BCRs. This is because the lower discount rates have a greater effect on longer-term benefits than on the costs which are at the start of the evaluation period and hence less sensitive to discount rates.

## File Note

### 7.2.2 Benefit Extrapolation Process

Modelling was undertaken in year 2016, 2026 and 2031. For the 40 year analysis period, the benefits beyond 2031 were extrapolated using the 2026 and 2031 values but the benefit growth was gradually capped after 2041. **Figure 7-1** below shows the benefits streams for each option.

**Figure 7-1 Benefit Streams**



Sensitivity tests on a straight line extrapolation (i.e. no capping) and a capping after 2031 were undertaken and the results are tabulated in the table below.

**Table 7-5 - Extrapolation Sensitivity Test Results (without agglomeration and WEBs)**

Tests	Option1	Option2	Option3	Option3c
Base Case (caped after 2041)	2.6	2.7	2.1	2.3
No capping	2.7	2.8	2.2	2.4
Capping after 2031	2.1	2.4	1.8	1.9

**Table 7-6 - Extrapolation Sensitivity Test Results (with agglomeration and WEBs)**

Tests	Option1	Option2	Option3	Option3c
Base Case (caped after 2041)	3.1	3.3	2.5	2.8
No capping	3.2	3.3	2.6	2.9
Capping after 2031	2.6	3.0	2.3	2.3

## File Note

From the above figure, Option 3c benefit is similar to Option 3 in 2016 and 2031, but less in 2026. As the extrapolation process used the 2026 and 2031 benefits, the Option 3c benefit stream curve is steeper and hence Option 3c benefits over 40 years are marginally higher than Option 3. Two sensitivity tests on the extrapolation process for Option 3c were undertaken as below:

- Test 1: Using only the Option 3c 2016 and 2031 benefits only to forecast 40 year benefits
- Test 2: Adopting the Option 3 growth rate beyond 2031 for Option 3c.

**Table 7-7 – Option 3c Extrapolation Sensitivity Test Results (without agglomeration and WEBs)**

Tests	Opt 3c Benefits	Option 3c BCR
Base Case	210.8	2.3
Test 1	206.5	2.3
Test 2	199.9	2.2

### 7.2.3 Value of Travel Time (VTTS)

As the project is located at the end of Tauranga Eastern Link (TEL), it will mostly serve rural-type long distance and traffic; however some proportion of commuter (Urban nature) traffic from the local area will also use the project. Hence this economic analysis used combination of 65% Rural and 35% Urban VTTS.

Two sensitivity tests of VTTS were undertaken as below:

- Test 1 - 100% Rural VTTS
- Test 2 - A combination of 35% Rural and 65% Urban.

**Table 7-8 – VTTS Sensitivity Test Results (without agglomeration and WEBs)**

Tests	Option1	Option2	Option3	Option3c
Base Case (65% Rural+35% Urban)	2.6	2.7	2.1	2.3
Test1 (100% Rural)	2.9	3.0	2.4	2.6
Test2 (35% Rural+65% Urban)	2.3	2.5	1.9	2.1

**Table 7-9 – VTTS Sensitivity Test Results (with agglomeration and WEBs)**

Tests	Option1	Option2	Option3	Option3c
Base Case (65% Rural+35% Urban)	3.1	3.3	2.5	2.8
Test1 (100% Rural)	3.4	3.6	2.8	3.1
Test2 (35% Rural+65% Urban)	2.9	3.0	2.3	2.5

### 7.2.4 Fixed Trip Matrix (FTM)

The methodology adopted for this study was to use Variable Trip Matrix (VTM) approach where benefits are assessed by using both Option and Do Minimum matrices.

## File Note

Sensitivity tests were undertaken for Option 3c using a Fixed Trip Matrix (FTM) method in which Do Minimum demand matrix was used to assess benefits in year 2031. The sensitivity test results are tabulated in **Table 7-10**. Note that the FTM BCR was estimated using the Option 3c benefit profile with the 2031 test result.

**Table 7-10 Option 3c Sensitivity Test Results using FTM method (without agglomeration and WEBs)**

Item	2031 Total Benefits	% Changes to Base	BCR
Base Case (VTM)	210.8	-	2.3
FTM using DM matrices	206.8	-2%	2.3

### 7.2.5 Train Frequency

Rail assumptions for future years had been checked with Kiwirail and it had been advised that frequencies and train lengths would be increased over time. In the existing Aimsun base model, there is 1 train per hour at the MGI and 1 train per every two hour at Te Maunga. In 2031, these will be increased to 4 trains per hour at MGI and 2 trains per hour at Te Maunga. Intermediate frequencies were used in the 2016 and 2026 model scenarios.

As the study area is adjacent to railway crossings, frequencies of train in the model have direct effects on the operations of the intersections. These effects may vary between scenarios as some options have railway realignment and grade separation.

**Table 7-11** summarises rail frequency, train length and estimated barrier time for the Base, Future years and sensitivity tests.

**Table 7-11 – Train Related Parameters**

Scenarios	Trains at MGI (per hour)	Trains at Te Maunga (per hour)	Train Length (m)	Estimated Barrier Time (minutes)
2012 Base	1	0.5	864	2.6
2031 Base Case	4	2	1,008	3.0
2031 "High"	6	3		
2031 "Low"	2	1		

Two sensitivity tests have been undertaken as "High" and "Low" train scenarios. Note that these tests were undertaken only in year 2031 for DM, Option1 and Option2 scenarios. Option 3 and Option 3c are not likely to be affected by train frequency changes as the railway line is relocated away from the MGI and grade-separated at Te Maunga in both options (however the BCRs have been recalculated due to changes in DM travel cost). The benefits for all options over the 40-year analysis period have been estimated using the respective benefit profiles of the options.



## File Note

Table 7-12 – Train Frequency Sensitivity Test Results (without agglomeration and WEBs)

Tests	Option1	Option2	Option3	Option3c
Base Case	2.6	2.7	2.1	2.3
High	2.6	3.2	2.6	2.7
Low	2.1	2.2	1.6	1.7

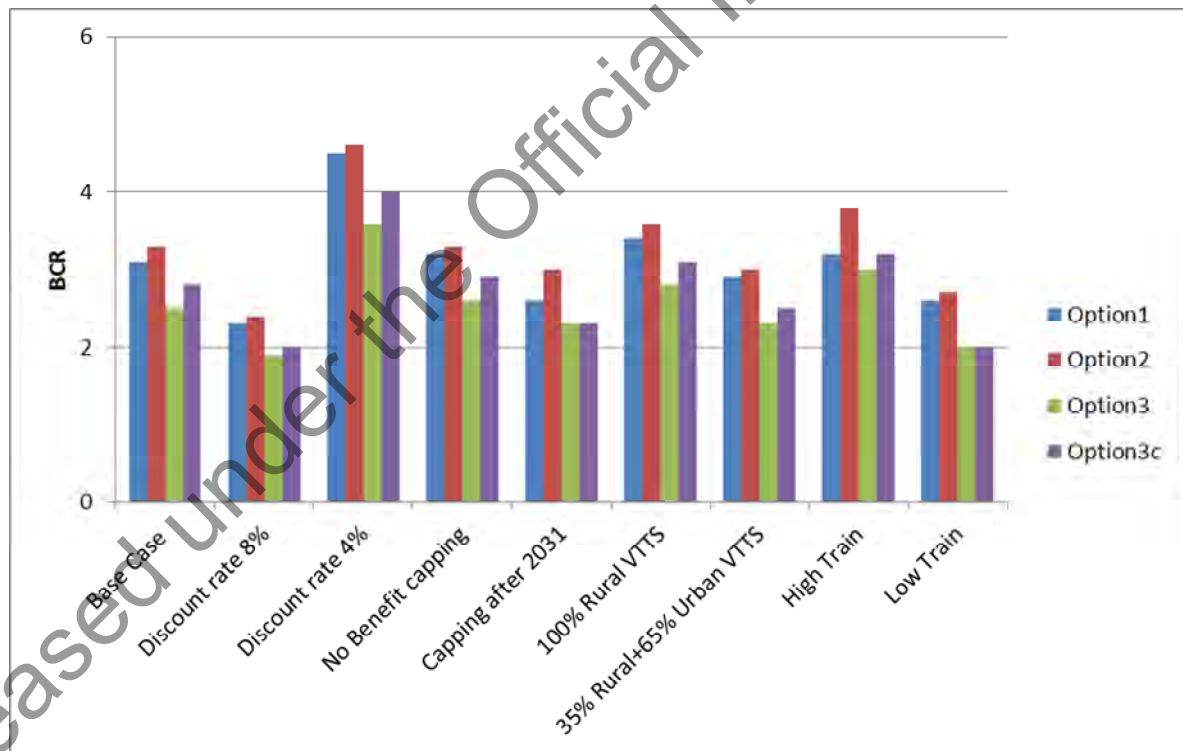
Table 7-13 – Train Frequency Sensitivity Test Results (with agglomeration and WEBs)

Tests	Option1	Option2	Option3	Option3c
Base Case	3.1	3.3	2.5	2.8
High	3.2	3.8	3.0	3.2
Low	2.6	2.7	2.0	2.0

### 7.2.6 Sensitivity Test Summary

The following figure summarises the sensitivity test results with agglomeration and WEBs.

Figure 7-2 Sensitivity Test Results (with agglomeration and WEBs)



Appendix A

**Updated Specific Land Use and  
Network Assumptions**

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## File Note

Table A1.1 - Changes in Land Use Assumptions

Development	TTM5.8					TTM5.9						
	Size	2011	2016	2021	2026	2031	Size	2011	2016	2021	2026	2031
<b>Major Employment Centres:</b>												
Tauriko Retail	60,000m <sup>2</sup> GFA	0%	31%	61%	90%	100%	57,240m <sup>2</sup> GLFA	0%	12%	33%	59%	82%
IMF (North)	139ha @ 182 trips/ha	9%	50%	79%	95%	100%	102ha @ 182 trips/ha	9%	20%	42%	62%	82%
IMF (South)	84ha @ 182 trips/ha	0%	0%	40%	78%	100%	72ha @ 182 trips/ha	0%	0%	21%	51%	82%
Rangioru Business Park	152ha @ 182 trips/ha	0%	9%	45%	79%	100%	145ha @ 182 trips/ha	0%	0%	16%	48%	81%
Mangatawa	62ha @ 200 trips/ha	4%	35%	57%	79%	100%	41ha @ 200 trips/ha	4%	35%	57%	79%	100%
<b>Wairakei and Te Tumu Employment: (same between TTM5.8 and TTM5.9)</b>												
Wairakei Retail	3,647 employees	0%	32%	64%	85%	100%	1,030 employees	0%	32%	64%	85%	100%
Wairakei Non-Retail	1,470 employees	0%	33%	64%	88%	100%	1,470 employees	0%	33%	64%	88%	100%
Te Tumu Retail	205 employees by 2031	0%	0%	12%	51%	100%	205 employees by 2031	0%	0%	12%	51%	100%
Te Tumu Non-Retail	305 employees by 2031	0%	0%	8%	54%	100%	305 employees by 2031	0%	0%	8%	54%	100%
<b>Wairakei and Te Tumu Households / Population:</b>												
Wairakei	2,906 HH	0%	37%	84%	96%	100%	2,906 HH	0	8%	31%	84%	100%
Te Tumu	3,357 HH	0%	0%	9%	54%	100%	3,357 HH	0	0	0	11.5%	54%
<b>Region-wide Growth:</b>	SmartGrowth						Dec 2011 SmartGrowth Review by TCC and Updated WBoPDC					

## File Note

Table A1 – Proposed Form and Timing of Projects Assumptions

Project	Description	TTM5.8	TTM5.9	Diff? Y/N
<b>State Highway Network</b>				
SH2 – Katikati Bypass	A two-lane road bypassing Katikati township	In 2021	In 2031	Y
SH2 – Omokoroa to Te Puna Four Laning	Widening of SH2 between SH2 / Omokoroa Road intersection and the TNL from 2 lanes to 4 lanes.	In 2026	In 2031	Y
SH2 – Omokoroa Road Roundabout (and closure of SH2 / Francis Road intersection)	<ul style="list-style-type: none"> <li>■ Francis Road is disconnected from SH2 and connected to Omokoroa Road via a new roundabout;</li> <li>■ SH2 / Omokoroa Road intersection is upgraded from priority to roundabout.</li> </ul>	In 2021	In 2021	N
SH2 – Waihi Road widening eastbound Bethlehem to Route J	Widening of eastbound on SH2 from 1 lane to 2 lanes from Bethlehem to Route J.	In 2016	Delete	Y
SH2 – Four laning through Bethlehem with bus lanes (between Te Paeroa Road and Bethlehem roundabout)	Dedicate one lane each way on SH2 between Te Paeroa Road and Bethlehem roundabout for buses i.e. one traffic lane.	In 2021	Delete	Y
SH2 – Tauranga Northern Link (TNL) <sup>2</sup>	<ul style="list-style-type: none"> <li>■ A 4-lane expressway from SH2 (around Loop Road) to Route K;</li> <li>■ Roundabout connection at the SH2 end and grade separated ramps at the Route K end;</li> <li>■ Widening north of Route K connection to Route J from 1 lane to 2 lanes; and</li> <li>■ New link from 15<sup>th</sup> Avenue to Route K.</li> </ul>	In 2021	In 2026	Y
SH2 – Tauranga Northern Link westbound slip lane onto SH2	A single westbound lane connecting TNL to SH2 bypassing the SH2 / TNL roundabout.	In 2031	Delete	Y
SH2 - Takitimu Drive / Elizabeth Street - interim upgrade (signals)	Upgrade the existing roundabout to a signalised roundabout.	In 2016	In 2016	N

<sup>2</sup> This project is currently in the Scheme Assessment stage and the final configuration is to be decided.

## File Note

Project	Description	TTM5.8	TTM5.9	Diff? Y/N
SH2 - Takitimu Drive / Elizabeth Street - grade separation	Grade separation of the southbound through movement and removal of the signalisation at the at-grade roundabout.	In 2031	In 2031	N
SH2 – Tauranga Eastern Link (TEL) (Phase 1)	<ul style="list-style-type: none"> <li>■ Widening of SH2 from Te Maunga to Domain Road from 2 to 4 lanes;</li> <li>■ New 4-lane divided motorway from Domain Road to Sh2/Sh33 intersection in Paengaroa;</li> <li>■ Connect Sandhurst Drive to SH2 via a new full diamond interchange;</li> <li>■ Upgrade the Domain roundabout to a full diamond interchange;</li> <li>■ New 3-legged interchange at Rangiuuru<sup>3</sup> connecting to the business park;</li> <li>■ Upgrade the intersection of SH2 / SH33 to a roundabout connecting to TEL;</li> <li>■ Grade separation of Parton Road from TEL;</li> <li>■ Realignment of Te Tumu Road north-west of TEL to connect to Maketu Road; and</li> <li>■ Tolls will be applied – current strategy is all day toll at \$2 for light vehicles and \$5 for heavy vehicles.</li> </ul>	In 2016	In 2016	N
SH2 – Tauranga Eastern Link (Ultimate)	Phase 1 plus: New full diamond interchange connecting to Papamoa East.	In 2026	In 2026	N
SH2 – Te Puke Intersections upgrade	<ul style="list-style-type: none"> <li>■ Realign Te Puke Quarry Road;</li> <li>■ Relocate the SH2 / Te Puke Quarry Road intersection north of current location and upgrade to a roundabout; and</li> </ul>	In 2016	In 2016	N

<sup>3</sup> Although the Rangiuuru Interchange is not part of the Phase 1 project, it has been included (albeit as developer funded), as it is a pre-requisite for full development of the Rangiuuru Business Park. This alternative 3-legged layout of the Interchange (without the southbound on-ramp) was assumed for SH2 Rangiuuru Intersections Improvement Study carried out by GHD and will be included as part of the standard assumptions unless otherwise advised by the study group.

## File Note

Project	Description	TTM5.8	TTM5.9	Diff? Y/N
SH2 – Te Puke local (internal) bypass	<ul style="list-style-type: none"> <li>Upgrade the SH2 / No. 3 Road intersection to a roundabout.</li> <li>A 4-lane local link bypassing the Te Puke town centre between King Street and Jocelyn Street; and</li> <li>Treatment to Te Puke town centre to discourage vehicle movements.</li> </ul>	In 2021	In 2031	Y
SH2 – Maunganui / Girven Intersection upgrade - interim upgrade (signals)	Upgrade the Maunganui Road (SH2) / Girven Road from roundabout to a signalised intersection.	In 2011	Delete	Y
SH2 – Maunganui / Girven Intersection upgrade - grade separation <sup>4</sup>	2-lane grade separated link bypassing the Maunganui Road / Girven Road signalised intersection.	In 2016 (assume 4L)	In 2016	Y
SH2A – Hairini Link	Hairini Stage 3: <ul style="list-style-type: none"> <li>Four-laning of 15<sup>th</sup> Avenue and Turret Road between Cameron Road and Maungatapu roundabout;</li> <li>Convert the existing one-way direction of Turret Road north of 15<sup>th</sup> Avenue from southbound to northbound only.</li> </ul>	In 2026	In 2026	N
	Hairini Stage 4: <ul style="list-style-type: none"> <li>2-lane grade separated link between Welcome Bay Road and Turret Road (bypassing both Welcome Bay and Maungatapu roundabouts)</li> </ul>	In 2026	In 2016	Y
SH29 – Tauriko Bypass <sup>5</sup>	<ul style="list-style-type: none"> <li>2-lane link connecting SH29 (south of Omanawa Road) to Takitumu Drive (Pyes Pa Bypass) with priority given to Tauriko Bypass;</li> <li>Staggered priority connection at Belk Road;</li> <li>Priority interchange with northbound on and off ramps at</li> </ul>	In 2031	In 2026	Y

<sup>4</sup> This project is currently under investigation and the final layout is yet to be confirmed.

<sup>5</sup> This project is currently under investigation and the final design is yet to be confirmed.

## File Note

Project	Description	TTM5.8	TTM5.9	Diff? Y/N
	<p>Kennedy Road;</p> <ul style="list-style-type: none"> <li>Grade-separated southbound ramp from Pyes Pa Bypass to Tauriko Bypass; and</li> <li>Omanawa Road will be grade separated and has no access to Tauriko Bypass</li> </ul> <p><u>Existing SH29 changes:</u></p> <ul style="list-style-type: none"> <li>Realignment of SH29 between Omanawa Road and Belk Road;</li> <li>Upgrade of SH29/Belk Road to roundabout;</li> <li>Upgrade SH29/Cambridge to signals;</li> <li>Minor upgrade at SH29/Gargan; and</li> <li>Lower the speed limit from 90km/h to 50km/h through the Tauriko village.</li> </ul>			
SH29 / Route K and Taurikura / Lakes Boulevard – roundabout upgrade <sup>6</sup>	<ul style="list-style-type: none"> <li>Slip lanes as a form of upgrade at the two roundabouts.</li> </ul>	In 2031	In 2026	Y
SH29 – Route K to Barkes Corner four laning	Widening of SH29 from 2 to 4 lanes between Route K and Barkes Corner.	In 2026	In 2026	N
SH29 – Route K to Barkes Corner – grade separation	2-lane grade separated link bypassing the Barkes Corner on SH29.	In 2026	In 2026	N
SH29 – Oropi Road Intersection – minor upgrade	Minor improvement of capacity.	In 2016	In 2016	N
SH2A/SH29 – Hairini to Maungatapu Bridge four laning	Widening of SH2A/SH29 from 2 to 4 lanes from Maungatapu roundabout including Maungatapu bridge.	In 2026	In 2026	N
SH2/SH29 – Te Maunga/Maunganui Intersection upgrade - interim upgrade (roundabout capacity improvement)	Widening of the northbound approach with a slip lane from Maunagau Road to SH29	In 2016 (assume signals)	In 2016	Y

<sup>6</sup> This project is currently under investigation and the final layout is yet to be confirmed.



## File Note

Project	Description	TTM5.8	TTM5.9	Diff? Y/N
SH2/SH29 – Te Maunga/Maunganui Intersection upgrade - grade separation	Grade separation of SH2/SH2 and allow weaving between flyover towards Mangatawa Interchange	Beyond 2031 with SH2/SH29 flyover	In 2026	Y
SH36 – Pyes Pa Bypass (Phase 2)	Phase 1 plus: <ul style="list-style-type: none"> <li>■ Widening of the bypass from 2 to 4 lanes; and</li> <li>■ Widening of the Taurikura Drive to SH29 section from 4 lanes to 6 lanes.</li> </ul>	In 2031	Beyond 2031	Y
<b>Local Road Network - North</b>				
Cambridge Road / Route J interchange - signals	Upgrade the interchange intersections from priority to traffic signals.	In 2016	In 2026	Y
Omokoroa Road (Francis Road to SH2) four laning	Widening of the section between Francis Road (realigned) and SH2 from 2 to 4 lanes.	In 2021	In 2021	N
Waihi Road / Bellevue Road intersection - signals	Upgrade the priority intersection to traffic signals.	In 2016	In 2026	Y
<b>Local Road Network - Central</b>				
Cameron Road / 3rd Avenue - minor upgrade	Minor upgrade allowing dedicated right turn from 3 <sup>rd</sup> Avenue and dedicated left turn into 3 <sup>rd</sup> Avenue.	In 2016	In 2021	Y
Cameron Road / 11 <sup>th</sup> Avenue – signal upgrade	Introduce right turn from 11 <sup>th</sup> Ave into Cameron Road northbound. Close right turn from Christopher Street to Waihi Road	In 2011	In 2011	N
Cameron Road / 15th Avenue - signal upgrade	Widening of the 15 <sup>th</sup> Avenue approaches.	In 2016	Delete	Y
Cameron Road / 18th Avenue - signals	Upgrade the priority intersection to traffic signals.	In 2016	Delete	Y
Cameron Road / Spring Street - signals	Upgrade the priority intersection to traffic signals.	In 2016	In 2016	N
Chadwick Road / Fraser Street - roundabout upgrade	Widening of the approach lanes to the roundabout.	In 2016	Delete	Y
Elizabeth Street / Cameron Road - signal upgrade	Widening of western Elizabeth Street approach to allow two dedicated right turn lanes.	In 2021	In 2021	N
Fraser Street / Merivale Road - roundabout	Upgrade the priority intersection to roundabout.	In 2021	Delete	Y

## File Note

Project	Description	TTM5.8	TTM5.9	Diff? Y/N
Hasting Road	Closure of existing access onto SH29 and realign to join Lakes Boulevard.	In 2016	In 2026	Y
Route K Tolling Strategy	<p><b>TTM 5.8</b> – For 2011: All day toll at \$1.50 for cars, \$2 for MCV and \$5 for HCV. Manual Transaction.</p> <p>From 2016: All day toll at \$1.50 for cars, \$3.75 for MCV and HCV. Electronic Transaction. Tolls escalate at CPI.</p> <p><b>TTM 5.9</b> - Starting from 1 Jan (2011): All day toll at \$1.5 for cars, \$2 for MCV and \$4 for HCV (manual)</p> <p>From 2016: All day toll at \$2 for cars, \$4 for all trucks (electronic)</p>	See description	See description	N
Tauriko IMF Industrial Development Network (south)	Extension of Taurikura Drive from Kennedy Road extension to Belk Road via a roundabout.	In 2021	In 2021	N
<b>Local Road Network - East</b>				
Tara Road four laning	Widening from 2 to 4 lanes.	In 2026	In 2016	Y
	Upgrade the priority intersection with Parton Road to a roundabout.	In 2016	In 2011	Y
Domain Road four laning	Widening from 2 to 4 lanes between Tara Road and Papamoa Beach Road.	In 2016	In 2021	Y
Domain Road / Gravatt Road - signals	Upgrade the priority intersection to traffic signals.	In 2011	In 2011	N
Girven Road four laning	Widening from 2 to 4 lanes between Gloucester Road to Maranui Street.	In 2021	In 2021	N
Gloucester Road / Grenada Street connections in Papamoa	Connect the western and eastern ends of Gloucester Road and Grenada Street.	In 2016	In 2021	Y
Golf Road / Ocenview Road intersection – signals	Upgrade the priority intersection to traffic signals.	None	Completed	N
Kaituna Link	New 2-lane link connecting Te Tumu Road across the Kaituna River to the Te Tumu residential development.	Beyond 2031	Beyond 2031	N

## File Note

Project	Description	TTM5.8	TTM5.9	Diff? Y/N
Papamoa East Stage 1 Structure Plan Network	Internal road network for the residential development in Wairakei.	In 2016	In 2016	N
Papamoa East Stage 2 Structure Plan Network	Internal road network for the residential development in Te Tumu.	In 2026	In 2031	Y
Papamoa Beach Road traffic calming	Lower speed environment (50-60km/h) assumed in the model.	In 2016	In 2016	N
Papamoa Beach Road / Domain Road - signals	Upgrade the priority intersection to traffic signals.	In 2021	In 2021	N
Rangiuru Business Park Local Road Network (prior to full development)	<ul style="list-style-type: none"> <li>■ New roundabout access on SH2 (at Affco site);</li> <li>■ SH2 / Pah Road intersection remains open; and</li> <li>■ Roundabout at the 3-legged Rangiuru Interchange.</li> </ul>	In 2016	In 2016	N
Rangiuru Business Park Local Road Network (full development)	<p>The above plus:</p> <ul style="list-style-type: none"> <li>■ Closure of SH2 / Maketu Road intersection</li> <li>■ New link to Kelly Road from interchange</li> <li>■ Upgrade the eastern side interchange intersection to a roundabout</li> <li>■ Upgrade the Kelly Road / Te Tumu Road to a roundabout</li> </ul>	In 2031	In 2031 (no connection to the eastern side)	Y

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Appendix B

## AIMSUN and TTM delay comparisons

**Do Minimum 2016**

Approach	<u>AIMSUN AM</u>		<u>TTM</u>		
	Flow	Delay (minutes)	Flow	Delay (minutes)	
MGI SBD LT	368	0.26	0.20	0.20	-0.06
MGI SBD TH	840	0.23	0.19	0.19	-0.04
MGI SBD RT	167	0.31	0.20	0.20	-0.11
MGI GIRVEN LT	79	1.14	1.11	1.11	-0.04
MGI GIRVEN TH	78	1.23	1.10	1.10	-0.13
MGI GIRVEN RT	703	1.17	1.11	1.11	-0.06
MGI NBD LT	89	3.34	3.04	3.04	-0.29
MGI NBD TH	1,025	3.29	3.04	3.04	-0.25
MGI NBD RT	238	3.44	3.04	3.04	-0.40
MGI MATAPIHI LT	109	0.47	0.28	0.28	-0.19
MGI MATAPIHI TH	39	0.45	0.29	0.29	-0.16
MGI MATAPIHI RT	59	0.56	0.28	0.28	-0.28
TE MAUNGA SBD TH	1	0.27	0.05	0.05	-0.22
TE MAUNGA SBD RT	331	0.14	0.05	0.05	-0.09
TE MAUNGA NBD LT	698	0.33	0.16	0.16	-0.17
TE MAUNGA NBD TH	871	0.58	0.16	0.16	-0.43
TE MAUNGA SH29 LT	478	2.40	1.57	1.57	-0.83
TE MAUNGA SH29 RT	441	1.40	1.56	1.56	0.17
	6,613	8480	7080	7080	
Approach	<u>AIMSUN IP</u>		Flow	Delay (minutes)	
	Flow	Delay (minutes)			
MGI SBD LT	510	0.41	0.51	0.51	0.10
MGI SBD TH	767	0.36	0.50	0.50	0.13
MGI SBD RT	219	0.43	0.50	0.50	0.08
MGI GIRVEN LT	202	0.76	0.74	0.74	-0.02
MGI GIRVEN TH	114	0.83	0.73	0.73	-0.10
MGI GIRVEN RT	546	0.78	0.74	0.74	-0.04
MGI NBD LT	127	0.64	0.78	0.78	0.14
MGI NBD TH	604	0.69	0.77	0.77	0.09
MGI NBD RT	370	0.89	0.79	0.79	-0.10
MGI MATAPIHI LT	94	0.37	0.19	0.19	-0.18
MGI MATAPIHI TH	78	0.40	0.21	0.21	-0.19
MGI MATAPIHI RT	71	0.51	0.19	0.19	-0.32
TE MAUNGA SBD TH	1	0.21	0.05	0.05	-0.16
TE MAUNGA SBD RT	396	0.13	0.05	0.05	-0.08
TE MAUNGA NBD LT	443	0.20	0.12	0.12	-0.08
TE MAUNGA NBD TH	651	0.21	0.12	0.12	-0.09
TE MAUNGA SH29 LT	380	0.21	0.22	0.22	0.02
TE MAUNGA SH29 RT	357	0.17	0.22	0.22	0.06
	5,930	2599	2611	2611	
Approach	<u>AIMSUN PM</u>		Flow	Delay (minutes)	
	Flow	Delay (minutes)			
MGI SBD LT	292	2.63	3.77	3.77	1.14
MGI SBD TH	1,031	2.41	3.76	3.76	1.35
MGI SBD RT	175	2.58	3.78	3.78	1.20
MGI GIRVEN LT	467	1.54	1.09	1.09	-0.45
MGI GIRVEN TH	126	1.41	1.08	1.08	-0.33
MGI GIRVEN RT	475	1.34	1.08	1.08	-0.26
MGI NBD LT	159	0.63	0.56	0.56	-0.08
MGI NBD TH	676	0.69	0.53	0.53	-0.15
MGI NBD RT	562	1.52	0.55	0.55	-0.97
MGI MATAPIHI LT	83	0.51	0.22	0.22	-0.29
MGI MATAPIHI TH	83	0.58	0.23	0.23	-0.35
MGI MATAPIHI RT	81	0.69	0.22	0.22	-0.47
TE MAUNGA SBD TH	1	0.29	0.11	0.11	-0.18
TE MAUNGA SBD RT	623	0.16	0.11	0.11	-0.05
TE MAUNGA NBD LT	563	0.27	0.12	0.12	-0.15
TE MAUNGA NBD TH	773	0.33	0.12	0.12	-0.21
TE MAUNGA SH29 LT	512	0.47	0.38	0.38	-0.09
TE MAUNGA SH29 RT	759	0.37	0.38	0.38	0.00
	7,440	7834	8321	8321	

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**Do Minimum 2026**

Approach	<u>AIMSUN AM</u>		<u>TTM</u>		
	Flow	Delay (minutes)	Flow	Delay (minutes)	
MGI SBD LT	336	0.38	0.53	0.53	0.16
MGI SBD TH	1,103	0.36	0.53	0.53	0.17
MGI SBD RT	175	0.53	0.54	0.54	0.01
MGI GIRVEN LT	46	1.36	1.85	1.85	0.48
MGI GIRVEN TH	70	1.48	1.84	1.84	0.36
MGI GIRVEN RT	503	1.32	1.85	1.85	0.53
MGI NBD LT	108	2.64	2.63	2.63	-0.02
MGI NBD TH	1,066	2.52	2.62	2.62	0.10
MGI NBD RT	245	2.61	2.62	2.62	0.02
MGI MATAPIHI LT	100	0.56	0.41	0.41	-0.15
MGI MATAPIHI TH	39	0.60	0.42	0.42	-0.18
MGI MATAPIHI RT	78	0.70	0.41	0.41	-0.29
TE MAUNGA SBD TH	1	0.36	0.14	0.14	-0.22
TE MAUNGA SBD RT	325	0.22	0.14	0.14	-0.08
TE MAUNGA NBD LT	868	0.94	0.76	0.76	-0.18
TE MAUNGA NBD TH	941	0.92	0.76	0.76	-0.16
TE MAUNGA SH29 LT	454	1.77	1.63	1.63	-0.14
TE MAUNGA SH29 RT	591	1.35	1.62	1.62	0.28
	7,051	8537	8931	8931	

Approach	<u>AIMSUN IP</u>			
	Flow	Delay (minutes)		
MGI SBD LT	358	0.96	1.17	0.21
MGI SBD TH	872	0.91	1.16	0.26
MGI SBD RT	206	1.14	1.17	0.03
MGI GIRVEN LT	245	1.26	1.32	0.06
MGI GIRVEN TH	120	1.42	1.31	-0.10
MGI GIRVEN RT	450	1.28	1.32	0.04
MGI NBD LT	146	1.43	1.54	0.10
MGI NBD TH	679	1.44	1.52	0.08
MGI NBD RT	413	1.84	1.54	-0.31
MGI MATAPIHI LT	93	0.66	0.65	-0.01
MGI MATAPIHI TH	76	0.73	0.66	-0.07
MGI MATAPIHI RT	90	0.83	0.65	-0.18
TE MAUNGA SBD TH	1	0.26	0.18	-0.08
TE MAUNGA SBD RT	429	0.24	0.18	-0.06
TE MAUNGA NBD LT	658	0.49	0.37	-0.12
TE MAUNGA NBD TH	770	0.39	0.37	-0.03
TE MAUNGA SH29 LT	378	0.54	0.56	0.02
TE MAUNGA SH29 RT	558	0.48	0.55	0.08
	6,541	5762	5931	

Approach	<u>AIMSUN PM</u>			
	Flow	Delay (minutes)		
MGI SBD LT	184	3.24	3.88	0.64
MGI SBD TH	1,151	3.04	3.88	0.83
MGI SBD RT	188	3.34	3.90	0.55
MGI GIRVEN LT	425	2.26	1.65	-0.61
MGI GIRVEN TH	109	2.11	1.64	-0.47
MGI GIRVEN RT	415	2.00	1.64	-0.36
MGI NBD LT	186	1.18	1.28	0.11
MGI NBD TH	771	1.21	1.25	0.05
MGI NBD RT	519	1.92	1.27	-0.66
MGI MATAPIHI LT	76	0.70	0.62	-0.08
MGI MATAPIHI TH	76	0.76	0.63	-0.13
MGI MATAPIHI RT	101	0.97	0.63	-0.34
TE MAUNGA SBD TH	1	0.40	0.24	-0.16
TE MAUNGA SBD RT	643	0.32	0.24	-0.08
TE MAUNGA NBD LT	834	1.09	0.85	-0.24
TE MAUNGA NBD TH	914	1.05	0.85	-0.20
TE MAUNGA SH29 LT	423	2.15	2.33	0.18
TE MAUNGA SH29 RT	936	1.92	2.33	0.41
	7,950	13885	14294	

**Do Minimum 2031**

Approach	<u>AIMSUN AM</u>		<u>TTM</u>		
	Flow	Delay (minutes)	Flow	Delay (minutes)	
MGI SBD LT	335	0.46	0.47	0.01	
MGI SBD TH	1,206	0.45	0.47	0.02	
MGI SBD RT	172	0.69	0.47	-0.22	
MGI GIRVEN LT	18	2.24	2.19	-0.06	
MGI GIRVEN TH	66	2.60	2.18	-0.42	
MGI GIRVEN RT	465	2.36	2.18	-0.18	
MGI NBD LT	107	3.28	2.94	-0.35	
MGI NBD TH	1,051	3.08	2.92	-0.16	
MGI NBD RT	172	3.18	2.93	-0.25	
MGI MATAPIHI LT	107	0.67	0.70	0.03	
MGI MATAPIHI TH	40	0.71	0.71	0.00	
MGI MATAPIHI RT	79	0.85	0.71	-0.14	
TE MAUNGA SBD TH	1	0.35	0.43	0.09	
TE MAUNGA SBD RT	296	0.30	0.44	0.13	
TE MAUNGA NBD LT	880	0.88	1.15	0.27	
TE MAUNGA NBD TH	899	0.85	1.15	0.30	
TE MAUNGA SH29 LT	403	2.54	2.76	0.22	
TE MAUNGA SH29 RT	637	2.01	2.76	0.75	
	6,934	10351	11095		

Approach	<u>AIMSUN IP</u>			
	Flow	Delay (minutes)		
MGI SBD LT	366	1.16	1.39	0.22
MGI SBD TH	934	1.12	1.38	0.25
MGI SBD RT	210	1.47	1.39	-0.08
MGI GIRVEN LT	193	1.48	1.53	0.06
MGI GIRVEN TH	113	1.60	1.53	-0.07
MGI GIRVEN RT	412	1.47	1.53	0.06
MGI NBD LT	145	1.76	1.96	0.20
MGI NBD TH	666	1.74	1.94	0.20
MGI NBD RT	380	2.13	1.96	-0.17
MGI MATAPIHI LT	98	0.68	0.68	0.00
MGI MATAPIHI TH	78	0.75	0.69	-0.06
MGI MATAPIHI RT	90	0.89	0.68	-0.20
TE MAUNGA SBD TH	1	0.29	0.27	-0.02
TE MAUNGA SBD RT	405	0.27	0.27	-0.01
TE MAUNGA NBD LT	716	0.60	0.47	-0.13
TE MAUNGA NBD TH	758	0.48	0.47	-0.01
TE MAUNGA SH29 LT	341	0.70	0.67	-0.03
TE MAUNGA SH29 RT	605	0.61	0.67	0.05
	6,510	6794	7112	

Approach	<u>AIMSUN PM</u>			
	Flow	Delay (minutes)		
MGI SBD LT	289	4.64	3.64	-1.01
MGI SBD TH	1,116	4.41	3.63	-0.78
MGI SBD RT	183	4.76	3.65	-1.11
MGI GIRVEN LT	358	2.45	2.01	-0.43
MGI GIRVEN TH	123	2.45	2.00	-0.45
MGI GIRVEN RT	391	2.32	2.01	-0.31
MGI NBD LT	176	1.93	2.02	0.10
MGI NBD TH	766	1.93	1.99	0.07
MGI NBD RT	462	2.64	2.01	-0.63
MGI MATAPIHI LT	80	0.89	0.87	-0.02
MGI MATAPIHI TH	76	0.97	0.89	-0.09
MGI MATAPIHI RT	107	1.21	0.88	-0.33
TE MAUNGA SBD TH	1	0.29	0.61	0.33
TE MAUNGA SBD RT	534	0.39	0.61	0.23
TE MAUNGA NBD LT	918	1.17	0.92	-0.25
TE MAUNGA NBD TH	935	0.93	0.92	0.00
TE MAUNGA SH29 LT	339	3.57	3.32	-0.25
TE MAUNGA SH29 RT	909	3.35	3.32	-0.03
	7,763	18928	16738	



**Option 1 2016**

Approach	<u>AIMSUN AM</u>		<u>TTM</u>		
	Flow	Delay (minutes)	Flow	Delay (minutes)	
MGI SBD LT	322	0.23	0.44	0.20	
MGI SBD TH	230	0.63	0.52	-0.11	
MGI SBD RT	137	2.15	1.75	-0.40	
MGI GIRVEN LT	184	0.43	0.47	0.04	
MGI GIRVEN TH	97	0.58	0.77	0.19	
MGI GIRVEN RT	421	0.79	1.48	0.69	
MGI NBD LT	132	0.38	0.44	0.06	
MGI NBD TH	437	0.58	0.59	0.01	
MGI NBD RT	372	1.24	0.85	-0.39	
MGI MATAPIHI LT	105	0.83	1.00	0.16	
MGI MATAPIHI TH	42	0.67	0.55	-0.13	
MGI MATAPIHI RT	61	0.71	0.67	-0.04	
TE MAUNGA SBD TH	101	0.42	0.36	-0.06	
TE MAUNGA SBD RT	376	0.40	0.36	-0.04	
TE MAUNGA NBD LT	600	0.22	0.30	0.09	
TE MAUNGA NBD TH	201	0.54	0.55	0.01	
TE MAUNGA SH29 LT	683	0.41	0.23	-0.18	
TE MAUNGA SH29 RT	465	0.46	0.28	-0.18	
	4,966	2827	2833		
Approach	<u>AIMSUN IP</u>				
	Flow	Delay (minutes)			
MGI SBD LT	478	0.25	0.48	0.23	
MGI SBD TH	204	0.52	0.52	0.00	
MGI SBD RT	199	1.08	1.30	0.22	
MGI GIRVEN LT	240	0.49	0.40	-0.09	
MGI GIRVEN TH	124	0.64	0.71	0.07	
MGI GIRVEN RT	427	0.91	1.02	0.10	
MGI NBD LT	138	0.38	0.59	0.21	
MGI NBD TH	166	0.49	0.48	-0.01	
MGI NBD RT	356	0.99	0.88	-0.11	
MGI MATAPIHI LT	97	1.04	0.73	-0.31	
MGI MATAPIHI TH	84	0.87	0.52	-0.35	
MGI MATAPIHI RT	66	0.82	0.80	-0.01	
TE MAUNGA SBD TH	163	0.36	0.27	-0.08	
TE MAUNGA SBD RT	408	0.33	0.27	-0.06	
TE MAUNGA NBD LT	359	0.19	0.22	0.03	
TE MAUNGA NBD TH	199	0.43	0.43	0.00	
TE MAUNGA SH29 LT	383	0.25	0.24	0.00	
TE MAUNGA SH29 RT	346	0.46	0.17	-0.29	
	4,440	2340	2327		
Approach	<u>AIMSUN PM</u>				
	Flow	Delay (minutes)			
MGI SBD LT	576	0.34	0.93	0.59	
MGI SBD TH	429	0.74	0.99	0.26	
MGI SBD RT	206	1.36	2.41	1.05	
MGI GIRVEN LT	297	0.50	0.48	-0.02	
MGI GIRVEN TH	117	0.65	0.73	0.08	
MGI GIRVEN RT	440	0.96	1.28	0.32	
MGI NBD LT	135	0.50	0.60	0.10	
MGI NBD TH	197	0.67	0.69	0.03	
MGI NBD RT	481	1.69	1.21	-0.48	
MGI MATAPIHI LT	87	0.92	0.80	-0.12	
MGI MATAPIHI TH	88	0.89	0.69	-0.20	
MGI MATAPIHI RT	74	0.87	0.93	0.06	
TE MAUNGA SBD TH	212	0.56	0.69	0.13	
TE MAUNGA SBD RT	676	0.54	0.69	0.15	
TE MAUNGA NBD LT	484	0.30	0.20	-0.10	
TE MAUNGA NBD TH	224	1.38	0.76	-0.62	
TE MAUNGA SH29 LT	489	0.53	0.29	-0.23	
TE MAUNGA SH29 RT	670	0.57	0.35	-0.23	
	5,881	4254	4507		

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**Option 1 2026**

Approach	AIMSUN AM		TTM		
	Flow	Delay (minutes)	Flow	Delay (minutes)	
MGI SBD LT	308	0.22	0.45	0.23	
MGI SBD TH	206	0.52	0.52	0.00	
MGI SBD RT	130	2.45	1.73	-0.72	
MGI GIRVEN LT	189	0.51	0.55	0.04	
MGI GIRVEN TH	94	0.69	0.90	0.22	
MGI GIRVEN RT	343	0.95	1.43	0.48	
MGI NBD LT	160	0.46	0.60	0.14	
MGI NBD TH	384	0.43	0.50	0.06	
MGI NBD RT	421	1.22	1.04	-0.18	
MGI MATAPIHI LT	99	1.10	1.41	0.31	
MGI MATAPIHI TH	47	0.88	0.88	0.00	
MGI MATAPIHI RT	74	0.89	1.26	0.37	
TE MAUNGA SBD TH	140	0.77	0.91	0.15	
TE MAUNGA SBD RT	365	0.73	0.92	0.19	
TE MAUNGA NBD LT	783	0.41	0.50	0.09	
TE MAUNGA NBD TH	250	0.84	0.88	0.04	
TE MAUNGA SH29 LT	663	0.81	0.83	0.03	
TE MAUNGA SH29 RT	648	0.74	0.78	0.04	
	5,305	3864	4277		

Approach	AIMSUN IP			
	Flow	Delay (minutes)		
MGI SBD LT	470	0.29	0.53	0.24
MGI SBD TH	221	0.58	0.66	0.08
MGI SBD RT	193	1.73	1.59	-0.14
MGI GIRVEN LT	312	0.69	0.61	-0.08
MGI GIRVEN TH	134	0.82	0.86	0.04
MGI GIRVEN RT	401	1.10	1.29	0.19
MGI NBD LT	161	0.50	0.73	0.23
MGI NBD TH	165	0.45	0.50	0.05
MGI NBD RT	396	1.47	1.31	-0.16
MGI MATAPIHI LT	96	1.20	0.89	-0.31
MGI MATAPIHI TH	87	1.10	0.71	-0.39
MGI MATAPIHI RT	82	1.14	1.31	0.17
TE MAUNGA SBD TH	229	0.54	0.62	0.08
TE MAUNGA SBD RT	476	0.53	0.62	0.09
TE MAUNGA NBD LT	493	0.30	0.53	0.22
TE MAUNGA NBD TH	249	0.51	0.69	0.19
TE MAUNGA SH29 LT	401	0.76	0.54	-0.22
TE MAUNGA SH29 RT	472	1.07	0.70	-0.37
	5,037	3864	3917	

Approach	AIMSUN PM			
	Flow	Delay (minutes)		
MGI SBD LT	616	0.80	1.21	0.40
MGI SBD TH	376	1.43	1.17	-0.26
MGI SBD RT	184	4.76	2.81	-1.95
MGI GIRVEN LT	329	0.73	0.73	0.00
MGI GIRVEN TH	140	0.90	1.02	0.13
MGI GIRVEN RT	414	1.72	1.52	-0.20
MGI NBD LT	171	0.48	0.72	0.24
MGI NBD TH	177	0.43	0.63	0.21
MGI NBD RT	501	1.29	1.32	0.03
MGI MATAPIHI LT	83	1.28	1.08	-0.19
MGI MATAPIHI TH	94	1.25	0.98	-0.27
MGI MATAPIHI RT	80	1.19	1.25	0.07
TE MAUNGA SBD TH	253	0.87	1.25	0.38
TE MAUNGA SBD RT	664	0.89	1.25	0.36
TE MAUNGA NBD LT	711	0.78	0.64	-0.14
TE MAUNGA NBD TH	227	2.26	2.21	-0.05
TE MAUNGA SH29 LT	506	1.49	1.13	-0.36
TE MAUNGA SH29 RT	821	1.52	1.60	0.08
	6,349	7987	7882	

**Option 1 2031**

Approach	<u>AIMSUN AM</u>		<u>TTM</u>		
	Flow	Delay (minutes)	Flow	Delay (minutes)	
MGI SBD LT	293	0.20	0.46	0.26	
MGI SBD TH	205	0.43	0.53	0.10	
MGI SBD RT	136	1.33	1.69	0.36	
MGI GIRVEN LT	192	0.74	0.57	-0.17	
MGI GIRVEN TH	102	0.92	1.00	0.08	
MGI GIRVEN RT	340	1.60	1.38	-0.22	
MGI NBD LT	163	0.64	0.62	-0.02	
MGI NBD TH	379	0.40	0.49	0.08	
MGI NBD RT	418	1.45	1.03	-0.41	
MGI MATAPIHI LT	96	1.60	1.92	0.32	
MGI MATAPIHI TH	50	1.19	1.01	-0.19	
MGI MATAPIHI RT	81	1.34	1.47	0.13	
TE MAUNGA SBD TH	149	1.23	0.97	-0.25	
TE MAUNGA SBD RT	369	1.17	0.98	-0.19	
TE MAUNGA NBD LT	838	0.63	0.70	0.07	
TE MAUNGA NBD TH	249	1.26	1.28	0.02	
TE MAUNGA SH29 LT	655	1.24	0.86	-0.38	
TE MAUNGA SH29 RT	709	1.09	1.06	-0.03	
	5,423	5335	4955		

Approach	<u>AIMSUN IP</u>			
	Flow	Delay (minutes)		
MGI SBD LT	483	0.25	0.55	0.30
MGI SBD TH	228	0.54	0.69	0.15
MGI SBD RT	178	2.27	2.09	-0.18
MGI GIRVEN LT	328	0.89	0.80	-0.09
MGI GIRVEN TH	140	1.08	0.90	-0.19
MGI GIRVEN RT	400	1.47	1.25	-0.22
MGI NBD LT	185	0.72	0.78	0.06
MGI NBD TH	171	0.45	0.48	0.04
MGI NBD RT	418	1.88	1.75	-0.13
MGI MATAPIHI LT	96	1.76	0.78	-0.98
MGI MATAPIHI TH	88	1.57	0.63	-0.94
MGI MATAPIHI RT	82	1.51	1.25	-0.25
TE MAUNGA SBD TH	264	0.75	0.47	-0.29
TE MAUNGA SBD RT	474	0.72	0.47	-0.25
TE MAUNGA NBD LT	551	0.38	0.42	0.05
TE MAUNGA NBD TH	266	0.78	0.60	-0.18
TE MAUNGA SH29 LT	424	0.64	0.34	-0.30
TE MAUNGA SH29 RT	482	0.81	1.61	0.80
	5,257	4721	4529	

Approach	<u>AIMSUN PM</u>			
	Flow	Delay (minutes)		
MGI SBD LT	612	0.45	1.30	0.85
MGI SBD TH	354	1.04	1.47	0.43
MGI SBD RT	186	3.20	2.90	-0.30
MGI GIRVEN LT	341	1.22	0.90	-0.32
MGI GIRVEN TH	147	1.31	1.37	0.06
MGI GIRVEN RT	414	2.44	1.49	-0.95
MGI NBD LT	168	1.02	0.98	-0.04
MGI NBD TH	181	0.93	0.90	-0.04
MGI NBD RT	508	2.60	1.83	-0.77
MGI MATAPIHI LT	92	1.58	1.38	-0.20
MGI MATAPIHI TH	98	1.55	1.30	-0.25
MGI MATAPIHI RT	84	1.52	1.77	0.25
TE MAUNGA SBD TH	282	1.33	1.13	-0.20
TE MAUNGA SBD RT	634	1.37	1.13	-0.24
TE MAUNGA NBD LT	752	1.50	0.77	-0.72
TE MAUNGA NBD TH	220	3.57	2.46	-1.11
TE MAUNGA SH29 LT	508	2.45	0.70	-1.75
TE MAUNGA SH29 RT	846	2.11	1.82	-0.28
	6,427	11122	8692	

**Option 2 2016**

Approach	<u>AIMSUN AM</u>		<u>TTM</u>		
	Flow	Delay (minutes)	Flow	Delay (minutes)	
MGI SBD LT	323	0.27	0.43	0.16	
MGI SBD TH	229	0.54	0.41	-0.13	
MGI SBD RT	142	1.30	1.33	0.03	
MGI GIRVEN LT	190	0.31	0.26	-0.05	
MGI GIRVEN TH	96	0.49	0.45	-0.04	
MGI GIRVEN RT	421	0.69	1.21	0.52	
MGI NBD LT	132	0.25	0.40	0.15	
MGI NBD TH	426	0.46	0.40	-0.06	
MGI NBD RT	373	0.60	0.67	0.07	
MGI MATAPIHI LT	106	0.82	0.65	-0.17	
MGI MATAPIHI TH	41	0.54	0.38	-0.16	
MGI MATAPIHI RT	61	0.56	0.65	0.09	
TE MAUNGA SBD TH	104	0.35	0.42	0.07	
TE MAUNGA SBD RT	379	0.42	0.42	0.00	
TE MAUNGA NBD LT	600	0.19	0.21	0.03	
TE MAUNGA NBD TH	201	0.46	0.58	0.11	
TE MAUNGA SH29 LT	673	0.44	0.25	-0.20	
TE MAUNGA SH29 RT	473	0.44	0.17	-0.27	
		2297	2313		
Approach	<u>AIMSUN IP</u>		Flow	Delay (minutes)	
	Flow	Delay (minutes)			
MGI SBD LT	438	0.33	0.59	0.26	
MGI SBD TH	202	0.61	0.57	-0.05	
MGI SBD RT	206	1.21	0.98	-0.23	
MGI GIRVEN LT	234	0.36	0.29	-0.07	
MGI GIRVEN TH	127	0.57	0.54	-0.03	
MGI GIRVEN RT	446	0.72	0.95	0.23	
MGI NBD LT	136	0.28	0.54	0.26	
MGI NBD TH	160	0.47	0.53	0.05	
MGI NBD RT	366	0.66	0.73	0.07	
MGI MATAPIHI LT	95	0.81	0.83	0.02	
MGI MATAPIHI TH	85	0.72	0.42	-0.30	
MGI MATAPIHI RT	68	0.67	0.68	0.02	
TE MAUNGA SBD TH	169	0.28	0.28	0.00	
TE MAUNGA SBD RT	405	0.35	0.28	-0.06	
TE MAUNGA NBD LT	355	0.15	0.19	0.03	
TE MAUNGA NBD TH	201	0.36	0.43	0.07	
TE MAUNGA SH29 LT	391	0.24	0.24	0.00	
TE MAUNGA SH29 RT	337	0.41	0.17	-0.24	
		2080	2187		
Approach	<u>AIMSUN PM</u>		Flow	Delay (minutes)	
	Flow	Delay (minutes)			
MGI SBD LT	570	0.49	0.93	0.44	
MGI SBD TH	438	0.94	0.91	-0.04	
MGI SBD RT	211	1.23	1.93	0.70	
MGI GIRVEN LT	324	0.43	0.31	-0.12	
MGI GIRVEN TH	108	0.66	0.63	-0.02	
MGI GIRVEN RT	443	0.81	1.28	0.47	
MGI NBD LT	135	0.30	0.50	0.20	
MGI NBD TH	197	0.54	0.47	-0.06	
MGI NBD RT	509	0.82	0.74	-0.08	
MGI MATAPIHI LT	84	0.91	0.91	0.00	
MGI MATAPIHI TH	88	0.85	0.66	-0.18	
MGI MATAPIHI RT	68	0.81	1.10	0.29	
TE MAUNGA SBD TH	212	0.64	0.78	0.14	
TE MAUNGA SBD RT	686	0.70	0.78	0.09	
TE MAUNGA NBD LT	491	0.20	0.17	-0.03	
TE MAUNGA NBD TH	241	0.62	0.67	0.05	
TE MAUNGA SH29 LT	499	0.50	0.43	-0.07	
TE MAUNGA SH29 RT	668	0.70	0.34	-0.36	
		3874	4212		

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**Option 2 2026**

Approach	<u>AIMSUN AM</u>		<u>TTM</u>		
	Flow	Delay (minutes)	Flow	Delay (minutes)	
MGI SBD LT	330	0.29	0.41	0.12	
MGI SBD TH	219	0.55	0.39	-0.17	
MGI SBD RT	146	1.03	0.94	-0.09	
MGI GIRVEN LT	225	0.33	0.24	-0.09	
MGI GIRVEN TH	104	0.51	0.44	-0.07	
MGI GIRVEN RT	415	0.70	0.94	0.24	
MGI NBD LT	150	0.26	0.38	0.12	
MGI NBD TH	377	0.45	0.37	-0.08	
MGI NBD RT	427	0.65	0.77	0.11	
MGI MATAPIHI LT	99	0.75	0.53	-0.22	
MGI MATAPIHI TH	49	0.58	0.39	-0.19	
MGI MATAPIHI RT	75	0.61	0.78	0.17	
TE MAUNGA SBD TH	139	0.48	0.98	0.50	
TE MAUNGA SBD RT	400	0.57	0.99	0.42	
TE MAUNGA NBD LT	778	0.30	0.62	0.32	
TE MAUNGA NBD TH	245	0.61	1.17	0.56	
TE MAUNGA SH29 LT	659	1.00	0.89	-0.11	
TE MAUNGA SH29 RT	657	0.93	0.73	-0.20	
		3370	3867		

Approach	<u>AIMSUN IP</u>			
	Flow	Delay (minutes)		
MGI SBD LT	424	0.34	0.62	0.28
MGI SBD TH	217	0.64	0.61	-0.03
MGI SBD RT	202	1.18	1.03	-0.15
MGI GIRVEN LT	305	0.38	0.32	-0.06
MGI GIRVEN TH	133	0.56	0.57	0.01
MGI GIRVEN RT	443	0.70	1.03	0.34
MGI NBD LT	158	0.29	0.57	0.28
MGI NBD TH	155	0.46	0.54	0.08
MGI NBD RT	448	0.78	0.88	0.10
MGI MATAPIHI LT	98	0.92	0.87	-0.05
MGI MATAPIHI TH	88	0.79	0.46	-0.33
MGI MATAPIHI RT	80	0.77	0.95	0.18
TE MAUNGA SBD TH	233	0.48	0.64	0.16
TE MAUNGA SBD RT	485	0.53	0.64	0.11
TE MAUNGA NBD LT	497	0.26	0.33	0.07
TE MAUNGA NBD TH	268	0.41	0.77	0.36
TE MAUNGA SH29 LT	415	0.66	0.53	-0.13
TE MAUNGA SH29 RT	474	0.93	0.45	-0.48
		3031	3267	

Approach	<u>AIMSUN PM</u>			
	Flow	Delay (minutes)		
MGI SBD LT	581	0.48	1.21	0.73
MGI SBD TH	384	1.13	1.14	0.01
MGI SBD RT	200	1.24	2.05	0.81
MGI GIRVEN LT	402	0.65	0.35	-0.30
MGI GIRVEN TH	124	0.68	0.67	-0.01
MGI GIRVEN RT	445	0.77	1.39	0.62
MGI NBD LT	161	0.34	0.54	0.20
MGI NBD TH	177	0.58	0.49	-0.09
MGI NBD RT	575	1.05	0.94	-0.10
MGI MATAPIHI LT	87	1.09	1.03	-0.06
MGI MATAPIHI TH	99	1.04	0.86	-0.18
MGI MATAPIHI RT	76	1.10	1.50	0.40
TE MAUNGA SBD TH	284	1.38	1.24	-0.15
TE MAUNGA SBD RT	679	1.42	1.24	-0.18
TE MAUNGA NBD LT	779	0.37	0.34	-0.03
TE MAUNGA NBD TH	294	0.85	1.43	0.58
TE MAUNGA SH29 LT	516	1.83	1.11	-0.72
TE MAUNGA SH29 RT	790	1.79	1.91	0.12
		6946	7355	

Option 2 2031

Approach	AIMSUN AM		TTM		
	Flow	Delay (minutes)	Flow	Delay (minutes)	
MGI SBD LT	311	0.29	0.40	0.11	
MGI SBD TH	195	0.69	0.39	-0.30	
MGI SBD RT	139	1.22	1.03	-0.19	
MGI GIRVEN LT	233	0.42	0.23	-0.18	
MGI GIRVEN TH	114	0.51	0.42	-0.09	
MGI GIRVEN RT	439	0.74	0.86	0.12	
MGI NBD LT	154	0.26	0.36	0.10	
MGI NBD TH	361	0.44	0.35	-0.09	
MGI NBD RT	436	0.70	0.72	0.02	
MGI MATAPIHI LT	100	0.78	0.50	-0.27	
MGI MATAPIHI TH	53	0.58	0.38	-0.20	
MGI MATAPIHI RT	78	0.78	0.79	0.01	
TE MAUNGA SBD TH	158	1.84	1.22	-0.62	
TE MAUNGA SBD RT	378	1.99	1.23	-0.76	
TE MAUNGA NBD LT	869	0.41	0.48	0.07	
TE MAUNGA NBD TH	250	0.74	1.41	0.67	
TE MAUNGA SH29 LT	643	1.03	1.18	0.15	
TE MAUNGA SH29 RT	695	0.90	1.42	0.52	
		4415	4617		
Approach	AIMSUN IP				
	Flow	Delay (minutes)			
MGI SBD LT	425	0.36	0.66	0.30	
MGI SBD TH	209	0.66	0.64	-0.02	
MGI SBD RT	196	1.43	1.10	-0.33	
MGI GIRVEN LT	329	0.40	0.35	-0.04	
MGI GIRVEN TH	139	0.64	0.60	-0.04	
MGI GIRVEN RT	435	0.68	1.14	0.46	
MGI NBD LT	169	0.36	0.60	0.24	
MGI NBD TH	151	0.48	0.57	0.10	
MGI NBD RT	467	0.77	1.02	0.25	
MGI MATAPIHI LT	96	0.97	1.00	0.03	
MGI MATAPIHI TH	86	0.80	0.50	-0.30	
MGI MATAPIHI RT	83	0.87	1.12	0.26	
TE MAUNGA SBD TH	249	0.56	0.73	0.18	
TE MAUNGA SBD RT	477	0.59	0.73	0.14	
TE MAUNGA NBD LT	535	0.33	0.60	0.27	
TE MAUNGA NBD TH	279	0.45	0.89	0.44	
TE MAUNGA SH29 LT	422	1.22	0.63	-0.59	
TE MAUNGA SH29 RT	511	1.47	0.76	-0.70	
		3799	3980		
Approach	AIMSUN PM				
	Flow	Delay (minutes)			
MGI SBD LT	583	0.48	1.29	0.81	
MGI SBD TH	351	1.21	1.22	0.00	
MGI SBD RT	193	1.23	2.31	1.07	
MGI GIRVEN LT	409	0.78	0.38	-0.40	
MGI GIRVEN TH	141	0.75	0.71	-0.04	
MGI GIRVEN RT	434	0.77	1.47	0.70	
MGI NBD LT	162	0.38	0.56	0.17	
MGI NBD TH	172	0.60	0.51	-0.10	
MGI NBD RT	572	1.08	0.98	-0.09	
MGI MATAPIHI LT	90	1.03	1.26	0.23	
MGI MATAPIHI TH	102	0.98	1.12	0.15	
MGI MATAPIHI RT	77	1.13	1.67	0.54	
TE MAUNGA SBD TH	299	1.66	1.45	-0.21	
TE MAUNGA SBD RT	643	1.70	1.45	-0.24	
TE MAUNGA NBD LT	780	0.55	0.43	-0.13	
TE MAUNGA NBD TH	286	1.06	2.02	0.96	
TE MAUNGA SH29 LT	505	2.44	1.31	-1.13	
TE MAUNGA SH29 RT	794	2.30	2.09	-0.21	
		8139	8215		

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**Option 3 2016**

Approach	<u>AIMSUN AM</u>		<u>TTM</u>		
	Flow	Delay (minutes)	Flow	Delay (minutes)	
MGI SBD LT	298	0.27	0.49	0.21	
MGI SBD TH	158	0.65	0.48	-0.18	
MGI SBD RT	196	1.10	1.12	0.03	
MGI GIRVEN LT	179	0.27	0.28	0.01	
MGI GIRVEN TH	116	0.50	0.55	0.04	
MGI GIRVEN RT	462	0.51	1.11	0.60	
MGI NBD LT	34	0.43	0.47	0.04	
MGI NBD TH	383	0.70	0.47	-0.23	
MGI NBD RT	222	1.00	0.69	-0.31	
MGI MATAPIHI LT	102	1.34	1.01	-0.33	
MGI MATAPIHI TH	38	0.87	0.59	-0.28	
MGI MATAPIHI RT	34	0.89	0.58	-0.31	
TE MAUNGA SBD TH	0	0.00	0.50	0.50	
TE MAUNGA SBD RT	217	0.80	0.61	-0.18	
TE MAUNGA NBD LT	538	0.54	0.16	-0.37	
TE MAUNGA NBD TH	0	0.00	0.03	0.03	
TE MAUNGA SH29 LT	640	0.17	0.22	0.05	
TE MAUNGA SH29 RT	456	0.14	0.28	0.14	
		2080	2051		
Approach	<u>AIMSUN IP</u>		Flow	Delay (minutes)	
	Flow	Delay (minutes)			
MGI SBD LT	461	0.32	0.58	0.25	
MGI SBD TH	145	0.60	0.54	-0.06	
MGI SBD RT	237	1.46	1.20	-0.26	
MGI GIRVEN LT	240	0.49	0.30	-0.19	
MGI GIRVEN TH	153	0.80	0.56	-0.24	
MGI GIRVEN RT	431	0.80	1.03	0.23	
MGI NBD LT	35	0.64	0.54	-0.10	
MGI NBD TH	116	0.74	0.52	-0.22	
MGI NBD RT	206	2.12	0.73	-1.39	
MGI MATAPIHI LT	102	1.23	1.04	-0.19	
MGI MATAPIHI TH	81	0.84	0.72	-0.12	
MGI MATAPIHI RT	51	0.82	0.66	-0.16	
TE MAUNGA SBD TH	0	0.00	0.49	0.49	
TE MAUNGA SBD RT	272	0.63	0.58	-0.06	
TE MAUNGA NBD LT	317	0.47	0.16	-0.31	
TE MAUNGA NBD TH	0	0.00	0.01	0.01	
TE MAUNGA SH29 LT	361	0.12	0.16	0.05	
TE MAUNGA SH29 RT	331	0.11	0.22	0.12	
		2352	2002		
Approach	<u>AIMSUN PM</u>		Flow	Delay (minutes)	
	Flow	Delay (minutes)			
MGI SBD LT	624	0.50	0.88	0.38	
MGI SBD TH	403	0.86	0.83	-0.03	
MGI SBD RT	249	1.25	1.84	0.59	
MGI GIRVEN LT	386	0.37	0.30	-0.06	
MGI GIRVEN TH	118	0.53	0.60	0.07	
MGI GIRVEN RT	468	1.61	1.17	-0.45	
MGI NBD LT	42	0.52	0.46	-0.06	
MGI NBD TH	147	0.56	0.43	-0.13	
MGI NBD RT	296	0.96	0.71	-0.25	
MGI MATAPIHI LT	85	1.46	1.17	-0.29	
MGI MATAPIHI TH	78	1.29	1.09	-0.19	
MGI MATAPIHI RT	45	1.18	0.66	-0.52	
TE MAUNGA SBD TH	0	0.00	0.53	0.53	
TE MAUNGA SBD RT	577	0.72	0.66	-0.06	
TE MAUNGA NBD LT	451	0.43	0.12	-0.30	
TE MAUNGA NBD TH	0	0.00	0.02	0.02	
TE MAUNGA SH29 LT	485	0.17	0.23	0.05	
TE MAUNGA SH29 RT	649	0.25	0.32	0.07	
		3449	3338		

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**Option 3 2026**

Approach	AIMSUN AM		TTM		
	Flow	Delay (minutes)	Flow	Delay (minutes)	
MGI SBD LT	292	0.33	0.52	0.19	
MGI SBD TH	166	0.71	0.51	-0.21	
MGI SBD RT	171	1.13	1.26	0.13	
MGI GIRVEN LT	249	0.25	0.28	0.02	
MGI GIRVEN TH	120	0.58	0.57	-0.01	
MGI GIRVEN RT	420	0.64	0.94	0.30	
MGI NBD LT	36	0.46	0.46	0.00	
MGI NBD TH	373	0.64	0.45	-0.19	
MGI NBD RT	266	0.91	0.79	-0.12	
MGI MATAPIHI LT	98	1.12	1.04	-0.08	
MGI MATAPIHI TH	40	0.85	0.70	-0.15	
MGI MATAPIHI RT	52	0.80	0.82	0.02	
TE MAUNGA SBD TH	0	0.47	0.60	0.13	
TE MAUNGA SBD RT	252	0.85	0.72	-0.13	
TE MAUNGA NBD LT	743	0.49	0.37	-0.12	
TE MAUNGA NBD TH	0	0.00	0.05	0.05	
TE MAUNGA SH29 LT	676	0.24	0.23	-0.01	
TE MAUNGA SH29 RT	688	0.21	0.30	0.09	
		2380	2371		

Approach	AIMSUN IP			
	Flow	Delay (minutes)		
MGI SBD LT	380	0.38	0.63	0.26
MGI SBD TH	155	0.63	0.62	-0.01
MGI SBD RT	224	2.55	1.44	-1.11
MGI GIRVEN LT	351	0.63	0.36	-0.26
MGI GIRVEN TH	160	1.24	0.62	-0.62
MGI GIRVEN RT	414	0.91	1.19	0.27
MGI NBD LT	36	0.60	0.58	-0.02
MGI NBD TH	135	0.48	0.56	0.08
MGI NBD RT	233	1.12	1.11	0.00
MGI MATAPIHI LT	93	0.95	1.39	0.44
MGI MATAPIHI TH	74	0.73	0.93	0.21
MGI MATAPIHI RT	59	0.76	0.94	0.17
TE MAUNGA SBD TH	0	0.27	0.63	0.36
TE MAUNGA SBD RT	321	0.67	0.72	0.05
TE MAUNGA NBD LT	465	0.53	0.26	-0.27
TE MAUNGA NBD TH	0	0.00	0.02	0.02
TE MAUNGA SH29 LT	404	0.13	0.17	0.03
TE MAUNGA SH29 RT	482	0.13	0.24	0.11
		2721	2520	

Approach	AIMSUN PM			
	Flow	Delay (minutes)		
MGI SBD LT	595	0.85	1.15	0.30
MGI SBD TH	374	1.16	1.08	-0.08
MGI SBD RT	211	2.44	2.00	-0.44
MGI GIRVEN LT	459	0.42	0.32	-0.09
MGI GIRVEN TH	120	0.84	0.63	-0.21
MGI GIRVEN RT	428	3.13	1.31	-1.82
MGI NBD LT	46	1.11	0.46	-0.65
MGI NBD TH	156	1.06	0.41	-0.65
MGI NBD RT	318	1.93	1.03	-0.90
MGI MATAPIHI LT	81	1.43	1.35	-0.08
MGI MATAPIHI TH	74	1.34	0.79	-0.55
MGI MATAPIHI RT	67	1.25	1.16	-0.09
TE MAUNGA SBD TH	0	0.00	0.77	0.77
TE MAUNGA SBD RT	604	0.74	0.89	0.15
TE MAUNGA NBD LT	758	0.54	0.30	-0.24
TE MAUNGA NBD TH	0	0.00	0.03	0.03
TE MAUNGA SH29 LT	520	0.33	0.26	-0.07
TE MAUNGA SH29 RT	921	0.31	0.42	0.11
		5537	4252	



**Option 3 2031**

Approach	<u>AIMSUN AM</u>		<u>TTM</u>	
	Flow	Delay (minutes)	Flow	Delay (minutes)
MGI SBD LT	288	0.32	0.58	0.26
MGI SBD TH	152	0.68	0.55	-0.13
MGI SBD RT	173	1.42	1.42	0.00
MGI GIRVEN LT	283	0.43	0.32	-0.11
MGI GIRVEN TH	132	0.82	0.62	-0.20
MGI GIRVEN RT	405	0.88	1.02	0.14
MGI NBD LT	38	0.44	0.50	0.05
MGI NBD TH	373	0.62	0.49	-0.13
MGI NBD RT	257	0.86	1.03	0.17
MGI MATAPIHI LT	93	1.11	1.32	0.21
MGI MATAPIHI TH	41	0.81	0.86	0.05
MGI MATAPIHI RT	57	0.82	1.01	0.19
TE MAUNGA SBD TH	0	0.02	0.58	0.56
TE MAUNGA SBD RT	241	0.78	0.70	-0.08
TE MAUNGA NBD LT	785	0.54	0.50	-0.04
TE MAUNGA NBD TH	0	0.00	0.07	0.07
TE MAUNGA SH29 LT	665	0.24	0.24	0.00
TE MAUNGA SH29 RT	789	0.22	0.32	0.10
		2626	2740	
Approach	<u>AIMSUN IP</u>			
	Flow	Delay (minutes)	Flow	Delay (minutes)
MGI SBD LT	428	0.40	0.66	0.26
MGI SBD TH	144	0.76	0.63	-0.13
MGI SBD RT	222	1.44	1.44	0.00
MGI GIRVEN LT	357	0.52	0.37	-0.15
MGI GIRVEN TH	174	0.87	0.62	-0.25
MGI GIRVEN RT	406	0.82	1.18	0.36
MGI NBD LT	38	0.55	0.58	0.04
MGI NBD TH	134	0.63	0.56	-0.07
MGI NBD RT	238	1.11	1.27	0.16
MGI MATAPIHI LT	94	1.31	1.43	0.12
MGI MATAPIHI TH	76	1.02	0.96	-0.07
MGI MATAPIHI RT	66	1.00	1.02	0.02
TE MAUNGA SBD TH	0	0.42	0.62	0.20
TE MAUNGA SBD RT	310	0.78	0.71	-0.07
TE MAUNGA NBD LT	519	0.57	0.36	-0.22
TE MAUNGA NBD TH	0	0.00	0.03	0.03
TE MAUNGA SH29 LT	410	0.14	0.17	0.03
TE MAUNGA SH29 RT	553	0.13	0.24	0.11
		2576	2692	
Approach	<u>AIMSUN PM</u>			
	Flow	Delay (minutes)	Flow	Delay (minutes)
MGI SBD LT	594	0.76	1.26	0.50
MGI SBD TH	365	1.16	1.18	0.02
MGI SBD RT	209	2.37	2.22	-0.15
MGI GIRVEN LT	493	0.42	0.36	-0.06
MGI GIRVEN TH	134	0.72	0.68	-0.04
MGI GIRVEN RT	429	1.05	1.38	0.33
MGI NBD LT	46	1.71	0.50	-1.21
MGI NBD TH	152	1.72	0.44	-1.28
MGI NBD RT	314	3.00	1.44	-1.55
MGI MATAPIHI LT	84	1.34	1.45	0.11
MGI MATAPIHI TH	73	1.25	1.04	-0.21
MGI MATAPIHI RT	74	1.26	1.08	-0.19
TE MAUNGA SBD TH	0	0.76	0.73	-0.03
TE MAUNGA SBD RT	605	0.75	0.85	0.11
TE MAUNGA NBD LT	782	0.60	0.37	-0.23
TE MAUNGA NBD TH	0	0.00	0.04	0.04
TE MAUNGA SH29 LT	516	0.45	0.27	-0.18
TE MAUNGA SH29 RT	999	0.34	0.50	0.16
		5194	4768	

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**Option 4 2016**

Approach	<u>AIMSUN AM</u>		<u>TTM</u>	
	Flow	Delay (minutes)	Flow	Delay (minutes)
MGI SBD LT	294	0.27	0.49	0.22
MGI SBD TH	209	0.53	0.48	-0.05
MGI SBD RT	149	1.24	0.81	-0.43
MGI GIRVEN LT	173	0.31	0.28	-0.03
MGI GIRVEN TH	92	0.47	0.53	0.06
MGI GIRVEN RT	466	0.78	1.09	0.31
MGI NBD LT	66	0.26	0.48	0.22
MGI NBD TH	398	0.45	0.47	0.03
MGI NBD RT	227	0.63	0.69	0.06
MGI MATAPIHI LT	108	0.87	0.59	-0.28
MGI MATAPIHI TH	37	0.53	0.46	-0.07
MGI MATAPIHI RT	60	0.57	0.53	-0.04
TE MAUNGA SBD TH	0	0.00	0.46	0.46
TE MAUNGA SBD RT	310	0.65	0.58	-0.08
TE MAUNGA NBD LT	531	0.52	0.15	-0.36
TE MAUNGA NBD TH	0	0.00	0.03	0.03
TE MAUNGA SH29 LT	646	0.20	0.22	0.02
TE MAUNGA SH29 RT	456	0.18	0.28	0.09
		2009	1987	

Approach	<u>AIMSUN IP</u>		Flow	Delay (minutes)
	Flow	Delay (minutes)		
MGI SBD LT	452	0.33	0.58	0.25
MGI SBD TH	175	0.59	0.54	-0.06
MGI SBD RT	209	1.27	0.92	-0.35
MGI GIRVEN LT	249	0.35	0.30	-0.05
MGI GIRVEN TH	129	0.53	0.56	0.03
MGI GIRVEN RT	440	0.71	1.03	0.32
MGI NBD LT	65	0.26	0.54	0.28
MGI NBD TH	149	0.45	0.52	0.07
MGI NBD RT	225	0.65	0.74	0.09
MGI MATAPIHI LT	93	0.91	0.58	-0.33
MGI MATAPIHI TH	80	0.74	0.54	-0.20
MGI MATAPIHI RT	69	0.74	0.60	-0.15
TE MAUNGA SBD TH	0	0.00	0.47	0.47
TE MAUNGA SBD RT	353	0.62	0.56	-0.06
TE MAUNGA NBD LT	318	0.42	0.16	-0.25
TE MAUNGA NBD TH	0	0.00	0.01	0.01
TE MAUNGA SH29 LT	374	0.15	0.17	0.01
TE MAUNGA SH29 RT	325	0.16	0.22	0.06
		1870	1947	

Approach	<u>AIMSUN PM</u>		Flow	Delay (minutes)
	Flow	Delay (minutes)		
MGI SBD LT	600	0.49	0.88	0.39
MGI SBD TH	433	0.92	0.83	-0.09
MGI SBD RT	215	1.23	1.41	0.18
MGI GIRVEN LT	388	0.43	0.30	-0.12
MGI GIRVEN TH	100	0.64	0.59	-0.05
MGI GIRVEN RT	469	0.88	1.19	0.31
MGI NBD LT	70	0.29	0.47	0.18
MGI NBD TH	201	0.57	0.43	-0.14
MGI NBD RT	323	0.87	0.74	-0.13
MGI MATAPIHI LT	83	0.92	0.71	-0.21
MGI MATAPIHI TH	87	0.90	0.66	-0.24
MGI MATAPIHI RT	74	0.92	0.77	-0.15
TE MAUNGA SBD TH	0	0.45	0.55	0.09
TE MAUNGA SBD RT	666	0.46	0.67	0.21
TE MAUNGA NBD LT	454	0.40	0.12	-0.27
TE MAUNGA NBD TH	0	0.00	0.02	0.02
TE MAUNGA SH29 LT	498	0.22	0.24	0.02
TE MAUNGA SH29 RT	648	0.40	0.33	-0.07
		3090	3292	

**Option 4 2026**

Approach	<u>AIMSUN AM</u>		<u>TTM</u>		
	Flow	Delay (minutes)	Flow	Delay (minutes)	
MGI SBD LT	267	0.27	0.57	0.30	
MGI SBD TH	200	0.55	0.56	0.01	
MGI SBD RT	143	1.00	1.02	0.02	
MGI GIRVEN LT	260	0.33	0.32	-0.02	
MGI GIRVEN TH	82	0.49	0.60	0.10	
MGI GIRVEN RT	402	0.67	1.07	0.40	
MGI NBD LT	70	0.27	0.50	0.23	
MGI NBD TH	391	0.46	0.49	0.03	
MGI NBD RT	256	0.75	0.90	0.15	
MGI MATAPIHI LT	98	0.80	0.79	-0.01	
MGI MATAPIHI TH	44	0.56	0.62	0.06	
MGI MATAPIHI RT	78	0.62	1.00	0.38	
TE MAUNGA SBD TH	0	0.96	0.52	-0.44	
TE MAUNGA SBD RT	340	0.71	0.64	-0.08	
TE MAUNGA NBD LT	735	0.43	0.34	-0.09	
TE MAUNGA NBD TH	0	0.00	0.05	0.05	
TE MAUNGA SH29 LT	681	0.27	0.23	-0.04	
TE MAUNGA SH29 RT	667	0.27	0.30	0.03	
	4,716	2185	2437		

Approach	<u>AIMSUN IP</u>			
	Flow	Delay (minutes)		
MGI SBD LT	379	0.33	0.64	0.30
MGI SBD TH	176	0.62	0.62	-0.01
MGI SBD RT	207	1.35	1.09	-0.26
MGI GIRVEN LT	380	0.39	0.33	-0.06
MGI GIRVEN TH	128	0.55	0.58	0.03
MGI GIRVEN RT	442	0.70	1.04	0.34
MGI NBD LT	68	0.28	0.56	0.28
MGI NBD TH	159	0.46	0.53	0.07
MGI NBD RT	254	0.77	0.95	0.17
MGI MATAPIHI LT	97	1.07	0.79	-0.29
MGI MATAPIHI TH	82	0.87	0.73	-0.15
MGI MATAPIHI RT	85	0.89	1.09	0.20
TE MAUNGA SBD TH	0	0.47	0.60	0.13
TE MAUNGA SBD RT	407	0.63	0.69	0.06
TE MAUNGA NBD LT	461	0.55	0.25	-0.30
TE MAUNGA NBD TH	0	0.00	0.02	0.02
TE MAUNGA SH29 LT	427	0.17	0.17	0.00
TE MAUNGA SH29 RT	473	0.18	0.24	0.06
	4,226	2247	2407	

Approach	<u>AIMSUN PM</u>			
	Flow	Delay (minutes)		
MGI SBD LT	595	0.50	1.15	0.65
MGI SBD TH	385	0.93	1.09	0.16
MGI SBD RT	200	1.28	1.68	0.40
MGI GIRVEN LT	462	0.40	0.40	0.00
MGI GIRVEN TH	92	0.63	0.65	0.03
MGI GIRVEN RT	433	0.76	1.39	0.63
MGI NBD LT	74	0.39	0.54	0.15
MGI NBD TH	193	0.65	0.48	-0.17
MGI NBD RT	310	1.28	1.53	0.25
MGI MATAPIHI LT	88	1.03	1.08	0.05
MGI MATAPIHI TH	84	1.13	0.91	-0.22
MGI MATAPIHI RT	88	1.15	1.48	0.33
TE MAUNGA SBD TH	0	0.57	0.69	0.12
TE MAUNGA SBD RT	686	0.52	0.81	0.30
TE MAUNGA NBD LT	705	0.39	0.25	-0.14
TE MAUNGA NBD TH	0	0.00	0.03	0.03
TE MAUNGA SH29 LT	503	0.36	0.26	-0.10
TE MAUNGA SH29 RT	909	0.70	0.41	-0.29
	5,807	3773	4441	

Option 4 2031					
Approach	AIMSUN AM		TTM		
	Flow	Delay (minutes)	Delay (minutes)		
MGI SBD LT	278	0.29	0.58	0.29	
MGI SBD TH	192	0.55	0.56	0.02	
MGI SBD RT	140	1.00	1.04	0.04	
MGI GIRVEN LT	301	0.36	0.32	-0.04	
MGI GIRVEN TH	91	0.52	0.60	0.08	
MGI GIRVEN RT	402	0.68	1.03	0.35	
MGI NBD LT	73	0.29	0.50	0.21	
MGI NBD TH	379	0.46	0.49	0.03	
MGI NBD RT	252	0.80	1.03	0.23	
MGI MATAPIHI LT	99	0.87	0.79	-0.08	
MGI MATAPIHI TH	50	0.63	0.67	0.05	
MGI MATAPIHI RT	84	0.71	1.10	0.39	
TE MAUNGA SBD TH	0	0.63	0.51	-0.11	
TE MAUNGA SBD RT	338	0.53	0.63	0.09	
TE MAUNGA NBD LT	772	0.42	0.44	0.02	
TE MAUNGA NBD TH	0	0.00	0.07	0.07	
TE MAUNGA SH29 LT	666	0.31	0.24	-0.06	
TE MAUNGA SH29 RT	747	0.34	0.32	-0.01	
	4,864	2289	2620		
Approach	AIMSUN IP				
	Flow	Delay (minutes)			
MGI SBD LT	413	0.34	0.66	0.32	
MGI SBD TH	168	0.62	0.63	0.01	
MGI SBD RT	201	1.26	1.11	-0.15	
MGI GIRVEN LT	383	0.39	0.33	-0.06	
MGI GIRVEN TH	130	0.59	0.58	-0.01	
MGI GIRVEN RT	444	0.72	1.06	0.34	
MGI NBD LT	72	0.32	0.57	0.25	
MGI NBD TH	160	0.46	0.53	0.07	
MGI NBD RT	251	0.84	1.09	0.25	
MGI MATAPIHI LT	103	1.14	0.84	-0.31	
MGI MATAPIHI TH	85	0.97	0.72	-0.24	
MGI MATAPIHI RT	87	1.02	1.16	0.14	
TE MAUNGA SBD TH	0	0.60	0.59	0.00	
TE MAUNGA SBD RT	400	0.62	0.68	0.05	
TE MAUNGA NBD LT	506	0.38	0.33	-0.06	
TE MAUNGA NBD TH	0	0.00	0.03	0.03	
TE MAUNGA SH29 LT	426	0.21	0.17	-0.05	
TE MAUNGA SH29 RT	514	0.24	0.24	0.00	
	4,342	2300	2554		
Approach	AIMSUN PM				
	Flow	Delay (minutes)			
MGI SBD LT	595	0.52	1.22	0.70	
MGI SBD TH	382	0.95	1.15	0.19	
MGI SBD RT	199	1.42	1.72	0.29	
MGI GIRVEN LT	492	0.43	0.39	-0.04	
MGI GIRVEN TH	99	0.68	0.66	-0.03	
MGI GIRVEN RT	435	0.75	1.38	0.64	
MGI NBD LT	78	0.68	0.53	-0.15	
MGI NBD TH	194	0.99	0.47	-0.51	
MGI NBD RT	306	1.99	1.73	-0.27	
MGI MATAPIHI LT	90	1.00	0.92	-0.08	
MGI MATAPIHI TH	92	1.14	0.89	-0.25	
MGI MATAPIHI RT	91	1.14	1.51	0.37	
TE MAUNGA SBD TH	0	0.80	0.66	-0.14	
TE MAUNGA SBD RT	687	0.94	0.78	-0.15	
TE MAUNGA NBD LT	766	0.39	0.34	-0.05	
TE MAUNGA NBD TH	0	0.00	0.04	0.04	
TE MAUNGA SH29 LT	501	0.69	0.27	-0.42	
TE MAUNGA SH29 RT	991	0.53	0.49	-0.04	
total Veh-mn	5998	4528	4744		
MGI veh-mn		2717			
TeMaunga Veh-mn		1811			

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Appendix C

## Methodology for Agglomeration and WEBS

## Methodology

Wider economic benefits for the MGI project were calculated based on the methodology prescribed by NZTA for the evaluation of RoNS projects, and the NZTA research report 448.

The wider economic benefits were focused around commuting costs and home-to-work trips. The majority of these trips take place during the morning peak, so only the AM peak was analysed.

The following steps were undertaken to measure labour supply impacts, labour demand impacts, and agglomeration:

1. Data Extraction and Pre-processing

GDP data, industry incomes, and regional GDP data was extracted from the Statistics New Zealand website through the Linked Employer Employee Database (LEED). Employment data from the 2006 census and the Tauranga Traffic Model (TTM) was also extracted.

To account for different dates in data, and for different catchment areas and populations, the GDP per worker was calculated based on the Bay of Plenty regional GDP and total GDP for the census catchment, the model catchment, and the LEED catchments were adjusted. The census meshblock data was also merged into comparable zones with the TTM models to allow further analysis.

The employment outputs from the TTM data also needed to be adjusted. The TTM model split employment into non-retail and retail wages, while the LEED data had a number of different categories. Weighted retail and non-retail wages were calculated to provide suitable wages for the TTM data.

2. Calculation of GDP per worker and GSP (residence-based GDP) per worker

Two measures of GDP per worker are needed:

- GDP per worker (based on the employment zone)
- GSP per worker (based on the residence zone)

The GSP per worker was calculated based on census data after filtering out hidden values. These values were hidden by Statistics New Zealand to prevent identification of individual incomes for smaller meshblocks. GSP per worker for each zone was calculated, weighted by the median incomes for the zone.

The GDP per worker was calculated with a similar methodology, using the TTM data instead.

2016 and 2026 GSP and GDP per worker were calculated by assuming 1.1% linear growth in GDP from 2012.

### 3. Calculation of Labour Supply Benefits

Labour supply impacts estimate the extent that additional workers are attracted to the existing pattern of jobs due to their travel costs being reduced. The change in commuting costs was calculated based on the TTM model outputs and the RoNs methodology was followed.

The following parameters were used:

Elasticity	0.4
New entrant penalty	0.81
Tax rate on new entrant	0.26
GDP growth rate (p.a)	1.1%

### 4. Calculation of Labour Demand Impacts

All zones in the TTM model were ranked by percentile based on reductions in commuting travel time. A factor of 0.4% increase in employment was applied to the zones which were in the 95<sup>th</sup> percentile or above, with zones receiving less travel time reduction scaled accordingly.

### 5. Agglomeration Benefits

The average generalised cost equation was calculated based on TTM outputs. To calculate effective density, travel time was used as a proxy for distance. Neighbouring zones were defined as zones with travel times of less than 5 minutes away.

Appendix D

**BCR Calculations**

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**ASSUMPTIONS SHEET**

**Project:** Maunganui Girven and Te Maunga Intersection Upgrade  
**Component:** Nov-13

**Time Period**

Time Zero:	2014
Base Date:	2012
Discount rate:	6%
Analysis year:	40

**Options**

Code	Name	Description
DM	Do Minimum	MGI=existing roundabout, TeMaunga=TEL designated layout
Opt1	Option 1	Grade Separation of SH2 Through Movements at both intersection, Signalling both intersection, no rail track relocation
Opt2	Option 2	Grade Separation of SH2 Through Movements at both intersection, Signalling both intersection, with rail track relocation
Opt3	Option 3	Grade Separation of SH2 Through Movements at both intersection, Signalling MGI, Grade Separation of rail at Te Maunga, with rail track relocation
Opt3c	Option 3c	

**Unit Cost Values**

Table: RUCRATES

Modelled Period	AM	IP	PM	Off peak	Weekend	All Period	Notes	
<b>NATIONAL EQUITY RESOURCE VALUES OF TIME, \$2002/hour</b>								
Urban Arterial								
Travel Time Costs, \$/hr	35%	15.13	17.95	14.96	14.93	14.09	16.27	
Congestion Time Costs, \$/hr	35%	3.88	3.6	3.79	3.68	4.26	3.95	
Rural Strategic								
Travel Time Costs, \$/hr	65%	25.34	25.34	25.34	25.34	19.21	23.25	
Congestion Time Costs, \$/hr	65%	4.23	4.23	4.23	4.23	5.22	4.39	
Composite								
Travel Time Costs, \$/hr		21.7665	22.7535	21.707	21.6965	17.418	20.807	
Congestion Time Costs, \$/hr		4.1075	4.0095	4.076	4.0375	4.884	4.236	
<b>National Equity Value</b>						<b>23.72 \$2007</b>		
						<b>4.83 \$2007</b>		
<b>\$2007</b>								
<b>LOCAL RESOURCE VOT, \$/hour</b>				<b>LOCAL USER VOT, \$/hour</b>				
Class	Time	CRV	Class %	Time	CRV	User/Resource	Description	
C1	\$12.39	\$2.26	14%	\$14.25	\$2.60	1.15	Home-Based Work	
C2	\$8.43	\$1.54	11%	\$9.70	\$1.77	1.15	Home-Based Shopping	
C3	\$8.43	\$1.54	28%	\$9.70	\$1.77	1.15	Home-Based Other	
C4	\$38.95	\$7.09	16%	\$38.95	\$7.09	1.00	Employers Business	
C5	\$8.43	\$1.54	26%	\$9.70	\$1.77	1.15	Non Home-Based Other	
C6	\$22.40	\$4.08	5%	\$22.40	\$4.08	1.00	MCV/HCV	
AVG	\$14.13	\$2.57	100%	\$15.79	\$2.88	1.12	Weighted-Average	
Equity Adjustment							1.68	
Correction Factor for Variability:							100%	EEM Table A4.6
VOC User Adjustment							1.2	
CO2 % of VOC							4.0%	EEM Page A9-9
Reliability % of TT							8.0%	
Crash Cost Adjustment for VTM							1.00	
<b>Update Factors, to base date:</b>		2013						
Travel Time Costs	2012/2007:	1.23	1.14					
Vehicle Operating Costs	2008 base VOC	1.06						
Accident Costs	2006 Base Ax	1.22						

**Annualisation**

Table: ANNUAL

Modelled Period	AM	IP	PM				Notes
1 Daily/annual periods:	(1-hr models)						
2 Periods per weekday peak	2	5.747	2.8365				
3 Off Peak		2.853					
4 Weekdays per year	245	245	245				
5 Periods per weekend		10.583	1.773				
6 Weekends per year		120	60				
7 <b>Weekday interpeak to off peak correction:</b>							
8 VOC		1					Factors so weekday results can be used for off peak
9 TT Cost:		0.954					
10 CRV Costs		1.007					
11 <b>Weekday to weekend correction:</b>							
12 VOC		1	1				Factors so weekday results can be used for weekends
13 TT Cost:		0.766	0.802				
14 CRV Costs		1.218	1.198				
15 <b>Annual Factors:</b>							
16 VOC	490.0	3377.0	801.3				
17 TTC	490.0	3046.7	780.3				
18 CRV	490.0	3658.8	822.4				

<b>COST ESTIMATES, \$</b>							
Description	Cost, \$	Factor	DM	Opt1	Opt2	Opt3	Opt3c
<b>Land Purchase</b>							
Opt1	18,478,405	1.00		18,478,405			
Opt2	5,768,854	1.00			5,768,854		
Opt3	15,090,036	1.00				15,090,036	
Opt4	14,249,166	1.00					14,249,166
<b>Total Land Purchase</b>			-	18,478,405	5,768,854	15,090,036	14,249,166
<b>LAND Disposal</b>							
Opt1	- 15,040,126	1.00	-	15,040,126			
Opt2	- 6,275,908	1.00			6,275,908		
Opt3	- 9,114,596	1.00				9,114,596	
Opt4	- 9,114,596	1.00					9,114,596
<b>Total Land Disposal</b>			-	15,040,126	6,275,908	9,114,596	9,114,596
<b>Design</b>							
Opt1	1,495,000	1.00		1,495,000			
Opt2	2,219,500	1.00			2,219,500		
Opt3	2,553,000	1.00				2,553,000	
Opt4	2,646,500	1.00					2,646,500
<b>Total Design Cost</b>			-	1,495,000	2,219,500	2,553,000	2,646,500
<b>Construction \$ MSQA</b>							
Opt1	70,971,622	1.00		70,971,622			
Opt2	78,638,019	1.00			78,638,019		
Opt3	104,770,016	1.00				104,770,016	
Opt4	96,850,562	1.00					96,850,562
<b>Total Construction</b>			-	70,971,622	78,638,019	104,770,016	96,850,562
<b>ANNUAL MAINTENANCE</b>							
Opt1	20,000	1.00		20,000			
Opt2	20,000	1.00			20,000		
Opt3	20,000	1.00				20,000	
DM	20,000	1.00	20,000				
Opt4	20,000	1.00					20,000
<b>Total Annual Maintenance</b>			20,000	20,000	20,000	20,000	20,000
<b>PERIODIC MAINTENANCE</b>							
DM	1,913,250	1.00	1,913,250				
Opt1	1,941,400	1.00		1,941,400			
Opt2	1,928,000	1.00			1,928,000		
Opt3	2,502,000	1.00				2,502,000	
Opt4	2,502,000	1.00					2,502,000
<b>Total Periodic Maintenance</b>			1,913,250	1,941,400	1,928,000	2,502,000	2,502,000
<b>TOTAL CAPITAL</b>			-	75,904,901	80,350,466	113,298,455	104,631,631
<b>Total</b>			1,933,250	77,866,301	82,298,466	115,820,455	107,153,631

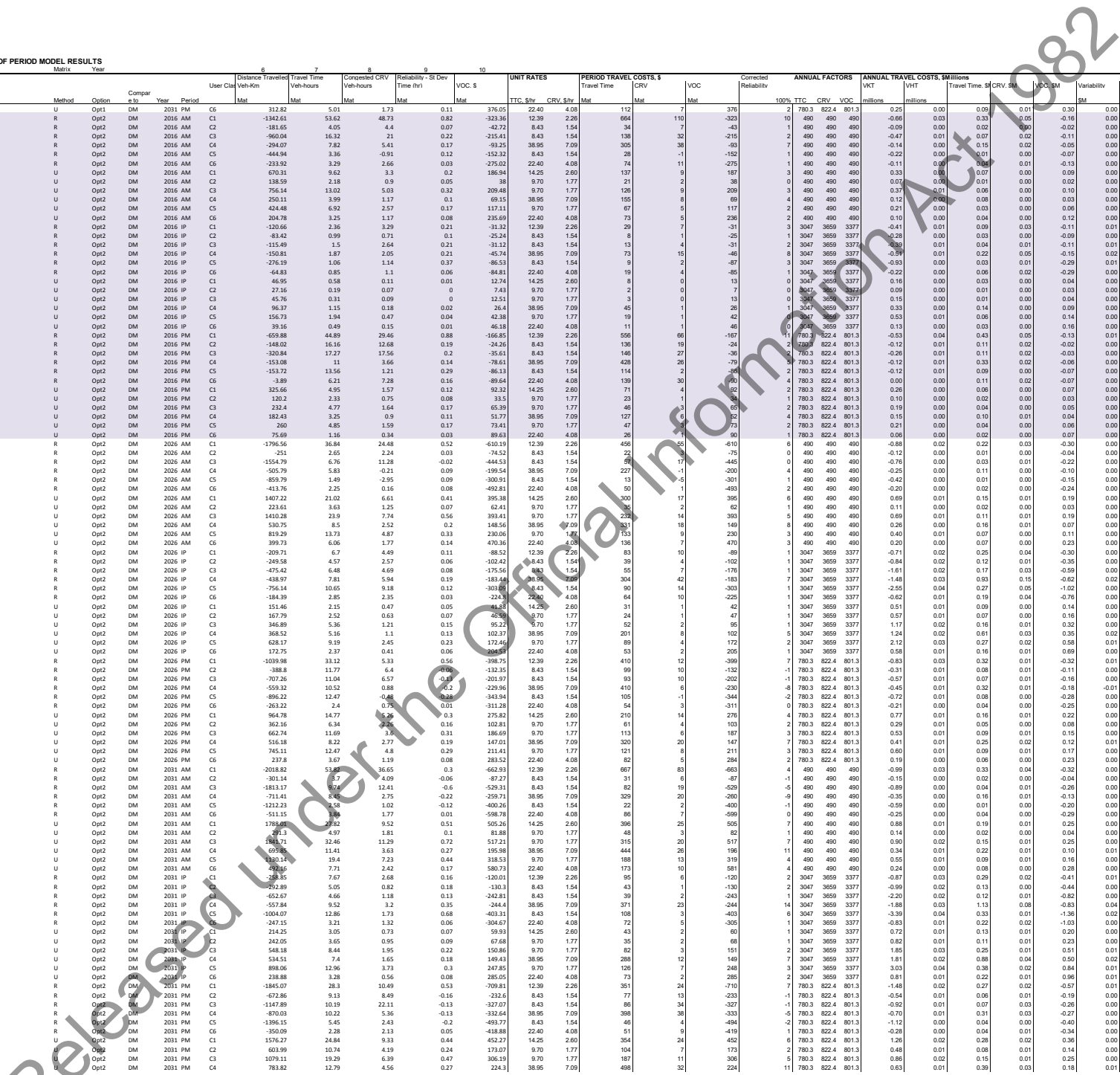


SUMMARY OF PERIOD MODEL RESULTS

R/R DATA	Matrix		Year	Period	User Class	Distance Traveled Veh-Km	Travel Time Veh-hours	Consolidated CRV Veh-hours	Reliability - St Dev Time (hr)	VOC \$	UNIT RATES	PERIOD TRAVEL CRV \$	VOC	Corrected Reliability	ANNUAL FACTORS				Travel Time St CRV SM	VOC SM	Variability SM	TOTAL SM														
	Method														Option	Compar	Year	Period					Mat	Mat	Mat	Mat	TTC	CRV	VOC	VOC	100% TFC	CRV	VOC	VHT	VHT	VHT
	Method	Option																																		
Option 1	R	Opt1	DM	2016	AM	C1	-1280.46	50.17	46.66	0.46	-312.41	12.39	2.26	622	106	-312	0	490	490	490	-0.63	0.02	0.30	0.05	-0.15	0.00	0.21									
Option 1	R	Opt1	DM	2016	AM	C2	-187.97	3.43	4.63	0.02	-42.73	8.43	1.54	30	7	-43	0	490	490	490	-0.09	0.00	0.01	0.00	-0.02	0.00	0.00									
Option 1	R	Opt1	DM	2016	AM	C3	-958.02	14.16	20.55	0.01	-214.97	8.43	1.54	119	32	-215	0	490	490	490	-0.47	0.01	0.06	0.02	-0.11	0.00	-0.03									
Option 1	R	Opt1	DM	2016	AM	C4	-294.53	5.46	6.5	0.05	-69.2	38.95	7.09	263	69	-69	2	490	490	490	-0.14	0.00	0.02	0.01	-0.04	0.00	0.15									
Option 1	R	Opt1	DM	2016	AM	C5	-472.67	1.28	-0.46	-0.01	-147.73	8.43	1.54	11	-1	-148	0	490	490	490	-0.23	0.00	0.01	0.00	-0.07	0.00	-0.07									
Option 1	R	Opt1	DM	2016	AM	C6	-238.01	2.68	2.39	0.01	-279.65	22.40	4.08	60	10	-280	0	490	490	490	-0.12	0.00	0.03	0.00	-0.14	0.00	-0.10									
Option 1	U	Opt1	DM	2016	AM	C1	652.36	9.33	3.16	0.39	181.85	14.25	2.60	133	8	133	3	490	490	490	0.32	0.00	0.07	0.00	0.09	0.00	0.16									
Option 1	U	Opt1	DM	2016	AM	C2	112.75	0.86	0.99	0.05	23.6	9.70	1.77	20	3	23	0	490	490	490	0.10	0.00	0.01	0.00	0.02	0.00	0.03									
Option 1	U	Opt1	DM	2016	AM	C3	711.19	12.16	4.68	0.3	196.92	9.70	1.77	118	8	197	3	490	490	490	0.35	0.01	0.06	0.00	0.10	0.00	0.18									
Option 1	U	Opt1	DM	2016	AM	C4	240.19	3.79	1.09	0.1	66.51	38.95	7.09	148	8	148	4	490	490	490	0.12	0.00	0.03	0.00	0.03	0.00	0.11									
Option 1	U	Opt1	DM	2016	AM	C5	407.1	6.57	2.43	0.15	112.41	9.70	1.77	84	4	112	1	490	490	490	0.20	0.00	0.03	0.00	0.06	0.00	0.09									
Option 1	U	Opt1	DM	2016	AM	C6	202.04	3.17	1.11	0.08	232.6	22.40	4.08	71	4	233	2	490	490	490	0.10	0.00	0.03	0.00	0.03	0.00	0.11									
Option 1	R	Opt1	DM	2016	IP	C1	-120.24	1.89	2.65	0.19	-32.62	12.39	2.26	23	6	-33	2	3047	3659	3377	-0.41	0.01	0.07	0.02	-0.11	0.01	-0.01									
Option 1	R	Opt1	DM	2016	IP	C2	-96.07	0.40	0.52	0.09	-30.11	8.43	1.54	4	1	-30	1	3047	3659	3377	-0.32	0.00	0.01	0.00	-0.10	0.00	-0.08									
Option 1	R	Opt1	DM	2016	IP	C3	-152.21	0.85	2.58	0.2	-42.5	8.43	1.54	7	4	-43	2	3047	3659	3377	-0.51	0.00	0.02	0.01	-0.14	0.01	-0.10									
Option 1	R	Opt1	DM	2016	IP	C4	-140.75	0.55	0.61	0.11	-46.24	38.95	7.09	21	4	-46	4	3047	3659	3377	-0.44	0.00	0.07	0.02	-0.16	0.01	-0.06									
Option 1	R	Opt1	DM	2016	IP	C5	-295.11	0.4	0.4	0.33	-85.63	8.43	1.54	-3	1	-86	3	3047	3659	3377	-0.38	0.00	-0.01	0.00	0.02	0.00	-0.29									
Option 1	R	Opt1	DM	2016	IP	C6	-61.67	0.61	0.76	0.06	-83.33	22.40	4.08	14	3	-83	1	3047	3659	3377	-0.21	0.00	0.04	0.01	-0.28	0.00	-0.22									
Option 1	U	Opt1	DM	2016	IP	C1	47.6	0.6	0.11	0.00	12.9	14.25	2.60	9	0	9	0	3047	3659	3377	0.16	0.00	0.03	0.00	0.04	0.00	0.07									
Option 1	U	Opt1	DM	2016	IP	C2	29.95	0.27	0.08	0	8.15	9.70	1.77	3	0	8	0	3047	3659	3377	0.10	0.00	0.01	0.00	0.03	0.00	0.04									
Option 1	U	Opt1	DM	2016	IP	C3	49.99	0.42	0.12	0	13.61	9.70	1.77	4	0	14	0	3047	3659	3377	0.17	0.00	0.01	0.00	0.05	0.00	0.06									
Option 1	U	Opt1	DM	2016	IP	C4	99.68	1.21	0.17	0.03	27.14	38.95	7.09	47	1	27	0	3047	3659	3377	0.34	0.00	0.14	0.00	0.09	0.00	0.24									
Option 1	U	Opt1	DM	2016	IP	C5	154.74	1.96	0.43	0.04	41.77	9.70	1.77	19	1	42	0	3047	3659	3377	0.52	0.01	0.08	0.00	0.14	0.00	0.20									
Option 1	U	Opt1	DM	2016	IP	C6	34.83	0.44	0.13	0.01	40.97	22.40	4.08	10	-1	41	0	3047	3659	3377	0.12	0.00	0.03	0.00	0.14	0.00	0.17									
Option 1	R	Opt1	DM	2016	PM	C1	-635.64	41.84	15.9	0.77	-165.28	12.39	2.26	518	16	-166	0	490	490	490	-0.51	0.01	0.06	0.03	-0.40	0.00	1.28									
Option 1	R	Opt1	DM	2016	PM	C2	-138.12	15.15	10.76	0.18	-20.44	8.43	1.54	128	17	-20	2	780.3	822.4	801.3	-0.11	0.01	0.10	0.01	-0.02	0.00	0.10									
Option 1	R	Opt1	DM	2016	PM	C3	-327.04	15.96	39.1	0.16	-36.59	8.43	1.54	135	25	-37	1	780.3	822.4	801.3	-0.26	0.01	0.11	0.02	-0.03	0.00	0.10									
Option 1	R	Opt1	DM	2016	PM	C4	-154.63	9.5	1.45	0.09	-74.73	38.95	7.09	370	10	-75	1	780.3	822.4	801.3	-0.12	0.01	0.29	0.01	-0.06	0.00	0.24									
Option 1	R	Opt1	DM	2016	PM	C5	-188.53	12.19	-0.08	0.11	-87.25	8.43	1.54	103	9	-87	1	780.3	822.4	801.3	-0.15	0.01	0.08	0.00	-0.07	0.00	0.18									
Option 1	R	Opt1	DM	2016	PM	C6	6.96	5.89	6.7	0.15	87.87	22.40	4.08	132	27	88	4	780.3	822.4	801.3	0.00	0.00	0.10	0.02	-0.07	0.00	0.08									
Option 1	U	Opt1	DM	2016	PM	C1	319.79	4.84	1.5	0.12	90.51	14.25	2.60	69	4	91	2	780.3	822.4	801.3	0.26	0.00	0.05	0.00	0.07	0.00	0.13									
Option 1	U	Opt1	DM	2016	PM	C2	103.57	2.05	0.62	0.07	28.8	9.70	1.77	20	1	29	1	780.3	822.4	801.3	0.08	0.00	0.02	0.00	0.02	0.00	0.04									
Option 1	U	Opt1	DM	2016	PM	C3	230.65	4.65	1.52	0.16	64.45	9.70	1.77	45	3	45	2	780.3	822.4	801.3	0.18	0.00	0.04	0.00	0.05	0.00	0.09									
Option 1	U	Opt1	DM	2016	PM	C4	185.51	3.85	0.26	0.11	52.3	38.95	7.09	127	1	127	4	780.3	822.4	801.3	0.15	0.00	0.10	0.01	0.04	0.00	0.11									
Option 1	U	Opt1	DM	2016	PM	C5	241.44	4.51	1.4	0.16	68.07	9.70	1.77	44	2	44	2	780.3	822.4	801.3	0.19	0.00	0.03	0.00	0.05	0.00	0.09									
Option 1	U	Opt1	DM	2016	PM	C6	70.85	1.08	0.3	0.03	84.03	22.40	4.08	24	4	24	1	780.3	822.4	801.3	0.06	0.00	0.02	0.00	0.07	0.00	0.09									
Option 1	R	Opt1	DM	2026	AM	C1	-1837.16	33.79	17.73	0.29	-627.69	12.39	2.26	419	20	-428	0	490	490	490	-0.90	0.02	0.21	0.02	-0.31	0.00	-0.08									
Option 1	R	Opt1	DM	2026	AM	C2	-249.74	1.43	0.94	0.01	-74.74	8.43	1.54	16	3	-74	0	490	490	490	-0.12	0.00	0.01	0.00	-0.04	0.00	0.01									
Option 1	R	Opt1	DM	2026	AM	C3	-1598.3	2.3	7.12	-0.24	-464.6	8.43	1.54	19	6	-465	-2	490	490	490	-0.78	0.00	0.01	0.01	-0.23	0.00	-0.21									
Option 1	R	Opt1	DM	2026	AM	C4	-546.44	3.85	-1.6	0	-209.2	38.95	7.09	150	-11	-209	0	490	490	490	-0.27	0.00	0.07	-0.01	-0.10	0.00	-0.03									
Option 1	R	Opt1	DM	2026	AM	C5	-892.68	-1.84	-3.51	-0.01	-301.95	8.43	1.54	16	-5	-302	0	490	490	490	-0.44	0.00	-0.01	0.00	-0.15	0.00	-0.16									
Option 1	R	Opt1	DM	2026	AM	C6	-439.49	0.23	-1.51	0.23	-22.40	38.95	7.09	34	24	-23	4	490	490	490	-0.22	0.00	0.05	0.00	-0.09	0.00	-0.04									
Option 1	U	Opt1	DM	2026	AM	C1	1440.75	21.43	6.77	0.41	440.73	14.25	2.60	308	14	308	6	490	490	490	0.71	0.01	0.15	0.01	0.20	0.00	0.28									
Option 1	U	Opt1	DM	2026	AM	C2	217.08	3.5	1.21	0.07	60.53	9.70	1.77	34	2	34	2	490	490	490	0.11	0.00	0.02	0.00	0.03	0.00	0.05									
Option 1	U	Opt1	DM																																	

SUMMARY OF PERIOD MODEL RESULTS

Table with columns: RUN DATA, Matrix, Year, User Class, Distance Traveled, Travel Time, Consented CRV, Reliability, ST Dev, UNIT RATES, PERIOD TRAVEL, COSTS, \$, ANNUAL FACTORS, ANNUAL TRAVEL COSTS, \$, VARIABILITY, TOTAL \$M. The table contains multiple rows of data for different options and years.



SUMMARY OF PERIOD MODEL RESULTS

RUN DATA		6				7			8			9			10			PERIOD TRAVEL		COSTS, \$		ANNUAL FACTORS				ANNUAL TRAVEL COSTS, \$Millions			
Method	Year	Matrix	Year	Period	User Class	Distance	Travelled	Travel Time	Consolidated	Reliability	Std Dev	VOC	UNIT RATES	Travel Time	Travel Time	VOC	Corrected	100%	TTC	CRV	VOC	VKT	VHT	Travel Time	Std Dev	CRV	VOC	Variability	TOTAL
Option Name	Method	Option	Compar	Year	Period	Mat	Veh-Km	Min	Veh-Hours	Mat	Mat	Mat	TTC	CRV	CRV	Mat	Rel	TTC	CRV	CRV	Mat	Millions	Millions	Min	Mat	Mat	Mat	SM	SM
Option 2	U	Opt2	DM	2016	PM	C5	1076.06	18.58	7.18	0.42		308.38	9.70	1.77	180	13	308	4	780.3	822.4	801.3	0.86	0.01	0.14	0.01	0.25	0.00	0.40	
Option 2	U	Opt2	DM	2016	AM	C6	333.19	5.28	1.8	0.11		399.78	22.40	4.08	116	7	400	2	780.3	822.4	801.3	0.27	0.00	0.09	0.01	0.32	0.00	0.42	
Option 2	R	Opt3	DM	2031	AM	C1	-1405.88	52.96	49.9	0.2	-0.12	-1318.64	12.39	2.28	688	193	-319	2	490	490	490	-0.69	0.03	0.32	0.06	-0.16	0.00	0.22	
Option 2	R	Opt3	DM	2016	AM	C4	-382	5.04	4.05	-0.04	-0.22	-384	8.43	1.54	164	34	-38	0	490	490	490	-0.09	0.01	0.07	0.01	-0.02	0.00	0.14	
Option 3	R	Opt3	DM	2016	AM	C3	-951.94	16.46	24.2	-0.21	-0.12	-192.96	8.43	1.54	139	37	-193	-2	490	490	490	-0.47	0.01	0.07	0.02	-0.09	0.00	-0.01	
Option 3	R	Opt3	DM	2016	AM	C4	-330.53	7.29	6.44	0	-0.24	-92.48	38.95	7.09	284	46	-92	0	490	490	490	-0.16	0.00	0.14	0.02	-0.05	0.00	0.12	
Option 3	R	Opt3	DM	2016	AM	C5	-496.41	1.91	0.91	-0.08	-0.04	-156.31	8.43	1.54	16	0	-156	0	490	490	490	-0.24	0.00	0.00	0.00	-0.08	0.00	-0.07	
Option 3	R	Opt3	DM	2016	AM	C6	-248.73	2.8	2.69	-0.08	-0.04	-276.28	22.40	4.08	60	8	-276	1	490	490	490	-0.12	0.00	0.00	0.00	-0.04	0.00	-0.10	
Option 3	U	Opt3	DM	2016	AM	C1	625.14	8.99	2.93	0.2	0.2	173.4	14.25	2.60	128	8	173	3	490	490	490	0.31	0.00	0.00	0.00	0.08	0.00	0.15	
Option 3	U	Opt3	DM	2016	AM	C2	130.29	2.06	0.86	0.04	0.04	35.69	9.70	1.77	20	2	35	0	490	490	490	0.06	0.00	0.01	0.00	0.02	0.00	0.03	
Option 3	U	Opt3	DM	2016	AM	C3	696.38	12.18	4.56	0.31	0.31	192.42	9.70	1.77	118	8	192	3	490	490	490	0.34	0.00	0.01	0.00	0.09	0.00	0.16	
Option 3	U	Opt3	DM	2016	AM	C4	229.01	3.64	1.03	0.1	0.1	63.3	38.95	7.09	142	7	63	4	490	490	490	0.11	0.00	0.01	0.00	0.03	0.00	0.11	
Option 3	U	Opt3	DM	2016	AM	C5	496.6	6.64	2.41	0.16	0.16	112.71	9.70	1.77	64	4	113	2	490	490	490	0.20	0.00	0.03	0.00	0.06	0.00	0.09	
Option 3	U	Opt3	DM	2016	AM	C6	192.53	3.04	1.05	0.08	0.08	221.65	22.40	4.08	68	4	193	2	490	490	490	0.09	0.00	0.03	0.00	0.11	0.00	0.14	
Option 3	R	Opt3	DM	2016	IP	C1	-116.07	1.14	2.89	0.07	-0.25	-25.77	12.39	2.28	14	7	-26	1	3047	3659	3377	-0.39	0.00	0.04	0.02	-0.09	0.00	-0.02	
Option 3	R	Opt3	DM	2016	IP	C2	-103.6	0.01	0.52	-0.01	-0.21	-28.16	8.43	1.54	10	1	-28	0	3047	3659	3377	-0.35	0.00	0.00	0.00	-0.10	0.00	-0.09	
Option 3	R	Opt3	DM	2016	IP	C3	-153.89	2.99	2.99	0.06	-0.37	-37.25	8.43	1.54	-3	3	-37	1	3047	3659	3377	-0.59	0.00	-0.01	0.01	-0.15	0.00	-0.12	
Option 3	R	Opt3	DM	2016	IP	C4	-177.47	-0.67	0.47	0.14	-0.49	-49.61	38.95	7.09	-26	3	-50	5	3047	3659	3377	-0.60	0.00	-0.08	0.01	-0.17	0.02	-0.22	
Option 3	R	Opt3	DM	2016	IP	C5	-356.21	-2.48	-1.07	0.25	-1.07	-107.73	8.43	1.54	-21	-2	-107	2	3047	3659	3377	-1.20	-0.01	-0.08	-0.01	-0.36	0.01	-0.43	
Option 3	R	Opt3	DM	2016	IP	C6	-60.4	-0.16	0.6	0.05	-0.75	-75.54	22.40	4.08	-4	2	-72	1	3047	3659	3377	-0.20	0.00	-0.01	0.01	-0.24	0.00	-0.24	
Option 3	U	Opt3	DM	2016	IP	C1	25.57	0.31	0.1	0.01	0.01	6.92	14.25	2.60	4	0	4	0	3047	3659	3377	0.09	0.00	0.01	0.00	0.03	0.00	0.04	
Option 3	U	Opt3	DM	2016	IP	C2	-0.02	-0.01	-0.02	0	0	2.78	9.70	1.77	0	0	0	0	3047	3659	3377	0.03	0.00	0.00	0.00	0.01	0.00	0.01	
Option 3	U	Opt3	DM	2016	IP	C3	5.42	-0.24	-0.16	-0.02	-0.12	9.70	1.77	-2	0	0	0	0	3047	3659	3377	0.02	0.00	-0.01	0.00	0.00	0.00	0.00	
Option 3	U	Opt3	DM	2016	IP	C4	80.09	0.8	0	0.01	0.21	21.82	38.95	7.09	31	0	22	0	3047	3659	3377	0.27	0.00	0.09	0.00	0.07	0.00	0.17	
Option 3	U	Opt3	DM	2016	IP	C5	116.54	1.37	0.24	0.03	0.21	32.05	9.70	1.77	13	0	13	0	3047	3659	3377	0.40	0.00	0.04	0.00	0.16	0.00	0.16	
Option 3	U	Opt3	DM	2016	IP	C6	21.3	0.22	0.07	0	0	25.81	22.40	4.08	5	0	26	0	3047	3659	3377	0.07	0.00	0.02	0.00	0.09	0.00	0.10	
Option 3	R	Opt3	DM	2016	PM	C1	-883.03	45.69	2.28	0.39	-0.11	-181.33	12.39	2.28	566	77	-181	5	780.3	822.4	801.3	-0.71	0.04	0.04	0.06	-0.15	0.00	0.38	
Option 3	R	Opt3	DM	2016	PM	C2	-242	17.02	13.72	0.05	-0.35	-36.51	8.43	1.54	144	21	-37	1	780.3	822.4	801.3	-0.19	0.01	0.11	0.02	-0.03	0.00	0.10	
Option 3	R	Opt3	DM	2016	PM	C3	-473.05	17.04	18.15	-0.07	-0.47	-55.47	8.43	1.54	144	21	-37	1	780.3	822.4	801.3	-0.25	0.01	0.11	0.02	-0.04	0.00	0.05	
Option 3	R	Opt3	DM	2016	PM	C4	-260.46	2.04	3.71	-0.02	-0.37	-93.76	38.95	7.09	409	28	-49	-1	780.3	822.4	801.3	-0.21	0.01	0.32	0.02	-0.08	0.00	0.28	
Option 3	R	Opt3	DM	2016	PM	C5	-349.31	12.65	1	0.11	-123.38	8.43	1.54	107	2	-223	1	780.3	822.4	801.3	-0.28	0.01	0.08	0.00	-0.10	0.00	-0.01		
Option 3	R	Opt3	DM	2016	PM	C6	-22.58	5.73	7.26	0.12	-105.32	22.40	4.08	128	30	-105	3	780.3	822.4	801.3	-0.02	0.00	0.10	0.02	-0.08	0.00	0.04		
Option 3	U	Opt3	DM	2016	PM	C1	304.5	4.78	1.55	0.13	86.44	14.25	2.60	98	4	98	2	780.3	822.4	801.3	0.24	0.00	0.05	0.00	0.07	0.00	0.13		
Option 3	U	Opt3	DM	2016	PM	C2	133.78	0.93	2.16	0.09	36.57	9.70	1.77	25	0	25	0	780.3	822.4	801.3	0.11	0.00	0.01	0.00	0.02	0.00	0.03		
Option 3	U	Opt3	DM	2016	PM	C3	280.78	5.67	1.95	0.2	78.75	9.70	1.77	55	0	55	0	780.3	822.4	801.3	0.22	0.00	0.04	0.00	0.06	0.00	0.11		
Option 3	U	Opt3	DM	2016	PM	C4	211.7	3.73	1.05	0.12	59.78	38.95	7.09	145	8	145	0	780.3	822.4	801.3	0.17	0.00	0.11	0.00	0.05	0.00	0.17		
Option 3	U	Opt3	DM	2016	PM	C5	312.08	5.81	1.92	0.2	87.82	9.70	1.77	56	3	56	3	780.3	822.4	801.3	0.25	0.00	0.04	0.00	0.07	0.00	0.12		
Option 3	U	Opt3	DM	2016	PM	C6	107.09	8.53	11.76	0.03	93.39	22.40	4.08	27	2	27	1	780.3	822.4	801.3	0.08	0.00	0.05	0.00	0.02	0.00	0.06		
Option 3	R	Opt3	DM	2026	AM	C1	-2203.36	40.28	40.93	-0.25	-669.15	12.39	2.28	499	9	-499	-3	490	490	490	-1.08	0.02	0.24	0.05	-0.33	0.00	-0.04		
Option 3	R	Opt3	DM	2026	AM	C2	-339.3	2.57	3.42	-0.06	-93.3	8.43	1.54	22	5	-93	-2	490	490	490	-0.17	0.00	0.01	0.00	-0.05	0.00	-0.03		
Option 3	R	Opt3	DM	2026	AM	C3	-2000.82	5.07	16.68	-0.5	-552.52	8.43	1.54	43	28	-553	-4	490	490	490	-0.98	0.00	0.02	0.01	-0.27	0.00	-0.24		
Option 3	R	Opt3	DM	2026	AM	C4	-719.21	2.5	4.1	-0.17	-340.88	38.95	7.09	199	11	-341	-1	490	490	490	-0.55	0.00	0.21	0.01	-0.10	0.01	-0.07		
Option 3	R	Opt3	DM	2026	AM	C5	-1149.52	-0.36	-0.11	-0.24	-364.33	8.43	1.54	-3	0	-364	-2	490	490	490	-0.56	0.00	0.00	0.00	-0.16	0.00	-0.18		
Option 3	R</																												

SUMMARY OF PERIOD MODEL RESULTS

Method	Matrix		Year		User Class	Distance Traveled Veh-Km	Travel Time Veh-Hours	Consolidated CRV Veh-Hours	Reliability - St Dev		10	UNIT RATES			PERIOD TRAVEL COSTS, \$		Corrected Reliability		ANNUAL FACTORS			ANNUAL TRAVEL COSTS, \$ Millions			Variability		TOTAL SM				
	Method	Option	Year	Period					Mat	Mat		Mat	Mat	Mat	Mat	UNIT RATES			PERIOD TRAVEL COSTS, \$		Corrected Reliability		ANNUAL FACTORS			ANNUAL TRAVEL COSTS, \$ Millions			Variability		
																TRC	Shr	CRV	Shr	Mat	Mat	Mat	100% TRC	TRC	VOC	millions		VHT	Travel Time	CRV	VOC
Option 3	U	Opt3	DM	2031	PM	C4	1164.83	18.85	6.61	0.41	332.94	38.95	7.09	734	47	333	16	780.3	822.4	801.3	0.83	0.02	0.57	0.04	0.27	0.01	0.80				
Option 3	U	Opt3	DM	2031	PM	C5	1638.2	27.9	10.83	0.62	468.45	9.70	1.77	271	19	488	6	780.3	822.4	801.3	1.31	0.02	0.21	0.01	0.38	0.00	0.61				
Option 3	U	Opt3	DM	2031	PM	C6	463.74	7.29	2.43	0.16	551.81	22.40	4.08	163	10	552	4	780.3	822.4	801.3	0.37	0.01	0.13	0.01	0.44	0.00	0.58				
Option 3c	R	Opt3c	DM	2016	AM	C1	1138.77	19.29	6.61	0.41	332.94	38.95	7.09	734	47	333	16	780.3	822.4	801.3	0.83	0.02	0.57	0.04	0.27	0.01	0.80				
Option 3c	R	Opt3c	DM	2016	AM	C2	-167.69	4.22	5	-0.02	-34.4	8.43	1.54	36	8	-34	0	490	490	490	-0.08	0.00	0.02	0.00	-0.02	0.00	0.00				
Option 3c	R	Opt3c	DM	2016	AM	C3	-821.85	17.57	24.38	-0.1	-155.78	8.43	1.54	148	37	-156	-1	490	490	490	-0.40	0.01	0.07	0.02	-0.08	0.00	0.01				
Option 3c	R	Opt3c	DM	2016	AM	C4	-353.88	6.87	6.02	-0.01	-65.03	38.95	7.09	209	14	-65	0	490	490	490	-0.16	0.00	0.02	0.00	-0.06	0.00	0.00				
Option 3c	R	Opt3c	DM	2016	AM	C5	-500.66	1.19	-0.48	-0.07	-160.32	8.43	1.54	16	-14	-160	-1	490	490	490	-0.25	0.00	0.00	0.00	-0.08	0.00	-0.08				
Option 3c	R	Opt3c	DM	2016	AM	C6	-251.26	2.95	3.38	-0.08	-276.22	22.40	4.08	57	11	-276	-1	490	490	490	-0.12	0.00	0.01	0.01	-0.14	0.00	-0.16				
Option 3c	U	Opt3c	DM	2016	AM	C1	634.3	7.75	2.18	0.01	31.51	14.25	2.60	110	6	159	3	490	490	490	0.05	0.00	0.05	0.00	0.07	0.00	0.13				
Option 3c	U	Opt3c	DM	2016	AM	C2	116.17	1.84	0.75	0.04	31.51	9.70	1.77	19	1	32	0	490	490	490	0.00	0.00	0.01	0.00	0.02	0.00	0.03				
Option 3c	U	Opt3c	DM	2016	AM	C3	575.42	10.43	3.79	0.26	158.98	9.70	1.77	101	6	159	3	490	490	490	0.00	0.01	0.05	0.00	0.08	0.00	0.13				
Option 3c	U	Opt3c	DM	2016	AM	C4	219.63	3.48	0.93	0.09	60.51	38.95	7.09	138	7	61	3	490	490	490	0.11	0.00	0.07	0.00	0.03	0.00	0.10				
Option 3c	U	Opt3c	DM	2016	AM	C5	384.42	6.23	2.2	0.15	105.38	9.70	1.77	80	4	105	2	490	490	490	0.19	0.00	0.03	0.00	0.05	0.00	0.08				
Option 3c	U	Opt3c	DM	2016	AM	C6	171.91	0.92	0.27	0.02	201.12	22.40	4.08	62	4	201	2	490	490	490	0.09	0.00	0.03	0.00	0.10	0.00	0.13				
Option 3c	R	Opt3c	DM	2016	IP	C1	-93.22	0.28	3.14	-0.02	-17.11	12.39	2.28	3	7	-17	0	3047	3659	3377	-0.31	0.00	0.01	0.03	-0.08	0.00	-0.02				
Option 3c	R	Opt3c	DM	2016	IP	C2	77.2	0.04	1.18	-0.03	-18.04	8.43	1.54	0	2	-18	0	3047	3659	3377	-0.25	0.00	0.00	0.01	-0.06	0.00	-0.05				
Option 3c	R	Opt3c	DM	2016	IP	C3	-103.38	3.8	-0.23	-0.03	-17.87	8.43	1.54	-2	6	-17	0	3047	3659	3377	-0.35	0.00	-0.01	0.02	-0.06	0.00	-0.05				
Option 3c	R	Opt3c	DM	2016	IP	C4	-158.79	-0.09	0.4	-0.04	-41.72	38.95	7.09	-4	14	-42	-2	3047	3659	3377	-0.54	0.00	-0.01	0.05	-0.14	0.00	-0.11				
Option 3c	R	Opt3c	DM	2016	IP	C5	-308.56	-1.58	0.95	0.02	-90.07	8.43	1.54	-13	1	-90	0	3047	3659	3377	-1.04	-0.01	-0.04	0.01	-0.30	0.00	-0.34				
Option 3c	R	Opt3c	DM	2016	IP	C6	-65.96	1.35	-0.09	-0.03	-68.98	22.40	4.08	-2	5	-67	-1	3047	3659	3377	-0.22	0.00	-0.01	0.02	-0.03	0.00	-0.21				
Option 3c	U	Opt3c	DM	2016	IP	C1	12.41	-0.08	0.33	0.01	3.22	14.25	2.60	2	0	3	0	3047	3659	3377	0.04	0.00	0.01	0.00	0.01	0.00	0.02				
Option 3c	U	Opt3c	DM	2016	IP	C2	-18.04	-0.35	-0.18	-0.01	-4.73	9.70	1.77	-3	0	-5	0	3047	3659	3377	-0.08	0.00	0.00	0.00	-0.02	0.00	-0.03				
Option 3c	U	Opt3c	DM	2016	IP	C3	-62.98	-1.16	0.55	0.03	-17.08	9.70	1.77	-11	-1	-17	-1	3047	3659	3377	-0.21	0.00	0.03	0.00	-0.06	0.00	-0.10				
Option 3c	U	Opt3c	DM	2016	IP	C4	56.65	0.05	-0.13	0.01	15.47	38.95	7.09	20	-1	15	0	3047	3659	3377	0.19	0.00	0.08	0.00	0.05	0.00	0.11				
Option 3c	U	Opt3c	DM	2016	IP	C5	0.01	0.77	0.02	0.00	20.12	22.40	4.08	1	0	21	0	3047	3659	3377	0.03	0.00	0.02	0.00	0.02	0.00	0.07				
Option 3c	U	Opt3c	DM	2016	IP	C6	8.37	0.0	0	0	10.8	22.40	4.08	1	0	11	0	3047	3659	3377	0.03	0.00	0.00	0.00	0.04	0.00	0.04				
Option 3c	R	Opt3c	DM	2016	PM	C1	-708.9	45.7	38.87	-0.08	-107.23	12.39	2.28	566	90	-107	-10	780.3	822.4	801.3	-0.57	0.04	0.44	0.07	-0.09	0.00	0.43				
Option 3c	R	Opt3c	DM	2016	PM	C2	-177.28	15.27	6.63	-0.02	-42.63	16.15	2.94	149	-17	-149	-1	780.3	822.4	801.3	-0.14	0.01	0.12	0.02	-0.03	0.00	0.11				
Option 3c	R	Opt3c	DM	2016	PM	C3	-317.13	19.07	6.04	-0.08	-101.78	8.43	1.54	161	34	-111	-1	780.3	822.4	801.3	-0.25	0.02	0.13	0.03	-0.10	0.00	0.14				
Option 3c	R	Opt3c	DM	2016	PM	C4	-209.13	11.52	6.29	-0.04	-85.54	38.95	7.09	449	45	-82	-2	780.3	822.4	801.3	-0.17	0.01	0.35	0.04	-0.07	0.00	0.32				
Option 3c	R	Opt3c	DM	2016	PM	C5	-280.3	3.95	3.65	-0.01	-101.09	8.43	1.54	121	1	-102	-1	780.3	822.4	801.3	-0.21	0.00	0.01	0.09	-0.08	0.00	0.12				
Option 3c	R	Opt3c	DM	2016	PM	C6	-30.82	5.83	0.88	-0.08	-106.34	22.40	4.08	131	32	-106	-1	780.3	822.4	801.3	-0.02	0.00	0.10	0.03	-0.09	0.00	0.04				
Option 3c	U	Opt3c	DM	2016	PM	C1	234.39	3.77	1.03	0.11	66.29	14.25	2.60	54	3	66	2	780.3	822.4	801.3	0.19	0.00	0.04	0.00	0.05	0.00	0.10				
Option 3c	U	Opt3c	DM	2016	PM	C2	91.56	0.95	0.07	0.10	25.58	9.70	1.77	19	1	26	0	780.3	822.4	801.3	0.07	0.00	0.01	0.00	0.02	0.00	0.07				
Option 3c	U	Opt3c	DM	2016	PM	C3	195.76	4.34	1.35	0.17	54.84	9.70	1.77	42	2	45	0	780.3	822.4	801.3	0.16	0.00	0.03	0.00	0.04	0.00	0.08				
Option 3c	U	Opt3c	DM	2016	PM	C4	168.96	3.1	0.81	0.11	44.14	38.95	7.09	121	6	44	0	780.3	822.4	801.3	0.14	0.00	0.09	0.00	0.04	0.00	0.14				
Option 3c	U	Opt3c	DM	2016	PM	C5	439.12	1.57	0.88	0.18	73.70	9.70	1.77	46	3	73	0	780.3	822.4	801.3	0.18	0.00	0.04	0.00	0.04	0.00	0.14				
Option 3c	U	Opt3c	DM	2016	PM	C6	73.3	1.11	0.27	0.03	86.63	22.40	4.08	25	1	86	0	780.3	822.4	801.3	0.06	0.00	0.00	0.00	0.07	0.00	0.09				
Option 3c	R	Opt3c	DM	2026	AM	C1	-2041.97	38.25	32.63	-0.48	-632.8	12.39	2.28	474	271	-633	-6	490	490	490	-1.00	0.02	0.23	0.04	-0.31	0.00	-0.44				
Option 3c	R	Opt3c	DM	2026	AM	C2	-2011.73	4.5	2.64	-0.02	-811.73	8.43	1.54	22	7	-812	-1	490	490	490	-0.15	0.00	0.02	0.01	-0.04	0.00	-0.04				
Option 3c	R	Opt3c	DM	2026	AM	C3	-1829.96	5.82	24.94	-0.56	-479.01	8.43	1.54	49	20	-479	-5	490	490	490	-0.90	0.00	0.02	0.02	-0.23	0.00	-0.19				
Option 3c	R	Opt3c	DM	2026	AM	C4	-883.29	3.31	1.9	-0.25	-103.39	38.95	7.09	203	20	-103	-2	490	490	490	-0.33	0.00	0.01	0.10	-0.07	0.00	0.03				
Option 3c	R	Opt3c	DM	2026	AM	C5	-1062.35	8.48	1.58	-0.15	-335.25	8.43	1.54	4	2	-335	-1	490	490	490	-0.52	0.00	0.00	0.00	-0.16	0.00	-0.16				
Option 3c	R	Opt3c	DM	2026	AM	C6	-480.38	2.22	3.37	-0.08	-543.37	22.40	4.08	50	24	-543	-2	490	490	490	-0.24	0.00	0.02	0.01	-0.27	0.00	-0.24				
Option 3c	U	Opt3c	DM	2026	AM	C1	1385.68	6.19	2.02	0.43	388.64	14.25	2.60	6	3	389	6	490	490	490	0.06	0.00	0.14	0.01	0.16	0.00	0.26				
Option 3c	U	Opt3c	DM	2026	AM	C2	238.6	3.82	1.27	0.08	66.25	9.70	1.77	37	2	66	1	490	490	490	0.12	0.00	0.02	0.00	0.03	0.00	0.05				
Option 3c	U	Opt3c	DM	2026	AM	C3	1465.99	24.82	7.75	0.6	407.28	9.70	1.77	241	14	408	6	490	490	490	0.72	0.01	0.12	0.01	0.20	0.00	0.33				
Option 3c	U	Opt3c	DM	2026	AM	C4	575.64	2.6	3.13	0.22	191.58	38.95	7.09	366	16	576	6	490	490	490	0.28	0.00	0.17	0.01	0.17	0.00	0.27				
Option 3c	U	Opt3c	DM	2026	AM	C5	879.13	14.57	5.05	0.35	246.08	9.70	1.77	141	8	246	3	490	490	490	0.43	0.01	0.07								

ANNUAL MODEL RESULTS

\$2012

Update Factors: 1.23 1.23 1.23 1.06 1.23 1.22

2016

Option	Comapre to	Cost	Year	VKT	VHT	TTC	CRV	VOC	Ax	CO2	Other 1	Other 2	TOTAL
Opt1	DM	R	2016	-5.64	0.13	2.23	0.34	-2.11		0.89	-0.08		1.26
Opt1	DM	U	2016	3.48	0.05	0.99	0.05	1.28			0.05		2.37
Opt2	DM	R	2016	-5.59	0.16	2.77	0.44	-2.07		0.90	-0.08		1.96
Opt2	DM	U	2016	3.55	0.05	1.00	0.06	1.32			0.05		2.43
Opt3	DM	R	2016	-6.80	0.12	2.00	0.38	-2.21		0.99	-0.09		1.08
Opt3	DM	U	2016	3.06	0.05	0.88	0.04	1.12			0.04		2.08
Opt3c	DM	R	2016	-5.74	0.13	2.15	0.53	-1.78		0.86	-0.07		1.69
Opt3c	DM	U	2016	2.05	0.03	0.65	0.02	0.77			0.03		1.47

3.63  
4.38  
3.16  
3.16

3.22 0.39 -0.83  
3.77 0.50 -0.75  
2.88 0.42 -1.09

2026S2

Option	Comapre to	Cost	Year	VKT	VHT	TTC	CRV	VOC	Ax	CO2	Other 1	Other 2	TOTAL
Opt1	DM	R	2026	-11.78	0.16	2.85	0.15	-5.91		0.67	-0.24		-2.47
Opt1	DM	U	2026	10.24	0.16	2.91	0.15	3.87			0.15		7.09
Opt2	DM	R	2026	-13.54	0.22	3.99	0.47	-6.34		0.71	-0.25		-1.42
Opt2	DM	U	2026	11.34	0.17	3.26	0.18	4.28			0.17		7.89
Opt3	DM	R	2026	-18.83	0.22	4.00	0.89	-7.62		0.96	-0.30		-2.08
Opt3	DM	U	2026	13.34	0.20	3.80	0.21	4.96			0.20		9.17
Opt3c	DM	R	2026	-17.07	0.21	3.82	0.82	-7.15		0.93	-0.29		-1.86
Opt3c	DM	U	2026	11.25	0.17	3.27	0.18	4.23			0.17		7.85

4.62  
6.47  
7.09  
5.98

5.76 0.31 -2.04  
7.25 0.65 -2.05  
7.80 1.10 -2.66

2031

Option	Comapre to	Cost	Year	VKT	VHT	TTC	CRV	VOC	Ax	CO2	Other 1	Other 2	TOTAL
Opt1	DM	R	2031	-16.96	0.20	3.76	0.21	-8.15		0.57	-0.33		-3.94
Opt1	DM	U	2031	15.76	0.24	4.53	0.26	5.92			0.24		10.94
Opt2	DM	R	2031	-18.43	0.24	4.42	0.38	-8.63		0.61	-0.35		-3.56
Opt2	DM	U	2031	16.46	0.26	4.75	0.28	6.17			0.25		11.44
Opt3	DM	R	2031	-25.88	0.23	4.29	0.69	-10.77		0.94	-0.43		-5.28
Opt3	DM	U	2031	20.81	0.32	5.90	0.34	7.71			0.31		14.27
Opt3c	DM	R	2031	-22.51	0.29	5.28	0.88	-9.61		0.97	-0.38		-2.87
Opt3c	DM	U	2031	17.03	0.27	4.92	0.29	6.38			0.26		11.86

7.00  
7.88  
8.99  
8.98



Agglomeration - Option 3

Forecast Revenue		Year	
		2016	2026
DM			
OptC			
Gross	Cost savings \$/yr	\$596,118	\$867,649

257,302 730,058

Other WEB - Option 3

Forecast Revenue		Year	
		2016	2026
DM			
OptC			
Gross	Cost savings \$/yr	\$1,723,605	\$2,924,099

FY	Analysis Year	Cost Stream \$/yr	SPPWF	Include	Included Value \$M
2005/2006	-8		1.5938	0	
2006/2007	-7		1.5036	0	
2007/2008	-6		1.4185	0	
2008/2009	-5	\$378,893	1.3382	0	\$0.000
2009/2010	-4	\$406,046	1.2625	0	\$0.000
2010/2011	-3	\$433,199	1.1910	0	\$0.000
2011/2012	-2	\$460,353	1.1236	0	\$0.000
2012/2013	-1	\$487,506	1.0600	0	\$0.000
2013/2014	0	\$514,659	1.0000	0	\$0.000
2014/2015	1	\$541,812	0.9434	0	\$0.000
2015/2016	2	\$568,965	0.8900	0	\$0.000
2016/2017	3	<b>\$596,118</b>	0.8396	0	\$0.000
2017/2018	4	\$623,271	0.7921	0	\$0.000
2018/2019	5	\$650,424	0.7473	1	\$0.650
2019/2020	6	\$677,577	0.7050	1	\$0.678
2020/2021	7	\$704,730	0.6651	1	\$0.705
2021/2022	8	\$731,884	0.6274	1	\$0.732
2022/2023	9	\$759,037	0.5919	1	\$0.759
2023/2024	10	\$786,190	0.5584	1	\$0.786
2024/2025	11	\$813,343	0.5268	1	\$0.813
2025/2026	12	\$840,496	0.4970	1	\$0.840
2026/2027	13	<b>\$867,649</b>	0.4688	1	\$0.868
2027/2028	14	\$867,649	0.4423	1	\$0.868
2028/2029	15	\$867,649	0.4173	1	\$0.868
2029/2030	16	\$867,649	0.3936	1	\$0.868
2030/2031	17	\$867,649	0.3714	1	\$0.868
2031/2032	18	\$867,649	0.3503	1	\$0.868
2032/2033	19	\$867,649	0.3305	1	\$0.868
2033/2034	20	\$867,649	0.3118	1	\$0.868
2034/2035	21	\$867,649	0.2942	1	\$0.868
2035/2036	22	\$867,649	0.2775	1	\$0.868
2036/2037	23	\$867,649	0.2618	1	\$0.868
2037/2038	24	\$867,649	0.2470	1	\$0.868
2038/2039	25	\$867,649	0.2330	1	\$0.868
2039/2040	26	\$867,649	0.2198	1	\$0.868
2040/2041	27	\$867,649	0.2074	1	\$0.868
2041/2042	28	\$867,649	0.1956	1	\$0.868
2042/2043	29	\$867,649	0.1846	1	\$0.868
2043/2044	30	\$867,649	0.1741	1	\$0.868
2044/2045	31	\$867,649	0.1643	1	\$0.868
2045/2046	32	\$867,649	0.1550	1	\$0.868
2046/2047	33	\$867,649	0.1462	1	\$0.868
2047/2048	34	\$867,649	0.1379	1	\$0.868
2048/2049	35	\$867,649	0.1301	1	\$0.868
2049/2050	36	\$867,649	0.1227	1	\$0.868
2050/2051	37	\$867,649	0.1158	1	\$0.868
2051/2052	38	\$867,649	0.1092	1	\$0.868
2052/2053	39	\$867,649	0.1031	1	\$0.868
2053/2054	40	\$867,649	0.0972	1	\$0.868
2054/2055	41	\$867,649	0.0917	1	\$0.868
2055/2056	42	\$867,649	0.0865	0	\$0.000
2056/2057	43	\$867,649	0.0816	0	\$0.000
2057/2058	44	\$867,649	0.0770	0	\$0.000
2058/2059	45	\$867,649	0.0727	0	\$0.000
2059/2060	46	\$867,649	0.0685	0	\$0.000
2060/2061	47	\$867,649	0.0647	0	\$0.000
2061/2062	48	\$867,649	0.0610	0	\$0.000
2062/2063	49	\$867,649	0.0575	0	\$0.000
2063/2064	50	\$867,649	0.0543	0	\$0.000
2064/2065	51	\$867,649	0.0512	0	\$0.000
2065/2066	52	\$867,649	0.0483	0	\$0.000
2066/2067	53	\$867,649	0.0456	0	\$0.000
2067/2068	54	\$867,649	0.0430	0	\$0.000
2068/2069	55	\$867,649	0.0406	0	\$0.000
2069/2070	56	\$867,649	0.0383	0	\$0.000
2070/2071	57	\$867,649	0.0361	0	\$0.000
2071/2072	58	\$867,649	0.0341	0	\$0.000
2072/2073	59	\$867,649	0.0321	0	\$0.000
2073/2074	60	\$867,649	0.0303	0	\$0.000
2074/2075	61	\$867,649	0.0286	0	\$0.000
2075/2076	62	\$867,649	0.0270	0	\$0.000
2076/2077	63	\$867,649	0.0255	0	\$0.000
2077/2078	64	\$867,649	0.0240	0	\$0.000
2078/2079	65	\$867,649	0.0227	0	\$0.000
2079/2080	66	\$867,649	0.0214	0	\$0.000
<b>TOTAL NPV</b>					<b>\$31.126</b> <b>\$9.486</b>

FY	Analysis Year	Cost Stream \$/yr	SPPWF	Include	Included Value \$M
2005/2006	-8		1.5938	0	
2006/2007	-7		1.5036	0	
2007/2008	-6		1.4185	0	
2008/2009	-5	\$763,210	1.3382	0	\$0.000
2009/2010	-4	\$883,260	1.2625	0	\$0.000
2010/2011	-3	\$1,003,309	1.1910	0	\$0.000
2011/2012	-2	\$1,123,358	1.1236	0	\$0.000
2012/2013	-1	\$1,243,408	1.0600	0	\$0.000
2013/2014	0	\$1,363,457	1.0000	0	\$0.000
2014/2015	1	\$1,483,506	0.9434	0	\$0.000
2015/2016	2	\$1,603,556	0.8900	0	\$0.000
2016/2017	3	<b>\$1,723,605</b>	0.8396	0	\$0.000
2017/2018	4	\$1,843,655	0.7921	0	\$0.000
2018/2019	5	\$1,963,704	0.7473	1	\$1.964
2019/2020	6	\$2,083,753	0.7050	1	\$2.084
2020/2021	7	\$2,203,803	0.6651	1	\$2.204
2021/2022	8	\$2,323,852	0.6274	1	\$2.324
2022/2023	9	\$2,443,901	0.5919	1	\$2.444
2023/2024	10	\$2,563,951	0.5584	1	\$2.564
2024/2025	11	\$2,684,000	0.5268	1	\$2.684
2025/2026	12	\$2,804,049	0.4970	1	\$2.804
2026/2027	13	<b>\$2,924,099</b>	0.4688	1	\$2.924
2027/2028	14	\$2,924,099	0.4423	1	\$2.924
2028/2029	15	\$2,924,099	0.4173	1	\$2.924
2029/2030	16	\$2,924,099	0.3936	1	\$2.924
2030/2031	17	\$2,924,099	0.3714	1	\$2.924
2031/2032	18	\$2,924,099	0.3503	1	\$2.924
2032/2033	19	\$2,924,099	0.3305	1	\$2.924
2033/2034	20	\$2,924,099	0.3118	1	\$2.924
2034/2035	21	\$2,924,099	0.2942	1	\$2.924
2035/2036	22	\$2,924,099	0.2775	1	\$2.924
2036/2037	23	\$2,924,099	0.2618	1	\$2.924
2037/2038	24	\$2,924,099	0.2470	1	\$2.924
2038/2039	25	\$2,924,099	0.2330	1	\$2.924
2039/2040	26	\$2,924,099	0.2198	1	\$2.924
2040/2041	27	\$2,924,099	0.2074	1	\$2.924
2041/2042	28	\$2,924,099	0.1956	1	\$2.924
2042/2043	29	\$2,924,099	0.1846	1	\$2.924
2043/2044	30	\$2,924,099	0.1741	1	\$2.924
2044/2045	31	\$2,924,099	0.1643	1	\$2.924
2045/2046	32	\$2,924,099	0.1550	1	\$2.924
2046/2047	33	\$2,924,099	0.1462	1	\$2.924
2047/2048	34	\$2,924,099	0.1379	1	\$2.924
2048/2049	35	\$2,924,099	0.1301	1	\$2.924
2049/2050	36	\$2,924,099	0.1227	1	\$2.924
2050/2051	37	\$2,924,099	0.1158	1	\$2.924
2051/2052	38	\$2,924,099	0.1092	1	\$2.924
2052/2053	39	\$2,924,099	0.1031	1	\$2.924
2053/2054	40	\$2,924,099	0.0972	1	\$2.924
2054/2055	41	\$2,924,099	0.0917	1	\$2.924
2055/2056	42	\$2,924,099	0.0865	0	\$0.000
2056/2057	43	\$2,924,099	0.0816	0	\$0.000
2057/2058	44	\$2,924,099	0.0770	0	\$0.000
2058/2059	45	\$2,924,099	0.0727	0	\$0.000
2059/2060	46	\$2,924,099	0.0685	0	\$0.000
2060/2061	47	\$2,924,099	0.0647	0	\$0.000
2061/2062	48	\$2,924,099	0.0610	0	\$0.000
2062/2063	49	\$2,924,099	0.0575	0	\$0.000
2063/2064	50	\$2,924,099	0.0543	0	\$0.000
2064/2065	51	\$2,924,099	0.0512	0	\$0.000
2065/2066	52	\$2,924,099	0.0483	0	\$0.000
2066/2067	53	\$2,924,099	0.0456	0	\$0.000
2067/2068	54	\$2,924,099	0.0430	0	\$0.000
2068/2069	55	\$2,924,099	0.0406	0	\$0.000
2069/2070	56	\$2,924,099	0.0383	0	\$0.000
2070/2071	57	\$2,924,099	0.0361	0	\$0.000
2071/2072	58	\$2,924,099	0.0341	0	\$0.000
2072/2073	59	\$2,924,099	0.0321	0	\$0.000
2073/2074	60	\$2,924,099	0.0303	0	\$0.000
2074/2075	61	\$2,924,099	0.0286	0	\$0.000
2075/2076	62	\$2,924,099	0.0270	0	\$0.000
2076/2077	63	\$2,924,099	0.0255	0	\$0.000
2077/2078	64	\$2,924,099	0.0240	0	\$0.000
2078/2079	65	\$2,924,099	0.0227	0	\$0.000
2079/2080	66	\$2,924,099	0.0214	0	\$0.000
<b>TOTAL NPV</b>					<b>\$103.870</b> <b>\$31.296</b>

**Project Benefits - Discounting**

Scenario: **Opt1**  
 Compared to: **DM**  
 Method: **VTM**  
 Time Zero: **2014**

TT	1.679	Equity Factor	User Adjustment
CRV	1.679		
Reliability	1.679		
VOC	1.000		1.2

TRAVEL TIME	Scenario	Compared to	VTM Terms
Year	RC	UC	Benefits Adjusted
2016	2.23	0.99	3.22 5.41
2026S2	2.85	2.91	5.76 9.67
2031	3.76	4.53	8.28 13.91

CRV	Year	2016	2026S2	2031
2016	0.34	0.05	0.39	0.65
2026S2	0.15	0.15	0.31	0.52
2031	0.21	0.26	0.47	0.79

Crash	Year	2016	2026S2	2031
2016	0.89	0.00	0.89	0.89
2026S2	0.67	0.00	0.67	0.67
2031	0.57	0.00	0.57	0.57

VOC	Year	2016	2026S2	2031
2016	-2.11	1.28	-0.58	-0.58
2026S2	-5.31	1.87	-1.27	-1.27
2031	-8.15	5.92	-1.05	-1.05

Start Construction Construction Period: **2**  
 Benefits Start in year: **5**  
 Benefit Streams: \$/year

Model	SPPWF	FY	Analysis Year	Include	Travel Time	CRV	Crash	VOC	CO2	Total (included yea NPV)
1.0000	2005/2006	-8	0	0	0.73	0.80	1.12	0.18	0.01	0.00
1.0000	2006/2007	-7	0	0	1.15	0.79	1.10	0.11	0.00	0.00
1.0000	2007/2008	-6	0	0	1.58	0.78	1.08	0.00	0.00	0.00
1.0000	2008/2009	-5	0	0	2.00	0.76	1.06	-0.03	0.00	0.00
1.0000	2009/2010	-4	0	0	2.43	0.75	1.04	-0.10	0.00	0.00
1.0000	2010/2011	-3	0	0	2.86	0.73	1.02	-0.17	-0.01	0.00
1.0000	2011/2012	-2	0	0	3.28	0.72	1.00	-0.23	-0.01	0.00
1.0000	2012/2013	-1	0	0	3.71	0.71	0.97	-0.30	-0.01	0.00
1.0000	2013/2014	0	0	0	4.13	0.69	0.95	-0.37	-0.01	0.00
0.9434	2014/2015	1	0	0	4.56	0.68	0.93	-0.44	-0.02	0.00
0.8900	2015/2016	2	0	0	4.99	0.67	0.91	-0.51	-0.02	0.00
0.8396	2016/2017	3	0	0	5.41	0.65	0.89	-0.58	-0.02	0.00
0.7921	2017/2018	4	1	0	5.84	0.64	0.87	-0.65	-0.03	0.00
0.7473	2018/2019	5	1	0	6.27	0.63	0.84	-0.72	-0.03	0.00
0.7050	2019/2020	6	1	0	6.69	0.61	0.82	-0.79	-0.03	0.00
0.6651	2020/2021	7	1	0	7.12	0.60	0.80	-0.85	-0.03	0.00
0.6274	2021/2022	8	1	0	7.54	0.58	0.78	-0.92	-0.04	0.00
0.5919	2022/2023	9	1	0	7.97	0.57	0.76	-0.99	-0.04	0.00
0.5584	2023/2024	10	1	0	8.40	0.56	0.74	-1.06	-0.04	0.00
0.5268	2024/2025	11	1	0	8.82	0.54	0.72	-1.13	-0.05	0.00
0.4970	2025/2026	12	1	0	9.25	0.53	0.69	-1.20	-0.05	0.00
0.4688	2026/2027	13	1	0	9.67	0.52	0.67	-1.27	-0.05	0.00
0.4423	2027/2028	14	1	0	10.52	0.57	0.65	-1.22	-0.05	0.00
0.4173	2028/2029	15	1	0	11.37	0.63	0.63	-1.18	-0.05	0.00
0.3936	2029/2030	16	1	0	12.22	0.68	0.61	-1.14	-0.05	0.00
0.3714	2030/2031	17	1	0	13.06	0.71	0.59	-1.09	-0.04	0.00
0.3503	2031/2032	18	1	0	13.91	0.79	0.57	-1.05	-0.04	0.00
0.3305	2032/2033	19	1	0	14.76	0.85	0.54	-1.01	-0.04	0.00
0.3118	2033/2034	20	1	0	15.60	0.90	0.52	-0.97	-0.04	0.00
0.2942	2034/2035	21	1	0	16.45	0.96	0.50	-0.92	-0.04	0.00
0.2775	2035/2036	22	1	0	17.30	1.01	0.48	-0.88	-0.04	0.00
0.2618	2036/2037	23	1	0	18.14	1.07	0.46	-0.84	-0.03	0.00
0.2470	2037/2038	24	1	0	18.99	1.13	0.44	-0.79	-0.03	0.00
0.2330	2038/2039	25	1	0	19.84	1.18	0.42	-0.75	-0.03	0.00
0.2198	2039/2040	26	1	0	20.69	1.24	0.39	-0.71	-0.03	0.00
0.2074	2040/2041	27	1	0	21.53	1.29	0.37	-0.66	-0.03	0.00
0.1956	2041/2042	28	1	0	22.38	1.35	0.35	-0.62	-0.02	0.00
0.1846	2042/2043	29	1	0	23.22	1.39	0.34	-0.58	-0.02	0.00
0.1741	2043/2044	30	1	0	23.33	1.41	0.33	-0.57	-0.02	0.00
0.1643	2044/2045	31	1	0	23.52	1.42	0.32	-0.56	-0.02	0.00
0.1550	2045/2046	32	1	0	23.52	1.42	0.32	-0.56	-0.02	0.00
0.1462	2046/2047	33	1	0	23.52	1.42	0.32	-0.56	-0.02	0.00
0.1379	2047/2048	34	1	0	23.52	1.42	0.32	-0.56	-0.02	0.00
0.1301	2048/2049	35	1	0	23.52	1.42	0.32	-0.56	-0.02	0.00
0.1227	2049/2050	36	1	0	23.52	1.42	0.32	-0.56	-0.02	0.00
0.1158	2050/2051	37	1	0	23.52	1.42	0.32	-0.56	-0.02	0.00
0.1092	2051/2052	38	1	0	23.52	1.42	0.32	-0.56	-0.02	0.00
0.1031	2052/2053	39	1	0	23.52	1.42	0.32	-0.56	-0.02	0.00
0.0972	2053/2054	40	1	0	23.52	1.42	0.32	-0.56	-0.02	0.00
0.0917	2054/2055	41	1	0	23.52	1.42	0.32	-0.56	-0.02	0.00
0.0865	2055/2056	42	0	0	23.52	1.42	0.32	-0.56	-0.02	0.00
0.0816	2056/2057	43	0	0	23.52	1.42	0.32	-0.56	-0.02	0.00
0.0770	2057/2058	44	0	0	23.52	1.42	0.32	-0.56	-0.02	0.00
0.0727	2058/2059	45	0	0	23.52	1.42	0.32	-0.56	-0.02	0.00
0.0685	2059/2060	46	0	0	23.52	1.42	0.32	-0.56	-0.02	0.00
0.0647	2060/2061	47	0	0	23.52	1.42	0.32	-0.56	-0.02	0.00
0.0610	2061/2062	48	0	0	23.52	1.42	0.32	-0.56	-0.02	0.00
0.0575	2062/2063	49	0	0	23.52	1.42	0.32	-0.56	-0.02	0.00
0.0543	2063/2064	50	0	0	23.52	1.42	0.32	-0.56	-0.02	0.00
0.0512	2064/2065	51	0	0	23.52	1.42	0.32	-0.56	-0.02	0.00
0.0483	2065/2066	52	0	0	23.52	1.42	0.32	-0.56	-0.02	0.00
0.0456	2066/2067	53	0	0	23.52	1.42	0.32	-0.56	-0.02	0.00
0.0430	2067/2068	54	0	0	23.52	1.42	0.32	-0.56	-0.02	0.00
0.0406	2068/2069	55	0	0	23.52	1.42	0.32	-0.56	-0.02	0.00
0.0383	2069/2070	56	0	0	23.52	1.42	0.32	-0.56	-0.02	0.00
0.0361	2070/2071	57	0	0	23.52	1.42	0.32	-0.56	-0.02	0.00
0.0341	2071/2072	58	0	0	23.52	1.42	0.32	-0.56	-0.02	0.00
0.0321	2072/2073	59	0	0	23.52	1.42	0.32	-0.56	-0.02	0.00
0.0303	2073/2074	60	0	0	23.52	1.42	0.32	-0.56	-0.02	0.00
0.0286	2074/2075	61	0	0	23.52	1.42	0.32	-0.56	-0.02	0.00
0.0270	2075/2076	62	0	0	23.52	1.42	0.32	-0.56	-0.02	0.00
0.0255	2076/2077	63	0	0	23.52	1.42	0.32	-0.56	-0.02	0.00
0.0240	2077/2078	64	0	0	23.52	1.42	0.32	-0.56	-0.02	0.00
0.0227	2078/2079	65	0	0	23.52	1.42	0.32	-0.56	-0.02	0.00
0.0214	2079/2080	66	0	0	23.52	1.42	0.32	-0.56	-0.02	0.00

<b>Sum over 37 included years</b>	Travel Time	623.53	CRV	37.97	Crash	18.56	VOC	-30.09	CO2	-1.20	Total (included yea NPV)	648.78	159.14
<b>NPV Sum</b>		153.42		9.65		7.08		-10.59		-0.42		159.14	

First Full Year	5
First Full Year Benefits	7.64
Discounted	5.71
Discounted Costs	69.3
FYRR	8.2%

**Project Benefits - Discounting**

Scenario: **Opt2**  
 Compared to: **DM**  
 Method: **VTM**  
 Time Zero: **2014**

TT	1.679	Equity Factor	User Adjustment
CRV	1.679		
Reliability	1.679		
VOC	1.000		1.2

TRAVEL TIME	Scenario	Compared to	VTM Terms
Year	RC	UC	Benefits Adjusted
2016	2.77	1.00	3.77 6.33
2026S2	3.99	3.26	7.25 12.17
2031	4.42	4.75	9.17 15.40

CRV	Year	2016	2026S2	2031
2016	0.44	0.06	0.50	0.83
2026S2	0.47	0.18	0.65	1.10
2031	0.38	0.28	0.66	1.11

Crash	Year	2016	2026S2	2031
2016	0.90	0.00	0.90	0.90
2026S2	0.71	0.00	0.71	0.71
2031	0.61	0.00	0.61	0.61

VOC	Year	2016	2026S2	2031
2016	-2.07	1.32	-0.46	-0.46
2026S2	-6.34	4.28	-1.20	-1.20
2031	-8.63	6.17	-1.23	-1.23

Start Construction Construction Period: **3**  
 Benefits Start in year: **5**  
 Benefit Streams: \$/year

Model	SPPWF	FY	Analysis Year	Include	Travel Time	CRV	Crash	VOC	CO2	Total (included yea NPV)
1.0000	2005/2006	-8	0	0	0.49	0.54	1.11	0.29	0.01	0.00
1.0000	2006/2007	-7	0	0	0.49	0.57	1.09	0.22	0.01	0.00
1.0000	2007/2008	-6	0	0	0.66	0.58	1.07	0.15	0.00	0.00
1.0000	2008/2009	-5	0	0	0.66	0.62	1.05	0.08	0.00	0.00
1.0000	2009/2010	-4	0	0	0.83	0.65	1.04	0.00	0.00	0.00
1.0000	2010/2011	-3	0	0	1.00	0.67	1.02	-0.07	0.00	0.00
1.0000	2011/2012	-2	0	0	1.17	0.67	1.00	-0.14	-0.01	0.00
1.0000	2012/2013	-1	0	0	1.34	0.67				

**Project Benefits - Discounting**

Scenario: **Opt3**  
 Compared to: **DM**  
 Method: **VTM**  
 Time Zero: **2014**

TT	Equity Factor	User Adjustment
CRV	1.679	
Reliability	1.679	
VOC	1.000	1.2

TRAVEL TIME	Scenario	Compared to	VTM Terms
Year	Opt3	DM	1
2016	2.00	0.88	2.88
2026S2	4.00	3.80	13.09
2031	4.29	5.90	10.20

CRV	Year	2016	2026S2	2031
0.38	0.04	0.42	0.71	1.85
0.89	0.21	1.10	1.85	1.75
0.69	0.34	1.04	1.75	

Crash	Year	2016	2026S2	2031
0.99	0.00	0.99	0.99	0.96
0.96	0.00	0.96	0.96	0.94
0.94	0.00	0.94	0.94	

VOC	Year	2016	2026S2	2031
-2.21	1.12	-0.87	-0.87	-1.67
-7.52	4.96	-1.67	-1.67	-1.52
-10.77	7.71	-1.52	-1.52	

Start Construction Construction Period: 2  
 Benefits Start in year: 5

Model	SPPWF	FY	Analysis Year	Include	Travel Time	CRV	Crash	VOC	CO2	Total (included yea NPV
2016	1.0000	2005/2006	-8	0	-4.24	-0.54	1.04	0.01	0.00	0.00
2016	1.0000	2006/2007	-7	0	-3.42	-0.43	1.03	-0.07	0.00	0.00
2016	1.0000	2007/2008	-6	0	-2.59	-0.31	1.03	-0.15	-0.01	0.00
2016	1.0000	2008/2009	-5	0	-1.77	-0.20	1.02	-0.23	-0.01	0.00
2016	1.0000	2009/2010	-4	0	-0.94	-0.09	1.02	-0.31	-0.01	0.00
2016	1.0000	2010/2011	-3	0	-0.11	0.03	1.02	-0.39	-0.02	0.00
2016	1.0000	2011/2012	-2	0	0.71	0.14	1.01	-0.47	-0.02	0.00
2016	1.0000	2012/2013	-1	0	1.54	0.26	1.01	-0.55	-0.02	0.00
2016	1.0000	2013/2014	0	0	2.36	0.37	1.01	-0.63	-0.03	0.00
2016	0.9434	2014/2015	1	0	3.19	0.48	1.00	-0.71	-0.03	0.00
2016	0.8900	2015/2016	2	0	4.01	0.60	1.00	-0.79	-0.03	0.00
2016	0.8396	2016/2017	3	0	4.84	0.71	0.99	-0.87	-0.03	0.00
2016	0.7921	2017/2018	4	0	5.66	0.83	0.99	-0.95	-0.04	0.00
2016	0.7473	2018/2019	5	1	6.49	0.94	0.99	-1.03	-0.04	7.34
2016	0.7050	2019/2020	6	1	7.31	1.05	0.98	-1.11	-0.04	8.20
2016	0.6651	2020/2021	7	1	8.14	1.17	0.98	-1.19	-0.05	9.05
2016	0.6274	2021/2022	8	1	8.96	1.28	0.98	-1.27	-0.05	9.90
2016	0.5919	2022/2023	9	1	9.79	1.40	0.97	-1.35	-0.05	10.75
2016	0.5584	2023/2024	10	1	10.62	1.51	0.97	-1.43	-0.06	11.61
2016	0.5268	2024/2025	11	1	11.44	1.62	0.96	-1.51	-0.06	12.46
2016	0.4970	2025/2026	12	1	12.27	1.74	0.95	-1.59	-0.06	13.31
2026S2	0.4688	2026/2027	13	1	13.09	1.85	0.96	-1.67	-0.07	14.16
2026S2	0.4423	2027/2028	14	1	13.90	1.83	0.95	-1.64	-0.07	14.97
2026S2	0.4173	2028/2029	15	1	14.70	1.81	0.95	-1.61	-0.06	15.79
2026S2	0.3936	2029/2030	16	1	15.51	1.79	0.94	-1.58	-0.06	16.60
2026S2	0.3714	2030/2031	17	1	16.31	1.77	0.94	-1.55	-0.06	17.41
2031	0.3503	2031/2032	18	1	17.12	1.75	0.94	-1.52	-0.06	18.22
2031	0.3305	2032/2033	19	1	17.92	1.72	0.93	-1.49	-0.06	19.03
2031	0.3118	2033/2034	20	1	18.73	1.70	0.93	-1.46	-0.06	19.85
2031	0.2942	2034/2035	21	1	19.53	1.68	0.93	-1.43	-0.06	20.66
2031	0.2775	2035/2036	22	1	20.34	1.66	0.92	-1.40	-0.06	21.47
2031	0.2618	2036/2037	23	1	21.14	1.64	0.92	-1.37	-0.05	22.28
2031	0.2470	2037/2038	24	1	21.95	1.62	0.91	-1.34	-0.05	23.09
2031	0.2330	2038/2039	25	1	22.75	1.60	0.91	-1.31	-0.05	23.90
2031	0.2198	2039/2040	26	1	23.56	1.58	0.91	-1.28	-0.05	24.72
2031	0.2074	2040/2041	27	1	24.37	1.56	0.90	-1.25	-0.05	25.53
2031	0.1956	2041/2042	28	1	25.17	1.53	0.90	-1.22	-0.05	26.34
2031	0.1846	2042/2043	29	1	25.97	1.52	0.89	-1.19	-0.05	27.15
2031	0.1741	2043/2044	30	1	26.08	1.51	0.89	-1.18	-0.05	27.96
2031	0.1643	2044/2045	31	1	26.26	1.51	0.89	-1.18	-0.05	28.77
2031	0.1550	2045/2046	32	1	26.26	1.51	0.89	-1.18	-0.05	29.58
2031	0.1462	2046/2047	33	1	26.26	1.51	0.89	-1.18	-0.05	30.39
2031	0.1379	2047/2048	34	1	26.26	1.51	0.89	-1.18	-0.05	31.20
2031	0.1301	2048/2049	35	1	26.26	1.51	0.89	-1.18	-0.05	32.01
2031	0.1227	2049/2050	36	1	26.26	1.51	0.89	-1.18	-0.05	32.82
2031	0.1158	2050/2051	37	1	26.26	1.51	0.89	-1.18	-0.05	33.63
2031	0.1092	2051/2052	38	1	26.26	1.51	0.89	-1.18	-0.05	34.44
2031	0.1031	2052/2053	39	1	26.26	1.51	0.89	-1.18	-0.05	35.25
2031	0.0972	2053/2054	40	1	26.26	1.51	0.89	-1.18	-0.05	36.06
2031	0.0917	2054/2055	41	1	26.26	1.51	0.89	-1.18	-0.05	36.87
2031	0.0865	2055/2056	42	0	26.26	1.51	0.89	-1.18	-0.05	37.68
2031	0.0816	2056/2057	43	0	26.26	1.51	0.89	-1.18	-0.05	38.49
2031	0.0770	2057/2058	44	0	26.26	1.51	0.89	-1.18	-0.05	39.30
2031	0.0727	2058/2059	45	0	26.26	1.51	0.89	-1.18	-0.05	40.11
2031	0.0685	2059/2060	46	0	26.26	1.51	0.89	-1.18	-0.05	40.92
2031	0.0647	2060/2061	47	0	26.26	1.51	0.89	-1.18	-0.05	41.73
2031	0.0610	2061/2062	48	0	26.26	1.51	0.89	-1.18	-0.05	42.54
2031	0.0575	2062/2063	49	0	26.26	1.51	0.89	-1.18	-0.05	43.35
2031	0.0543	2063/2064	50	0	26.26	1.51	0.89	-1.18	-0.05	44.16
2031	0.0512	2064/2065	51	0	26.26	1.51	0.89	-1.18	-0.05	44.97
2031	0.0483	2065/2066	52	0	26.26	1.51	0.89	-1.18	-0.05	45.78
2031	0.0456	2066/2067	53	0	26.26	1.51	0.89	-1.18	-0.05	46.59
2031	0.0430	2067/2068	54	0	26.26	1.51	0.89	-1.18	-0.05	47.40
2031	0.0406	2068/2069	55	0	26.26	1.51	0.89	-1.18	-0.05	48.21
2031	0.0383	2069/2070	56	0	26.26	1.51	0.89	-1.18	-0.05	49.02
2031	0.0361	2070/2071	57	0	26.26	1.51	0.89	-1.18	-0.05	49.83
2031	0.0341	2071/2072	58	0	26.26	1.51	0.89	-1.18	-0.05	50.64
2031	0.0321	2072/2073	59	0	26.26	1.51	0.89	-1.18	-0.05	51.45
2031	0.0303	2073/2074	60	0	26.26	1.51	0.89	-1.18	-0.05	52.26
2031	0.0286	2074/2075	61	0	26.26	1.51	0.89	-1.18	-0.05	53.07
2031	0.0270	2075/2076	62	0	26.26	1.51	0.89	-1.18	-0.05	53.88
2031	0.0255	2076/2077	63	0	26.26	1.51	0.89	-1.18	-0.05	54.69
2031	0.0240	2077/2078	64	0	26.26	1.51	0.89	-1.18	-0.05	55.50
2031	0.0227	2078/2079	65	0	26.26	1.51	0.89	-1.18	-0.05	56.31
2031	0.0214	2079/2080	66	0	26.26	1.51	0.89	-1.18	-0.05	57.12

<b>Sum over 37 included years</b>	Travel Time	721.73	CRV	57.38	Crash	34.24	VOC	-48.85	CO2	-1.95	Total (included yea NPV	193.63
<b>NPV Sum</b>		181.37		17.65		11.02		-15.79		-0.63		193.63

First Full Year	5
First Full Year Benefits	8.0
Discounted	6.0
Discounted Costs	101
FYRR	5.9%

**Project Benefits - Discounting**

Scenario: **Opt3c**  
 Compared to: **DM**  
 Method: **VTM**  
 Time Zero: **2014**

TT	Equity Factor	User Adjustment
CRV	1.679	
Reliability	1.679	
VOC	1.000	1.2

TRAVEL TIME	Scenario	Compared to	VTM Terms
Year	Opt3c	DM	1
2016	2.15	0.65	2.80
2026S2	3.82	3.27	7.09
2031	5.28	4.92	10.21

CRV	Year	2016	2026S2	2031
0.53	0.02	0.55	0.92	1.69
0.82	0.18	1.00	1.69	1.96
0.88	0.29	1.17	1.96	

Crash	Year	2016	2026S2	2031
0.86	0.00	0.86	0.86	0.86
0.93	0.00	0.93	0.93	0.93
0.97	0.00	0.97	0.97	

VOC	Year	2016	2026S2	2031
-1.78	0.77	-0.86	-0.86	-1.67
-7.15	4.23	-1.67	-1.67	-1.52
-9.61	6.38	-1.52	-1.52	

Start Construction Construction Period: 3  
 Benefits Start in year: 5

Model	SPPWF	FY	Analysis Year	Include	Travel Time	CRV	Crash	VOC	CO2	Total (included yea NPV
2016	1.0000	2005/2006	-8	0	-3.22	-0.09	0.77	0.49	0.02	0.00
2016	1.0000	2006/2007	-7	0	-2.59	0.16	0.78	0.36	0.01	0.00
2016	1.0000	2007/2008	-6	0	-1.96	0.24	0.79	0.24	0.00	0.00
2016	1.0000	2008/2009	-5	0	-1.33	0.32	0.80	0.12	0.00	0.00
2016	1.0000	2009/2010	-4	0	-0.74	0.39	0.80	0.00	0.00	0.00
2016	1.0000	2010/2011	-3	0	0.38	0.47	0.81	-0.12	0.00	0.00
2016	1.0000	2011/2012	-2	0	1.10	0.54	0.82	-0.25	-0.01	0.00
2016	1.0000	2012/2013	-1							

# Worksheet 3: Benefit Cost Analysis - Variable Trip Matrix Method

## Benefit Cost Analysis

Project: **Maunganui Girven and Te Maunga Intersection Upgrade**  
 Component: **Aug-13**

Discount Rate= 6%  
 Analysis Period= 40 Years

Project Options Code Compared Against	DM DM	Opt1 DM	Opt2 DM	Opt3 DM	Opt3c DM		Opt1 DM	Opt2 DM	Opt3 DM	Opt3c DM
VTM Code	DMDM	Opt1DM	Opt2DM	Opt3DM	Opt3cDM					
<b>BENEFITS (NPV):</b>							<b>PV of Benefits Calculated through Consumer Surplus</b>			
1a Travel Time Benefits							153.4	166.8	181.4	184.4
1b Congestion Benefits							9.7	12.3	17.7	21.2
1c Trip Reliability							12.3	13.3	14.5	14.8
2 Vehicle Operating Costs Benefits							-10.6	-12.7	-15.8	-19.9
3 Accident Costs							7.1	7.5	11.0	11.1
4 Carbon Dioxide							-0.4	-0.5	-0.6	-0.8
<b>7 PV Total Net Benefits</b>							<b>171.4</b>	<b>186.8</b>	<b>208.1</b>	<b>210.8</b>
<b>COSTS (NPV):</b>							<b>PV of Costs</b>		<b>PV of Net Costs</b>	
8 Land Purchase	0.000	17.432	5.442	14.236	13.443		17.432	5.442	14.236	13.443
9 Design	0.000	1.410	2.094	2.408	2.497		1.4	2.1	2.4	2.5
10 Land Disposal	0.000	-12.671	-5.129	-7.449	-7.449		-12.7	-5.1	-7.4	-7.4
11 Construction	0.000	59.657	66.101	88.067	81.410		59.7	66.1	88.1	81.4
12 Maintenance	1.726	1.748	1.738	2.186	2.186		0.0	0.0	0.5	0.5
13 Renewal							-	-	-	-
14 Operating (tolls)							-	-	-	-
15 External Impact mitigation							-	-	-	-
16 Project contingency costs							-	-	-	-
17 Risk management							-	-	-	-
<b>18 PV of Total Net Costs</b>	1.726	67.577	70.246	99.448	92.086		65.9	68.5	97.7	90.4
<b>19 National BCR = (7)/(18)</b>							<b>2.6</b>	<b>2.7</b>	<b>2.1</b>	<b>2.3</b>
20 Agglomeration Benefits, NPV \$M							8.0	8.7	9.5	9.6
							pro-rata	pro-rata	calculated	pro-rata
<b>21 PV Total Net Benefits with Agglomeration</b>						(7) + (20)	179.4	195.5	217.6	220.4
<b>22 PV of Total Net Costs</b>						(18)	65.9	68.5	97.7	90.4
<b>National BCR with Agglomeration = (21)/(22)</b>							<b>2.7</b>	<b>2.9</b>	<b>2.2</b>	<b>2.4</b>
23 Other WEB Benefits, NPV \$M							26.5	28.8	31.3	31.8
<b>24 PV Total Net Benefits with Agglomeration + WEB</b>						(7) + (20)	205.9	224.3	248.9	252.2
<b>25 PV of Total Net Costs</b>						(18)	65.9	68.5	97.7	90.4
<b>National BCR with Agglomeration + WEB = (24)/(25)</b>							<b>3.1</b>	<b>3.3</b>	<b>2.5</b>	<b>2.8</b>

Appendix B

Peer Review

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**flow**

TRANSPORTATION SPECIALISTS

**Peer Review: Maunganui Girven and Te  
Maunga Intersection Upgrade Study**

New Zealand Transport Agency

December 2013

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## 1 INTRODUCTION

Flow Transportation Specialists (Flow) has been commissioned by the NZ Transport Agency to complete a technical peer review of the Maunganui Road / Girven Road intersection (MGI) and Te Maunga (SH2/SH29) intersection improvement study. The existing roundabouts on SH2 experience high levels of congestion and delay during peak periods, particularly when a train passes. The level of traffic demand through the corridor is predicted to increase as a result of forecast growth and the completion of planned regional infrastructure, namely the Tauranga Eastern Link (TEL).

This review has three elements to it, being:

- ◆ A review of the future Do Minimum model. An iterative methodology, using the higher level Tauranga Traffic Model (TTM) and a detailed Aimsun corridor model developed for the purposes of the MGI and Te Maunga intersection improvement study has been used
- ◆ A review of the Options considered
- ◆ A review of the Economic Evaluation of each option, which has relied on outputs from the TTM.

Flow has been involved with the peer review of the base year Aimsun traffic models<sup>1</sup>, where the methodology and assumptions used in the model were agreed. It was considered that the model replicates observed traffic conditions well enough to produce future year forecasts. This report sets out the issues identified during the next stage of the project, being the peer review of the forecast base models, option models and economic evaluation.

### 1.1 Peer Review Scope

Noting the three elements highlighted above, the scope of this peer review focuses on the following:

- ◆ Review the development and operation of the forecast Aimsun Do Minimum models, including 2016, 2026 and 2031 forecast years for the AM, inter and PM peak periods
- ◆ Review the future train frequency assumptions and the effects increased train demands will have on the operation of the corridor
- ◆ Review the process used to carry the predicted operation assessed in Aimsun through to the higher tier Tauranga Traffic Model (TTM), which is used to inform Aimsun model traffic demands as well as the economic evaluation
- ◆ Review of the preferred option model, whereby interchange coding and construction of the model is covered, as well as the predicted performance. In relation to the other options, a general review is completed
- ◆ Spot checks on the intersection coding with regards to signal timings used, phasing design at the proposed signalised intersection of MGI and Te Maunga
- ◆ Checking consistency of peak period models with regards to all of the above; and
- ◆ Review the economic evaluation assumptions and the economic assessment of four options.

Beca has created a number of traffic models for the assessment (5 model scenarios, 10 replications, 3 assessment years, 3 time periods, 2 modelling platforms). It was not intended that the scope of the review would include the specifics of each model. Instead the scope focuses on the process used to undertake the assessment, concentrating on the 2026 forecast year for the future do minimum model and

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<sup>1</sup> Maunganui Road: Girven and Te Maunga Microsimulation Traffic Model Review, 6 November 2013 (Reference: FN3A131023)

preferred option. The general process and predictions of the other forecast years and options considered have been reviewed to a lesser extent.

## 1.2 Submitted Information for Peer Review

The review inputs provided to Flow include the following documents.

- ◆ A File Note dated 7 November 2013 documents the methodology and assumptions used for the future year model forecasting and economic evaluation. (Reference: 3933377)
- ◆ An Excel spreadsheet detailing the evaluation process and the Benefit Cost Analysis for the four improvement options.

A meeting held at Beca on 14 November 2013 clarified assumptions and methodologies. The future DO Minimum and Option Aimsun models were also observed. The following additional information was requested during the meeting with Beca:

- ◆ Concept drawings for each option.
- ◆ Screenshots summarising the signal phasing and cycle times used in Aimsun for each option.
- ◆ Modelled train frequency information.

## 1.3 Project Summary

Project Name: Maunganui Girven and Te Maunga Intersection Upgrade Study

**Table 1: Project Attributes**

<b>Road Controlling Authority</b>	NZ Transport Agency
<b>Project Evaluator / Date</b>	Beca Infrastructure / November 2011
<b>Total Undiscounted Capital Cost (excludes Maintenance)</b>	Option 1: \$75.9 million Option 2: \$80.4 million Option 3: \$113.3 million Option 3C: \$104.6 million
<b>Traffic Volumes</b>	By 2026, an AADT of 52,800 vehicles per day is predicted on Maunganui Road (SH2) in the do minimum (constrained network). Daily traffic volumes following the proposed improvements are predicted to be between 63,300 and 63,700 vehicles per day. See Table 4-4 in Beca report for more details.
<b>BCR</b>	The National BCR for the options are predicted to be between 2.1 and 2.7, with Option 2 being predicted to produce the highest BCR (2.7), while Option 3 is predicted to have the lowest BCR (2.1).  The National BCR with Agglomeration are found to be between 2.2 and 2.9, while the National BCRs with Agglomeration and Wide Economic Benefits are predicted to be between 2.5 and 3.3.  An incremental analysis has been undertaken, with Option 2 being found to be the preferred option if the target incremental BCR is 2.0. Option 3C would be preferred if the target incremental BCR is 1.0.

**Table 1: Project Attributes**

<b>Issue Identification</b>	<ul style="list-style-type: none"> <li>◆ Predicted increases in traffic demands as a result of planned development</li> <li>◆ Predicted increases in traffic demands on SH2 following the completion of the Tauranga Eastern Link</li> <li>◆ The existing MGI and Te Maunga intersections are congested at peak hours when a train passes.</li> </ul>
<b>Crash History</b>	Not provided
<b>Recommended Option</b>	Option 3C

## 1.4 Options Considered

Four improvement options were investigated in the Study. A brief summary of each option is provided as follows:

### Option 1: Maunganui/Girven Flyover & Te Maunga Flyover

- ◆ Two Lane Flyover – SH2 to SH2 at MGI and Te Maunga (SH2/29) Intersections; over at-grade signalised intersections
- ◆ East Coast Main Trunkline (ECMT) rail to remain in current corridor along SH2. (approximately 160m west of the existing alignment)

### Option 2: Maunganui/Girven Flyover & Te Maunga Flyover

- ◆ Two Lane Flyover – SH2 to SH2 at MGI and Te Maunga (SH2/29) Intersections; over at-grade signalised intersections
- ◆ ECMT to be relocated to corridor adjoining Liftan Place. (approximately 160m west of the existing alignment)

### Option 3: Maunganui/Girven Flyover & Te Maunga Diamond Interchange

- ◆ Two lane flyover – SH2 to SH2 at MGI over signalised intersection and Diamond interchange over SH2 at Te Maunga (SH2/29) Intersection
- ◆ ECMT to be relocated to corridor adjoining Liftan Place; (approximately 160m west of the existing alignment)
- ◆ Signalisation of Matapihi/Owens place intersection.

### Option 3C: Maunganui/Girven Flyover & Te Maunga Diamond Interchange

- ◆ Two lane flyover – SH2 to SH2 at MGI over signalised intersection and Diamond interchange over SH2 at Te Maunga (SH2/29) Intersection
- ◆ ECMT to be relocated to corridor adjoining Liftan Place; (approximately 160m west of the existing alignment)
- ◆ Relocation of the SH29/Truman Lane roundabout.

This review has focused primarily on Option 3C, the preferred option.

## 1.5 Assessment Overview

### 1.5.1 Traffic Modelling Overview

The traffic modelling and economic assessment has been completed using an iterative process between two traffic modelling packages. The higher tier modelling has used the Tauranga Traffic Model (TTM), with the detailed modelling using an Aimsun model developed for the purposes of this project.

The higher tier model is the TTM Version 5.9. This model is used to predict future year traffic demands for each scenario/option. The TTM considers the distribution of traffic about the wider network when subjected to predicted SH2 corridor conditions (as predicted in Aimsun). The TTM also includes wider area infrastructure such as the Transport Agency's Tauranga Eastern Link (TEL) and associated works and the traffic demand changes resulting from these.

The detailed vehicle interactions through the SH2 study corridor, such as vehicle weaving, capacity constraints and the effects of trains passing through the MGI and Te Maunga intersections are assessed using Aimsun, a micro-simulation traffic modelling package. The outputs from the Aimsun models are predicted delays along defined routes/movements.

As mentioned above, the traffic modelling assessment used an iterative process. The process is summarised as:

- ◆ **Step 1:** Corridor traffic demands were produced by the TTM and input into Aimsun
- ◆ **Step 2:** The traffic demands are assigned to the Aimsun corridor network, with the predicted delays through the corridor (as assessed in Aimsun) being extracted and fed back into TTM
- ◆ **Step 3:** Corridor delays are replicated in TTM
- ◆ **Step 4:** Repeat steps 1 to 3 until the delays and traffic volumes become stable between both traffic models. This is referred to as convergence.

The iterative process based on the concepts of the above steps was undertaken for each scenario/option. Each process requires the TTM and Aimsun model to reflect the same infrastructure detail through the study corridor. That is to say, the Do Minimum scenario (ie the existing roundabouts) are included within each model platform, while the scenario layouts (grade separation) are included in both model platforms.

The iterative process involved comparison of delays between the two platforms for all vehicle movements at the MGI and Te Maunga intersections. Intersection capacities in the TTM were adjusted to replicate the delay predicted in Aimsun. While not detailed within the supporting information, it is understood following discussions that multiple iterations were required to reach a state where changes in delay (Aimsun) and traffic demands (TTM) were stable. Further discussion on the process is provided in Section 5.1.

### 1.5.2 Economic Assessment Overview

The economic assessment has been informed by outputs obtained from the traffic modelling completed for each scenario, forecast year and period.

Several methodologies were assessed to determine the preferred process to be used for obtaining road user travel time and travel distance outputs from the available traffic models. Three economic methodologies were considered with the strengths and weaknesses of each being discussed in the Beca filenote. Beca chose to use TTM outputs only for the economic evaluation. As the process used in converging the traffic volume predictions in the TTM with the corridor delays in Aimsun has been

completed thoroughly, we agree with this approach. Flow agrees with the principle of only using a single model platform (ie only TTM) for economic evaluation. This approach will provide more consistent travel time outputs, and the ability to capture induced traffic and allow the variable trip matrix evaluation to be undertaken.

The future year models cover the AM, inter and PM peak periods for the years 2016, 2026 and 2031. Flow consider this is appropriate to provide suitable information to evaluate the economic viability of each project option.

## 2 FORECAST MODEL ASSUMPTIONS

### 2.1 Predicted Traffic Demands

Future traffic demands used in the assessment are based on the TTM5.9 land use and network assumptions which include future road network upgrades such as TEL. Appendix A of the filenote provides the specific land use and network assumptions.

With regard to predicted traffic volumes through the study corridor, two key elements that contribute to growth in traffic include:

- ♦ The Tauranga Eastern Link. The TEL is one of the seven Roads of National Significance (RoNS), and connects with SH2 approximately 1km south of the Te Maunga intersection. The TTM predicts the local connections at Gloucester Road and Grenada Street will divert more local traffic from Maranui Street to the TEL which will place greater pressure on the project study area
- ♦ Smartgrowth. The TTM5.9 uses the latest version of Smartgrowth which has a slower growth rate when compared to the previous version, TTM5.8. Essentially the growth projected about Wairakei and Te Tumu remains at 100% build out at 2031, with major town centre growth reducing to some 80% (as opposed to 100%) in 2031
- ♦ In relation to development immediately adjacent to the MGI intersection, the TTM assumes Bayfair Shopping Centre increases in GFA by 32% in 2016 and 85% in 2026, therefore increasing PM Peak hour trips by some 1,100 vehicles per hour

Traffic volumes across screenlines about the Tauranga area are provided in Table 4.3 of the filenote. In relation to Screenline One (located immediately south of the study corridor) and Screenline Two (located immediately to the north of the study corridor), the following points are noted:

- ♦ Screenline One: The average daily traffic (ADT) crossing the screenline is predicted to be some 54,800 vehicles in 2016 (Do Minimum). This increases to 78,800 vehicles per day (Do Minimum) in 2031, which reflects an arithmetic growth rate of some 3.0% per annum. The growth rate for the option scenarios also sit at 3.0% per year
- ♦ Screenline Two: The average daily traffic (AADT) crossing the screenline is predicted to be some 64,800 vehicles in 2016 (Do Minimum). This increases to 73,400 vehicles per day (Do Minimum) in 2031, which reflects an arithmetic growth rate of some 1.0% per annum. The growth rates for the option scenarios also have similar growth rates of 1.3% per year.

An element of the increase in traffic volumes relates to induced traffic. That is new traffic introduced into the study corridor as a result of the improvement works. Assuming that the daily flow predictions across Screenline One are not greatly influenced by constraints within the network, the difference between in daily flows between the Do Minimum and Option 3c are +1,200 vehicles (2016), +1,900 vehicles (2026) and +2,800 vehicles (2031) across the day.

The traffic predictions used in the assessment are sourced from the TTM, being an accepted forecasting tool for Tauranga. The future land use and infrastructure assumptions included in the model reflect programmed investments.

## 2.2 Future Train Frequency

Aside from the forecast traffic projections through the study corridor (related to growth and regional transport investments), train frequency assumptions in the forecast models will also impact on the predicted benefits of options. Options that grade separate or shift the rail corridor away from the current alignment will improve SH2 corridor operation, compared with that predicted in the Do Minimum, where the capacity at the MGI and Te Maunga intersections is significantly reduced when a train passes through.

As noted in the development of the base model, freight trains pass through the corridor at an average rate of one train per hour. The freight trains however are not assigned to a specific schedule, and as such, the impact of the train on the surrounding road network will alter depending on the timing of the train and the timing of peak traffic volumes.

The forecast model assumptions note that 2031 train frequencies are assumed to increase from one train per hour to four trains per hour at the Maunganui Girven intersection and one train every two hours increasing to two trains per hour at Te Maunga. Intermediate frequencies (i.e between those used in the base scenario and those used in 2031) were used in the 2016 and 2026 model years. The time when the barrier is down for each train is some 2.6 to 3.0 minutes.

Following a request from Flow, Beca has provided further information on the train frequencies included in each modelled period. The Do Minimum train frequencies are summarised in Table 2.

Table 2: Future Train Frequency (Do Minimum) – Per Hour

Model Year	AM Peak	Inter Peak	PM Peak
2016	2.4	2.4	2.4
2026	4.0	3.2	4.0
2031	4.0	4.0	4.0

Typically, a reasonable proportion of project benefits for roading upgrade projects stem from the inter peak model, as the outputs from a two hour interpeak model inform the longer 9am to 3pm interpeak period, the weekday off peak period and weekend benefits. Based on the hourly train frequencies assumed above, the daily trains have been calculated by applying the annualisation factors used in the economics. The future weekday and weekend (Saturday) train frequencies are summarised in Table 3 below.

Table 3: Future Train Frequency (Do Minimum) – Daily

Model Year	AM Peak		Inter Peak		PM Peak		Daily	
	Weekday (2 hrs)	Saturday (0 hrs)	Weekday (8.6 hrs)	Saturday (11.04 hrs) <sup>2</sup>	Weekday (2.84 hrs)	Saturday (1.77 hrs)	Weekday (13.44 hrs)	Saturday (12.81 hrs)
2016	5	-	21	22	7	4	33	26
2026	8	-	28	29	11	7	47	36
2031	8	-	34	36	11	7	53	43

<sup>2</sup> Based on the Saturday Factor. Sunday interpeak factor is 10.13.

Based on the annualisation factors used, the number of trains along the corridor each weekday is assumed to be 33 trains per day in 2016, increasing to 53 trains per day in 2031. As noted above, Flow's concern rests with the number of trains assumed during the weekday interpeak and weekend periods.

Noting that the assumptions relating to train frequencies hinge on industries using the rail system to transport goods (paper, pulp and logs), it is difficult to determine whether the assumptions used are realistic or not. Based on the daily train frequencies assumed in the evaluation, it is necessary for the industries and rail network to operate seven days a week.

With the Do Minimum corridor operation being affected by the above assumptions, the sensitivity of the interpeak train frequencies was queried by Flow. The results of this are discussed further in the economic review below.

### 3 DO MINIMUM MODEL OPERATION

#### 3.1 Forecast Model Changes

The 2016, 2026 and 2031 Do Minimum models were created using the validated Do Minimum model as a base. The changes made to the Do Minimum models (from that of the original validated model) include:

- ◆ The layout of the proposed Te Maunga roundabout was updated to reflect the completion of TEL. An extra approach lane was added to the existing roundabout to represent the proposed connection to the TEL, with a section of SH2 also being widened to four lanes.
- ◆ Future traffic projections have been developed for 2016, 2026 and 2031
- ◆ Future train frequencies have been included.

Flow concurs with these network changes.

#### 3.2 Corridor Traffic Predictions

The traffic predictions modelled in the Do Minimum Aimsun corridor model are those output from the iterative process used between Aimsun and the TTM. As noted above, the iterative process was used until such time as the delays (as output from Aimsun and reflected in TTM) resulted in stable traffic demands about the analysed traffic movements. This process was thorough and is supported by Flow.

With this process being applied to each of the Do Minimum modelled periods and years, the delays predicted about the network result in similar demands being predicted along the Maunganui Road corridor in the TTM. Concentrating on the section of Maunganui Road between MGI and Te Maunga, the following table summarises the traffic volumes (as reflected in Aimsun) for each of the forecast Do Minimum traffic models.

Table 4: Maunganui Road Corridor Traffic Projections (between MGI and Te Maunga) - Hourly

Model Year	AM Peak			Interpeak			PM Peak		
	Nbound	Sbound	2-Way	Nbound	Sbound	2-Way	Nbound	Sbound	2-Way
2016	1,350	980	2,330	1,100	1,040	2,140	1,400	1,580	2,980
2026	1,420	1,230	2,650	1,240	1,210	2,450	1,480	1,680	3,160
2031	1,330	1,300	2,630	1,190	1,220	2,410	1,400	1,580	2,980

The forecast traffic volumes on Maunganui Road (between MGI and Te Maunga) are all similar. The 2026 two-way traffic volume predictions are slightly higher across each of the modelled periods. While the above Maunganui Road summary shows static or minimal growth, the flows on the alternative route, being Ocean Beach Road, are predicted to increase.

Based on the traffic demands about the study corridor being consistent (and slightly higher in 2026) and the train frequencies in 2026 reflecting those assumed for 2031 (AM and PM peak) the review of the corridor performance (as modelled in Aimsun) concentrated on the 2026 Do Minimum periods.

### 3.3 2026 Model Operation

#### 3.3.1 Observations

As noted above, the 2026 forecast models generally have consistent traffic demands about the study corridor. As such, each of the 2026 AM, interpeak and PM Peak models were thoroughly reviewed. Observations made when viewing the models are noted below.

No severe queuing (referring to network gridlock) was observed during the review of each modelled period. Areas where queues were noted (mostly during the PM peak) include:

- ♦ Maunganui Road southbound on the approach to MGI. The longest queue was observed in the PM peak period on Maunganui Road southbound, with the southbound queue extending back to Hewletts Road. The northern model boundary extends towards Hewletts Road and therefore the extent of the queue is modelled on the network. This is important, as delay information is not recorded should queues extend off the network.
- ♦ Midblock queuing on Maunganui Road, between MGI and Te Maunga roundabouts. Queuing within the mid-block was observed to occur during the AM and PM peak periods. Queue predominantly occurs in the northbound direction and is a result of the future predicted growth in traffic as well as the passing of trains. At the time a train passes, the roundabout at MGI blocks the northbound movements through the roundabout, therefore causing queues. The northbound queue extends from MGI towards Te Maunga for some distance. However the queue does not extend through the Te Maunga intersection.
- ♦ Queuing on SH29 approach to Te Maunga. At times traffic queues extended beyond the model boundary on SH29 (for a short period). As mentioned above, the Aimsun output will not capture the vehicle delay from the model and will therefore underestimate the intersection delay. This will lead to slightly lower delays being predicted for the Do Minimum on this approach. Flow considers the issue will have minor effects on the predicted travel times, given the limited time in which the queues extend off the network. As a result, no further action is required.

The file note provided gives little commentary on the operation of the study corridor, and the predicted recovery times following the passing of a train. The recovery time, or impact on the network at the time a train passes through, was a focus when reviewing the operation of the models. The following points were observed.

- ♦ In relation to the northbound traffic operation, the forecast traffic demands generate queues about the Maunganui Road corridor, irrespective of a train passing or not. When a train passes, the MGI roundabout continues to operate until such time as the exit to Matapihi is blocked. When this occurs, queues on Maunganui Road (northbound) increase. Queues however remain within the mid-block between MGI and Te Maunga.
- ♦ An unexpected observation was that the passing of a train assists in managing the queue length on Maunganui Road (southbound on the approach to MGI). As a result of the Matapihi bound vehicles



blocking the roundabout and therefore blocking northbound traffic, traffic on the southbound approach travelling to Girven Road or Maunganui Road (south) continues to operate with reduced conflicts (ie traffic from Matapihi or Maunganui Road (south) turning right in Girven Road). While the southbound queue on Maunganui Road (north of MGI) remains relatively long, the bursts of capacity obtained when a train passes through prevent the queues from extending off the modelled network

- ◆ In general, the recovery time of the network following a train passing appears to be between 5 minutes and 15 minutes, depending on the time the train arrives. With 4 trains passing per hour, the network appears to recover suitably prior to the next train arriving. The operation of all the 2026 Do Minimum models appear reasonable, with no queuing occurring that would give rise to the travel times being predicted for the Do Minimum scenario.

It is appreciated that the viewing of each model once reflects one run. Traffic model outputs extracted from Aimsun for input to the TTM iteration process were based on an average of ten replications per peak and as such there are likely to be variations between model runs. While Flow agrees with the number of runs, the reporting provided to date does not comment on the variability in travel times between the runs.

### 3.3.2 Model Variability

Flow requested further information from Beca which would demonstrate the variability in travel times between each of the Aimsun model runs. This is to provide confidence that each of the models runs perform in a similar way and therefore that stable results are being provided from which average delays are calculated. To limit the amount of information provided for review, Beca provided 2026 origin - destination outputs between the key zones within the study corridor, being SH2 (north), SH2 (south) and SH29. Providing 2026 outputs only is accepted given the reasons highlighted above, regarding study area demands (Maunganui Road) and train times being consistent across each of the modelled years.

A review of this information highlights that there is relatively high variability between the model runs between zones that pass through the network where queues (as discussed above) were observed. Table 5 summarises where Flow considers variability in travel times between model runs exist.

Table 5: Model Variability Assessment: 2026

Origin	SH2 (north)		SH2 (south)		SH29	
	SH2 (south)	SH29	SH29	SH2 (north)	SH2 (north)	SH2 (south)
AM Peak	✓	✓	✓	x	x	✓
Interpeak	✓	✓	✓	✓	✓	✓
PM Peak	x	x	✓	✓	✓	x

The paths which are considered to have high variability are summarised as follows:

- ◆ AM Peak – SH2 (south) to SH2 (north) and SH29 to SH2 (north). The variability between these areas is likely due to the Maunganui Road northbound midblock between Te Maunga and MGI being affected by roundabout capacity at MGI, as well as the passing of the train further reducing the roundabout capacity
- ◆ Interpeak – no major areas of concern, relatively consistent
- ◆ PM Peak – SH2 (north) to SH2 (south), SH2 (north) to SH29 and SH29 to SH2 (south). The variability between the routes originating from the north is due to the queuing on Maunganui Road southbound (between Hewletts Road and MGI). While congestion between the modelled runs is likely to be consistent, the arrival of a train (as observed) does benefit the northern approach to MGI

which assists in managing the queue length. As such, the variability shown is likely to be driven by the random arrival of trains. Highlighted in the observations, queues on SH29 were observed during the PM Peak, and as such, variable times between the runs are not unexpected for the SH29 to SH2 (south) movement.

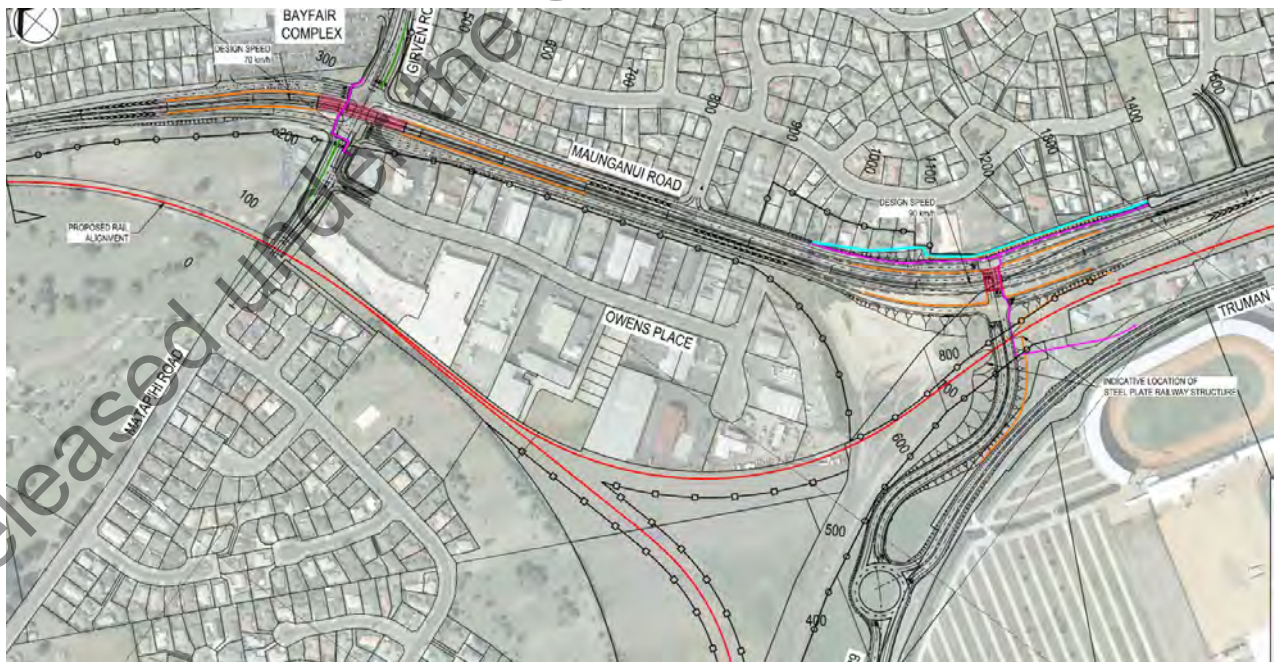
Drawing conclusions from the above assessment is somewhat difficult, as the random release of trains in each model will result in variability occurring by default. Should the passing of a train in the Do Minimum model coincide with peak traffic volumes in one run and not the other, the network performance and recovery time will result in large delay and long travel time differences occurring.

Variances in travel times about the network occur where queues in the network have been observed. The queue lengths about the network are affected by train occurrences which are randomly placed on the network between model runs. As such, the random nature of the train release is providing a range of results which are then being averaged and input into TTM. To this end, Flow accepts the process used and the variations presented.

## 4 AIMSUN FORECAST OPTION MODEL REVIEW

Flow has concentrated on the 2026 Option 3C (Preferred Option) models, in relation to observing the model coding and operation. The option models cover the same model boundary as the Do Minimum and include the proposed improvement option as described in Section 1.4 above. The layout of Option 3C is shown below in Figure 1.

Figure 1: Option 3C Layout



### 4.1 Network Coding

Option 3C shifts the alignment of the rail corridor (about the MGI roundabout) approximately 160m to the west. This is reflected well in the models. The proposed road network layout such as the MGI flyover and Te Maunga interchange was modelled on top of CAD drawing which is consistent with micro-simulation

coding. Visual observations of the option models reveal that vehicles do not switch lanes erratically and impact the intersection/movement capacity. Vehicle movements in the model are simulated sensibly.

## 4.2 Traffic Demands

Similarly to the Do Minimum models, traffic demands used in the Option Aimsun models are sourced from the TTM. The same iterative process between Aimsun (which determines delay) and the TTM (which reflects delay and determine corridor traffic demands) was used for each of the option models.

While it is unclear how many iterations were undertaken to arrive at stable traffic demands, it is envisaged that the process for the Option models required fewer runs than the Do Minimum, given that the options improve network capacity and reduce conflicts with the train passing.

As with the Do Minimum Aimsun traffic demand process, Flow accepts that the process used for the Options is consistent, and is therefore supported. While actual iteration information has not been provided, discussion on the process with Beca is considered sufficient.

## 4.3 Signal / Pedestrian Crossing Review

Upon reviewing the design drawings and comparing the design with the assumptions included in the traffic models, there are instances where pedestrian crossings are excluded from both the drawings and the model, when it may be prudent to include a crossing when moving into detail design. Noting that the models are consistent with the drawings, the operation of the design should a pedestrian crossing be introduced (as the design progresses through to detailed design) may alter the necessary length of short lanes. To determine whether the capacity included at the new interchanges reflect pedestrian movements (as designed) or allows for pedestrian movements (where not currently located) a review of the interchange cycle times and phasing was completed.

The cycle times modelled in the 2026 Aimsun model are summarised in Table 3. Documented in Section 5.3 of the file note, LINSIG models were developed to determine the initial signal timing setup in Aimsun. Intersection operation is based on actuated signal settings.

**Table 6: 2026 Signal Cycle Time**

Peak Period	Option 1	Option 2	Option 3	Option 3C	Option 1	Option 2	Option 3	Option 3C
	Cycle Time at MGI intersection (secs)				Cycle Time at Te Maunga Intersection (secs)			
AM Peak	85	80	120	80	65	65	60	60
Inter Peak	95	90	90	90	65	65	60	60
PM Peak	95	120	120	120	65	95	60	60

The cycle times for the MGI interchange range between 80 and 120 seconds. The inter-green times used in the model are 6 seconds which include a 4 second amber period. While an 80 second cycle time may be considered short for a typical interchange, the MGI interchange is relatively compact and as such will operate similar to that of a large intersection.

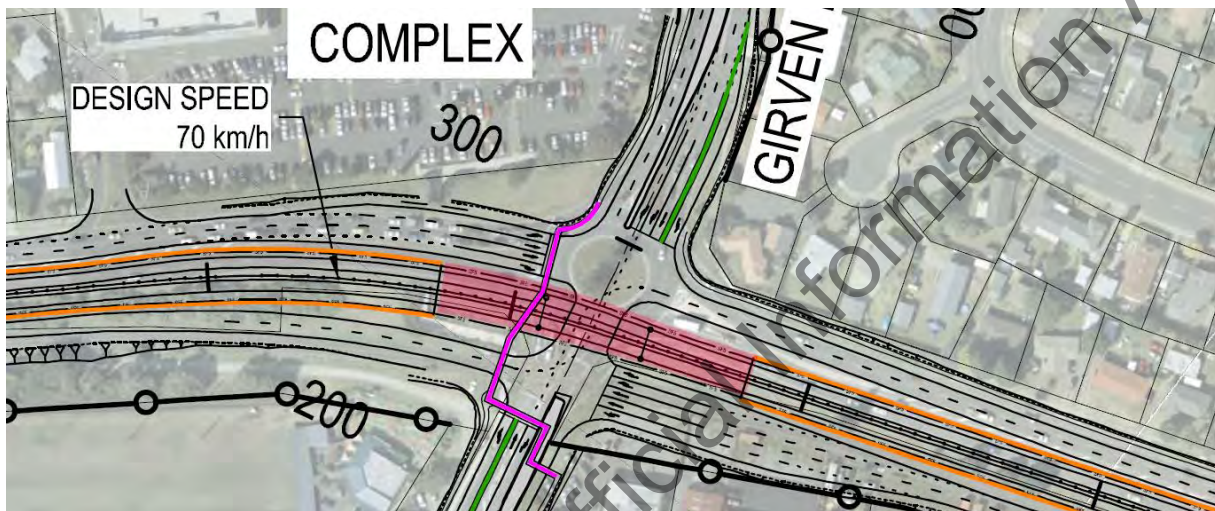
Phases generally operate for a minimum time of 10 seconds (when operating an 80 second cycle time), with the maximum phase time being 27 seconds (when operating a 120 second cycle time). With a large number of vehicles being removed from the intersections (due to grade separation), the low cycle time and low phase times appear to provide sufficient capacity when observing the model.

## 4.4 Pedestrian Phases

Pedestrian crossings are provided in the design across Matapihi Road and Maunganui Road (north). No crossing is provided across Girven Road and Maunganui Road (south). The proposed layout of the intersection with the proposed pedestrian crossings is shown in Figure 2.

The pedestrian crossings across Matapihi Road and Maunganui Road are designed as split pedestrian crossings, meaning that pedestrians are required to cross each arm of the intersection in two pedestrian phases. Split pedestrian phases are becoming less common as it does require pedestrians to wait for long periods within intersection mid-blocks / islands until the next pedestrian phase is called.

Figure 2: Option 3C Layout: Maunganui Road/Girven Road Interchange



The phases, times and delays introduced given the order of phases needing to be used to cross from the industrial area of Matapihi Road to Bayfair Shopping Centre and vice versa have been assessed.

Table 7: Girven Road Pedestrian (Time = seconds)

	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5
Matapihi Road (westbound crossing)		✓			
Matapihi Road (eastbound crossing)			✓	✓	
Maunganui Road (northbound crossing)	✓				
Maunganui Road (southbound crossing)			✓		✓
Required Crossing Time <sup>3</sup> (incl intergreen)	12	8	18	18	20
AM Peak Modelled Time	14	12	18	20	16
Interpeak Modelled Time	18	12	19	24	17
PM Peak Modelled Time	24	12	29	33	22

The table indicates that the phases in which pedestrian crossings operate are generally of sufficient length. Phase 5 however is marginally short during the AM and interpeak periods. It is during these times however where demand for the pedestrian crossing is unlikely to be required every cycle. As such, the

<sup>3</sup> Pedestrian crossing time is based on the carriageway widths (lane widths) multiplied by 1.2 seconds (walk time) plus 3 seconds for the red phase.

traffic signal operating system will be able to adapt to the demand and not adversely affect the overall intersection operation.

When using the crossing in a clockwise direction, crossing Matapihi Road (westbound (Phase 2) and eastbound (Phase 3 and 4) carriageways) will be reasonably seamless for pedestrians. Small delays (some 10 to 20 seconds) will be experienced by pedestrians when crossing Maunganui Road (northbound (Phase 1) and southbound (Phase 3 and 5) carriageways).

When using the crossing anti-clockwise, the calling of the pedestrian phase will depend on the delay experienced by pedestrians. As noted in the phasing table, the pedestrian phases to be called are Phase 5, Phase 1, Phase 3 or 4 and Phase 2. Whether pedestrians will wait within the Matapihi Road waiting area or run across the single traffic lane is not part of this review, but should phasing change to account for this safety concern, then the phasing time for Phase 2 will need to be increased which will impact on delays and queues on the Matapihi and Girven Road approaches.

As mentioned above, the operation of the MGI intersection does not include pedestrian crossing movements on all approaches, namely Girven Road. While the scope of this review does not extend into a review of the design, the impacts on the modelling outcomes, should pedestrian crossings be implemented through the design process, have been commented on.

With the Bayfair Shopping Centre located on the north-west corner of the intersection, and a residential catchment located on the north-east of the intersection, a controlled pedestrian crossing across the new six lane carriageway would appear necessary. This will therefore connect east to west, but also east to south, as no crossing is included on the Maunganui Road (south) approach also.

Based on a crossing speed for pedestrians of 1.2 metres per second, this will require a phase time of some 25 seconds, plus the time needed to provide sufficient capacity to the left turn movement from Maunganui Road (north). When reviewing the phase times used in the model, and noting that demand for pedestrian crossing during the AM peak is likely to be relatively low, the phases and times modelled when the pedestrian phase would occur have been summarised.

**Table 8: Girven Road Pedestrian**

	<b>Phase 1</b>	<b>Intergreen</b>	<b>Phase 2</b>	<b>Pedestrian Time (excl end intergreen)</b>
AM Peak	8 seconds	6 seconds	6 seconds	20 seconds
Inter Peak	12 seconds	6 seconds	6 seconds	24 seconds
PM Peak	18 seconds	6 seconds	6 seconds	30 seconds

As the pedestrian crossing across Girven Road (if installed) is not expected to be called every cycle during the AM and interpeak periods, the combined phase time for Phase 1 and Phase 2 is considered sufficient in the model. With the PM Peak operating a 120 second cycle time, the phasing allows for a parallel crossing phase to operate within the modelled times. Based on the above, the modelling outputs would not be expected to change significantly should a pedestrian crossing across Girven Road be introduced.

In relation to the other options the modelled times where the Girven Road pedestrian phase would operate have been reviewed. All options provide between 20 and 27 seconds during the AM and interpeak periods, with between 26 and 30 seconds being modelled during the PM Peak. As such each option has similar timings from which the pedestrian crossing could operate without affected overall modelled results as assessed.

## 4.5 Future Option Model Conclusion

The development and operation of the future Aimsun option models are considered satisfactory for assessing the predicted operation of each option. The traffic demands assigned to the options have been determined through an iterative process with the TTM, similar to that used in the Do Minimum. The resulting traffic demands account for the differing capacities associated with each option, and therefore the demand expected to be attracted to the study corridor (as modelled in Aimsun) from wider alternative routes.

The representation of Option 3C in Aimsun is consistent with that of the design drawing. A review of each option proposed shows no pedestrian crossing on the Girven Road approach. While the scope of this review does not extend into a review of the design, the impacts on the modelling outcomes should pedestrian crossings be implemented through the design process have been commented on. It is noted however that the exclusion of the crossing is consistent across each of the options considered. As such, the comparison between each option is not affected.

## 5 ECONOMIC EVALUATION REVIEW

The economic evaluation has been undertaken in accordance with the Transport Agency's Economic Evaluation Manual (EEM), with the main features being:

- ◆ The evaluation period is 40 years from the start of construction
- ◆ The evaluation is based on variable trip matrix techniques, which is considered appropriate in this instance
- ◆ A discount rate of 6% per annum is used for all costs and benefits; and
- ◆ Update factors are those set out in the July 2013 version of the EEM.

It is noted that the EEM was updated in July 2013, with the official release of the updated version of the EEM being in November 2013. As noted above, the economic evaluation has been completed according to the latest procedures/values.

### 5.1 AIMSUN to TTM Process

The economic assessment of the options considered for MGI and Te Maunga rely on outputs from the TTM. As mentioned earlier, several methodologies were assessed to determine the preferred process to obtain road user travel time and travel distance outputs from the available traffic models.

Three economic methodologies were considered with the strengths and weaknesses of each being discussed. With the process used in converging the traffic volume predictions in the TTM with the corridor delays in Aimsun being thorough, the decision to use outputs from TTM to inform the economic evaluation is generally accepted.

The methodology adopted however does present an economic evaluation that somewhat differs from that typically completed when a project is solely based on an isolated higher tier traffic modelling assessment. When one modelling platform is used (such as the TTM) the coding of a scenario (between periods and years) will generally be consistent, meaning that saturation flows and the like will be the same. The coding of the scenarios in this assessment however are all inconsistent, given that the TTM and Aimsun iterative process has altered the TTM coding to match Aimsun delays. A result of this is:

- The coding of individual scenarios (referring to core coding elements such as saturation flows) in TTM differ between each TTM modelled period, ie a saturation flow in the AM peak that represents a movement may differ from that modelled in the interpeak
- The coding of individual scenarios (referring to core coding elements such as saturation flows) in TTM differ between each TTM modelled year, ie a saturation flow in the 2016 that represents a movement may differ from that modelled in 2026, and again in 2031.

As mentioned above, the inconsistencies between modelled periods and years are a result of the iterative process applied in the evaluation methodology. It is unclear whether the changes made to each respective model (period and year) result in the option definition (as modelled in TTM) being altered radically. Further, if an option definition is being altered in TTM, is the extent to which it is being altered affecting projected benefits or dis-benefits between periods and years, relative to the Do Minimum?

It is believed that the impact of these inconsistencies is partly highlighted in Figure 7-1 of the Beca filenote, where the benefit streams cross over each other. Obviously the performance of each scenario differs with changing traffic volumes, however to what extent this influences the streams shown is not clear, given the methodology applied.

Given the complexity of the corridor performance however when considering train movements and the associated traffic delays, the process used does serve a purpose. Effort has been placed on obtaining stable traffic models and using average outputs to inform TTM. Because of this, we accept the process and suggest that the sensitivity tests completed assist in understanding the crossover of benefits attributed to each option shown in the benefit stream assessment. This is discussed further below.

## 5.2 AIMSUN to TTM Comparison

A comparison of average model delays at the Maunganui Road / Girven Road intersection and Te Maunga intersection between the TTM and Aimsun models is documented in Appendix B of the Beca file note.

The outputs show that the delays (provided in minutes) modelled in Aimsun are generally consistent with those modelled in the TTM. It is worth noting however that the delay is one component that contributes to the overall travel time, where costs are applied to the predicted vehicle hours. As such, the number of vehicles assigned to each movement also has a bearing on the economic performance of each option.

A review of the vehicle minute totals (the sum of the key movements) summarised for Aimsun and the TTM allows an appreciation of whether travel time savings about the study area are being consistently applied across both modelling platforms.

With the interpeak period model outputs informing a large number of hours across the year, Table 9 summarises the differences between each platform. A positive percentage reflects that the TTM delay is higher, with a negative percentage reflecting that the TTM delay is lower to that predicted in Aimsun.

**Table 9: Interpeak Model Platform Differences (comparison between Aimsun and TTM)**

	Do Minimum	Option 1	Option 2	Option 3	Option 3c
2016 Interpeak	0%	-1%	5%	-15%	4%
2026 Interpeak	3%	1%	8%	-7%	7%
2031 Interpeak	5%	-4%	5%	5%	11%

The following points are noted:

- ◆ Do Minimum travel times (delays) about the study corridor in the TTM are 3 to 5% higher than those predicted in Aimsun. This suggests that the Do Minimum is performing slightly worse in the TTM
- ◆ Option 1 travel times (delays) about the study corridor are similar between the TTM and Aimsun for 2016 and 2026. Delays represented in the TTM for 2031 are some 4% lower than those predicted in Aimsun, which result in a difference of some 10% between the Do Minimum and Option travel times
- ◆ Option 2 and Option 3c travel times (delays) about the study corridor are higher in the TTM than those predicted in Aimsun. This will result in the TTM output (as used for economics) for these options producing slightly lower benefits than those expected. Noting that the Do Minimum delays are also predicted to be higher in the TTM, the differences are marginal, at some 5% or less
- ◆ Option 3 delays included in TTM are some 15% and 7% lower in the TTM than those predicted in Aimsun. As such, option benefits are expected to be inflated by some 10%.

A perfect match between the two model platforms is not expected, given the differences between the two model assignment techniques. An appreciation however of where differences exist and how these are applied to the economic evaluation is important. Should the preferred option assessment be influenced by the economic assessment, the differences noted should be considered should option costs be close.

### 5.3 Benefit Stream

Figure 7-1 of the Beca file note provides the benefit stream used in the assessment. It is noted that while Option 3 is predicted to provide more benefits than Option 3C in both 2026 and 2031, the benefits of Option 3C are still higher than those of Option 3 over the 40 year evaluation period. As explained by Beca, this is a result of a steeper benefit stream curve between 2026 and 2031, and therefore the predicted yearly benefit of Option 3C will increase above the yearly benefit of Option 3 sometime after year 2031. This results in slightly higher benefits for Option 3C.

As discussed above however, the change in option order benefits may be attributed to the subtle differences in the model coding which is causing future year benefits between options to alter.

Two sensitivity tests have therefore been undertaken to check alternative benefit stream scenarios. One includes using 2016 and 2031 benefits only to forecast 40 year benefits, with the second test adopting the Option 3 growth rate beyond 2031 for Option 3C. The two sensitivity tests return BCRs of 2.3 and 2.2 respectively, which indicates that we need not consider the issue of Option 3C 2026 and 2031 benefits being lower than Option 3 as a significant impediment to this assessment.

### 5.4 Source of Benefits

The future year model covers the AM, inter and PM peak periods for the year 2016, 2026 and 2031. Flow considers this is appropriate to provide suitable information to evaluate the economic viability of each project option.

The source of the project benefits has been examined to identify which components are predicted to provide the majority of the benefits. The predicted project benefits are summarised in Table 4 below:

**Table 10: Make-Up of Project Benefits**

Component	Option 1	Option 2	Option 3	Option 3C
Travel Times	89%	89%	87%	87%



Component	Option 1	Option 2	Option 3	Option 3C
Congestion (CRV)	6%	7%	8%	10%
Trip Reliability	7%	7%	7%	7%
Vehicle Operating Costs	-6%	-7%	-8%	-9%
Crash Costs	4%	4%	5%	5%
Carbon Dioxide	0%	0%	0%	0%
Pedestrian and Cycle Benefits	n/a	n/a	n/a	n/a
Total	100%	100%	100%	100%

The above table indicates that the make-up of project benefits is similar across the four options. More than 95% of project benefits are a result of total travel time savings (travel time savings plus congestion relief savings). This is slightly high for a project of this nature, however it is recognised that negative benefits are predicted for vehicle operating costs and carbon dioxide costs. This is likely a result of the longer travel distances on SH2, as a result of the proposed flyover, which would lead to increases in vehicle operating costs for the options.

Table 5 below provides a summary of travel time benefits, derived from the 2026 forecast models.

**Table 11: Annual Travel Time Benefit Contribution (\$million)**

Evaluated Scenario	AM Peak		Inter Peak		PM Peak	
	Yearly Benefits	Percentage	Yearly Benefits	Percentage	Yearly Benefits	Percentage
Option 1	1.92	19%	5.21	51%	3.07	30%
Option 2	2.15	16%	7.61	57%	3.51	26%
Option 3	2.23	15%	7.55	51%	5.01	34%
Option 3C	2.25	17%	7.00	51%	4.34	32%

Table 5 above shows that more than 50% of the annual benefits are derived from the inter peak models. While inter peak hourly flows (as modelled) are lower than those in the commuter peak periods, it is common that the inter peak period contributes a large portion of project benefits. This is a result of the inter peak benefit time period capturing the weekday inter peak, weekday evening/night time and weekend inter peak periods, contributing 59% of the weighted annualisation factor.

It is noted that some non-standard annualisation factors have been used in this assessment. However the Beca file note indicates that these assumptions are based on the actual flow profile at intersections along SH2 and therefore these are considered appropriate in this case.

Option 3 has the highest travel time benefits, followed by Option 3C. Option 1 contributes the lowest benefits when comparing with other options.

## 5.5 Trip Reliability Benefits

Trip reliability benefits have not been calculated explicitly, but have been assumed to equate to 8% of travel time savings. This value is consistent with other roading project evaluations.

## 5.6 Vehicle Operating Cost

Vehicle Operating Costs (VOC) have been calculated using model outputs for 2016, 2026 and 2031, with the costs for the years in between being interpolated. Table 5 below provides a summary of annual vehicle operating cost benefits, derived from the 2026 forecast models.

**Table 12: 2026 Vehicle Operating Cost Benefits (\$million)**

	Option 1	Option 2	Option 3	Option 3C
Annual Vehicle Operating Cost Benefits	-1.27	-1.2	-1.67	-2.07

Table 6 indicates that negative vehicle operating cost savings are predicted with each option, with the biggest disbenefits predicted with the preferred Option 3C. A closer look into the model summary statistic results reveals that the total network travel distances in each option scenario are longer than those with the Do Minimum scenario. Flow considers that the negative benefits may lead to a conservative estimate of the BCR of the project. It is noted that the negative VOC benefits will also affect the benefits of vehicle emission costs, which are discussed below.

Vehicle running costs have been derived from a combination of 65% rural strategic cost values and 35% Urban Arterial cost values. Beca has undertaken two sensitivity tests with variable assumptions on travel cost values. Flow considers the standard travel cost values used on Rural Strategic roads are based on a daily average which potentially overestimates benefits in the weekday inter peak and off peak periods. Therefore, a test was undertaken whereby travel cost values were based on 100% Urban. The result shows that the effect on the BCR is insignificant and the result is presented below.

**Table 13: Sensitivity Test on Value of Travel Times**

	Option 1	Option 2	Option 3	Option 3C
<b>Without Agglomeration and WEBs</b>				
Base Case (65% Rural+35% Urban)	2.6	2.7	2.1	2.3
Additional Test (100% Urban)	2.0	2.1	1.7	1.8
<b>With Agglomeration and WEBs</b>				
Base Case (65% Rural+35% Urban)	3.1	3.3	2.5	2.8
Additional Test (100% Urban)	2.5	2.6	2.1	2.3

## 5.7 Crash Cost Benefits

Crash cost benefits equate to around 4% to 5% of the total benefits in each option. The evaluation indicates upgrading Te Maunga intersection to a diamond interchange (Option 3 and 3C) will contribute more crash savings than a flyover option (Option 1 and 2). Beca assumed a 20% reduction in crash costs when the existing EMCT railway line is relocated. This is considered to be appropriate.

The crash costs were evaluated using the EEM full accident procedures. An Accident by Accident method has been adopted in the assessment to evaluate the crash costs for the Do Minimum scenario. For the options, the Accident Rate method has been correctly adopted, as the option presents a fundamental change.

It is noted that the future accident costs for both Do Minimum and the options have been assumed to increase at the same rate as traffic growth. We consider that it is reasonable to assume an increasing crash rate due to the predicted traffic growth. However it would be more appropriate to incorporate the

crash trend adjustment in the assessment, as required by EEM Section 6.4.. With crash costs benefits being a small component of the total project benefits, a change to the crash cost calculations will have minimal impact on the crash cost benefits.

## 5.8 Vehicle Emission Cost Benefits

Vehicle emission cost (CO<sub>2</sub>) benefits are based on 4% of VOC benefits, which is in accordance with the EEM. As discussed above, the negative VOC benefits will result in CO<sub>2</sub> benefits having a similar trend given the methodology used to calculate CO<sub>2</sub>, with each option having CO<sub>2</sub> benefits being about -1%.

## 5.9 Pedestrian and Cycle Benefits

No pedestrian or cyclists benefits have been included in this assessment. Facilities are included for walking and cycling. As noted above, pedestrian movements across Girven Road may require further assessment when progressing with the study. The contribution walking and cycling benefits will add to the project are likely to be minor in comparison to the travel time benefits assessed and will therefore have little impact on the reported BCRs.

## 5.10 Agglomeration and Wider Economic Benefits

Wider economic and agglomeration benefits were evaluated as per the EEM and using the same methodology as that used for the RoNS (Tauranga Eastern Link) project. The latest version of the EEM includes additional wider economic benefits (WEBS).

It is noted at Appendix 10.3 of the EEM that it is only the large and complex urban transport activities that will provide the relevant conditions that justify an analysis of agglomeration benefits. While this is relevant to the TEL project, one wonders whether the improvements along Maunganui Road at the Girven Road and Te Maunga intersections will result in indirect benefits related to employment, productivity, competition, prices/wages and investment.

It is acknowledged that improved business travel time savings can result in higher productivity and output, however the focus of productivity and output along this corridor (long term) may be focussed on the rail network, which has priority in any case (Do Minimum or Option). While a number of trucks use State Highway 2, it is unlikely that any efficiencies gained through business travel time savings will be passed onto the customer, given that the length of the corridor is likely to be a fraction of the total journey.

It would be useful to understand how the benefits assessed compare to those assessed for TEL.

The added benefits attributed to agglomeration are minimal and represent some 4.5% to 5.0% of the tangible benefits assessed. The effect these have on the BCRs assessed is minimal, with ratios altering by 0.1 to 0.2. The economic efficiency of the options considered remains between 2 and 4, with an efficiency rating of **Medium (M)** retained.

Wider economic benefits (WEBS) are assessed to contribute a further 14.5% benefit on top of the tangible benefits assessed and the agglomeration benefits. Again, the economic efficiency of the options considered remain between 2 and 4, with an efficiency rating of **Medium (M)**.

## 5.11 Sensitivity Tests

Various sensitivity tests have been undertaken for the options assessed, with the outcomes illustrated in Figure 7.2 of the Beca file note. Tests include the following:

- ◆ Discount rate of 4% and 8% per annum are used for all costs and benefits (6% was used in the base case)
- ◆ No capping of benefits (benefits are capped beyond 2041 in the base case)
- ◆ All benefits capped at 2031 levels
- ◆ Travel time cost is assumed to be 100% rural strategic (a composite value of 35% Urban and 65% Rural was used in the base case)
- ◆ Travel time cost is assumed to be a combination of 65% Urban and 35% Rural
- ◆ A “Low” (1.5 trains per hour) and “High” (6.5 trains per hour) train scenario in 2031 (4 trains per hour are assumed in the base case).

It is noted that the above sensitivity tests (except for the train frequency test) alter the “outputs” of the modelling. The Transport Agency currently has a focus on sensitivity tests adjusting the “inputs” to the modelling, and therefore determining a range of results from which to appreciate the stability of the project evaluation. As mentioned above, Flow had concerns relating to the daily number of trains, ie those assumed during the interpeak period. Beca completed a sensitivity test that reduced the interpeak trains, and retained the AM and PM commuter peak train frequencies. This test revealed that the change in interpeak train frequency had a minor effect on the overall BCR for Option 3C, with the National BCR shifting from 2.3 to 2.1. With the BCR remaining above 2.0, the efficiency rating remains at **Medium (M)**.

The underlying land use, while consistent with Smartgrowth and regional projections, does produce a traffic growth rate of some 3% about the study area. This is generated by regional growth which assumes a build out timeframe of 2031, with the Bayfair Shopping Centre projected to expand by some 82% of the existing mall size by 2026. A sensitivity test that offsets the land use input timeframes by five to ten years is likely to sit close to the test that caps growth at 2031 levels.

The result of the sensitivity test indicates all BCRs are between 2.0 to 4.5, with the economic efficiency rating generally remaining at **Medium (M)** as per the assessment profile rating. Option 2 has the highest BCR in most of the tests. Although Option 2 is the best option economically, Beca explained Option 3C was preferred due to the long term development strategy on SH2 and the multi-criteria analysis being used to determine the preferred option.

## 6 CONCLUSION

Flow has reviewed the traffic modelling and economic assessment of the SH2 Maunganui Girven and Te Maunga intersection improvement study undertaken by Beca.

Flow accepts the general methodology and assumptions used to complete the assessment, with the process followed being in accordance with the procedures provided in the Economic Evaluation Manual. The National Benefit Cost Ratio with Agglomeration and wider economic benefits of the preferred Option 3C is 2.8, which is considered to provide a **Medium (M)** economic efficiency. Sensitivity tests completed show the National Benefit Cost Ratio generally remains between 2.0 and 4.0, therefore retaining the **Medium (M)** rating.

## Appendix D – Capital Cost Estimates

MGI Improvements Scheme Estimate Report – February 2014.

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Report

# Maunganui Girven Intersection Improvements Scheme Estimate Report February 2014

Prepared for NZ Transport Agency (NZTA) (Client)

By (Beca)

28 March 2014

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### Revision History

Revision N°	Prepared By	Description	Date
A	s 9(2)(a)	Scheme Estimate – Option 3A	28 March 2014

### Document Acceptance

Action	Name	Signed	Date
Prepared by	s 9(2)(a)		28/3/14
Reviewed by			28/3/14
Approved by			28/3/14
on behalf of	Beca Ltd.		

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Appendix C – Physical Works Cost Estimate Breakdown

Appendix D – Residual Risk Register Assessment of Cost



## 1 Executive Summary

Beca was engaged by NZ Transport Agency (NZTA) to undertake the Investigation Phase on the Maunganui Girven Interchange (MGI). Scheme Option 3A was selected and parallel estimated by Construction Consulting Group Ltd as the NZTA industry expert (IE) in February 2014. The SE was reconciled to within \$4.6M or 5.6% at the Construction Estimate level with the IE, however the following major differences were identified;

- property purchase costs were excluded from the industry experts estimate (for the purpose of this report Beca has added these to the IE estimate),
- the industry expert applied a flat 20% allowance for contingency and a further 35% for the 95<sup>th</sup> percentile funding risk, rather than assessing the residual/contingency risk requirements for the project

We consider that the cost differential between the Beca and IE Construction estimates is acceptable. A detailed comparison between the Beca and industry expert estimates is included in Appendix B.

Outlined below is a summary of the recommended project costs.

**Table 1.1 – Schedule of Recommended Project Costs – Option 3A Scheme Estimate**

	Total \$M
Physical Works Estimate	77.17
Construction Cost (Physical Works Estimate and MSQA Phase)	81.75
Total Base Estimate	88.62
5 <sup>th</sup> Percentile Estimate (P5)	94.74
<b>Total Expected Estimate</b>	<b>102.00</b>
95 <sup>th</sup> Percentile Funding Estimate (P95)	115.70

The SE is based on the preliminary design for Option 3A as at October 2013. Property purchase costs (circa \$10.8M) and a credit for the disposal of the surplus property (\$8.2M) has been included in the SE as advised by The Property Group. No formal decision on the form of procurement for the MGI has been made. For the purposes of this estimate Design and Construct (D&C) procurement has been assumed.

The SE has been prepared on a defined scope (see Section 3 for details) with the following assumptions:

- A separate enabling earthworks and KiwiRail contract to relocate the railway.
- Grade separation of the SH2 Maunganui/Girven and SH2/29 Te Maunga intersections.
- At grade roundabout on SH29 linking with Truman Lane.

In order to reduce the degree of uncertainty in the project cost outturn, and potentially reduce the Expected and 95th Percentile Estimates, continual investment in the mitigation of risks, pursuit of opportunities and the development of the design is recommended throughout the project development cycle.

## 2 Introduction

This report has been produced to provide a Scheme Estimate (SE) for the SH2 Maunganui/Girven and Te Maunga Intersection Improvements (MGI) based on the scope contained in Option 3A to assist in determining a budget for funding the project.

The MGI (Option 3A scope) project is defined as a new grade separated interchanges at the intersections of Maunganui Rd / Girven Rd and SH2 / SH29, with an at grade roundabout on SH29 connecting to Truman Lane.

The existing road is widened on the west side of the alignment and this requires the existing railway to be relocated to an alternative corridor.

The road works, including the interchanges, is not designated. However, the alternative rail corridor is already designated.

This SE is produced in accordance with the requirements set out in NZTA Cost Estimation Manual (SM014).

No formal process to select the method for procuring the project has been carried out. This SE has been based on the assumption that the Design and Construct (D&C) form of procurement will be adopted for the main physical works. The rail relocation works will be undertaken as an enabling works contract and will be procured via a traditional Measure and Value Contract.

This SE has been parallel estimated by NZTA industry expert Construction Consulting Group Ltd (February 2014) and the two estimates have been reconciled within acceptable margins at the Construction estimate level.

### 3 Scope of Work

The scope of the MGI project Option 3A is defined below:

#### 3.1 Road

At the Maunganui Rd / Girven Rd Interchange a two lane flyover will pass over an at-grade signalised intersection, which will grade separate state highway traffic from the local traffic. The bridge structure for the flyover is approximately 105m long

At the SH2/SH29, SH29 will pass over SH2 and the railway in a compact diamond interchange arrangement. The SH2 corridor remains at-grade at the SH2/SH29 intersection, with the local and SH29 movement's grade separated over SH2. This arrangement grade separates SH29 from the railway line. Access to Truman Lane and the ASB Arena and Baypark is maintained by the introduction of an at grade roundabout on SH29 and an at-grade link road from Mangatawa Interchange along Truman Lane. No connection from SH29 to Owens Place is provided.

The approaches to the bridge structures will be constructed using MSE walls with precast panels or traditional earthwork embankments.

Stone columns ground improvements will be utilised for the immediate approaches to the bridge abutments. Other areas of the embankment footprints will be undercut and filled imported rubble.

Option 3A potentially affects properties on Maunganui Rd, Palliser Pl, Eversham St and Matapihi Rd. This includes Housing NZ properties and KiwiRail parcels. Allowances for solatium compensation payments, removal of houses and property accommodation works have been made.

Services relocations and/or protection are required which includes overhead/underground power cables, underground gas pipeline, telecommunication cables and TCC stormwater, water and sewer pipes.

#### 3.2 Rail

The road widening occurs to the west for this option, which requires the railway to be relocated to the alternative railway corridor behind Owens Place and through the Omanu Golf Course. The existing at-grade railway level crossing will be relocated further along Matapihi Road to increase the distance from the Maunganui/Girven intersection.

It may not be possible to mitigate the noise effects generated by the new rail alignment so an allowance for noise mitigation works to 17No. properties in Liftan Pl have been included.

A 1.5km noise wall is also required to mitigate the rail noise effects, which will be constructed immediately adjacent to the new rail alignment.

Services relocations and/or protection are required which includes overhead power transmission lines, underground gas pipeline, telecommunication cables and TCC stormwater, water, sewer pipes.

## 4 Cost Estimation and Risk Analysis Processes

### 4.1 Cost Estimation

As mentioned above, the SE has been produced using best practise techniques as defined in SM014. The estimate is determined through establishing a set of costs in the following progressive order:

- Physical Works Estimate** Total of the actual construction cost inclusive of preliminaries and general to physically construct a product, i.e. a new road network. The physical works costs are produced from the sum of calculated quantities from a drawing multiplied by the current market rates for each work. No contingencies are allowed for at this stage.
- Base Estimate** The total sum of the elements that make up an estimate, inclusive of future Land Purchase Costs, Investigation & Reporting fees, Design and MSQA fees and the Physical Works cost.
- Expected Estimate** The Base Estimate plus an allowance for contingency produced from a project specific risk analysis that calculates the statistical average (mean) of the cost impact of a risk.
- 95th Percentile Estimate** The Expected Estimate plus an allowance for contingency produced from a project specific risk analysis to calculate the statistical 95th percentile cost impact of a risk.

### 4.2 Risk Analysis and Assessment of Contingency

A risk management workshop for this project with participants from vested interested parties, i.e. the client, consultants and beneficiaries was undertaken on 11 December 2013. The risk register prepared at this workshop has been priced and has been statistically analysed to produce the residual target risk contingency and 95<sup>th</sup> percentile funding allowances

For cost estimation, 'risk' is the chance of something happening, that will have either a beneficial, or a detrimental impact on the final out-turn cost. Therefore both the consequence and likelihood of the risk, or opportunity need to be assessed.

Risk can be classified as 'known risks' and 'unknown risks'.

- Known risks are those identified during the risk management process as an unplanned event that could occur in the project. The amount of contingency assigned to a known risk includes for, but not limited to, management of and the cost consequence of a risk.
- Unknown risks are those where the existence and degree of impact on the project are uncertain, for example, design errors and omissions. The amount of contingency assigned to an unknown risk is more subjective. Such factors as historical information and past experiences are considered.

The resulting outcome of the above process is that all identifiable risks that cannot be mitigated are evaluated and a statistical mean average contingency and 95th Percentile fund risk are established. As assessment of the calculated risk amounts was then made, in order to provide an appropriate Expected Estimate and 95th Percentile Estimates for the project.

## 5 Assumptions and Inclusions made in Scheme Estimate

The Option 3A SE has been prepared using the following assumptions:

- The cost of property to be purchased is \$10.8M. A credit of \$8.2M for the disposal value of surplus property has been assumed (as advised by The Property Group). The overall (net) allowance for property is \$2.5M
- Allowance of \$10,000 for accommodation works to each partial property acquisition.
- Allowance of \$25,000 for total removal of house, site clearance, disconnect services, topsoil and grass site to each total properties acquisition.
- Allowance of \$10,000 for solatium payment for each total property acquisition has been included within the Base Estimate.
- The property purchase and disposal costs are a desktop estimate only. No properties have been inspected for the purposes of this exercise. The estimates are based upon current sales evidence and data provided by a registered Valuer. Residential properties, for example, have had a premium applied to their rating values based upon the sales evidence.
- Roading works, including the grade separated interchanges will be procured with a Design and Construct Contract.
- Rail relocation works will be tendered as a separate enabling works project and will be procured with a traditional Measure and Value Contract.
- NZTA managed costs have been assessed at \$0.5M for the D&PD phase and 0.5M for the MSQA phase as advised by the NZTA.
- An allowance of \$1.5M as a contribution to the unsuccessful D&C tenderers (assumed contribution to two tenderers).
- The designation does not have sufficient space for the construction of a treatment or detention device to mitigate the additional stormwater run-off from the MGI. Tauranga City Council will be undertaking stormwater upgrades within the South Mount Maunganui stormwater catchment which will also require a stormwater consent. An agreement is being sought between NZTA and TCC to construct a combined treatment/detention device within Omanu Golf Course. It is assumed that no additional land purchase for stormwater requirements is required.
- It has been assumed that the designation area has sufficient space for the construction a treatment/detention pond for the additional stormwater run-off from the SH2/SH29 Interchange. No additional land purchase for stormwater requirements has been made for this area of the project.
- Ground Improvements at bridge abutments are assumed to be a stone column type treatment. 15m deep at 1.50m centres extending generally 25m from bridge abutment and 5m beyond the MSE wall or shoulder of pavement.
- It has been assumed that the bridge embankments will be undercut 1m deep to waste on site, backfilled with imported rubble (undercut starts 25m from bridge abutment and extends to bottom of ramp). This assumption has been based on traditional embankment ground improvement construction (e.g. the adjacent Hewlett's Rd fly-over used stone columns). Note that the NZTA Bridge Manual No.3 was issued part way through the estimating process and has not been specifically allowed for. However allowances have been made in the project risk register and contingency allowances for changes to design standards
- Existing pavements – cut 230mm deep, new 50mm fatigue layer (structural asphalt) and 150mm structural asphalt layer with 30mm SMA surfacing.
- New pavements – 150mm GAP40 sub-basecourse, 50mm fatigue layer (structural asphalt) and 150mm structural asphalt layer with 30mm SMA surfacing.

- A preliminary review of existing services requiring relocation has been carried out. A combination of pricing from utility providers and historical projects had been used to estimate the services relocation allowances.
- A 3 year construction period has been assumed.

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## 6 Exclusions from Scheme Estimate

The following items are excluded from the SE:

- Property purchase cost for noise mitigation measures to any properties in Russley Drive.
- Investigation and Reporting fees (sunk cost).
- Goods and Services Tax (GST).
- Escalation beyond 30 September 2013.
- Operating and maintenance costs associated with the project outcome.

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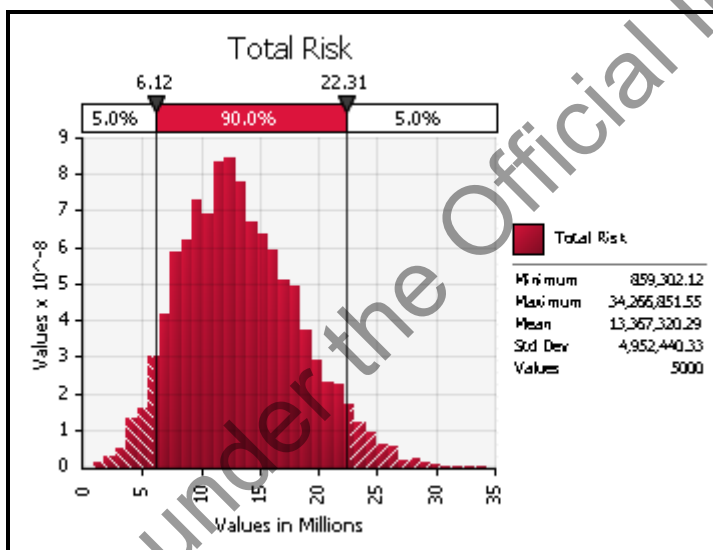
## 7 Analysis of the Contingency Allowance and 95<sup>th</sup> Percentile Estimate

A risk analysis has been undertaken to ascertain allowances for contingency and funding risk based on the output from the risk management workshop held on 11 December 2013. Analysis of the risk produced contingency and an assessed 95<sup>th</sup> Percentile Risk Funding allowances are as follows:

**Table 7.1 – 50<sup>th</sup> Percentile Contingency and 95<sup>th</sup> Percentile Risk Funding Allowances**

Description of Allowance	Total \$M	% of Base Estimate
5 <sup>th</sup> Percentile Contingency Allowance (P5)	\$6.12M	7.1%
50 <sup>th</sup> Percentile Contingency Allowance (P50)	\$12.89M	14.9%
Statistical mean contingency allowance	\$13.38M	15.4%
95 <sup>th</sup> Percentile Risk Funding (assessed)	\$13.70M	15.8%

The table below shows the ranking of the ten highest risks. It is recommended that mitigation plans be developed to effectively manage these risks.



Change in Output Statistic for Total Risk			
Rank	Name	Lower	Upper
1	Geotech conditions	11,555,390	19,374,510
2	Property purchase	12,032,901	16,944,582
3	Changes to existing design standards	11,612,448	15,853,598
4	Safety audit requirements	12,601,011	16,000,541
5	Design development	12,088,713	15,259,709
6	Flight path clearance	12,713,357	15,357,031
7	Rail mitigation accommodation works costs	12,504,348	15,070,060
8	Embankment structures effect on property	12,770,558	15,197,756
9	Inadequate space to construct project	12,725,589	15,053,107
10	Rail relocation	12,780,761	14,981,840



We consider that the contingency and 95<sup>th</sup> percentile risk funding allowances are appropriate as the project has undergone a robust risk assessment to assess the residual (i.e. post mitigated remaining) risk.

The contingency and 95<sup>th</sup> percentile risk funding allowances are limited to the Option 3A scope only. No allowance has been made for scope changes to the project. These scope changes could include:

- Additional property purchase requirements
- Additional connections to local roads (such as Truman Lane).

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## 8 Comparison with Industry Expert Parallel Estimate

Outlined below is a comparison of the estimates prepared by Beca and the Industry Expert (IE) at the opening of the parallel estimates on 31 January 2014.

**Table 8.1 – Comparison of Estimates at Opening of Parallel Estimates**

	Beca \$M	Industry Expert \$M	Difference from Beca Estimate \$M	Difference from Beca Estimate %
Physical Works Estimate	77.50	86.56	+9.06	12%
Construction Estimate (Physical works plus MSQA Phase)	85.94	95.06	9.12	11%
Base Estimate	88.46	95.06	6.73	8%
Expected Estimate	101.80	N/A	N/A	
95 <sup>th</sup> Percentile Estimate	115.50	N/A	N/A	

At the opening of the parallel estimate there were significant differences between the Beca and IE. This is largely due to the following;

- The IE had measured all quantities from the drawings provided and had re-structured the scheduled take-off quantity items provided. Due to this, only high-level comparisons of costs were made.
- A comparison of the quantities measured was made. There were differences in the quantity of earthworks and safety barriers but this was considered to be negligible. The IE had priced for the existing stormwater drainage system to be replaced – this is not required and adjustments were made. All other quantities were comparable.
- The IE had excluded property purchase costs
- The IE had made no assessment of the contingency and risk funding allowances at the time of the opening exchange of estimates

Following the opening of the parallel estimate, both Beca and the IE have separately reconsidered their estimates (refer Appendix A for more detail) and have updated them as outlined below.

**Table 8.2 – Final Reconciled Estimate between Beca and IE**

	Beca \$M	Industry Expert \$M	Difference from Beca Estimate \$M	Difference from Beca Estimate %
Net Property Cost	2.52	2.52*	Nil	Nil
Physical Works Estimate	77.17	82.37	5.20	6.7%
Construction Estimate (Physical works plus MSQA Phase)	81.75	86.37	4.62	5.6%
Base Estimate	88.62	93.39	4.77	5.4%
Expected Estimate	102.00	111.57	9.57	9.4%

	Beca \$M	Industry Expert \$M	Difference from Beca Estimate \$M	Difference from Beca Estimate %
95 <sup>th</sup> Percentile Estimate	115.70	125.20	9.50	8.2%

The revised estimates contain the following differences between Beca and the IE;

1. Beca has added the net property cost (property purchase minus disposal of surplus property) to the IE estimate, as required by the NZTA Cost Estimation Manual SM014.
2. Contingency and risk funding allowances. The IE has applied a flat percentage to the Base Estimate (20% for contingency and 35% for 95<sup>th</sup> percentile funding risk). Beca has analysed the project risk register to value the residual target risk (i.e. post-mitigation remaining risk) requirements as required by NZTA Z/44.

A difference of \$\$4.77M (5.4%) between the Beca and IE Base Estimates, based on preliminary design information at the Scheme Phase, is considered acceptable. Beca considers that as the IE has not applied the principles of NZTA Z/44 to assess the target risk outcomes, that the residual risk analysis by Beca should be adopted to determine the funding allowance required for the next stage of the project. Accordingly the recommended project funding (Expected Estimate) amount is \$102M with a 95<sup>th</sup> percentile estimate of \$115.70M.

## 9 Recommendations

Our recommended cost allowances for the project are:

**Table 9.1 – Schedule of Recommended Project Costs – Option 3A Scheme Estimate**

	Total \$M
Physical Works	77.17
Construction Cost (Physical Works Estimate and MSQA phase)	81.75
Base Estimate	88.62
<b>Expected Estimate</b>	<b>102.00</b>
95 <sup>th</sup> Percentile Funding Estimate	115.70

We recommend that the budget estimate for this project be set at the Expected Estimate of \$102.00M with a 95<sup>th</sup> Percentile Estimate of \$115.70M.

In order to reduce the degree of uncertainty in the project cost outturn, and potentially reduce the Expected and 95<sup>th</sup> Percentile Estimates, continual investment in the mitigation of risks and the development of the design is recommended throughout the project development cycle.

Appendix A

Scheme Estimate – Option  
3A

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# Project estimate

# SE

Project name: Maunganui Girven Interchange - Option 3A

Scheme estimate

Item	Description	Base estimate	Contingency	Funding risk
	- Acquisition	s 9(2)(b)(ii)	Nil	Nil
	- Disposal		Nil	Nil
<b>A</b>	<b>Nett project property cost</b>	<b>2,520,000</b>	<b>380,000</b>	<b>390,000</b>
	Investigation and reporting:			
	- consultancy fees	Nil	Nil	Nil
	- the NZTA-managed costs	Nil	Nil	Nil
<b>B</b>	<b>Total investigation and reporting</b>	<b>Nil</b>	<b>Nil</b>	<b>Nil</b>
	Design and project documentation:			
	- consultancy fees, incl geotech investigations	s 9(2)(b)(ii)		
	- Railway design			
	- the NZTA-managed costs			
	- contribution to unsuccessful tenderers			
<b>C</b>	<b>Total design and project documentation</b>	<b>4,350,000</b>	<b>655,000</b>	<b>670,000</b>
	Construction			
	<b>MSQA</b>			
	- consultancy fees	s 9(2)(b)(ii)		
	- Railway civil construction consultancy fees			
	- the NZTA-managed costs			
	- consent monitoring fees			
	<b>Sub-total base MSQA</b>	<b>4,580,000</b>	<b>690,000</b>	<b>705,000</b>
	<b>Physical works</b>			
1	Environmental compliance	s 9(2)(b)(ii)		
2	Earthworks			
3	Ground improvements			
4	Drainage			
5	Pavement and surfacing			
6	Bridges			
7	Retaining walls			
8	Traffic services			
9	Service relocations			
10	Landscaping			
11	Traffic management and temporary works			
	Contractor's design & construction monitoring			
12	Preliminary and general			
13	Extraordinary construction costs - Railway Relocation			
	<b>Sub-total base physical works</b>	<b>77,170,000</b>	<b>11,655,000</b>	<b>11,935,000</b>
<b>D</b>	<b>Total construction</b>	<b>81,750,000</b>	<b>12,345,000</b>	<b>12,640,000</b>
<b>E</b>	<b>Project base estimate (A+D)</b>	<b>88,620,000</b>		
<b>F</b>	<b>Contingency (Assessed/Analysed) (A+D)</b>		<b>13,380,000</b>	
<b>G</b>	<b>Project expected estimate (E+F)</b>		<b>102,000,000</b>	
	Project property cost expected estimate		2,900,000	
	Investigation and reporting expected estimate		Nil	
	Design and project documentation expected estimate		5,005,000	
	Construction expected estimate		94,095,000	
<b>H</b>	<b>Funding risk (Assessed/Analysed) (A+D)</b>			<b>13,700,000</b>
<b>I</b>	<b>95th percentile project estimate (G+H)</b>			<b>115,700,000</b>
	Project property cost 95th percentile estimate			3,290,000
	Investigation and reporting 95th percentile estimate			Nil
	Design and project documentation 95th percentile estimate			5,675,000
	Construction 95th percentile estimate			106,735,000
<b>Date of estimate</b>		<b>Cost index (Qtr/Year): September 2013</b>		
<b>Estimate prepared by: Warren Perkins (Beca)</b>		<b>Signed</b>		
<b>Estimate internal peer review by: Tim Haig (Beca)</b>		<b>Signed</b>		
<b>Estimate external peer review by: Construction Consulting Group</b>		<b>Signed</b>		
<b>Estimate accepted by the NZTA: Greig Stephens</b>		<b>Signed</b>		

Note: (1) These estimates are exclusive of escalation and GST.

(2) Investigation and reporting, and design and project documentation project phases estimates are set to nil as these are now sunk costs.

(3) Include a project phase funding application assessment form I with the DE.

Appendix B

Industry Expert Estimate and  
Comparison with Beca  
Estimate

Released under the Official Information Act 1982



NZ TRANSPORT AGENCY  
WAKA KOTAHI

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# SH2 Maunganui/Girven and Te Maunga Intersection Improvements

## Project Scheme Estimate Report

by

**Construction Consulting Group Ltd**

March 2014

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Issued: Version 2 – Final  
Date of Issue: 19<sup>th</sup> March 2013





## 1 SUMMARY

This report covers the parallel estimate for the SH2 Maunganui, Girven and Te Maunga Intersection Improvements scheme design. The expected estimate (risk adjusted at the P50) is \$109.0m.

The estimate has been reconciled, accepting some variances, to the estimate received from Beca 7<sup>th</sup> February 2014 of \$99.5m (excluding property). The significant item of difference is the P50 Contingency – refer attached table.

## 2 GENERAL BASIS OF ESTIMATE

- (i) The estimate is based on 3rd quarter 2013 rates and market conditions.
- (ii) The estimate is risk adjusted and represents forecast out-turn costs.
- (iii) A provision for increased cost (escalation) is not included.
- (iv) Nett Project Property costs and Property and Land Accommodation Works are not included.
- (v) Investigation and Reporting (sunk) costs are not included.
- (vi) We have assumed the NZTA procurement model will be design and construct.
- (iv) The estimate is based on the MGI Intersection Improvements briefing document and appendices dated 15<sup>th</sup> November 2013.

## 3 SCOPE OF WORKS

- 3.1 Nett Project Property costs (and Property Land Accommodation works) have been excluded. We understand your Property Group have advised the project team the value of this item.
- 3.2 Design and Project Development costs include \$2.5m for the specimen design and \$1.5m for the intellectual property associated with unsuccessful tenders.
- 3.3 MSQA costs include \$3.25m for NZS3910 contract administration.
- 3.4 Environmental Compliance: We have allowed for two stormwater treatment ponds at Te Maunga and the Omanu Golf Course. We have included 700m of noise wall along Mt Maunganui Rd. Other noise walls are included in the rail schedule.

- 3.5 Earthworks: We have assumed ROP from the Poplar Lane quarry will be suitable for fill embankments. Beca have advised a typical rate for this material of \$27-\$30. The total fill required is approx. 140,000 m<sup>3</sup>.
- 3.6 Ground Improvement works include 3,000 m<sup>2</sup> of 15m deep stone columns at the MGI and SH2 bridge abutments and 28,000 m<sup>3</sup> of undercut and replacement fill to the remaining embankment footprint.
- 3.7 Drainage: We have allowed for 3 x 600mm culverts crossing the state highway alignment and 4,900m of new stormwater pipework. Beca have advised some of the existing stormwater network can be reused and only catchpits and catchpit leads require replacement.
- 3.8 Pavement: The pavement works include 75,000 m<sup>2</sup> of new pavement to SH2 and SH29 and 10,000 m<sup>2</sup> of pavement to Tauranga City Council roads. The state highway pavement design allows for 150mm sub-basecourse, 200mm structural asphalt and 30mm of OGPA or SMA surfacing. The Tauranga City Council roads are assumed to be an unbound pavement 350mm depth. We have allowed 80% of the subgrade preparation and improvement to be between 4% and 6% CBR and 20% < 4% CBR.
- 3.9 Bridges: The estimate includes new structures for the MGI intersection flyover 105m x 18m, the SH2 overbridge 30m x 21m, and the ECMT Rail Crossing 30m x 21m. Bridges are assumed to be typical precast beam and slab. We have assumed piled foundations 35-50m in length.
- 3.10 We have assumed all retaining walls to be mechanically stabilised earth with a 150-200mm precast concrete facing panel. The total area of retaining walls is approx. 8,700 m<sup>2</sup>.
- 3.11 Traffic Services: The estimate includes 3,800m of rigid concrete barriers (TL4) and 1,500m of wire rope barrier (TL3). Typical state highway design and costs are assumed for signs, gantries, pavement marking and street lighting. We have included for traffic signals at the SH2/Girven and SH2/SH29 intersections.
- 3.12 We have used the sum of \$1.3m advised by Beca for Service Relocations. We understand this is based on quotations received from, and discussions with, service providers.
- 3.13 Traffic Management: We have allowed for the purchase of 3.9km of temporary barriers with a 15% residual value. We have allowed standard COPTTM traffic management controls and operations and approx. 2,000t of temporary pavement.
- 3.14 Rail: Drawings for the rail infrastructure and enabling works have not been issued. For the civil works we have used the Beca estimate less 17.5% assumed to have been allowed for overheads and margin. We

have used the total Beca/Kiwirail estimate of \$4.6m for trackwork and signalling.

- 3.15 Contractors Design is calculated at 8.5% of the contractors direct cost.
- 3.16 Contractors Overheads are calculated at 21% of the contractors direct cost.
- 3.17 The Contractors Margin is calculated at 11.0% of the sum of the contractors direct cost, design and overheads.
- 3.18 The contingency for P50 is calculated at 20% of Total E.
- 3.19 The contingency for the 95<sup>th</sup> percentile funding risk is calculated at 35% of Total E.

#### 4 ATTACHMENTS

- 1 Reconciliation Summary
- 2 Summary of Direct Costs

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Item	Description	IE	BECA	Difference
A1000	NETT PROJECT PROPERTY COSTS	EXCLUDED	EXCLUDED	\$ -
B1000	INVESTIGATION AND REPORTING	EXCLUDED	EXCLUDED	\$ -
C1000	DESIGN AND PROJECT DOCUMENTATION	s 9(2)(b)(ii)		
D0100	MSQA			
D0200	ENVIRONMENTAL COMPLIANCE			
D0300	EARTHWORKS			
D0400	GROUND IMPROVEMENT			
D0500	DRAINAGE			
D0600	PAVEMENT AND SURFACING			
D0700	STRUCTURES			
D1000	RETAINING WALLS			
D1100	TRAFFIC SERVICES			
D1200	SERVICE RE-LOCATIONS			
D1300	LANDSCAPING AND URBAN DESIGN			
D1400	TRAFFIC MANAGEMENT			
D1500	RAIL			
D2000	CONTRACTORS DESIGN			
D3000	CONTRACTORS OVERHEAD ( PRELIMINARY & GENERAL )			
D4000	CONTRACTORS MARGIN			
E1000	PROJECT BASE ESTIMATE ( Total E )			
F1000	CONTINGENCY P50			
G1000	PROJECTED EXPECTED ESTIMATE AT P50			
H1000	CONTINGENCY P95			
I1000	PROJECTED EXPECTED ESTIMATE AT P95			

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Item	Description	Qty	Unit	Rate	Amount
A1000	NETT PROJECT PROPERTY COSTS	1	L.S.		EXCLUDED
B1000	INVESTIGATION AND REPORTING	1	L.S.		EXCLUDED
C1000	DESIGN AND PROJECT DOCUMENTATION	1	L.S.	\$	<div style="background-color: black; color: red; padding: 5px;">s 9(2)(b)(ii)</div>
C1010	Consulting Fees	1	L.S.		
C1020	Geotechnical Investigation and Testing	1	L.S.		
C1030	NZTA Managed Costs	1	L.S.		
C1040	Tendering Costs (Unsuccessful Tenderers IP)	1	L.S.		
D0100	MSQA	1	L.S.	\$	
D1010	Consulting Fees	1	L.S.		
D1020	Consent and Monitoring Fees	1	L.S.		
D1030	NZTA Managed Costs	1	L.S.		
D0200	ENVIRONMENTAL COMPLIANCE	1	L.S.	\$	
D0210	Erosion and Sediment Control	1	L.S.		
D0220	Stormwater Treatment System	1	L.S.		
D0230	Noise Walls	1	L.S.		
D0300	EARTHWORKS	1	L.S.	\$	
D0310	Site Clearing and Demolition	1	L.S.		
D0320	Topsoil Stripping	1	L.S.		
D0330	Cut to Fill	1	L.S.		
D0340	Cut to Waste (Landscaped Fill)	1	L.S.		
D0360	Imported Fill	1	L.S.		
D0370	Re-Spread Topsoil	1	L.S.		
D0400	GROUND IMPROVEMENT	1	L.S.	\$	
D0410	Embankment Settlement Mitigation and General Ground Improvement Works	1	L.S.		
D0420	Bridge Foundation Settlement Mitigation and General Ground Improvement Works	1	L.S.		
D0430	Geotechnical Instrumentation and Monitoring	1	L.S.		
D0500	DRAINAGE	1	L.S.	\$	
D0510	Culverts	1	L.S.		
D0520	Network Stormwater Drainage	1	L.S.		
D0540	Surface Drainage Channel	1	L.S.		
D0550	Sub-Soil and Pavement Drains	1	L.S.		
D0560	Kerb and Channel	1	L.S.		
D0600	PAVEMENT AND SURFACING	1	L.S.	\$	

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Item	Description	Qty	Unit	Rate	Amount
D0610	Sub-Grade Preparation and Improvement	1	L.S.		s 9(2)(b)(ii)
D0620	Sub-Base	1	L.S.		
D0630	Basecourse	1	L.S.		
D0640	Surfacing and Wearing Course	1	L.S.		
D0700	STRUCTURES	1	L.S.	\$	
D0710	MGI Flyover	1	L.S.		
D0720	SH2 Overbridge	1	L.S.		
D0730	ECMT Rail Crossing	1	L.S.		
D0740	Baypark Footbridge	1	L.S.		
D1000	RETAINING WALLS	1	L.S.	\$	
D1010	Retaining Wall MGI North Abutment	1	L.S.		
D1020	Retaining Wall MGI South Abutment	1	L.S.		
D1030	Retaining Wall SH2 East Abutment	1	L.S.		
D1040	Retaining Wall SH2 West Abutment	1	L.S.		
D1050	Retaining Wall SH2 and SH29 Interchange Ramp	1	L.S.		
D1060	Retaining Wall SH2 and SH29 Baypark Access	1	L.S.		
D1100	TRAFFIC SERVICES	1	L.S.	\$	
D1110	Barrier Systems	1	L.S.		
D1120	Signs	1	L.S.		
D1130	Sign Gantry	1	L.S.		
D1140	Pavement Marking	1	L.S.		
D1150	Traffic Signals	1	L.S.		
D1170	Street Lighting	1	L.S.		
D1200	SERVICE RE-LOCATIONS	1	L.S.	\$	
D1300	LANDSCAPING AND URBAN DESIGN	1	L.S.	\$	
D1310	Planting	1	L.S.		
D1320	Grassing and Hydroseed	1	L.S.		
D1330	Streetscape Works	1	L.S.		
D1340	Fencing	1	L.S.		
D1350	Property Land Accommodation Works	1	L.S.		
D1400	TRAFFIC MANAGEMENT	1	L.S.	\$	
D1410	Installation and Removal of Traffic Management Works	1	L.S.		
D1420	Mobile Traffic Management Operations	1	L.S.		
D1440	Temporary Pavement and Road Diversion	1	L.S.		

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Item	Description	Qty	Unit	Rate	Amount
D1500	RAIL	1	L.S.	\$	<div style="background-color: black; color: red; padding: 5px;">s 9(2)(b)(ii)</div>
D1510	Civil Works	1	L.S.		
D1520	KiwiRail (Trackwork and Signalling)	1	L.S.		
D2000	CONTRACTORS DESIGN	1	L.S.	\$	
D3000	CONTRACTORS OVERHEAD (PRELIMINARY & GENERAL)	1	L.S.	\$	
D4000	CONTRACTORS MARGIN	1	L.S.	\$	
E1000	PROJECT BASE ESTIMATE (Total E)				
F1000	CONTINGENCY P50	1	L.S.	\$	
G1000	PROJECTED EXPECTED ESTIMATE AT P50				
H1000	CONTINGENCY P95	1	L.S.	\$	
I1000	PROJECTED EXPECTED ESTIMATE AT P95				\$ 122,677,727

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# MGI SH2/SH29 Intersection Estimate Summary

# SE

Option 3A

Scheme estimate

Item	Description	Beca Revised Estimate (A)	CCG Revised Estimate (B)	Difference \$ (C= A-B)	Difference %	Comment
A	<b>Nett project property cost</b>	2,520,000	2,520,000	-	-	Property cost excluded by IE - added by Beca
	Investigation and reporting:	Nil	Nil	-	-	
	- consultancy fees	Nil	Nil	-	-	
	- the NZTA-managed costs	Nil	Nil	-	-	
B	<b>Total investigation and reporting</b>	Nil	Nil	-	-	
	Design and project documentation:	s 9(2)(b)(ii)				
	- consultancy fees					
	- KiwiRail design fee allowance					
	- geotechnical investigation and testing					
	- the NZTA-managed costs					
	- contribution to unsuccessful tenderers					
C	<b>Total design and project documentation</b>	4,350,000	4,500,000	(150,000)	200	
	Construction					
	<i>MSQA</i>	s 9(2)(b)(ii)				
	- consultancy fees					
	- the NZTA-managed costs					
	- consent and monitoring fees					
	<i>Sub-total base MSQA</i>	4,580,000	4,000,000	580,000	13	
	<i>Physical works</i>	s 9(2)(b)(ii)				
1	Environmental compliance					
2	Earthworks					
3	Ground improvements					
4	Drainage					
5	Pavement and surfacing					
6	Structures (Bridges and Retaining)					
7	Traffic services					
8	Landscaping					
9	Services relocation					
10	Traffic Management					
11	Contractor's Design & Construction Monitoring					
12	Preliminary and General					
13	Railway Relocation - Earthworks					
14	Railway Relocation - Noise Wall					
15	Railway Relocation - Kiwirail					
	Contractors margin					Margin included in Beca rates
	<i>Sub-total base physical works</i>	77,170,000	82,372,390	2,997,610	4	
D	<b>Total construction</b>	81,750,000	86,372,390	3,577,610	4	
E	<b>Project base estimate</b>	88,620,000	93,392,390	3,427,610	4	
F	<b>Contingency (Assessed Residual Risk Allowance)</b>	13,380,000	18,174,478	-4,794,478	(36)	
G	<b>Project expected estimate</b>	102,000,000	111,566,868	-9,566,868	(9)	
	Project property cost expected estimate			-		
	Investigation and reporting expected estimate			-		
	Design and project documentation expected estimate					
	Construction expected estimate					
H	<b>Funding risk (Assessed/Analyser)</b>	13,700,000	13,630,859	69,141	1	
I	<b>95th percentile project estimate</b>	115,700,000	125,197,727	-9,497,727	(8)	
	Project property cost 95th percentile estimate	-		-		
	Investigation and reporting 95th percentile estimate	Nil	Nil	-		
	Design and project documentation 95th percentile estimate			-		
	Construction 95th percentile estimate			-		

Note: (1) These estimates are exclusive of escalation and GST.  
 (2) Investigation and reporting.



Appendix C

Physical Works Cost  
Estimate Breakdown –  
Option 3A

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**GENERAL SUMMARY**

PROJECT : Maunganui Girven Option 3A Estimate

SubTitle : Post Exchange Reconciliation of Parallel Estimate January 2014

COMPANY : Beca

DATE : Thu 27 Mar 2014 02:26pm

Bid Currency : NZ\$

CO	SECTION NAME	UNIT	QTY	RATE	DJC
1	OPTION 3A PARALLEL ESTIMATE JAN 2014				115,700,000.00
<b>TOTALS OF SELECTED SECTIONS</b>					<b>115,700,000.00</b>

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BOREF	DESCRIPTION	UNIT	QTY	RATE	COST
	<b><u>OPTION 3A - October 2013</u></b>				
	Based on Option 4 changed to Option 3C then Option 3A October 2013				
	<b><u>Drawings</u></b>				
4.1	Beca Drawing 3933377 - C - K089 Rev B dated 10 October 2013 for information plus additional hand drawn sketch notes				
	<b><u>Scope</u></b>				
	<b><u>Assumptions</u></b>				
4.2	Managtawa Interchange / Truman Lane can be used to divert westbound traffic (to SH29) during construction of Te Maunga westbound off ramp				
4.3	Property purchase and disposal of surplus property costs provided by The Property Group (9 September 2013) have been used. It is assumed that: ~ \$10,000 solatium payment per total property purchase will be made ~ \$30,000 for acoustic treatment / upgrade of the Lifton PI properties ~ Russley Drive properties STET require any acoustic treatment or accommodation works				
	<b><u>Exclusions</u></b>				
4.4	Property accomodation works to Russley Drive properties				
	<b><u>MAIN CONTRACT PHYSICAL WORKS</u></b>				
	<b><u>Environmental Compliance</u></b>				
4.5	Allowance for general environmental compliance	LS	1		
4.6	Allowance to mitigate noise along SH2 (noise fence)	m	600		
4.31	Allow for golf-course outfall, attenuation and stormwater treatment	LS	1		
4.34	Allow for Baypark / estuary outfall, attenuation and stormwater treatment	LS	1		
4.7	<b>Total Environmental Compliance**</b>				1,080,000.00
	<b><u>Earthworks</u></b>				

## Section '1'-OPTION 3A PARALLEL ESTIMATE JAN 2014'

COMPANY : Beca

PROJECT : Maunganui Girven Option 3A Estimate

DATE : Thu 27 Mar 2014 02:26pm

SubTitle : Post Exchange Reconciliation of Parallel Estimate January 2014

Bid Currency : NZ\$

BOREF	DESCRIPTION	UNIT	QTY	RATE	COST
4.8	Site clearance and demolition	LS	1	s 9(2)(b)(ii)	
4.9	Remove existing kerb and channel	m	5,060		
4.10	Remove existing concrete median islands up to approx 3m wide	m	565		
4.11	Mill existing pavement surfacing to waste on site (for areas of structural AC in existing pavement)	m2	22,515		
4.12	Cut to waste on site for new pavement widening or new structural AC layer	m3	39,000		
4.13	Undercut subgrade to waste on-site and backfill with imported hardfill (assume 20% of new pavement area x 0.5m deep)	m3	5,400		
4.14	GAP65 fill to make up subgrade levels	m3	5,960		
4.15	Bulk fill to MSE walls and bridge embankments	m3	136,340		
4.16	Demolish and backfill existing Maunganui Rd pedestrian underpass	LS	1		
4.17	Estimate rounding	LS	1		
4.18	<b>Total Earthworks **</b>				
	<b>Ground Improvement</b>				
4.19	Stone columns - assume 15m (av) deep at 1.50m centres extending generally 25m from bridge abutment and 5m beyond MSE wall or shoulder of pavement	no	1,562		
4.20	Undercut toe of embankment 1m deep to waste on site, backfill with imported sand (undercut starts 25m from bridge abutment and extends to bottom of embankment ramp)	m3	31,580		
4.21	Estimate rounding	LS	1		
4.22	<b>Total Ground Improvements **</b>				
	<b>Drainage</b>				
4.23	Kerb and channel	m	9,179		
4.24	Subsoil drain under kerb	m	9,179		
4.25	Remove existing catchpit and lead	No	66		
4.26	Single catchpit and 3m long lead (assumed every 70m)	no	78		
4.27	Manhole	no	54		

## Section '1'-OPTION 3A PARALLEL ESTIMATE JAN 2014'

COMPANY : Beca

PROJECT : Maunganui Girven Option 3A Estimate

DATE : Thu 27 Mar 2014 02:26pm

SubTitle : Post Exchange Reconciliation of Parallel Estimate January 2014

Bid Currency : NZ\$

BOREF	DESCRIPTION	UNIT	QTY	RATE	COST
4.28	Pipework between catchpits (Assume existing has to be removed and replaced)	m	4,600	s 9(2)(b)(ii)	
4.29	600 dia culvert thrust under Manganui Rd (ASSUMED in 2No. locations)	m	60		
4.30	Thrusting pit (ASSUMED required)	no	4		
4.32	600mm dia culvert under SH29 (ASSUMED)	m	30		
4.33	Head walls to 600mm dia culvert	no	2		
4.35	Estimate rounding	LS	1		
<b>4.36</b>	<b>Total Drainage**</b>				
	<b><u>Pavement and Surfacing</u></b>				
4.37	Trim subgrade	m2	90,440		
4.38	GAP40 sub-basecourse 150mm thick to new pavement areas (under new structural AC)	m3	9,019		
4.39	150mm thick structural asphalt (to existing pavement areas)	m2	19,915		
4.40	50mm thick fatigue layer to existing pavement (structural asphalt)	m2	19,915		
4.41	150mm thick structural asphalt (to new pavement areas)	m2	58,725		
4.42	50mm thick fatigue layer to new pavement (structural asphalt)	m2	58,725		
4.43	30mm thick SMA	m2	78,640		
4.44	Allowance for modifications to Bayfair and Owens PI entrances	no	2		
4.45	Allowance for tie in to existing pavement at Ch0	no	1		
4.46	Allowance for tie in to existing pavement on Girven and Matapihi	no	2		
4.47	Allowance for tie in to Truman Lane entrance	no	1		
4.48	Allowance for tie in to existing pavement at Ch1600 and SH29	no	2		
4.49	Allowance for tie in to Exeter Rd	no	1		
4.50	Estimate rounding	LS	1		
<b>4.51</b>	<b>Total Pavement and Surfacing**</b>				
	<b><u>Retaining Walls</u></b>				
4.52	600 x 300mm strip footing to base of MSE				

## Section '1'-'OPTION 3A PARALLEL ESTIMATE JAN 2014'

COMPANY : Beca

PROJECT : Maunganui Girven Option 3A Estimate

DATE : Thu 27 Mar 2014 02:26pm

SubTitle : Post Exchange Reconciliation of Parallel Estimate January 2014

Bid Currency : NZ\$

BOREF	DESCRIPTION	UNIT	QTY	RATE	COST
	precast wall	m	810	s 9(2)(b)(ii)	
4.53	MSE wall including 200mm precast concrete panel, urban design pattern and graffiti paint finish	m2	7,702		
4.54	Capping beam to MSE wall	m	810		
4.55	Allowance for retaining wall to Bayfair carpark - assume 50m long x 1m high	m	50		
4.56	Estimate rounding	LS	1		
<b>4.57</b>	<b>Total Retaining Walls **</b>				
	<b>Bridge Structures</b>				
4.58	Maunganui Girven flyover 105m long including side barriers and pavement surfacing	m2	2,000		
4.59	SH2 over-bridge size 30m long including side barriers and surfacing	m2	636		
4.60	CSP Steel plate railway structure 10m wide x 6.5m high	LS	1		
4.61	Concrete footing for steel plate 6.5m high	LS	1		
4.62	Train derailment guide rails - assume 0.5 x 1.5m deep x 30m long both sides of rail	m	60		
4.92	Pedestrian overbridge (between Truman Lane & SH29 rail overbridge), assume 3m wide. Agreed Parallel estimate 31 January 2014 to allow \$750,000	m	120		
4.63	Estimate rounding	LS			
<b>4.64</b>	<b>Total Bridge Structure **</b>				
	<b>Traffic Services</b>				
4.65	Longitudinal road markings - thermoplastic	m	25,940		
4.66	Flush median or shoulder Chevron marking	m2	1,430		
4.67	Allowance for sundry road markings	LS	1		
4.68	Kerb to median and splitter islands	m	1,430		
4.69	Concrete infill to medians and splitter islands	m2	1,215		
4.70	Pedestrian crossings and safety island	no	10		
4.71	Pedestrian refuge to median	no	4		
4.72	Overhead gantry across 2 to 4 lanes (Type 1)	no	2		
4.73	Ground planted cantilevered gantry (Type 2)	no	7		

## Section '1'-OPTION 3A PARALLEL ESTIMATE JAN 2014'

COMPANY : Beca

PROJECT : Maunganui Girven Option 3A Estimate

DATE : Thu 27 Mar 2014 02:26pm

SubTitle : Post Exchange Reconciliation of Parallel Estimate January 2014

Bid Currency : NZ\$

BOREF	DESCRIPTION	UNIT	QTY	RATE	COST
				9(2)(b)(ii)	
4.74	Ground planted signs (large)	no	26		
4.75	Allowance for general signage	LS	1		
4.76	Allow to re-configure access paths into pedestrian underpass	LS	1		
4.77	Reconstruct vehicle crossings	m2	180		
4.78	Footpath 1.5m wide	m	1,120		
4.79	Remove existing streetlight	no	71		
4.80	New streetlight	no	111		
4.81	Lane lighting to Maunganui/Girven bridge deck and embankment approaches - assume deck mounted light at 5m centres	no	200		
4.82	Traffic signals to Maunganui / Girven intersection	LS	1		
4.83	Traffic signals to Mataphi / Owens intersection (deleted from project scope)	LS	1		
4.84	Traffic signals to SH2/SH29 diamond interchange	LS	1		
4.85	Wire rope median barrier	m	1,600		
4.86	TL4 median barrier to SH29 overbridge	m	400		
4.87	Tie into existing TEL wire rope median barrier	No	1		
4.88	Allowance for modifications to existing SH29 median barrier	LS	1		
4.89	Ground planted TL4 concrete barrier and graffiti paint to on/off ramps and bridge embankments	m	3,960		
4.90	Crash cushion	no	5		
4.91	Level rail crossing to Owens PI extension (additional to KiwiRail enabling works to relocate existing Te Maunga rail crossing)	no	1		
	Safety fencing to road and rail crossing	m	550		
4.93	Estimate rounding	LS	1		
4.94	<b>Total Traffic Services**</b>				
	<b>Landscaping</b>				
4.95	Allowance for landscape planting (assume approx 70% of berm area) plus area under bridge	m2	10,000		
4.96	Imported topsoil to berms 150mm thick	m3	3,335		

BOREF	DESCRIPTION	UNIT	QTY	RATE	COST
4.97	Grassing	m2	15,100		
4.98	Estimate rounding	LS	1		
<b>4.99</b>	<b>Total Landscaping **</b>				
	<b><u>Services Relocations</u></b>				
4.100	Allow to relocate pump station (corner of Maunganui & Matapihi)	LS	1		
4.101	Existing services on northern side of Maunganui Rd (Chorus, power and TCC water, sewer, stormwater and SCATS) require relocation or protection	LS	1		
4.102	Allowance for general services relocations	LS	1		
<b>4.103</b>	<b>Total Services Relocations **</b>				
	<b><u>Traffic Management</u></b>				
4.104	Allowance for temporary traffic management	LS	1		
<b>4.105</b>	<b>Total Traffic Management **</b>				
<b>4.106</b>	<b>Sub Total Physical Works ##</b>				
	<b><u>Contractor's Design and Construction Monitoring</u></b>				
4.107	Allowance for Contractor's Design and Construction Monitoring - based on the assumption that the project will be procured by Design and Construct method	%	52,190,000		
<b>4.108</b>	<b>Total Contractor's Design &amp; Construction **</b>				
	<b><u>Preliminary and General</u></b>				
4.109	Allowance for Preliminary & General costs	%	56,890,000		
<b>4.110</b>	<b>Total Preliminaries **</b>				
<b>4.111</b>	<b>TOTAL OF MAIN CONTRACT PHYSICAL WORKS ##</b>				
	<b><u>ENABLING WORKS</u></b>				
	<b><u>RAIL RELOCATION - 400M RADIUS OPTION (Scenario B)</u></b>				
4.112	<b>Information</b>				
4.113	Estimates have been prepared from				



## Section '1'-OPTION 3A PARALLEL ESTIMATE JAN 2014'

COMPANY : Beca

PROJECT : Maunganui Girven Option 3A Estimate

DATE : Thu 27 Mar 2014 02:26pm

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Bid Currency : NZ\$

BOREF	DESCRIPTION	UNIT	QTY	RATE	COST
	un-numbered drawings received 1 June 2012 and drawing 3933377-C-K035B, K036A & K025A received 29 May 2012				
4.114	400m radius option refers to the curvature of the track from the Owens Place corridor through the Te Maunga intersection (string MT03)				
4.115	The track from the Owens Place corridor west towards Matapihi is 250m radius (string MT02)				
4.116	New track lengths are: String MT03 Tie in MT03 and existing line String MT02 to tie into MT03 TOTAL track length	m m m m	1,470 50 600 2,120		
4.117	Estimated costs have been reviewed by KiwiRail (Terry Hodder letter dated 19 July 2013 - meridio email file 7967101). Beca estimates have been revised to KiwiRail recommendations)				
4.118	<b>Assumptions</b>				
4.119	No geotechnical investigation has been carried out.				
4.120	It is assumed that topsoil is 300mm thick				
4.121	It is assumed that cut material is unsuitable for structural fill				
4.122	All cut material is cut to waste on site. No allowance for off-site disposal has been made				
4.123	It is assumed that Poplar Lane quarry rubble is suitable for filling to rail embankments				
4.124	An allowance for undercutting a section of the track 500m long x 10m wide x 1m deep (5,000m <sup>3</sup> ) has been made, backfilled with imported dune sand				
4.125	It is assumed that the railway can be aligned so that existing power services (especially pylons) do not require relocation or provision of train derailment guide beams				
4.126	This estimate has been based on the assumption that NZTA will procure the earthworks/drainage works and the KiwiRail works under two separate contracts				
4.127	An allowance fo \$50,000 for KiwiRail management to monitor the works has been included				

## Section '1'-OPTION 3A PARALLEL ESTIMATE JAN 2014'

COMPANY : Beca

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Bid Currency : NZ\$

BOREF	DESCRIPTION	UNIT	QTY	RATE	COST
4.128	<b>Exclusions</b>				
4.129	Project property purchase costs				
4.130	Credit for the disposal or sale of property				
4.131	Removal of contaminated material				
4.132	Archaeological investigations				
4.133	Investigation and reporting fees (assumed all costs are sunk)				
4.134	<b>Railway Earthworks</b>				
4.135	Clearance to rail corridor 10m wide	m2	21,200		
4.136	300mm thick topsoil strip, temporarily stockpile and re-spread on sides of rail embankment on completion	m3	6,360		
4.137	Cut to waste on-site from strip level to MX formation level plus 200mm for sleepers and ballast	m3	6,970		
4.138	Fill embankment with Poplar Lane quarry rubble	m3	9,029		
4.139	Undercut Ch0-Ch500 section of track - assume 10m wide x 1m deep, cut to waste on-site	m3	5,000		
4.140	Backfill undercut with imported dune sand	m3	5,000		
4.141	Geotextile cloth to undercut areas	m2	5,000		
4.142	Allow for retaining wall approx 500mm high to Ch820-860	m	80		
4.143	Grassing to rail embankments	m2	21,200		
4.144	Drainage swale to both sides of rail track	m	4,240		
4.145	Assume 450mm dia culvert 10m long with 2No. headwalls at 50m centres along track	No	43		
4.146	Allowance for stormwater detention pond an outlet into existing stormwater system	LS	1		
4.147	Allow to reinstate existing Matapihi Rd level crossing when rail tracks are removed	LS	1		
4.148	Allow for replacement of existing 450mm dia AC watermain (in power corridor), approx 20m long under new rail embankment	m	20		
4.149	Protection of gas main at rail crossings	no	2		
4.150	Allowance to relocate Transpower overhead cables, Vector gas main and FX Networks fibre optic cables from rail corridor				

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BOREF	DESCRIPTION	UNIT	QTY	RATE	COST
	(KiwiRail fibre optic relocated separately in Enabling Works contract). Include for protection of TCC sewer and stormwater pipework	LS	1		
4.151	Allow for traffic management of KiwiRail works to level crossings (3No.) and general project works	LS	1		
4.152	Allow for traffic management for railway services relocations adjacent Maunganui Rd	LS	1		
4.153	Noise wall to adjoining residential properties	m	1,500		
4.154	Allowance for Earthworks Contractor's P&G costs	%	2,889,913		
4.155	<b>KiwiRail Railway Works</b>				
4.156	Refer Kiwi Rail (Terry Hodder) letter 19 July 2013 with revisions to Beca June 2012 estimate				
4.157	Provide new single rail track, ballast and sleepers	m	2,120		
4.158	Extra over for rail isolation for vibration effects	m	250		
4.159	Allow to tie into existing track at northern end - allow to slew existing tracks over to join new track	No	1		
4.160	New turn-out switch	No	3		
4.161	Re-lay existing (un-used) Tauranga to Kawerau direct line (Beca assessment)	m	500		
4.162	Allow for re-connection of unused Tauranga to Kawerau direct line into existing Mt Maunganui line at Te Maunga	LS	1		
4.163	Uncover existing (buried) un-used Te Maunga level crossing and re-lay tracks and sleepers. Allow to construct new rubber surfaced level crossing	m	30		
4.164	The following provided by KiwiRail (Terry Hodder email 27 June 2012) including - Relocation of existing Matapihi Rd level crossing alarms - Relocation of SH29 (Te Maunga) level crossing alarms to suit the new rail alignment - Relocate fibre optic cables (KiwiRail only - excludes FX Network & Telstra Clear) - New signalling design and equipment for the altered junction and track layout - New building to house the signalling equipment	LS	1		

## Section '1'-OPTION 3A PARALLEL ESTIMATE JAN 2014'

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BOREF	DESCRIPTION	UNIT	QTY	RATE	COST
4.165	Construct new rubber surfaced level crossing to Matapihi Rd	m	15	s 9(2)(b)(ii)	
4.166	Relocate existing barrier arms at Te Maunga and Matapihi Rd to new locations	No	2		
4.167	Allow for new signals, communications and controls	LS	1		
4.168	Remove existing single track, sleepers and ballast (including contaminated ballast)	LS	1		
4.169	Remove existing switch	No	2		
4.170	Assume that the topsoil stripped for new rail tracks can be spread over the places where existing tracks have been removed. No additional quantity required	Note			
4.171	Allowance for KiwiRail construction monitoring and management fees	LS	1		
4.172	Estimate rounding	LS	1		
<b>4.173</b>	<b>Total Enabling Works (Railway Relocation) **</b>				
	<b>CONSTRUCTION</b>				
	<b>Investigation and Reporting</b>				
4.174	Allowance for I&R fees	LS			
4.175	Allowance for geotechnical investigations	LS			
<b>4.176</b>	<b>Total of I&amp;R **</b>				
	<b>D&amp;PD</b>				
4.177	Allowance for Design & Project Documentation fees for Design and Construct procurement including interactive tendering process for Main Physical Works contract. Allowance for Design and Project Documentation fee for detailed design of Enabling Works contact	LS	1		
4.178	Allowance for KiwiRail design of rail and signals	LS	1		
4.179	Allowance for geotechnical investigation and testing	LS	1		
	Allowance for NZTA Managed Costs including specialist design fees and risk management	LS	1		
4.184	Allowance for NZTA contribution to unsuccessful Design & Construct tenderers (assume 2No payments)	No	2		
<b>4.180</b>	<b>Total of D&amp;PD **</b>				

BOREF	DESCRIPTION	UNIT	QTY	RATE	COST
	<b><u>Construction Phase Fees</u></b>				
4.181	Allowance for MSQA fee (for Main Physical Works contracts), based on 3 years construction and 3 years Defects Liability Period.	LS	1		
4.182	Allowance for MSQA fee for Enabling Works	LS	1		
4.183	Allowance for NZTA Managed Costs	LS	1		
4.185	Allowance for Resource Consent fees, consent monitoring and building consent fees	LS	1		
	Allowance for risk mitigation and management (residual risk contingency allowances only included) - allowance for additional NZTA managed costs	LS	1		
4.186	<b>Total of Construction Phase Fees **</b>				
4.187	<b>TOTAL CONSTRUCTION ###</b>				
	<b><u>PROJECT PROPERTY COSTS</u></b>				
	<u>Maunganui Rd, Palliser Pl, Eversham St, Matapihi Rd</u>				
4.188	Allow for property purchase for road corridor widening and rail corridor (as advised by the Property Group Ltd 9 September 2013 \$10,905,555) - total of 27No. affected properties on Maunganui Rd, Palliser Pl, Eversham St, Matapihi Rd. Revised as The Property Group 12 November 2013 (Meridio email 8549164) totalling \$9,749,315	LS	1		
4.189	Allowance for solatium payment (assume \$10,000 average per total property acquisition)	No	11		
4.190	Allow for total removal of houses, site clearance, disconnection of services, topsoil and grass site	No	11		
4.191	Allow for property accommodation works to partial acquisition properties)	No	12		
	<u>Rail Relocation Noise Mitigation Property Purchase Risk (Liftan Place)</u>				
4.192	Allow for noise mitigation works to Liftan Pl properties - assume double glazing and some acoustic treatment to houses	No	17		
4.193	Allow for property purchase for rail noise				

## Section '1'-OPTION 3A PARALLEL ESTIMATE JAN 2014'

COMPANY : Beca

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BOREF	DESCRIPTION	UNIT	QTY	RATE	COST
	mitigation - Level 2 (Russley Drive). Included in 95th Percentile Funding Risk section	LS	1		
	<u>Disposal of Surplus Property</u>				
4.194	DEDUCT disposal value of surplus properties (to Maunganui Rd, Palliser Pl, Eversham St, Matapihi Rd & Titoki Pl) - no surplus property identified	LS			
4.195	DEDUCT disposal value of surplus NZTA land (as the Property Group valuation dated 9 September 2013 = minus \$7,925,736). Revised by the Property Group 12 November 2013 to minus \$8,243,856 - Meridio email 8549164)	LS	1		
4.196	Estimate rounding	LS	1		
4.197	<b>Total of Project Property Costs **</b>				
4.198	<b>TOTAL OF BASE ESTIMATE ##</b>				
	<u>Contingency Allowance</u>				
4.199	Allowance for general project contingency - assume 15% (no detailed risk analysis has been completed)	%	88,620,000		
4.201	Estimate rounding	LS	1		
4.202	<b>Total of Contingency Allowance **</b>				
4.203	<b>TOTAL OF EXPECTED ESTIMATE ##</b>				
	<u>95th Percentile Funding Estimate</u>				
4.204	Allowance for 95th percentile funding risk	LS	1		
4.200	Allow for residual property purchase and accommodation works - approx 15%	%	1,505,459		
4.205	Solatium Payment	No			
4.206	Allowance for solatium payment (assume \$10,000 average per total property acquisition)	No			
4.207	<b>Total of 95th Percentile Funding Risk ##</b>				
	<b>Totals for Section '1'-OPTION 3A PARALLEL ESTIMATE JAN 2014'</b>				

Appendix D

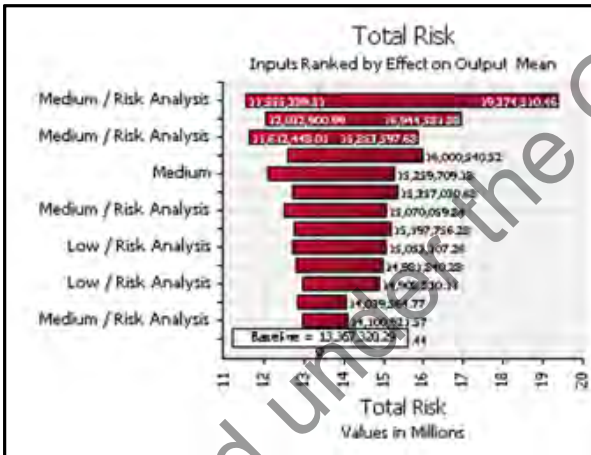
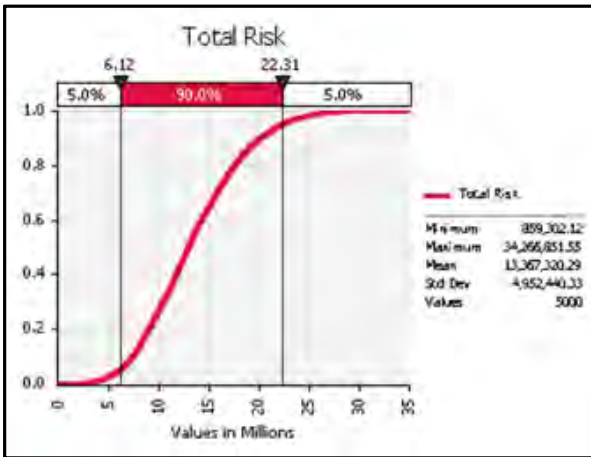
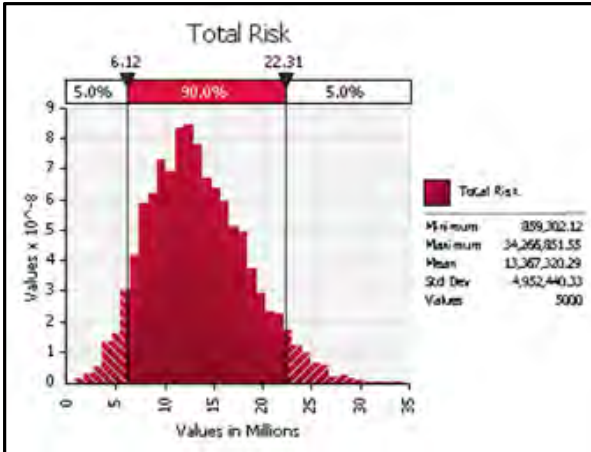
Residual Risk Register  
Assessment of Cost

Released under the Official Information Act 1982

# @RISK Output Report for Total Risk

Performed By: S9(2)(a)

Date: Thursday, 27 March 2014 12:17:54 p.m.



Simulation Summary Information	
Workbook Name	NZ1-8547418-Maunganui Gir
Number of Simulations	1
Number of Iterations	5000
Number of Inputs	82
Number of Outputs	1
Sampling Type	Monte Carlo
Simulation Start Time	26/03/2014 13:17
Simulation Duration	00:00:06
Random # Generator	Mersenne Twister
Random Seed	706029980

Summary Statistics for Total Risk			
Statistics		Percentile	
Minimum	859,302	5%	6,117,018
Maximum	34,266,852	10%	7,303,650
Mean	13,367,320	15%	8,207,841
Std Dev	4,952,440	20%	8,982,634
Variance	2.45267E+13	25%	9,694,032
Skewness	0.414667222	30%	10,385,733
Kurtosis	2.908554366	35%	11,104,320
Median	12,894,307	40%	11,709,191
Mode	13,321,139	45%	12,317,164
Left X	6,117,018	50%	12,894,307
Left P	5%	55%	13,513,339
Right X	22,306,164	60%	14,246,168
Right P	95%	65%	15,033,666
Diff X	16,189,147	70%	15,776,901
Diff P	90%	75%	16,597,044
#Errors	0	80%	17,583,541
Filter Min	Off	85%	18,616,933
Filter Max	Off	90%	20,052,753
#Filtered	0	95%	22,306,164

Change in Output Statistic for Total Risk			
Rank	Name	Lower	Upper
1	Geotech conditions	11,555,390	19,374,510
2	Property purchase	12,032,901	16,944,582
3	Changes to existing design standards	11,612,448	15,853,598
4	Sfaety audit requirements	12,601,011	16,000,541
5	Design development	12,088,713	15,259,709
6	Flight path clearance	12,713,357	15,357,031
7	Rail mitigation accommodation works costs	12,504,348	15,070,060
8	Embankment structures affect on property	12,770,558	15,197,756
9	Inadequate space to construct project	12,725,589	15,053,107
10	Rail relocation	12,780,761	14,981,840
11	Services relocation costs	12,979,355	14,908,830

Released under the Official Information Act 1982



**NZTA Tauranga Risk Register**  
 Friday, 6 December 2013 (Updated 27 March 2014)  
 s 9(2)(a) (NZTA Lead & Owner)

BOP Fields		Semi-Quantitative					Treatment Strategy	Treatment Status	Start Date	Finish Date	Semi-Quantitative			Cost (\$)							Commentary & Closure Statement	
Risk Type	Risk Title	Description/ Cause/ Consequence	Risk Status	Conseq	Prob	CURRENT Risk Score	(refer to Actions Register for detail)	Treatmt Status	Start Date	Finish Date	Conseq	Prob	RESIDUAL Risk Score	Probability	No	Min	Most Likely	Max	Yes	No		Risk Analysis
Stakeholder Relationships	MGI construction not aligned with TEL	<b>Description:</b> There is a threat that NZTA reputation compromised because the construction works do not start before the completion of the TEL <b>Cause:</b> The cause of the threat is delays to progression of design and procurement/ enabling works mean late construction start. <b>Consequence:</b> The consequence is bad PR.	Live - Threat	High	High	21	Raise profile within NZTA and get project ready to go with VAC approvals.	Proposed	11/12/2013	30/03/2014	High	Medium	19									TEL planned to complete mid 2015.
Stakeholder Relationships	Tangata Whenua Opposition	<b>Description:</b> There is a threat that Tangata Whenua object to the NZTA project designation and resource consents. <b>Cause:</b> The cause of the threat is they do not feel as though they have been involved. <b>Consequence:</b> The consequence of the threat is time delay in RMA.	Live - Threat	High	High	21	Ongoing consultation with Hapu and aim to gather acceptance from them. Develop protocol	Ongoing	11/12/2013	30/03/2014	Medium	Medium	15	30%	70%	50,000	150,000	500,000	233,333	0	0	Allow additional consultation fees
Stakeholder Relationships	AMP Opposition through RMA	<b>Description:</b> There is a threat that AMP opposes elements of the project through RMA. <b>Cause:</b> The cause of the threat is conflict with AMP development. <b>Consequence:</b> The consequence of the threat is delay to RMA.	Live - Threat	High	High	21	Ongoing consultation with AMP during design process. Develop MOU (March 2014).	Proposed	11/12/2013	30/03/2014	Medium	Medium	15	50%	50%	100,000	250,000	500,000	283,333	0	0	Interactions with SW cost share MOU end of March.
Project Scope	Truman - Mangatawa Link Road	<b>Description:</b> There is a threat that stakeholders object to the proposed design solution for the link road from Truman Lane to the Mangatawa Interchange. <b>Cause:</b> The cause of the threat is incomplete network provided by TEL project/TCC/MPBI interaction. <b>Consequence:</b> The consequence of the threat is TEL cannot provide link or delays the connection between Te Munga lane and Mangatawa which then creates uncertainty for the consenting of Option 3.	Live - Parked	High	High	21	Raise risk profile within NZTA/TCC. GS to monitor TCC progress.	Ongoing	11/12/2013	30/03/2014	Low	Low	6	20%	80%	50,000	100,000	1,100,000	416,667	0	0	
Project Scope	Changes to Existing Design Standards	<b>Description:</b> There is a threat of changes to existing design standards occurring during investigation and design stage of the project. <b>Cause:</b> The cause of the threat is change in legislation or NZTA requirements, i.e. Bridge Manual rev 3, Safe Systems. <b>Consequence:</b> The consequence of the threat is re-design and additional cost.	Live - Parked	High	Medium	19	Ongoing Communication between Beca and NZTA for monitoring potential changes to design.	Ongoing	11/12/2013	30/03/2014	Medium	Medium	15	50%	50%	2,000,000	3,000,000	5,000,000	3,333,333	0	0	
Consents Land Property	Golf Course Additional Land for Railway Realignment	<b>Description:</b> There is a threat that is that additional land is required to provide space to construct the realigned rail corridor through the golf course. <b>Cause:</b> The cause of the threat is the existing designation is too narrow to build the rail track as planned <b>Consequence:</b> The consequence of the threat is delay due to opposition during the consenting process.	Live - Threat	High	Medium	19	Concept design shows railway will fit within corridor. Obtain KiwiRail approval through project agreement.	Proposed	11/12/2013	30/03/2014	Very Low	Very Low	1	5%	95%	300,000	500,000	1,500,000	766,667	0	0	Design shows single track will fit.
Environmental Impact	Liftan Place Mitigation Measues	<b>Description:</b> There is a threat that rail noise and vibration mitigation measures at Liftan Place not accepted by affected parties. <b>Cause:</b> The cause of the threat is affected party concerns and challenge. <b>Consequence:</b> The consequence of the threat is additional mitigation and adverse publicity.	Live - Threat	Medium	Very High	18	Obtain expert advice for determining mitigation measures.	Ongoing	11/12/2013	30/03/2014	Medium	Very High	18	70%	30%	200,000	500,000	1,000,000	566,667	0	566,667	
Consents	Hapu opposition to level of stormwater treatment.	<b>Description:</b> There is a threat that Hapu will oppose consent for stormwater discharge to the harbour. <b>Cause:</b> The cause of the threat is higher expectations of treatment from Hapu. <b>Consequence:</b> The consequence of the threat is delay in consenting process.	Live - Threat	Medium	High	17	Consult early and design Stormwater treatment.	Ongoing	11/12/2013	30/03/2014	Low	Medium	10	50%	50%	150,000	250,000	500,000	300,000	0	0	

Maunganui Girven Risk Register December 2013

Friday, 6 December 2013 (Updated 27 March 2014)  
John McCarthy (NZTA Lead & Owner)

BOP Fields				Semi-Quantitative			Treatment Strategy	Treatment Status	Start Date	Finish Date	Semi-Quantitative			Cost (\$)							Commentary & Closure Statement	
Risk Type	Risk Title	Description/ Cause/ Consequence	Risk Status	Consq	Prob	CURRENT Risk Score	(refer to Actions Register for detail)	Treatmt Status	Start Date	Finish Date	Consq	Prob	RESIDUAL Risk Score	Probability	No	Min	Most Likely	Max	Yes	No		Risk Analysis
Consents Land Property	Obtaining Deed of Grant	<b>Description:</b> There is a threat that obtaining a Deed of Grant for service authorities takes longer than expected. <b>Cause:</b> The cause of the threat is time consuming processes within KiwiRail. <b>Consequence:</b> The consequence of the threat is delay to commencement of project until agreement reached.	Emerging	High	Low	16	Commence early negotiations during design phase.	emerging	30/03/2014	1/06/2014	Low	Low	6									Agreement in principle has been obtained, April 2013.
Stakeholder Relationships	Public Perception due to construction delay	<b>Description:</b> There is a threat of negative public perception of delay due to government funding. <b>Cause:</b> The cause of the threat is a change in government objectives and / or funding priorities. <b>Consequence:</b> The consequence of the threat is project delay.	Live - Parked	Medium	Medium	15	Manage public expectations.	Ongoing	11/12/2013	30/06/2014	Medium	Medium	15									
Design Issues	Design Developments Additional Costs	<b>Description:</b> There is a threat that design development results in additional costs being identified. <b>Cause:</b> The cause of the threat is the "high level" design and costing that has been undertaken to date. <b>Consequence:</b> The consequence of the threat is increased costs.	Live - Parked	Medium	Medium	15	Review scope in next phase of project. Maintain close control of scope.	Proposed	30/03/2014	30/12/2014	Medium	Medium	15	50%	50%	1,000,000	2,500,000	4,000,000	2,500,000	0	0	
Consents	Stormwater Treatment Inadequate Space	<b>Description:</b> There is a threat that inadequate space is provided for the treatment for of stormwater required for the project <b>Cause:</b> The cause of the threat is limited space available. <b>Consequence:</b> The consequence of the threat is an extension of the designation, redesign and additional costs.	Live - Threat	Medium	Medium	15	Undertake further investigations during I&R phase	Proposed	11/12/2013	30/06/2014	Medium	Medium	15	40%	60%	400,000	600,000	1,500,000	833,333	0	0	
Stakeholder Relationships	Golf Club Membership Objections	<b>Description:</b> There is a threat that the golf club membership could object to the design solutions during the planning process. <b>Cause:</b> The cause of the threat is the affect on the golf course layout. <b>Consequence:</b> The consequence of the threat is a delay in the RMA.	Live - Threat	Medium	Medium	15	Ongoing consultation with golf club and TCC reserves.	Proposed	11/12/2013	30/06/2014	Medium	Medium	15	50%	50%	100,000	250,000	500,000	283,333	0	0	Lots of impacts on course operation: Practice fairway, Stormwater, Hole 13, Tee relocation, Fencing, Planting. TCC has included in 2014/15 financial year request.
Consents	Lifan Place Rail Noise Walls	<b>Description:</b> There is a threat that public objection to two rail noise walls adjacent to railway at Lifton Pl. <b>Cause:</b> The cause of the threat is community opposition to visual impact and perceived concern to personal safety through walkway. <b>Consequence:</b> The consequence of the threat is poor PR.	Live - Threat	Medium	Medium	15	Prepare visualisations. Undertake consultation.	Ongoing	12/12/2013	30/03/2014	Medium	Medium	15	50%	50%	250,000	750,000	1,500,000	833,333	0	0	
Consents	Rail Noise Mitigation	<b>Description:</b> There is a threat that the proposed rail noise mitigation is opposed by the community and/or TCC (NZTA unable to legally require it). <b>Cause:</b> The cause of the threat is there is no legal process for the community to oppose except for through politicians and media. <b>Consequence:</b> The consequence of the threat is image, reputation, delays and cost.	Live - Threat	Medium	Medium	15	Careful consultation strategy and messaging.	Ongoing	12/12/2013	30/03/2014	Medium	Medium	15	50%	50%	1,000,000	1,500,000	2,500,000	1,666,667	0	0	
Land & Property	Adequate Space	<b>Description:</b> There is a threat that we do not have adequate space to build the project within the proposed designation. <b>Cause:</b> The cause of the threat is not enough contingency has been made to designate sufficient land to construct the project. <b>Consequence:</b> The consequence of the threat is the lack of space to carry out temporary and permanent construction works and delay for consenting.	Live - Threat	Medium	Medium	15	Review extent of land needed to build project. Provide spacial contingency.	Proposed	11/12/2013	30/03/2014	Medium	Low	11	30%	70%	1,000,000	2,000,000	3,000,000	2,000,000	0	0	Note constrained for space at Exeter St.
Environmental Impact	Visual and Shadow Impacts	<b>Description:</b> There is a threat that visual and shadow impacts result in strong opposition from the public to elements of the project. <b>Cause:</b> The cause of the threat is the Maori and public perception of flyovers having a negative visual impact. <b>Consequence:</b> The consequence of the threat is a delay in obtaining designation in order to close out opposition.	Closed	Medium	Medium	15	Obtain expert advice for determining mitigation measures and ongoing public consultation.					Low	Medium	10								Already included in another risk.

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Stakeholder Relationships	Transpower Poles Relocation - Time	<b>Description:</b> There is a threat that the relocation of Transpower poles takes longer than expected. <b>Cause:</b> The cause of the threat is lack of commitment from Transpower. <b>Consequence:</b> The consequence of the threat is delay to railway construction.	Live - Threat	Medium	Medium	15	Engage with Transpower and get design concepts developed. Join with Hairini concept work.	Live	11/12/2013	30/03/2014	Low	Medium	10	30%	70%	150,000	300,000	500,000	316,667	0	0	
Stakeholder Relationships	Negative Political Responses	<b>Description:</b> There is a threat of negative political responses from TCC councillors to the project. <b>Cause:</b> The cause of the threat is political support for affected community members who have objections. <b>Consequence:</b> The consequence of the threat is poor public relations, redesign or delay to project commencement.	Emerging	Medium	Medium	15	Keep councillors involved in the project and understand objectives. Need quarterly meetings with Councillors.	Ongoing	11/12/2013	30/03/2014	Low	Low	6									
Programme	Rescheduling of Resource Consenting Programme	<b>Description:</b> There is an opportunity to advance the construction start date through rescheduling of resource consenting programme. <b>Cause:</b> The cause of the opportunity is an ability to vary the normal I&R and D&PD procedures. <b>Consequence:</b> The consequence of the opportunity is an earlier start date than currently planned.	Closed	Medium	Medium	15	Additional work underway.	Proposed	11/12/2013	30/06/2014	Low	Low	6									
Modelling	Assumptions on Rail Movements	<b>Description:</b> There is a threat that the assumptions on current and future rail movements are incorrect resulting in poor intersection performance. <b>Cause:</b> The cause of the threat is that it is difficult to predict future rail movements and there is a lot of variability in the day to day KiwiRail operation. <b>Consequence:</b> The consequence of the threat is that mitigation is not at an optimal level.	Closed	Medium	Medium	15	KiwiRail forecast rail movements received. Ongoing communication with KiwiRail to monitor any changes.	Parked			Low	Very Low	2									Using best available data.
Design Issues	Owens Place Inadequate Design	<b>Description:</b> There is a threat that inadequate carriageway capacity has been allowed for in the design for at Owens Place. <b>Cause:</b> The cause of the threat is changes in the traffic volumes <b>Consequence:</b> The consequence of the threat is additional cost to widen the carriageway.	Closed	Low	High	12		parked			Low	Low	6									Not relevant to Option 3a
Constructability	Mangatawa / Truman Link	<b>Description:</b> There is a threat that the Mangatawa / Truman link not provided in time for construction staging. <b>Cause:</b> The cause of the threat is link not provided. <b>Consequence:</b> The consequence of the threat is additional costs for construction staging.	Live - Threat	Low	High	12	TCC to commit to construction.	On-going	30/03/2014	30/12/2014	Very Low	Low	3	10%	90%	50,000	100,000	150,000	100,000	0	0	
Design Issues	Construction Methodology	<b>Description:</b> There is a threat that the construction methodology and sequencing does not provide adequate temporary pedestrian, carriageway and cycleway facilities. <b>Cause:</b> The cause of the threat due to error and omission. <b>Consequence:</b> The consequence of the threat is additional cost, H & S, poor reputation.	Live - Parked	Medium	Low	11	Contractor to manage. Cover in PRs.	Proposed	30/03/2014	30/12/2014	Medium	Low	11	30%	70%	100,000	300,000	500,000	300,000	0	0	
Design Issues	Signaling Equipment Technology	<b>Description:</b> There is an opportunity to use more flexible traffic signal controllers than current generation SCATS. <b>Cause:</b> The cause of the opportunity is that equipment is available and in use in other regions but not yet approved for general use in NZ. <b>Consequence:</b> The consequence of the opportunity is the ability to increase capacity to traffic and reduce delays for traffic and peds.	Live - Threat	Medium	Low	11	Monitor new technology.	Proposed	30/03/2014	30/12/2014	Medium	Low	11									
Consents Land Property	AMP Opposition	<b>Description:</b> There is a threat of opposition from AMP to an alteration to the designation required for option 1. <b>Cause:</b> The cause of the threat is AMP objection to a change in designation due to lack of consistency with their Master Plan. <b>Consequence:</b> The consequence of the threat is a delay in obtaining alteration to designation due to AMP appeal.	Closed	Medium	Low	11	Ongoing engagement with AMP.	Proposed	1/04/2013	1/09/2013	Low	Low	6									Option 1 risks no longer relevant.

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Project Scope	Pedestrian and Cyclist Safety Demands	<b>Description:</b> There is a threat that an grade separation is deemed necessary in order to satisfy safe pedestrian and cyclist demands at MGI. <b>Cause:</b> The cause of the threat is the risk of strong public opposition to there being no underpass. <b>Consequence:</b> The consequence of the threat is additional cost.	Live - Threat	Medium	Low	11	Project team to make a decision and inform VAC.	Ongoing	11/12/2013	28/02/2014	Medium	Very Low	4	10%	90%	100,000	500,000	1,000,000	533,333	0	0		
Stakeholder Relationships	Rail Realignment Agreement	<b>Description:</b> There is a threat that obtaining KiwiRail agreement to relocate tracks takes longer than anticipated within the designation process. <b>Cause:</b> The cause of the threat is delay in decision making by KiwiRail and objection to elements of the project scope. <b>Consequence:</b> The consequence of the threat a delay to the project until agreement is made, re-design and additional cost.	Live - Threat	Medium	Low	11	Maintain communication with KiwiRail. They are currently supportive. Project agreement to be signed by end of January 2014.	Ongoing	11/12/2013	28/02/2014	Low	Very Low	2	10%	90%	50,000	150,000	500,000	233,333	0	0		
Growth Forecasts	Predicted Growth Forecast	<b>Description:</b> There is a threat that the predicted growth forecast is incorrect. <b>Cause:</b> The cause of the threat is inability to forecast future land use changes and growth patterns. <b>Consequence:</b> The consequence of the threat design and infrastructure is not optimised for under or over scope.	Closed	Medium	Low	11	Review forecast intersection/flyover performance and advise NZTA of effect on project/options early in SAR	Ongoing					0										Note extra risk of potential land use changes near Owens Place
Programme	Underestimation of Construction Programme	<b>Description:</b> There is a threat that the sequencing of the construction programme is underestimated with regard to time and cost for the railway construction. <b>Cause:</b> The cause of the threat is lack of experience in railway construction, cost and programme requirements. <b>Consequence:</b> The consequence of the threat is additional cost and delay and engaging with expert consultants.	Live - Threat	Low	Medium	10	Good level of advice received from KiwiRail	Parked			Low	Medium	10	10%	90%	150,000	250,000	500,000	300,000	0	0		
Safety	Safety Audit	<b>Description:</b> There is a threat that a safety audit identifies a need to change elements of the project scope. <b>Cause:</b> The cause of the threat is that there have been limited independent safety reviews for the project undertaken to date. <b>Consequence:</b> The consequence of the threat is cost and time associated with redesign	Live - Threat	Low	Medium	10	RSA undertaken. Reassess during Specimen Design phase	Proposed	30/03/2014	30/12/2014	Low	Medium	10	30%	70%	1,500,000	2,500,000	4,000,000	2,666,667	0	0		
Site/ground conditions	Poor Geotechnical Conditions	<b>Description:</b> There is a threat of encountering poorer geotechnical conditions than assumed in the design. <b>Cause:</b> The cause of the threat is unforeseen ground conditions. <b>Consequence:</b> The consequence of the threat is redesign, construction phase delay and additional cost due to unforeseen ground conditions.	Live - Parked	Low	Medium	10	Reassess in Specimen Design phase	Proposed	30/03/2014	30/12/2014	Low	Medium	10	30%	70%	3,000,000	5,000,000	10,000,000	6,000,000	0	0		
Design Issues	Flight Path Clearance	<b>Description:</b> There is a threat that the flight path clearance height is a significant restriction to the construction. <b>Cause:</b> The cause of the threat is the flight path cannot be changed. <b>Consequence:</b> The consequence of the threat is a change to construction.	Live - Threat	Low	Medium	10	Reassess in Specimen Design phase.	Proposed	30/03/2014	30/12/2014	Low	Medium	10	30%	70%	1,000,000	2,000,000	4,000,000	2,333,333	0	0		
Community	Public Reaction to Lack of Consultation	<b>Description:</b> There is a threat that the public reacts negatively to perceived lack of consultation on preferred option. <b>Cause:</b> The cause of the threat is that information provided to date has not considered Option 3a apart from the newsletter. <b>Consequence:</b> The consequence of the threat is negative public reaction.	Live - Threat	Low	Medium	10	Careful messaging in the open day and targeted consultation prior to open day.	Ongoing	12/12/2013	30/03/2014	Low	Medium	10	30%	70%	50,000	100,000	150,000	100,000	0	0		
Geotechnical	Embankment Structures	<b>Description:</b> There is a threat that embankment structures may affect properties and services outside the designation. <b>Cause:</b> The cause of the threat is proximity of embankments and construction vibration. <b>Consequence:</b> The consequence of the threat is effect on construction methodology and potential repair costs to third party properties.	Live - Parked	Low	Medium	10	Review extent of risk based on geotechnical investigation data and re-assess potential impacts compared to extending designation.	On-going	30/03/2014	30/12/2014	Low	Medium	10	30%	70%	1,000,000	2,000,000	3,000,000	2,000,000	0	0		

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Stakeholder Relationships	Baypark Owner/Operators	<b>Description:</b> There is a threat that Baypark owner/operators are not aligned with the project. <b>Cause:</b> The cause of the threat is due to lack of alignment of expectations with NZTA and limited consultation to date, and access changes. <b>Consequence:</b> The consequence of the threat is delay and cost implications	Live - Threat	Low	Medium	10	Increase consultation with owner/operators to manage their expectations and reduce objections. Develop access arrangement.	Proposed	11/12/2013	28/02/2014	Low	Low	6	10%	90%	100,000	250,000	500,000	283,333	0	0		
Stakeholder Relationships	Owens Place Owner/Operators	<b>Description:</b> There is a threat that Owens Place owner/operators want intersection signalised. <b>Cause:</b> The cause of the threat is existing concerns with Owens Place / Matapihi intersection, but not being in preferred option. <b>Consequence:</b> The consequence of the threat is delay and cost implications.	Live - Threat	Low	Medium	10	Ongoing consultation with owner/operators to manage their expectations and reduce objections.	Proposed	11/12/2013	28/02/2014	Low	Low	6	10%	90%	50,000	250,000	350,000	216,667	0	0		
Constructability	Temporary Traffic Management Methodologies	<b>Description:</b> There is a threat that the assumptions and methodologies regarding constructability and temporary traffic management are incorrect. <b>Cause:</b> The cause of the threat is limited space is available and complexity of construction procedures while working around live lanes. <b>Consequence:</b> The consequence of the threat is increase in traffic management and temporary works costs.	Live - Parked	Low	Medium	10	Consider further in specimen design phase. Agree use of local roads with TCC.	Ongoing	30/03/2014	30/12/2014	Low	Low	6	20%	80%	50,000	200,000	350,000	200,000	0	0	Reliant on Mangatawa-Truman Link.	
Project Scope	ODV	<b>Description:</b> There is a threat that the requirements for Over Dimensional Vehicles (ODV) may increase width / height of structures. <b>Cause:</b> The cause of the threat is limited understanding of ODV requirements. <b>Consequence:</b> The consequence of the threat is scope increase to provide ODV route and additional cost.	Live - Threat	Low	Medium	10	Set appropriate Principal Requirements for D & C contract. Get agreement on ODV route from NZTA.	Proposed	30/03/2014	30/12/2014	Low	Low	6	10%	90%	50,000	150,000	500,000	233,333	0	0	Design Philosophy Statement to explain route.	
Stakeholder Relationships	Bus Interchange	<b>Description:</b> There is a threat that the bus interchange construction not undertaken in time. <b>Cause:</b> The cause of the threat is 3rd parties delay in implementation/change of intersection affects routes. <b>Consequence:</b> The consequence of the threat that the bus route or diversions change.	Live - Threat	Low	Medium	10	TCC consulting with AMP to complete interchange ahead of project commencement.	Ongoing	30/03/2014	30/12/2014	Low	Low	6	20%	80%	20,000	50,000	75,000	48,333	0	0		
Project Scope	Utility Services Relocation	<b>Description:</b> There is a threat that the cost of utility services relocations is greater than anticipated. <b>Cause:</b> The cause of the threat is inaccurate or incomplete services information and/or poor response from utility companies and/o limited space available within designation. <b>Consequence:</b> The consequence of the threat is cost increase and construction phase delays.	Live - Threat	Low	Medium	10	Reassess in Specimen Design phase	Proposed	30/03/2014	30/12/2014	Low	Low	6	25%	75%	500,000	1,000,000	2,500,000	1,333,333	0	0		
Other Engineering Costs	Rail Relocation Costs	<b>Description:</b> There is a threat that rail relocation costs are greater than expected including provision for property purchase and land disposal values. <b>Cause:</b> The cause of the threat is a inability to assess accurate construction and property purchase costs. <b>Consequence:</b> The consequence of the threat is increased project cost.	Live - Threat	Low	Medium	10	Reassess in Specimen Design phase	Proposed	30/03/2014	30/12/2014	Low	Low	6	30%	70%	1,000,000	1,500,000	2,500,000	1,666,667	0	0		
Traffic Management	Mangatawa Interchange Capacity	<b>Description:</b> There is a threat that inadequate capacity has been allowed for in the design carriageway capacity at Mangatawa Interchange. <b>Cause:</b> The cause of the threat is option 3 changes the traffic volumes. <b>Consequence:</b> The consequence of the threat is additional cost to widen the carriageway.	Closed	Low	Medium	10	Review design during SAR	Proposed	1/04/2013	1/09/2013	Low	Low	6										

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Project Scope	Existing Stormwater System	<b>Description:</b> There is a threat that the existing Tauranga City Council (TCC) stormwater system is inadequate and that additional stormwater system upgrade works are required than currently assumed in the design scope. <b>Cause:</b> The cause of the threat is a lack of current knowledge of the stormwater system requirements and condition. <b>Consequence:</b> The consequence of the threat is additional cost and delay for redesign.	Live - Threat	Low	Medium	10	Consult with TCC and develop strategy. Investigation works to assess TCC system capacity and condition prior to design completion. Develop MOU.	Ongoing	12/12/2013	30/03/2014	Low	Low	6	20%	80%	500,000	750,000	1,000,000	750,000	0	0	Integration of AMP, TCC & NZTA stormwater may be an opportunity. Refer to Stormwater Treatment risk.	
Consents Land Property	Opposition to Property Acquisition	<b>Description:</b> There is a threat that the property acquisition gets opposed by the affected landowners. <b>Cause:</b> The cause of the threat is property owner opposition to the project. <b>Consequence:</b> The consequence of the threat is delay to construction programme due to acquisition issues.	Live - Parked	Low	Low	6	Develop compulsory acquisition strategy once preferred option confirmed.	Parked			Low	Low	6	10%	90%	250,000	500,000	1,000,000	583,333	0	0		
Modelling	TTS Strategy	<b>Description:</b> There is a threat that MGI - Te Maunga SAR is inconsistent with TTS strategy, i.e. achieving LOS D for strategic traffic and LOS E for local traffic. <b>Cause:</b> The cause of the threat is a lack of robust traffic modeling to determine the achievable LOS. <b>Consequence:</b> The consequence of the threat is project scope increases or objectives modified.	Closed	Low	Low	6	Monitor LOS performance against TTS objectives.	Parked			Low	Low	6									Option 3a.	
Stakeholder Relationships	TCC Staff Knowledge	<b>Description:</b> There is a threat that Tauranga City Council staff who have a detailed knowledge of the project and its objectives leave the organisation. <b>Cause:</b> The cause of the threat is changes to TCC staffing and organisational structure. <b>Consequence:</b> The consequence of the threat is delay in decision making and longer approval process.	Live - Parked	Low	Low	6	Maintain close and regular contact with key TCC staff.	Ongoing	30/03/2014	30/12/2014	Low	Low	6										
Community	Community Objections	<b>Description:</b> There is a threat that the community objects to the project due to removal of houses and relocation of members of the community. <b>Cause:</b> The cause of the threat is high level of concern from the community and objections to house removals. <b>Consequence:</b> The consequence of the threat is delay to obtaining the designation due to appeals.	Emerging	Low	Low	6	Monitor community reaction during consultation. Review consultation strategy if high concerns identified.	Ongoing	1/04/2013	1/09/2013	Low	Low	6	10%	90%	20,000	50,000	100,000	56,667	0	0		
Community	Matapihi Residents	<b>Description:</b> There is a threat that Matapihi residents oppose the preferred option because it provides no alternative access out of Matapihi Rd <b>Cause:</b> The cause of the threat is perceived expectation that it will be provided. <b>Consequence:</b> The consequence of the threat is opposition to alteration to designation.	Live - Threat	Low	Low	6	Ongoing consultation.	Ongoing	12/12/2013	30/03/2014	Low	Low	6	20%	80%	20,000	50,000	100,000	56,667	0	0		
Growth Forecasts	Bayfair Development Detrimental Affect	<b>Description:</b> There is a threat that the proposed Bayfair development may leave a detrimental affect on the proposed intersection configuration. <b>Cause:</b> The cause of the threat is uncertainty in regard to the scope and timing of adjacent private developments. <b>Consequence:</b> The consequence of the threat is an intersection that doesn't perform as expected.	Live - Parked	Low	Low	6	Monitor AMP development plans through regular meetings.	Ongoing	12/12/2013	30/03/2014	Very Low	Low	3	5%	95%	20,000	50,000	100,000	56,667	0	0		
Structures	Bridge Impact Loadings	<b>Description:</b> There is a threat that the bridge impact loadings from train are going to change. <b>Cause:</b> The cause of the threat is the NZTA review of the current standards will lead to changes in bridge design standards. <b>Consequence:</b> The consequence of the threat is increased cost and redesign.	Live - Parked	Low	Low	6	Obtain NZTA agreement on the design standard to be adopted for this project.	On-going	30/03/2014	30/12/2014	Low	Very Low	2	10%	90%	50,000	100,000	200,000	116,667	0	0		
Design Issues	Bridge Design	<b>Description:</b> There is a threat that there is the need for the bridge to be designed for increased live loads. <b>Cause:</b> The cause of the threat is the NZTA's potential revision of the bridge design standards. <b>Consequence:</b> The consequence of the threat is extra cost.	Emerging	Very Low	Medium	5	Monitor design standard changes, e.g. HPMV.	On-going	30/03/2014	30/12/2014	Very Low	Low	3	5%	95%	150,000	250,000	500,000	300,000	0	0		

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Environmental Impact	Urban Form (Functionality)	<p><b>Description:</b> There is a threat that the urban form (functionality) of the final design solution receives strong opposition from stakeholders during the consenting and designation process.</p> <p><b>Cause:</b> The cause of the threat is lack of NZTA and stakeholder alignment.</p> <p><b>Consequence:</b> The consequence of the threat is stakeholder objections, delay to consenting process and possible re-design.</p>	Live - Threat	Very Low	Low	3	Engage with NZTA national office	Ongoing	12/12/2013	30/03/2014	Very Low	Low	3	5%	95%	20,000	50,000	125,000	65,000	0	0		
Consents Land Property	KiwiRail Deed of Grant	<p><b>Description:</b> There is a threat that the purchasing of property and the obtaining of a Deed of Grant from KiwiRail takes longer than anticipated.</p> <p><b>Cause:</b> The cause of the threat is time consuming processes within KiwiRail.</p> <p><b>Consequence:</b> The consequence of the threat is delay to commencement of project until agreement reached.</p>	Emerging	Low	Very Low	2	Commence early negotiations once preferred option determined.	At end of SAR Phase	1/02/2014	1/06/2014	Very Low	Very Low	1	100%						0	0	0	Agreement in principle has been obtained, April 2013.
Land & Property	Property Purchase & Disposal Values	<p><b>Description:</b> There is a threat that the purchasing of property is more expensive than estimated and/or the value of surplus land for disposal is less than estimated</p> <p><b>Cause:</b> The cause of the threat is accuracy of the Property Group estimates (+/-30% accuracy advised by TPG for both property purchase &amp; disposal), and extent of property purchase, solatium /compensation and accommodation works requirements.</p> <p><b>Consequence:</b> The consequence of the threat is additional overall property costs or delays for additional valuation/negotiations</p>	Emerging	Medium	High	17	Commence early negotiations once preferred option determined.	At end of SAR Phase	1/03/2014	1/06/2014	High	Medium	19	30%	70%	3,000,000	4,000,000	6,000,000	4,333,333	0	0	0	

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## Appendix E – Maintenance Cost Estimates

Refer Section 10.2 for the maintenance costs allowed for in the economic evaluation.

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## Appendix F – Implementation Funding Forecast

Forecast (\$state year)	Financial Year Starting 1 July					
	2014	2015	2016	2017	2018	2019
Design	\$2.8m	\$2.1m	-	-	-	-
Property Purchase	-	\$2.9m	\$2.9m	\$6.6m	-	-
Property Disposal	-	-	-	-	-	(\$9.5m)
Enabling Works	\$1.8m	\$6.5m	\$1.2m	-	-	-
Construction/Implementation	-	-	\$15.6m	\$36.9m	\$26.4m	\$5.6m
<b>TOTAL IMPLEMENTATION COST</b>	<b>\$4.7m</b>	<b>\$11.5m</b>	<b>\$19.7m</b>	<b>\$43.5m</b>	<b>\$26.4m</b>	<b>(\$3.9m)</b>

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## Appendix G – Project Risk Analysis

### **Risk Identification**

A risk analysis has been undertaken in accordance with NZTA's minimum standard Z/44. The risk report is attached.

### **Risk Quantification**

The risk were analysed for the determining the cost estimates. The outcome of the analysis is included in the Cost Report in Appendix D.

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Report

# Maunganui-Girven Te Maunga Intersections Risk Report - 11 December 2013

Prepared for

Prepared by Beca Ltd (Beca)

30 January 2014



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## Revision History

Revision N°	Prepared By	Description	Date
1	s 9(2)(a)	Risk Report	May 2013
2	s 9(2)(a)	Updated Risk Report following workshop December 2013	30 January 2014
3			
4			
5			

## Document Acceptance

Action	Name	Signed	Date
Prepared by	s 9(2)(a)	s 9(2)(a)	31/1/14
Reviewed by	s 9(2)(a)		30/1/14
Approved by	s 9(2)(a)		30/1/14
on behalf of	Beca Ltd		

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This report has been prepared by Beca on the specific instructions of our Client. It is solely for our Client's use for the purpose for which it is intended in accordance with the agreed scope of work. Any use or reliance by any person contrary to the above, to which Beca has not given its prior written consent, is at that person's own risk.

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## Appendices

### Appendix A

Option 3A drawing  
(3933377-C-K088 Rev C)

### Appendix B

Risk Register

### Appendix C

Risk Register Supporting Documents

### Appendix D

Risk Treatment Plans – Extreme and High Risks  
(Scores 16 or greater)

## Executive Summary

A formal and structured advanced risk management approach was applied to the Maunganui-Girven Intersection Project at a risk workshop on 11<sup>th</sup> December 2013 attended by NZTA and Beca members of the project team. The purpose of the workshop was to update the existing risk register from April 2013 and to reflect the requirements of NZTA's Minimum Standard Z/44 – Risk Management procedure. Attendees were required to identify threats and opportunities to the project, undertake a qualitative assessment, prioritise the risks and formulate risk treatment plans with risk managers to actively manage the risks throughout the Scheme Assessment phase.

Upon the completion of the workshop, 53 threats and 1 opportunity were identified and the current risk ratings are shown in the following table.

Table 1: Current Risk and Opportunity Summary

	Threats	Opportunities
Extreme	4	
High	17	
Moderate	29	1
Low	3	
TOTAL	53	1

Treatment strategies have been developed and residual risk scores assessed. The summary of the residual risk scores is shown below.

Table 2: Residual Risk and Opportunity Summary

	Threats	Opportunities
Extreme	0	
High	11	
Moderate	31	1
Low	11	
TOTAL	53	1

In accordance with the requirements of Z/44 an Activity Risk File (ARF) has been set up and is being maintained throughout the current phase of the project. The ARF will include the following information;

- Project risk register.
- Qualitative risk scoring probability and consequence tables amended to suit the requirement of the project in terms of cost and time consequence impacts.
- Risk review minutes.
- Quantitative Risk Analysis data for contingency value calculation.
- Risk adjusted programme.

Risk reviews of Extreme and High threats and opportunities will be undertaken on a monthly basis either through Project Control Group meetings or a one-on-one interview with each risk manager. The outcome of these risk reviews will be reported in the monthly Project Control Group meeting minutes by the Risk

Champion s 9(2)(b)(i) included in the ARF risk review minutes. The risk register as a whole will be reviewed approximately every 90 days to monitor any changes to all of the risks identified to date.

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# 1 Introduction

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The NZ Transport Agency (NZTA) has commissioned Beca to carry out an Advanced Risk Management process on the Maunganui-Girven, Te Maunga Intersection Improvements Project at the Scheme Assessment Report (SAR) phase.

The Maunganui-Girven and Te Maunga site includes the existing roundabout on SH2/Maunganui Road, Girven Road and Matapihi Road the SH2/29 intersection and SH29/Truman intersection at Te Maunga. Bordering the intersections on the eastern side is Bayfair Shopping Centre and residential housing. The western side of the site is adjacent to the East Coast Main Trunk (ECMT) railway and the Baypark facilities.

Located approximately midway between the recently completed Harbour Link Stages 1 and 2 and the currently under construction Tauranga Eastern Link, these intersections experience high volumes of traffic with large numbers of turning traffic, especially at peak times.

The NZTA has identified that the Maunganui-Girven and Te Maunga Intersections as a bottle neck in the network between the Tauranga Eastern Link, which is a Road of National Significance (RONS), and the Port of Tauranga. The purpose of the Investigation Phase is to identify the long term solution for the intersections.

The investigation has identified that Option 3A is likely to be the preferred option. The layout of Option 3A is shown in Appendix A.

## 1.1 General

The risk management process adopted for this project has been carried out in accordance with the advanced approach set out in NZTA's Minimum Standard Z/44 - Risk Management and the principles described in ISO 31000:2009 Risk Management – Principles and Guidelines.

The objective of the risk management process within any project commission can be defined as:

- “To manage future uncertainties, by planning for the unintended event through action or mitigation.”

The primary purpose of this project risk management procedure is to provide a structured methodology for identifying, assessing, evaluating and treating project risks to assist the Client to make best decisions throughout the lifecycle of the project to minimise failures and maximise opportunities.



## 2 Risk Management Process and Procedures

### 2.1 General

In order to provide a consistent and thorough approach to the management of risks for the project, Beca has followed the processes presented in ISO 31000 2009: Risk Management – Principles and Guidelines and NZTA’s Minimum Standard Z/44 – Risk Management.

The risk management process can be usefully broken down into five primary elements as follows:

- Establish Context (what are the objectives and what are the risk cultures of the participants?)
- Risk Identification (or, what can go wrong?)
- Risk Analysis (or, what is the degree of risk?)
- Risk Evaluation (or, is the degree of risk acceptable?)
- Risk Treatment (or, what can be done to avoid, minimise the effects of risks?)

Best practice risk management requires a continual cycle of the monitoring, reviewing and reporting of risks throughout the life of the project. The most effective risk management such as Z/44 requires a large degree of review and reporting to ensure the risk register is kept as up-to-date as possible and the project team are fully aware of the risks affecting the projects objectives.

The diagram in Figure 1 adapted from ISO 31000:2009 shows graphically the cyclical nature of the risk management process utilised for the Maunganui-Girven Te Maunga Intersection project.

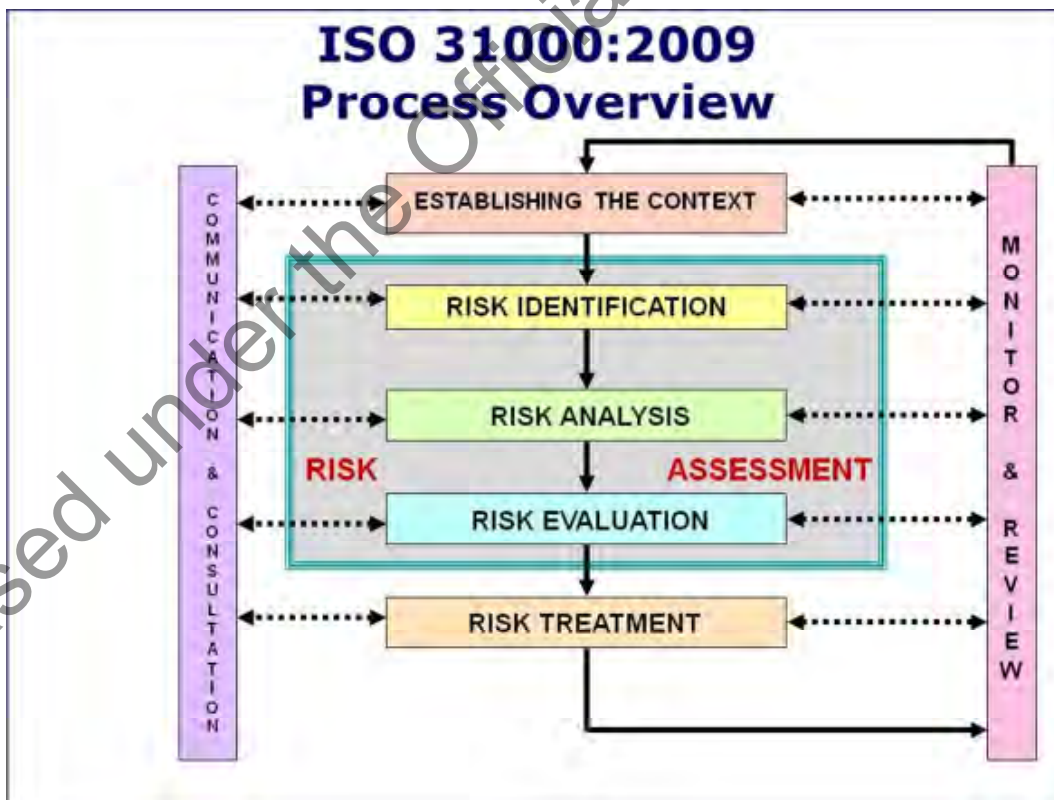


Figure 1: Risk Management Methodology (adapted from ISO 31000:2009)

### 3 Project Methodology

#### 3.1 Preparation of the Risk Register

This report provides an update of the risk review undertaken for the project and the resultant project risk register prepared in April 2013.

The project risk register formulated using the AC/Man/1 Risk Management Process manual has been updated to adhere to the requirements of NZTA’s Minimum Standard Z/44 – Risk Management.

A formal facilitated risk workshop was held on 11<sup>th</sup> December 2013 which was attended by the NZTA, TCC, KiwiRail and Beca representatives listed in the Table 3 below.

Table 3: Risk Workshop Attendees

NZTA	TCC	KiwiRail	Beca
John McCarthy, Greig Stephen, Eranga Dasanayaka	s 9(2)(a)	s 9(2)(a)	s 9(2)(a)

At the commencement of the risk workshop the facilitator explained the Z/44 risk management framework and described the process to be followed during the workshop. The focus of the risk workshop was to review and amend the existing risk register and identify any new risks and uncertainties affecting the project objectives.

The purpose of this process was for all attendees to look outside of their own field of knowledge at other areas of risk and recognised how these risks would “interplay” with their own field of expertise. To this end a risk identification brainstorming session was carried out in one group in order to get an agreed consensus of opinion on the identified risks.

#### 3.2 Risk Assessment

In order to confirm the ranking of the identified risks, each risk was scored with respect to its probability of occurrence and consequence impact of the event should the risk occur. The tables shown below in Figure 2 are common to NZTA’s Minimum Standard Z/44 – Risk Management (March 2013) and represent an effective way to assess and rate the identified risks.

It should be noted that the Cost and Delivery columns have been altered to reflect this specific project risk tolerance, programme duration and capital value using an appropriate logarithmic scale.

#### 3.3 Risk Evaluation

The modified NZTA scoring system and matrix method (as shown in Appendix C) has been adopted in order to prioritise the key risks to the project.

The NZTA scoring method assigns a value against the probability and consequence criteria (refer to tables in Appendix C). These values are then simply multiplied together to give a total as shown on figure 2 below.

A risk assigned a probability of “very high” and a consequence of “very high,” gives a total score of 25 and as such would be given a risk priority of “Extreme”.

Any risk prioritised as “High” or “Extreme” requires due diligence and appropriate care.

HNO Threat & Opportunity Probability Impact Grid (PIG)													
		Threat					Opportunity						
		Very Low	Low	Medium	High	Very High	Very High	High	Medium	Low	Very Low		
Probability	Very High	9	14	18	22	25	25	22	18	14	9	Very High	
	High	7	12	17	21	24	24	21	17	12	7	High	
	Medium	5	10	15	19	23	23	19	15	10	5	Medium	
	Low	3	6	11	16	20	20	16	11	6	3	Low	
	Very Low	1	2	4	8	13	13	8	4	2	1	Very Low	
		Very Low	Low	Medium	High	Very High	Very High	High	Medium	Low	Very Low	Consequence	

Figure 2: Risk Scores

Priority is assigned using the Probability Impact Grid (Figure 3 below). Each risk is prioritised comparing the scores for consequence and impact against a risk criteria matrix, which ranks risks against 4 defined classes or sets (Low, Moderate, High and Extreme).

It should also be accepted that all risks, regardless of their ranking, should be regularly monitored to ensure these risks do not move to a higher ranking as the project moves through to construction.

HNO Risk Level				
Threat Level	Action	Notification of new risk or risk where the Threat/ Opportunity level has increased	Reporting	Opportunity Level
Extreme Threat (Score 21-25)	Maintain record in risk register, determine requirement for treatment, thereafter implement, manage and monitor as appropriate.	Notify NZTA Client within 1 working day or immediately if urgent response is required.  NZTA Client to evaluate risk for escalation.	As per contract reporting requirements	Extreme Opportunity (Score 21-25)
High Threat (Score 13-20)				High Opportunity (Score 13-20)
Moderate Threat (Score 6-15)		Notify NZTA Client within 5 working day or immediately if urgent response is required.  NZTA Client to evaluate risk for escalation.		Moderate Opportunity (Score 6-15)
Low Threat (Score 1-5)	Maintain record in risk register, risk may be Parked without requirement for treatment, requires ongoing monitoring.	Notify Line Manager within 5 working day.		Low Opportunity (Score 1-5)

Figure 3: Probability Impact Grid (From NZTA Minimum Standard Z/44)

### 3.4 Workshop Outcome

The findings from the workshop identified 53 threats and 1 opportunity that have been prioritised as follows:

**Current Risk:**

- 4 Extreme Threats
- 17 High Threats
- 30 Moderate Threats
- 3 Low Threats.
- 1 Moderate Opportunity

Treatment strategies have been developed and residual risk scores assessed. The summary of the residual risk scores is shown below.

**Residual Risk:**

- 0 Extreme Threats
- 11 High Threats
- 32 Moderate Threats
- 11 Low Threats.
- 1 Moderate Opportunity

### 3.5 Risk Treatment Plans and Residual Risks

Following the risk identification and evaluation process, risk treatments and residual risks were discussed for the threats with the ranking of either scores of 16 or greater (Extreme and High risks). The risk treatment plans included in the project risk register detail a proposed action or course of actions to be following, a risk manager responsible for implementation of the action, the status of the risk and the anticipated reduction score once mitigation measures have been implemented.

It is recommended that the project team monitor these management actions on a monthly basis as the project moves through specimen design into construction, and that a regular risk review occurs to monitor all risks on the project.

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Appendix A

Option 3A drawing  
(3933377-C-K088 Rev C)

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**LEGEND**

- EXISTING TEL DESIGNATION
- PROPOSED MGI DESIGNATION
- PROPOSED RAIL DESIGNATION
- PEDESTRIAN ROUTE
- AT GRADE PEDESTRIAN ROUTE
- CYCLIST ROUTE
- MSE RETAINING WALL
- FF4 BARRIER FULL FACE TL4
- SF4 BARRIER SINGLE FACE TL4
- SF5 BARRIER SINGLE FACE TL5
- WIRE ROPE BARRIER

DATA OBTAINED FROM OTHERS AND INCLUDED IN THESE DRAWINGS ARE AS FOLLOWS:

TAURANGA CITY COUNCIL WESTERN BOP DISTRICT COUNCIL	PROPERTY BOUNDARIES & AERIAL PHOTOGRAPHY
TAURANGA CITY COUNCIL, POWER Co, VECTOR GAS, CHORUS, FX NETWORKS, TELSTRA CLEAR, VODAFONE, TRANSFIELD UFBB.	SERVICE PLANS
LEVEL DATUM	MOTURIKI
COORDINATE SYSTEM	BAY OF PLENTY 2000

- NOTES:**
- DESIGN LAYOUT IS PRELIMINARY ONLY AND IS SUBJECT TO FURTHER REFINEMENT
  - LAND REQUIREMENT IS PRELIMINARY ONLY AND IS SUBJECT TO FURTHER DESIGN REFINEMENT
  - CRASH CUSHIONS TO BE INSTALLED AT THE LEADING END OF ALL CONCRETE BARRIERS

No.	Revision	By	Chk	Appd	Date
C	OPTION NUMBER AMENDED	BIL	TVH	TVH	19.12.13
B	ALIGNMENT UPDATED SH29 - TE MAUNGA INTERSECTION FOR SAFETY AUDIT	AWS	TVH	TVH	01.11.13
A	FOR INFORMATION	SJF	TVH	TVH	09.09.13

Drawing Originator: **Beca**

Original Scale (A1)	Design	SJF	09.09.13	Approved For Construction*
1:2500	Drawn	SJF	09.09.13	Date
Reduced Scale (A3)	Dwg Verifier			
1:5000	Dwg Check			

\* Refer to Revision 1 for Original Signature

Client: **NZ TRANSPORT AGENCY**  
WAKA KOTAHĪ

Project: **SH2 MAUNGANUI / GIRVEN AND TE MAUNGA INTERSECTION IMPROVEMENTS**

Title: **OPTION 3A ROUNDABOUT ON SH29 GENERAL ARRANGEMENT**

Discipline:	<b>CIVIL</b>
Drawing No.:	<b>3933377-C-K088</b>
Rev.:	<b>C</b>

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Appendix B

Risk Register



NZTA Tauranga Risk Register  
 Friday, 6 December 2013  
 John McCarthy (Project Lead & Owner)



1982

Impact	RID	BOP Fields			Risk Title	Description/ Cause/ Consequence	Risk Owner	Risk Owning Org	Date Raised	Risk Status	Phase	Established Controls	Semi-Quantitative			Treatment Strategy		Treatment Status		Semi-Quantitative		Commentary & Closure Statement
		Business Unit	Project/ Network	Risk Type									Conseq	Prob	CURRENT Risk Score	(refer to Actions Register for detail)	Treatmt Status	Start Date	Finish Date	Conseq	Prob	
Impact	1	Projects	MGI	Stakeholder Relationships	MGI construction not aligned with TEL <b>Description:</b> There is a threat that NZTA reputation compromised because the construction works do not start before the completion of the TEL. <b>Cause:</b> The cause of the threat is delays to progression of design and procurement/ enabling works mean late construction start. <b>Consequence:</b> The consequence is bad PR.	GS	NZTA	1/05/2013	Live - Threat	Detailed Business Case	Communications plan to manage public expectations, HNO project prioritisation process	High	High	21	Raise profile within NZTA and get projects ready to go with VAC approvals.	Proposed	11/12/2013	30/03/2014	High	Medium	19	TEL planned to complete mid 2015.
	2	Projects	MGI	Stakeholder Relationships	Tangata Whenua Opposition <b>Description:</b> There is a threat that Tangata Whenua object to the NZTA project designation and resource consents. <b>Cause:</b> The cause of the threat is they do not feel as though they have been involved. <b>Consequence:</b> The consequence of the threat is time delay in RMA.	CLR	Beca	1/04/2013	Live - Threat	Detailed Business Case	Consultation with Hapu through Advisory Group meetings	High	High	21	Ongoing consultation with Hapu and aim to gather acceptance from them. Develop protocol	Ongoing	11/12/2013	30/03/2014	Medium	Medium	15	
	3	Projects	MGI	Stakeholder Relationships	AMP Opposition through RMA <b>Description:</b> There is a threat that AMP opposes elements of the project through RMA. <b>Cause:</b> The cause of the threat is conflict with AMP development. <b>Consequence:</b> The consequence of the threat is delay to RMA.	CLR	Beca	1/04/2013	Live - Threat	Detailed Business Case	Requires active management with regular meetings with AMP	High	High	21	Ongoing consultation with AMP during design process. Develop MOU (March 2014).	Proposed	11/12/2013	30/03/2014	Medium	Medium	15	Interactions with SW cost share MOU end of March.
	4	Projects	MGI	Project Scope	Truman - Mangatawa Link Road <b>Description:</b> There is a threat that stakeholders object to the proposed design solution for the link road from Truman Lane to the Mangatawa Interchange. <b>Cause:</b> The cause of the threat is incomplete network provided by TEL project/TCC/MPBI interaction. <b>Consequence:</b> The consequence of the threat is TEL cannot provide link or delays the connection between Te Munga lane and Mangatawa which then creates uncertainty for the consenting of Option 3.	GS	NZTA	1/04/2013	Live - Parked	Detailed Business Case		High	High	21	Raise risk profile within NZTA/TCC. GS to monitor TCC progress.	Ongoing	11/12/2013	30/03/2014	Low	Low	6	
	5	Projects	MGI	Project Scope	Changes to Existing Design Standards <b>Description:</b> There is a threat of changes to existing design standards occurring during investigation and design stage of the project. <b>Cause:</b> The cause of the threat is change in legislation or NZTA requirements, i.e. Bridge Manual rev 3, Safe Systems. <b>Consequence:</b> The consequence of the threat is re-design and additional cost.	TH	Beca	1/04/2013	Live - Parked	Detailed Business Case	Beca are monitoring potential changes to design standards and will inform NZTA of the impact of changes.	High	Medium	19	Ongoing Communication between Beca and NZTA for monitoring potential changes to design.	Ongoing	11/12/2013	30/03/2014	Medium	Medium	15	
	6	Projects	MGI	Consents Land Property	Golf Course Additional Land for Railway Realignment <b>Description:</b> There is a threat that is that additional land is required to provide space to construct the realigned rail corridor through the golf course. <b>Cause:</b> The cause of the threat is the existing designation is too narrow to build the rail track as planned <b>Consequence:</b> The consequence of the threat is delay due to opposition during the consenting process.	TH	Beca	1/04/2013	Live - Threat	Detailed Business Case	Consultation with KiwiRail	High	Medium	19	Concept design shows railway will fit within corridor. Obtain KiwiRail approval through project agreement.	Proposed	11/12/2013	30/03/2014	Very Low	Very Low	1	Design shows single track will fit.
	7	Projects	MGI	Environmental Impact	Liftan Place Mitigation Measures <b>Description:</b> There is a threat that rail noise and vibration mitigation measures at Liftan Place not accepted by affected parties. <b>Cause:</b> The cause of the threat is affected party concerns and challenge. <b>Consequence:</b> The consequence of the threat is additional mitigation and adverse publicity.	CLR	Beca	1/04/2013	Live - Threat	Detailed Business Case	Outline Plan process, consultation with residents	Medium	Very High	18	Obtain expert advice for determining mitigation measures.	Ongoing	11/12/2013	30/03/2014	Medium	Very High	18	
	8	Projects	MGI	Consents	Hapu opposition to level of stormwater treatment. <b>Description:</b> There is a threat that Hapu will oppose consent for stormwater discharge to the harbour. <b>Cause:</b> The cause of the threat is higher expectations of treatment from Hapu. <b>Consequence:</b> The consequence of the threat is delay in consenting process.	CLR	Beca	1/04/2013	Live - Threat	Detailed Business Case	Resource consent process	Medium	High	17	Consult early and design Stormwater treatment.	Ongoing	11/12/2013	30/03/2014	Low	Medium	10	
	9	Projects	MGI	Consents Land Property	Obtaining Deed of Grant <b>Description:</b> There is a threat that obtaining a Deed of Grant for service authorities takes longer than expected. <b>Cause:</b> The cause of the threat is time consuming processes within KiwiRail. <b>Consequence:</b> The consequence of the threat is delay to commencement of project until agreement reached.	GS	NZTA	1/04/2013	Emerging	Pre Implementation		High	Low	16	Commence early negotiations during design phase.	emerging	30/03/2014	1/06/2014	Low	Low	6	Agreement in principle has been obtained, April 2013.
	10	Projects	MGI	Stakeholder Relationships	Public Perception due to construction delays <b>Description:</b> There is a threat of negative public perception of delay due to government funding. <b>Cause:</b> The cause of the threat is a change in government objectives and / or funding priorities. <b>Consequence:</b> The consequence of the threat is project delay.	GS	NZTA	1/04/2013	Live - Parked	Pre Implementation	Communications plan to manage public expectations, HNO project prioritisation process	Medium	Medium	15	Manage public expectations.	Ongoing	11/12/2013	30/06/2014	Medium	Medium	15	
	11	Projects	MGI	Design Issues	Design Developments Additional Costs <b>Description:</b> There is a threat that design development results in additional costs being identified. <b>Cause:</b> The cause of the threat is the "high level" design and costing that has been undertaken to date. <b>Consequence:</b> The consequence of the threat is increased costs.	GS	NZTA	1/04/2013	Live - Parked	Pre Implementation		Medium	Medium	15	Review scope in next phase of project. Maintain close control of scope.	Proposed	30/03/2014	30/12/2014	Medium	Medium	15	

Impact	BOP Fields													Semi-Quantitative		Treatment Strategy	Treatment Status	Start Date	Finish Date	Semi-Quantitative		RESIDUAL Risk Score	Commentary & Closure Statement
	RID	Business Unit	Project/ Network	Risk Type	Risk Title	Description/ Cause/ Consequence	Risk Owner	Risk Owning Org	Date Raised	Risk Status	Phase	Established Controls	Conseq	Prob	CURRENT Risk Score	(refer to Actions Register for detail)	Treatmt Status	Start Date	Finish Date	Conseq	Prob		
	12	Projects	MGI	Consents	Stormwater Treatment Inadequate Space	Description: There is a threat that inadequate space is provided for the treatment of stormwater required for the project. Cause: The cause of the threat is limited space available. Consequence: The consequence of the threat is an extension of the designation, redesign and additional costs.	TH	Beca	1/04/2013	Live - Threat	Detailed Business Case		Medium	Medium	15	Undertake further investigations during I&R phase	Proposed	11/12/2013	30/06/2014	Medium	Medium	15	
	13	Projects	MGI	Stakeholder Relationships	Golf Club Membership Objections	Description: There is a threat that the golf club membership could object to the design solutions during the planning process. Cause: The cause of the threat is the affect on the golf course layout. Consequence: The consequence of the threat is a delay in the RMA.	CLR	Beca	1/04/2013	Live - Threat	Detailed Business Case	Consultation with golf course manager and TCC reserves.	Medium	Medium	15	Ongoing consultation with golf club and TCC reserves.	Proposed	11/12/2013	30/06/2014	Medium	Medium	15	Lots of impacts on course operation: Practice fairway, Stormwater, Hole 13, Tee relocation, Fencing, Planting. TCC has included in 2014/15 financial year request.
	14	Projects	MGI	Consents	Lifton Place Rail Noise Walls	Description: There is a threat that public objection to two rail noise walls adjacent to railway at Lifton Pt. Cause: The cause of the threat is community opposition to visual impact and perceived concern to personal safety through walkway. Consequence: The consequence of the threat is poor PR.	CLR	Beca	11/12/2013	Live - Threat	Detailed Business Case	RMA process	Medium	Medium	15	Prepare visualisations. Undertake consultation.	Ongoing	12/12/2013	30/03/2014	Medium	Medium	15	
	15	Projects	MGI	Consents	Rail Noise Mitigation	Description: There is a threat that the proposed rail noise mitigation is opposed by the community and/or TCC (NZTA unable to legally require it). Cause: The cause of the threat is there is no legal process for the community to oppose except for through politicians and media. Consequence: The consequence of the threat is image, reputation, delays and cost.	CLR	Beca	11/12/2013	Live - Threat	Detailed Business Case	RMA process	Medium	Medium	15	Careful consultation strategy and messaging.	Ongoing	12/12/2013	30/03/2014	Medium	Medium	15	
	16	Projects	MGI	Land & Property	Adequate Space	Description: There is a threat that we do not have adequate space to build the project within the proposed designation. Cause: The cause of the threat is not enough contingency has been made to designate sufficient land to construct the project. Consequence: The consequence of the threat is the lack of space to carry out temporary and permanent construction works and delay for recontesting.	TH	Beca	1/04/2013	Live - Threat	Detailed Business Case		Medium	Medium	15	Review extent of land needed to build project. Provide special contingency.	Proposed	11/12/2013	30/03/2014	Medium	Low	11	Note constrained for space at Exeter St.
	17	Projects	MGI	Environmental Impact	Visual and Shadow Impacts	Description: There is a threat that visual and shadow impacts result in strong opposition from the public to elements of the project. Cause: The cause of the threat is the Maori and public perception of flyovers having a negative visual impact. Consequence: The consequence of the threat is a delay in obtaining designation in order to close out opposition.	CLR	Beca	1/04/2013	Closed	Detailed Business Case		Medium	Medium	15	Obtain expert advice for determining mitigation measures and ongoing public consultation.				Low	Medium	10	Already included in another risk.
	18	Projects	MGI	Stakeholder Relationships	Transpower Poles Relocation - Time	Description: There is a threat that the relocation of Transpower poles takes longer than expected. Cause: The cause of the threat is lack of commitment from Transpower. Consequence: The consequence of the threat is delay to railway construction.	GL	Beca	11/12/2013	Live - Threat	Pre Implementation		Medium	Medium	15	Engage with Transpower and get design concepts developed. Join with Hairini concept work.	Live	11/12/2013	30/03/2014	Low	Medium	10	
	19	Projects	MGI	Stakeholder Relationships	Negative Political Responses	Description: There is a threat of negative political responses from TCC councillors to the project. Cause: The cause of the threat is political support for affected community members who have objections. Consequence: The consequence of the threat is poor public relations, redesign or delay to project commencement.	GS	NZTA	1/04/2013	Emerging	Detailed Business Case	Engaging with Councilors. Presentations with councilors.	Medium	Medium	15	Keep councilors involved in the project and understand objectives. Need quarterly meetings with Councilors.	Ongoing	11/12/2013	30/03/2014	Low	Low	6	
	20	Projects	MGI	Programme	Rescheduling of Resource Consenting Programme	Description: There is an opportunity to advance the construction start date through rescheduling of resource consenting programme. Cause: The cause of the opportunity is an ability to vary the normal I&R and D&PD procedures. Consequence: The consequence of the opportunity is an earlier start date than currently planned.	GS	NZTA	1/05/2013	Closed	Detailed Business Case		Medium	Medium	15	Additional work underway.	Proposed	11/12/2013	30/06/2014	Low	Low	6	
	21	Projects	MGI	Modelling	Assumptions on Rail Movements	Description: There is a threat that the assumptions on current and future rail movements are incorrect resulting in poor interlocking performance. Cause: The cause of the threat is that it is difficult to predict future rail movements and there is a lot of variability in the day to day KiwiRail operation. Consequence: The consequence of the threat is that mitigation is not at an optimal level.	GS	NZTA	1/04/2013	Closed	Operation	KiwiRail has provided the best projections they can. NZTA to consider the level of resilience they require.	Medium	Medium	15	KiwiRail forecast rail movements received. Ongoing communication with KiwiRail to monitor any changes.	Parked			Low	Very Low	2	Using best available data.

Impact	BOP Fields													Semi-Quantitative		Treatment Strategy	Treatment Status	Start Date	Finish Date	Semi-Quantitative		Commentary & Closure Statement	
	RID	Business Unit	Project/ Network	Risk Type	Risk Title	Description/ Cause/ Consequence	Risk Owner	Risk Owning Org	Date Raised	Risk Status	Phase	Established Controls	Conseq	Prob	CURRENT Risk Score	(refer to Actions Register for detail)	Treatment Status	Start Date	Finish Date	Conseq	Prob		RESIDUAL Risk Score
	22	Projects	MGI	Design Issues	Owens Place Inadequate Design	Description: There is a threat that inadequate carriageway capacity has been allowed for in the design for at Owens Place. Cause: The cause of the threat is changes in the traffic volumes Consequence: The consequence of the threat is additional cost to widen the carriageway.	TH	Beca	1/04/2013	Closed	Detailed Business Case		Low	High	12		parked			Low	Low	6	Not relevant to Option 3a
	23	Projects	MGI	Constructability	Mangatawa / Truman Link	Description: There is a threat that the Mangatawa / Truman link not provided in time for construction staging. Cause: The cause of the threat is link not provided. Consequence: The consequence of the threat is additional costs for construction staging.	GS	NZTA	11/12/2013	Live - Threat	Implementation		Low	High	12	TCC to commit to construction.	On-going	30/03/2014	30/12/2014	Very Low	Low	3	
	24	Projects	MGI	Design Issues	Construction Methodology	Description: There is a threat that the construction methodology and sequencing does not provide adequate temporary pedestrian, carriageway and cycleway facilities. Cause: The cause of the threat due to error and omission. Consequence: The consequence of the threat is additional cost, H & S, poor reputation.	TH	Beca	1/04/2013	Live - Parked	Implementation		Medium	Low	11	Contractor to manage. Cover in PPA.	Proposed	30/03/2014	30/12/2014	Medium	Low	11	
	25	Projects	MGI	Design Issues	Signaling Equipment Technology	Description: There is an opportunity to use more flexible traffic signal controllers than current generation SCATS. Cause: The cause of the opportunity is that equipment is available and in use in other regions but not yet approved for general use in NZ. Consequence: The consequence of the opportunity is the ability to increase capacity to traffic and reduce delays for traffic and peaks.	DT	Beca	1/04/2013	Live - Threat	Pre Implementation		Medium	Low	11	Monitor new technology.	Proposed	30/03/2014	30/12/2014	Medium	Low	11	
	26	Projects	MGI	Consents Land Property	AMP Opposition	Description: There is a threat of opposition from AMP to an alteration to the designation required for option 1. Cause: The cause of the threat is AMP objection to a change in designation due to lack of consistency with their Master Plan. Consequence: The consequence of the threat is a delay in obtaining alteration to designation due to AMP appeal.	CLR	Beca	1/04/2013	Closed	Pre Implementation	Consultation with AMP quarterly (ongoing). No indication of opposition or inconsistency with Master Plan.	Medium	Low	11	Ongoing engagement with AMP.	Proposed	1/04/2013	1/09/2013	Low	Low	6	Option 1 risks no longer relevant.
	27	Projects	MGI	Project Scope	Pedestrian and Cyclist Safety Demands	Description: There is a threat that an grade separation is deemed necessary in order to satisfy safe pedestrian and cyclist demands at MGI. Cause: The cause of the threat is the risk of strong public opposition to there being no underpass. Consequence: The consequence of the threat is additional cost.	CLR	Beca	1/04/2013	Live - Threat	Detailed Business Case	At grade crossing provided.	Medium	Low	11	Project team to make a decision and inform VAC.	Ongoing	11/12/2013	28/02/2014	Medium	Very Low	4	
	28	Projects	MGI	Stakeholder Relationships	Rail Realignment Agreement	Description: There is a threat that obtaining KiwiRail agreement to relocate tracks takes longer than anticipated within the designation process. Cause: The cause of the threat is delay in decision making by KiwiRail and objection to elements of the project scope. Consequence: The consequence of the threat a delay to the project until agreement is made, re-design and additional cost.	GS	NZTA	1/04/2013	Live - Threat	Detailed Business Case	Maintaining close communication and have obtained an agreement in principle.	Medium	Low	11	Maintain communication with KiwiRail. They are currently supportive. Project agreement to be signed by end of January 2014.	Ongoing	11/12/2013	28/02/2014	Low	Very Low	2	
	29	Projects	MGI	Growth Forecasts	Predicted Growth Forecast	Description: There is a threat that the predicted growth forecast is incorrect. Cause: The cause of the threat is inability to forecast future land use changes and growth patterns. Consequence: The consequence of the threat design and infrastructure is not optimised for under or over scope.	DT	Beca	1/04/2013	Closed	I & R	Utilising the latest Smart Growth Model. NZTA are a signatory of the planning process.	Medium	Low	11	Review forecast intersection/cover performance and advise NZTA of effect on project/options early in SAR	Ongoing					0	Note extra risk of potential land use changes near Owens Place
	30	Projects	MGI	Programme	Underestimation of Construction Programme	Description: There is a threat that the sequencing of the construction programme is underestimated with regard to time and cost for the railway construction. Cause: The cause of the threat is lack of experience in railway construction, cost and programme requirements. Consequence: The consequence of the threat is additional cost and delay and engaging with expert consultants.	TH	Beca	1/04/2013	Live - Threat	Pre Implementation		Low	Medium	10	Good level of advice received from KiwiRail	parked			Low	Medium	10	
	31	Projects	MGI	Safety	Safety Audit	Description: There is a threat that a safety audit identifies a need to change elements of the project scope. Cause: The cause of the threat is that there have been limited independent safety reviews for the project undertaken to date. Consequence: The consequence of the threat is cost and time associated with redesign.	GL	NZTA	1/04/2013	Live - Threat	Pre Implementation	NZTA RSA Process	Low	Medium	10	RSA undertaken. Reassess during Specimen Design phase	Proposed	30/03/2014	30/12/2014	Low	Medium	10	
	32	Projects	MGI	Site/ground conditions	Floor Geotechnical Conditions	Description: There is a threat of encountering poorer geotechnical conditions than assumed in the design. Cause: The cause of the threat is unforeseen ground conditions. Consequence: The consequence of the threat is redesign, construction phase delay and additional cost due to unforeseen ground conditions.	TH	Beca	1/04/2013	Live - Parked	Implementation		Low	Medium	10	Reassess in Specimen Design phase	Proposed	30/03/2014	30/12/2014	Low	Medium	10	

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Impact	BOP Fields													Semi-Quantitative		Treatment Strategy		Treatment Status	Start Date	Finish Date	Semi-Quantitative		Commentary & Closure Statement
	RID	Business Unit	Project/ Network	Risk Type	Risk Title	Description/ Cause/ Consequence	Risk Owner	Risk Owning Org	Date Raised	Risk Status	Phase	Established Controls	Conseq	Prob	CURRENT Risk Score	(refer to Actions Register for detail)	Treatmt Status	Start Date	Finish Date	Conseq	Prob	RESIDUAL Risk Score	
	33	Projects	MGI	Design Issues	Flight Path Clearance	<b>Description:</b> There is a threat that the flight path clearance height is a significant restriction to the construction. <b>Cause:</b> The cause of the threat is the flight path cannot be changed. <b>Consequence:</b> The consequence of the threat is a change to construction.	TH	Beca	1/04/2013	Live - Threat	Pre Implementation		Low	Medium	10	Reassess in Specimen Design phase.	Proposed	30/03/2014	30/12/2014	Low	Medium	10	
	34	Projects	MGI	Community	Public Reaction to Lack of Consultation	<b>Description:</b> There is a threat that the public reacts negatively to perceived lack of consultation on preferred option. <b>Cause:</b> The cause of the threat is that information provided to date has not considered Option 3a apart from the newsletter. <b>Consequence:</b> The consequence of the threat is negative public reaction.	CLR	Beca	11/12/2013	Live - Threat	Detailed Business Case	RMA process	Low	Medium	9	Careful messaging in the open day and targeted consultation prior to open day.	Ongoing	12/12/2013	30/03/2014	Low	Medium	10	
	35	Projects	MGI	Geotechnical	Embankment Structures	<b>Description:</b> There is a threat that embankment structures may affect properties and services outside the designation. <b>Cause:</b> The cause of the threat is proximity of embankments and construction vibration. <b>Consequence:</b> The consequence of the threat is effect on construction methodology and potential repair costs to third party properties.	TH	Beca	11/12/2013	Live - Parked	Pre Implementation		Low	Medium	10	Review extent of risk based on geotechnical investigation data and re-assess potential impacts compared to extending designation.	On-going	30/03/2014	30/12/2014	Low	Medium	10	
	36	Projects	MGI	Stakeholder Relationships	Baypark Owner/Operators	<b>Description:</b> There is a threat that Baypark owner/operators are not aligned with the project. <b>Cause:</b> The cause of the threat is due to lack of alignment of expectations with NZTA and limited consultation to date, and access changes. <b>Consequence:</b> The consequence of the threat is delay and cost implications.	CLR	Beca	1/04/2013	Live - Threat	Detailed Business Case		Low	Medium	10	Increase consultation with owner/operators to manage their expectations and reduce objections. Develop access arrangement.	Proposed	11/12/2013	28/02/2014	Low	Low	6	
	37	Projects	MGI	Stakeholder Relationships	Owens Place Owner/Operators	<b>Description:</b> There is a threat that Owens Place owner/operators want intersection signalised. <b>Cause:</b> The cause of the threat is existing concerns with Owens Place / Masaga intersection, but not being in preferred option. <b>Consequence:</b> The consequence of the threat is delay and cost implications.	DT	Beca	1/04/2013	Live - Threat	Detailed Business Case		Low	Medium	10	Ongoing consultation with owner/operators to manage their expectations and reduce objections.	Proposed	11/12/2013	28/02/2014	Low	Low	6	
	38	Projects	MGI	Constructability	Temporary Traffic Management Methodologies	<b>Description:</b> There is a threat that the assumptions and methodologies regarding constructability and temporary traffic management are incorrect. <b>Cause:</b> The cause of the threat is limited space is available and complexity of construction procedures while working around live lanes. <b>Consequence:</b> The consequence of the threat is increase in traffic management and temporary works costs.	TH	Beca	1/04/2013	Live - Parked	Detailed Business Case		Low	Medium	10	Consider further in specimen design phase. Agree use of local roads with TCC.	Ongoing	30/03/2014	30/12/2014	Low	Low	6	Reliant on Mangatawa-Truman Link.
	39	Projects	MGI	Project Scope	ODV	<b>Description:</b> There is a threat that the requirements for Over Dimensional Vehicles (ODV) may increase width / height of structures. <b>Cause:</b> The cause of the threat is limited understanding of ODV requirements. <b>Consequence:</b> The consequence of the threat is scope increase to provide ODV route and additional cost.	TH	Beca	1/04/2013	Live - Threat	Pre Implementation		Low	Medium	10	Set appropriate Principal Requirements for D & C contract. Get agreement on ODV route from NZTA.	Proposed	30/03/2014	30/12/2014	Low	Low	6	Design Philosophy Statement to explain route.
	40	Projects	MGI	Stakeholder Relationships	Bus Interchange	<b>Description:</b> There is a threat that the bus interchange construction not undertaken in time. <b>Cause:</b> The cause of the threat is 3rd parties delay in implementation/change of intersection affects routes. <b>Consequence:</b> The consequence of the threat is the bus route or diversions change.	PK	TCC	1/04/2013	Live - Threat	Pre Implementation		Low	Medium	10	TCC consulting with AMP to complete interchange ahead of project commencement.	Ongoing	30/03/2014	30/12/2014	Low	Low	6	
	41	Projects	MGI	Project Scope	Utility Services Relocation	<b>Description:</b> There is a threat that the cost of utility services relocations is greater than anticipated. <b>Cause:</b> The cause of the threat is inaccurate or incomplete services information and/or poor response from utility companies and/or limited space available within designation. <b>Consequence:</b> The consequence of the threat is cost increase and construction phase delays.	TH	Beca	1/04/2013	Live - Threat	Pre Implementation	Good understanding of the location of services. Relocation strategy developed.	Low	Medium	10	Reassess in Specimen Design phase	Proposed	30/03/2014	30/12/2014	Low	Low	6	
	42	Projects	MGI	Other Engineering Costs	Rail Relocation Costs	<b>Description:</b> There is a threat that rail relocation costs are greater than expected including provision for property purchase and/or disposal values. <b>Cause:</b> The cause of the threat is an inability to assess accurate construction and property purchase costs. <b>Consequence:</b> The consequence of the threat is increased project cost.	TH	Beca	1/04/2013	Live - Threat	Pre Implementation		Low	Medium	10	Reassess in Specimen Design phase	Proposed	30/03/2014	30/12/2014	Low	Low	6	

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Impact	BOP Fields													Semi-Quantitative		Treatment Strategy	Treatment Status	Start Date	Finish Date	Semi-Quantitative		Commentary & Closure Statement	
	RID	Business Unit	Project/ Network	Risk Type	Risk Title	Description/ Cause/ Consequence	Risk Owner	Risk Owning Org	Date Raised	Risk Status	Phase	Established Controls	Conseq	Prob	CURRENT Risk Score	(refer to Actions Register for detail)	Treatmt Status	Start Date	Finish Date	Conseq	Prob		RESIDUAL Risk Score
	43	Projects	MGI	Traffic Management	Mangatawa Interchange Capacity	Description: There is a threat that inadequate capacity has been allowed for in the design carriageway capacity at Mangatawa Interchange. Cause: The cause of the threat is option 3 changes the traffic volumes. Consequence: The consequence of the threat is additional cost to widen the carriageway.	TH	Beca	1/04/2013	Closed	I & R		Low	Medium	10	Review design during SAR	Proposed	1/04/2013	1/09/2013	Low	Low	6	
	44	Projects	MGI	Project Scope	Existing Stormwater System	Description: There is a threat that the existing Tauranga City Council (TCC) stormwater system is inadequate and that additional stormwater system upgrade works are required than currently assumed in the design scope. Cause: The cause of the threat is a lack of current knowledge of the stormwater system requirements and condition. Consequence: The consequence of the threat is additional cost and delay for redesign.	GL	Beca	1/04/2013	Live - Threat	Detailed Business Case	Task force meetings with TCC on an ongoing basis	Low	Medium	10	Consult with TCC and develop strategy. Investigation works to assess TCC system capacity and condition prior to design completion. Develop MOU.	Ongoing	12/12/2013	30/03/2014	Low	Low	6	Integration of AMP, TCC & NZTA stormwater may be an opportunity. Refer to Stormwater Treatment risk
	45	Projects	MGI	Consents Land Property	Opposition to Property Acquisition	Description: There is a threat that the property acquisition gets opposed by the affected landowners. Cause: The cause of the threat is property owner opposition to the project. Consequence: The consequence of the threat is delay to construction programme due to acquisition issues.	GS	NZTA	1/04/2013	Live - Parked	Pre Implementation		Low	Low	6	Develop compulsory acquisition strategy once preferred option confirmed.	Parked			Low	Low	6	
	46	Projects	MGI	Modelling	TTS Strategy	Description: There is a threat that MGI - Te Maunga SAR is inconsistent with TTS strategy, i.e. achieving LOS D for strategic traffic and LOS E for local traffic. Cause: The cause of the threat is a lack of robust traffic modeling to determine the achievable LOS. Consequence: The consequence of the threat is project scope increases or objectives modified.	GS	NZTA	1/04/2013	Closed	Detailed Business Case		Low	Low	6	Monitor LOS performance against TTS objectives.	Parked			Low	Low	6	Option 3a.
	47	Projects	MGI	Stakeholder Relationships	TCC Staff Knowledge	Description: There is a threat that Tauranga City Council staff who have a detailed knowledge of the project and its objectives leave the organisation. Cause: The cause of the threat is changes to TCC staffing and organisational structure. Consequence: The consequence of the threat is delay in decision making and longer approval process.	GS	NZTA	1/04/2013	Live - Parked	Detailed Business Case		Low	Low	6	Maintain close and regular contact with key TCC staff.	Ongoing	30/03/2014	30/12/2014	Low	Low	6	
	48	Projects	MGI	Community	Community Objections	Description: There is a threat that the community objects to the project due to removal of houses and relocation of members of the community. Cause: The cause of the threat is high level of concern from the community and objections to house removals. Consequence: The consequence of the threat is delay to obtaining the designation due to appeals.	CLR	Beca	1/04/2013	Emerging	Detailed Business Case		Low	Low	6	Monitor community reaction during consultation. Review consultation strategy if high concerns identified.	Ongoing	1/04/2013	1/09/2013	Low	Low	6	
	49	Projects	MGI	Community	Matapihi Residents	Description: There is a threat that Matapihi residents oppose the preferred option because it provides no alternative access out of Matapihi Rd Cause: The cause of the threat is perceived expectation that it will be provided. Consequence: The consequence of the threat is opposition to alteration to designation.	CR	Beca	11/12/2013	Live - Threat	Pre Implementation		Low	Low	6	Ongoing consultation.	Ongoing	12/12/2013	30/03/2014	Low	Low	6	
	50	Projects	MGI	Growth Forecasts	Bayfair Development Detrimental Affect	Description: There is a threat that the proposed Bayfair development may leave a detrimental affect on the proposed intersection configuration. Cause: The cause of the threat is uncertainty in regard to the scope and timing of adjacent private developments. Consequence: The consequence of the threat is an intersection that doesn't perform as expected.	CLR	Beca	1/04/2013	Live - Parked	Detailed Business Case		Low	Low	6	Monitor AMP development plans through regular meetings.	Ongoing	12/12/2013	30/03/2014	Very Low	Low	3	
	51	Projects	MGI	Structures	Bridge Impact Loadings	Description: There is a threat that the bridge impact loadings from train are going to change. Cause: The cause of the threat is the NZTA review of the current standards will lead to changes in bridge design standards. Consequence: The consequence of the threat is increased cost and redesign.	TH	Beca	1/04/2013	Live - Parked	Pre Implementation		Low	Low	6	Obtain NZTA agreement on the design standard to be adopted for this project.	On-going	30/03/2014	30/12/2014	Low	Very Low	2	
	52	Projects	MGI	Design Issues	Bridge Design	Description: There is a threat that there is the need for the bridge to be designed for increased live loads. Cause: The cause of the threat is the NZTA's potential revision of the bridge design standards. Consequence: The consequence of the threat is extra cost.	GS	NZTA	1/04/2013	Emerging	Pre Implementation		Very Low	Medium	5	Monitor design standard changes, e.g. HPMV.	On-going	30/03/2014	30/12/2014	Very Low	Low	3	

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Impact	BOP Fields				Risk Title	Description/ Cause/ Consequence	Risk Owner	Risk Owning Org	Date Raised	Risk Status	Phase	Established Controls	Semi-Quantitative			Treatment Strategy	Treatment Status	Start Date	Finish Date	Semi-Quantitative			Commentary & Closure Statement
	RID	Business Unit	Project/ Network	Risk Type									Conseq	Prob	CURRENT Risk Score	(refer to Actions Register for detail)	Treatment Status	Start Date	Finish Date	Conseq	Prob	RESIDUAL Risk Score	
	53	Projects	MGI	Environmental Impact	Urban Form (Functionality)	<p><b>Description:</b> There is a threat that the urban form (functionality) of the final design solution receives strong opposition from stakeholders during the consenting and designation process.</p> <p><b>Cause:</b> The cause of the threat is lack of NZTA and stakeholder alignment.</p> <p><b>Consequence:</b> The consequence of the threat is stakeholder objections, delay to consenting process and possible re-design.</p>	CLR	Beca	1/04/2013	Live - Threat	Detailed Business Case		Very Low	Low	3	Engage with NZTA national office	Ongoing	12/12/2013	30/03/2014	Very Low	Low	3	
	54	Projects	MGI	Consents Land Property	KiwiRail Deed of Grant	<p><b>Description:</b> There is a threat that the purchasing of property and the obtaining of a Deed of Grant from KiwiRail takes longer than anticipated.</p> <p><b>Cause:</b> The cause of the threat is time consuming processes within KiwiRail.</p> <p><b>Consequence:</b> The consequence of the threat is delay to commencement of project until agreement reached.</p>	GS	NZTA	1/04/2013	Emerging	Pre Implementation		Low	Very Low	1	Commence early negotiations once preferred option determined.	At end of SAR Phase	1/02/2014	1/06/2014	Very Low	Very Low	1	Agreement in principle has been obtained, April 2013.

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Appendix C

Risk Register Supporting  
Documents

HNO Threat & Opportunity Probability Impact Grid (PIG)													
Threat						Opportunity							
		Very Low	Low	Medium	High	Very High	Very High	High	Medium	Low	Very Low		
Probability	Very High	9	14	18	22	25	25	22	18	14	9	Very High	Probability
	High	7	12	17	21	24	24	21	17	12	7	High	
	Medium	5	10	15	19	23	23	19	15	10	5	Medium	
	Low	3	6	11	16	20	20	16	11	6	3	Low	
	Very Low	1	2	4	8	13	13	8	4	2	1	Very Low	
		Very Low	Low	Medium	High	Very High	Very High	High	Medium	Low	Very Low		
Consequence													

- Notes:
1. The ranking priority for risks is weighted towards consequence rather than probability, therefore a very high consequence/very low probability risk is considered more important than a very low consequence/very high probability risk. This weighting can be considered appropriate since the high consequences are often disproportionately severe in comparison with low consequences and the highest consequence band in the semi-quantitative criteria has no upper limit.
  2. The PIG provides risk scores for threats and opportunities but these scores are only intended to enable ranking of the risks. The risk score does not convey the risks relative importance to other risks in the risk register.



Risk Status		
A risk is to have a status which reflects its position in the Risk Lifecycle.		
Lifecycle Stage	Status	Description
Identify	Emerging	<p>The initial status of a risk is Emerging. This status remains until sufficient data is provided to satisfy progression to a Live status as follows:</p> <p>For an entry to progress to Live the following fields shall be populated, as a minimum:</p> <ul style="list-style-type: none"> <li>• RID</li> <li>• Title</li> <li>• Description</li> <li>• Date Raised</li> <li>• Risk Owner</li> <li>• Risk Bearing Organisation</li> <li>• Phase</li> <li>• Established Controls</li> <li>• Current Exposure</li> <li>• Treatment</li> <li>• Residual (Target) Exposure</li> </ul> <p>The person making the entry is required to inform the nominated Risk Owner of the creation of the new entry. The status should only be changed to Live with the agreement of the Risk Owner.</p>
Manage	Live - Threat	The treatment strategy is to treat, this may consist of, removing the risk source, changing the probability, changing the consequence or a combination thereof.
	Live - Parked	<p>a). The risk level is below the established Risk Tolerance Threshold, or</p> <p>b). The risk treatment is to tolerate the risk, i.e. no treatment (a 'Treat' risk will change status to 'Parked' following successful completion of treatment(s)), or</p> <p>c). The risk treatment is to share or transfer the risk with a 3rd party (e.g. via insurance).</p> <p>Note: If the risk occurs there may still be an impact on objectives despite transferral, i.e. risk transfer may have been purely financial.</p>
Outcome	Impacted	<p>The risk has occurred. The consequential impact is to be recorded in the commentary field. Provide data on reactive treatment including relevant cost and time impact data.</p> <p>Note: The impact of a risk may occur on more than one occasion throughout the life of the project/contract/activity to which the risk relates, the consequential impact of each occurrence must be recorded to ensure a full understanding of the overall impact on objectives.</p>
	Closed	<p>Management of the risk is no longer required because:</p> <p>a). The risk treatment is to avoid the possibility of occurrence by removing the activity to which the risk relates from the scope of work, or</p> <p>b). The associated activity has been completed and the risk did not impact.</p>
	Rejected	<p>The risk register entry has been rejected because:</p> <p>a). It is no longer relevant, or</p> <p>b). It has been raised in error.</p>

Treatment Status		
A treatment action is to have a status which reflects its position in the Treatment Lifecycle.		
Lifecycle Stage	Status	Description
Identify	Proposed	The treatment action is intended as a future activity.
Manage	Live	The treatment action is in progress.
Outcome	Completed - successful	The treatment action is complete and <b>did</b> reduce the current exposure of the threat/increase the current exposure of the opportunity.
	Completed - unsuccessful	The treatment action is complete but <b>did not</b> reduce the current exposure of the threat/increase the current exposure of the opportunity.
	Rejected	<p>The action has been rejected because:</p> <p>a). It is no longer relevant, or</p> <p>b). It has been raised in error.</p>

HNO Threat Probability Rating					
	Very Low	Low	Medium	High	Very High
<b>Likelihood</b> (applicable to Capital Projects)	≤10%	>10% - 30%	>30% - 50%	>50% - 70%	>70%
<b>Frequency</b> (applicable to NM&O contracts)	Less than once in 10 years	At least once in a period of >6 - 10 years	At least once in a period of >2 - 6 years	At least once in a period of >1 - 2 years	At least once in a period of 12 months

HNO Opportunity Probability Rating					
	Very Low	Low	Medium	High	Very High
<b>Likelihood</b> (applicable to Capital Projects)	≤5%	>5% - 15%	>15% - 25%	>25% - 35%	>35%
<b>Frequency</b> (applicable to NM&O contracts)	Less than once in 20 years	At least once in a period of >16 - 20 years	At least once in a period of >10 - 16 years	At least once in a period of >5 - 10 years	At least once in a period of 5 years

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Note

- i. A risk does not have to be assessed against all of the criteria - use only those criteria relevant for the particular risk.
- ii. Where there are a number of possible consequences use the highest rating. Ensure all relevant impacts are detailed within the consequences part of the risk description.
- iii. When defining bandings for cost, utilise an appropriate logarithmic scale to suit the risk appetite.

HNO Semi-Quantitative Threat Criteria						
Rating Scale	Reputation			NZTA Performance		
	Stakeholders	Public / Media	Legal/Compliance	Delivery	Cost	Health, Safety & Environmental (HS&E)
Very High	Potential breakdown in stakeholder relationship halting progression of nationally strategic activity.	Potential for negative international and national media coverage. Intervention by Minister required, possibly leading to loss of Ministerial confidence. Commission of Inquiry instigated.	Potential for high profile prosecution(s) with potential for custodial sentence.	Potential for programme failure resulting in delivery delay by more than <b>1 year</b>	Potential for financial impact of >\$20M	Potential for fatality or multiple injuries leading to permanent disability or permanent negative impact on public health.  Potential incident causing an environmental impact that takes more than 1 year to restore or is permanent or is of international concern.
High	Potential for disruption to stakeholder relationship slowing progression of nationally strategic activity.	Potential for negative national media coverage. Possible Ministerial inquiry leading to loss of Ministerial confidence/formal enquiry by OAG or statutory agency.	Potential for an individual prosecution.	Potential for programme delay by between <b>6 months to 1 years</b>	Potential for negative financial impact between <b>\$10M to \$20M</b>	Potential for recoverable injuries requiring hospitalisation or resulting in non permanent negative impact on public health.  Potential incident causing an environmental impact that may take up to 1 year to restore or is of national importance.
Medium	Potential for breakdown in stakeholder relationship halting progression of regionally strategic activity.	Potential for negative regional media coverage. Parliamentary/Ministerial questions or 3rd party investigation.	Potential breach with legal rebuke /abatement notice/restrictions.	Potential for programme failure resulting in delivery delay by between <b>3 months to 6 months</b>	Potential for negative financial impact between <b>\$5M to \$10M</b>	Potential for recoverable injuries requiring professional medical treatment and resulting in employment absenteeism.  Potential incident causing an environmental impact that may take 6 - 12 months to restore or is reportable to relevant authorities or is of regional importance.
Low	Potential for disruption to stakeholder relationships slowing progression of regionally strategic activity.	Potential for negative regional media coverage. Official information request, negative feedback from Minister.	Potential breach with letter from authority requesting action.	Potential for programme delay by between <b>1 and 3 months.</b>	Potential for financial impact of <b>\$1M to \$5M</b>	Potential for recoverable injuries requiring professional medical treatment but with negligible lost time.  Potential incident causing an environmental impact that may take 1 - 6 months to restore.
Very Low	Potential for disruption to stakeholder relationship requiring additional intervention.	Potential for negative regional media coverage.	Potential breach managed at a regional level.	Potential for programme failure resulting in delivery delay by <b>less than 1 month.</b>	Potential for negative financial impact of <b>&lt;\$1M</b>	Potential for recoverable injuries manageable with in-situ first aid care.  Potential incident causing an environmental impact that should take less than 1 month to restore.

HNO Semi-Quantitative Opportunity Criteria					
Rating Scale	Reputation			NZTA Performance	
	Stakeholders	Public / Media	Delivery	Cost	Health, Safety & Environmental (HS&E)
Very High	Potential for enhancement to stakeholder relationship likely to lead to improved implementation of nationally strategic activity.	Potential for enhancement to NZTA reputation from positive international or national media coverage likely to lead to recognition from Minister.	Potential for programme advancement by more than <b>2 years</b>	Potential for financial benefit of more than <b>\$20M</b>	Potential to demonstrate Health & Safety innovation likely to lead to changes in international standards.  Potential to demonstrate environmental innovation likely to lead to changes in international standards.
High	Potential for enhancement to stakeholder relationship likely to lead to improved implementation of regionally strategic activity.	Potential for enhancement to NZTA reputation from positive international or national media coverage likely to lead to recognition from NZTA Board.	Potential for programme advancement by between <b>1 and 2 years</b>	Potential for financial benefit between <b>\$10M to \$20M</b>	Potential to demonstrate Health & Safety innovation likely to lead to changes in national standards.  Potential to demonstrate environmental innovation likely to lead to changes in national standards.
Medium	Potential for enhancement to stakeholder relationship likely to lead to improved implementation of a region specific activity.	Potential for enhancement to NZTA reputation from regional media coverage likely to lead to recognition from Senior Leadership Team.	Potential for programme advancement by between <b>6 months and 1 year</b>	Potential for financial benefit between <b>\$5M to \$10M</b>	Potential to demonstrate a number of enhancements to Health & Safety best practise.  Potential to demonstrate a number of enhancements to environmental best practise.
Low	Potential for enhancement to NZTA reputation from recorded regional stakeholder feedback.	Potential for enhancement to NZTA reputation from positive industry media coverage.	Potential for programme advancement by between <b>3 months and 6 months</b>	Potential for financial benefit between <b>\$1M to \$5M.</b>	Potential to demonstrate industry leading application of Health & Safety best practise.  Potential to demonstrate industry leading application of environmental best practise.
Very Low	Potential for perceived enhancement to NZTA reputation from non-recorded regional stakeholder feedback.	Potential for perceived enhancement to NZTA reputation arising from an absence of negative media coverage.	Potential for programme advancement by less than <b>3 months</b>	Potential for financial benefit of <b>&lt;\$1M.</b>	Potential to demonstrate compliance with Health & Safety practise.  Potential to demonstrate compliance with environmental practise.


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Appendix D


Risk Treatment Plans –  
Extreme and High Risks  
(Scores 16 or greater)




<b>Risk No.</b>	<b>Project:</b>	
1	Maunganui-Girven Te Maunga Intersections	
<b>Risk</b>	<b>Risk Type</b>	Stakeholder Relationships
	<b>Risk Title</b>	MGI construction not aligned with TEL
	<b>Description</b>	There is a threat that NZTA reputation compromised because the construction works do not start before the completion of the TEL
	<b>Cause</b>	The cause of the threat is delays to progression of design and procurement/ enabling works mean late construction start.
	<b>Consequence</b>	The consequence is bad PR.
<b>Current Qualitative</b>	<b>Probability</b>	High
	<b>Consequence</b>	High
	<b>Risk Score</b>	21 – Extreme
<b>Current Quantitative</b>	<b>Time Impact</b>	-
	<b>Cost Impact</b>	-
	<b>Other Impacts</b>	Bad PR
<b>Treatment Strategy</b>	<b>Risk Owner</b>	Greig Stephen
	<b>Strategy</b>	Raise profile within NZTA and get project ready to go with VAC approvals.
	<b>Timeframe</b>	11/12/2013 – 30/03/2014
	<b>Resources</b>	
	<b>Costs</b>	
	<b>Action Taken</b>	
	<b>Date Closed</b>	
<b>Residual Risk</b>	<b>Consequence</b>	High
	<b>Probability</b>	Medium
	<b>Risk Score</b>	19 - High
<b>Further Comments</b>	TEL planned to complete mid 2015.	


<b>Risk No.</b> 2	<b>Project:</b> Maunganui-Girven Te Maunga Intersections	
<b>Risk</b>	<b>Risk Type</b>	Stakeholder Relationships
	<b>Risk Title</b>	Tangata Whenua Opposition
	<b>Description</b>	There is a threat that Tangata Whenua object to the NZTA project designation and resource consents.
	<b>Cause</b>	The cause of the threat is they do not feel as though they have been involved.
	<b>Consequence</b>	The consequence of the threat is time delay in RMA.
<b>Current Qualitative</b>	<b>Probability</b>	High
	<b>Consequence</b>	High
	<b>Risk Score</b>	21 - Extreme
<b>Current Quantitative</b>	<b>Time Impact</b>	Delay
	<b>Cost Impact</b>	-
	<b>Other Impacts</b>	-
<b>Treatment Strategy</b>	<b>Risk Owner</b>	§ 9(2)(a)
	<b>Strategy</b>	Ongoing consultation with Hapu and aim to gather acceptance from them. Develop protocol
	<b>Timeframe</b>	11/12/2013 – 30/03/2014
	<b>Resources</b>	
	<b>Costs</b>	
	<b>Action Taken</b>	
	<b>Date Closed</b>	
<b>Residual Risk</b>	<b>Consequence</b>	Medium
	<b>Probability</b>	Medium
	<b>Risk Score</b>	15 - High
	<b>Further Comments</b>	

<b>Risk No.</b>	<b>Project:</b>	
3	Maunganui-Girven Te Maunga Intersections	
<b>Risk</b>	<b>Risk Type</b>	Stakeholder Relationships
	<b>Risk Title</b>	AMP Opposition through RMA
	<b>Description</b>	There is a threat that AMP opposes elements of the project through RMA.
	<b>Cause</b>	The cause of the threat is conflict with AMP development.
	<b>Consequence</b>	The consequence of the threat is delay to RMA.
<b>Current Qualitative</b>	<b>Probability</b>	High
	<b>Consequence</b>	High
	<b>Risk Score</b>	21 – Extreme
<b>Current Quantitative</b>	<b>Time Impact</b>	Delay
	<b>Cost Impact</b>	-
	<b>Other Impacts</b>	-
<b>Treatment Strategy</b>	<b>Risk Owner</b>	§ 9(2)(a)
	<b>Strategy</b>	Ongoing consultation with AMP during design process. Develop MOU (March 2014).
	<b>Timeframe</b>	11/12/2013 – 30/03/2014
	<b>Resources</b>	
	<b>Costs</b>	
	<b>Action Taken</b>	
	<b>Date Closed</b>	
<b>Residual Risk</b>	<b>Consequence</b>	Medium
	<b>Probability</b>	Medium
	<b>Risk Score</b>	15 - High
<b>Further Comments</b>	Interactions with SW cost share MOU end of March.	

<b>Risk No.</b>	<b>Project:</b>	
4	Maunganui-Girven Te Maunga Intersections	
<b>Risk</b>	<b>Risk Type</b>	Project Scope
	<b>Risk Title</b>	Truman – Mangatawa Link Road
	<b>Description</b>	There is a threat that stakeholders object to the proposed design solution for the link road from Truman Lane to the Mangatawa Interchange.
	<b>Cause</b>	The cause of the threat is incomplete network provided by TEL project/TCC/MPBI interaction.
	<b>Consequence</b>	The consequence of the threat is TEL cannot provide link or delays the connection between Te Munga lane and Mangatawa which then creates uncertainty for the consenting of Option 3.
<b>Current Qualitative</b>	<b>Probability</b>	High
	<b>Consequence</b>	High
	<b>Risk Score</b>	21 – Extreme
<b>Current Quantitative</b>	<b>Time Impact</b>	Delay
	<b>Cost Impact</b>	-
	<b>Other Impacts</b>	Consenting
<b>Treatment Strategy</b>	<b>Risk Owner</b>	§ 9(2)(a)
	<b>Strategy</b>	Raise risk profile within NZTA/TCC. GS to monitor TCC progress.
	<b>Timeframe</b>	11/12/2013 – 30/03/2014
	<b>Resources</b>	
	<b>Costs</b>	
	<b>Action Taken</b>	
	<b>Date Closed</b>	
<b>Residual Risk</b>	<b>Consequence</b>	Low
	<b>Probability</b>	Low
	<b>Risk Score</b>	6 - Moderate
	<b>Further Comments</b>	



<b>Risk No.</b>	<b>Project:</b>	
5	Maunganui-Girven Te Maunga Intersections	
<b>Risk</b>	<b>Risk Type</b>	Project Scope
	<b>Risk Title</b>	Changes to Existing Design Standards
	<b>Description</b>	There is a threat of changes to existing design standards occurring during investigation and design stage of the project.
	<b>Cause</b>	The cause of the threat is change in legislation or NZTA requirements, i.e. Bridge Manual rev 3, Safe Systems.
	<b>Consequence</b>	The consequence of the threat is re-design and additional cost.
<b>Current Qualitative</b>	<b>Probability</b>	Medium
	<b>Consequence</b>	High
	<b>Risk Score</b>	19 - High
<b>Current Quantitative</b>	<b>Time Impact</b>	-
	<b>Cost Impact</b>	Cost
	<b>Other Impacts</b>	Re-design
<b>Treatment Strategy</b>	<b>Risk Owner</b>	§ 9(2)(a)
	<b>Strategy</b>	Ongoing Communication between Beca and NZTA for monitoring potential changes to design.
	<b>Timeframe</b>	11/12/2013 – 30/03/2014
	<b>Resources</b>	
	<b>Costs</b>	
	<b>Action Taken</b>	
	<b>Date Closed</b>	
<b>Residual Risk</b>	<b>Consequence</b>	Medium
	<b>Probability</b>	Medium
	<b>Risk Score</b>	15 - High
	<b>Further Comments</b>	

<b>Risk No.</b>	<b>Project:</b>	
6	Maunganui-Girven Te Maunga Intersections	
<b>Risk</b>	<b>Risk Type</b>	Consents Land Property
	<b>Risk Title</b>	Golf Course Additional Land for Railway Realignment
	<b>Description</b>	There is a threat that is that additional land is required to provide space to construct the realigned rail corridor through the golf course.
	<b>Cause</b>	The cause of the threat is the existing designation is too narrow to build the rail track as planned.
	<b>Consequence</b>	The consequence of the threat is delay due to opposition during the consenting process.
<b>Current Qualitative</b>	<b>Probability</b>	Medium
	<b>Consequence</b>	High
	<b>Risk Score</b>	19 - High
<b>Current Quantitative</b>	<b>Time Impact</b>	Delay
	<b>Cost Impact</b>	-
	<b>Other Impacts</b>	-
<b>Treatment Strategy</b>	<b>Risk Owner</b>	§ 9(2)(a)
	<b>Strategy</b>	Concept design shows railway will fit within corridor. Obtain KiwiRail approval through project agreement.
	<b>Timeframe</b>	11/12/2013 – 30/03/2014
	<b>Resources</b>	
	<b>Costs</b>	
	<b>Action Taken</b>	
	<b>Date Closed</b>	
<b>Residual Risk</b>	<b>Consequence</b>	Very Low
	<b>Probability</b>	Very Low
	<b>Risk Score</b>	1 – Low
<b>Further Comments</b>	Design shows single track will fit.	

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Risk No.


7

Project:


Maunganui-Girven Te Maunga Intersections



<b>Risk</b>	<b>Risk Type</b>	Environmental Impact
	<b>Risk Title</b>	Liftan Place Mitigation Measures
	<b>Description</b>	There is a threat that rail noise and vibration mitigation measures at Liftan Place not accepted by affected parties.
	<b>Cause</b>	The cause of the threat is affected party concerns and challenge.
	<b>Consequence</b>	The consequence of the threat is additional mitigation and adverse publicity.
<b>Current Qualitative</b>	<b>Probability</b>	Very High
	<b>Consequence</b>	Medium
	<b>Risk Score</b>	18 - High
<b>Current Quantitative</b>	<b>Time Impact</b>	-
	<b>Cost Impact</b>	-
	<b>Other Impacts</b>	Additional mitigation and adverse publicity.
<b>Treatment Strategy</b>	<b>Risk Owner</b>	§ 9(2)(a)
	<b>Strategy</b>	Obtain expert advice for determining mitigation measures.
	<b>Timeframe</b>	11/12/2013 – 30/03/2014
	<b>Resources</b>	
	<b>Costs</b>	
	<b>Action Taken</b>	
	<b>Date Closed</b>	
<b>Residual Risk</b>	<b>Consequence</b>	Medium
	<b>Probability</b>	Very High
	<b>Risk Score</b>	18 - High
	<b>Further Comments</b>	

<b>Risk No.</b>	<b>Project:</b>	
8	Maunganui-Girven Te Maunga Intersections	
<b>Risk</b>	<b>Risk Type</b>	Consents
	<b>Risk Title</b>	Hapu opposition to level of Stormwater treatment
	<b>Description</b>	There is a threat that Hapu will oppose consent for stormwater discharge to the harbour.
	<b>Cause</b>	The cause of the threat is higher expectations of treatment from Hapu.
	<b>Consequence</b>	The consequence of the threat is delay in consenting process.
<b>Current Qualitative</b>	<b>Probability</b>	High
	<b>Consequence</b>	Medium
	<b>Risk Score</b>	17 - High
<b>Current Quantitative</b>	<b>Time Impact</b>	Delay
	<b>Cost Impact</b>	-
	<b>Other Impacts</b>	-
<b>Treatment Strategy</b>	<b>Risk Owner</b>	s 9(2)(a) [REDACTED]
	<b>Strategy</b>	Consult early and design Stormwater treatment.
	<b>Timeframe</b>	11/12/2013 – 30/03/2014
	<b>Resources</b>	
	<b>Costs</b>	
	<b>Action Taken</b>	
	<b>Date Closed</b>	
<b>Residual Risk</b>	<b>Consequence</b>	Low
	<b>Probability</b>	Medium
	<b>Risk Score</b>	10 - Moderate
	<b>Further Comments</b>	

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Risk No.	Project:	
9	Maunganui-Girven Te Maunga Intersections 	
<b>Risk</b>	<b>Risk Type</b>	Consents Land Property
	<b>Risk Title</b>	Obtaining Deed of Grant
	<b>Description</b>	There is a threat that obtaining a Deed of Grant for service authorities takes longer than expected.
	<b>Cause</b>	The cause of the threat is time consuming processes within KiwiRail.
	<b>Consequence</b>	The consequence of the threat is delay to commencement of project until agreement reached.
<b>Current Qualitative</b>	<b>Probability</b>	Low
	<b>Consequence</b>	High
	<b>Risk Score</b>	16 – High
<b>Current Quantitative</b>	<b>Time Impact</b>	Delay
	<b>Cost Impact</b>	-
	<b>Other Impacts</b>	-
<b>Treatment Strategy</b>	<b>Risk Owner</b>	Greig Stephen
	<b>Strategy</b>	Commence early negotiations during design phase.
	<b>Timeframe</b>	30/03/2014 – 01/06/2014
	<b>Resources</b>	
	<b>Costs</b>	
	<b>Action Taken</b>	
	<b>Date Closed</b>	
<b>Residual Risk</b>	<b>Consequence</b>	Low
	<b>Probability</b>	Low
	<b>Risk Score</b>	6 – Moderate
	<b>Further Comments</b>	Agreement in principle has been obtained, April 2013.

## Appendix H –Reviews and Audits

### Peer Review

A traffic modelling and economic peer review has been completed by Flow Ltd and the agreed outputs are included in the Maunganui/Girven (MGI) – Te Maunga (SH2/29) Transport Assessment Report included in Appendix C.

### Safety Audits

A safety audit of Option 3A has been completed and is attached.

### Cost Estimate Review

The Scheme Estimate has been parallel estimated and reconciled with Construction Consulting Group Ltd as an Industry Expert. The Cost Report and response from the Parallel Estimate is included in Appendix D.

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## Appendix I – Consenting Strategy

The preferred option (Option 3A) requires consents under the Resource Management Act and the Heritage New Zealand Pouhere Taonga Act. The following advice is given on the basis of what is known at the time of writing.

### 1. Resource Management Act

#### 1.1 Rail Designation (RC3)

Option 3A utilises the rail corridor that lies between the Owens Place business area and the Matapihi residential area and the Omanu Golf Course. We have been advised by KiwiRail that the rail alignment across the Omanu Golf Course will be a single track and therefore no additional land will be required to accommodate the design. Given the tight timeframes for approvals and construction it is recommended that the rail approvals be undertaken first to enable rail design and relocation/construction to commence earlier than the roading design and construction as the rail move is a precursor to road construction.

Research has found that the rail designation was confirmed by the Mount Maunganui Borough Council on or around the end of 1980. No evidence has been found of the Council recommendation (potentially similar to the Transit decision) in the Tauranga City Council or KiwiRail files. We have found the Special Town Planning Committee hearing minutes dated 28 November 1980 which included a recommendation as follows:

- a) *That the objections be not upheld and the requirements of the Minister pursuant to sections 122 and 118 of the Town and Country Planning Act 1977 as set out on the plans referred to as TP 8219/1 to 8219/4 be proceeded with*
- b) *That such details be incorporated in the Third review of the District planning Scheme*
- c) *That the Minister be strongly urged to have carried out the surveys required for the acquisition of the land required and to hasten the assessment of compensation procedures to the maximum degree possible.*
- d) *That the Minister be asked to complete the requirements under section 118 of the Act in respect of the land owned by Paxhaven Holdings Ltd.*

From this information we conclude that there was unlikely to be conditions attached to the Designation that would inform the design of the alignment. However the Third Review of the Mount Borough District Scheme did contain provisions. Section 3.4.3 (Page 41) refers to eventual removal of the railway to an alignment approximating the previously designated motorway/limited access road, to reduce the detrimental effects of the railway on the nearby residential zone areas to the east of Maunganui Road.

*“In conjunction with this railway reconstruction/realignment a raised embankment is to be introduced adjoining the railway line, on its north eastern boundary to assist in the reduction of noise from the railway line use. This embankment is to be screen planted“*

Scheme Statement 4.303 states “*On the south –eastern side of Matapihi Road and opposite the Omanu Golf Course an area has been zoned Residential A. Because of the nearness of the railway designation and industrial area in the north–east, it will be Council policy to require land set aside as reserve contribution upon subdivision, in this area, to be suitably located to act as a “buffer” between these elements (see Appendix I)*”. The Appendix 1 Structure Plan for Matapihi Residential shows a buffer reserve and Appendix J2 shows the detail of Designations 49 and 50 over Matapihi Road .Designations 49 over golf course and 50 over Matapihi Road

Similar provisions are found in the 4<sup>th</sup> Review of the District Scheme with the addition of the following words to section 3.6.3 of that Scheme.( old 3.4.3 ) ” *The work should be done in consultation with the railways Corporation”*

We have found a letter from S Colson of the MOWD to the writer (then at Harrison and Grierson) dated October 1983 which states:

*“The intention was that an embankment would be necessary where the railway was located closer to the residential uses north of Maunganui Road and where no protection was afforded buy industrial buildings. However, as far as I am aware, no such commitment was made in the Matapihi Road Area where no residential development existed at the time the requirement was made. I presume this is one of the reasons why Council has promoted a buffer reserve in this location “*

In the Tauranga District Plan of 1997 the policy statement 7.4.12 stated:

*This will reduce noise and vibration for nearby residential properties, and provide the opportunity for measures, such as a landscaped embankment, to be incorporated to assist in traffic noise mitigation. No timetable has been set for this week”*

The Operative Tauranga City Plan (The City Plan), made operative on the 9 September 2013, shows the rail Designation as RC3 for the *Term of Plan*.

### 1.1.1 Alteration to Designation

To the north – west of the re–alignment on the Omanu Golf Course there is a small triangle of land that is not in the ownership of NZTA or KiwiRail. This small portion of land (1000m<sup>2</sup>) is in the ownership of the Tauranga City Council. It is on the very edge of the golf course and its removal will not impede golfing.

Under Section 181 of the RMA an Alteration to Designation can be undertaken as a non–notified process provided that

*(3)A territorial authority may at any time alter a designation in its district plan or a requirement in its proposed district plan if—*

*(a) the alteration—*

- (i) involves no more than a minor change to the effects on the environment associated with the use or proposed use of land or any water concerned; or*
- (ii) involves only minor changes or adjustments to the boundaries of the designation or requirement; and*



- (b) written notice of the proposed alteration has been given to every owner or occupier of the land directly affected and those owners or occupiers agree with the alteration;*
- and*
- (c) both the territorial authority and the requiring authority agree with the alteration— and [sections 168 to 179](#) shall not apply to any such alteration.*

Through continued consultation this Alteration has been undertaken as a non-notified alteration (we have gained the written approval of the Tauranga City Council and the Omanu Golf Course as leasee to the alteration) This has included an assessment of environmental effects particularly information about the potential visual effects.

### 1.1.2 Outline Plan

Prior to construction of the rail line and Outline Plan of the works must be submitted to the Tauranga City Council. Under section 176 of the RMA the Requiring Authority (KiwiRail) is to submit an Outline Plan of the public work showing in particular the following

*(3) An outline plan must show—*

- (a) the height, shape, and bulk of the public work, project, or work; and*
- (b) the location on the site of the public work, project, or work; and*
- (c) the likely finished contour of the site; and*
- (d) the vehicular access, circulation, and the provision for parking; and*
- (e) the landscaping proposed; and*
- (f) any other matters to avoid, remedy, or mitigate any adverse effects on the environment.*

*(4) Within 20 working days after receiving the outline plan, the territorial authority may request the requiring authority to make changes to the outline plan.*

*(5) If the requiring authority decides not to make the changes requested under subsection (4), the territorial authority may, within 15 working days after being notified of the requiring authority's decision, appeal against the decision to the Environment Court.*

A key point to note is that the sub-clause (f) requires any other matters to avoid remedy or mitigate any adverse effect be detailed. In this project the noise and vibration effects or relocating the rail are a key adverse effect that would be required to be dealt with.

In addition the Act has a general duty as follows:

#### **Section 16: Duty to avoid unreasonable noise**

*(1) Every occupier of land (including any premises and any coastal marine area), and every person carrying out an activity in, on, or under a water body or the coastal marine area, shall adopt the best practicable option to ensure that the emission of noise from that land or water does not exceed a reasonable level.*

*(2) A national environmental standard, plan, or resource consent made or granted for the purposes of any of [sections 9, 12, 13, 14, 15, 15A, and 15B](#) may prescribe noise emission standards, and is not limited in its ability to do so by subsection (1).*

Therefore there is a duty to manage the adverse effects of noise under the RMA even though the Designation was confirmed years ago. This fact has a bearing on the assessment of the preferred option as well as the mitigation detail that will follow.

The Outline Plan process is non-notified and would be undertaken when the design drawings and mitigation measures are agreed and documented. With robust assessments of the adverse effects of the rail relocation and pre lodgement discussions it is likely that the Council will accept the Outline Plan.

### 1.2 Road Designation (NZTA 1, 4, 9 12 and NZTA 14)

#### 1.2.1 Alteration to Designation

Option 3A requires construction and operation of the road outside the current road reserve.

In this case an Alteration to Designation would be undertaken for the discrete areas of land acquisition required for the preferred option. The above quoted clauses from the Act would apply and given the extent of the impacts a notified process is expected. In addition, there will be restrictions to access on Maunganui Road and Girven Road and at the intersections of Concord and Exeter Streets.

It would be necessary to lodge with the documentation a letter that confirms Kiwi Rail's agreement to the use of the existing rail corridor for the purposes of highway under section 178 of the Act. The rail Designation can be removed by way of letter under section 182 of the Act when all consents are appeal free.

The usual notified process takes approximately 4-6 months to process through Council assuming no appeals to the Environment Court.

#### 1.2.2 Outline Plan

The above described Outline Plan process would apply to the Road Designation once the design is completed.

#### 1.2.3 Conclusion

The Road Designation will be a notified process.

Ongoing consultation detail is crucial for the risks associated with the following:

- AMP – stormwater mitigation and banning Girven Rd right turn exist from Carpark
- Owens Place a few northern rail leasees – loss of sustainable business sites and may raise traffic effects and noise effects
- Tangata whenua particularly effect on Nga Potiki's recently acquired business land in Truman Lane.

### 1.3 Transpower Lines – Resource Consents

There is a Transpower high voltage transmission line in the east near State Highway 29. To construct the rail line it will be necessary to move the line by way of resource consent and building consent (or alternatively change the corridor on the planning maps). We understand that Transpower are undertaking this work.

## 1.4 Resource Consents

Where land is designated on the City Plan for the public work, the Designation takes precedence over all Plan provisions. Therefore no resource consents will be required within the designated land area.

### 1.4.1 Earthworks

Consent for earthworks will be required given the proposed extent of works under Rule 1C of the Regional Water and Land Plan. Included in this will be a preliminary check of the potential for land contamination and the need for resource consents (this has been found not to be required).

### 1.4.2 Stormwater

We are aware that the Tauranga City Council is undertaking catchment modelling for the western residential catchment about the Bayfair Shopping Centre. This catchment requires upgrade to accommodate increased flows and mitigation measures for detention. This catchment is one of many in the city that are the subject of a comprehensive discharge consent from the Regional Council. We are also aware that the AMP Shopping centre site requires an upgrade to its stormwater discharge into the Council system. The consequence of this is that all three parties are working together to prepare a combined solution in the western catchment. Stormwater modelling is progressing now and it is anticipated that a mitigation solution for the western catchment will be available in the first quarter of 2015.

In addition, the existing discharge outlet to the west of the Baypark complex for stormwater from the eastern end of this project will be used by this project. We are assuming that the project discharge volumes will be able to comply with the existing consent conditions

Consultation was undertaken on this in 2014 and the earthworks consent particularly with the tangata whenua.

## 1.5 Timing/Staging of Consents

Given the availability of design information we consider that the following timetable is likely.

2014 last quarter	<b>Rail: Alteration to Designation (non-notified). Completed.</b>
	<b>Road – Alteration to Designation (notified)</b>
	<b>Regional consents and earthworks—could be non-notified or notified</b>
2015 first quarter	<b>Rail: Outline Plan</b>
	<b>Transpower poles: resource consent (non-notified)</b>
2015 last quarter	<b>Road: Outline Plan</b>

## 2 Heritage New Zealand Pouhere Taonga Act

In addition to any requirements under the RMA 1991, the Act protects all archaeological sites whether recorded or not, and they may not be damaged or destroyed unless an Authority to modify an archaeological site has been issued by the HNZPA Trust.

An archaeological site is defined as: 'any place in New Zealand that was associated with human activity that occurred before 1900, and is or may be able through investigation by archaeological methods to provide evidence relating to the history of New Zealand'.

An authority to modify, damage or destroy unrecorded archaeological features that may be encountered during earthworks associated with the proposed works will be required.

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## Appendix J – Property Strategy

The property purchase and disposal strategy is attached.

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B2B - OPTION 3A

Project Data				Government Valuation Data as at 1/07/2012				Project Property Costs						Property Information			Property Strategy							
Plan Ref	Address	Landowner	Total / Partial Acquisition	Total Land Area m <sup>2</sup>	Land Area Required m <sup>2</sup>	Severance to be Acquired m <sup>2</sup>	Total Land Area to be Acquired m <sup>2</sup>	Capital Value	Land Value	Value of Improvements	Zoning	Total Compensation Outlay (G) (A+D+E=G)	Land Purchase Costs (A)	Disposal Value (B)	Net Land Costs (C) (A-B=C)	Property Compensation Costs (D)	Landowner Accommodation Works (E)	Project Property Costs (F) (C+D+E=F)	Legal Description	Computer Freehold Register	Estate	Acquisition Strategy		
s 9(2)(a)			Partial	661	34			320,000	240,000	80,000	Suburban Residential	s 9(2)(a)							Lot 162	DPS 21746	SA20B/917	Fee Simple		
			Partial	660	14.5			320,000	240,000	80,000	Suburban Residential									Lot 163	DPS 21746	SA20B/918	Fee Simple	
			Total	475	475			302,000	176,000	126,000	Suburban Residential									Lot 2	DPS 85077	SA67C/53	Fee Simple	
			Total	417	417			Refer above			Suburban Residential									Lot 1	DPS 85077	SA67C/52	Fee Simple	
			Total	832	832			258,000	167,000	91,000	Suburban Residential									Lot 9	DPS 20324	SA30C/778	Fee Simple	
			Total	771	770			263,000	167,000	96,000	Suburban Residential									Lot 8	DPS 20324	SA30C/777	Fee Simple	
			Total	710	710			258,000	165,000	93,000	Suburban Residential									Lot 7	DPS 20324	SA27A/708	Fee Simple	
			Total	608	608			264,000	165,000	99,000	Suburban Residential									Lot 6	DPS 20324	SA30C/776	Fee Simple	
			Total	607	607			251,000	159,000	92,000	Suburban Residential									Lot 5	DPS 20324	SA30C/775	Fee Simple	
			Total	607	607			257,000	159,000	98,000	Suburban Residential									Lot 4	DPS 20324	SA30C/774	Fee Simple	
			Total	840	840			269,000	184,000	85,000	Suburban Residential									Lot 2	DPS 20925	SA19B/1436	Fee Simple	
			Total	837	837			263,000	184,000	79,000	Suburban Residential									Lot 1	DPS 20925	SA19B/1435	Fee Simple	
			Partial	0	0			275,000	124,000	151,000	Suburban Residential									Flat 1	DPS 60529	SA52B/880	Fee Simple	
			Partial	0	0			224,000	129,000	95,000	Suburban Residential									Flat 2	DPS 60529	SA52B/881	Fee Simple	
			Total	0	373			237,000	123,000	114,000	Suburban Residential									Flat 3	DPS 69778	SA56B/197	Fee Simple	
			Total	5583	268			1,585,000	585,000	1,000,000	Suburban Residential									Lot 1	DPS 29916	SA26D/1049	Fee Simple	
			Partial		12539						Reserve													
			Partial		30460						Industry													
			Partial		2379						Industry													
			Partial		6710						Industry													
			Partial		473						Reserve													
			Partial		200						Reserve													
			Partial		2380						Reserve													
		Partial		2394						Reserve														
												<b>9,718,957</b>	<b>9,549,157</b>	<b>0</b>	<b>9,549,157</b>	<b>169,800</b>	<b>0</b>	<b>9,718,957</b>						

NZTA Land Available for Disposal

New Kiwirail corridor	Matapihi Rd	NZTA (use in exchange with KiwiRail)	4812							Reserve				72,180									
New Kiwirail corridor	Matapihi Rd	NZTA (use in exchange with KiwiRail)	5737							Reserve/Industrial				358,610									
New Kiwirail corridor	Matapihi Rd	NZTA (use in exchange with KiwiRail)	13876							Industrial				1,984,268									
New Kiwirail corridor	Matapihi Rd	NZTA (use in exchange with KiwiRail)	8285							Reserve				124,275									
58, 59 & 66	Maunganui Rd	KiwiRail & NZTA (available for disposal post project as industrial)	21487							Industry				5,672,568									
67, 68A & 70A	SH29	NZTA (assumed vested in KiwiRail - no access)	28749							Industry				431,235									
68B, 69, 70B & 71	SH29	NZTA (assumed vested in KiwiRail - no access)	44228							Reserve				663,420									
72 & 73	SH 29	NZTA (available for disposal post project, assume reserve)	6754							Reserve				101,310									
74	SH 29	NZTA (available for disposal post project as industrial)	26433							Industry				6,978,312									
75	Matapihi Rd	NZTA (available for disposal post project, assume reserve)	148							Reserve				2,220									
																<b>\$ 13,849,065</b>							

- The land requirement areas have been supplied to us by Beca and are approximate only. Plan references 3933377-C-G007 Rev B, 3933377-C-G008 Rev E and 3933377-C-G009 Rev B
- Total Acquisition refers to properties likely to qualify for outright purchase pursuant to Sec 34 PWA 1981.
- Severance to be Acquired refers to the balance of land outside the land requirement and has been estimated by The Property Group.
- Total Compensation Outlay refers to the total compensation funding excluding revenue from disposals.
- Property Project Costs refer to NZTA's specific requirements for formatting of project property costs.
- Compensation estimates have been assessed on a desktop basis utilising an aerial plan supplied to us by Beca.
- Property Compensation Costs includes estimates for business relocation, injurious affection and landowner fees.
- Landowner accommodation works have not been identified at this stage of the project, therefore no allowance has been made in this report.
- Estimates are based on current zoning. The Property Group Limited reserves the right to reassess the estimates upon a change of zoning.
- The estimates are based on current sales evidence as at August 2013 including data supplied by Alastair Pratt, Registered Valuer Tauranga.
- Estimates are based on a margin of error of +/- 30%
- All values are exclusive of GST.

## Appendix K – Procurement Strategy

The project procurement strategy is attached.

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# Maunganui-Girven Road Intersection Improvements (MGI)

## Project Procurement Strategy

- Professional Services for Specimen Design & MSQA
- Enabling Works Phase
- Design & Construct Physical Works Phase

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# Document Control Record

Document Control						
<b>Report Title</b>		Maunganui-Girven Road Intersection Improvements (MGI) – Project Procurement Strategy				
<b>Document ID</b>		<b>Project Number</b>		09-024		
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Approval			
<b>Author Signature</b>		<b>Approver Signature</b>	
<b>Name</b>	Greig Stephen	<b>Name</b>	
<b>Title</b>	Project Manager	<b>Title</b>	

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## Appendices

### Appendix A

Preferred Option – Option 3a

### Appendix B

Draft Designation Strategy

### Appendix C

Delivery Model Selection Matrix

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## 1. Purpose

The purpose of this procurement strategy is to outline the strategy to be adopted for the procurement of the subsequent design and construction stages of the project. The key elements of the strategy are:

- Selection of the appropriate contract delivery model;
- Procurement of professional services
- Procurement of Physical works (including Enabling works where relevant)

## 2. Project Background

### Project Location

The project is located within the Tauranga Eastern Corridor, which includes the Tauranga Eastern Link (TEL) which is a Road of National Significance – RONS. The TEL is located immediately to the south and is due for completion by late 2015. The corridor is of key strategic importance to the delivery of freight to and from the Port of Tauranga.

The Maunganui Road and Girven Road Intersection (MGI) is located between the Hewletts Road Flyover and the TEL and is the key intersection for the Bayfair commercial centre, Bayfair suburban bus interchange, and bulk retail and industrial development on the Matapihi Peninsula.

The project also incorporates the SH2/SH29 intersection. Traffic modelling during the investigation phase confirmed that a solution at MGI was directly impacted by the efficiency of the SH2/SH29 intersection and as such this has been included in the project scope.

The ASB Baypark Arena and BayPark stadium are also key traffic generator's within the project location.



Figure Error! No text of specified style in document..1 Location Plan

## 2.1 Problem

There are a number of problems that exist along this corridor;-

- **Traffic Growth and TEL Opening** - the current volume of local traffic and the high volume of turning movements at the intersections restrict the flow of SH2 inter-regional traffic. Future growth as facilitated by the opening of TEL in 2015/2016 will exacerbate the current problems, compromising the ability for TEL to realise its full benefits.
- **Congestion** - delays at MGI are generally at their worst during the evening peak on the southbound approach on Maunganui Road, operating at a LOS of F with queues often extending to the Hewletts Road flyover, some 1.5km to the north of the intersection. The SH2/SH29 intersection at Te Maunga is currently operating at LOS C or better because MGI acts as a choke point and constrains flow onto the intersection. If the capacity constraint at MGI is removed the queues of over 400m are forecast to form on the SH29 approach to the SH2/SH29 intersection.

- 
- **Railway Level Crossings, Matapihi Road and SH29** – the railway level crossings at Matapihi Road and SH29 have a significant influence on the layout of the intersections and the efficient operation of the state highways and local roads. Forecast increases in train movements and durations of crossing closures will significantly exacerbate the current problems;– a train crossing SH29 results in delays and queues that are expected to require some 15 minutes to fully dissipate or longer if a second train crosses prior to the queues clearing. The queues generated are likely to impact on the performance of SH2 unless significant lengths of queuing space is provided, in the order of 300 to 400m.
  - **Interaction between MGI and Te Maunga intersections** – the MGI and SH2/SH29 intersections are located within approximately 800m of each other. It is currently possible to make lane changes between the intersections. Changes to the form of the intersections reduce the length of road available between intersections to make lane changes. This makes the weaving movement potentially unsafe and reduces efficiency. Therefore improvements need to consider both intersections collectively.
  - **Ability to Provide Low Cost Interim Improvements** – the existing problems at the MGI intersection, combined with the high forecast traffic growth and interaction with the SH2/SH29 intersection prevent the ability to provide low cost interim improvements to adequately improve the performance of the intersections.

## 2.2 Preferred Option

The Preferred Option is Option 3a, which incorporates a two-lane flyover of MGI, with a signalised intersection below. At SH2/29 an elevated diamond interchange, placing SH29 traffic over four lanes of straight-through traffic along SH2. In order to facilitate the additional road widening, the adjacent ECMT railway line is to be relocated into the alternative corridor behind Owens Place (refer to Figure 2.2).



Figure Error! No text of specified style in document..2 Preferred Option 3a

## 2.3 Designation Strategy

The designation strategy will be progressed as two separate processes;–

- Rail Designation – An existing rail designation exists between the Owens Place business area and the Matapihi residential area. This corridor was designated for rail purposes in the early 1980's and is currently owned by the Crown. A small triangle of land on the Omanu Golf Course is required to allow for the rail relocation, which is currently owned by Tauranga City Council and will need to be progressed through the Alteration to Designation process. Relocation of the railway will need to be approved under the Outline Plan process.
- Road Designation – construction and operation of the Preferred Option will require land outside of the current road reserve. An Alteration to Designation would be undertaken for the discrete areas of land acquisition required, and given the extent of impacts, a notified process is expected. The Outline Plan process would then apply to the Road Designation once the design is completed.

The railway relocation will need to be completed and fully operational prior to decommissioning of the existing railway line and commencement of physical works on the state highway. To facilitate this process, the rail Outline Plan application will be staged first before lodging the Alteration to Designation application for roading improvements.

## 2.4 Resource Consenting

It is important to progress the project quickly to align with the completion of the TEL project. Therefore the consenting strategy is to complete resource consents in parallel with the designation process to achieve concurrent activity. This has been identified as an opportunity to drive efficiencies and accelerate project development by incorporating the designation and resource consenting process into a single stage of hearings.

## 2.5 Property

The proposed road designation can be seen on the attached drawing (refer to Appendix A) and will have a direct impact on 23 properties.

Type	Required	No Properties affected
Crown Land		2
Residential	Frontage only	3
Residential	Full property (loss access)	11 <sup>1</sup>
Reserve Land (TCC)		2
Kiwirail Land		5
<b>Total</b>		<b>23</b>

## 2.6 Project Cost estimate

The Preferred Option construction estimate is \$102M. This is made up of the following elements:

### Property

	Base	Expected
• Property acquisition costs	\$10.8M	\$12.4M
• Property disposal value	-\$8.2M	-\$9.5M
• TOTAL PROPERTY (NET)	\$2.5M	\$2.9M

### Design

<sup>1</sup> Housing NZ own 10 of these properties



	Base	Expected
• Consultancy Fees	\$1.7M	\$1.9M
• Unsuccessful tenderer contribution	\$1.5M	\$1.7M
• NZTA Managed costs	\$800k	\$920k
• KiwiRail design costs	\$350k	\$400k
• TOTAL DESIGN	\$4.4M	\$5.0M

#### MSQA

	Base	Expected
• MSQA fees	\$3.5M	\$4.1M
• NZTA managed costs	\$650k	\$750k
• Consent monitoring fees	\$300k	\$345k
• Railway civil works consultancy fees	\$100k	\$115k
• TOTAL MSQA	\$4.6M	\$5.3M

#### Physical Works

	Base	Expected
• Railway Relocation works	\$7.7M	\$8.8M
• State Highway phase	\$69.5M	\$80.0M
• TOTAL PHYSICAL WORKS	\$77.2M	\$88.8M

**TOTAL BASE ESTIMATE \$88.6M**

**TOTAL EXPECTED ESTIMATE \$102.0M**

**TOTAL 95<sup>TH</sup> PERCENTILE ESTIMATE \$115.7M**

## 2.7 Risks

A risk workshop was held on 11<sup>th</sup> December 2013 for the Preferred Option, Option 3a, which identified 46 threats. The threats have been prioritised as outlined in the table below.

Level	Threats Identified
Extreme	4
High	14

Level	Threats Identified
Moderate	25
Low	3
<b>Total</b>	<b>46</b>

Treatment strategies have been developed for the extreme and high threats, which identify actions, responsibility and timeframe for managing the risks. These actions will be monitored through continuing phases of the project.

The risks identified as extreme threats are identified in the table below with a summary of the associated mitigation plans.

Risk Description	Treatment Strategy	Owner	Timeframe
<p>Description: There is a threat that NZTA reputation compromised because the construction works do not start before the completion of the TEL</p> <p>Cause: The cause of the threat is delays to progression of design and procurement/ enabling works mean late construction start.</p> <p>Consequence: The consequence is bad PR.</p>	Raise profile within NZTA and get project ready to go with VAC approvals.	NZTA Project Manager	Ongoing, through scheme approval & programming stage.
<p>Description: There is a threat that Tangata Whenua object to the NZTA project designation and resource consents.</p> <p>Cause: The cause of the threat is they do not feel as though they have been involved.</p> <p>Consequence: The consequence of the threat is time delay in RMA.</p>	Ongoing consultation with Hapu and aim to gather acceptance from them. Develop protocol to manage relationship.	Project Planning Team	Ongoing through next round of consultation.
<p>Description: There is a threat that AMP opposes elements of the project through RMA.</p> <p>Cause: The cause of the threat is conflict with AMP development.</p> <p>Consequence: The consequence of the threat is delay to RMA.</p>	Ongoing consultation with AMP during design process. Develop MOU (March 2014).	Project Planning Team	Ongoing through next round of consultation.

Risk Description	Treatment Strategy	Owner	Timeframe
<p>Description: There is a threat that stakeholders object to the proposed design solution for the link road from Truman Lane to the Mangatawa Interchange.</p> <p>Cause: The cause of the threat is incomplete network provided by TEL project/TCC/MPBI interaction.</p> <p>Consequence: The consequence of the threat is TEL cannot provide link or delays the connection between Truman Lane and Mangatawa which then creates uncertainty for the consenting of Option 3a.</p>	<p>Raise risk profile within NZTA/TCC.</p> <p>GS to monitor TCC progress.</p>	NZTA Project Manager	Ongoing.

## 2.8 Funding requirements

The following funding plan required to progress the project and tender phases accordingly:

	Design	MSQA	Property	Enabling Works Design	Enabling Works	Main D&C Construction	NZTA managed costs	Annual cost total
2014/15	\$1.9M	\$350k		\$400k	\$1.5M		\$500k	\$4.7M
2015/16	\$1.7M	\$1.5M	\$2.9M		\$6.0M		\$420k	\$11.0M
2016/17		\$600k	\$2.9M		\$1.4M	\$15.0M	\$270k	\$20.2M
2017/18		\$1.5M	\$6.6M			\$35.0M	\$400k	\$43.5M
2018/19		\$1.0M				\$25.0M	\$350k	\$26.4M
2019/20		\$350k	-\$3.0M			\$5.0M	\$250k	\$2.6M
2020/21			-\$6.5M					-\$6.5M

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## 3. Project Delivery

### 3.1 Project Delivery Model

The recommended delivery model for this project is to be conducted primarily under a Design and Construct (D&C) approach. It is also recommended that the design services are procured as PQM simple including provision of MSQA services, and enabling works packages in accordance with the specialist nature of those works.

The key factors influencing the decision to utilise any delivery model are:

- a) The project has a number of complexities beyond the scope of a Traditional approach.
- b) NZTA are keen to source an innovative value for money approach.
- c) Alternative solutions are possible but the amount of flexibility permitted needs to be clearly determined in the RFT.
- d) Programme constraints and deliverability need to be considered.
- e) Market conditions for D&C contractors for this size project remain very strong in the region.
- f) Complex stakeholder management and consultation required
- g) Challenging construction sequencing and site management required

### 3.2 Delivery model considerations

On balance it is considered that the D&C approach will deliver the best value for money for this project. Attached in Appendix D is the delivery model selection matrix which confirms the D&C delivery model as the most suitable and recommended delivery model for the MGI project.

Early Contractor Involvement (ECI) requires early feedback from participating Contractor's to determine the extent of their involvement. Although early shortlisting of potential Contractor's would be beneficial, ECI is not considered a cost competitive option for this project.

Competitive or Project Alliance the scale of the project is sufficient for consideration as an alliance in order to share risk and drive innovation from all parties. However, the moderate complexity of the project, along with the relative low value (for Alliances) of \$102M, are less than desirable for this type of model. Given the procurement process and subsequent project involvement requires substantial NZTA resources, this delivery method is not considered appropriate.

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Traditional M&V or Lump Sum the scope of the project is considered beyond the desirable top end value for a measure and value engagement. The traditional approach is also not considered appropriate to deliver innovation or the optimal solution to deliver the physical works.

All values proposed for price and quality weightings and specific non-price attributes in the following chapters are indicative only at this stage and will be confirmed once contract estimates are confirmed.

## 4. Procurement – Specimen design and MSQA

### 4.1 Specimen design and MSQA – scope of work

The scope for this phase will mainly be focused on delivering a completed set of Principals Requirements, with the provision to extend to include full MSQA services. This package of works will be tendered to the open market, and services will include;

- development of a specimen design and project documentation (principals requirements) but excluding any interactive tendering.
- identification of enabling works critical to meet the project timeline of the construction phase.
- management of the enabling works phase of the contract, including full design works associated with these packages
- providing quality assurance services (MSQA Role) over the D&C contractor.

For expediency to progress the project it is proposed that resource consents will be prepared and lodged as part of the investigation phase.

### 4.2 Specimen design and MSQA – procurement approach

It is proposed to procure a supplier to undertake the specimen design, and continue through and act as the principal's agent and provide quality assurance during the D&C physical works. This approach has the benefit of;

- reduction of duplicated effort,
- reduction in procurement costs and time
- retention of project information and establishment, and
- continuity of key relationships throughout the life of the project.

It has been demonstrated this approach provides good value for money in MSQA rates at the time of procurement of the design phase.

This contract will be procured using a Price Quality Method (Simple) approach to supplier selection. A quality / price weighting of **80% / 20%** is proposed for this contract.

The tender will be structured with the competitive pricing elements including technical design and engineering services and include for preparation of all material necessary for public consultation and communication. Provisional sum elements will include the production of detailed design material for the enabling works and the associated MSQA role through to construction of all enabling works items, and the main construction package.

#### 4.3 Specimen design MSQA – TET

TET		TET Role
Greig Stephen	NZTA Project Manager (CPP Qual)	TET Leader
John McCarthy	NZTA Senior Project Manager (complex)	
§ 9(2)(a)	independent Consultant	Rail advisor

#### 4.4 Specimen design MSQA – Evaluation Criteria

Supplier Selection Method	Weightings	Non- Price Attributes	%
PQM (Simple)	PRICE (20%)		20
	QUALITY (80%)	Relevant Experience	15
		Relevant Skills	35
		Methodology	30
			100

#### 4.5 Specimen design Tender estimate

On the basis of the above the likely expected cost of the primary consultant fees for design and MSQA activities is estimated at \$6.0M.

The estimated design costs are \$1.9M, compared to the MSQA estimate at \$4.1M. To mitigate this, the tender documents will be structured advising suppliers that the Principal Advisors role and MSQA services to the main D&C phase will be confirmed at the NZTA's

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discretion based upon the performance of the successful supplier through Specimen Design and enabling works delivery.

- Preferred supplier interview
- Acknowledgment to unsuccessful suppliers
- Appointment of professional services supplier for Specimen Design and associated deliverables.

## 5. Procurement – Enabling Works

### 5.1 Enabling Works – Scope

The Investigation Phase has identified the areas where preparatory enabling works can be completed / or are required before the main contract works can commence.

Construction of the realigned railway is critical to enable the transfer of rail movements off the existing alignment and allow the contractors to then prepare the existing rail alignment land for the widening of the main SH2 road lanes.

The exact work detail will be further developed under the specimen design phase but it is currently well understood that the following items will require preparation in advance of a main contract;

- Relocation of the East Coast Main Trunk railway line.
- Relocation of Transpower's electricity supply pylons

- **Relocation of the East Coast Main Trunk railway line**

To provide sufficient space and commence the main construction programme, the relocated railway line will need to be commissioned and fully operational in the alternative corridor prior to demolition of the existing ECMT railway line which runs adjacent to SH2. This railway's new alignment will also require the relocation of three electricity supply pylons and associated cabling.

- **Relocation of 3 Transpower's electricity supply pylons, and associated cabling**

Whilst the design of the relocation of the electricity supply pylons is yet to be developed, it is recognised that this can be done in conjunction with the specimen design, albeit to a full design standard. This works package will be procured either through separately tendered Measure and Value contracts or utilising Transpower's preferred suppliers.

The project has engaged with KiwiRail to understand the requirements and contractual options for delivery of new track construction.

The recommendation for the design and construction of the enabling works railway relocation package, consists of three elements;-

Physical Works	Sub Package	Delivery Model	Supplier	Principal
<b>Enabling Works - Rail relocation</b>	Earthworks	Traditional	General Contractor	NZTA
	Track Alignment	Design and Construct	Specialist Contractor	KiwiRail
	Signals	Design and Installation	Specialist Contractor (Australian Supplier)	KiwiRail
<b>Enabling Works - Transpower Relocation</b>	Power relocation Design & Construct	Design & Construct	Transpower approved supplier	NZTA
<b>Main Contract</b>		Design and Construct	D&C Contractor	NZTA

## 5.2 Enabling Works – Relocation of the East Coast Main Trunk railway line

- **Earthworks – design and construction**

In order to progress resource consents in parallel with the designation process (refer to item 2.3), it is anticipated that the earthworks design package will be undertaken as part of the I&R phase, through engagement with the current professional services consultant.

It is expected that physical works for the embankment construction up to rail formation level would be undertaken as an enabling works contract, managed by NZ Transport Agency, in advance of the main MGI project.

- **Track alignment – design and construction**

As per the earthworks, it is anticipated that the track alignment design packages will also be undertaken as part of the I&R phase.

Track construction will include placing of the ballast, sleepers and tracks. This would be undertaken by KiwiRail staff or contractors working directly for KiwiRail. The works and materials would be procured and managed by KiwiRail. This would be subject to approval



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from the NZ Transport Agency that best practice processes are followed to ensure tendering is undertaken in competitive market conditions.

- **Signals – design and installation**

Rail signals design will require input from a specialist signal designer. KiwiRail has advised that there may not be sufficient resources available within New Zealand for the foreseeable future and that an Australian designer may have to be commissioned to undertake the signal design.

Given the specialist nature of rail signals, it is expected that the procurement both of design and installation services be managed by KiwiRail. This would be subject to approval from the NZ Transport Agency that best practice processes are followed to ensure tendering is undertaken in competitive market conditions.

### **5.3 Enabling Works – Relocation of Transpower Power Lines**

At this stage a full detailed design is yet to be completed, but it is anticipated that three power poles will need to be relocated to facilitate the new rail alignment.

Traditionally the procurement both of design and construction of power lines is managed by Transpower as the principal, due to the specialist nature of the works. However, the draft programme received from Transpower to carry out the works was estimated to take up to 28 months, including 6 months for investigations and detailed design. This is due to a lack of available resourcing within Transpower to deliver the works.

We are investigating the feasibility of engaging LineTech, a Transpower-approved third party, to carry out the design works. This approach has been successfully adopted on the adjacent Hairini Link underpass project.

## **6 Procurement – Main Works**

### **6.1 Main Works – Scope**

The main works will consist of;– a flyover structure at MGI, an overbridge spanning state highway 2 and the ECMT railway, retaining structures for the SH29 off and on-ramps, road widening, pavement and surfacing works, stormwater drainage and attenuation ponds, traffic signalisation works, and utility relocations.

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The construction methodology, programme and sequencing of events for the main works will be confirmed by the physical works contractor, however at this stage the anticipated construction staging is as follows;-

- **Stage 1** – construction of the earthworks embankments at SH2/29 intersection and areas of offline pavement, including the new SH29 roundabout.
- **Stage 2** – construction of bridge structures and MSE embankment structures.
- **Stage 3** – SH2/29 northbound off-ramp & Truman Lane connection, including rehabilitation of the existing SH29 pavement.
- **Stage 4** – rehabilitation of the existing SH2 pavement.

## 6.2 Main Works – Procurement approach

In accordance with the project delivery model the main works will be procured as a D&C contract.

Given the current market interest is high for projects of this type and scale it is expected there will be significant interest that warrants a shortlisting phase in the procurement approach.

It is recommended that the main works is procured as a “**Price Quality Method Special (PQM Special)**”. Using a two stage process to identify a maximum of 3 D&C teams to progress to an interactive RFT stage.

Stage 1 – Shortlisting Phase (Statement of Interest and Ability)

Stage 2 – Interactive Design Phase (Request for Tender)

### Stage 1 : Statement of Interest and Ability (SIA)

3 attributes will be evaluated during the SIA process. Only scores for relevant skills will be carried forward into the RFT process to ensure teams retain skilled team members presented at the SIA stage.

The three highest overall scoring Applicants will be short-listed as tenderers unless the fourth highest scoring Applicant is within one mark of the third highest scoring Applicant, in which case the four highest scoring Applicants will be short-listed as tenderers.

### Stage 2 : Interactive Tender Process (RFT)

The RFT process will not commence until land purchase is secured and the resource consents have been granted.

The Tender Documents for the contract works will be based on NZTA's Design and Construct (D&C) pro-forma, with an interactive tender period of approx. 15 weeks.

The design and construct procurement model will be reviewed following a hold point after completion of the specimen design phase. Whilst a design construct option has been identified as the most appropriate method of delivering this project, progression through the specimen design phase will better identify the risk profile.

### 6.3 Main Works – TET

TET		TET Role
Greig Stephen	NZTA Project Manager (CPP Qual)	TET Leader
John McCarthy	NZTA Senior Project Manager (complex)	
TBC	NZTA National Procurement Representative	
TBC	Specimen Design Consultant	

#### Specialist Advisor

s 9(2)(a)	Vitruvius Consulting	Rail advisor
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### 6.4 Main Works – Evaluation Criteria

PQM (Special)		Contractor	Designer
<b>Phase 1 – Shortlisting</b>			
Statement Interest and Ability			
	Relevant Experience	20%	15%
	Track Record	10%	5%
	Relevant Skills	30%	20%
		<b>60%</b>	<b>40%</b>
<b>Phase 2 – Interactive Design</b>			
Interactive RFT			

PQM (Special)		Contractor	Designer
	Relevant Skills	25%	15%
	Methodology	60%	Refer Note <sup>2</sup>
		<b>85%</b>	<b>15%</b>

#### Price Quality Method – Special (PQM Special)

For transparency purposes, the Risk Parameters and the associated Supplier Quality Premium (SQP) for a 10% non-price attribute range that will be used in the tender evaluation are given below:

Risk Parameters	SQP for a 10% non-price attribute range
Contract Management	TBC
Earthworks	TBC
Structures	TBC
Traffic Management	TBC
Drainage	TBC
Risk Management	TBC
Environmental	TBC
Total	TBC

#### Tangible Cost Adjustments

Specific prescribed 'Tangible Costs' will be calculated in relation to individual Tenderer's submission(s) and added to or subtracted from the Tender Price.

Item	Description	Adjustment Formula	Adjustment Value
1	Quality of Product	Net Present Value Methodology will be used to evaluate the whole of life costs, benefits and risks with respect to the quality of the product offered by one tender, relative to that of other tenders.	TBC

<sup>2</sup> The Contractor's Methodology Statement is to address the proposed methodology to be adopted by the Designer(s) for the Contractor's Design

## 7. Procurement Indicative Programme

### 7.1 Contract – Specimen Design & MSQA

Activity	Duration	Proposed start date
Tender Document Preparation	2 Mths	May 2014
Advertisement	1 Mth	August 2014
Shortlisting (if reqd)	3 mths	August 2014
Tender process	6 mths	November 2014
Contract Award		May 2015

### 7.2 Contract – Enabling Works

Activity	Procurement	Proposed start date
Transpower Pole Relocation	Led by Transpower	March 2015
Rail Relocation – Civil Works	Led by NZTA	May 2015
Rail Relocation – Track Construction / Signals installation	Led by KiwiRail	September 2015

### 7.3 Contract – Main Works

Activity	Duration	Proposed start date
Tender Document Preparation	3 Mths	August 2015
Advertisement	1 Mth	November 2015
Shortlisting (if reqd)	3 mths	November 2015
Interactive Tender process	6 mths	February 2016
Contract Award		August 2016

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# Appendices

Released under the Official Information Act 1982



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