



Volume 1: Ōtaki to North Levin

Detailed Business Case

East of Levin

Multi-Criteria Analysis (MCA)

Report

PREPARED FOR: WAKA KOTAHITI | January 2023





# Revision Schedule

Rev No	Date	Description	Signature of Typed Name (documentation on file)			
			Prepared by	Checked by	Reviewed by	Approved by
1	15 November 2021	Version 1	Selwyn Blackmore	Phil Peet	Selwyn Blackmore	Phil Peet
2	20 December 2021	Version 2	Selwyn Blackmore	Phil Peet	Selwyn Blackmore	Phil Peet
3	15 August 2022	Version 3 (inclusion of East of Levin Recheck Process)	Selwyn Blackmore	Phil Peet	Selwyn Blackmore	Phil Peet
4	21/10/22	WAKA KOTAHI DECISION UPDATE	Selwyn Blackmore	Greg Lee	Selwyn Blackmore	Phil Peet
5	20/1/23	Waka Kotahi insertion of Section 8: investigations of options following MCA completion	Section 8: Greg Lee	Section 8: Rob Napier		Section 8: Lonnie Dalzell

# Quality Statement

This document has been prepared for the benefit of Waka Kotahi. No liability is accepted by this company or any employee or sub-consultant of this company with respect to its use by any other person.

This disclaimer shall apply notwithstanding that the report may be made available to Waka Kotahi and other persons for an application for permission or approval to fulfil a legal requirement.

PROJECT MANAGER	PROJECT TECHNICAL LEAD
Jon England	Phil Peet
<b>PREPARED BY</b> Selwyn Blackmore	 28 / 10 / 2022
<b>CHECKED BY</b> Phil Peet	 28 / 10 / 2022
<b>REVIEWED BY</b> Phil Peet	 28 / 10 / 2022
<b>APPROVED FOR ISSUE BY</b> Jon England	 28 / 10 / 2022

Level 15, 10 Brandon Street, Wellington, Wellington 6011  
PO Box 13-052, Armagh, Christchurch 8141  
TEL +64 04 381 6700

STATUS: FINAL | Project No 310203848

# Executive Summary

As part of the NZ Upgrade Programme, Waka Kotahi NZ Transport Agency (Waka Kotahi) has been investigating the potential for a new highway alignment to address the safety, resilience and efficiency issues negatively impacting on State Highway 1. To this end, Waka Kotahi has been preparing a Detailed Business Case (DBC) to identify the new highway alignment, interchanges, and local road connections – this business case is referred to as the Ōtaki to North Levin (Ō2NL) DBC.

In September 2021, and as part of the Ō2NL DBC process, Waka Kotahi identified a need to undertake a detailed multi-criteria analysis (MCA) for the design options for the Queen Street and Tararua Road intersections. It also identified that an MCA was required to help guide decision making on the height of the new Ō2NL highway between these two intersections. Accordingly, this report identifies the technically strongest performing intersection design options for both Queen Street and Tararua Road intersections as well as the best performing design option for the height of the new Ō2NL highway.

This report also includes a summary of investigations and decision making by Waka Kotahi that occurred following the MCA processes to select preferred options as reported on in the Ō2NL DBC.

## ***Queen Street intersection options evaluated***

After completing a long listing process, nine intersection options were identified for detailed evaluation through the MCA process. The options short listed are as follows:

Options	Description
<b>Q0</b>	New highway fully below grade (DBC)
<b>Q1</b>	New highway partially below grade
<b>Q2</b>	Local road partially below grade
<b>Q3</b>	At-grade: Roundabout
<b>Q4</b>	At-grade: Close Queen, upgrade Liverpool
<b>Q5</b>	At-grade: Queen diverted north
<b>Q6</b>	New highway over top
<b>Q7</b>	Local road over top
<b>Q8</b>	At-grade: 5-arm, shift SH57 connection South*

## ***Tararua Road intersection options evaluated***

After completing a long listing process, six intersection options were identified for detailed evaluation through the MCA process. The options short listed are as follows:

Options	Description
<b>T0</b>	New highway fully below grade (DBC)
<b>T1</b>	New highway partially below grade
<b>T2</b>	Local road partially below grade
<b>T3</b>	At-grade: Roundabout
<b>T6</b>	New highway over top

<b>T7</b>	Local road over top
-----------	---------------------

### **Midblock options**

Two midblock options were identified for a MCA evaluation, these been Option 1 (i.e. the new Ō2NL highway at ground level) and Option 2 (i.e. the new Ō2NL highway nominally three to four meters below ground level).

### **MCA processes**

To be consistent with the previous MCA processes undertaken for the new highway alignment, interchanges and local roads, the same assessment criteria used in the Ō2NL MCA Summary Report 2021 was selected.<sup>1</sup> Similarly, and where possible, the same MCA assessors who had undertaken the previous MCA DBC assessments were utilised to ensure consistency.

Following the MCA assessors' selection, and Waka Kotahi issuing its instructions for the MCA, each MCA assessor undertook their evaluation of the options. The initial outcomes of each evaluation were presented at an MCA workshop held on Wednesday 13 October 2021.

### **MCA outcomes**

The Queen Street and Tararua Road intersection options were compared against the current situation and evaluated through unweighted and weighting scenario assessment processes. The unweighted scoring process enable raw scores to be identified for each assessment criteria<sup>2</sup>. The weighting assessment process was undertaken to test the various sensitivities of the unweighted scores to matters considered, under various weightings, to be more important. The same weighting scenarios as tested in the Ō2NL MCA Summary Report 2021 were "reused" for this MCA to ensure consistency, and were as follows:

- Workshop weighting scenario
- RMA Section 6 matters scenario, and
- Four scenarios of social, economic, cultural and environment were separately assessed (referred to as quadruple bottom line scenarios).

For the Queen Street intersection options, Options Q5, Q6 and Q4 / Q7 were identified as the three best performing options. However, it is noted Option Q5 was the technically strongest performing option under both the unweighted and weighting scenario assessment processes.

For the Tararua Road intersection option, Options T7, T6 and T3 were identified as the best performing options. It is noted Option T7 was the technically strongest performing option under both the unweighted and weighting scenario assessment processes.

For the midblock section between Tararua Road and Queen Street, Option 1 was the technically strongest performing option under both the unweighted and weighting scenario assessment processes.

### **Queen Street Intersection Re-check in 2022**

Following completion of the 2021 East of Levin MCA processes, Waka Kotahi undertook additional engagement with Horowhenua District Council (HDC) and the Muaūpoko Tribal Authority on the above short-listed options in early 2022. It also undertook additional design refinements to Q5 and Q7.<sup>3</sup> As a consequence of these processes, and in particular the design changes to Q5 and Q7, Waka Kotahi

<sup>1</sup> It is noted that the only assessment criteria not "reused" from the previous MCA process was the Kāpiti Coast District Development criteria. This assessment criteria was not required as the East of Levin locality is located in the Kāpiti district

<sup>2</sup> For avoidance of doubt, the unweighted (raw) scores were equally weighted

<sup>3</sup> The key design changes to Q5 and Q7 are as follows (for avoidance of doubt there were no design changes to Q6 and Q4):

- Q5 – updated horizontal and vertical geometric design that seeks to better relate to property boundary lines and existing and possible future road network layout (including the Tara-Ika Masterplan). Additional work was also undertaken on the pedestrian and cycle bridge on the existing Queen Street alignment
- Q7 – minor changes to the alignment and the location of the bridge crossing, which is offset northwards from the existing Queen Street alignment

asked the MCA assessors to re-check their original evaluations / scores for each short-listed Queen Street intersection option and to update these if deemed appropriate.

Following the re-check process the Landscape / Visual / Urban Design, Archaeology, and Horowhenua District Development MCA assessors updated their original unweighted scores. However, overall, there was no material change in the unweighted or weighting scenario option rankings, and therefore there was no change to the original recommendations for the short listed intersection options for Queen Street. That is, Option Q5 was still the technically strongest performing option under both MCA assessment processes (followed by Option Q6).

### **Recommendations**

For the Queen Street intersection option (including taking into account the outcomes of the re-check process), it is recommended Options Q5, Q6, Q4 and Q7 be taken forward for further consideration by Waka Kotahi as they were considered to be the best performing options under both the unweighted and weighted assessment processes. Despite recommending four options be taken forward for further consideration, it is noted Option Q5 was the technically strongest performing option under both assessment processes.

For the Tararua Road intersection option, it is recommended Option T7, T6 and T3 be taken forward for further consideration by Waka Kotahi as they were considered to be the best performing options under both the unweighted and weighted assessment processes. Despite recommending three options be taken forward for further consideration, it is noted Option T7 was the technically strongest performing option under both assessment processes.

For the midblock section between Tararua Road and Queen Street, it is recommended Option 1 be taken forward for further consideration by Waka Kotahi as it was the technically strongest performing option under both the unweighted and weighting scenario assessment processes.

It is important to note that the outcomes of this MCA process are not the only factors that Waka Kotahi will consider when making decisions on the preferred intersection and midblock options. It will also need to consider a range of other matters including cost, value for money, funding availability, risk and opportunities, how these elements fit together and within the wider project, and the desired outcomes of Iwi and key stakeholders.

### ***Ō2NL DBC investigation of options and decision making by Waka Kotahi***

For the Queen Street intersection option, and although finely balanced and after undertaking further option evaluation analysis (including partner, public and stakeholder engagement), Waka Kotahi ultimately considered that Option Q7 would be the best fit for the transport network, and with HDC's growth plans overall. It was also considered that Option Q7 provided opportunities to be designed with positive legacy outcomes (by celebrating Wai Mārie in particular) and could also be design in a way that protected views along Queen Street East between Punahau / Lake Horowhenua and the Tararua Range. Accordingly, Option Q7 was incorporated into the Ō2NL DBC.

For the Tararua Road intersection option, Waka Kotahi's post MCA workshop decision making processes ultimately endorsed Option T7 as the best overall performing option. In particular, this option performed relatively well against the project objectives, was likely to have the smallest scale of productive land losses, better landscape / visual and noise outcomes when compared to Options T3 and T6. It was also considered to be cost efficient due to reduced drainage requirements. Accordingly, Option T7 was incorporated into the Ō2NL DBC.

For the two midblock options, Waka Kotahi's post MCA workshop decision making processes ultimately endorsed Option 1 as the best overall performing option. This decision was made on the basis of its superior MCA unweighted scores, and weighting scenario scores (except for the economic weighting scenario) when compared to Option 2. Accordingly, Option 1 was incorporated into the Ō2NL DBC.

The recommendations from this report were adopted into the Ō2NL DBC for further investigation as part of an iterative design refinement process. The iterative design refinement process has led to some minor design refinements as more information has become available including feedback from stakeholders and landowners.

# Contents

<b>Executive Summary .....</b>	<b>iii</b>
<b>1. Introduction .....</b>	<b>4</b>
<b>2. Core Principles.....</b>	<b>5</b>
<b>3. Purpose.....</b>	<b>6</b>
<b>4. East of Levin Intersection Options to be Assessed.....</b>	<b>7</b>
4.1.1. Queen Street Intersection Options .....	8
4.1.2. Tararua Road Intersection Options.....	14
4.1.3. Midblock Options .....	18
<b>5. MCA Methodology .....</b>	<b>20</b>
5.1. MCA Assessment Criteria and MCA Assessors	20
5.2. Preparing for the MCA Evaluations	23
<b>6. Evaluating the Options.....</b>	<b>25</b>
6.1. MCA Assessor Scores	25
6.1.1. MCA Assessor Evaluation Summaries .....	29
6.1.1.1. Fit with Project Objectives .....	29
6.1.1.2. Iwi Cultural Values (Muaūpoko).....	33
6.1.1.3. Terrestrial Ecology .....	34
6.1.1.4. Freshwater / Wetlands Ecology .....	35
6.1.1.5. Landscape / Visual / Urban Design .....	36
6.1.1.6. Heritage .....	39
6.1.1.7. Archaeology .....	39
6.1.1.8. Noise / Vibration.....	40
6.1.1.9. Productive Land Values .....	41
6.1.1.10. Social / Community / Recreation .....	42
6.1.1.11. Horowhenua District Development .....	44
6.1.1.12. Fit with Local Road System .....	45
6.1.1.13. Engineering Degree of Difficulty .....	47
6.1.1.14. Property Degree of Difficulty .....	48
6.1.2. Unweighted Evaluations / Scores Summary .....	49
6.2. MCA Weighting Scenario Assessments	50
6.2.1. Queen Street and Tararua Road Intersection Options Weighting Scenarios.....	50
6.2.1.1. Intersection Weighted Scenario Scores and Rankings .....	52
6.2.2. Summary of Intersection Option Weighting Scenario Outcomes .....	55
6.2.2.1. Queen Street Intersection Options .....	55
6.2.2.2. Tararua Road Intersection Options.....	55



6.2.3.	Midblock Options Weighting Scenarios .....	56
<b>6.2.3.1.</b>	<b>Midblock Weighted Scenario Scores and Rankings .....</b>	<b>58</b>
6.2.4.	Summary of Midblock Option Weighting Scenario Outcomes.....	59
6.3.	Summary of MCA Outcomes and Recommendations for the Intersection and Midblock Options	60
6.3.1.	Summary of Queen Street Intersection Option Unweighted Evaluations / Scores .....	60
<b>6.3.1.1.</b>	<b>Fit with Project Objectives .....</b>	<b>60</b>
6.3.1.2.	Environmental and Social Impacts .....	60
6.3.1.3.	Implementability Impacts .....	61
6.3.1.4.	Summary of Queen Street Unweighted Assessments .....	61
6.3.2.	Summary of Queen Street Intersection Option Weighted Scenario Assessment .....	61
6.3.3.	Recommended Queen Street Intersection Option.....	62
6.3.4.	Queen Street Intersection Short Listed Option Re-check 2022 .....	62
6.3.4.1.	Summary of the Outcomes of the Re-check Process.....	62
6.3.4.2.	Conclusion of the Re-check Process.....	67
6.3.5.	Summary of Tararua Road Intersection Option Unweighted Evaluations / Scores.....	67
6.3.5.1.	Fit with Project Objectives .....	67
6.3.5.2.	Environmental and Social Impacts .....	67
6.3.5.3.	Implementability Impacts .....	68
6.3.5.4.	Summary of Tararua Road Unweighted Assessments .....	68
6.3.6.	Summary of Tararua Road Intersection Option Weighted Scenario Assessment .....	69
6.3.7.	Recommended Tararua Intersection Option .....	69
6.3.8.	Summary of Midblock Option Unweighted Evaluations / Scores .....	69
6.3.8.1.	Fit with Project Objectives .....	69
6.3.8.2.	Environmental and Social Impacts .....	69
6.3.8.3.	Implementability Impacts .....	70
6.3.8.4.	Summary of Midblock Unweighted Assessments.....	70
6.3.9.	Summary of Midblock Option Weighted Scenario Assessment .....	70
6.3.10.	Recommended Midblock Option.....	71
<b>7.</b>	<b>Conclusions and Recommendations .....</b>	<b>71</b>
<b>8.</b>	<b>Ō2NL DBC Investigation of Options and Decision Making by Waka Kotahi .....</b>	<b>71</b>
8.1.1.	Queens Street Intersection Options .....	71
8.1.2.	Tararua Road Intersection Options.....	73
8.1.3.	Mid-Block Options.....	73

## List of Tables

Table 1:	Option group and long list of intersection option variants .....	7
Table 2:	Queen Street intersection options .....	9
Table 3:	Tararua Road intersection options .....	15
Table 4:	Assessment areas and MCA assessors .....	21
Table 5:	6-point scoring system.....	23
Table 6:	MCA assessor option scores for the Queen Street options.....	26
Table 7:	MCA assessor unweighted option scores for the Tararua Road options.....	27

Table 8: MCA assessor option scores for the Midblock options .....	28
Table 9: Numerical Values Assigned to each of the Weighting Scenario Options.....	51
Table 10: Average scores for the Queen Street intersection weighting scenarios .....	52
Table 11: Weighting scenario ranking orders for the scores identified in Table 10 .....	53
Table 12: Average scores for Tararua Road intersection weighting scenarios.....	54
Table 13: Weighting scenario ranking orders for the scores identified in Table 12 .....	54
Table 14: Numerical values assigned to each of the weighting scenario options.....	57
Table 15: Average scores for the Midblock weighting scenarios.....	59
Table 16: Weighting scenario ranking orders for the scores identified in Table 17 .....	59
Table 17: Summary of changes to the Visual / Landscape / Urban Amenity, Archaeology and Horowhenua District Development MCA assessors original evaluations / scores .....	63
Table 18: Updated unweighted MCA assessor scores.....	65
Table 19: Average scores for the short listed Queen Street intersection weighting scenarios .....	66
Table 20: Weighting scenario ranking orders for the scores identified in Table 19 .....	67
Table 21: Option Q5 and Q7 Comparison .....	72

### List of Figures

Figure 1: Preferred 300m corridor for the new Ō2NL Highway .....	4
Figure 2: General locality of the East of Levin MCA.....	5
Figure 3: Option 1 (general alignment and vertical profile).....	18
Figure 4: Option 2 (general alignment and vertical profile).....	18
Figure 5: Vertical profiles for both Options 1 and 2 .....	19

### List of Appendices (Volume 2)

Appendix A	Queen Street General Layout .....
Appendix B	Tararua Road General Layout .....
Appendix C	MCA Workshop Attendees.....
Appendix D	Fit with Project Objectives (Safety) Assessment Report.....
Appendix E	Muaūpoko Tribal Authority Assessment Report .....
Appendix F	Ecology Assessment Report.....
Appendix G	Landscape / Visual Assessment Report .....
Appendix H	Heritage Assessment Report .....
Appendix I	Archaeology Assessment Report.....
Appendix J	Noise / Vibration Assessment Report .....
Appendix K	Productive Land Assessment Report.....
Appendix L	Social / Community / Recreation Assessment Report.....
Appendix M	Horowhenua District Development Assessment Report .....
Appendix N	Fit with Local Road System Report Assessment Report.....
Appendix O	Engineering Degree of Difficulty and Cost Assessment Report .....
Appendix P	Property Degree of Difficulty Assessment Report.....
Appendix Q	Queen Street Intersection Short Listed Options Re-check 2022.....

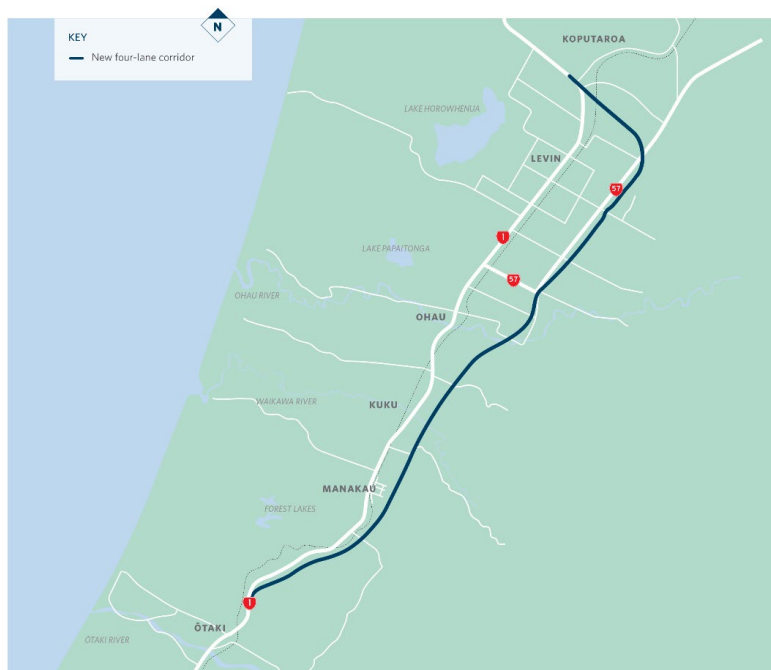
# 1. Introduction

State Highway 1 (SH1) is New Zealand's premier highway, but the section between Ōtaki and Levin is afflicted by a number of serious safety, efficiency and resilience problems. The importance of this section of SH1 is characterised by its function in connecting Wellington to the upper North Island, where no other resilient route exists. It also provides an essential economic connection to Palmerston North, the largest freight node in central New Zealand.

Therefore, Waka Kotahi NZ Transport Agency (Waka Kotahi) has been investigating potential upgrade and new alignment options to address the issues with the existing SH1 route. In 2018, an Indicative Business Case (IBC) was endorsed by Waka Kotahi, which included endorsement for an offline highway, from Taylors Road (in the south) to north of Levin (the Project or new Ō2NL highway), and a 300m corridor (the preferred 300m corridor) for further investigation. The Ō2NL Project was subsequently included in the NZ Upgrade Programme to “improve safety and access, support economic growth, provide greater route resilience, and better access to walking and cycling facilities”. Waka Kotahi endorsed the preferred 300m corridor on 14 December 2018.

Waka Kotahi is now undertaking a Detailed Business Case (DBC) to investigate and develop the new highway alignment, interchanges, and local road connections for the preferred 300m corridor and to undertake scheme design.

As set out in Figure 1 below, the preferred corridor is located to the east of SH1 and State Highway 57 (SH57). In summary, heading north, the new Ō2NL highway will extend from the northern end of the Peka Peka to Ōtaki Expressway (which is located approximately 2km north of the Ōtaki township) and will re-connect into SH1 and SH57 to the north of Levin.



**Figure 1: Preferred 300m corridor for the new Ō2NL Highway**

To inform the Ō2NL DBC's developmental processes, Waka Kotahi has undertaken a number of multi criteria analysis (MCA) processes to help identify the new Ō2NL highway's alignment, interchange and local road option preferences for the preferred 300m corridor. These processes are set out in detail in the **Ō2NL DBC MCA Summary Report 2021**.<sup>4</sup>

In September 2021, and as part of its MCA DBC processes, Waka Kotahi identified a need to undertake a specific MCA for the design options for the new Ō2NL highway's intersections with Queen Street and Tararua Road, which are located to the east of Levin. In addition, Waka Kotahi also identified a need to evaluate the highway's proposed height between these two intersections. The general locality of the

<sup>4</sup> Ō2NL DBC MCA Summary Report October 2021

section of the new Ō2NL highway is set out in Figure 2 (in the red circle) below. Waka Kotahi collectively referred to these MCA processes as the “East of Levin” MCA.

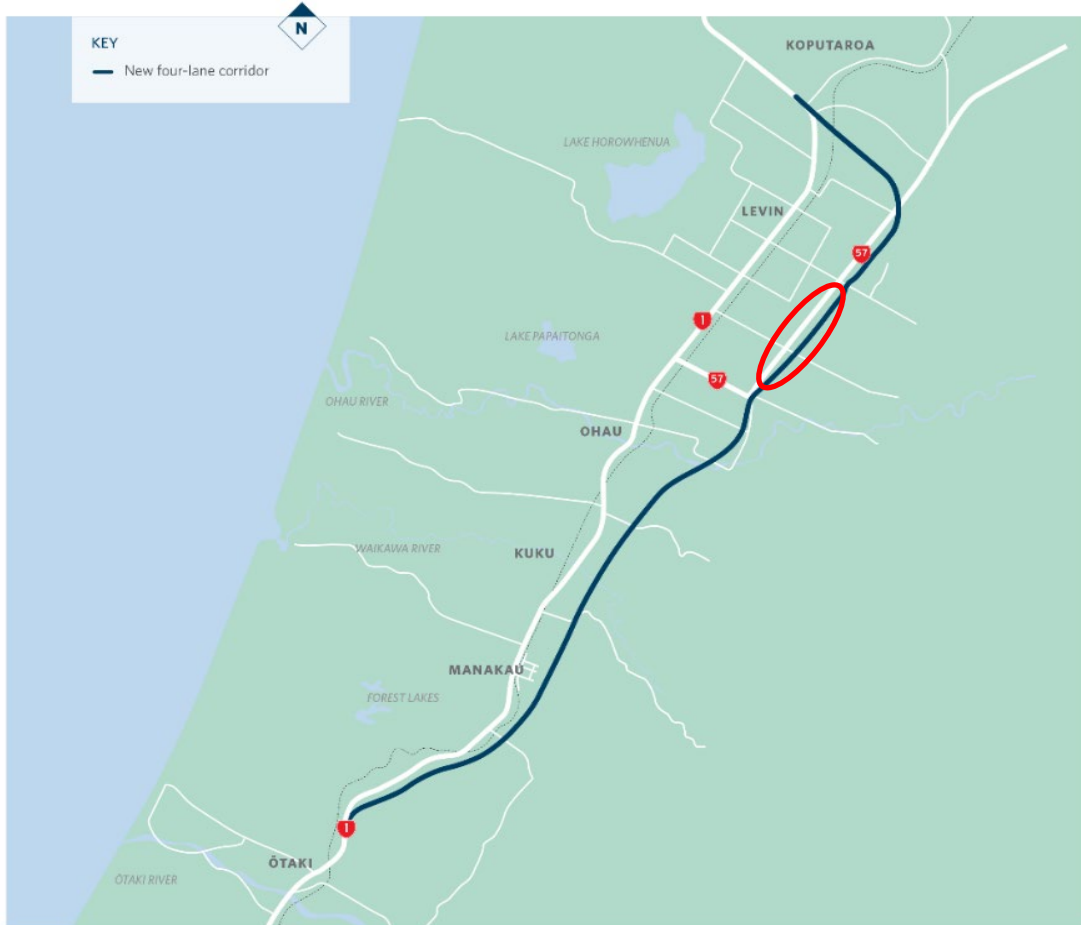


Figure 2: General locality of the East of Levin MCA

## 2. Core Principles

Through Waka Kotahi’s partnership with Mana Whenua, core principles for the project have been established as follows:

- Tread Lightly, with the whenua
  - Me tangata te whenua (treat the land as a person)
  - Kia māori te whenua (Let it be its natural self)
- Create an Enduring Community Legacy:
  - Kia māori to whakairo (normalise māori values)
  - Ma noho tangata whenua ngāmātāpono (embed the principles in all things), and
  - Tū ai te tangata, Tū ai te whenua, Tūai te Wai (elevate the status of the people, land and water).

The core principles bring a focus on the project development and design response for positive, measurable project and community outcomes.

For this MCA process, the core principles contributed to the need for additional focus on this area and the need to look at alternatives. They have been front and centre in guiding the development of options and how they were assessed through the MCA process.

Mana Whenua have been involved in the process to ensure the project team incorporate these principles in line with local values.

### 3. Purpose

In September 2021, following completion of preliminary groundwater investigations, the Ō2NL Project Team identified that existing groundwater was periodically high in some locations in the east of Levin locality. In addition, through Waka Kotahi's partner discussions with the Muaūpoko Tribal Authority (Muaūpoko), a shared understanding of the cultural importance of groundwater in the east of Levin locality was obtained.

Consequently, Waka Kotahi determined that it needed to consider the design options for the new Ō2NL highway in the east of Levin locality. In particular, it needed to identify the grade levels for the new highway's intersections with Tararua Road and Queen Street as well as for the midblock section between the intersections. To assess the various grade level options, Waka Kotahi determined that an MCA process was required.

Accordingly, the purpose of this report is to summarise the MCA processes undertaken by the Ō2NL Project Team, its partners and technical specialists to help identify the technically strongest performing intersection and midblock options for the east of Levin section of the new Ō2NL highway. The recommendations from this report are then to be used to inform Waka Kotahi decision making processes on the Ō2NL DBC.

## 4. East of Levin Intersection Options to be Assessed

The starting point for option development for the East of Levin MCA was for the Project Design Team<sup>5</sup> to firstly identify a long list of intersection options for Tararua Road and Queen Street.

The first step in the long listing process was to identify “groups” of intersection forms that could apply to both intersections. The long list of intersection form groups was as follows:

- Fully Submerged Option Group (i.e. where the new highway would be fully submerged below grade level)
- Partially Submerged Option Group (i.e. where the new highway would only be partially located below grade)
- At-grade Option Group (i.e. where the new highway would be located at grade or at existing ground level), and
- Standard Bridge Option Group.

The second step in the process was to identify all of the intersection option variants for each of the above groups. Table 1 sets out the long list of intersection option variants ultimately identified by the Project Design Team.

**Table 1: Option group and long list of intersection option variants**

Option Group	Intersection Option Variant
Fully Submerged	New highway fully below grade
	New highway fully below grade in engineered trough/trench
	Local road fully below grade
Partially Submerged	New highway partially below grade
	Local road partially below grade
At-grade	At-grade: Roundabout
	At-grade: Local road closed
	At-grade: Close Queen, upgrade Liverpool
	At-grade: Queen diverted north
	At-grade: Relocate SH57 closer to Queen Street
Standard Bridge	New highway over top
	Local road over top

Following a Project Team Review of the long list option variants, the following two variants from the Fully Submerged Option Group were not progressed:

- New highway fully below grade in engineered trough / trench  
The key reasons for not progressing this option were due to engineering complexity, including a significant screw piling requirement that would significantly increase project costs, and was unlikely to be supported by mana whenua.
- Local road fully below grade  
The key reasons for not progressing this option were due to engineering complexity. In particular, it was considered that there would be insufficient space between the proposed new highway and any SH57 intersection to construct an appropriate local road gradient. Furthermore, there would be a

<sup>5</sup> Jamie Povall (Design Manager), Phil Peet (Stantec Team Leader), Keith Weale (Geometrics Lead), Selwyn Blackmore (Transport Planning Lead), Rob Napier (Client Project Manager) and Greg Lee (Lead Resource Planner)

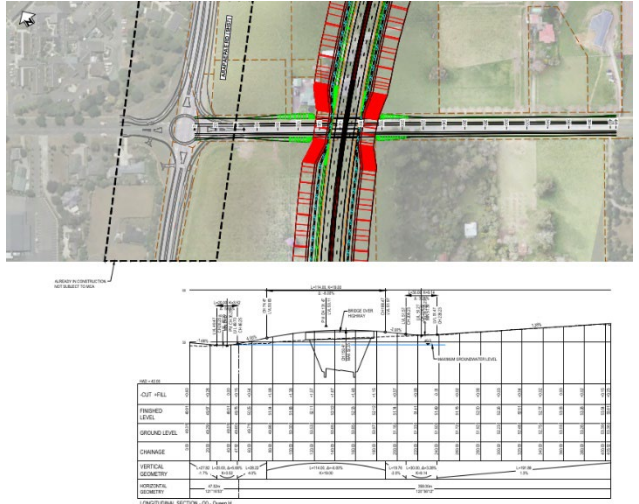
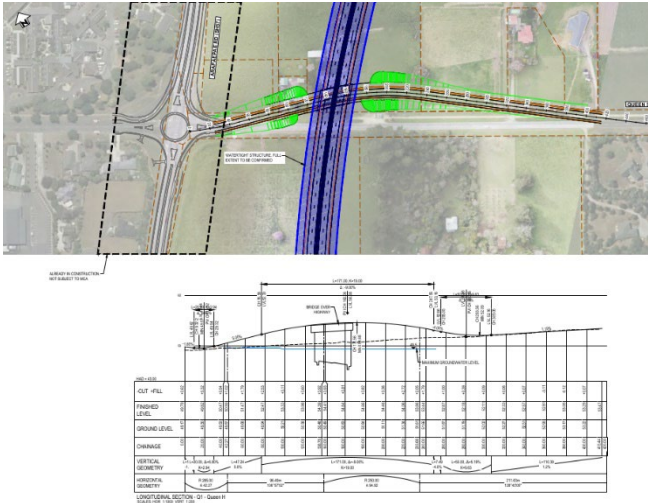
significant screw piling requirement that would significantly increase project costs, and was unlikely to be supported by Mana Whenua.

The third step in the option identification process involved the Project Design Team identifying a short list of specific intersection options for the Queen Street and Tararua Road intersections. As discussed further below, the Project Design Team also identified a short list of midblock options (between the Queen Street and Tararua Road intersections) for MCA evaluation.

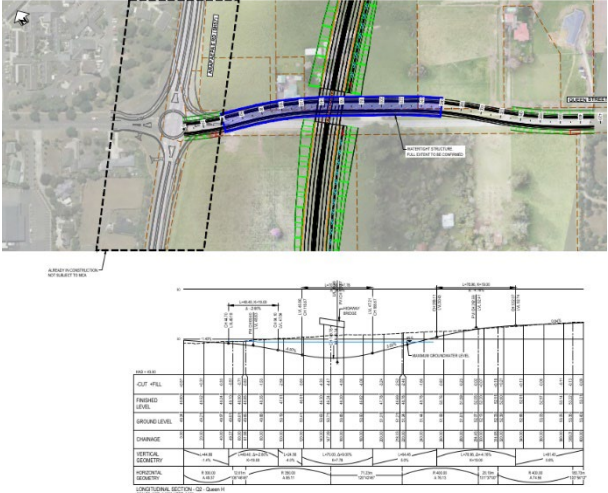
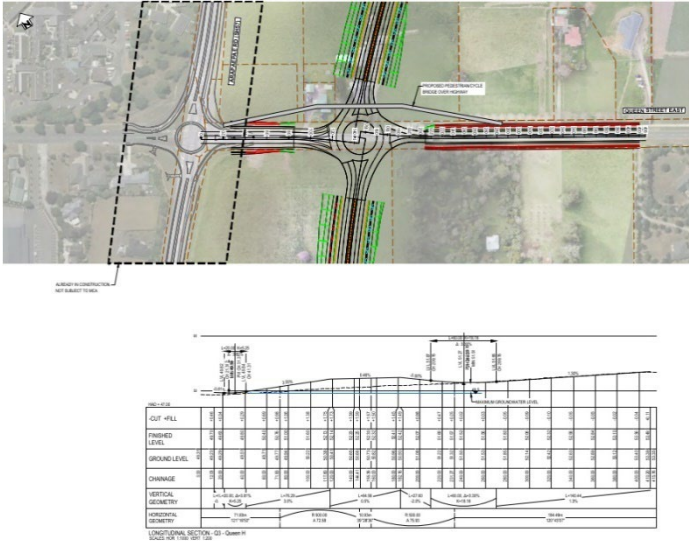
#### 4.1.1. Queen Street Intersection Options

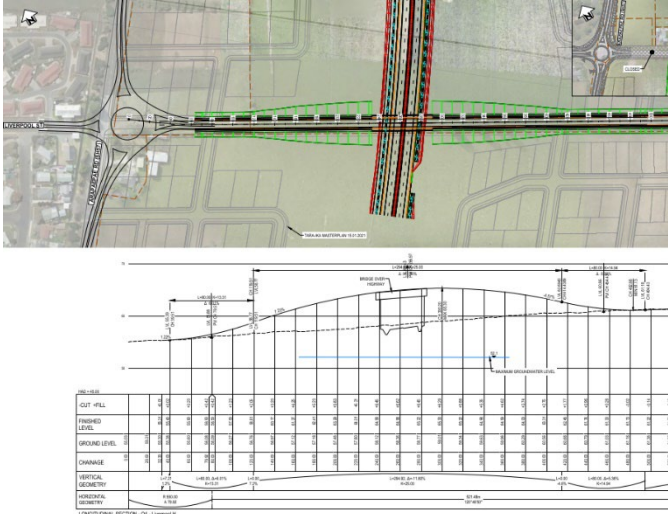
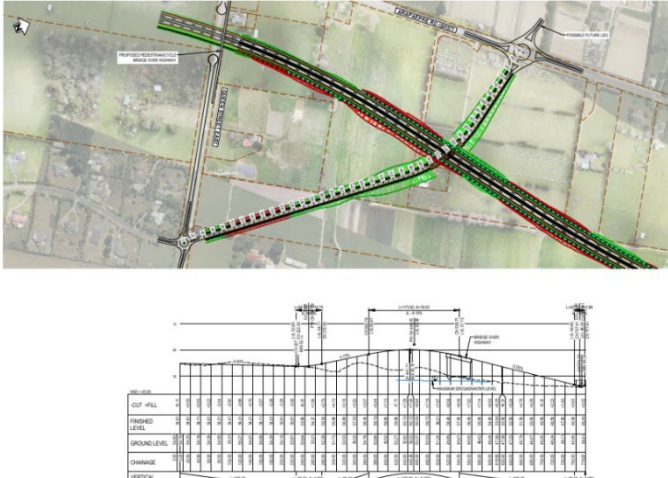
The Project Design Team identified nine Queen Street intersection options to be evaluated as set out in Table 2 below (see **Appendix A** for more detailed general arrangement plans).

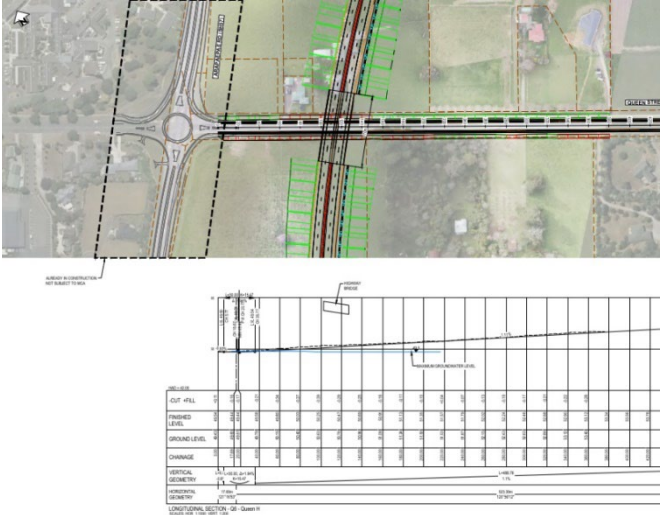
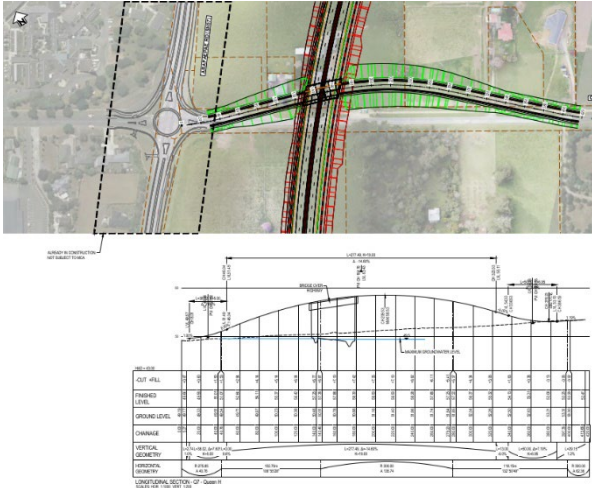
**Table 2: Queen Street intersection options**

Option Reference	General Description	General Layout and Vertical Profile
Q0	<ul style="list-style-type: none"> <li>• New highway goes beneath Queen Street</li> <li>• Queen remains close to existing grade</li> <li>• Standard earthworks batter cut slopes</li> <li>• <u>Currently identified in the Draft DBC as the preferred option</u></li> </ul>	
Q1	<ul style="list-style-type: none"> <li>• New highway partially submerged at Queen Street</li> <li>• Queen Street reconnected via overbridge</li> <li>• 'Half and half' option with highway partially submerged and local road partially raised</li> <li>• Queen Street realigned northwards to enable construction and maintain access to the Prouse Homestead</li> <li>• New below grade structure expected to be watertight trough and have screw pile anchors</li> </ul>	



Option Reference	General Description	General Layout and Vertical Profile
Q2	<ul style="list-style-type: none"> <li>• New highway partially raised at Queen Street</li> <li>• Queen Street reconnected via underpass</li> <li>• 'Half and half' option with Queen Street partially submerged and new highway partially raised</li> <li>• Queen Street realigned northwards to enable construction and maintain access to the Prouse Homestead</li> <li>• New below grade structure expected to be watertight trough and have screw pile anchors</li> </ul>	 <p>General layout and vertical profile for Option Q2. The layout shows a highway crossing Queen Street via an underpass. The vertical profile shows a raised highway section with a trough for Queen Street.</p>
Q3	<ul style="list-style-type: none"> <li>• New highway at, or close, to grade</li> <li>• New roundabout provides access direct to / from the new highway</li> <li>• New walking and cycling bridge provided over the new highway</li> </ul>	 <p>General layout and vertical profile for Option Q3. The layout shows a highway at grade with a roundabout and a bridge over it. The vertical profile shows a highway at or near ground level.</p>

Option Reference	General Description	General Layout and Vertical Profile																																																												
Q4	<ul style="list-style-type: none"> <li>• New highway at, or close, to grade</li> <li>• Queen Street would be closed</li> <li>• New connection at Liverpool Street</li> <li>• Liverpool Street on bridge over new highway</li> <li>• New roundabout on Arapaepae Road</li> </ul>	 <p>The vertical profile for Option Q4 includes the following data:</p> <table border="1"> <thead> <tr> <th>Stationing</th> <th>OUT-FILL</th> <th>FINISHED LEVEL</th> <th>GROUND LEVEL</th> <th>CHANGING</th> </tr> </thead> <tbody> <tr> <td>0+00</td> <td>0.00</td> <td>10.00</td> <td>10.00</td> <td></td> </tr> <tr> <td>0+10</td> <td>0.00</td> <td>10.00</td> <td>10.00</td> <td></td> </tr> <tr> <td>0+20</td> <td>0.00</td> <td>10.00</td> <td>10.00</td> <td></td> </tr> <tr> <td>0+30</td> <td>0.00</td> <td>10.00</td> <td>10.00</td> <td></td> </tr> <tr> <td>0+40</td> <td>0.00</td> <td>10.00</td> <td>10.00</td> <td></td> </tr> <tr> <td>0+50</td> <td>0.00</td> <td>10.00</td> <td>10.00</td> <td></td> </tr> <tr> <td>0+60</td> <td>0.00</td> <td>10.00</td> <td>10.00</td> <td></td> </tr> <tr> <td>0+70</td> <td>0.00</td> <td>10.00</td> <td>10.00</td> <td></td> </tr> <tr> <td>0+80</td> <td>0.00</td> <td>10.00</td> <td>10.00</td> <td></td> </tr> <tr> <td>0+90</td> <td>0.00</td> <td>10.00</td> <td>10.00</td> <td></td> </tr> <tr> <td>1+00</td> <td>0.00</td> <td>10.00</td> <td>10.00</td> <td></td> </tr> </tbody> </table>	Stationing	OUT-FILL	FINISHED LEVEL	GROUND LEVEL	CHANGING	0+00	0.00	10.00	10.00		0+10	0.00	10.00	10.00		0+20	0.00	10.00	10.00		0+30	0.00	10.00	10.00		0+40	0.00	10.00	10.00		0+50	0.00	10.00	10.00		0+60	0.00	10.00	10.00		0+70	0.00	10.00	10.00		0+80	0.00	10.00	10.00		0+90	0.00	10.00	10.00		1+00	0.00	10.00	10.00	
Stationing	OUT-FILL	FINISHED LEVEL	GROUND LEVEL	CHANGING																																																										
0+00	0.00	10.00	10.00																																																											
0+10	0.00	10.00	10.00																																																											
0+20	0.00	10.00	10.00																																																											
0+30	0.00	10.00	10.00																																																											
0+40	0.00	10.00	10.00																																																											
0+50	0.00	10.00	10.00																																																											
0+60	0.00	10.00	10.00																																																											
0+70	0.00	10.00	10.00																																																											
0+80	0.00	10.00	10.00																																																											
0+90	0.00	10.00	10.00																																																											
1+00	0.00	10.00	10.00																																																											
Q5	<ul style="list-style-type: none"> <li>• New highway at, or close, to grade</li> <li>• Queen Street closed in current location, but walking and cycling bridge provided</li> <li>• Queen Street realigned further north</li> <li>• New roundabout onto Arapaepae Road</li> <li>• Option shows new highway at-grade with realigned Queen overbridge</li> </ul>	 <p>The vertical profile for Option Q5 includes the following data:</p> <table border="1"> <thead> <tr> <th>Stationing</th> <th>OUT-FILL</th> <th>FINISHED LEVEL</th> <th>GROUND LEVEL</th> <th>CHANGING</th> </tr> </thead> <tbody> <tr> <td>0+00</td> <td>0.00</td> <td>10.00</td> <td>10.00</td> <td></td> </tr> <tr> <td>0+10</td> <td>0.00</td> <td>10.00</td> <td>10.00</td> <td></td> </tr> <tr> <td>0+20</td> <td>0.00</td> <td>10.00</td> <td>10.00</td> <td></td> </tr> <tr> <td>0+30</td> <td>0.00</td> <td>10.00</td> <td>10.00</td> <td></td> </tr> <tr> <td>0+40</td> <td>0.00</td> <td>10.00</td> <td>10.00</td> <td></td> </tr> <tr> <td>0+50</td> <td>0.00</td> <td>10.00</td> <td>10.00</td> <td></td> </tr> <tr> <td>0+60</td> <td>0.00</td> <td>10.00</td> <td>10.00</td> <td></td> </tr> <tr> <td>0+70</td> <td>0.00</td> <td>10.00</td> <td>10.00</td> <td></td> </tr> <tr> <td>0+80</td> <td>0.00</td> <td>10.00</td> <td>10.00</td> <td></td> </tr> <tr> <td>0+90</td> <td>0.00</td> <td>10.00</td> <td>10.00</td> <td></td> </tr> <tr> <td>1+00</td> <td>0.00</td> <td>10.00</td> <td>10.00</td> <td></td> </tr> </tbody> </table>	Stationing	OUT-FILL	FINISHED LEVEL	GROUND LEVEL	CHANGING	0+00	0.00	10.00	10.00		0+10	0.00	10.00	10.00		0+20	0.00	10.00	10.00		0+30	0.00	10.00	10.00		0+40	0.00	10.00	10.00		0+50	0.00	10.00	10.00		0+60	0.00	10.00	10.00		0+70	0.00	10.00	10.00		0+80	0.00	10.00	10.00		0+90	0.00	10.00	10.00		1+00	0.00	10.00	10.00	
Stationing	OUT-FILL	FINISHED LEVEL	GROUND LEVEL	CHANGING																																																										
0+00	0.00	10.00	10.00																																																											
0+10	0.00	10.00	10.00																																																											
0+20	0.00	10.00	10.00																																																											
0+30	0.00	10.00	10.00																																																											
0+40	0.00	10.00	10.00																																																											
0+50	0.00	10.00	10.00																																																											
0+60	0.00	10.00	10.00																																																											
0+70	0.00	10.00	10.00																																																											
0+80	0.00	10.00	10.00																																																											
0+90	0.00	10.00	10.00																																																											
1+00	0.00	10.00	10.00																																																											

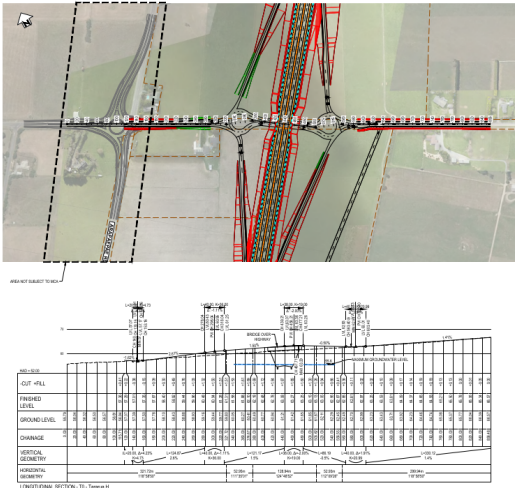
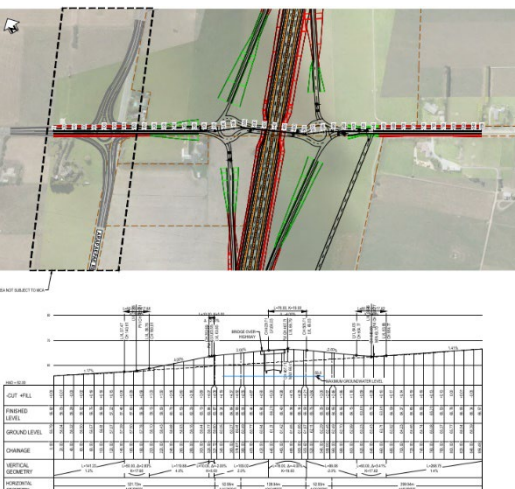
Option Reference	General Description	General Layout and Vertical Profile
Q6	<ul style="list-style-type: none"> <li>• Queen Street remains at-grade</li> <li>• New highway on bridge over Queen Street</li> <li>• Total bridge span of 70m</li> </ul>	
Q7	<ul style="list-style-type: none"> <li>• New highway at, or close, to grade</li> <li>• Queen Street on bridge over new highway</li> </ul>	

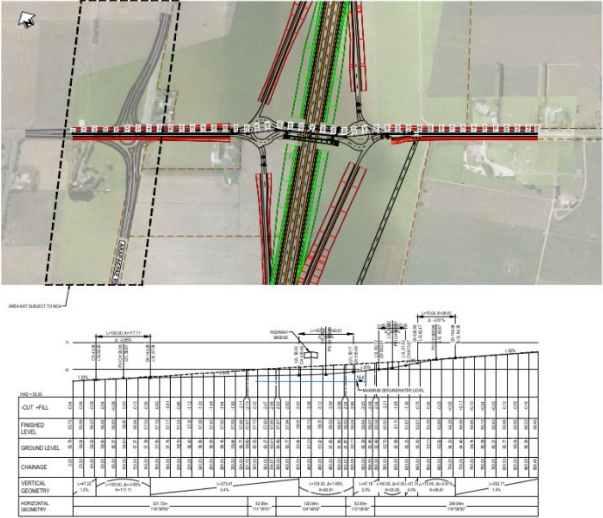
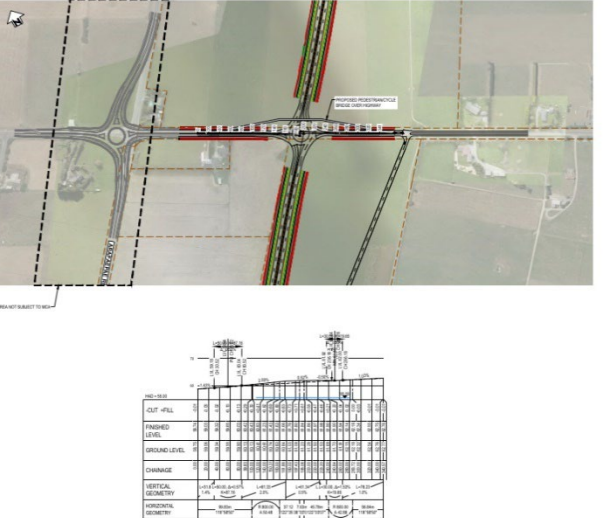
Option Reference	General Description	General Layout and Vertical Profile
Q8	<ul style="list-style-type: none"> <li>• New highway at, or close, to grade at Queen Street</li> <li>• Queen Street closed to traffic and relocated northwards</li> <li>• New 5-arm at-grade roundabout linking SH1 and SH57</li> <li>• Walking and cycling bridge provided at Queen Street</li> <li>• New highway taken over SH57 further north (see sheet SK1009 in Appendix A)</li> </ul>	

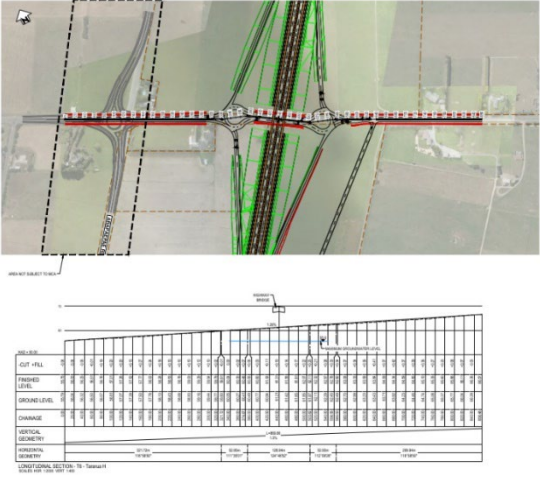
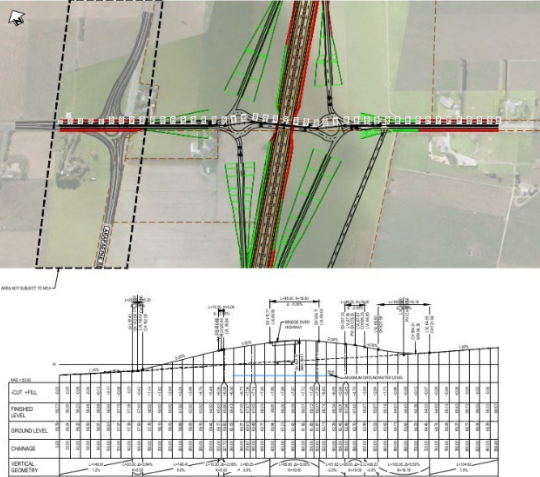
## 4.1.2. Tararua Road Intersection Options

The Project Design Team identified six Tararua Road intersection options to be evaluated as set out in Table 3 (see **Appendix B** for more detailed general arrangement plans).

**Table 3: Tararua Road intersection options**

Option Reference	General Description	General Layout and Vertical Profile
T0	<ul style="list-style-type: none"> <li>• New highway fully submerged beneath Tararua Road</li> <li>• Tararua Road and new roundabouts remain close to existing grade</li> <li>• Standard earthworks batter cut slopes</li> <li>• <u>Currently identified in the Draft DBC as the preferred option</u></li> </ul>	 <p>LONGITUDINAL SECTION T0 - Tararua H SCALE: 1:1000</p>
T1	<ul style="list-style-type: none"> <li>• New highway partially submerged at Tararua Road</li> <li>• 'Half and half' option with highway partially submerged and local road partially raised</li> <li>• Maximum depth of excavation limited to a few metres to avoid maximum GW level</li> <li>• New highway bridge around four to five metres above existing ground level</li> <li>• <u>Currently identified in the Draft DBC as the preferred option</u></li> </ul>	 <p>LONGITUDINAL SECTION T1 - Tararua H SCALE: 1:1000</p>

Option Reference	General Description	General Layout and Vertical Profile
T2	<ul style="list-style-type: none"> <li>• New highway travels over the top of the local road</li> <li>• 'Half and half' option with local road partially submerged and highway partially raised</li> <li>• Maximum depth of excavation limited to a few metres to avoid maximum GW level</li> <li>• New highway bridge around four to five metres above existing ground level</li> </ul>	
T3	<ul style="list-style-type: none"> <li>• New highway at, or close, to grade</li> <li>• New roundabout</li> <li>• New walking and cycling bridge provided over the new highway</li> </ul>	

Option Reference	General Description	General Layout and Vertical Profile																																																
T6	<ul style="list-style-type: none"> <li>Tararua Road remains at-grade</li> <li>New roundabouts also at-grade</li> <li>New highway on bridge over Tararua Road (about seven to eight metres above ground level)</li> </ul>	 <p>Vertical Profile Data for Option T6 (Approximate values):</p> <table border="1"> <thead> <tr> <th>Stationing</th> <th>Ground Level (m)</th> <th>Finished Level (m)</th> <th>Change (m)</th> </tr> </thead> <tbody> <tr><td>0+00</td><td>10.00</td><td>10.00</td><td>0.00</td></tr> <tr><td>0+10</td><td>10.00</td><td>10.00</td><td>0.00</td></tr> <tr><td>0+20</td><td>10.00</td><td>10.00</td><td>0.00</td></tr> <tr><td>0+30</td><td>10.00</td><td>10.00</td><td>0.00</td></tr> <tr><td>0+40</td><td>10.00</td><td>10.00</td><td>0.00</td></tr> <tr><td>0+50</td><td>10.00</td><td>10.00</td><td>0.00</td></tr> <tr><td>0+60</td><td>10.00</td><td>10.00</td><td>0.00</td></tr> <tr><td>0+70</td><td>10.00</td><td>10.00</td><td>0.00</td></tr> <tr><td>0+80</td><td>10.00</td><td>10.00</td><td>0.00</td></tr> <tr><td>0+90</td><td>10.00</td><td>10.00</td><td>0.00</td></tr> <tr><td>1+00</td><td>10.00</td><td>10.00</td><td>0.00</td></tr> </tbody> </table>	Stationing	Ground Level (m)	Finished Level (m)	Change (m)	0+00	10.00	10.00	0.00	0+10	10.00	10.00	0.00	0+20	10.00	10.00	0.00	0+30	10.00	10.00	0.00	0+40	10.00	10.00	0.00	0+50	10.00	10.00	0.00	0+60	10.00	10.00	0.00	0+70	10.00	10.00	0.00	0+80	10.00	10.00	0.00	0+90	10.00	10.00	0.00	1+00	10.00	10.00	0.00
Stationing	Ground Level (m)	Finished Level (m)	Change (m)																																															
0+00	10.00	10.00	0.00																																															
0+10	10.00	10.00	0.00																																															
0+20	10.00	10.00	0.00																																															
0+30	10.00	10.00	0.00																																															
0+40	10.00	10.00	0.00																																															
0+50	10.00	10.00	0.00																																															
0+60	10.00	10.00	0.00																																															
0+70	10.00	10.00	0.00																																															
0+80	10.00	10.00	0.00																																															
0+90	10.00	10.00	0.00																																															
1+00	10.00	10.00	0.00																																															
T7	<ul style="list-style-type: none"> <li>New highway is at-grade</li> <li>Interchange ramps and local road / new roundabouts all raised</li> <li>New local road bridge over highway about seven to eight metres above ground level</li> </ul>	 <p>Vertical Profile Data for Option T7 (Approximate values):</p> <table border="1"> <thead> <tr> <th>Stationing</th> <th>Ground Level (m)</th> <th>Finished Level (m)</th> <th>Change (m)</th> </tr> </thead> <tbody> <tr><td>0+00</td><td>10.00</td><td>10.00</td><td>0.00</td></tr> <tr><td>0+10</td><td>10.00</td><td>10.00</td><td>0.00</td></tr> <tr><td>0+20</td><td>10.00</td><td>10.00</td><td>0.00</td></tr> <tr><td>0+30</td><td>10.00</td><td>10.00</td><td>0.00</td></tr> <tr><td>0+40</td><td>10.00</td><td>10.00</td><td>0.00</td></tr> <tr><td>0+50</td><td>10.00</td><td>10.00</td><td>0.00</td></tr> <tr><td>0+60</td><td>10.00</td><td>10.00</td><td>0.00</td></tr> <tr><td>0+70</td><td>10.00</td><td>10.00</td><td>0.00</td></tr> <tr><td>0+80</td><td>10.00</td><td>10.00</td><td>0.00</td></tr> <tr><td>0+90</td><td>10.00</td><td>10.00</td><td>0.00</td></tr> <tr><td>1+00</td><td>10.00</td><td>10.00</td><td>0.00</td></tr> </tbody> </table>	Stationing	Ground Level (m)	Finished Level (m)	Change (m)	0+00	10.00	10.00	0.00	0+10	10.00	10.00	0.00	0+20	10.00	10.00	0.00	0+30	10.00	10.00	0.00	0+40	10.00	10.00	0.00	0+50	10.00	10.00	0.00	0+60	10.00	10.00	0.00	0+70	10.00	10.00	0.00	0+80	10.00	10.00	0.00	0+90	10.00	10.00	0.00	1+00	10.00	10.00	0.00
Stationing	Ground Level (m)	Finished Level (m)	Change (m)																																															
0+00	10.00	10.00	0.00																																															
0+10	10.00	10.00	0.00																																															
0+20	10.00	10.00	0.00																																															
0+30	10.00	10.00	0.00																																															
0+40	10.00	10.00	0.00																																															
0+50	10.00	10.00	0.00																																															
0+60	10.00	10.00	0.00																																															
0+70	10.00	10.00	0.00																																															
0+80	10.00	10.00	0.00																																															
0+90	10.00	10.00	0.00																																															
1+00	10.00	10.00	0.00																																															



### 4.1.3. Midblock Options

The Project Design Team identified the following two midblock options (which would be about 1.2 kilometers in length) to be evaluated:

- Option 1: Ground Level (i.e. at grade), and
- Option 2: Below Ground Level (i.e. below grade in a shallow trench, with depths ranging up to four metres).

The general alignment and vertical profiles for both Options 1 and 2 are set out in Figure 3 and Figure 4 respectively. The vertical profiles for both options (for comparison purposes) are set out in Figure 5.

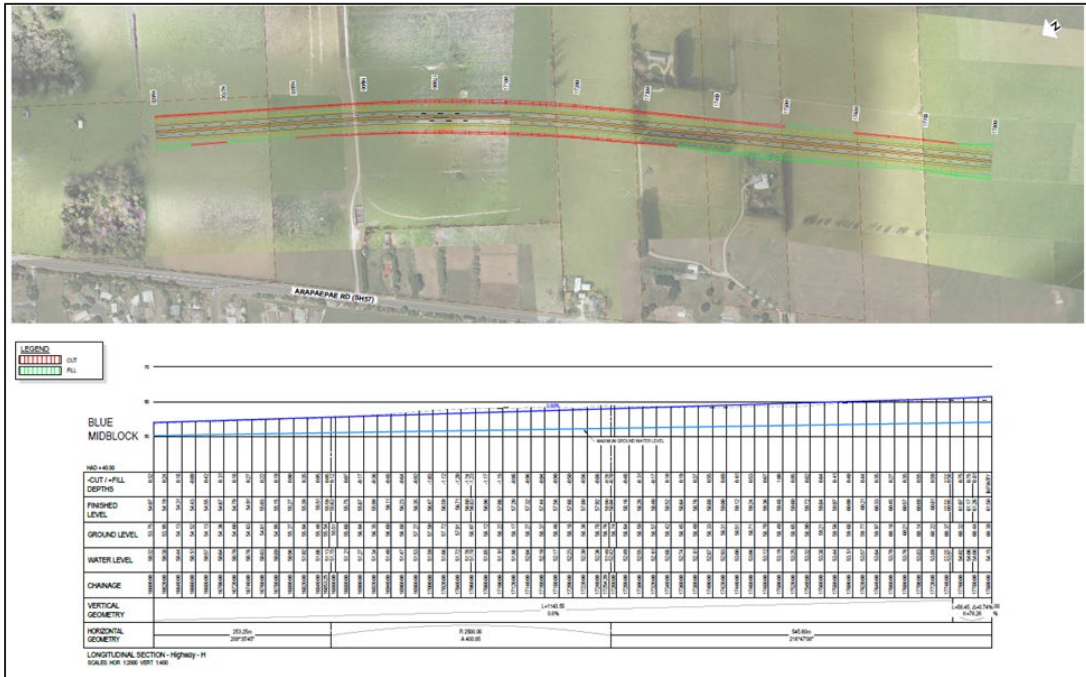


Figure 3: Option 1 (general alignment and vertical profile)

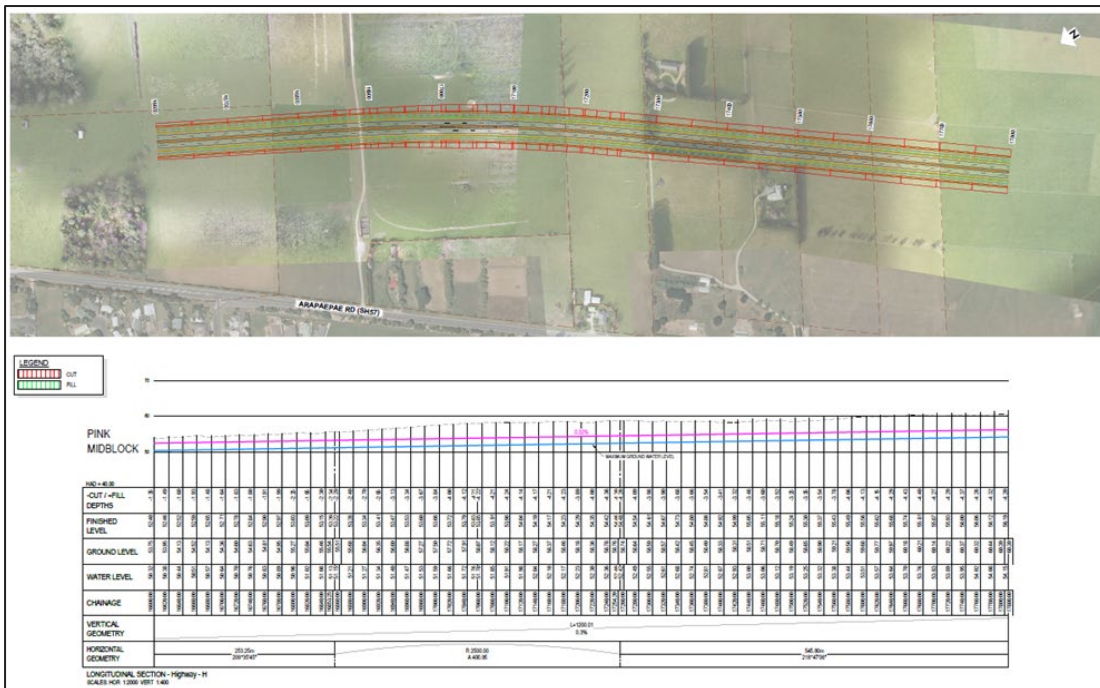


Figure 4: Option 2 (general alignment and vertical profile)

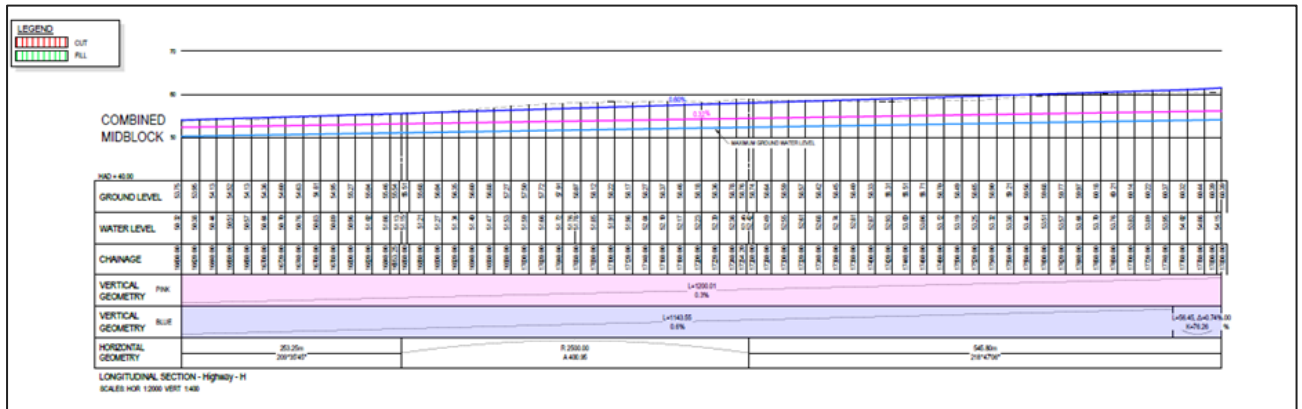


Figure 5: Vertical profiles for both Options 1 and 2

## 5. MCA Methodology

This section of the report summarises the MCA processes undertaken to evaluate the Queen Street and Tararua Road intersection options as well as the midblock options.

It is noted that the assessment criteria and selection of the MCA assessors was undertaken in accordance with Waka Kotahi's MCA guidelines<sup>6</sup>.

### 5.1. MCA Assessment Criteria and MCA Assessors

The first key step in determining the MCA methodology was to identify the MCA assessment criteria to be used for evaluating the East of Levin intersection and midblock options. To ensure consistency, Waka Kotahi identified that the same assessment criteria as used for evaluating the new Ō2NL highway, interchange and local road options (as per the Ō2NL MCA Summary Report 2021) would also be used for evaluating the intersection and midblock options. The only exception was the Kāpiti Coast District Development assessment criteria, which was not needed as the east of Levin area is fully located within the Horowhenua District.

The next step was to determine the MCA assessors who would undertake the evaluations of the assessment criteria. Waka Kotahi determined, where it was possible, that the same MCA assessors who had undertaken the previous MCA assessments (as per the Ō2NL MCA Summary Report 2021) would be "reused" to ensure consistency. This approach was however not possible for the following MCA assessment criteria and / or MCA assessors:

- **Iwi Cultural Values** Ngāti Raukawa ki te Tonga : As Muaūpoko are Mana Whenua in this area only their scores were provided for the East of Levin MCA. However, Ngāti Raukawa ki te Tonga representatives were involved in the process and have given their input and feedback to Waka Kotahi and the Project Design Team
- **Noise / Vibration**: Due to lack of availability, Chiles Ltd was replaced by Altissimo Consulting, and
- **Horowhenua District Development and Fit with Local Road System**: Due to time delays, and for the purposes of this MCA only, the evaluation of the District Development and Fit with Local Road System assessment criteria, was undertaken by appropriate assessors from Stantec [rather than by Horowhenua District Council (HDC) as per the Ō2NL MCA Summary Report 2021]. Further liaison discussion will occur with HDC to ensure its views and perspectives are included in the preferred option development.

Table 4 below sets out the MCA assessment criteria chosen to evaluate the intersection and midblock options as well as the MCA assessor's organisations who were selected to undertake the assessments. Each MCA assessment criteria has been "grouped" under the assessment themes identified in Waka Kotahi's MCA guidelines.

---

<sup>6</sup> See: [MCA User Guidance Feb 2021-FINAL.pdf \(nzta.govt.nz\)](#)

**Table 4: Assessment areas and MCA assessors**

Assessment Criteria	Summary of Assessment Criteria	MCA Assessor Organisation
<b>Theme: Fit with Project Objectives</b>		
<b>Fit with Project Objectives</b>	<p>This assessment criterion involves a high-level assessment of the overall contribution each option will make to the following project / RMA objectives:</p> <ul style="list-style-type: none"> <li>• Enhance the safety of the State highway network by delivering a four lane State highway between Ōtaki and North of Levin</li> <li>• Improve the resilience of the State highway network</li> <li>• Provide integration between the State highway network and the local road network including supporting access to multi-modal connections and Levin</li> <li>• Enable mode choice for journeys between local communities by providing a walking and cycling facility, and</li> <li>• Support intra and inter-regional economic growth and productivity through improved movement of people and freight.</li> </ul>	Stantec
<b>Theme: Environmental / Social impacts</b>		
<b>Iwi Cultural Values (Muaūpoko)</b>	This assessment criterion considers the impacts on Muaūpoko values that are associated with the options, including past and present associations, key areas of settlement (marae and papakāinga), wāhi tapu (if known) and other cultural values, areas of use (e.g. food gathering), current ownership, and important elements of the natural environment such as waterways and wetlands.	Muaūpoko Tribal Authority
<b>Landscape / Visual / Urban Design</b>	This assessment criterion considers natural and landscape character impacts (including degree of modification and presence of structures) of the intersection and local road options. It includes considering potential landscape and urban design impacts of the options on nearby townships or notable lifestyle areas.	Isthmus
<b>Terrestrial Ecology</b>	This assessment criterion considers terrestrial ecological values such as indigenous vegetation areas that are nationally, regionally or locally significant in terms of habitat values and the presence of species.	Forbes Ecology Limited
<b>Freshwater / Wetland Ecology</b>	This assessment criterion considers the potential effects on waterways (e.g. lakes, rivers and streams) and wetlands.	

<b>Heritage</b>	This assessment criterion considers impacts on known heritage buildings.	Ian Bowman, Architect and Conservator
<b>Archaeology</b>	This assessment criterion considers the impacts on known archaeological sites and features, and the risks of encountering archaeological features, or new areas of significance.	Daniel Parker, Insite Archaeology
<b>Noise / Vibration</b>	This assessment criterion considers the noise and vibration impacts on nearby dwellings and other community buildings (sensitive receptors).	Altissimo Consulting
<b>Productive Land Values</b>	This assessment criterion considers the impacts on productive values of Classes I to III soils.	Land Vision
<b>Social / Community / Recreation</b>	This assessment criterion considers the social / community and recreational impacts on local communities, including community severance / opportunities, and construction phase impacts.	BECA
<b>Horowhenua District Development</b>	This assessment criterion considers the impacts on the approved Horowhenua District Plan's provisions and the confirmed future growth plans for the Horowhenua District.	Stantec
<b>Theme: Implementability impacts</b>		
<b>Fit with Local Road System</b>	This assessment criterion considers the contribution of the options to the management of the local road network, including the opportunities to update or integrate effectively with the existing roading hierarchy in the Horowhenua district. This criterion differs from the transport benefits criteria, as it focuses on the local network as a system in its own right (i.e. receiving and dispatching traffic in the Horowhenua district).	Stantec
<b>Engineering Degree of Difficulty (EDoD)</b>	This assessment criterion considers the physical components of the options, including: volume and balance of earthworks, structures, complexity of programming and temporary works, traffic and access management during construction, risks around "unknowns", any necessary additional provisions to address natural hazards, and general degree of difficulty in construction.	
<b>Property Degree of Difficulty (PDoD)</b>	This assessment criterion considers the number of properties, extent of severance of existing properties, the general ability to align an option with property boundaries, potential for effects on farming/business operations, Māori land, and any known land tenure issues that may create difficulties.	The Property Group

## 5.2. Preparing for the MCA Evaluations

Two specific briefings were held for the MCA assessors to provide them with their “MCA instructions” prior to undertaking their evaluations and attending the MCA workshop that was held on 13 October 2021. Both briefings were held via MS Teams, with the first one held on 22 September 2020 and the second one held on 4 October 2021.

In summary, the MCA instructions comprised of the following:

- The East of Levin MCA would be undertaken to inform both the DBC and subsequent RMA processes
- The MCA workshop would be premised on the Decision Conferencing approach (i.e. where scoring and weightings are identified through discussion and consensus, but informed by expert views)
- Where possible, the MCA assessor evaluation should be evidence based (e.g. use of quantitative information)
- The following project / RMA objectives would be evaluated:
  - Enhance the safety of the State highway network by delivering a four lane State highway between Ōtaki and North of Levin (referred to as the “safety objective”)
  - Improve the resilience of the State highway network (referred to as the “resilience objective”)
  - Support intra and inter-regional economic growth and productivity through improved movement of people and freight (referred to as the “appropriate connectivity objective”)
  - Provide integration between the State highway network and the local road network including supporting access to multi-modal connections and Levin (referred to as the “enhanced movement objective”), and
  - Enable mode choice for journeys between local communities by providing a walking and cycling facility (referred to as the “mode choice objective”).<sup>7</sup>
- Each option was to be evaluated against the 6-point scoring system in
- Table 5 below:

**Table 5: 6-point scoring system**

Score	Description
1	The option presents few difficulties on the basis of the criterion being evaluated and may provide significant benefits in terms of the attribute
2	The option presents only minor aspects of difficulty on the basis of the criterion being evaluated, and may provide some benefits in terms of the criterion
3	The option presents some aspects of reasonable difficulty in terms of the criterion being evaluated and problems cannot be completely avoided. There are few apparent benefits in terms of the criterion
4	The option includes clear aspects of difficulty in terms of the criterion being evaluated, and very limited perceived benefits

<sup>7</sup> It is noted that five project / RMA objectives were evaluated for this MCA, whereas only four objectives were considered / used in the Ō2NL MCA Summary Assessment Report 2021. The additional objective (i.e. Mode Choice) is as follows: *enable mode choice for journeys between local communities by providing a walking and cycling facility*. This objective was added following a review of project / investment objectives for the Ō2NL DBC in early 2021, which concluded that the objectives needed to be updated to include recognition of active mode connections. It is noted that *mode choice* had previously been considered under the ‘appropriate connections’ objective in the Ō2NL MCA Summary Assessment Report 2021

Score	Description
5	The option includes significant difficulties or problems in terms of the criterion being evaluated and no apparent benefits
F	The option will result in completely unacceptable adverse effects that cannot be appropriately avoided, remedied or mitigated (including offsetting)

- All scoring was to be absolute (that is, no artificial distinctions were to be made between the options)
- MCA evaluation / scoring of the options should be against the current environment, including Tara-lka Plan Change 4 as publicly notified on 16 November 2020<sup>8</sup>
- Reasonable mitigation measures should be assumed to be included in the Ō2NL RMA applications. Therefore, each assessor's evaluations would need to be clear what their mitigation measure assumptions were when assessing the options
- Construction costs for the options would not be assessed, rather costs would be considered in Waka Kotahi's decision making processes
- Weighting scenarios would be applied to the unweighted (i.e. raw) scores for sensitivity testing purposes [i.e. workshop weightings, RMA Section 6 matter weightings and the separate social, environmental, cultural and economic scenarios (quadruple bottom line scenarios)]
- Each MCA assessor would be required to provide a powerpoint presentation at the MCA workshop, which was to summarise their initial option assessment
- A draft and final option assessment report would be required for each assessment area. The final report would need to include at a minimum the following:
  - Methodology, including technical reports / guidelines and background reports reviewed plus any quantitative information relied upon for the evaluations
  - Identification of key assumptions (e.g. mitigation measures)
  - Identification of key exclusions
  - Identification of any sub-criteria used to evaluate the options, and
  - The option evaluation outcomes, including identifying any other effects that other MCA assessors may need to consider.

---

<sup>8</sup> It is noted that Plan Change 4 proposes to change the existing zoning to Greenbelt Residential, Low Density Residential, Standard Residential, Medium Density Residential, Commercial and Open Space. The plan change proposes to accommodate up to 2,500 houses, a small commercial area, new parks and reserves, and educational facilities

## 6. Evaluating the Options

This section of the report sets out the outcomes of each MCA assessor's unweighted (or raw) evaluations / scores for the intersection and midblock options. In addition to considering the raw scores, a weighting scenario exercise was undertaken by the Project Design Team to test the various sensitivities of the raw scores to matters considered, under various weightings, to be more important. The outcomes of the weighting scenario exercise are also set out in this section of the report.

### 6.1. MCA Assessor Scores

The outcomes of the MCA assessors unweighted (or raw) scores for each intersection and midblock option, including the final overall (combined) scores for each option, are set out in the following tables:

- Queen Street intersection unweighted scores are set out in Table 6
- Tararua Road intersection unweighted scores are set out in Table 7, and
- Midblock unweighted scores are set out in Table 8.

The MCA assessor's individual evaluations for all the intersection and midblock options are then summarised in the commentary that follows Table 8.



**Table 6: MCA assessor option scores for the Queen Street options**

Option	Enhanced movement	Safety	Resilience	Mode Choice	Connections	Iwi Muaūpoko	Landscape / visual	Ecological - Terrestrial	Ecological - Freshwater & Wetlands	Heritage	Archaeology	Noise and vibration	Productive land values	Social/community/recreation	Horowhenua District development	Fit with local road system	Engineering degree of difficulty	Property degree of difficulty	Total Score (equally weighted)
<b>Q0 - New highway fully below grade (DBC)</b>	1	1	2	1	1	F	2	F	5	1	1	3	4	2	1	1	F	2	<b>58</b>
<b>Q1 - New highway partially below grade</b>	1	1	1	1	1	F	3	F	5	2	1	3	3	2	2	1	5	2	<b>54</b>
<b>Q2 - Local road partially below grade</b>	1	1	1	1	1	F	4	F	5	2	1	3	2	3	3	2	4	2	<b>56</b>
<b>Q3 - At-grade: Roundabout</b>	2	3	2	1	3	2	3	2	2	3	1	5	2	3	3	2	1	2	<b>42</b>
<b>Q4 - At-grade: Close Queen, upgrade Liverpool</b>	1	1	1	2	2	2	2	1	1	2	1	3	2	4	4	4	2	5	<b>40</b>
<b>Q5 - At-grade: Queen diverted north</b>	1	1	1	1	1	1	4	1	1	2	1	3	3	3	3	3	2	3	<b>35</b>
<b>Q6 - New highway over top</b>	1	1	1	1	1	3	3	2	2	3	1	3	2	4	3	1	2	2	<b>36</b>
<b>Q7 - Local road over top</b>	1	2	1	2	1	3	3	2	2	3	2	3	2	3	3	2	2	3	<b>40</b>
<b>Q8 - At-grade: 5-arm, shift SH57 connection South</b>	3	3	2	1	3	2	4	1	1	2	1	5	4	3	3	4	2	3	<b>47</b>

**Fatal Flaw Score:** For the sole purposes for calculating a numerical value, a score of 10 was afforded to a fatal flaw score

**Table 7: MCA assessor unweighted option scores for the Tararua Road options**

Option	Enhanced movement	Safety	Resilience	Mode Choice	Connections	Iwi Muaūpoko	Landscape / visual	Ecological - Terrestrial	Ecological - Freshwater & Wetlands	Heritage	Archaeology	Noise and vibration	Productive land values	Social/community/recreation	Horowhenua District development	Fit with local road system	Engineering degree of difficulty	Property degree of difficulty	Total Score (equally weighted)
<b>T0 - New highway fully below grade (DBC)</b>	1	1	1	2	1	<b>F</b>	2	1	1	1	1	4	4	3	1	1	3	2	<b>40</b>
<b>T1 - New highway partially below grade</b>	1	1	1	2	1	<b>F</b>	3	1	1	1	1	4	3	3	3	1	2	2	<b>41</b>
<b>T2 - Local road partially below grade</b>	1	1	1	2	1	<b>F</b>	4	1	1	1	1	4	3	3	3	1	2	2	<b>42</b>
<b>T3 - At-grade: Roundabout</b>	2	3	2	1	3	1	3	1	1	1	1	5	3	3	3	2	1	2	<b>38</b>
<b>T6 - New highway over top</b>	1	1	1	2	1	3	3	1	1	1	1	4	3	4	3	1	1	2	<b>34</b>
<b>T7 - Local road over top</b>	1	1	1	2	1	3	3	1	1	1	1	4	3	3	3	1	2	2	<b>34</b>

**Fatal Flaw Score:** For the sole purposes for calculating a numerical value, a score of 10 was afforded to a fatal flaw score

**Table 8: MCA assessor option scores for the Midblock options**

Option	Enhanced movement	Safety	Resilience	Mode Choice	Connections	Iwi Muaūpoko	Landscape / visual	Ecological - Terrestrial	Ecological - Freshwater & Marine	Heritage	Archaeology	Noise and vibration	Productive land values	Social/community/recreation	Horowhenua District development	Fit with local road system	Engineering degree of difficulty	Property degree of difficulty	Total Score (equally weighted)
<b>Option 1: Ground Level</b>	1	1	1	2	1	1	3	1	1	1	1	3	2	3	3	3	1	3	<b>32</b>
<b>Option 2: Below Ground Level</b>	1	1	1	1	1	<b>F</b>	2	<b>F</b>	5	1	1	3	3	2	1	1	1	3	<b>48</b>

**Fatal Flaw Score:** For the sole purposes for calculating a numerical value, a score of 10 was afforded to a fatal flaw score

### 6.1.1. MCA Assessor Evaluation Summaries

This section of the report summarises each MCA assessor's evaluation and unweighted (i.e. raw) scores for the intersection and midblock options (further information on each assessor's evaluations can be found in the relevant appendices identified in this section of the report).

The MCA workshop was held on Wednesday 13 October 2021. It was attended by the MCA assessors as well as observers from Waka Kotahi and partners. The names of those who took part in the MCA workshop are provided in **Appendix C**. As outlined above, members of Ngāti Raukawa ki te Tonga attended the workshop as observers but did not evaluate or score any of the options.

The discussion of each MCA assessors evaluations / scores below is grouped under the Waka Kotahi MCA assessment themes that are identified in Table 8 above.

#### 6.1.1.1. Fit with Project Objectives

The MCA assessor for the Fit with Project Objectives assessment criteria evaluated all five project objectives for the intersection and midblock options (against the current environment). The assessor's evaluations and scores for each option is summarised below.

##### **Safety Objective**

The MCA assessor advised that safety was assessed in a qualitative manner relying on the SATURN transport modelling results to understand the impact on flows and traffic re-assignment. This modelling was supplemented by more detailed SIDRA modelling of intersection performance to further understand queueing and delays.<sup>9</sup> In addition, a qualitative assessment of safety was also undertaken by considering initial intersection designs (including walking and cycling provisions).

Consideration was also given to the new Ō2NL highway from a Wellington Northern Corridor perspective. That is, whilst each interchange option was considered from a standalone perspective, consideration of the wider interchange layout was undertaken. For example, an at grade roundabout should not be located between two grade separated interchanges.

Where there was a known slope on an overpass structure, stopping sight distances for each option were assessed to ensure suitable visibility would be achieved.

##### **Queen Street Evaluation Summary**

Options Q0, Q1, Q2, Q4, Q5 and Q6 all recorded scores of 1, and were therefore considered to be the best performing options from a Safety Objective perspective. The MCA assessor noted that they had no material safety concerns with any of these options.

Option Q7 recorded a score of 2, which was one point worse than the best performing options. The MCA assessor noted that this inferior score was largely due to the concern that the steep gradient of the local road overbridge could result in braking and sight distance issues for traffic approaching SH57 from Tara-Ika.

Option Q3 recorded a score of 3, which was two points worse than the best performing options. The MCA assessor advised that the key reasons for this score was due to the likelihood that greater queueing would occur on the new Ō2NL highway generating safety risks (e.g. unexpected stop / starts at the roundabout). While this risk could be mitigated by constructing additional lanes, these lanes would create further weaving maneuvers which would carry their own safety risks.

Option Q8 recorded a score of 3, which was also two points worse than the best performing options. The MCA assessor's key concerns with this option included:

- All local traffic travelling to and from Tara-Ika would need to cross a high-speed highway via a large multi lane roundabout

---

<sup>9</sup> It is noted that crash models from the crash estimation compendium were considered as a method of assessment, however as the traffic volumes for which the models are valid and the expected flows on the new Ō2NL highway did not overlap for all options, the models were deemed to not be suitable for this assessment

- SIDRA transport modelling had shown delays for several minutes for two approaches by 2049. At this point, risky gap taking would become an issue as drivers were likely to become frustrated, and
- Future capacity issues could be resolved by making sections of the roundabout 3 lanes, which would increase the amount of lane changing within the roundabout, further increasing crash risk.

### ***Tararua Road Evaluation Summary***

All options recorded scores of 1 (except for Option T3) and were therefore considered to be the best performing options from a Safety Objective perspective. Other than Option T3, the MCA assessor advised that there were no material safety concerns with these options.

For Option T3, which scored a 3 (which is two points worse than the best performing options), the MCA assessor advised that there would be increased braking and stopping safety risks created by an at-grade roundabout on the new Ō2NL highway.

### ***Midblock Evaluation Summary***

Both Options 1 and 2 recorded scores of 1. The MCA assessor advised that the level of the new Ō2NL highway raised no material Safety Objective concerns.

### **Resilience Objective**

The MCA assessor advised that the Resilience Objective evaluated the following elements:

- The ability of the intersection to facilitate travel on the alternative route (i.e. the existing SH1 and the new Ō2NL highway)
- The impacts on the network if there is a crash at the intersection, and
- The potential of a natural hazard causing the new Ō2NL highway to close.

The MCA assessor advised that they had not considered the engineering difficulty of preventing a closure [as this was covered by the EDoD evaluation criteria (see below)].

### ***Queen Street Evaluation Summary***

Options Q1, Q2, Q4, Q5, Q6 and Q7 all recorded scores of 1, and were therefore considered to be the best performing options from a Resilience Objective perspective. The MCA assessor advised that these options were preferred as they were either fully above, or only partially below, maximum groundwater (and therefore less likely to be affected by flooding).

Option Q0 recorded a score of 2, which was one-point worse than the best performing options. The MCA assessor advised that large storm events (e.g. 1:100 year events) could force short closures of the new Ō2NL highway if this option was pursued.

Option Q3 and Q8 both recorded scores of 2, which was also one-point worse than the best performing options. The MCA assessor advised that at grade roundabouts on the new Ō2NL highway (at either location) would create crash risks that were likely to impact on traffic in both directions.

### ***Tararua Road Evaluation Summary***

All options recorded scores of 1 (except for Option T3), and therefore were considered to be the best performing options from a Resilience Objective perspective. Except for Option T3, the MCA assessor advised that they had no material resilience concerns with these options.

Option T3 recorded a score of 2, which was one point worse than the best performing options. The MCA assessor advised that its inferior score was due to an at-grade roundabout on the new Ō2NL highway creating crash risks that were likely to impact on traffic in both directions.

### ***Midblock Evaluation Summary***

Both Options 1 and 2 recorded scores of 1. The MCA assessor advised that the level of the new Ō2NL highway would have no impact on operability in the event of a crash and there were no concerns over slope stability.

## **Appropriate Connections**

The MCA assessor advised that the evaluation of the Appropriate Connections Objective focused on assessing intersection forms in relation to the current road environment, the potential future road environment as well as the wider One Network Road Classification (ONRC) system (and corresponding Customer Levels of Service).

### **Queen Street Evaluation Summary**

Options Q0, Q1, Q2, Q5, Q6 and Q7 all recorded scores of 1, and were therefore considered to be the best performing options from an Appropriate Connections Objective perspective. The MCA assessor noted that they hadn't identified any material concerns with these options.

Option Q4 recorded a score of 2, which was one point worse than the best performing options. The MCA assessor noted that this option would sever Queen Street (which could have impacts on future public transport connections), however the Central Spine Connection for Tara-Ika was consistent with the direction recommended in the draft Horowhenua Network Operating Framework<sup>10</sup> (hence its score of 2).

Option Q3 recorded a score of 3, which was two points worse than the best performing options. The MCA assessor advised that the key concern with this option was the presence of an at-grade roundabout on the new Ō2NL highway, which would be inconsistent with the ONRC's National High Volume Road criteria (which prioritises state highway through traffic).

Option Q8 recorded a score of 3, which was two points worse than the best performing options. The MCA assessor noted that their key concerns with this option were as follows:

- Northbound traffic on the new Ō2NL highway would be giving way to Queen Street East traffic, representing a significant give-way disparity between ONRC classes at an intersection (e.g. a National High Volume route giving way to an Arterial or a lower class route), and
- It forces purely local traffic into a 100m diameter dual lane roundabout with an anticipated 100 km/h speed limit.

The MCA assessor also noted that the impact of the priority favouring Queen Street East traffic over northbound Ō2NL traffic was considered to be significant due to the high traffic volumes expected to be on Queen Street East as a consequence of the Tara-Ika development.

### **Tararua Road Evaluation Summary**

All options recorded scores of 1 (except for Option T3), and were therefore considered to be the best performing options from an Appropriate Connections perspective. Except for Option T3, the MCA assessor advised that they had no material concerns with the options.

For Option T3, which scored a 3 (which is two points worse than the best performing options), the MCA assessor advised that an at-grade roundabout on the new Ō2NL highway would be inconsistent with the National High Volume Road criteria under the ONRC (which prioritises state highway through traffic).

### **Midblock Options**

Both Options 1 and 2 recorded scores of 1. The MCA assessor noted that the level of the highway would have no impact on the Appropriate Connectivity Objective.

### **Mode Choice Objective**

The MCA assessor advised that the evaluation of the Mode Choice Objective included assessing whether a specific east-west active modes facility would be provided, if there were any issues posed by the option's gradient and if there were any difficulties expected for active mode users navigating the area by means of the road form or volumes. In determining final scores, the assessor noted that priority was assigned to both pedestrians and cyclists as per the direction of the draft Horowhenua Network Operating Framework.

---

<sup>10</sup> Draft Horowhenua Network Operating Framework, GHD, October 2021

### ***Queen Street Evaluation Summary***

Options Q0, Q1, Q2, Q3, Q5, Q6 and Q8 all recorded scores of 1, and were therefore considered the best performing options from a Mode Choice Objective perspective. The MCA assessor noted that these options all provided separated active mode facilities and had limited gradients for active mode users to traverse.

Option Q4 recorded a score of 2, which was one point worse than the best performing options. The MCA assessor noted that this score was premised on this option's active mode facility's gradient being about seven percent, which would not be desirable for active mode users.

Option Q7 recorded a score of 2, which was one point worse than the best performing options. The MCA assessor noted that this score was premised on this option's active mode facility's gradient been about eight percent, which would not be desirable for active mode users. The assessor noted that such a gradient could also create safety issues for active mode users.

### ***Tararua Road Evaluation Summary***

Option T3 recorded a score of 1, and was therefore considered the best performing option from a Mode Choice Objective perspective. The MCA assessor noted that this option was preferred as a specific overbridge facility would be provided for active mode users so they could avoid the roundabout on the new highway.

All of the other options recorded scores of 2, which was one point worse than the best performing options. The MCA assessor noted that the key reason for these inferior scores was they would all require active mode users to traverse three roundabouts, which is less desirable from an active mode perspective.

### ***Midblock Options***

Option 2 recorded a score a 1, whereas Option 1 recorded a score of 2. Accordingly, Option 2 was considered the best performing option from a Mode Choice Objective perspective. The MCA assessor advised that Option 2 would provide an opportunity to reduce the gradient of the Tara-Ika Central Spine connection (e.g. overbridge) onto SH57.

### ***Enhanced Movement Objective***

The MCA assessor advised that the Enhanced Movement Objective was evaluated by assessing travel times (using the SATURN and SIDRA transport models) on key routes through the Ō2NL Project Area.

### ***Queen Street Evaluation Summary***

Options Q0, Q1, Q2, Q4, Q5, Q6 and Q7 all recorded scores of 1, and were therefore considered to be the best performing options from an Enhanced Movement Objective perspective. The MCA assessor advised that these options were unlikely to create delays on the key travel routes (i.e. when compared to previous travel time assessments undertaken for the draft Ō2NL DBC), with the new Ō2NL highway providing approximately 10 minute travel time savings for journeys from Ōtaki to North of Levin (via SH1 or SH57) and 5 minute travel time savings for trips from Ōtaki to Levin.

Option Q3 recorded a score of 2, which was one point worse than the best performing options. The MCA assessor advised that this option's inferior score was due to the at-grade roundabout disrupting journey times for state highway traffic. The assessor did note however that this option would generate journey time benefits for local east / west trips to and from the Levin Town Centre.

Option Q8 recorded a score of 3, which was two points worse than the best performing options. The MCA assessor advised that this score was due to its journey time disbenefits created by a 5 arm roundabout (e.g. it could create delays on the SH57 approaches in the PM peak in the 2049 future year, and add journey time delays for local trips to and from Tara-Ika to the Levin Town Centre).

### ***Tararua Road Evaluation Summary***

All options recorded scores of 1 (except for Option T3), and were therefore considered to be the best performing options from an Enhanced Movement Objective perspective. Other than Option T3, the MCA assessor advised that these options would not impact on journey times.

Option T3 recorded a score of 2, which was one point worse than the best performing options. The MCA assessor advised that this score was due to its journey time disbenefits created by an at grade roundabout.

### **Midblock Options**

Both Options 1 and 2 recorded scores of 1. The MCA assessor noted that the level of the highway would have no impact on the Journey Time Objective.

See **Appendix D** (Fit with Project Objectives Assessment Report) for the MCA assessor's detailed assessment report.

#### **6.1.1.2. Iwi Cultural Values (Muaūpoko)**

The MCA assessor for Muaūpoko advised that its objective for the MCA was to follow Whāia te tika me te pono o Muaūpoko (that is, to follow Muaūpoko lore). This meant that Muaūpoko needed to:

- Tiakina te mana o te wai (protect the spiritual and cultural qualities of water), and
- Tiakina ngā tohu whenua me te wairuatanga (protect the spiritual and cultural features within the landscape).

The MCA assessor used the following assessment criteria for evaluating the intersection and midblock options against the current environment (all criteria were equally weighted):

- Papatūānuku me tōna toto (earthworks and groundwater dynamics)
- Te mana o ngā awa [the mauri (lifeforce) of surface waters]
- Taonga (the role of taonga species as kaitiaki in the landscape), and
- Ngā ara wairua (interactions with spiritual pathways and connections).

The MCA assessor also advised that the Core Principles developed for the Ō2NL Project had been used to guide their evaluation of the options (See Section 2).

As a general comment, the MCA assessor noted that the new Ō2NL highway alignment was chosen in partnership with Muaūpoko, and therefore avoided a wide range of cultural sites, features and landscapes. Consequently, Muaūpoko understand that there is a functional need for the highway to exist in the east of Levin location, however it does not accept that there is a functional need for a cutting. While cultural effects (i.e. cutting into the earth and perturbation of local water soakage) exist for at grade road construction and operations, these effects were considered reasonable, and could be remedied or mitigated. Thus, at grade options were scored a 1 for the criteria "Papatūānuku me tōna toto" as these options presented fewer difficulties for Muaūpoko. However, above grade options scored more poorly due to the need for extensive piling, while cutting options were scored as Fatal Flaws.

### **Queen Street Evaluation Summary**

Options Q0, Q1 and Q2 scores were recorded as Fatal Flaws. The MCA assessor advised that these options were completely unacceptable to Muaūpoko as cutting into the Horowhenua gravels would introduce an adverse effect on the Horowhenua landscape / Papatūānuku me tōna toto that could not be appropriately avoided.

Option Q5 recorded a score of 1, and therefore was considered to be the best performing option for Muaūpoko. The MCA assessor advised that the closure of Queen Street East (and cul-de-sac design) and walking and cycling facilities is considered to be a good opportunity to enhance / develop connections with ara wairua and development of mahi toi.

Options Q3 and Q4 recorded scores of 2, which was one point worse than the best performing option. For Option Q3, the MCA assessor advised that construction works for this option would have the potential to impact the role of Mokomoko and ngata as kaitiaki, but the walking / cycling bridge with a lookout and development of mahi toi (Māori artworks) would help with connections with ngā ara wairua. For Option Q4, the assessor noted the closure of Queen Street East (and cul-de-sac design) is considered a good opportunity to develop connections with ara wairua and development of mahi toi (however as the design of Option Q4 stood there would be adverse effects on ara wairua).



Option Q8 also recorded a score of 2<sup>11</sup>, which was one point worse than the best performing option. The MCA assessor advised that this option had opportunity to enhance the role of kaitiaki and walking / cycle connections with ngā ara wairua. The assessor noted that this option may have impacts on surface water quality as a result of building new local roads.

Both Options Q6 and Q7 recorded scores of 3<sup>12</sup>, which was two points worse than the best performing option. The MCA assessor advised that both options would minimise impacts on ngā ara wairua. However, noise and vibration would impact the role of kaitiaki during construction, and therefore mitigation would be required.

### ***Tararua Road Evaluation Summary***

Options T0, T1 and T2 scores were recorded as Fatal Flaws. The MCA assessor advised that these options were completely unacceptable to Muaūpoko as cutting into the Horowhenua gravels would introduce an adverse effect on the Horowhenua landscape / Papatūānuku me tōna toto that could not be appropriately avoided.

Option T3 recorded a score of 1<sup>13</sup>, and was therefore considered the best performing option for Muaūpoko. The MCA assessor advised that this option would not impact kaitiaki within the landscape, it would interact with the Waiporoporo track and retain connections between Tararua Ranges and Te Moana o Raukawakawa.

Options T6 and T7 both recorded scores of 3<sup>14</sup>, which was two points worse than the best performing option. The MCA assessor advised that both options would impact on connections between Tararua Ranges and Te Moana o Raukawakawa, however there was a preference for Tararua Road to be elevated over the new Ō2NL highway to allow Muaūpoko to access mountain and moana views.

### ***Midblock Evaluation Summary***

Option 2 recorded a Fatal Flaw. The MCA assessor advised this option was completely unacceptable to Muaūpoko as cutting into the Horowhenua gravels would introduce an adverse effect on the Horowhenua landscape / Papatūānuku me tōna toto that could not be appropriately avoided.

Option 1 recorded a score of 1, and was considered to be the best performing option for Muaūpoko. The MCA assessor advised that this option presented few difficulties for Muaūpoko. The assessor did note that water (e.g. water soakage from an at grade road) could be managed in a way that supports mauri.

See **Appendix E** (Muaūpoko Tribal Authority Assessment Report) for the MCA assessor's detailed assessment report.

#### **6.1.1.3. Terrestrial Ecology**

Referencing the Ecological Impact Assessment NZ guidelines,<sup>15</sup> the Ecology MCA assessor evaluated the terrestrial ecology constraints of the intersection and midblock options (against the current environment) by assessing the following constraint evaluation criteria (all sub-constraint criteria were equally weighted):

- Ecosystems
- Species, and
- One Plan Schedule F [Threaten or At-Risk habitat (Threatened or At-Risk)].

---

<sup>11</sup> It is noted that Q8 was scored a 1.75 in the Muaūpoko Assessment Report, however this was rounded up to 2 to ensure scoring consistency across all MCA assessors

<sup>12</sup> It is noted that Q7 was scored a 2.5 in the Muaūpoko Assessment Report, however this score was rounded up to 3 to ensure scoring consistency across all MCA assessors

<sup>13</sup> It is noted that T3 was scored a 1.25 in the Muaūpoko Assessment Report, however this score was rounded down to 1 to ensure scoring consistency across all MCA assessors

<sup>14</sup> It is noted that T6 scored a 2.75 in the Muaūpoko Assessment Report, however this score was rounded up to 3 to ensure scoring consistency across all MCA assessors. Similarly, T7 was scored a 2.5, which was rounded up to 3

<sup>15</sup> <https://www.eianz.org/document/item/4447>

### ***Queen Street Evaluation Summary***

Options Q0, Q1 and Q2 scores were recorded as Fatal Flaws. The MCA assessor advised that these options were fatally flawed due to potential adverse impacts on local groundwater systems that were likely to be supplying the native bush (remnant) blocks located near the Prouse Homestead.

Except for Options Q6 and Q7, all of the remaining options, recorded scores of 1, and were therefore considered the best performing options from a terrestrial ecology perspective. The MCA assessor noted that these options scored 1s as they were considered to have minimal terrestrial ecology interactions or impacts.

Both Options Q6 and Q7 recorded scores of 2, which was one point worse than the best performing options. The MCA assessor advised that the key reason for these inferior scores included that there was a possibility that construction activities could impact on the native bush blocks located near the Prouse Homestead.

### ***Tararua Road Evaluation Summary***

All options recorded scores of 1, as such, there was no best performing option identified from a terrestrial ecology perspective. The MCA assessor advised that the options were likely to present few difficulties at the location as it was denuded, cultivated and dry.

### ***Midblock Evaluation Summary***

Option 1 recorded a score of 1 and Option 2 recorded a Fatal Flaw score. The MCA assessor preferred that the new Ō2NL highway be at-grade as it would have minimal interaction or impacts on terrestrial ecology. In contrast, Option 2 would have highly negative impacts on existing groundwater systems that were likely to supply the native bush (remnant) stands located near the Prouse Homestead (and therefore was fatally flawed from a terrestrial ecology perspective).

See **Appendix F** (Ecology Assessment Report) for the MCA assessor's detailed assessment report.

#### **6.1.1.4. Freshwater / Wetlands Ecology**

Referencing the Ecological Impact Assessment NZ guidelines, the Ecology MCA assessor evaluated the freshwater / wetland ecology constraints of the intersection and midblock options (against the current environment) by assessing the following constraint criteria (all sub-criteria were equally weighted):

- Ecosystems
- Species, and
- One Plan Schedule B [i.e. Site of Significant – Aquatic (SOS-A), SOS – Riparian (SOS-R) and Natural State].

### ***Queen Street Evaluation Summary***

Options Q4, Q5 and Q8 recorded scores of 1, and therefore were considered the best performing options from a freshwater / wetland ecology perspective. The MCA assessor advised that these options were at-grade, and would present few difficulties for local freshwaters or wetlands.

Option Q3, Q6 and Q7 recorded scores of 2, which was one point worse than the best performing options. The MCA assessor advised that the key reason for these inferior scores was that construction works would be near the native bush (remnant) stands located near the Prouse Homestead.

Options Q0, Q1 and Q2 all recorded scores of 5, which was four points worse than the best performing options. The MCA assessor advised that these options were almost fatally flawed due to their potential adverse effects on overland flow management and stormwater management.

### ***Tararua Road Evaluation Summary***

All options recorded scores of 1, as such, there was no best performing option identified from a freshwater / wetland perspective. The MCA assessor advised that the options were likely to present few difficulties at the location as it was denuded, cultivated and dry freshwater / wetland ecology.

### **Midblock Evaluation Summary**

Option 1 was recorded a score of 1 whilst Option 2 recorded a score of 5. The MCA assessor preferred that the new Ō2NL highway be at-grade as it would have minimal interaction or impacts on local freshwaters and wetlands. In contrast, Option 2 scored poorly due to the potential adverse effects on overland flow management and stormwater management (and was closed to recording a fatal flaw score).

See **Appendix F** (Ecology Assessment Report) for the MCA assessor's detailed assessment report.

#### **6.1.1.5. Landscape / Visual / Urban Design**

The MCA assessor evaluated the Landscape / Visual and Urban Design effects of the intersection and midblock options (against the current environment) by responding to the following sub assessment criteria (all sub-criteria were equally weighted):

- **Visual effects** (i.e. visual effects related to the new infrastructure and moving traffic, including night-time lights)
- **Connectivity** (e.g. connectivity relates to connections between Tara-Ika and Levin along the local roads): Factors influencing local connectivity include legibility (straight is best), grade (at-grade is best), amenity (underpasses generally less preferable), directness (short is best) and the nature of intersections (roundabouts are impediments to cyclists and pedestrians). It is also influenced by the relationship of the road to the street network ('space syntax'), and
- **Landform** (e.g. landform includes potential effects such as earthworks on the intrinsic values of the landform including its groundwater, and on the legibility of the landform surface): The landscape perspective of the landform assessment focuses on the legibility of the landform which in this instance relates mainly to the flat land surface (noting that the intrinsic values of Kei te Whakahoro te Whenua landform<sup>16</sup> are addressed as a cultural effect through the Iwi values assessment).

### **Queen Street Evaluation Summary**

Options Q0 and Q4 both recorded scores of 2, and were considered the best performing options from a Visual / Landscape / Urban Design perspective for the following key reasons:

- For Option Q0, there would be moderate visual effects (e.g. traffic and noise walls would be screened from close quarters). In terms of legibility and landform, Option Q0 would retain the existing Queen Street alignment (which was preferable). The MCA assessor did acknowledge that there would be effects on the Kei te Whakahoro te Whenua landform, but that the existing legibility of the broad landform would be retained, and
- For Option Q4, there would be moderate visual effects (e.g. traffic and noise walls would be screened from close quarters), although the visual effects from the Central Spine / Liverpool bridge connection on nearby properties may be more than moderate. This connection however would provide benefits between Tara-Ika and Levin, and its (proposed) straight alignment would be preferable from a legibility perspective.

Options Q1, Q3, Q6 and Q7 all recorded scores of 3, which was one point worse than the best performing options. The MCA assessor's key reasons are summarised as follows:

- For Option Q1, there would be low visual effects as it would be located below ground level and traffic would be largely screened (and noise walls would be avoided). However, the Queen Street diversion would reduce legibility and the bridge elevation would act as a small impediment to pedestrians and cyclists. In addition, there would be some localised effects on the legibility because of both cuts and fills, although the legibility of the broad landform surface would be retained
- For Option Q3, there would be moderate adverse visual effects and therefore noise walls were likely to be required). Queen Street East would have moderate connectivity. However, the connection between Tara-Ika and Levin would be weakened by the need for local traffic to interact with SH1

---

<sup>16</sup> The Kei te Whakahoro te Whenua (the great landslide) landform is from which Horowhenua takes its name. This is the landform that gently slopes between the Arapapepae foothills of the Tararua Ranges to Waipunahau (Lake Horowhenua)

traffic. The roundabout would be a barrier for pedestrians and cyclists. While the footbridge would mitigate this adverse effect, it would require a seven-metre climb with relatively steep ramps. There would be reduced effects on the legibility of the Kei te Whakahoro te Whenua landform surface because both the highway and local road would be close to grade

- For Option Q6, there would be a high visual effect as it would be elevated on a flyover. However, Queen Street East would retain high connectivity and legibility given it would retain its current straight alignment and be at grade. There would be some localised effects on the legibility of the Kei te Whakahoro te Whenua landform because of the fills placed on the surface, although the legibility of broad landform surface would be retained, and
- For Option Q7, there would be moderate to high adverse visual effects due to the likely prominence of the Queen Street East overbridge, which would be exacerbated by its inconsistency with the existing landscape pattern. Queen Street East would retain moderate connectivity between Tara-Ika and Levin, but its seven-metre change in grade is likely to be an impediment for pedestrians and cyclists. There would be localised effects on legibility of the Kei te Whakahoro te Whenua landform surface because of the fills to construct ramps.

Options Q2, Q5 and Q8 all recorded scores of 4, which was two points worse than the best performing options. The MCA assessor's key reasons for recording these scores are as follows:

- For Option Q2, there would be moderate to high adverse visual effects (e.g. the highway would be two metres in height). There would be low to moderate connectivity effects on Queen Street (e.g. the underpass would have poor amenity and the deviation from the straight alignment would reduce legibility). The 4.5 metre change in grade would be a disincentive for pedestrians and cyclists. There would be some localised effects on the legibility of the Kei te Whakahoro te Whenua landform because of both cuts and fills, although the legibility of the broad landform surface would be retained
- For Option Q5, there would be moderate adverse visual effects (e.g. road and traffic would be visible at grade and the overbridge would be prominent). Connectivity between Queen Street East and Levin would be relatively poor (low). It would require a significant deviation (roughly 900 metres) from the straight alignment and it would have poor legibility. The new road would not tie logically into the Tara-Ika development because the new roundabout would be opposite a no-exit rural residential enclave (Redwood Close). It would have poor space syntax. There would be some localised effects on the legibility of the Kei te Whakahoro te Whenua landform because of fills placed on the surface, although the legibility of broad landform surface would be retained, and
- For Option Q8, there would be low-moderate adverse visual effects. The visual effects of the roundabout would be partly offset by the removal of the proposed SH1 / SH57 (new Ō2NL highway) roundabout further north. This would have benefits by enabling Arapaepae Road to maintain its straight alignment in keeping with landscape patterns to the north. Connectivity between Queen Street East and Levin would be relatively poor (low-moderate). It would require a significant deviation (roughly 700 metres) from Queen Street's straight alignment, the connection with Levin would have poor legibility (it would depend on signage or memory). The roundabout would further diminish connectivity between Tara-Ika and Levin because of the need for local traffic to interact with SH1 and SH57 traffic. There would be low effects on legibility of the Kei te Whakahoro te Whenua landform surface because the roundabout would be at grade.

### ***Tararua Road Evaluation Summary***

Option T0 recorded a score of 2, and was therefore considered the best performing option from a Visual / Landscape / Urban Design perspective. The MCA assessor's score was due to the likelihood of the new Ō2NL highway been effectively screened from nearby properties. In terms of connectivity, Option T0 would maintain the existing straight and at-grade alignment of the local road, which was preferable. There would be some effects on the legibility of the Kei te Whakahoro te Whenua landform through the cut into the surface although the legibility of the broad landform surface would be retained.

Options T1, T3, T6 and T7 all recorded scores of 3, which is one point worse than the best performing option. The MCA assessor's key reasons for these scores are as follows:

- For Option T1, there would be low to moderate adverse visual effects as the new Ō2NL highway would be largely screened by the trench, however the elevated roundabouts, highway ramps, and Tararua Road bridge would be more prominent. Option T0 would provide moderate connectivity between Tara-Ika and Levin as the existing straight alignment of the local road would be maintained. There would be adverse effects on the legibility of the Kei te Whakahoro te Whenua landform through the cut into the surface and the broad fill required to accommodate the ramps and roundabouts
- For Option T3, there would be moderate to high adverse visual effects as a consequence of the new Ō2NL highway (and its traffic) been prominent. Option T3 would also provide relatively poor (low to moderate) connectivity between Tara-Ika and Levin. That is, it would maintain the existing straight alignment of the local road, but there would be a three metre change in grade and poor amenity in the underpass. There would be adverse effects on the legibility of the Kei te Whakahoro te Whenua landform through the fill used to create the ramps and the broad cut into the surface to accommodate the roundabouts and underpass
- For Option T6, there would be high adverse visual effects because the new Ō2NL highway would be elevated on a flyover. Tararua Road would retain moderate connectivity and legibility given it would retain its current straight alignment and be at grade. For similar reasons (straight, at grade) there would be reasonable amenity in the underpass although the combination of double-roundabouts and an underpass would be a disincentive for pedestrians and cyclists. There would be some effects on the legibility of the Kei te Whakahoro te Whenua landform through fill been placed on the surface, although the legibility of the broad landform surface would be retained, and
- For Option T7, there would be moderate to high adverse visual effects. While the new Ō2NL highway would be at grade, the ramps, roundabouts, and local bridge would be elevated with a large footprint. Tararua Road would retain moderate to low connectivity. Legibility will be retained given it would retain the current straight alignment. The double roundabouts and associated elevation would however provide a barrier to connections between Tara-Ika and Levin. There would be adverse effects on the legibility of the Kei te Whakahoro te Whenua landform through the fill required to construct the broad ramps. The broad landform surface would be retained.

Option T2 was the least preferred option by the MCA assessor as it would have moderate to high adverse visual effects due to the new Ō2NL highway (and its traffic) being elevated. It would provide relatively poor (low to moderate) connectivity between Tara-Ika and Levin. It would maintain the existing straight alignment of the local road, but there would be a three metre change in grade and poor amenity in the underpass. There would be adverse effects on the legibility of the Kei te Whakahoro te Whenua landform through the fill created for the ramps and the broad cut into the surface to accommodate the roundabouts and underpass.

### **Midblock Evaluation Summary**

Option 1 was scored a 3 and Option 2 was scored a 2. Accordingly, Option 2 was the best performing option from a Visual / Landscape / Urban Design perspective.

Option 2's superior score was due to it been located in a shallow trench, and therefore would have low visual effects (especially on the Tara-Ika development). In addition, the east-west Central Spine / Liverpool Street extension (e.g. overbridge) would have reduced visual effects due to its lower elevation. It would also improve connectivity for local connections due to the reduce ramp gradient across the new Ō2NL highway. There would be some effects on the legibility of the Kei te Whakahoro te Whenua landform through a long trench. The broad landform, though, would still be perceived as a surface either side of the highway.

Option 1 would have moderate adverse visual effects (e.g. noise walls up to three metres high). In addition, the elevated Central Spine Road / Liverpool Street extension and the two strategic cycleways (as shown on the Tara-Ika Structure Plan) would have visual effects to some degree. The elevation of the bridges would detract from connectivity. There would however be low effects on the legibility of the Kei te Whakahoro te Whenua landform because the highway would be at grade.

See **Appendix G** (Landscape / Visual / Urban Design Assessment Report) for the MCA assessor's detailed assessment report.

#### **6.1.1.6. Heritage**

The MCA assessor evaluated the built heritage effects of the intersection and midblock options against the current situation.

The MCA assessor advised that the only heritage building potentially impacted by the options was the Prouse Homestead (also referred to as “Ashleigh”). Its value grading is ranked<sup>17</sup> as medium, meaning it is of high or medium importance, regional scale, category 1 or 2 Heritage New Zealand Pouhere Taonga (HNZPT) listing. It is noted that the homestead is not listed by HNZPT nor is it identified in the Horowhenua District Plan’s Schedule 2: Historic Heritage – Buildings, Structures and Sites.

The MCA assessor noted that none of the intersection or midblock options were likely to directly impact on the Prouse Homestead nor would impinge on its property boundaries. Therefore, any impacts on the building and property would be indirect only. Accordingly, the MCA assessor advised that they had used the following sub-criteria (all sub-criteria were equally weighted) to assess the options<sup>18</sup>:

- Visual
- Noise, and
- Amenity.

#### ***Queen Street Evaluation Summary***

Option Q0 recorded a score of 1, and was therefore considered the best performing option from a Heritage perspective. The MCA assessor advised that this option would have negligible noise, visual and amenity impacts from these options on the Prouse Homestead.

Options Q2, Q3, Q5, and Q8 all recorded a score of 2, which was one point worse than the best performing option. The MCA assessor advised that there was likely to be minor noise, visual and amenity impacts from these options on the Prouse Homestead.

Options Q3 and Q6 recorded scores of 3, which was two points worse than Q0. The MCA assessor noted that both options would have moderate impacts on the Prouse Homestead, including:

- The noise from both Queen Street and the new Ō2NL highway would introduce new noise impacts on the homestead, and
- Although the historic access to the Prouse Homestead will not change, the view from the entry gates will be modified.

#### ***Tararua Road Evaluation Summary***

All of the Tararua Road options recorded scores of 1, and were therefore considered the best performing options from a Heritage perspective. The MCA assessor advised that these scores were due to the fact there was no built heritage places located in the Tararua Road locality.

#### ***Midblock Evaluation Summary***

Both Options 1 and 2 recorded scores of 1. The MCA assessor advised that these scores were due to the fact there was no built heritage places located in the Tararua Road to Queen Street locality.

See **Appendix H** (Heritage Assessment Report) for the MCA assessor’s detailed assessment report.

#### **6.1.1.7. Archaeology**

The MCA assessor evaluated the archaeology impacts of the intersection and midblock options against the current environment. The assessor noted that they had applied the same assessment

---

<sup>17</sup> As per Waka Kotahi’s “Guide to assessing cultural heritage effects for state highway projects” March 2015, Guideline 2 Transport Agency built heritage assessment report template”. See: <http://www.WakaKotahi.govt.nz/assets/resources/guide-to-assessing-cultural-heritage-effects/docs/historicheritage-impact-assessment-guide-2015.pdf>

<sup>18</sup> The MCA assessor noted that there were no vibration effects on the Prouse Homestead, so this potential sub-assessment criteria was not evaluated

methodology as applied for the new highway alignment assessments for Zone F, G, H and K (as set out in the Ō2NL DBC MCA Summary Report 2021<sup>19</sup>).

The MCA assessor noted that the only archaeological site in the east of Levin area was the Prouse Homestead, although there was potential for other archaeological sites to be discovered during construction.

#### ***Queen Street Evaluation Summary***

All options recorded scores of 1 (except Option Q7), and were therefore considered the best performing options from an Archaeology perspective. The MCA assessor noted that these options presented few difficulties and could provide significant benefits (e.g. discovery of new archaeological information during construction).

Option Q7 recorded a score of 2, which was one point worse than the best performing options. The MCA assessor advised that the adverse effects of this option would be less than minor, however research undertaken for the Ō2NL Project had indicated that there might be some archaeological sites (e.g. former pre-1900 houses) present in this option's general locality.

#### ***Tararua Road Evaluation Summary***

All of the Tararua Road options recorded scores of 1, and were therefore considered the best performing options. The MCA assessor noted that these options presented few difficulties and could provide significant benefits (e.g. discovery of new archaeological information during construction).

#### ***Midblock Evaluation Summary***

Both Options 1 and 2 recorded scores of 1. The MCA assessor noted that these options presented few difficulties and could provide significant benefits (e.g. discovery of new archaeological information during construction). The assessor did note that a potential Māori track, linking Lake Horowhenua / Werarua clearing to the Tararua foothills, could be present in the Tararua Road to Queen Street locality.

See **Appendix I** (Archaeology Assessment Report) for the MCA assessor's detailed assessment report.

#### **6.1.1.8. Noise / Vibration**

The MCA assessor evaluated the intersection and midblock options against the current situation. This assessment considered the potential noise effects on nearby Protected Premises and Facilities (PPF) using the following methodologies:

- For the Queen Street and Tararua Road intersection options, the evaluation was made on a qualitative basis considering the noise characteristics generated by the different intersection types
- For the Queen Street intersection, the effect of the change in horizontal and vertical alignment was also assessed on a qualitative basis, and
- For the midblock option, a quantitative assessment was made on the likely noise impacts on nearby PPFs (using computer noise modelling).

The MCA assessor advised that the noise assessment methodology / approach undertaken for this MCA was consistent with the processes undertaken for the Ō2NL MCA Summary Report 2021.

#### ***Queen Street Evaluation Summary***

Options Q0, Q1, Q2, Q4, Q5, Q6 and Q7 all recorded scores of 3, and therefore were considered the best performing options from a Noise / Vibration criteria perspective.

For Options Q0, Q1 and Q2, positive noise / vibration attributes for these options included traffic on the new Ō2NL highway and Queen Street being uninterrupted (i.e. there would be no stopping / starting) and the use of barriers (e.g. concrete barriers) would help to reduce noise nuisance. Options Q4 and Q5 also had the same positive noise / vibration attributes, and in addition, there would be fewer nearby

---

<sup>19</sup> See Section 7.2.2.5 of the Ō2NL DBC MCA Summary Report 2021

PPFs affected by both options (when compared to the other options). For Option Q7, there would be the same positive noise attributes, and in addition, this option would have reduced effects on the Prouse Homestead as it would be located further away.

The key negative noise effects for Options Q3 and Q8, which both scored a 5, was that traffic on both the new Ō2NL highway (and on Queen Street for Option Q3) would be interrupted by the roundabout and would therefore have increased braking and accelerating noise effects on nearby PPFs.

#### ***Tararua Road Evaluation Summary***

All of the Tararua Road options scored negatively. Options T0, T1, T2, T6 and T7 all scored 4s, and therefore were considered the best performing options from a Noise / Vibration criteria perspective.

A common positive noise attribute for the best performing options was that traffic on the new Ō2NL highway would be uninterrupted (i.e. there would be no stopping / starting noise effects) and the use of barriers (e.g. concrete barriers) would help to disrupt noise nuisance. However, the spacing of the roundabouts and / or gradient of the overhead structures would create noise effects (but these were insufficient to result in any scoring changes).

Option T3's score of 5 was due to the noise effects from traffic being interrupted by the roundabout proposed for the new Ō2NL highway (that is, there would be increased braking and accelerating noise effects on nearby PPFs).

#### ***Midblock Evaluation Summary***

Both Options 1 and 2 recorded scores of 3.

For Option 1, the MCA assessor noted that NZS 6806 Category A was likely to be achieved for all residential sections in the Tara-Ika Masterplan. For Option 2, the assessor noted that the existing terrain screening would be of benefit from a noise effects perspective.

The MCA assessor noted that both options would have reduced noise effects on Arapaepae Road (as a result of highway through traffic shifting to the new Ō2NL highway) and there were options for further noise mitigation.

See **Appendix J** (Noise / Vibration Assessment Report) for the MCA assessor's detailed assessment report.

#### **6.1.1.9. Productive Land Values**

The MCA assessor evaluated the intersection and midblock options against the current situation. This assessment focused on the potential impacts of the options on Highly Productive Lands (HPL) and Highly Versatile Lands (HVL). The assessor noted that HPL included Land Use Class (LUC) 1, 2 and 3 whilst HVL included LUC 1, 2, 3e1 and 3e2.

#### ***Queen Street Evaluation Summary***

Options Q2, Q3, Q4, Q6 and Q7 recorded scores of 2, and therefore were considered the best performing options from a productive land's perspective. The assessor's advised that the key reasons for scores of 2 were as follows:

- Option Q2: Avoids impacting on any HVL (i.e. the land located to the immediate north of existing Queen Street), including the local road being on a "geological tilt" which would further help to minimise any impacts on existing HVL
- Option Q3, Q4 and Q6: These options avoid impacting on HVL (i.e. the land located to the immediate north of existing Queen Street), and
- Option Q7: Avoids impacting on HVL (i.e. the land located to the immediate north of existing Queen Street), although there may be some potential negative impacts on local soil hydrology (but this effect was not sufficient to change this option's score).

Options Q1 and Q5 recorded scores of 3, which was one point worse than the best performing options. The MCA assessor noted that both options would impact on HPL and HVL, which was not desirable. The



assessor also noted that there was also potential for both options to have negative impacts on local soil hydrology due to being located partially below grade.

Options Q0 and Q8 both recorded scores of 4, which was two points worse than the best performing option. For Option Q0, the MCA assessor was concerned with this option's potential effects on soil hydrology because it would be located below grade. For Option Q8, the assessor was concerned with the size of the main roundabout's "footprint" impact on existing HVL land located to the immediate north of existing Queen Street.

### ***Tararua Road Evaluation Summary***

Options T1, T2, T3, T6 and T7 all recorded scores of 3, and were therefore considered the best performing options. The MCA assessor's key reasons for these scores are summarised as follows:

- Option T1: Impacts on HPL and there could be potential negative effects on local soil hydrology (because it would be located partially below grade)
- Option T2: Impacts on HPL
- Option T3: Impacts on HPL, however the local road roundabouts could increase the size of the "footprint" impact
- Option T6: Impacts on HPL, and
- Option T7: Impacts on HPL and there could be potential negative effects on local soil hydrology.

Option T0 recorded a score of 4, which was one point worse than the best performing options. The MCA assessor advised the key reasons for this score included potential effects on local soil hydrology (as a consequence of being located partially below grade) combined with a large footprint impact.

### ***Midblock Evaluation Summary***

Option 1 scored a 2, and Option 2 scored a 3. The MCA assessor advised that although both options were located fully on HPL, Option 2's score was inferior as it would be located below grade and was likely to have impacts on local soil hydrology (in contrast Option 1 was at-grade and was expected to have less soil hydrology impacts).

See **Appendix K** (Productive Land Assessment Report) for the MCA assessor's detailed assessment report.

#### **6.1.1.10. Social / Community / Recreation**

The MCA assessor evaluated the social impacts of the intersection and midblock options against the current environment.

The MCA assessor's evaluation comprised of evaluating / scoring each option against the following sub-criteria (all sub-criteria were equally weighted):

- Impacts on way of life (how people carry out and get to their activities of daily living including consideration of access to and between communities and places / centres where people live, work, study and play)
- Impacts on community cohesion [connectivity between people including potential impacts relating to severance of communities and loss of communities (through the physical impact / land take of the project)]
- Impacts on health and wellbeing (this encompasses a state of complete physical, mental, social and spiritual wellbeing and is not merely the absence of disease or infirmity), and
- Impacts on the quality of the environment (the sense of place, identity and changes to the character and amenity of living environments and valued community characteristics).

### ***Queen Street Evaluation Summary***

Options Q0 and Q1 recorded scores of 2, and were considered the best performing options from a Social / Community / Recreation perspective. The MCA assessor's key reasons for preferring both options

included that there would be minimal disruption for way of life, community cohesion and health and wellbeing, however the new Ō2NL highway would create separation (albeit underground) that could create severance effects and potentially reduce the quality of the living environment.

Options Q2, Q3, Q5, Q7 and Q8 all recorded scores of 3, which was one point worse than the best performing options. The MCA assessor's overall reasons for each option's score of 3 are as follows:

- Option Q2: This option was likely to have some community cohesion and quality of environment impacts due to the visual presence / prominence of the new Ō2NL highway. Depending on how the underpass is constructed / perceived, this design element could have potential impacts on health and wellbeing and quality of the environment. There may also be severance effects created by the perceived physical 'division' between central and east Levin
- Option Q3: This option potentially disrupts the existing community in regard to the quality of living environment, community cohesion and way of life, and has the potential to make traversing Queen Street more difficult. The walking and cycling bridge may help to retain ease of movement and would be more desirable than an underpass
- Option Q5: An at grade new Ō2NL highway could create a real or perceived 'division' between east Levin and the wider community. Diverting Queen Street is also likely to disrupt existing recreation and service connections. There may be some potential benefits from the provision of dedicated walking and cycling access connections
- Option Q7: An at grade new Ō2NL highway could create a real or perceived 'division' between east Levin and the wider community and is likely to have quality of the environment impacts, and
- Option Q8: An at grade new Ō2NL highway could create a real or perceived 'division' between east Levin and the wider community. Diverting Queen Street is also likely to disrupt existing recreation and service connections. There may be some potential benefits from the provision of dedicated walking and cycling access connections.

Options Q4 and Q6 recorded scores of 4, which is two points worse than the best performing options. The MCA assessor's overall reasons for each options score of 4 are as follows:

- Option Q4: This option severs direct connections with central Levin for vehicles through the closure of Queen Street (and the Liverpool Street connection is not direct) which has the potential to increase perceived severance and isolation of east Levin residents. This option also has the potential to create a change in environment for those to the west as a consequence of traffic diverting to this area, and
- Option Q6: The elevated new Ō2NL highway design element will be visually prominent and could create real or perceived severance. Such an effect would reduce quality and enjoyment of the environment. Although a local road connection is retained the elevated highway represents a greater degree of change when compared to the at grade options.

### **Tararua Road Evaluation Summary**

Options T0, T1, T2, T3 and T7 all recorded scores of 3, and therefore were considered the best performing options from a Social / Community / Recreation assessment perspective. The MCA assessor's key reasons for preferring these options are summarised as follows:

- Options T0 and T1: Both options would minimise disruption to community cohesion and quality of environment as the new Ō2NL highway would be below grade, however the new roundabouts would introduce conflict points with high-speed traffic that would impact on ease of access
- Option T2: This option would minimise disruption to way of life, community cohesion, quality of the environment as the new Ō2NL highway would be below grade, however the new roundabouts would introduce conflict points with high-speed traffic and therefore have ease of access impacts. Depending on how the underpass is constructed / perceived, this design element could also have a potential impact on health and wellbeing and quality of the environment
- Option T3: This option would have quality of environment, community cohesion and way of life impacts, and could make traversing Tararua Road potentially more difficult. This option includes less conflict points than other options (e.g. east-west transport movements only need to traverse two

roundabouts), however interacting with high-speed through-traffic would have ease of access effects. Access for pedestrians and cyclists would be improved relative to other options through provision of a separate bridge, and

- Option T7: The at grade highway forms a physical 'division' that could have potential severance effects, create difficulties for local movements and impact on quality of the environment.

Options T6 recorded a score of 4, which is one point worse than the best performing options. The MCA assessor noted that an elevated new Ō2NL highway would be visible and may create a perceived barrier for local communities. Although a local road connection is retained the raised highway would reduce enjoyment of recreation and living environment and represents a greater degree of change when compared to the at grade options.

### ***Midblock Evaluation Summary***

Option 2 recorded a score of 2, and was considered the best performing option from a Social / Recreation / Community assessment perspective. The MCA assessor advised that locating the new Ō2NL highway below grade would be less visible and therefore potentially perceived as less of a severance than an at grade road.

Option 1 recorded a score of 3, which was one point worse than Option 2. The MCA assessor advised that this option presented some potential aspects of difficulty for community cohesion and quality of environment, including creating a perception of a physical barrier for the local community.

See **Appendix L** (Social / Community / Recreation Assessment Report) for the MCA assessor's detailed assessment report.

### **6.1.1.11. Horowhenua District Development**

The MCA assessor evaluated the district development impacts of the intersection and midblock options against the current environment. The assessment was based on the following planning / strategy documents:

- The Wellington Regional Growth Framework Report 2021
- The Horowhenua Growth Strategy 2040
- The 2015 District Plan provisions, and
- Proposed Plan Change 4 for the Tara-Ika development.

### ***Queen Street Evaluation Summary***

Option Q0 recorded a score of 1 and was the best performing option from a Horowhenua District Development perspective. The MCA assessor advised that this option was consistent with the intent of the planning / strategy documents, and in particular the direction of the District Plan and Horowhenua Growth Strategy.

Option Q1 was the next best performing option with a score of 2, which was one point worse than the best performing option. Although generally considered consistent with the planning / strategy documents, its potential negative urban design impacts could be considered to be inconsistent with some aspects of the planning / strategy documents (hence its score of 2).

Options Q2, Q3, Q5, Q6, Q7, and Q8 all recorded scores of 3. The key reasons for the MCA assessor's inferior scores for these options were as follows:

- Options Q2 and Q6: Potential adverse urban design impacts (from the elevated new Ō2NL highway) could be considered to be inconsistent with some aspects of the planning / strategy documents, and
- Options Q3, Q5, Q7 and Q8: An at-grade new Ō2NL highway could be considered to be inconsistent with some aspects of the planning / strategy documents, and may reduce connectivity between Tara-Ika and Levin (which is inconsistent with the District Plan).

Option Q4 recorded a score of 4, which was three points worse than the best performing option. The MCA assessor's key reasons for this inferior score included that local connectivity could be impacted from closing Queen Street and there could be adverse urban design impacts that could be inconsistent with

some aspects of the planning / strategy documents. The assessor also noted that there may be reduced connectivity between the Tara-Ika development and Levin (which is inconsistent with the District Plan).

### ***Tararua Road Evaluation Summary***

Option T0 recorded a score of 1, and was therefore the best performing option from a Horowhenua District Development perspective. The MCA assessor advised that this option was consistent with the intent of the planning / strategy documents, and in particular the direction of the District Plan and Horowhenua Growth Strategy.

Options T1, T2, T3, T6 and T7 all recorded scores of 3. The key reasons for the MCA assessors inferior scores for these options included:

- Options T1, T2, T6 and T7: Each option could have potential adverse urban design impacts (from the elevated design elements of each option) that could be considered to be inconsistent with some aspects of the planning / strategy documents, and
- Option T3: An at-grade new Ō2NL highway may have adverse urban design impacts (from the elevated design elements of each option) that could be considered to be inconsistent with some aspects of the planning / strategy documents, and there could be reduced connectivity for local traffic between Tara-Ika and Levin.

### ***Midblock Evaluation Summary***

Option 1 was scored a 1 and Option 2 was scored a 3. Accordingly, Option 1 was the best performing option from a Horowhenua District Development perspective as it was considered to be consistent with the direction of the planning / strategy documents.

Option 2's inferior score, which was two points worse than Option 1. The MCA assessor considered it could potentially have adverse urban design impacts that could be considered to be inconsistent with some aspects of the planning / strategy documents.

See **Appendix M** (Horowhenua District Development Assessment Report) for the MCA assessor's detailed assessment report.

#### **6.1.1.12. Fit with Local Road System**

The MCA assessor evaluated the Fit with Local Road System impacts of the intersection and midblock options against the current environment. This assessment criteria evaluated the impacts that each option would have on the local road network, both in terms of the future network form and changes to the traffic for all modes within the area.

The MCA assessor's evaluation / scoring of the options was undertaken using the following sub-assessment criteria (all were equally weighted):

- Road Network Fit: This assessment considered how the option would fit into the planned road network. It also included consideration of the currently notified plans and the ability for future expansion of the Levin urban area
- Local Traffic Impacts: This assessment considered the impact on the road users, from all perspectives. It also included consideration of impacts on traffic volumes on existing roads, and
- Active Mode Considerations: This assessment considered the impacts on the councils current and planned active mode networks, including if it makes an option less attractive.

### ***Queen Street Evaluation Summary***

Options Q0, Q1 and Q6 all recorded scores of 1 and were therefore considered to be the best performing options from a Fit with Local Road System criteria perspective. The MCA assessor advised that all three options would have minimal effects on local traffic (e.g. introduce no new turning conflicts) and would provide for active mode access. The assessor also noted that these options would maintain Queen Street connections (however, the assessor did acknowledge that the connection for Option Q1 would be steeper).

Options Q2, Q3 and Q7 all recorded scores of 2, which was one point worse than the scores for the best performing options. The MCA assessor's key reasons for recording these scores for each option are as follows:

- Option Q2: Its positive aspects included minimal local traffic impacts (e.g. the existing Queen Street connection would be retained), however its negative aspects included the local road / active mode connections being located below ground level
- Option Q3: Its positive aspects included good active mode provision, however its negative aspects included longer local traffic trips because of the closure of Queen Street and the close proximity of the roundabouts, and
- Option Q7: Its positive aspects included minimal local traffic impacts, including retaining the existing Queen Street connections, however its negative aspects included the steep gradient change for active modes.

Options Q4 and Q5 recorded scores of 3, which was two points worse than the scores for the best performing options. The MCA assessor's key concerns with both options included longer trips for local traffic and an increase in the number of vehicles on previously low volume roads (which would also impact on active mode safety). In addition, the severed Queen Street would not fit with the planned road network for the Tara-Ika development.

Option Q8 recorded a score of 4, which was three points worse than the scores for the best performing options. The MCA assessor's key concerns included that the complexity of the large multi-lane / high speed roundabout would encourage local traffic to divert onto Tara-Ika's proposed Central Spine Connector (which would neutralize any active mode benefits created by the active mode facility). In addition, the assessor advised that this option could impact future road network development to the north of the Tara-Ika development.

### ***Tararua Road Evaluation Summary***

All options recorded scores of 1 (except for Option T3), and therefore all were considered to be best performing options from a Fit with Local Road System criteria perspective. The MCA assessor advised that these options scored 1 on the basis that their designs were very similar to those previously proposed in 2020 for the Tararua Road interchange (i.e. as evaluated in the Ō2NL MCA Summary Report 2021<sup>20</sup>). Accordingly, the assessor advised that there were no reasons to change the previous scores (of 1). The assessor noted that the options would provide strong local connectivity benefits (by opening up access to all four corners of the Tararua Road area), provide direct access to local growth areas (i.e. Tara-Ika, LS7, and the Tararua industrial growth areas). The assessor also noted that the options would provide good access into the Levin Town Centre.

The score for Option T3, which was 2, was an improvement on its previous MCA score identified in the Ō2NL MCA Summary Report 2021. The improved score was due to the provision of a grade separated active mode facility, however the roundabout regime would force state highway and local road traffic to mix and this would impact on local trip journey times.

### ***Midblock Options***

Option 1 was scored a 3 and Option 2 was scored a 1. Accordingly, Option 2 was the best performing option from a Fit with Local Road System perspective.

The MCA assessor noted that Option 2 was preferred as having the new Ō2NL highway below ground level would mean the Tara-Ika Central Spine Connector (and the shared user path bridges) would be closer to ground level and would be more attractive for active mode users.

For Option 1, the MCA assessor advised that having the new Ō2NL highway at ground level would mean that the three planned local road connections across the new highway would have steeper gradients that would impact on active mode users.

---

<sup>20</sup> See Section 7.6.3 of the Ō2NL MCA Summary Report 2021

See **Appendix N** (Fit with Local Road System Assessment Report) for the MCA assessor's detailed assessment report.

#### **6.1.1.13. Engineering Degree of Difficulty**

The MCA assessor evaluated the engineering degree of difficulty of the intersection and midblock options. This assessment was undertaken using the following sub-criteria (all sub-criteria were weighted, with the weightings used showing in the brackets below):

- Geotechnical and Structures: complexity with ground conditions and geotechnical / structural design (30 per cent)
- Local Roads: complexity of connecting to local network (10 per cent)
- Flood and drainage: effect on existing overland flow paths and road stormwater (30 per cent), and
- Constructability: ease of the build activity / temporary works / traffic effects (30 per cent).

The MCA assessor noted that their assessment of the options was not against the current environment as this was not considered a suitable evaluation approach given EDoD is not an effect. This approach is consistent with how the EDoD effects were evaluated in the Ō2NL DBC MCA Summary Report 2021.

#### ***Queen Street Evaluation Summary***

Option Q3 recorded a score of 1 and was therefore considered the best performing option from a EDoD assessment perspective. The MCA assessor advised that this option scored well against all of the sub-criteria (listed above).

Options Q4, Q5, Q6 and Q7 all recorded scores of 2, which is one point worse than the best performing option. The MCA assessor's key reasons for the scores of 2 are summarised as follows:

- Option Q4: This option presented few EDoD difficulties. However, the local roads sub-criteria evaluation / score was contingent upon the timing and delivery of the wider Tara-Ika local road network (i.e. otherwise this option would have no road network to connect into on the eastern side of the new Ō2NL highway)
- Option Q5: No significant EDoD issues were identified. However, the MCA assessor noted that the proximity of the works to higher groundwater levels, the need for two structures and the constructability of a new on-line roundabout on Arapaepae Road were issues that would need careful design consideration
- Option Q6: No significant EDoD issues identified. However, the MCA assessor did note that the 70 metre three-span bridge would be located in close proximity to shallow maximum groundwater, and therefore would require careful design consideration, and
- Option Q7: No significant EDoD issues identified. The MCA assessor noted that this option included a moderate vertical crest curve and associated downhill grade for road users travelling in an east-west direction towards central Levin. The assessor also noted that this option didn't fit well with connecting the new bridge to the new SH57 / Queen Street roundabout currently being constructed.

Option Q8 recorded a score of 3, which was two points less than the best performing option. The MCA assessor noted this option scored relatively poorly on the local road sub-criteria, mostly due to the number of accesses and intersections on Arapaepae Road that would be impacted.

Option Q2 recorded a score of 4, which was three points worse than the best performing option. The MCA assessor noted that this option would be complex to design / construct. For example, a watertight trough structure would be needed and would intercept with existing high groundwater levels. Accordingly, drainage management requirements would be highly complex.

Option Q1 recorded a score of 5, which was four points worse than the best performing option. The MCA assessor advised that this option scored poorly in all sub-criteria other than for local road. The MCA assessor noted that this option would be complex to design / construct. For example, a watertight trough structure would be needed for a few hundred metres in order to manage drainage of the high existing groundwater levels.

Option Q0 recorded a Fatal Flaw. The MCA assessor advised that this option could only be achieved by locating the new Ō2NL highway below ground level by up to seven metres. As maximum groundwater is periodically higher than this depth, and as this option does not have a watertight trough structure, this consequently meant that Option Q0 was technically infeasible from an EDoD perspective.

### ***Tararua Road Evaluation Summary***

Both Options T3 and T6 recorded scores of 1, and were considered the best performing options from an EDoD perspective. The MCA assessor noted that both options presented few EDoD difficulties (however the assessor did note that Option T6 would require a large groundwater offset).

Options T1, T2 and T7 all recorded scores of 2, which is one point worse than the best performing options. The MCA assessor's key reasons for their scores for these options are as follows:

- Option T1: There would be engineering complexity for structures / geotechnical, flood / drainage and constructability for this option. However, constructability would not be overly challenging
- Option T2: There would be engineering complexity for structures / geotechnical and constructability for this option. However, there were no concerns with flood / drainage management, and
- Option T7: There would be engineering complexity for structures / geotechnical, flood / drainage and constructability for this option. The MCA assessor noted the inclusion of a structure and grading on Arapaepae Road would add complexity, but these issues would not be significant.

Option T0 recorded a score of 3, which was two points worse than the best performing options. The MCA assessor advised that this option would have some geotechnical / structural, flood / drainage and constructability challenges due to the long and deep cutting and the proximity to maximum groundwater level, drainage across and within the cutting, and the challenges of maintaining local road traffic within the cutting excavation.

### ***Midblock Evaluation Summary***

Both Options 1 and 2 recorded scores of 1 each as there were no EDoD issues based on where the design stood for this MCA. However, the MCA assessor did note that these scores were dependent on further investigation into ground conditions, topsoil depth, vertical geometry and drainage.

See **Appendix O** (Engineering Degree of Difficulty and Cost Assessment Report) for the MCA assessor's detailed assessment report.

#### **6.1.1.14. Property Degree of Difficulty**

The MCA assessor evaluated the intersection and midblock options against the current situation by considering the following sub-criteria (each assessment criteria was equally weighted):

- Effects on horticultural holdings and any severance issues
- Effects on lifestyle holdings and residential holdings including access, severance and other issues
- Additional properties which were previously unaffected which are now affected, and
- Any significant land tenure issues.

The MCA assessor noted that there was no Māori land or commercial property affected by the options.

### ***Queen Street Evaluation Summary***

Options Q0, Q1, Q2, Q3 and Q6 all recorded scores of 2, and were considered the best performing options from a PDoD assessment perspective. The MCA assessor advised that these options presented few PDoD difficulties due to either there being no new properties affected or only minor changes required to newly affected properties.

Options Q5, Q7 and Q8 all recorded scores of 3, which was one point worse than the best performing options. The MCA assessor's key reasons for recording scores of 3 for these options are as follows:

- Option Q5: This option would affect one new property. The option's site plan also showed a possible future leg to the west, which could only be obtained via voluntary agreement with the affected owner

(i.e. land cannot be compulsorily acquired for a future requirement). This option would also increase severance issues for two property blocks that form a large horticultural holding

- Option Q7: This option affects one new residential site and one improved lifestyle property which is already partially affected. The option is also likely to affect one new driveway. In addition, there are likely to be visual and noise impacts on two properties that may require compensation, and
- Option Q8: This option appears to affect four new properties, and is likely to increase severance for two nearby property blocks which form a large horticultural holding.

Option Q4 recorded a score of 5, which is three points worse than the best performing options. The MCA assessor's key concerns with this option included:

- Three new properties affected. One residential, one improved lifestyle property and one common property, and
- The common property is likely to be part of a multi-unit title property / retirement community and appears to be owned by 70 different owners. It is therefore likely to be difficult to acquire and presents a significant land tenure issue.

The MCA assessor advised that the score for Q4 could potentially be reduced if the common property was no longer affected (i.e. it was avoided through design adjustments).

#### ***Tararua Road Evaluation Summary***

All of the options recorded scores of 2. Accordingly, there was no best performing option from a PDoD assessment perspective. The MCA assessor advised that the options did not impact on new properties or would only affect one new property (the addition of one new affected property wasn't sufficient to result in a scoring change).

#### ***Midblock Evaluation Summary***

Both Options 1 and 2 recorded scores of 3. The MCA assessor advised that both options had similar property acquisition effects, although it was unclear whether Option 2 would have additional indirect effects on the general hydrology of the area (which would be an additional property effect and may require compensation).

See **Appendix P** (Property Degree of Difficulty Assessment Report) for the MCA assessor's detailed assessment report.

### **6.1.2. Unweighted Evaluations / Scores Summary**

For the Queen Street intersection options, and in accordance with Table 6 above, the following intersection options were identified as the three best performing options under the unweighted scoring process:

- Option Q5 was ranked 1<sup>st</sup>
- Option Q6 was ranked 2<sup>nd</sup>, and
- Options Q4 and Q7 were ranked 3<sup>rd</sup> equally.

For the Tararua Road intersection options, and in accordance with Table 7 above, the following intersection options were identified as the three best performing options under the unweighted scoring process:

- Options T7 and T6 were ranked 1<sup>st</sup> equal, and
- Option T3 was ranked 3<sup>rd</sup>.

In accordance with Table 8, and for the midblock options, Option 1 (at-grade) was ranked as the best performing option.



## 6.2. MCA Weighting Scenario Assessments

In addition to identifying the MCA equally weighted scores, a weighting exercise was undertaken by the Project Design Team to test the various sensitivities of the intersection and midblock scores to matters considered, under various weightings, to be more important. This section of the report summarises the outcomes of the weighting scenario assessment process.

### 6.2.1. Queen Street and Tararua Road Intersection Options Weighting Scenarios

The weighting scenarios used to test the sensitivities for the Queen Street and Tararua Road intersection options were the same as used to test the interchange options in the Ō2NL DBC MCA Summary Report 2021.<sup>21</sup> To recap, the interchange weightings that were used to sensitivity test the interchange scores from this report were as follows:

- Workshop weightings scenario

To recap, the workshop weightings scenario was determined collectively by the MCA assessors at MCA Workshop 2 (June 2020)<sup>22</sup>

- RMA Section 6 scenario

To recap, the RMA Section 6 scenario assigned the highest numerical values to the assessment criteria that have the most weight under Section 6 of the RMA. To this end, the Iwi Values and Landscape / Visual assessment criteria were assigned the highest weighting value of 10, whilst the Ecology, Heritage and Archaeology assessment criterion were also assigned high numerical values (of eight).<sup>23</sup>

- Quadruple bottom line scenario

- To recap, four scenarios were separately assessed as follows (quadruple bottom line scenarios):

- Social weighting scenario: This scenario placed the highest weighting value on the social aspects of the intersection options. The highest weighting was assigned to the Social / Community / Recreation assessment criterion to reflect the social benefit / cost impacts that the provision of the option would have on the local community. The next highest-ranking social weighting values were for Iwi Values, Heritage and Archaeology (to reflect the important social dimensions of these respective assessment criterion). The Horowhenua District Development

---

<sup>21</sup> See Section 7.6 of the Ō2NL DBC MCA Summary Report 2021

<sup>22</sup> To summarise and recap, a “workshop weighting” for the interchanges reflected the importance that the MCA assessors collectively placed on each individual assessment criterion following workshop discussions. To help determine the workshop weightings, at the completion of the scoring component of MCA Workshop 2, the MCA assessors discussed / identified the importance of each assessment criteria and then collectively assigned a low, medium or high “workshop weighting”. Ultimately, the assessors ranked the following assessment criteria as been of high importance for identifying a best performing interchange option:

- Enhanced movement, safety and connectivity project objectives
- Iwi Values (i.e. due to potential impacts on cultural values)
- Landscape / Visual
- Noise / Vibration
- Horowhenua District Development (i.e. to reflect local existing and future growth pressures)
- Fit with Local Road System (i.e. to reflect the importance of maintaining local connectivity), and
- EDoD (i.e. due to design complexity, risk and cost implications).

The MCA assessors considered ecology and productive land value impacts to be of medium importance. They considered the resilience (project objective), heritage and archaeology assessment areas to be of low importance.

Following completion of MCA Workshop 2, the Project Team (using its professional judgement) then assigned numerical values (out of 10) to the low, medium and high rankings. It determined that a low ranking weighting would be between one and four, a medium ranking weighting would be between five and seven and a high ranking weighting would be between eight and 10

<sup>23</sup> It is noted that the individual numerical values were determined by the Project Design Team following completion of MCA Workshop 2

assessment criterion was also afforded a high ranking of eight to reflect its important social dimensions

- Environment weighting scenario: This scenario placed the highest weighting value on the environmental elements of both the Ecology assessment criteria. Both Iwi Values criteria were also afforded a ranking (of eight) to reflect that cultural values are closely intertwined with the environment. Criteria without a physical environmental component were given a zero ranking
- Cultural weighting scenario: This scenario placed the highest value on the Iwi Values criteria, which was afforded a value ranking of 10. Given their close cultural dimensions, the Archaeology, Heritage, Ecology (both) and Social / Community / Recreation assessment criteria were also ranked highly with weighting values of eight each, and
- Economic weighting scenario: This scenario placed the highest weighting values on the engineering complexity (i.e. the EDoD criteria) and impacts on property (i.e. the PDoD criteria). Little or no direct economic bearing was placed on the other assessment criterion.

The numerical values that were assigned to each of the weighted scenarios for each of the Queen Street and Tararua Road options are set out in Table 9 below. For the avoidance of doubt, these were the same values for the interchange weighting scenarios that were identified in the Ō2NL DBC MCA Summary Report 2021.

**Table 9: Numerical Values Assigned to each of the Weighting Scenario Options<sup>24</sup>**

<u>Assessment criteria</u>	Workshop weightings	RMA Section 6	Quadruple Bottom Line			
			Social	Environment	Cultural	Economic
<b>Enhanced Movement</b>	10	3	4	0	0	10
<b>Safety</b>	10	3	7	0	0	10
<b>Resilience</b>	4	8	4	0	0	10
<b>Mode Choice</b>	10	8	8	7	7	0
<b>Appropriate Connections</b>	10	3	8	0	0	10
<b>Landscape / Visual</b>	10	10	5	6	5	0
<b>Ecological - Terrestrial</b>	5	7	3	10	8	0
<b>Ecological - Freshwater &amp; Wetlands</b>	5	7	3	10	8	0
<b>Heritage</b>	2	7	7	3	3	0
<b>Archaeology</b>	2	7	7	3	8	0
<b>Noise / Vibration</b>	10	5	7	3	3	0
<b>Productive Land Values</b>	5	2	3	0	0	5
<b>Social / Community / Recreation</b>	8	5	10	3	8	3
<b>Horowhenua District Development</b>	10	5	7	0	2	7
<b>Fit with Local Road System</b>	10	2	3	0	0	5
<b>Engineering Degree of Difficulty</b>	10	2	3	0	0	10
<b>Property Degree of Difficulty</b>	5	2	5	0	0	10

<sup>24</sup> It is noted that a value of 10 is the highest value able to be recorded, and a value of zero is the lowest value able to be recorded

Assessment criteria	Workshop weightings	RMA Section 6	Quadruple Bottom Line			
			Social	Environment	Cultural	Economic
Iwi Values (Muaūpoko Tribal Authority)	10	10	8	8	10	2

For avoidance of doubt, it is noted that the numerical value weightings applied to the Iwi values assessment criteria (i.e. Muaūpoko) were guided by the “weighting discussions” held at MCA Workshop 2.

### 6.2.1.1. Intersection Weighted Scenario Scores and Rankings

Table 10 below sets out the weighted scores for each of the Queen Street intersection options (these scores were calculated<sup>25</sup> in accordance with the numerical values set out in Table 9). For ease of reference, Table 11 below provides an overall ranking for each weighting scenario (i.e. these are the “colour coded” rankings identified in Table 11).

In addition to examining the weighted scores for each individual weighting scenario assessment, both Table 10 and Table 11 also provide overall combined average scores and rankings as an alternative means of interpreting the weighting scenario assessment process as follows:

- The left hand light pink column in Table 10 provides the combined average score for all of the six weighting scenarios (i.e. all scenario scores are added up and then divided by six) with the lowest average score ranked first and highest score ranked last (as identified in the right hand light pink column), and
- The left hand light pink column in Table 11 provides a combined score for all of the weighting scenario rankings (i.e. all of the rankings are added up) with the lowest overall score ranked first and highest score ranked last (as identified in the right hand light pink column).

The same method of presenting the weighting scenario process results for the Tararua Road intersection are set out in Table 12 and Table 13 respectively.

**Table 10: Average scores for the Queen Street intersection weighting scenarios**

Queen Street Options	Workshop Weighting	RMA Sec 6	Social	Environment	Cultural	Economic	Combined Average Score	Overall Average Score Ranking
Q0 - New highway fully below grade (DBC)	3.03	3.17	2.61	4.43	3.82	2.71	3.30	8
Q1 - New highway partially below grade	2.78	3.19	2.58	4.57	3.96	2.02	3.18	7
Q2 - Local road partially below grade	2.94	3.36	2.75	4.72	4.17	2.02	3.33	9
Q3 - At-grade: Roundabout	2.26	2.10	2.28	1.92	1.89	2.19	2.11	5
Q4 - At-grade: Close Queen, upgrade Liverpool	2.17	1.81	2.16	1.51	1.71	2.31	1.95	3

<sup>25</sup> To calculate the weighted score, each MCA assessor’s score has been multiplied by the assigned weight to the relevant criteria which is then summed and divided by the sum of all the weightings

Queen Street Options	Workshop Weighting	RMA Sec 6	Social	Environment	Cultural	Economic	Combined Average Score	Overall Average Score Ranking
Q5 - At-grade: Queen diverted north	1.88	1.67	1.79	1.41	1.47	1.81	1.67	1
Q6 - New highway over top	1.88	1.93	1.97	2.00	2.06	1.60	1.91	2
Q7 - Local road over top	2.08	2.09	2.15	2.11	2.15	1.86	2.07	4
Q8 - At-grade: 5-arm, shift SH57 connection South	2.62	2.14	2.43	1.64	1.69	2.79	2.22	6

Table 11: Weighting scenario ranking orders for the scores identified in Table 10

Queen Street Options	Workshop Weighting	RMA Sec 6	Social	Environment	Cultural	Economic	Total combined Ranking Score	Overall Ranking
Q0 - New highway fully below grade (DBC)	9	7	8	7	7	8	46	8
Q1 - New highway partially below grade	7	8	7	8	8	4	42	7
Q2 - Local road partially below grade	8	9	9	9	9	4	48	9
Q3 - At-grade: Roundabout	5	5	5	4	4	6	29	5
Q4 - At-grade: Close Queen, upgrade Liverpool	4	2	4	2	3	7	22	3
Q5 - At-grade: Queen diverted north	1	1	1	1	1	2	7	1
Q6 - New highway over top	1	3	2	5	5	1	17	2
Q7 - Local road over top	3	4	3	6	6	3	25	4
Q8 - At-grade: 5-arm, shift SH57 connection South	6	6	6	3	2	9	32	6

**Table 12: Average scores for Tararua Road intersection weighting scenarios**

Tararua Road Options	Workshop Weighting	RMA Sec 6	Social	Environment	Cultural	Economic	Combined Average Score	Overall Average Score Ranking
T0 - New highway fully below grade (DBC)	2.27	2.27	2.25	2.51	2.63	1.80	2.29	4
T1 - New highway partially below grade	2.38	2.42	2.37	2.61	2.75	1.79	2.39	5
T2 - Local road partially below grade	2.45	2.52	2.42	2.70	2.82	1.79	2.45	6
T3 - At-grade: Roundabout	2.13	1.76	2.05	1.36	1.44	2.23	1.83	3
T6 - New highway over top	1.88	1.79	1.93	1.74	1.89	1.54	1.79	2
T7 - Local road over top	1.90	1.76	1.86	1.69	1.78	1.62	1.77	1

**Table 13: Weighting scenario ranking orders for the scores identified in Table 12**

Tararua Road Options	Workshop Weighting	RMA Sec 6	Social	Environment	Cultural	Economic	Total combined Ranking Score	Overall Ranking
T0 - New highway fully below grade (DBC)	4	4	4	4	4	5	25	4
T1 - New highway partially below grade	5	5	5	5	5	3	28	5
T2 - Local road partially below grade	6	6	6	6	6	3	33	6
T3 - At-grade: Roundabout	3	1	3	1	1	6	15	3
T6 - New highway over top	1	3	2	3	3	1	13	2
T7 - Local road over top	2	1	1	2	2	2	10	1

## 6.2.2. Summary of Intersection Option Weighting Scenario Outcomes

### 6.2.2.1. Queen Street Intersection Options

Based on the combined average scores and associated ranking orders identified above in Table 10, the three strongest performing Queen Street intersection options for the weighted scenario assessments were:

- Option Q5 (ranked first)
- Option Q6 (ranked second), and
- Option Q4 (ranked third).

Option Q5 recorded the strongest performing weighted scores for five of the six weighting scenario assessments in Table 10. It had the best scores for the workshop weighting (first equal), RMA Section 6 matters, social, environment and cultural weighting scenarios. It had the second best score for the economic weighting scenario. As identified in Table 10, once the weighting scores were combined, Option Q5 was the best performing intersection option. Option Q5's preference was also "re-confirmed" in Table 11, which saw it ranked first as well.

Option Q6 was the next best performing option in Table 10. This option had the best scores for the economic and workshop weighting (first equal) scenarios. Its scores also saw it ranked second and third respectively for the social and RMA Section 6 weighting scenarios. However, its scores for the environment and cultural weighting scenarios saw it ranked fifth. Once these average scores were combined, Option Q6 was the second best performing option in Table 10. Option Q6's second best performing position was also confirmed in Table 11.

Option Q4 was the third best performing option in Table 10. It recorded the best scores for the RMA Section 6 matters and environment weighting scenarios in this table. However, its social and cultural weighting scenario scores saw it ranked third, its scores for the workshop weighting scenario saw it ranked fourth and its scores for the economic weighting scenario ranked seventh. Once these average scores were combined, Option Q6 was the third best performing option in Table 10. Option Q4's third best performing position was also confirmed in Table 11.

Options Q7, Q3 and Q8 combined average scores saw it ranked fourth, fifth and sixth overall in Table 10 (and in Table 11). Options Q1, Q0 and Q2 had the worst combined average scores and saw it ranked seventh, eighth and ninth (or last) in Table 10 (and in Table 11).

Overall, Option Q5, Q6 and Q4 were considered to be the three best performing intersection options under the weighting scenario assessment process. Option Q5 was considered the strongest overall performing option.

### 6.2.2.2. Tararua Road Intersection Options

Based on the average combined scores and associated ranking orders identified above in Table 12, the three strongest performing Tararua Road intersection options for the weighted scenario assessments were:

- Option T7 (ranked first)
- Option T6 (ranked second), and
- Option T3 (ranked third).

Option T7 recorded the best performing combined average score in Table 12. In particular, it had the best scores for the workshop weighting, RMA Section 6 matters and social weighting scenarios. It had the second best scores for the environment, cultural and economic weighting scenarios. Once these average scores were combined, Option T7 was the best performing intersection option in Table 12. Option T7's preference was also re-confirmed in Table 13.

Option T6 recorded the best score for the economic weighting scenario in Table 12. It received the second best scores for the workshop and social weighting scenarios, and the third best scores for the

RMA Section 6 matters, environment and cultural weighting scenarios. Once these average scores were combined, Option T6 was the second best performing option in Table 12. Option T6's second best performing position was also re-confirmed in Table 13.

Option T3 recorded the third best performing combined average scores in Table 12. However, the combined average scores between Option T6 and T3 were very close. Option T3 received the best performing scores for the RMA Section 6 matters, environment and cultural weighting scenarios in Table 12. It received the third best scores for the workshop and social weighting scenarios, but was in sixth place for its score for the economic weighting scenario. Once these average scores were combined, Option T3 was the third best performing option. Option T3's third best performing position was also re-confirmed in Table 13.

Options T0, T1 and T2 combined average scores for the weighting scenario assessments saw these options ranked overall fourth, fifth and sixth respectively in Table 12 (and in Table 13).

Accordingly, Option T7, T6 and T3 were considered to be the three best performing intersection options for Tararua Road under the weighting scenario assessment process. Option T7 was considered the strongest overall performing option.

### 6.2.3. Midblock Options Weighting Scenarios

The weighting scenarios used to test the sensitivities of the midblock options were the same as used to test the new Ō2NL highway alignment options as identified in the Ō2NL DBC MCA Summary Report 2021.<sup>26</sup> To recap, the weightings that were used to sensitivity test the midblock scores were as follows:

- Workshop weightings scenario

To recap, the workshop weightings (for this scenario) were determined collectively by the MCA assessors at MCA Workshop 1 (May 2020)<sup>27</sup>

- RMA Section 6 scenario

To recap, the RMA Section 6 scenario assigned the highest numerical values to the assessment criteria that have the most weight under Section 6 of the RMA. To this end, the Iwi Values assessment criteria was afforded the highest weighting value of 10 in order to reflect the high importance assigned to cultural values under Section 6. The resilience (Fit with Project Objectives), Landscape / Visual, Heritage and Archaeology assessment criteria were also assigned high weighting values (and were given a numerical value of eight). Both Ecology assessment criteria were also assigned high values to reflect that both criteria were intertwined with the Iwi Values

---

<sup>26</sup> See Section 7.3 of the Ō2NL DBC MCA Summary Report 2021

<sup>27</sup> To summarise and recap, a "workshop weighting" for the new highway alignment reflected the importance that the MCA assessors collectively placed on each individual assessment criterion following workshop discussions. To help determine the workshop weightings, at the completion of the scoring component of MCA Workshop 1, the MCA assessors discussed / identified the importance of each assessment criteria for the highway alignment and then collectively assigned a low, medium or high "workshop weighting". Ultimately, the assessors ranked the following assessment criteria as been of high importance for selecting a best performing highway alignment:

- Iwi Values (i.e. due to potential impacts on cultural values)
- Ecology (i.e. particularly on freshwater / wetlands)
- Horowhenua District Development (i.e. to reflect local existing and future growth pressures)
- Fit with Local Road System (i.e. to reflect the importance of maintaining local connectivity)
- EDoD (i.e. due to risk and cost implications), and
- PDoD (i.e. due to complexity of acquiring a number of properties).

The MCA assessors ranked landscape / visual, archaeology, productive land value and social / community / recreation as been of medium importance. Both the Fit with the project objectives and heritage criterion were given low rankings. Following completion of MCA Workshop 1, the Project Team (using its professional judgement) then assigned numerical values (out of 10) to the low, medium and high rankings. It determined that a low ranking weighting would be between one and four, a medium ranking weighting would be between five and seven and a high ranking weighting would be between eight and 10

assessment criteria. All other assessment criteria were given a mixture of medium and low weighting values.<sup>28</sup>

- Quadruple bottom line scenario<sup>29</sup>
- To recap, four scenarios were separately assessed as follows (quadruple bottom line scenarios):
  - Social weighting scenario: This scenario placed the highest weighting value on the social aspects of the alignment option. Accordingly, the highest weighting value (of 10) was assigned to the Social / Community / Recreation assessment criterion to reflect the importance of the social benefits / costs of the alignment option on the community. The enhanced connectivity (project objective), Iwi values, Heritage, Archaeology, Horowhenua District Development criteria all have social dimensions and were also therefore assigned high values (of between seven and eight)
  - Environment weighting scenario: This scenario placed the highest weighting value on the physical environmental elements. Both ecology criteria were afforded the highest score of 10. Both Iwi Values criteria were also afforded a high ranking to reflect that Iwi values are closely intertwined with the health of the environment. Criteria without a physical environment component received low or zero numerical values
  - Cultural weighting scenario: This scenario placed the highest weighting value on the Iwi Values criteria (i.e. a 10). Ecology, Archaeology and Social / Community / Recreation criteria were also assigned high numerical values (and afforded values of eight), as they were all considered to have important cultural dimensions. The other assessment criteria that were considered to have limited or no cultural bearing received low or zero numerical values, and
  - Economic weighting scenario: This scenario assigned the highest numerical values to the Fit with Project Objectives, EDoD and PDoD assessment criteria (all received values of 10). The Horowhenua District Development criterion was also considered to be high from an economic perspective and was assigned a value of seven. The other assessment criteria that had little or no direct economic bearing on the Ō2NL Project or the local economy were scored zero.

The numerical values that were assigned to each of the weighted scenarios for each of the midblock options are set out in Table 14 below. For the avoidance of doubt, these were the same values for the new Ō2NL highway alignment option weighting scenarios that were identified in the Ō2NL DBC MCA Summary Report 2021.

**Table 14: Numerical values assigned to each of the weighting scenario options<sup>30</sup>**

<u>Assessment criteria</u>	Workshop Weightings	RMA Section 6	Quadruple bottom line			
			Social	Environment	Cultural	Economic
<b>Enhanced Movement</b>	2	3	4	0	0	10
<b>Safety</b>	2	3	7	0	0	10
<b>Resilience</b>	2	8	4	0	0	10
<b>Mode Choice</b>	10	3	8	0	0	10
<b>Appropriate Connections</b>	2	3	8	0	0	10
<b>Landscape / Visual</b>	6	8	5	6	5	0

<sup>28</sup> It is noted that the individual numerical values were determined by the Project Design Team following completion of MCA Workshop 1

<sup>29</sup> The quadruple bottom-line weighting is a different type of evaluation from the Benefit Cost Ratio (BCR) evaluation normally undertaken by Waka Kotahi

<sup>30</sup> It is noted that a value of 10 is the highest value able to be recorded, and a value of zero is the lowest value able to be recorded



Assessment criteria	Workshop Weightings	RMA Section 6	Quadruple bottom line			
			Social	Environment	Cultural	Economic
Ecological - Terrestrial	8	8	3	10	8	0
Ecological - Freshwater & Wetlands	8	8	3	10	8	0
Heritage	3	8	7	3	3	0
Archaeology	6	8	7	3	8	0
Noise / Vibration	3	3	7	3	3	0
Productive Land Values	6	3	3	0	0	5
Social / Community / Recreation	6	5	10	3	8	3
Horowhenua District Development	8	5	7	0	2	7
Fit with Local Road System	10	2	3	0	0	5
Engineering Degree of Difficulty	10	2	3	0	0	10
Property Degree of Difficulty	10	2	5	0	0	10
Iwi Values (Muaūpoko Tribal Authority)	10	10	8	8	10	2

For avoidance of doubt, it is noted that the numerical value weightings applied to the Iwi values assessment criteria (i.e. Muaūpoko) were guided by the “weighting discussions” held at MCA Workshop 1.

### 6.2.3.1. Midblock Weighted Scenario Scores and Rankings

Table 15 below sets out the weighted scores (and associated rankings) for the midblock options (these scores were calculated<sup>31</sup> in accordance with the numerical values set out in Table 14 above). For ease of reference, Table 16 below provides an overall ranking for each midblock option scenario assessment’s score (i.e. these are the colour coded rankings identified in Table 16 below).

In addition to examining the weighted scores for each individual weighting scenario assessment, both Table 15 and Table 16 also provide overall combined average scores and rankings as an alternative means of interpreting the weighting scenario assessment process as follows:

- The left hand light pink column in Table 15 provides the average score for all of the six weighting scenarios (i.e. all scenario scores are added up and then divided by six) with the lowest score ranked first and highest score ranked last (as identified in the right hand light pink column), and
- The left hand light pink column in Table 16 provides the total score for all of the weighting scenario rankings (i.e. all of the rankings are added up) with the lowest overall score ranked first and highest score ranked last (as identified in the right hand light pink column).

<sup>31</sup> To calculate the weighted score, each MCA assessor’s score has been multiplied by the assigned weight to the relevant criteria which is then summed and divided by the sum of all the weightings

**Table 15: Average scores for the Midblock weighting scenarios**

Midblock Options	Workshop Weighting	RMA Sec 6	Social	Environment	Cultural	Economic	Combined Average Score	Overall Average Score Ranking
Option 1: Ground Level	1.66	1.39	1.47	1.28	1.28	1.77	1.47	1
Option 2: Below Ground Level	2.31	2.99	2.22	4.04	3.23	1.25	2.67	2

**Table 16: Weighting scenario ranking orders for the scores identified in Table 17**

Midblock Options	Workshop Weighting	RMA Sec 6	Social	Environment	Cultural	Economic	Total combined Ranking Score	Overall Ranking
Option 1: Ground Level	1	1	1	1	1	2	7	1
Option 2: Below Ground Level	2	2	2	2	2	1	11	2

#### 6.2.4. Summary of Midblock Option Weighting Scenario Outcomes

Based on the combined average scores and ranking orders identified in Table 15, Option 1 was the best performing option. To this end, and apart from Option 1's economic weighting scenario score, it had the strongest performing scores for all of the weighting scenarios. Accordingly, Option 1 overall had the best performing average score for the midblock MCA. Option's 1 preference was also re-confirmed in Table 16.

## 6.3. Summary of MCA Outcomes and Recommendations for the Intersection and Midblock Options

This section of the report summarises the outcomes of the MCA assessor's evaluations / scores and the weighting scenario assessment processes for the intersection and midblock options. This section concludes with the identification of the three strongest performing intersection options for Queen Street and Tararua Road as well as the best performing option for the midblock for Waka Kotahi's consideration.

### 6.3.1. Summary of Queen Street Intersection Option Unweighted Evaluations / Scores

A discussion of the MCA assessors key option differentiators for their evaluations and scores for the Queen Street intersection is set out below. It is noted that each assessment criteria are grouped under the Waka Kotahi MCA assessment themes that are identified in Table 4 above.

#### 6.3.1.1. Fit with Project Objectives

The Fit with Project Objectives MCA assessor evaluated / scored the Queen Street intersection options positively (scores ranged from 1 to 3). In general, the assessor tended to record more positive scores for the grade separated options when compared to the scores for the at grade options (e.g. roundabouts). Key reasons for the preference for grade separation included improved safety (particularly for active modes) and more efficient outcomes for inter-regional trips (e.g. no stop / starting at roundabouts). Overall, and when the assessor's raw scores were aggregated, there was a preference for Options Q1, Q2 and Q6 (i.e. grade separation options), but also for Option Q5 (at-grade option).

#### 6.3.1.2. Environmental and Social Impacts

The Muaūpoko MCA assessor advised that Options Q0, Q1 and Q2 were all fatally flawed. This scoring was on the basis that Muaūpoko did not accept there was a functional need for a cutting into the Horowhenua gravels. In contrast, the scores ranged from 1 to 3 for the other intersection options. Overall, Option Q5 was considered to be the best performing option from Muaūpoko's perspective as it would provide opportunities to protect and enhance the role of kaitiaki in the landscape by drawing roadways and traffic away from the area.

The Terrestrial Ecology MCA assessor scores ranged from 1 to Fatal Flaws. In terms of the latter, Options Q0, Q1 and Q2 were fatally flawed due to potential adverse groundwater effects on the native bush blocks located near the Prouse Homestead. Except for Options Q6 and Q7, all of the other options recorded scores of 1 as they were considered to have minimal terrestrial ecology interactions or impacts. Overall, there was no clear terrestrial ecology preference between Options Q4, Q5 and Q8, which all recorded scores of 1.

The Freshwater / Wetland Ecology MCA assessor's scores ranged from 1 to 5. The MCA assessor advised that the best performing options from a freshwater / wetland perspective were the at-grade options, as they would have minimal interactions or impacts with local freshwater or wetlands. Overall, there was no clear freshwater / wetland ecology preference between Options Q4, Q5 and Q8, which all recorded scores of 1.

The Landscape / Visual MCA assessor's scores ranged from 2 to 4. Overall, the assessor identified Options Q0 and Q4 as their better performing options. For Option Q0, the MCA assessor noted it would have moderate visual effects and the existing Queen Street alignment would be retained. For Option Q4, the MCA assessor noted it would have moderate visual effects, provide moderate to high connection benefits between Tara-Ika and Levin and retain a straight alignment.

The Heritage MCA assessor scores ranged from 1 to 3. The options that performed better were those that had minimal or reduced noise, visual and amenity effects on the historic Prouse Homestead. Overall, Option Q0 was identified as the best performing option as it was considered to have the least impacts on the Prouse Homestead.

The Archaeology MCA assessor recorded scores of 1 to 2 for all of the intersection options as all known archaeological sites would be avoided. Overall, there was no clear archaeology intersection option preference for the options that recorded scores of 1.

The Noise / Vibration MCA assessor assigned moderate to negative scores to the intersection options (i.e. scores ranged from 3 to 5). All options, with the exception of Options Q3 and Q8, recorded scores of 3. Both Options Q3 and Q8 recorded scores of 5 due to the likely noise effects created by traffic stop / starting at the proposed roundabouts for both the new Ō2NL highway and / or local road network. Overall, there was no clear noise / vibration intersection option preference for the options that recorded scores of 3.

The Productive Land Values MCA assessor's scores ranged from 2 to 4. Inferior scores were recorded for those options that had larger "footprint impacts" on existing HPL and / or HVL or could potentially have adverse impacts on local soil hydrology (these options tended to be those options that had design elements located partially or fully below ground level). Options Q2, Q3, Q4, Q6 and Q7 were the best performing options (with scores of 2), due to requiring less HPL and / or HVL.

The Social / Community / Recreation MCA assessor's scores ranged from 2 to 4. Overall, the assessor identified both Options Q0 and Q1 as their better performing options. Both options were preferred as they would maintain existing social connections / movements at Queen Street.

The Horowhenua District Development MCA assessor's scores ranged from 1 to 4. The MCA assessor preferred intersection options that were consistent with the direction set out in the relevant planning / strategy documents. In contrast, the options that recorded inferior scores were generally due to their urban design impacts being considered to be inconsistent with some aspects of the planning / strategy documents (other negative reasons included impacts on connections to the Tara-Ika development). Overall, Option Q0 was identified as the best performing option as it was considered to be consistent with the relevant planning / strategy documents.

The Fit with Local Road System MCA assessor's scores ranged from 1 to 4. The MCA assessor preferred Options Q0, Q1 and Q6 as they would have minimal effects on local traffic movement, provide for active mode access and retain existing Queen Street connections. Overall, there was no assessment preference between these options, which all recorded scores of 1.

#### **6.3.1.3. Implementability Impacts**

Except for Options Q0 (fatal flaw) and Q1 (which recorded a score of 5), the EDoD MCA assessor's scores for the options ranged from 1 to 4. Overall, the assessor identified Option Q3 as the better performing EDoD option with a score of 1. The assessor noted that they had minimal concerns with this option from a geotechnical / structures, local road, flood / drainage, and constructability perspective.

The PDoD MCA assessor identified Options Q0, Q1, Q2, Q3 and Q6 as the better performing options (with scores of 2 each). The assessor advised that these options presented few PDoD difficulties due to there either been no new properties affected or there been only minor effects on new properties. Overall, there was no clear PDoD intersection option preference for the options that recorded scores of 2.

#### **6.3.1.4. Summary of Queen Street Unweighted Assessments**

For the Queen Street intersection, the following options were identified as the three technically strongest performing options under the unweighted scoring process:

- Option Q5 was ranked 1<sup>st</sup>
- Option Q6 was ranked 2<sup>nd</sup>, and
- Options Q4 and Q7 were ranked 3<sup>rd</sup> equally.

### **6.3.2. Summary of Queen Street Intersection Option Weighted Scenario Assessment**

Based on the weighting assessment scenarios assessed for this MCA, and in accordance with the scores and ranking orders identified in Section 6.2.2.1, the three strongest performing Queen Street intersection options under the weighted scenario assessment process are as follows:

- Option Q5 (ranked first)
- Option Q6 (ranked second), and
- Option Q4 (ranked third).

Option Q5 had the best weighted scores for five of the six weighting scenario assessments. That is, it had the best scores for the workshop weighting (first equal), RMA Section 6 matters, social, environment and cultural weighting scenarios (and it had the second-best score for the economic weighting scenario). Once the weighted scores were combined, Option Q5 was the technically strongest performing intersection option overall under the weighting scenario assessment process.

### 6.3.3. Recommended Queen Street Intersection Option

It is recommended that Options Q5, Q6, Q4 and Q7 be taken forward for further consideration by Waka Kotahi on the basis they were the strongest performing options under both the equally weighted and weighted scoring assessment processes. Despite recommending four options be taken forward for further consideration, it is noted Option Q5 was the technically strongest performing option under both assessment processes.

### 6.3.4. Queen Street Intersection Short Listed Option Re-check 2022

In 2022, following further engagement with HDC and the Muaūpoko Tribal Authority and additional design refinements to Q5 and Q7, Waka Kotahi decided to ask the MCA assessors to re-check their original evaluations / scores for each short-listed Queen Street intersection options (and to update these if deemed appropriate).

In summary, the key design changes to Q5 and Q7 were as follows<sup>32</sup>:

- Q5: Updated horizontal and vertical geometric design that seeks to better relate to property boundary lines and existing and possible future road network layout (including the Tara-Ika Masterplan). Additional work was also undertaken on the pedestrian and cycle bridge on the existing Queen Street alignment
- Q7: Minor changes to the alignment and the location of the bridge crossing, which is offset northwards from the existing Queen Street alignment

**Appendix Q** sets out key design changes to Q5 and Q7 in more detail. It also sets out the Waka Kotahi's re-check processes as well as the outcome of these processes.

#### 6.3.4.1. Summary of the Outcomes of the Re-check Process

Following the re-check process, the only MCA assessors to change their original evaluations / scores (i.e. from the East of Levin October 2021 MCA Workshop) were the Visual / Landscape / Urban Amenity, Archaeology and Horowhenua District Development MCA assessors. Their score changes and supporting reasons are summarised in Table 17 below. Table 18 (located immediately below Table 17) sets out the updated unweighted scores for each of the short listed options. The updated scores are shown in **red** in this table.

---

<sup>32</sup> For avoidance of doubt there were no design changes to Q4 or Q6

**Table 17: Summary of changes to the Visual / Landscape / Urban Amenity, Archaeology and Horowhenua District Development MCA assessors original evaluations / scores**

Option	Original score	Re-check score (April 2022)	Status	Comments
<b>Visual / Landscape / Urban Amenity (Theme: Environmental / Social impacts)</b>				
Q4	2	3	Change	On reflection the original score of 2 gave insufficient weight to the importance of the Queen Street access and overly weights the benefits for the future Tara-lka development at the expense of adverse effects on the existing Queen Street East. This option would undermine Queen Street East as an important element of Levin’s urban form and result in a circuitous and poorly legible connection for the existing Queen Street Area. A score of 3 better reflects a balance weighting between the existing Queen Street East axis and the future planned Tara-lka.
Q5	4	5	Change	This option originally scored a 4 due to the moderate adverse visual effects of the bridge and significant adverse effects on connectivity and legibility on Queen Street East. There would be significant adverse effects on legibility and landscape connectivity compared to the existing environment. On reflection, a score of 5 more clearly reflects these effects. The refined option does not alter the original concerns with Q5 (and therefore the score would remain as a 5). While the revised alignment has a better fit to the cadastral pattern (i.e. in terms of the bridge and its approaches), it diverts Queen Street East to leave a section “marooned” as a side road.
Q6	3	3	No change	<p>Whilst there is no scoring change to Q6, the MCA assessor did comment on the visual / landscape effects on the Prouse Homestead and the viewshafts between Levin and the Tararua ranges as follows:</p> <ul style="list-style-type: none"> <li>• Q6 would have fewer effects on Prouse when compared to Q7 because the Q6 bridge(s) and approaches would be to one side of the property (whereas Q7 would be in front of the property). It would also retain the relationship of the property frontage with Queen Street East, including the relationship between the property and Levin and its historic urban form</li> <li>• From the centre of Levin the view shaft of the Tararua Ranges would be relatively unaffected. Further east (e.g. Bartholomew Road), the highway structure is likely to be noticed, but its effect would be insignificant</li> </ul>
Q7	3	4	Change	This option originally scored a 3 because of its moderate to high visual effects and moderate connectivity and legibility effects when compared to the existing environment. On reflection a score of 4 better reflects these effects. The refined options introduce a more pronounced deviation of Queen Street East’s straight alignment, but the vertical alignment will be symmetrical which will look more elegant than the original design (this “benefit” is not sufficient to change the new score of 4).

Archaeology (Theme: Environmental / Social impacts)				
Q4	1	1	No change	No score changes or comments
Q5	1	1	No change	
Q6	1	1	No change	
Q7	2	1	Change	The refined Q7 option is re-scored as a 1 as it would have a reduced effect on the Prouse Homestead's frontage (and therefore curtilage)
Horowhenua District Development (Theme: Environmental / Social impacts)				
Q4	4	4	No change	<p>There were no changes to the original intersection option scores. The MCA assessor made the following comment on Q4:</p> <ul style="list-style-type: none"> <li>Closing Queen Street, a raised connection to SH57 and a highway at grade may not achieve good urban design outcomes relating to amenity / environmental and social aspects (Objective 6A.1). Reduced connectivity of northern part of Tara-Ika to Levin. Not consistent with northern part of Structure Plan 013</li> </ul>
Q5	3	2	Change	<p>This option was re-scored a 2 (from a 3). The MCA assessor made the following comment in support of this score change:</p> <ul style="list-style-type: none"> <li>Highway at grade and a raised deviation of Queen Street may not achieve good urban design outcomes relating to amenity / environmental and social aspects (Objective 6A.1). Refined Q5 is an improvement on the original option as there is better connectivity between Tara-Ika to Levin, and is more consistent with Structure Plan 013 (hence the 1-point scoring change)</li> </ul>
Q6	3	3	No change	<p>There were no changes to the original intersection option scores. The MCA assessor made the following comment on Q6:</p> <ul style="list-style-type: none"> <li>Raising highway may not achieve good urban design outcomes relating to amenity / environmental and social aspects (Objective 6A.1) – adverse effects</li> </ul>
Q7	3	3	No Change	<p>There were no changes to the original intersection option scores. The MCA assessor made the following comment on Q7:</p> <ul style="list-style-type: none"> <li>Highway at grade and raising Queen Street may not achieve good urban design outcomes relating to amenity / environmental and social aspects (Objective 6A.1) – adverse effects</li> </ul>

**Table 18: Updated unweighted MCA assessor scores**

Option	Enhanced movement	Safety	Resilience	Mode Choice	Connections	Iwi Muaūpoko	Landscape / visual	Ecological - Terrestrial	Ecological - Freshwater & Wetlands	Heritage	Archaeology	Noise and vibration	Productive land values	Social/community/recreation	Horowhenua District development	Fit with local road system	Engineering degree of difficulty	Property degree of difficulty	Updated total Score (equally weighted) April 2022	Original Total Score (equally weighted) November 2021
<b>Q4 - At-grade: Close Queen, upgrade Liverpool</b>	1	1	1	2	2	2	3	1	1	2	1	3	2	4	4	4	2	5	<b>40</b>	<b>39</b>
<b>Q5 - At-grade: Queen diverted north</b>	1	1	1	1	1	1	5	1	1	2	1	3	3	3	2	3	2	3	<b>35</b>	<b>35</b>
<b>Q6 - New highway over top</b>	1	1	1	1	1	3	3	2	2	3	1	3	2	4	3	1	2	2	<b>36</b>	<b>36</b>
<b>Q7 - Local road over top</b>	1	2	1	2	1	3	4	2	2	3	1	3	2	3	3	2	2	3	<b>40</b>	<b>40</b>



As set out in Table 18 above, despite the changes to the original Visual / Landscape, Archaeology and Horowhenua District Development unweighted scores, there has been no material change in total scores or the overall option rankings from the East of Levin October 2021 MCA Workshop. Put simply the “increased” Visual / Landscape assessment scores have been “neutralised” by the “score reductions” in the Archaeology and Horowhenua District Development assessments. Accordingly, there was no change to the unweighted scores from the MCA Workshop.

The weighted scenario (i.e. Workshop weighting, RMA Section 6 matters and Quadruple bottom line scenarios) scores / rankings were also re-checked. Table 19 below sets out the weighted scores for the short-listed Queen Street intersection options (these scores were calculated<sup>33</sup> in accordance with the numerical values assign to each assessment criteria as set out above in Table 9). For ease of reference, Table 20 below provides an overall ranking for each weighting scenario (i.e. these are the “colour coded” rankings identified in Table 20).

In addition to examining the weighted scores for each individual weighting scenario assessment, both Table 19 and Table 20 also provide overall combined average scores and rankings as an alternative means of interpreting the weighting scenario assessment process as follows:

- The left hand light pink column in Table 19 provides the average score for all of the six weighting scenarios (i.e. all scenario scores are added up and then divided by six) with the lowest average score ranked first and highest score ranked last (as identified in the right hand light pink column), and
- The left hand light pink column in Table 20 provides a total score for all of the weighting scenario rankings (i.e. all of the rankings are added up) with the lowest overall score ranked first and highest score ranked last (as identified in the right hand light pink column).

The change in weighted scenario scores from the East of Levin October 2021 MCA Workshop Report are highlighted in red in the tables below.

**Table 19: Average scores for the short listed Queen Street intersection weighting scenarios**

Queen Street Options	Workshop Weighting	RMA Sec 6	Social	Environment	Cultural	Economic	Average Score	Overall Average Score Ranking
Q4 - At-grade: Close Queen, upgrade Liverpool	2.21	1.89	2.18	1.61	1.78	2.25	1.98	3
Q5 - At-grade: Queen diverted north	1.88	1.72	1.77	1.51	1.51	1.73	1.69	1
Q6 - New highway over top	1.88	1.93	1.97	2.00	2.06	1.60	1.91	2
Q7 - Local road over top	2.13	2.12	2.14	2.16	2.11	1.86	2.09	4

<sup>33</sup> To calculate the weighted score, each MCA assessor’s score has been multiplied by the assigned weight to the relevant criteria which is then summed and divided by the sum of all the weightings

**Table 20: Weighting scenario ranking orders for the scores identified in Table 19**

Queen Street Options	Workshop Weighting	RMA Sec 6	Social	Environment	Cultural	Economic	Total Ranking Score	Overall Ranking
Q4 - At-grade: Close Queen, upgrade Liverpool	4	2	4	2	3	7	22	3
Q5 - At-grade: Queen diverted north	1	1	1	1	1	2	7	1
Q6 - New highway over top	1	3	2	5	5	1	17	2
Q7 - Local road over top	3	5	3	6	6	3	26	4

Overall, there were no changes to the weighting scenario rankings from the East of Levin MCA November 2021 Report. That is, Options Q5, Q6, Q4 and Q7 remained ranked one to four respectively.

#### 6.3.4.2. Conclusion of the Re-check Process

Overall, there was no material change in the unweighted or weighting scenario option rankings, and therefore there was no change to the original recommendation to take forward Options Q5, Q6, Q4 and Q7 for further consideration by Waka Kotahi. It is noted that Option Q5 remained the strongest overall performing option under both MCA assessment processes (followed by Option Q6).

### 6.3.5. Summary of Tararua Road Intersection Option Unweighted Evaluations / Scores

A discussion of the MCA assessors key option differentiators for their evaluations and scores of the Tararua Road intersection is set out below. It is noted that each assessment criteria are grouped under the Waka Kotahi MCA assessment themes that are identified in Table 4 above.

#### 6.3.5.1. Fit with Project Objectives

The Fit with Project Objective MCA assessor evaluated / scored the Tararua Road intersection options positively (scores ranged from 1 to 2). Overall, the assessor recorded more positive scores for the grade separated options when compared to the at grade options (e.g. Option T3). The key reasons for the overall preference for grade separation included improved safety (particularly for active modes) and more efficient outcomes for inter-regional trips (e.g. no stop / starting at roundabouts). Overall, there was no clear project objective intersection option preference between the grade separated options.

#### 6.3.5.2. Environmental and Social Impacts

The Muaūpoko MCA assessor advised that Options T0, T1 and T2 were all fatally flawed. This scoring was on the basis that Muaūpoko did not accept there was a functional need for a cutting into the Horowhenua gravels. In contrast, the scores ranged from 1 to 3 for the other intersection options. Overall, Option T3 was considered to be the best performing option as it would provide opportunities to protect and enhance the role of kaitiaki in the landscape by drawing roadways and traffic away from the area.

The Terrestrial Ecology MCA assessor recorded scores of 1 for all intersection options as they were considered to have minimal terrestrial ecology interactions or impacts. Overall, there was no clear terrestrial ecology preference between the Tararua Road options, which all recorded scores of 1.

The Freshwater / Wetland Ecology MCA assessor recorded scores of 1 for all intersection options as they were considered to have minimal interactions or impacts with local freshwater or wetlands. Overall, there was no clear freshwater / wetland ecology preference between the Tararua Road options, which all recorded scores of 1.

The Landscape / Visual MCA assessor's scores for the intersection options ranged from 2 to 4. Overall, the MCA assessor identified Option T0 as the best performing option due to the potential for the new Ō2NL highway to be screened, for the Tararua Road overbridge to have reduced visual effects and local road legibility would be retained (i.e. it would maintain the existing straight at-grade alignment of the local road).

The Heritage MCA assessor recorded scores of 1 for all of the intersection options as no built heritage places would be impacted. Overall, there was no clear heritage intersection option preference.

The Archaeology MCA assessor recorded scores of 1 for the intersection options as all known archaeological sites would be avoided. Overall, there was no clear archaeological intersection option preference.

The Noise / Vibration MCA assessor scored all of the intersection options negatively (i.e. scores ranged from 4 to 5). All options, except for Option T3, recorded scores of 4. Option T3 recorded a score of 5 due to the likely noise effects created by traffic stop / starting at the proposed roundabouts for the new Ō2NL highway and / or local road network. Overall, there was no clear noise / vibration intersection option preference for the options that scored 4.

The Productive Land Values MCA assessor's scores ranged from 3 to 4. Except for Option T0, all options recorded scores of 3, as they would have had similar "footprint impacts" on HPL. Option T0 recorded a worse score of 4, it was also likely to have negative impacts on local soil hydrology as well as a large footprint impact on local HPL. Overall, there was no clear productive land values intersection option preference for the options that scored 3.

The Social / Community / Recreation MCA assessor intersection scores ranged from 3 to 4. Option T6 recorded a score of 4 due to the likelihood that the new Ō2NL highway would be perceived by the community to be a barrier. Overall, there was no clear social / community / recreation intersection option preference for the options that scored 3.

The Horowhenua District Development MCA assessor's scores ranged from 1 to 4. The MCA assessor preferred intersection options that were consistent with the direction set out in the relevant planning / strategy documents. In contrast, the options that recorded inferior scores were generally due to their urban design impacts being considered to be inconsistent with some aspects of the planning / strategy documents. Overall, Option T0 was identified as the best performing option as it was considered to be consistent with the relevant planning / strategy documents.

The Fit with Local Road System MCA assessor's scores ranged from 1 to 2. With the exception of Option T3 (which scored a 2), all intersection options recorded scores of 1 as they would provide strong local connectivity benefits (by opening up access to all four corners of the Tararua Road area), provide direct access to local growth areas (i.e. Tara-Ika, LS7, and the Tararua industrial growth areas) and would provide good access into the Levin Town Centre.

#### **6.3.5.3. Implementability Impacts**

The EDoD MCA assessor's scores for the intersection options ranged from 1 to 3. Overall, the assessor identified Options T3 and T6 as their best performing options (with scores of 1). The assessor noted that there were minimal concerns with both options from a geotechnical / structures, local road, flood / drainage, and constructability perspective.

The PDoD MCA assessor recorded scores of 2 for all of the intersection options. The assessor advised that these options presented few PDoD difficulties. Overall, there was no clear PDoD intersection option preference.

#### **6.3.5.4. Summary of Tararua Road Unweighted Assessments**

For the Tararua Road intersection options, and in accordance with Table 7 above, the following intersection options were identified as the three strongest performing options under the unweighted scoring process:

- Options T7 and T6 were ranked 1<sup>st</sup> equal, and
- Option T3 was ranked 3<sup>rd</sup>.

### 6.3.6. Summary of Tararua Road Intersection Option Weighted Scenario Assessment

Based on the weighting assessment scenarios assessed for this MCA, and in accordance with the scores and ranking orders identified in Section 6.2.2.2, the three strongest performing Tararua Road intersection options were:

- Option T7 (ranked first)
- Option T6 (ranked second), and
- Option T3 (ranked third).

Option T7 recorded the best weighted scores for the workshop weighting, RMA Section 6 matters and social weighting scenarios. It also had the second-best weighted scores for the environment, cultural and economic weighting scenarios. Once these scores were combined, Option T7 was the strongest performing intersection option overall under the weighting scenario assessment process.

### 6.3.7. Recommended Tararua Intersection Option

It is recommended Option T7, T6 and T3 be taken forward for further consideration by Waka Kotahi on the basis they were the strongest performing options under both the equally weighted and weighted scoring assessment processes. Despite recommending three options be taken forward for further consideration, it is noted Option T7 was the technically strongest performing option under both assessment processes.

### 6.3.8. Summary of Midblock Option Unweighted Evaluations / Scores

A discussion of the MCA assessors key option differentiators for their evaluations and scores of the midblock options is set out below. It is noted that each assessment criteria are grouped under the Waka Kotahi MCA assessment themes that are identified in Table 4 above.

#### 6.3.8.1. Fit with Project Objectives

The Fit with Project Objective MCA assessor evaluated / scored both midblock options positively (scores ranged from 1 to 2). However, the assessor did prefer Option 2 for the mode choice project objective as it would provide a reduce gradient for active modes crossing the Tara-Ika Central Spine connection onto SH57. As such, it is considered that the MCA assessor had a “slight” preference for Option 2 (below ground).

#### 6.3.8.2. Environmental and Social Impacts

The Muaūpoko MCA assessor advised that Option 2 was fatally flawed. This scoring was on the basis that Muaūpoko did not accept there was a functional need for a cutting into the Horowhenua gravels. However, the assessor did record a score of 1 for Option 1, and this option is therefore Muaūpoko’s preference.

The Terrestrial Ecology MCA assessor recorded a score of 1 for Option 1 and a Fatal Flaw score for Option 2. The MCA assessor preferred that the new Ō2NL highway was at-grade as it would have minimal terrestrial ecology interactions or impacts. In contrast, Option 2 was fatally flawed due to the negative impacts on existing groundwater systems that supplied the native bush stands located near the Prouse Homestead. Overall, Option 1 was preferred for the midblock option.

The Freshwater / Wetland Ecology MCA assessor recorded a score of a 1 for Option 1 whilst Option 2 recorded a score of 5. The MCA assessor preferred that the new Ō2NL highway was at-grade as it would have minimal freshwater / wetland ecology interactions or impacts. In contrast, Option 2 would have high stormwater management impacts on freshwater / wetland ecology and was scored a 5. Overall, Option 1 was preferred for the midblock option.

The Landscape / Visual MCA assessor's scored Option 1 a 3 and Option 2 a 2. Overall, the assessor preferred Option 2 as it would have reduced visual effects (i.e. the new Ō2NL highway would be in a shallow trench) and local connections would be improved due to the reduced ramp gradients across the highway.

The Heritage MCA assessor recorded scores of 1 for both options as no built heritage places would be impacted. Overall, there was no clear heritage midblock option preference.

The Archaeology MCA assessor recorded scores of 1 for both options as all known archaeological sites would be avoided. Overall, there was no clear archaeological midblock option preference.

The Noise / Vibration MCA assessor scored both options a 3. For Option 1, the MCA assessor noted that NZS 6806 Category A was likely to be achieved for all residential sections in the Tara-Ika Masterplan. For Option 2, the assessor noted that the terrain screening would be of benefit from a noise effects perspective. The MCA assessor advised that both options would have reduced noise effects on Arapaepae Road (as a result of state highway traffic shifting to the new Ō2NL highway) and there were options for further noise mitigation. Overall, there was no clear noise / vibration midblock option preference.

The Productive Land Values MCA assessor recorded a score of 2 for Option 1 and a score of 3 for Option 2. The MCA assessor advised that both options would be located fully on HPL, however Option 2 would be located below grade and therefore was likely to have additional impacts on local soil hydrology (hence its inferior score). Overall, Option 1 was the assessor's preferred midblock option.

The Social / Community / Recreation MCA assessor scored Option 1 a 3 and Option 2 a 2. The MCA's assessor's preference for Option 2 was due to the new Ō2NL highway been less visible (as it would be below grade) and therefore potentially perceived as less of a barrier when compared to an at grade road. Overall, Option 2 was the assessor's preferred midblock option.

The Horowhenua District Development MCA assessor scored Option 1 a 1 and Option 2 a 3. Option 1 was the best performing option as it was considered to be more consistent with the direction of the relevant planning / strategy documents (when compared to Option 2). Overall, Option 1 was the assessor's preferred midblock option.

The Fit with Local Road System MCA assessor recorded a score of 3 for Option 1 and a 1 for Option 2. Option 2 was preferred as having the new Ō2NL highway below ground level would mean the Tara-Ika Central Spine Connector (and the shared user path bridges) would be closer to ground level and would therefore be more attractive for active mode users. Overall, Option 2 was the assessor's preferred midblock option.

#### **6.3.8.3. Implementability Impacts**

The EDoD MCA assessor's recorded scores of 1 for both midblock options. The assessor noted that they had minimal concerns with both options from a geotechnical / structures, local road, flood / drainage, and constructability perspective.

The PDoD MCA assessor recorded scores of 3 for both midblock options. The assessor advised that both options had similar property acquisition effects, although it was unclear whether Option 2 would have additional indirect effects on the general hydrology of the area (which would be an additional property effect).

#### **6.3.8.4. Summary of Midblock Unweighted Assessments**

Overall, Option 1 was considered to be the strongest performing midblock option from an unweighted assessment perspective.

### **6.3.9. Summary of Midblock Option Weighted Scenario Assessment**

Based on the weighting scenarios assessed for this MCA, and in accordance with the scores and ranking orders identified in Section 6.2.3.1, Option 1 was considered to be the strongest performing midblock option. Except for the economic weighting scenario assessment, Option 1 had the technically strongest performing scores for all of the weighting scenarios.

### 6.3.10. Recommended Midblock Option

It is recommended Option 1 be taken forward as it was the strongest performing midblock option. This recommendation is made on the basis it was preferred through both the equally weighted and weighting scenario assessment processes.

## 7. Conclusions and Recommendations

For the Queen Street intersection option (including taking into account the outcomes of the re-check process), it is recommended Options Q5, Q6, Q4 and Q7 be taken forward for further consideration by Waka Kotahi as they are considered to be the strongest performing options under both the equally weighted and weighted assessment processes. Despite recommending four options be taken forward for further consideration, it is noted Option Q5 was the strongest overall performing option under both assessment processes.

For the Tararua Road intersection location, it is recommended Options T7, T6 and T3 be taken forward for further consideration by Waka Kotahi as they are considered to be the strongest performing options under both the equally weighted and weighted assessment processes. Despite recommending three options be taken forward for further consideration, it is noted Option T7 was the best overall performing option under both assessment processes.

For the midblock section between Tararua Road and Queen Street, it is recommended Option 1 be taken forward for further consideration by Waka Kotahi as it was the technically strongest performing option under both the equally weighted and weighting scenario assessment processes.

It is important to note that the outcomes of this MCA process are not the only factors that Waka Kotahi will consider when making decisions on the preferred intersection and midblock options. It will also need to consider a range of other matters including cost, value for money, funding availability, risk and opportunities, how these elements fit together and within the wider project, and the desired outcomes of Iwi and key stakeholders.

## 8. Ō2NL DBC Investigation of Options and Decision Making by Waka Kotahi

This section of the report summarises the investigations that have occurred since completion of the MCA process and describes the decisions made by Waka Kotahi as part of those investigations.

The two key phases for this process were as follows:

- Select preferred options for further investigation, and
- Following effects assessments and stakeholder feedback, a recheck of the preferred options was undertaken in respect of Queen Street.

The outcomes of the above processes are provided below.

### 8.1.1. Queens Street Intersection Options

Following effects assessments of the preferred option and stakeholder feedback, Waka Kotahi recognised the performance of the short-listed options was finely balanced. As such, and in order to make a decision on a preferred option for the Queen Street intersection, Waka Kotahi undertook further short list analysis. This process involved firstly short listing the recommended four intersection options down to two, and then subsequent further evaluation to identify a preferred option.

The identification of two short list options for further evaluation can be summarised, as follows:

- Option Q4 was disregarded from further consideration due to the significant planned urban development to the east of Levin needing three connections to Levin (rather than two as proposed by Option Q4), including a connection to Queen Street East
- Option Q5 was advanced for further consideration as it was the strongest performing option through the MCA process
- Option Q6 was disregarded from further consideration due to cultural, ecology, heritage and social concerns (that were raised during the MCA process). In addition, HDC did not favour this option as the new highway would be located on an earth embankment structure close to existing homes and the proposed urban development (Tara-Ika Growth Area), and
- Option Q7 was advanced for further consideration on the basis that it was preferred by HDC, and it was likely to have a similar mode choice and safety performance when compared to Option Q5.

Accordingly, Waka Kotahi decided to advance Options Q5 and Q7 for further comparison analysis. This involved assessing the two shortlisted options against the following evaluation criteria (which provided information additional to that obtained during the MCA process):

- Transport network performance (both options were assessed against the current network in 2039, including travel time and vehicle operating cost evaluations). This assessment also considered active mode performance
- Safety assessment (considering gradients and stopping distances)
- Feedback from public consultation and engagement processes undertaken in May 2022
- High level cost assessments for each option, and
- Partner<sup>34</sup> and stakeholder<sup>35</sup> views.

The comparative performance of the Q5 and Q7 options are summarised in Table 21 below.

**Table 21: Option Q5 and Q7 Comparison**

Topic / Area	Option Q5	Option Q7
<b>Transport network performance</b>	Worst performing	Best performing
<b>Active modes</b>	Meets design guides	Meets design guides
<b>Safety</b>	Meets design guides Provides more opportunities for improved traffic safety outcomes	Meets design guides
<b>Cost</b>	Most expensive (\$12M more than Option Q7)	Cheapest
<b>Community feedback</b>	Similar numbers supported / opposed both options	
<b>Cultural</b>	Through design can help deliver aspiration to develop and celebrate the spiritual pathway and water (Wai Mārie), including preserve views up and down Queen Street East, help develop the green / ecology corridor between Tararua Range and Punahau / Lake Horowhenua, and potentially incorporate tree-fort concepts	
<b>HDC</b>	Concerned about urban design effects	Best fit with growth plans

<sup>34</sup> Muaūpoko Tribal Authority and Ngāti Raukawa ki te Tonga

<sup>35</sup> HDC

The decision remained finely balanced following the above comparative analysis process and taking into account the MCA results. Waka Kotahi ultimately considered that Option Q7 would be a better fit for the transport network, and with HDC's growth plans overall. It also considered that Q7 provided opportunities to be designed with positive legacy outcomes (by celebrating Wai Mārie in particular) and could also be designed in a way that protected views along Queen Street East between Punahau / Lake Horowhenua and the Tararua Range. Accordingly, Option Q7 was adopted for further investigation, which informed an iterative design development process leading to a design that has ultimately been incorporated into the Ō2NL DBC.

### 8.1.2. Tararua Road Intersection Options

Following completion of the MCA process, Waka Kotahi carefully considered the strongest performing options, the MCA outcomes as follows:

- When compared to Options T6 and T7, Option T3 performed poorly against the Project Objectives. As such, Waka Kotahi disregarded Option T3 from further consideration, and
- When compared to Option T7, Waka Kotahi identified that Option T6 was likely to result in a greater loss of productive land and would not perform as well as T7 in terms of potential landscape and visual effects. Furthermore, whilst from a noise perspective T6 and T7 had the same unweighted scores, the MCA noise expert advised that T7 was likely to have a comparatively better noise outcome.

Waka Kotahi also considered that Option T7 was likely to be more cost efficient due to reduced drainage requirements.

Accordingly, Waka Kotahi identified Option T7 as the preferred Tararua Road intersection option to be investigated, which informed an iterative design development process leading to a design that has ultimately been incorporated into the Ō2NL DBC.

### 8.1.3. Mid-Block Options

Waka Kotahi adopted the MCA Report's recommendation for Option 1. This decision was made on the basis of its superior MCA unweighted scores, and weighting scenario scores (except for the economic weighting scenario) when compared to Option 2. Accordingly, Option 1 was adopted for further investigation, which informed an iterative design development process leading to a design that has ultimately been incorporated into the Ō2NL DBC.



# CREATING COMMUNITIES

---

Communities are fundamental. Whether around the corner or across the globe, they provide a foundation, a sense of belonging. That's why at Stantec, we always **design with community in mind.**

We care about the communities we serve—because they're our communities too. We're designers, engineers, scientists, and project managers, innovating together at the intersection of community, creativity, and client relationships. Balancing these priorities results in projects that advance the quality of life in communities across the globe.

**New Zealand offices:**

Alexandra, Auckland, Balclutha, Christchurch, Dunedin,  
Gisborne, Greymouth, Hamilton, Hastings, Napier,  
Nelson, Palmerston North, Queenstown, Tauranga,  
Wellington, Whangārei

