

# Ōtaki to North of Levin Highway Project

## Volume 1: Consideration of Alternatives Multi-Criteria Analysis Summary Report (Detailed Business Case Phase)

PREPARED FOR: WAKA KOTAHI | January 2023





# Revision Schedule

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# Executive Summary

This report documents the Waka Kotahi NZ Transport Agency (Waka Kotahi) multi-criteria analysis (MCA) process for the Ōtaki to North Levin (Ō2NL) New Highway Project. In particular, it identifies the alignment, interchange and local road options for the new highway that are recommended to be further investigated in the next stage of the Ō2NL Detailed Business Case (DBC).

In 2018, Waka Kotahi endorsed an Indicative Business Case (IBC), which included confirming a new offline highway to be located within a 300m wide corridor located to the east of existing State Highways 1 and 57, for further investigation. It is now undertaking a DBC in order to refine the new highway within this 300m corridor and to undertake scheme design prior to seeking the required statutory authorisations under the Resource Management Act 1991.

The Ō2NL Project is part of the NZ Upgrade Programme to “*improve safety and access, support economic growth, provide greater route resilience, and better access to walking and cycling facilities*”.

## **Delivering the MCA process in stages**

Building on the MCA processes undertaken to inform the decision making on the location of the 300m corridor in the IBC, the MCA process for the Ō2NL DBC has been staged as follows:

- Stage 1: Long to short list assessment processes to identify a short list of alignment and interchange location / form preferences for detailed MCA evaluation
- Stage 2: Short list of emerging preferred alignments and interchange MCAs, including MCA Workshops 1 (Alignment) and 2 (Interchanges and Local Roads)
- Stage 3A: Iwi engagement on the draft preferred highway alignment and interchange options and Iwi MCA scoring of the “public engagement 2020” alignment option
- Stage 3B: Public engagement on the draft preferred alignment, interchange and local road options
- Stage 4: Preferred alignment and interchange MCA Workshop 3 (November 2020)
- Stage 5: Additional MCAs for the Taylors Road Half interchange, Tararua to Kimberley Option A local road alignment location<sup>1</sup> and SH1 / Tararua Road intersection options, including MCA Workshop 4 (April 2021). In addition, Stage 5 also included a recheck of the IBC MCA processes / outcomes for the short listed northern 300m corridor options, and
- Stage 6: Recommendation of the new highway’s alignment and interchange preferences to Waka Kotahi for further assessment through the DBC process. The recommendation is based on the assessments undertaken and subsequent unweighted (i.e. raw) scores, the outcomes of sensitivity tests (i.e. weighting scenarios), and other factors identified throughout the MCA process as discussed in this report.

The outcomes of Stages 1 and 2 of the MCA process were detailed in the draft *Multi Criteria Analysis Assessment Report: Assessment of New highway alignment, interchange and Local Road Options (July 2020)* – the “draft MCA Assessment Report 2020”. This report, along with the *Multi Criteria Analysis: Post MCA Design Update Report (August 2020)* – the “draft Post MCA Report 2020”, formed the basis for the community engagement programme that was undertaken by Waka Kotahi between August and September 2020 (i.e. Stages 3A and 3B).

This report summarises the outcomes of Stages 1 to 3 (above) in order to provide an overall comprehensive MCA report to assist and inform Waka Kotahi decision making on the Ō2NL DBC. It also provides a more detailed account of the subsequent stages, in particular, this report provides an update of each MCA assessor’s alignment, interchange and local road option

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<sup>1</sup> This MCA was required to further refine the recommended options for Local Road Zone F, G, H, I and J. That is, Option A (no Kimberley bridge / connection) was identified through the traffic light evaluation process as a local road option that demonstrated technical strength. Accordingly, this MCA was undertaken to help identify the alignment location for Option A

evaluations following completion of Waka Kotahi's public engagement programme. It also takes into account the additional technical assessments / investigation works undertaken by both the Project Design Team and the MCA assessors as well as the additional MCAs (and recheck process) undertaken in 2021 (i.e. Stage 5).

This report includes a summary of investigations and decision making by Waka Kotahi that occurred following the MCA processes to select preferred options to be reported in the Detailed Business Case.

### ***Partnership approach with Iwi***

Waka Kotahi has partnered with Ngāti Raukawa ki te Tonga and the Muaūpoko Tribal Authority on the Ō2NL Project from an early stage in the MCA process. This engagement ensured that Waka Kotahi benefited from the historic and cultural insights of both Iwi during the MCA process.

With regards to Stages 1 and 2, both Ngāti Raukawa ki te Tonga and the Muaūpoko Tribal Authority were observers at the first two MCA workshops, and chose not to specifically score the alignment, interchange and local road options evaluated during these stages.

For Stage 4, both Iwi established their own project teams. These teams engaged on the alignment options for the new highway with each respective hapū. The outcomes of this engagement informed each Iwi's option evaluations / scores at MCA Workshop 3. It is noted that Iwi chose to only evaluate / score the draft preferred alignment that had been identified in Waka Kotahi's August / September 2020 public engagement programme (whereas the other MCA assessors evaluated the alignment options identified for each "highway zone"). They also chose not to evaluate / score the interchange and local road options that were also proposed in this programme.

### ***Stages 1 and 2 – identifying emerging preferred options***

Stages 1 and 2 involved a detailed long to short listing evaluation process. In particular, it comprised identifying a long list of new highway alignment, interchange and local road options, followed by specialist assessments and scoring of the shortlisted options<sup>2</sup> through two MCA workshops. These processes are detailed in the draft MCA Assessment Report 2020.

To recap, the key short listed evaluation / scoring processes from Stages 1 and 2 are as follows:

- The MCA assessment criterion selected for Stages 1 and 2 was based on the MCA criterion used in the IBC MCA. There were however some updates to the IBC criteria plus there were some additional criteria added to reflect the decision-making processes needed to complete the DBC. For example, the project objectives criterion was updated, terrestrial and freshwater / ecology and heritage / archaeology were assessed as separate criterion, the Iwi values assessment criterion was evaluated separately by both Ngāti Raukawa ki te Tonga and the Muaūpoko Tribal Authority and a new Property Degree of Difficulty criterion replaced the previous IBC's "Impacts on Dwellings" assessment criteria. In addition, project costs were not assessed as part of the MCA (as project costs was considered to be solely a NZ Upgrade Programme / Waka Kotahi DBC investment decision)
- Where possible, the same MCA assessors who had undertaken the IBC MCA assessments were engaged to ensure their previous experience was utilised again
- Both the new highway and interchange shortlisted options were evaluated through unweighted and weighting scenario assessment processes. Based on a 6-point scoring system (that was previously used for the IBC's MCA), the unweighted scoring<sup>3</sup> process enable "raw scores" to be identified for each assessment criteria. The weighting assessment process tested the sensitivities of the unweighted scores to matters considered, under various weightings, to be more important. The weighting scenario assessments used included:

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<sup>2</sup> It is noted that the NZ Upgrade Programme includes provision for a shared user path to form part of the Ō2NL Project. To this end, the Project Design Team noted that none of the alignment, interchange and local road options evaluated would preclude or hinder development of such a facility

<sup>3</sup> For avoidance of doubt, the unweighted (raw) scores were equally weighted

- 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).
- The local road options were evaluated through a high level “traffic light signal” evaluation process (that is, a **green** was recorded if the MCA assessor had only minor impacts or concerns, an **orange** was recorded if there would be moderate impacts or issues and a **red** was recorded if there were serious or significant negative impacts or issues).

Following completion of the draft MCA Assessment Report 2020, further design refinements were undertaken by the Project Design Team for the highway alignment, interchange and local road options. In particular, the Project Design Team identified that there was a need to “stitch” together the new highway alignment preferences identified in the draft MCA Assessment Report 2020 to ensure that each could technically connect to the alignment in the next highway zone. In addition, this process also enabled the Project Design Team to respond to key issues that had been highlighted by the MCA assessors at MCA Workshops 1 and 2 (such as avoiding terrestrial ecological effects or complex property acquisitions) as well as ensuring the relevant alignments integrated appropriately with the emerging interchange option preferences. These processes are documented in the Post MCA Report 2020 (and summarised in this report).

At the completion of the Post MCA Report 2020, emerging alignment, interchange and local road options were identified for public engagement (i.e. Stages 3A and 3B). The emerging options put forward for engagement were the culmination of the MCA evaluations that had been undertaken at that time (i.e. the outcomes of the unweighted and weighting scenario assessments from MCA Workshop’s 1 and 2) as well as the Post MCA Report 2020.

### ***Stage 3A and 3B - Seeking community and Iwi feedback on the options***

During August and September 2020, Waka Kotahi undertook public engagement on the emerging option preferences. One of the key purposes of this engagement was to inform the MCA processes to be undertaken in Stage 4.

The “top five comment topics” for the emerging option preferences that were ultimately identified through Waka Kotahi’s public engagement programme were:

- Interchanges
- Draft preferred alignment
- Access and connectivity
- Walking / cycling, and
- Local roads (including feedback on the local alternative options proposed for the Kimberley and Waihou / McDonald Road locations).

As noted above, both Ngāti Raukawa ki te Tonga and the Muaūpoko Tribal Authority established project teams to engaged directly with their respective hapū on the emerging option preferences identified in the public engagement programme.

In addition, informal community reference groups were established by Waka Kotahi at Manakau, Ohau, Levin and North Levin to provide an additional forum for community discussion on the Ō2NL Project. For avoidance of doubt, these groups were not formally appointed representatives of the community.

### ***Stage 4 – MCA updating / evaluation processes***

The MCA processes comprised of each MCA assessor undertaking the following:

- Considering whether community and / or Iwi feedback and post-MCA design refinement processes had materially altered their original MCA unweighted evaluations (from MCA Workshops 1 and 2) of the highway alignment and interchange options, and if so, how and why
- Evaluating new highway alignment options for Highway Zone’s A, B, E, K and L

- Evaluating a new half grade separated interchange option at the Tararua location, and
- Undertaking a new traffic light signal evaluation of the refined local road options.

A third MCA workshop was held on 18 November 2020 (i.e. MCA Workshop 3). At this workshop, the MCA assessors presented their updated unweighted assessment evaluations / scores for the alignment, interchange and local roads. In addition, the assessors provided their unweighted evaluations / scores of the new highway alignment options for Highway Zone's A, B, E, K and L and the new half grade separated interchange option at the Tararua location (that is, these were the new options that had been generated through public engagement feedback and / or the Post MCA Report 2020 process).

MCA Workshop 3 also provided an opportunity for both Ngāti Raukawa ki te Tonga and the Muaūpoko Tribal Authority to present the outcomes of their respective hapū engagement and evaluations of the “public engagement alignment option” (that is, and as noted above, both Iwi chose to only provide unweighted scores for the highway alignment that was proposed in the public engagement programme).

### **Recommended alignment, interchange and local road preferences for the new highway**

Based on the Stage 4 processes (i.e. the updated unweighted scores and weighting scenario assessments), the alignment preferences for each highway zone that are recommended to be further investigated as part of the Ō2NL DBC are set out below.

Highway Zone	Recommended alignment preferences to be further investigated
<b>A</b>	Combined Green / New (November 2020) Alignment (The Green Alignment was the original alignment preference identified in the draft MCA Assessment Report 2020)
<b>B</b>	New (November 2020) Alignment (The White Alignment was the original alignment preference identified in the draft MCA Assessment Report 2020)
<b>C</b>	White Alignment
<b>D</b>	Dark Blue Alignment
<b>E</b>	New (November 2020) Alignment (The Green Alignment was the original alignment preference identified in the draft MCA Assessment Report 2020)
<b>F</b>	White Alignment
<b>G</b>	Purple Alignment
<b>H</b>	Cyan Alignment
<b>K</b>	New (November 2020) Alignment (Both the Yellow and Dark Blue Alignments were the original alignment preferences identified in the draft MCA Assessment Report 2020)
<b>L</b>	New (November 2020) Alignment (Both Orange and Black Alignments were the original alignment preferences identified in the draft MCA Assessment Report 2020)

Based on the Stage 4 processes, the interchange location / form preferences that are recommended to be further investigated as part of the Ō2NL DBC are set out below.

Interchange location	Recommended interchange location / form preferences to be further investigated
<b>Manakau / Kuku</b>	No connection, but if a connection is to be provided in the future, then there is a preference for an interchange to be located at Kuku (form undecided)
<b>Kimberley / Tararua</b>	A full grade separated (compact diamond) interchange at Tararua
<b>SH1 / SH57 Split</b>	Roundabout
<b>North Levin</b>	Roundabout

For local roads, and based on the outcomes of the traffic light signal evaluation process, the following local road option preferences that are recommended to be advanced to the Ō2NL DBC are set out below.

Local Road Zones	Recommended local road options
<b>A</b>	Utilise new Taylors Road connection currently being built as part of the Peka Peka to Otaki Expressway (and reconfigure existing SH1) to access Taylors Road traffic only. Reconnect existing SH1 with a localised realignment and new grade-separated connection across expressway
<b>Combined B and C (referred to as B to C)</b>	Provide full multi-modal connectivity between Honi Taipua Street and Manakau Heights Drive
<b>D</b>	Connection at Manakau North Road
<b>E</b>	Connection at Kuku East Road
<b>Combined F, G, H, I and J (referred to as F to J)</b>	Option A: Provide connections at Muhunua East Road and Tararua Road (no Kimberley Road connection but parallel local roads)  [Note that two alignment location options were subsequently developed for Option A (referred to as Options A1 and A2). The recommended preference for Option A's alignment location is set out below in the Stage 5 commentary]
<b>J (Liverpool Street only)</b>	No option provided as part of the new highway
<b>K</b>	Connection at Queen Street
<b>L</b>	Option A: Provide a new connection between Waihou Road and McDonald Road and connection on to SH57
<b>Combined N, P and Q</b>	Provide supporting local connections for the proposed North Levin roundabout

### Stage 5 – Additional MCAs 2021

In April 2021, Waka Kotahi decided to undertake additional MCAs for the Taylors Road Half Interchange, Tararua to Kimberley Option A local road alignment location and SH1 / Tararua Road intersection options. The key findings of these additional MCA processes are as follows:



- For the Taylors Road Half Interchange options, unweighted scores were assessed using the 6-point scoring scale. The weighting scenarios used to sensitivity test these scores were based on the “interchange weightings” (i.e. as used for MCA Workshop 2). Through this process Option 1 (i.e. Local Road Zone A local road option) scored the highest but both Options 1 and 2 are recommended to be advanced to the Ō2NL DBC for further consideration as Option 2 scores well comparatively against the project objectives
- For the Tararua to Kimberley Local Road Option A alignment location preference (i.e. Option A1 or A2), unweighted scores were also assessed using the 6 point scoring scale. The weighting scenarios used to sensitivity test these scores were based on the “alignment weightings” (i.e. as used for MCA Workshop 1). Through both evaluation processes both Options A1 and A2 scoring was very close. Accordingly, it is recommended that both Options A1 and A2 be advanced to the Ō2NL DBC for further consideration, and
- For the SH1 / Tararua Road intersection options, which used the traffic light signal evaluation method to identify green, orange and red signals, a preference for at-grade Options 1, 2 and 3 to be advanced to the Ō2NL DBC was identified (and a preference that grade separated Options 4 and 5 be discarded from further investigation).

In addition to the above MCAs, Waka Kotahi undertook a recheck of the evaluations / scores for the short-listed northern corridor options N4, N5 and N9 that were shortlisted in the IBC in 2018 for evaluation / scoring. It decided to undertake this process on the basis that it was possible that Tara-Ika Plan Change 4 could be fully operative prior to it lodging the relevant Resource Management Act authorisations for the Ō2NL Project. The overall outcome of the recheck process was that there were no material evaluation / scoring changes needed to the original IBC evaluations / scores. That is, the IBC’s recommended preference for Option N4 remained (with its preference possibly enhanced due to improved Landscape / Visual and Social / Community / Recreation evaluations / scores). It is noted that the recheck process recommended that no further corridor option evaluation processes be undertaken as a result of proposed Plan Change 4.

### ***Recommendations and next steps***

The next step is for Waka Kotahi to further investigate the option preferences recommended in this report for the new highway’s alignment, interchange and local roads through the Ō2NL DBC process.

It is important to note that the MCA outcomes are not the only factor that Waka Kotahi will consider in making decisions on the preferred alignment, interchange solutions and local road connections for the Ō2NL Project. Waka Kotahi may also consider a range of other matters including cost and funding availability, risk and opportunities, and the desired outcomes of Iwi and key stakeholders. Further, the DBC process will investigate the option preferences in more detail, including potentially making design changes to avoid or minimise effects. The outcomes of the next phase of investigations will be reported in the Ō2NL DBC.

A re-check of the IBC’s northern corridor was also undertaken in 2022 to establish if the relative performance of the corridor options had altered as a result of proposed Plan Change 4 (for the new Tara-Ika Growth Area) becoming operative prior to Waka Kotahi lodging the relevant Resource Management Act (RMA) authorisations for the Ō2NL Project. This assessment concluded that no further corridor option evaluation processes were needed as the selected preferred corridor option now performed better than previously.

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

Following completion of the MCA processes in this report:

- The recommendations from this report for the new highway alignments (for each highway zone), local road and local road reconnections, as well as the initially considered interchange locations / forms were selected for further investigation (including consultation and engagement) as part of an iterative design refinement process
- The recommendations for the local roads from this report were adopted into the Ō2NL DBC. Local road alignment Option A1 (within corridor option) for the combined Local Road Zone F, G, H, I and J, was selected by Waka Kotahi in preference to Option A2, and was also adopted into the Ō2NL DBC

- For the Taylors Road Interchange, ultimately Option 2 (half interchange) was adopted into the Ō2NL DBC. This was because Waka Kotahi preferred Option 2 as it would not re-introduce through traffic to the Ōtaki township (and would allow more direct access to the highway from Manakau and Ohau). More specifically Option 2 would maintain strategic traffic patterns and similar levels of connectivity for road users that become available with the opening of Peka Peka to Ōtaki Expressway and would provide better connections to Manakau (helping with concerns about the lack of an interchange at Manakau). Option 2 was also preferable (when compared to Option 1) from a resilience perspective. Accordingly, Option 2 was adopted into the Ō2NL DBC
- Of the three at-grade options for the SH1 / Tararua Road intersection [including crossing of the North Island Main Trunk rail line (NIMT)], Option 2 (Traffic Signals Tararua Extension) was preferred from a cost, enhanced movement and landscape / visual perspective. Accordingly, Option 2 was adopted into the Ō2NL DBC, and
- The iterative design refinement process has led to further design refinement as more information has become available including feedback from stakeholders and landowners. The outcome of this process has been incorporated into the Ō2NL DBC and the design to form the basis for RMA applications.

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- Appendix R** Muaūpoko Tribal Authority PowerPoint
- Appendix S** MCA Workshop 4 Attendees
- Appendix T** Review of IBC Northern Section Corridor Options Report

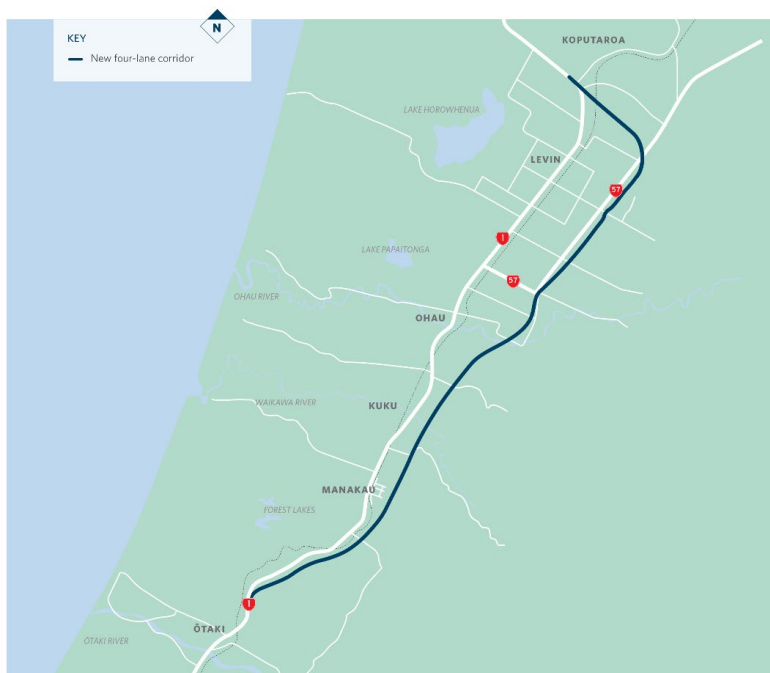
# 1. Introduction

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 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 State Highway 1 (SH1) and State Highway 57 (SH57). In summary, heading north, the proposed new 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 Ōtaki to North Levin New Highway**

At the completion of the IBC it was identified that one of the first key activities to be undertaken for the DBC was to advance multi criteria analysis (MCA) processes. These processes were needed to help identify the new highway’s alignment, interchange and local road option preferences for the recommended 300m corridor.



## 2. Purpose

The purpose of this report is to summarise the MCA processes undertaken by the Ō2NL Project Design Team, its partners and technical specialists in order to identify a preferred new highway alignment (within the preferred 300m corridor) and interchange locations (and forms) to be considered by Waka Kotahi in the Ō2NL DBC. In addition, the report identifies local road preferences for further consideration in the Ō2NL DBC.

The processes undertaken to prepare this report, and ultimately its recommendations, build upon the option and development processes set out in the following reports:

- *Draft Multi Criteria Analysis Report: Assessment of new highway alignment, interchange and Local Road Options (July 2020)*<sup>4</sup> – this report is referred to as the **draft MCA Assessment Report 2020**
- *Draft Multi Criteria Analysis: Post MCA Design Update Report (August 2020)*<sup>5</sup> – this report is referred to as the **Post MCA Report 2020**, and
- *The Draft Ō2NL Community Engagement Report 2020* – this report is referred to as the **Community Engagement Report**<sup>6</sup>.

### 2.1 Summary of Indicative Business Case MCA process

The MCA processes that were undertaken by Waka Kotahi to select the preferred 300m corridor route<sup>7</sup> are detailed in the IBC.<sup>8</sup> Table 1 below summarises the key MCA steps undertaken to inform the IBC.

**Table 1: IBC’s Key MCA Steps**

IBC Step	Outcome of IBC Step
1. Strategic alternatives assessment	Various strategic alternatives were assessed through an MCA process. Ultimately, a new offline highway was identified as being the only method that could satisfactorily resolve the current problems with the State highway network between Ōtaki and north of Levin.
2. Existing constraints map updated, and key design characteristics of the offline highway corridor identified	Key constraints / design characteristics of the offline highway corridor identified to assist with IBC corridor evaluations.
3. Long listing of offline corridor routes	Long list of corridor route options were identified for the southern and northern sections of the offline highway corridor (for the avoidance of doubt, corridor options to the west and east of SH1 and SH57 were identified).
4. IBC MCA Workshop 1	Workshop attendees <sup>9</sup> reviewed the proposed long list of corridor routes. The long list of options and proposed MCA assessment criteria were updated.

<sup>4</sup> See: [Technical reports | Waka Kotahi NZ Transport Agency \(nzta.govt.nz\)](https://www.nzta.govt.nz/technical-reports/)


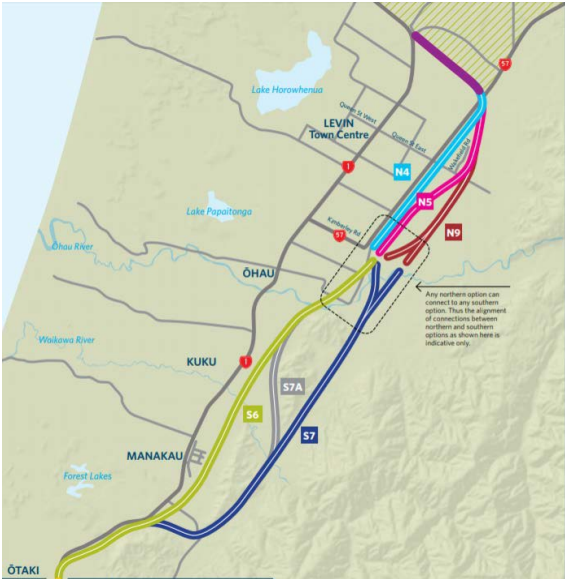
<sup>5</sup> Ibid

<sup>6</sup> This report was subsequently published by Waka Kotahi in March 2021

<sup>7</sup> The 300m width for the IBC corridor routes was determined to be appropriate as it would allow flexibility to locate the new highway within this band whilst leaving room to avoid any key constraints and to address other adverse effects that may come to light during development of the DBC.

<sup>8</sup> See: [Technical reports | Waka Kotahi NZ Transport Agency \(nzta.govt.nz\)](https://www.nzta.govt.nz/technical-reports/)

<sup>9</sup> Attendees at both Workshops 1 and 2 included representatives of the local community, from mana whenua (Muaūpoko Tribal Authority and Ngāti Raukawa ki te Tonga, from local and regional councils (Kāpiti Coast District Council, Horowhenua District Council, Horizons and Greater Wellington Regional Councils). Workshop 1 included a half day site visit of the various corridor options.

IBC Step	Outcome of IBC Step
<p>5. Refinement of long list of corridor route options</p>	<p>The IBC Project team further refined the long list of corridor routes in preparation for IBC MCA Workshop 2<sup>9</sup>. The long list of corridor options are set out below:</p> 
<p>6. IBC MCA Workshop 2</p>	<p>The long list of corridor options were evaluated at IBC MCA Workshop 2<sup>9</sup>, allowing the following short list of corridor options to be identified:</p>  <p>At the conclusion of IBC MCA Workshop 2, it was identified that additional information on Tangata whenua impacts, traffic modelling, and constructability was required before the short list of corridor options could be further refined. Public engagement on the corridor options was also identified.</p>
<p>7. Public engagement (2018) on the short-listed corridor route options (identified in Step 6 above)</p>	<p>Public, key stakeholder and land owner engagement undertaken by Waka Kotahi on the corridor route options. Southern Route Option S6 and North Route Option N4 was favoured by many submitters.</p>

IBC Step	Outcome of IBC Step
8. Additional technical assessments undertaken (as identified at IBC MCA Workshop 2)	Additional information was collected on costs, travel times and transport benefits for the corridor options.
9. IBC MCA assessors reviewed the public engagement feedback and previous evaluations. Noise, heritage and ecology effects further considered by Waka Kotahi	No changes were made to the MCA assessor evaluations from the IBC MCA Workshop 2. Noise, heritage and ecology considerations identified.
10. Peer review of the MCA process <sup>10</sup>	A peer review of the MCA processes, including corridor option selection and approach to involvement of local community, stakeholders and tangata whenua in the MCA process through workshops was undertaken by Mitchell Daysh and Associates. This process included interviews with representatives from the community and tangata whenua. The peer review confirmed that the process undertaken at that time was appropriate.
11. Ō2NL IBC Project Team (using MCA processes) evaluated corridor options	<p>For the southern section the Ō2NL IBC Project Team’s “differentiator analysis” focused on seven (of the 12) MCA assessment criteria that had more than a 1-point difference, feedback on the options from the public and the outcomes of the additional technical work undertaken (in Steps 6 and 8). Through this process, <b>Corridor Route Option S6</b> was preferred.</p> <p>For the northern section, the differentiator analysis focused on two (of the 12) MCA assessment criteria that had more than a 1-point difference for the shortlisted options (as well as public engagement feedback and the additional technical analysis). Through this process, <b>Corridor Option N4</b> was preferred.</p>

Ultimately, the MCA processes undertaken for the IBC identified the preferred 300m corridor. This being a corridor consisting of Waka Kotahi’s preferred S6 (for the southern section) and N4 (for the northern section) corridor alignments.

Following completion of the IBC and a project re-evaluation<sup>11</sup>, the preferred 300m corridor was formally endorsed by the Waka Kotahi Board in December 2018.<sup>12</sup>

In January 2020, Ō2NL was included in the Wellington package of the NZ Upgrade Programme<sup>13</sup>. Development of the Ō2NL DBC commenced in early 2020.

<sup>10</sup> See - <https://www.nzta.govt.nz/assets/projects/otaki-to-north-of-levin/docs/technical-reports/ibc/Otaki-to-North-of-Levin-IBC-App-G.pdf>

<sup>11</sup> See - [Ōtaki to north of Levin independent re-evaluation report \(nzta.govt.nz\)Waka Kotahi: Ō2NL IBC Appendix M](#)

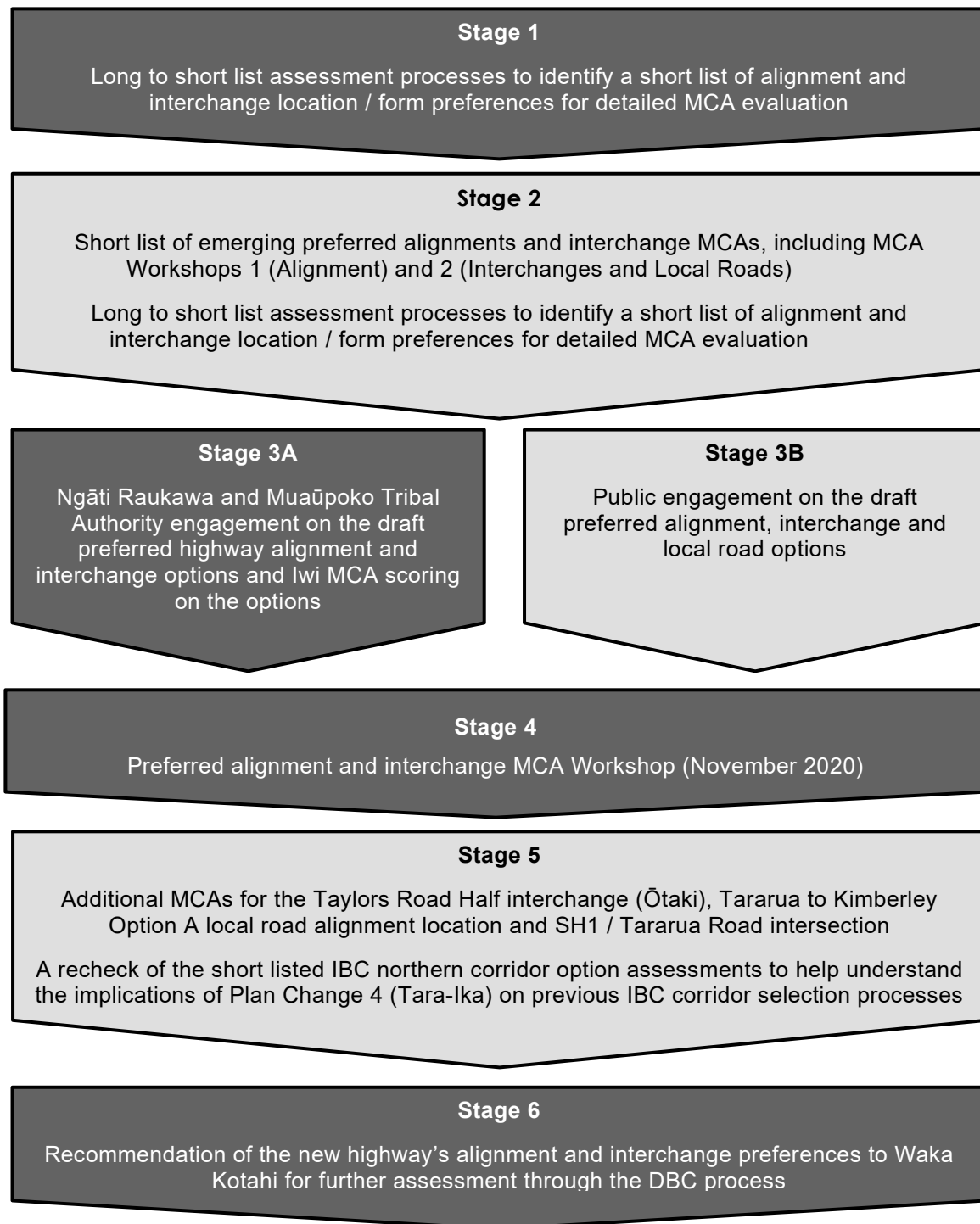
<sup>12</sup> See Board Meeting minutes from Friday 14 December 2018 (i.e. Resolution 2):

<https://www.nzta.govt.nz/assets/About-us-2/docs/board-meeting-minutes-2017/minutes-20181214.pdf>

<sup>13</sup> [Wellington package | Waka Kotahi NZ Transport Agency \(nzta.govt.nz\) \(as of 23<sup>rd</sup> August 2021\)](#)

### 3. Ō2NL DBC MCA Developmental Stages

The MCA processes undertaken to identify alignment, interchange and local road preferences for the new Ō2NL highway comprised of the stages as summarised in Figure 2 below.



**Figure 2: Ō2NL MCA assessment stages**

This report summarises and / or details the following information for each of the above stages:

- The outcomes of Stages 1 and 2 are documented in detail in the draft MCA Assessment Report 2020, and in the Post MCA Report 2020. However, this report does provide a summary of the outcomes of these stages for ease of reference purposes

- The outcomes of Stages 3A and 3B are documented in this report. It is noted that both Iwi and public engagement was undertaken between August and September 2020
- The outcomes of Stage 4 are documented in this report. In summary, this stage involved undertaking the following key activities:
  - Consideration of whether community and / or Iwi feedback and post-MCA design refinement processes had materially altered the original MCA evaluation outcomes for the highway alignment and interchange options (as identified in the draft MCA Assessment Report 2020), and if so, how and why
  - Evaluating new highway alignment options for Highway Zone's A, B, E, K and L as a consequence of post-MCA refinement processes and community engagement
  - Evaluating a (new) half grade separated interchange option at the Tararua location, and
  - Undertaking a new "traffic light signal" evaluation of the refined local road options (as identified in the Phase 2 Post MCA Report).

In addition, Stage 4 considered both Ngāti Raukawa ki te Tonga and Muaūpoko Tribal Authority's (Muaūpoko) feedback / evaluation / scoring for the "public engagement alignment option". That is, the alignment that was identified in Waka Kotahi's August / September 2020 public engagement programme. As noted in the draft MCA Assessment Report 2020, both Ngāti Raukawa ki te Tonga and Muaūpoko did not provide evaluations / scores for the highway / interchange / local road options at either MCA Workshop 1 or 2 as both had requested more time to consider the options. Ultimately for Stage 4, both Iwi decided to only evaluate the public engagement alignment option [it is noted that both Iwi were provided with all of the necessary information on how this option had been identified (e.g. interchange location design principles)].

- The outcomes of Stage 5 are documented in this report. This stage involved undertaking MCAs on the Taylors Road Half interchange (Ōtaki), Tararua to Kimberley Option A local road alignment location and SH1 / Tararua Road intersection. It also involved a recheck of the short listed IBC northern corridor option assessments in order to help understand the implications of Plan Change 4 (Tara-Ika) for the previous IBC corridor selection processes, and
- Stage 6 comprises of Waka Kotahi's decision-making processes for selecting and further developing the new highway alignment, interchange, and local road preferences as part of the DBC process. Accordingly, the outcomes of Stage 6 are documented in the Ō2NL's DBC.

In summary, this report summarises the outcomes of Stages 1 to 5. In particular, it provides further information on Stages 3, 4 and 5, including documenting the MCA assessor's updated evaluations of the draft alignment, interchange and local road options (as identified through the Stage 1 and 2 processes) following feedback received from Ngāti Raukawa ki te Tonga and Muaūpoko and through Waka Kotahi's community engagement programme. It also takes into account the additional technical assessments / investigation works undertaken by both the Project Design Team and the MCA assessors in 2020 as well as the additional MCAs undertaken in early 2021.

Accordingly, this report provides an overall comprehensive summary of the MCA processes undertaken over the course of 2020 and 2021 to assist and inform Waka Kotahi's decision making on the Ō2NL Project's DBC.

## 4. Stage 1: Long to Short Listing

This section of the report summarises the long to short listing processes undertaken for Stage 1 of the MCA process. It also provides a summary of the long to short listing process undertaken for the local road options. A more detailed explanation of Stage 1 processes can be found in the draft MCA Assessment Report 2020.

### 4.1 Highway Alignment Short Listing Process

To identify a short list of highway alignment options for each “highway zone” (as described below) the following steps were undertaken:

- Step 1: Identification / mapping of key fixed points along the preferred 300m corridor [including start and finish points, the location of known Resource Management Act (RMA) 1991 Section 6 “factors”]
- Step 2: Identification of 10 highway zones (ranging from 1.5 to 4.5km in length) for the preferred 300m corridor. The purpose of identifying such zones was to enable “area focused” MCA evaluations to be undertaken on the long list of highway alignment options for each zone.<sup>14</sup> The location and length of each zone was based on engineering / environmental considerations (e.g. topography, preliminary interchange locations and waterway locations)
- Step 3: Identification of a long list of 80m<sup>15</sup> wide highway alignment options for each zone. Each 80m alignment option was premised on horizontal geometry standards, property information and topographical information plus the constraints and opportunities identified in the IBC’s constraints and opportunities map. Typically, up to six alignments were identified for each highway zone
- Step 4: Implementation of a “screening process” to determine whether any of the long-listed alignment options for each zone could be removed or could be adapted to a more optimal alignment. This screening process was undertaken at a Project Design Team workshop<sup>16</sup> (held in mid-March 2020) and included removing any obviously fatally flawed options (based on the IBC’s constraints and opportunities maps), and responding to the following questions:
  - Does any alignment impact on a residential dwelling(s)?
  - Does any alignment impact on any known community/lwi assets (including future Horowhenua District Council (HDC) growth areas)?
  - Does an alignment make reconnecting the local road network more complex?
  - Is an alignment located within a flood zone, if so, will it make it more complex to construct?
  - Does the alignment impact on a known/significant ecological area?
  - Does the alignment impact on high quality productive land?
  - Does an alignment optimise (or compromise) preferred bridge crossing locations?
  - Does the alignment make connecting the alignment in the zones to the south and / or north more complex to implement?
  - Will the local topography for the alignment make constructability more complex?

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<sup>14</sup> It is noted that some modification to these zones occurred during the long to short listing process, but the original zone letters were retained to ensure consistency for the Project Design Team (hence some zone lettering not been in alphabetical order)

<sup>15</sup> It is noted that the 80m width was sufficient to provide for the road carriageway (e.g. four lanes and road shoulders), a shared path, landscaping, drainage and earthworks in most places. It is noted that future design stages and designation processes will result in the 80m width being narrowed in the most part. However, in some areas, the 80m width may increase around the interchanges, areas of cut/fill, drainage and stormwater treatment, parallel service roads and to accommodate mitigation (e.g. noise bunding and planting). It is also noted that each highway zone was assigned a unique identifying letter (e.g. Zone A, B and C).

<sup>16</sup> The attendees at the Project Design Team workshop were Selwyn Blackmore (Transport Planning Lead), Jamie Povall (Design Manager), Phil Peet (Team Leader), Keith Weale (Geometrics Lead), April Peckham (Resource Planner), and Chris Hansen (Lead Resource Planner)

- Will the alignment result in sub-optimal property parcel outcomes?
- Will the alignment impact on a special amenity area [as defined by the Kāpiti Coast District Council's (KCDC) District Plan]?

If the Project Design Team's collective answer was "yes" to any of the above questions, it then used its professional technical expertise to identify whether an alignment option should be removed from further consideration or adapted to a more optimal alignment.

It is noted that the Project Design Team acknowledged at the start of the screening workshop that its long to short listing recommendations may need to be revisited following completion of the MCA process.

- Step 5: Documenting / reporting the long to short list alignment process in the report entitled the *Ōtaki to North of Levin Detailed Business Case: Initial Alignment Review (12 May 2020)*<sup>17</sup>.

## 4.2 Interchange Long to Short Listing Process

To identify a short list of interchange locations and forms for detailed MCA evaluation the following key steps were undertaken:

- Step 1: Development of interchange principles<sup>18</sup> and design requirements<sup>19</sup>. Development processes were undertaken by the Project Design Team<sup>20</sup> with input from Waka Kotahi and HDC
- Step 2: Identification of a long list of (nine) interchange option locations for evaluation against the interchange principles
- Step 3: Evaluation of the interchange long list options against the interchange principles in order to identify a short list of interchange locations to be taken forward for further MCA assessment, and
- Step 4: Identification of the form / type (e.g. service, interchange or at-grade) of the interchanges for each short-listed location. This step also enabled the Project Design Team to determine the likely interchange footprint size at each short listed interchange location for further MCA assessment.

In terms of Steps 3 and 4, the following interchange locations and forms (in brackets) were short listed:

- Manakau South (both service grade separated and at-grade roundabout interchange forms were identified)
- Manakau North (both service grade separated and at-grade roundabout interchange forms were identified). It is noted that this interchange location would be located near North Manakau Road, and was subsequently renamed Kuku following MCA Workshop 2
- Kimberley or Tararua (both service grade separated and at-grade roundabout forms were identified). It is noted that only one interchange would be required in the Kimberly / Tararua locality

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<sup>17</sup> See Appendix A of the draft MCA Assessment Report 2020

<sup>18</sup> The interchange principles were as follows: current urban form; future urban form; technical; and environmental and cultural impacts

<sup>19</sup> The key interchange design requirements included:

- Suitable separation between interchanges and other significant structures
- Direct impacts on well established residential / commercial areas are to be avoided if possible
- Interchanges need to connect to an existing road (and the existing road ideally should be of a standard and function that it serves a reasonable community catchment), and
- Interchanges are generally not to be located where ramp entry and exits would be on tight horizontal curves, and
- Interchanges need to be safe for all modes.

<sup>20</sup> The Design Team comprised of Jamie Povall (Design Manager), Phil Peet (Team Leader), and Selwyn Blackmore (Transport Planning Lead)

- “SH1 / 57” Split location (including service and system grade separated and at-grade roundabout interchange forms were identified), and
- North Levin (both service grade separated and at-grade roundabout forms were identified).

The interchange locations discarded from the long list included “north Kuku” (located near Kuku East Road / Ohau River), Muhunua and Queen Street. They were generally discarded as they would provide poor local connectivity and / or would encounter a range of challenging environmental / cultural / buildability constraints.

In terms of discarded interchange forms, and with the exception of the SH1 / 57 Split location, system interchanges were discarded from further consideration as the Project Design Team determined that there was no need for a high-speed standard connection for the short-listed interchange locations.

Further information on the outcomes of the long to short list interchange process can be found in the *Ōtaki to North of Levin Detailed Business Case: Interchange Options Report (15 May 2020)*.<sup>21</sup>

### 4.3 Local Road Long Listing Process

The following design principles were applied to identify a long list of local road options:

- Local road and non-motorised mobility options to be considered to ensure community severance is minimised
- Motorised vehicle access to be maintained. Where the new highway is to sever a local road, a replacement route is to be provided. Such a route should not unreasonably increase the current journey length by more than a few kilometres
- Motorised private motor vehicle access to properties to be retained, including accepting that some private accesses may need to be new extended driveways or rights of way
- All local road options to have the same cross sections (e.g. all would be capable of providing walking and cycling)
- Bridges could be located either over or under the new highway, and
- Interdependencies between local road options to be considered. For example, it may be unreasonable to adopt all options that provide a bridge over the highway, resulting in multiple bridges in a short length. Equally, it may be unreasonable to adopt many successive cul de sacs that would require long diversions to a crossing point.

The above long listing processes, along with the actual long list of local road options that were evaluated, are identified in the report entitled the *Ōtaki to North of Levin Detailed Business Case: Local Roads Access Long List Options Report (25 May 2020)*.<sup>22</sup>

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<sup>21</sup> See: [O2NL community - Appendix O - Interchange options report - July-August 2020 \(nzta.govt.nz\)](#)

<sup>22</sup> See Appendix P of the draft MCA Assessment Report 2020



## 5. Stage 2: Draft MCA Evaluations

This section of the report summarises the MCA processes for Stage 2 that informed the alignment, interchange locations / forms and local road option preferences for the new highway proposed in Waka Kotahi's public engagement programme in August and September 2020.

More detailed explanations of the processes and outcomes of Stage 2 are provided in the draft MCA Assessment Report 2020 and Post MCA Report 2020, respectively.

It is noted that the assessment criteria and selection of the MCA assessors was undertaken in accordance with Waka Kotahi's MCA guidelines<sup>23</sup>.

### 5.1 Highway Alignment and Interchange Assessment Criteria and MCA Assessors

The first key step in the Stage 2 process was to select the relevant MCA assessment criteria for evaluating the alignment, interchange and local road options for the new highway. The next step was to select the MCA assessor organisations who would undertake each assessment.

Table 2 sets out the MCA assessment criteria chosen to evaluate the alignment and interchange location / form options as well as the MCA assessors who were selected to undertake these assessments. It is noted that the same MCA assessors also undertook the traffic light signal evaluations for the local road options.

As detailed in the draft MCA Assessment Report 2020, the Project Design Team selected the same MCA assessors who were involved in the IBC's corridor MCA process where it was possible to secure their services again. This approach was predicated on ensuring their specialist knowledge of the project area was retained, and a consistent assessment approach was adopted where relevant.

A similar approach was adopted for the selection of the MCA assessment criteria. That is, the IBC assessment criteria was replicated for the Ō2NL DBC MCA assessments where relevant. There were however some updates to the IBC criteria plus there were some additional criteria added to reflect the decision-making processes needed to complete the DBC. For example, the project objectives criterion was updated, terrestrial and freshwater / ecology and heritage / archaeology were assessed as separate criterion, the lwi values assessment criterion was evaluated separately by both Ngāti Raukawa ki te Tonga and Muaūpoko and a new Property Degree of Difficulty criterion replaced the previous IBC's "Impacts on Dwelling" assessment criteria. In addition, project costs were not assessed as part of the MCA (as project costs was considered to be solely a NZ Upgrade Programme / Waka Kotahi DBC investment decision).

It is noted that each Ō2NL MCA DBC assessment criteria identified in Table 2 has been "grouped" under the assessment themes identified in Waka Kotahi's MCA guidelines.

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<sup>23</sup> See: [MCA User Guidance Feb 2021-FINAL.pdf \(nzta.govt.nz\)](#)

**Table 2: 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 alignment and interchange 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>• Support intra and inter-regional economic growth and productivity through improved movement of people and freight</li> <li>• Provide integration between the State highway network and the local road network including supporting access to multi-modal connections and Levin, and</li> <li>• Enhance efficiency and journey time reliability along the State highway network.</li> </ul>	Stantec
<b>Theme: Environmental / Social impacts</b>		
<b>Iwi Cultural Values (Te Rūnanga o Raukawa, Ngāti Raukawa hapū) (“Ngāti Raukawa ki te Tonga”)</b>	This assessment criterion considers the impacts on Ngāti Raukawa ki te Tonga 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.	Ngāti Raukawa ki te Tonga
<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</b>	This assessment criterion considers natural and landscape character impacts (including degree of modification and presence of structures) of the alignment, interchange and local road options. It	Isthmus

Assessment Criteria	Summary of Assessment Criteria	MCA Assessor Organisation
	includes considering potential landscape and urban design impacts of the alignment on nearby townships or notable lifestyle areas.	
<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.	Forbes Ecology Limited
<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 dwellings and other community buildings (sensitive receptors) located within 300m of the alignment, interchange and local road options (which don't require removal).	Chiles Ltd
<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 (applying to Horowhenua only)</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.	Horowhenua District Council

Assessment Criteria	Summary of Assessment Criteria	MCA Assessor Organisation
<b>Kāpiti Coast District Development (applying to the Kāpiti District only, and to the alignment only)</b>	This assessment criterion considers the impacts on the provisions of the approved KCDC District Plan and the confirmed future growth plans for the Kāpiti Coast District.	Kāpiti Coast District Council
<b>Theme: Implement ability impacts</b>		
<b>Fit with Local Road System</b>	This assessment criterion considers the contribution of the alignment and interchange 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).	Horowhenua District Council
<b>Engineering Degree of Difficulty (EDoD)</b>	This assessment criterion considers the physical components of the alignment, interchange and local road 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.	Stantec
<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 Steps Undertaken to Prepare the draft MCA Assessments

### 5.2.1 MCA Assessment Instructions

Prior to the Stage 2 MCA workshops, various briefings and written instructions were provided to the MCA assessors on the MCA process.

The first technical briefing (#1), which was held via MS Teams on 9 April 2020, provided the MCA assessors with an update on the Ō2NL Project as well as providing them with an opportunity to identify what additional information they would need to undertake their evaluations.

In early May 2020, the MCA assessors were issued with written instructions on the MCA process for Stage 2. These instructions included the following information:

- There would be two MCA workshops (i.e. for Stage 2). MCA Workshop 1 would consider the short list of highway alignment options, and MCA Workshop 2 would consider the interchange location and form options (and long list of local roads). It was also noted that a third MCA workshop (i.e. MCA Workshop 3) would be undertaken in Stage 4 of the MCA process
- Each MCA workshop would be predicated on the *Decision Conferencing* approach (i.e. where scoring and weightings are identified through discussion and consensus, but informed by expert views)
- The assessment requirements needed for Stage 2 of the MCA process (e.g. participation and presentations in the MCA workshops, and production of detailed specialist MCA reports)
- The information needing to be detailed in the specialist MCA reports for Stage 2, including key background / baseline information, key assumptions applied<sup>24</sup> to the MCA assessors scoring as well as identifying what additional information might be needed to complete scoring for the final MCA workshop to be held later in Stage 4, and
- The location of the Project SharePoint website for storing MCA evaluation information.

A second technical briefing (#2) was held via MS Teams on 12 May 2020. At this briefing it was confirmed:

- The MCAs would be undertaken to inform both the DBC and subsequent RMA processes
- That 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
  - Improve the resilience of the State highway network
  - Support intra and inter-regional economic growth and productivity through improved movement of people and freight
  - Provide integration between the State highway network and the local road network including supporting access to multi-modal connections and Levin, and
  - Enhance efficiency and journey time reliability along the State highway network.
- Each highway and interchange location / form option were to be evaluated against the 6-point scoring system in Table 3 below:

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<sup>24</sup> It was noted in the instructions that each MCA assessor were to base their assessments on an assumption that reasonable mitigation measures were to be applied for managing effects

**Table 3: 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
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 (i.e. at the time of the MCA workshop)
- 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
- All specialist MCA assessments for Stage 2 (and ultimately for the Stage 4 assessment were to be based on existing information, and professional expert judgment applied when scoring each option)<sup>25</sup>
- 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)], and
- 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.

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<sup>25</sup> It is noted that the MCA assessors were also asked at MCA Workshops 1 and 2 to identify if they required any further technical information in order to finalise their final MCA evaluations in Stage 4

## 5.2.2 Local Road Traffic Light Signal Evaluations

As noted above, the same MCA assessors were also asked to undertake a high-level evaluation of the long list of local road options. The instructions for undertaking this evaluation are summarised below:

- Review the long list of local road options (as identified in *the Local Access Roads Long List Options Report, June 2020*), and
- Evaluate the long list of local road options (and to provide comment where relevant) using the following traffic light signals system to indicate whether there were low, medium or high-level concerns as follows:
  - **Green** (or 1) if an option is likely to have only minor impacts or issues
  - **Orange** (or 2) if an option is likely to have moderate impacts or issues, and
  - **Red** (or 3) if an option is likely to have serious or significant negative impacts or issues.

## 5.3 Key MCA Workshop 1 and 2 Processes

MCA Workshop 1, which was held to help evaluate the short-listed highway alignment options, was held on 25 May 2020, and MCA Workshop 2, which was held to help evaluate the interchanges and long list of local road options, was held on 3 June 2020. Both workshops were attended by the MCA assessors, key members of the Project Design Team, observers from Waka Kotahi as well as representatives from Ngāti Raukawa ki te Tonga and Muaūpoko.

At MCA Workshop 1, and with the exception of Ngāti Raukawa ki te Tonga and Muaūpoko, each MCA assessor presented their evaluation methodology and results for each short-listed highway alignment (i.e. per highway zone). Similar presentations were made by the same MCA assessors for the interchange and long list of local road options at MCA Workshop 2.

At each workshop, each MCA assessor was also asked to identify what additional investigations would be needed to complete their assessments for the MCA workshop in Stage 4 (i.e. MCA Workshop 3). The assessors who identified that extra investigation work (i.e. over and above considering community / Iwi feedback from the pending public engagement programme) was needed to complete their assessments included:

- Social / Community / Recreation – the MCA assessor noted that their MCA scores (for all options) were provisional as additional social impact data would be needed before their MCA scores could be confirmed (including undertaking an independent social impact survey and conducting their own stakeholder interviews)
- Archaeology – the MCA assessor noted that geophysical surveys of key locations (e.g. Pukehou) would be required before their draft scores for the highway alignment options could be confirmed, and
- Heritage – the MCA assessor noted that site visits of identified heritage buildings (e.g. the Prouse Homestead) would be required to confirm their draft alignment and interchange scores.

For avoidance of doubt, the MCA assessors were also specifically asked at each workshop to ensure that their evaluations considered the impacts of the northern options on the Tara-Iki Growth Area (i.e. based on the information that was available for this development at the time).

Furthermore, it is noted that the Fit with Project Objectives MCA assessor advised at MCA Workshop 1 that they had 'refined' the five project objectives in order to be consistent with the IBC's investment objectives as well as the recommended investment objectives identified through Waka Kotahi's re-evaluation of the Ō2NL Project in 2018. Accordingly, the refined objectives used to assess the Fit with Project Objectives assessment criterion were as follows:

- **Enhanced movement** (links directly with the following objectives: enhance the safety of the State highway network by delivering a four lane State highway between Ōtaki and

North of Levin; and, support intra and inter-regional economic growth and productivity through improved movement of people and freight)

- **Appropriate connections** (links directly with the objective to provide integration between the State highway network and the local road network including supporting access to multi-modal connections and Levin)
- **Resilience** (links directly to the objective to improve the resilience of the State highway network), and
- **Safety** (links directly with the objective to enhance efficiency and journey time reliability along the State highway network).

See **Appendix A** (Fit with Project Objectives Report) for more information.

### 5.3.1 MCA Specialist Reports

Each MCA assessor’s individual Stage 2 evaluations are summarised in the draft MCA Assessment Report 2020. However, for ease of reference, extracts of the relevant commentary for the highway alignment and interchange options from this report are provided in **Appendix B** and **C**, respectively.

For additional ease of reference, and where relevant, each MCA assessors’ full reports from the draft MCA Assessment Report 2020 are attached in full as appendices to this report.

### 5.3.2 Ngāti Raukawa ki te Tonga and Muaūpoko’s Stage 2 Participation

Although both Ngāti Raukawa ki te Tonga and Muaūpoko attended MCA Workshops 1 and 2 as observers, they did not evaluate or score any of the new highway alignment, interchange or local road options. To this end, and at the beginning of MCA Workshop 1, both Iwi advised that they needed more time to consider the new highway proposals before providing their evaluations / scores for the options.

## 5.4 Recommendations from the draft MCA Assessment Report 2020

### 5.4.1 Initial Highway Alignment Option Preferences

The alignment preferences identified for each highway zone in the draft MCA Assessment Report 2020 are set out in Table 4 below.

**Table 4: Alignment preferences identified in the draft MCA Assessment Report 2020**

Highway Zone	Draft MCA Report 2020’s alignment preferences
<b>A</b>	Green Alignment
<b>B</b>	White Alignment
<b>C</b>	White Alignment
<b>D</b>	Dark Blue Alignment
<b>E</b>	Green Alignment
<b>F</b>	Both Orange and White Alignments
<b>G</b>	Purple Alignment
<b>H</b>	Cyan Alignment
<b>K</b>	Both Yellow and Dark Blue Alignments



L	Both Orange and Black Alignments
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## 5.4.2 Initial Interchange Option Preferences

The interchange location / form options identified in the draft MCA Assessment Report 2020 are set out in Table 5 below.

**Table 5: Interchange location / form option preferences identified in the draft MCA Assessment Report 2020**

Interchange Location	Draft MCA Assessment Report 2020's Interchange Location / Form Preferences
<b>Manakau / Kuku (location and form)</b>	No connection, but if a connection was to be provided, then there is a preference for an interchange at Kuku (form undecided)
<b>Kimberley or Tararua (location and form)</b>	Tararua only, noting a preference for grade separation
<b>SH1 / SH57 Split (form only)</b>	No option selected (i.e. all interchange options retained for further consideration)
<b>North Levin (form only)</b>	Roundabout (only)

## 5.4.3 Long List of Local Road Options

At MCA Workshop 2 each MCA assessor evaluated the long list of local road options (that had been grouped into specific Local Road Zones) using the traffic light signal evaluation system described above in Section 5.2.2.

Each MCA assessor's individual traffic light signal evaluations are summarised in the draft MCA Assessment Report 2020. For ease of reference, the assessment commentary for the local road options from this report is provided in **Appendix D**.

## 5.5 Outcomes of the Post MCA Report 2020

Following completion of the draft MCA Assessment Report 2020, and prior to public engagement, the Project Design Team<sup>26</sup> undertook further design refinements of the highway alignment, interchange locations / forms and local road long list options. The key outcomes of this process are summarised below (and documented in detail in the Post MCA Report 2020).

### 5.5.1 Updates to the Highway Alignment Preferences

The Project Design Team identified that there was a need to "stitch" together the alignment preferences identified in the draft MCA Assessment Report 2020 to ensure that each could technically connect to the alignment in the next highway zone. In addition, this process also enabled the Project Design Team to respond to the key issues that had been signalled by the MCA assessors at MCA Workshops 1 and 2 (such as avoiding ecologically sensitive areas or complex property acquisitions) as well as ensuring the relevant alignments integrated appropriately with the emerging interchange option preferences.

Table 6 sets out the updated highway alignment options identified following the Post MCA Report 2020 process (along with a comparison against the draft MCA Assessment Report 2020 preferences). These draft alignment preferences were the options ultimately recommended to

<sup>26</sup> The key members of the Project Design Team who undertook this assessment were Jamie Povall (Design Manager), Keith Weale (Geometrics Lead), Phil Peet (Team Leader) and Selwyn Blackmore (Transport Planning Lead)

be included in Waka Kotahi's public engagement programme that was undertaken between August and September 2020.

**Table 6: Updated alignment preferences identified in the Post MCA Report 2020**

Highway Zone	Draft MCA Assessment Report 2020's alignment preferences (July 2020)	Post MCA Report 2020's alignment preferences (August 2020)
<b>A</b>	Green Alignment	Refined Green Alignment
<b>B</b>	White Alignment	No change
<b>C</b>	White Alignment	No change
<b>D</b>	Dark Blue Alignment	No change
<b>E</b>	Green Alignment	No change
<b>F</b>	Both Orange and White Alignments	Refined White Alignment
<b>G</b>	Purple Alignment	No change
<b>H</b>	Cyan Alignment	No change
<b>K</b>	Both Yellow and Dark Blue Alignments	Refined Alignment (i.e. combined Yellow and Dark Alignments)
<b>L</b>	Both Orange and Black Alignments	Refined Alignment (i.e. combined Orange and Black Alignments)

## 5.5.2 Updates to the Interchange Options

For the interchange location / forms options, further refinements to the option preferences for the Tararua and "SH1 / SH57 Split" locations were identified. These are discussed below.

For the avoidance of doubt, no changes were identified for the Manakau / Kuku or North Levin interchange location options.

### 5.5.2.1 Tararua Interchange Options

For the Tararua interchange location, the draft MCA Assessment Report 2020 identified a preference for an interchange at the Tararua Road location (rather than at the Kimberley Road location), but only an indicative preference for full grade separation.

In the Post MCA Report 2020, it was noted that grade separation at the Tararua Road location could take the form of either a half or full diamond shaped interchange. A half diamond interchange would facilitate movements to and from the south only (i.e. movements from the north would be catered for at the SH1 / SH57 Split location). A full diamond interchange would facilitate all movements from both the south and the north. Accordingly, Waka Kotahi decided to seek feedback from the public in August and September 2020 on the basis that the grade separated interchange at the Tararua Road location could either be a half or full grade separated interchange.

Figure 3 sets out the location and indicative form of the half grade separated interchange option. This figure also sets out the option of a full grade separated interchange for comparison purposes.



**Figure 3: Half (left) and full (right) grade separated interchanges at Tararua Road**

### 5.5.2.2 SH1 / SH57 Split Interchange Form Options

For the SH1 / SH57 Split interchange location, the draft MCA Assessment Report identified a need for an interchange to be located at this location, but did not identify a preference for its form. Through post MCA workshop discussions between Waka Kotahi and HDC officers and as a result of further design development, a preference was identified for a roundabout only option to be progressed at the SH1 / 57 Split location (rather than the grade separation options). The key reasons for identifying this preference were as follows:

- Future long-term adaptability and flexibility with the intersection form and location for any highway upgrades that may occur on SH57 to the north of the SH1 / 57 Split location which could be required in the future
- A roundabout would have a significantly lower cost than a grade-separated interchange, and still provide similar / acceptable levels of customer service (i.e. from a through and local traffic movement and safety perspective)
- The need to appropriately signal the end of the grade-separated standard highway with a gateway type feature, particularly for northbound traffic continuing onward towards Palmerston North, by requiring an at-grade slow speed movement and deliberate change in road environment
- A roundabout form was more likely to have less environmental impacts than a grade separated interchange, given it would have a significantly smaller footprint in comparison, and
- A roundabout would integrate efficiently with the emerging highway alignment preferences in Zone K and would be compatible with existing local road connections.

### 5.5.2.3 Summary of Updated Interchange Options

Table 7 below sets out the updated / refined interchange options identified through the Post MCA Report 2020 process. These draft interchange preferences were the options recommended to be included in Waka Kotahi's public engagement programme that was undertaken between August and September 2020.

**Table 7: Updated interchange location / form options identified in the Post MCA Report 2020**

Interchange location	Draft MCA Assessment Report 2020's Interchange Option Preferences (July 2020)	Post MCA Report 2020's Interchange Option Preferences (August 2020)
<b>Manakau / Kuku</b>	No connection, but future proofing for an interchange at South Kuku (form undecided)	No change
<b>Kimberley or Tararua</b>	Tararua only, noting a preference for grade separation	A grade separated compact diamond interchange at Tararua, or A "half" diamond interchange at Tararua
<b>SH1 / SH57 Split</b>	All interchange options	Roundabout (only)
<b>North Levin</b>	Roundabout (only)	No change

More information on the updating process for the interchange option preferences can be found in Section 5 of the Post MCA Report.

### 5.5.3 Updates to the Local Road Options

The draft MCA Assessment Report 2020 identified a long list of local road options (and their initial traffic light signal evaluations) for further consideration. Following completion of this report, further engagement with HDC, KDC and technical specialists from Waka Kotahi was undertaken. Consequently, some of the original local road zones were combined and the long list of local road options further refined (as set out in Section 6 of the Post MCA Report 2020). For some of the local road zones only one local road option was identified,<sup>27</sup> however for Local Road Zones F to J and L alternative options were identified for further engagement with the community. Table 8 below sets out the updated local road options following completion of the Post MCA Report 2020.

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<sup>27</sup> It is noted that for some of the Local Road Zones only one option was identified for assessment. This decision was based on the need to integrate with the alignment and interchange preferences identified in the draft MCA Assessment Report 2020 as well as responding to HDC's requirements (as documented in the Phase 2 Post MCA Report). These decisions were also premised on the understanding that local road designs would be further optimised / refined through the DBC

**Table 8: Updated local road options identified in the Post MCA Report 2020**

Local Road Zones	Updated Local Road Options
<b>A</b>	Utilise new Taylors Road connection currently being built as part of the Peka Peka to Otaki Expressway (and reconfigure existing SH1) to access Taylors Road traffic only. Reconnect existing SH1 with a localised realignment and new grade-separated connection across expressway
<b>Combined B and C (referred to as B to C)</b>	South Manakau Road, and a pedestrian and cycling facility at Honi Taipua Street
<b>D</b>	Connection at Manakau North Road
<b>E</b>	Connection at Kuku East Road
<b>Combined F, G, H, I and J (referred to as F to J)</b>	Option A: Provide connections at Muhunua East Road and Tararua Road (no Kimberley Road connection but parallel local roads) or Option B: Provide connections at Muhunua East, Kimberley and Tararua Roads
<b>J (Liverpool Street only)</b>	No option provided as part of the new highway
<b>K</b>	Connection at Queen Street
<b>L</b>	Option A: Provide a new connection between Waihou Road and McDonald Road and connection on to SH57 or Option B: Provide a new connection between McDonald, Waihou Road (East) and Wakefield Street onto Queen Street
<b>Combined N, P and Q</b>	Provide supporting local connections for the proposed North Levin roundabout

#### 5.5.3.1 Kimberley and Waihou / McDonald Road location options

As set out above, two local road options were identified for the Kimberley Road location (i.e. Local Road Zone F to J) and for the Waihou / McDonald Road location (i.e. Local Road Zone L).

Figure 4 sets out the options for the Kimberley Road location, and Figure 5 sets out the options for the Waihou / McDonald Road location.



**Figure 4: Kimberley Road options (Option A – “No Kimberley Bridge” to the left, and Option B to the right)**



**Figure 5: Waihou and McDonald Road options (Option A to the left, and Option B to the right)**

It is noted that the location maps for the local road zones where only one option was proposed (i.e. Local Road Zone’s A, D, E, K and N / P / Q) can be found below in Section 7.10 of this report or in Section 6 of the Post MCA Report 2020.

## 6. Stages 3A and 3B: Public and Iwi Engagement Feedback

This section of the report summarises the feedback received by Waka Kotahi from its public engagement programme undertaken between August and September 2020. The *Ō2NL Engagement Summary Report (March 2021)*<sup>28</sup> provides further information on the feedback received, including Waka Kotahi's detailed responses to this feedback.

This section also summarises the feedback received from the Ngāti Raukawa ki te Tonga and Muaūpoko project teams prior to MCA Workshop 3.

### 6.1 Public Engagement Feedback

One of the key purposes of Waka Kotahi's public engagement programme was to identify information to help inform decision making on the alignment, interchange and local road options. For example, feedback was sought on:

- How people would use the new highway and its connections
- Options for connecting local roads, including options in the Kimberley Road area and around Waihou and McDonald Roads
- Shared path considerations
- How people typically move around the area, and
- How often they travel on the existing state highways.

The "top five comment topic" areas on the options were as follows:

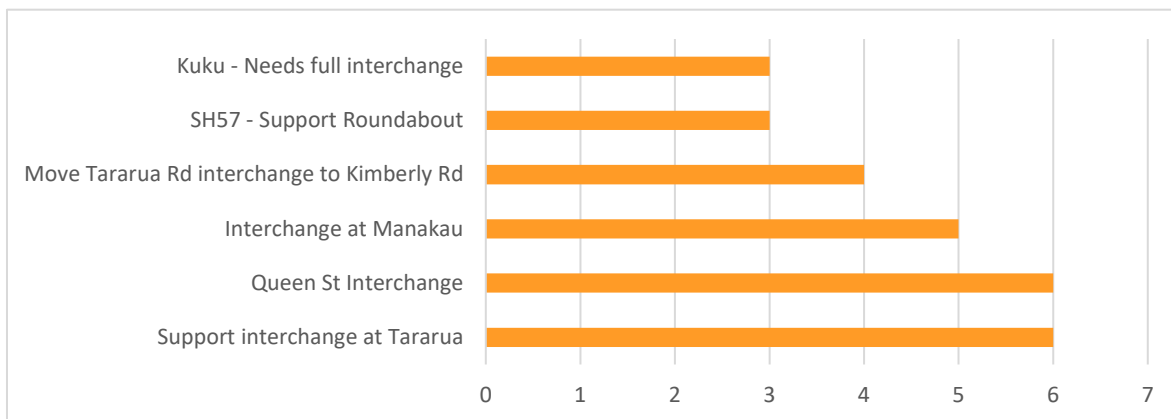
- Interchanges
- Alignment
- Access and connectivity
- Walking / cycling, and
- Local roads.

#### 6.1.1 Proposed Interchanges

As set out in Figure 6, about 80 comments were received on the proposed interchanges. A number of these comments were in support of establishing full grade separation interchanges rather than roundabouts. Of particular note was the feedback received on the form of the interchange proposed at the SH1 / SH57 Split location.

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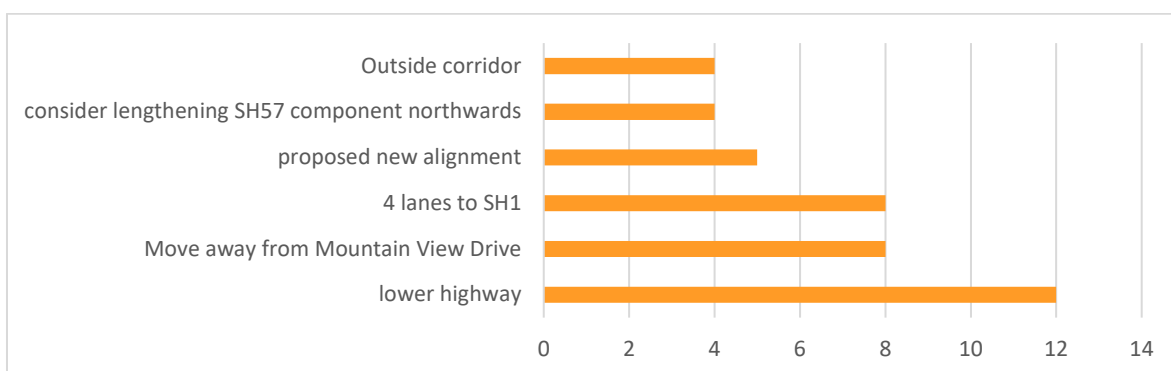
<sup>28</sup> See: [Ōtaki to North of Levin engagement summary report – August-September 2020 \(nzta.govt.nz\)](#)



**Figure 6: Comments received on the proposed interchanges**

### 6.1.2 Proposed Alignment

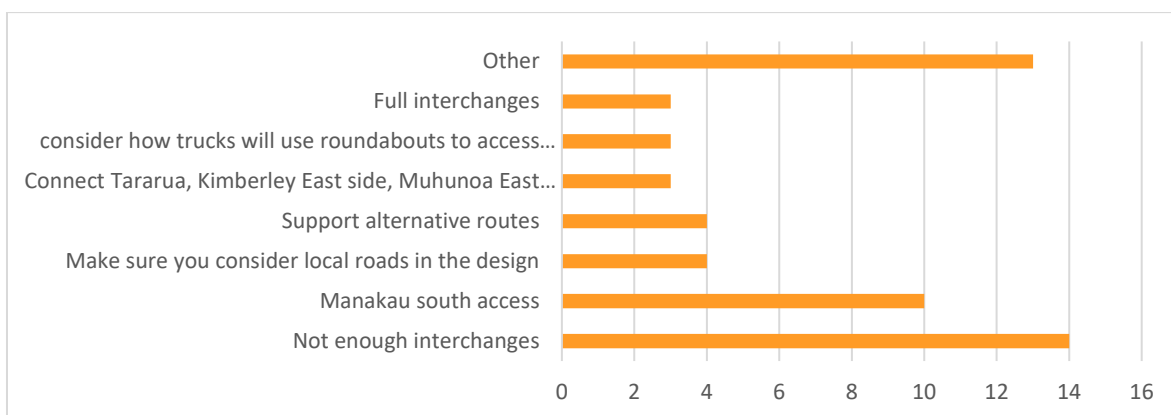
As set out in Figure 7, over 70 comments were received on the proposed alignment. Several of these comments were opposed to having roundabouts on the alignment (with many of these submitters preferring full interchanges). Some people also commented that a lower elevation profile for the highway was preferred as a means of allowing overpasses at grade and to mitigate noise effects.



**Figure 7: Comments received on the proposed alignment**

### 6.1.3 Access and Connectivity

As set out in Figure 8, over 50 comments were received on access and connectivity. Many of these comments were in support of more interchanges. Some also raised concerns regarding access from Manakau to South Manakau.



**Figure 8: Comments received on access and connectivity**



### 6.1.4 Walking / Cycling

Over 50 comments were received on walking and cycling. Most of the comments received requested that all existing east-west accesses crossed by the new highway be retained. A number of these comments also requested that the proposed shared path be designed to double up as a bridleway. Other key requests / suggestions / comments included:

- Ensure safe crossings
- Ensure safety on the revoked / current SH1
- Shared pathway connecting north and south Manakau
- Shared pathway to Muhunoa and Kimberley River reserves
- Create loop walk from Speldhurst to McLeavey Road
- No bridleways
- Shared pathway between Ohau and Manakau
- Place shared path on western side of alignment
- Link to other shared paths
- Use good design practices
- Create shared pathways along rivers
- Design shared paths at grade
- Consider property privacy when creating shared paths, and
- Improve the existing SH1 before revocation.

### 6.1.5 Local Roads (general)

As set out in Figure 9, over 20 comments were received on the proposed local road options in general. A number of these comments requested that all existing east-west accesses across the proposed alignment be retained.

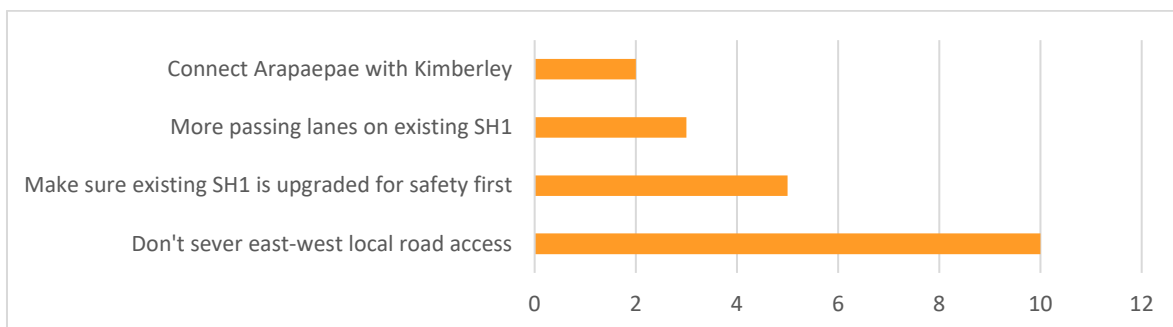


Figure 9: Comments received on the proposed local roads (general)

### 6.1.6 Local Road Alternative Options

Fourteen responses on the Kimberley Road location options were received. Thirteen of these supported Option A (i.e. no Kimberley Road Bridge option) and one supported Option B.

Eight responses were received for the Waihou / McDonald Road options. Seven were in support of Option A (i.e. a new connection between Waihou and McDonald Roads), and one supported Option B.

As set out below in Figure 10, an active mode only connection was proposed for the Honi Taipua Street (and South Manakau Road) location in Waka Kotahi's public engagement material. In response, comments were received from the community that providing an active

mode only connection was likely to result in local transport resilience issues, and therefore a full connectivity option should also be considered.

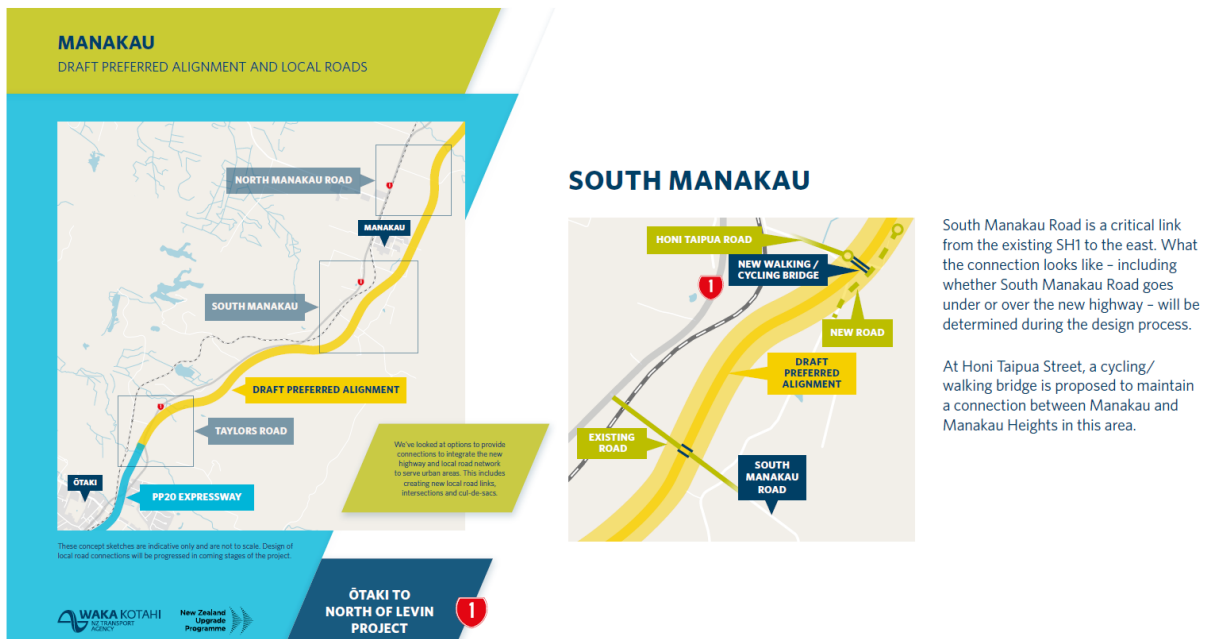


Figure 10: Proposed location for the Honi Taipua Street active mode option

## 6.2 Iwi Engagement

Waka Kotahi is partnering with various hapū of Ngāti Raukawa ki te Tonga and with Muaūpoko Tribal Authority on the Ō2NL Project. For Stages 3A (and Stage 4), Waka Kotahi ensured that both Iwi were resourced with the appropriate expertise to participate in the MCA process so they could meaningfully consider the technical assessments used to inform the process.

### 6.2.1 Ngāti Raukawa ki te Tonga

Specific engagement on the MCA process between Waka Kotahi and Ngāti Raukawa ki te Tonga commenced in March 2020, and focused initially on establishing the engagement processes needed for the MCA process. As noted in previous sections, Ngāti Raukawa ki te Tonga subsequently elected to participate in MCA Workshops 1 and 2 as observers only. This was because Ngāti Raukawa ki te Tonga had determined that they needed more time to engage with their hapū on the options.

Following MCA Workshops 1 and 2, and in order to evaluate the options, Ngāti Raukawa ki te Tonga established its own project team to manage its response to the final stages of the MCA process. This project team engaged with various hapū of Ngāti Raukawa ki te Tonga on the proposed options for the new highway during August and September 2020. The key engagement processes undertaken during this time included:

- Ō2NL Project Team hui (Raukawa hapū) held on 1 August 2020 – at this hui a project presentation was made, followed by a bus tour of the Ō2NL project
- Huia, Matau and Kereru Marae hui on 26 August, 10 September and 17 September 2020 – at these hui an overview of the Ō2NL project was provided (these meetings included zoom attendees)
- Ngāti Kikopiri and Ngāti Hikitanga hui on 3 September and 24 September 2020 – at these hui an overview of the Ō2NL project was provided (this meeting included zoom attendees)
- Ngāti Wehi Wehi (marae committee) hui on 8 September 2020 - at this hui an overview of the Ō2NL project was provided
- Drop-in sessions at the Runanga offices were held on 29 September and 1 October 2020 – at these sessions the Ō2NL project and cultural concerns were discussed, and

- Tukorehe Marae hui on 30 September 2020 – at this hui the Ō2NL project and cultural concerns were discussed.

## 6.2.2 Muaūpoko Tribal Authority

Specific engagement on the MCA process between Waka Kotahi and Muaūpoko commenced in March 2020 and focused initially on establishing engagement processes needed for the MCA process. As noted in previous sections, Muaūpoko Tribal Authority (Muaūpoko) subsequently elected to participate in MCA Workshops 1 and 2 as observers only. This was because Muaūpoko had determined that they needed more time to understand and engage with their hapū on the options.

Following MCA Workshops 1 and 2, and in order to evaluate the options, Muaūpoko established its own project team to manage its response to the final stages of the MCA process in August 2020. This project team engaged with Muaūpoko's membership on the proposed options for the new highway from August to October 2020. The key engagement processes undertaken during this time comprised of the following:

- Muaūpoko rangatahi hui on 25 September 2020
- Membership drop-in sessions at Te Takeretanga-o-Kura-Hau-po from 28 September to 3 October 2020, and
- Hui with the Muaūpoko kaumatua on 2 October 2020.

## 6.2.3 Core Principles

In 2021, through Waka Kotahi's partnership with Ngāti Raukawa ki te Tonga and Muaūpoko, the following core principles for the Ō2NL Project were established:

- Tread Lightly, with the whenua:
  - Me tangata te whenua (treat the land as a person), and
  - 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).

For avoidance of doubt, the above core principles were developed / agreed following completion of the MCA workshop processes in 2020 (and were therefore not in place at the time of the MCA workshop processes).

## 6.3 Community Reference Groups

To further support Waka Kotahi's public engagement programme, and its ongoing Ō2NL project engagement, Waka Kotahi established informal community reference groups at Manakau, Ohau, Levin and North Levin. During the public engagement programme, these groups met to provide feedback on the option development process, key design issues (e.g. noise and location of local roads) as well as the community engagement processes. For avoidance of doubt, these groups were not formal representatives of the community.

## 7. Stage 4: MCA 3 Processes and Outcomes

This section of the report summarises the steps undertaken to complete Stage 4 of the MCA process.

### 7.1 MCA Workshop 3 Assessment / Evaluation Instructions

On 30 October 2020, the MCA assessors were briefed on the assessment process requirements for MCA Workshop 3 (held on 18 November 2020). Each assessor was specifically asked to:

- Consider whether community and / or Iwi feedback and post-MCA design refinement processes had materially altered their original MCA evaluation outcomes for the highway alignment and interchange options (as identified in the draft MCA Assessment Report 2020), and if so, how and why
- Evaluate new highway alignments for Highway Zone's A, B, E, K and L (see Section 7.1.1 for further information on these new alignments)
- Evaluate a half grade separated interchange option at the Tararua location (as this option hadn't been previously assessed by the MCA assessors in Stages 1 or 2), and
- Undertake a new traffic light signal evaluation of the refined local road options identified in the Phase 2 MCA Report, and as identified in Table 8 above.

At this briefing it was also confirmed that the same MCA evaluation processes (e.g. scoring) as set out above in Section 5.2 of this report would apply to the final MCA evaluations, and that they were to report the outcomes of their updated evaluations in either addendum reports or via updates to their original assessment reports.

The MCA assessors were also briefed on the feedback received through Waka Kotahi's public engagement programme (as summarised above) and were provided with the draft Ō2NL Engagement Summary Report.

The MCA assessors were also provided with an update on the feedback that had been received by the Ngāti Raukawa ki te Tonga and Muaūpoko project teams. In summary, the assessors were advised that both Iwi were likely to be only assessing the public engagement alignment option at MCA Workshop 3 (i.e. they would not be assessing the individual alignment options identified for each highway zone, and would not be evaluating the interchanges or local road options).

Figure 11 below sets out the public engagement alignment option<sup>29</sup> that was ultimately evaluated by both Iwi for the MCA Workshop 3. That is, both evaluated this option rather than evaluating the highway "zone-by- zone" options that were assessed by the MCA assessors.

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<sup>29</sup> See: [Ōtaki to north of Levin proposed new highway | Waka Kotahi NZ Transport Agency \(nzta.govt.nz\)](#)



**Figure 11: Public engagement alignment option evaluated by Ngāti Raukawa ki te Tonga and Muaūpoko**

**7.1.1 New Highway Alignment Options Identified for Evaluation**

Through the public engagement programme, and through discussions with affected property owners, requests were made for new or additional highway alignments to be evaluated for Highway Zone’s A, B, E, K and L. The proposed “new” or amended alignments for each of these zones are summarised below. These options were ultimately referred to at the MCA Workshop 3 as the “**New (November) Alignment**”, noting that this refers to the month that the option was introduced (which was specifically November 2020).

**7.1.1.1 Zone A**

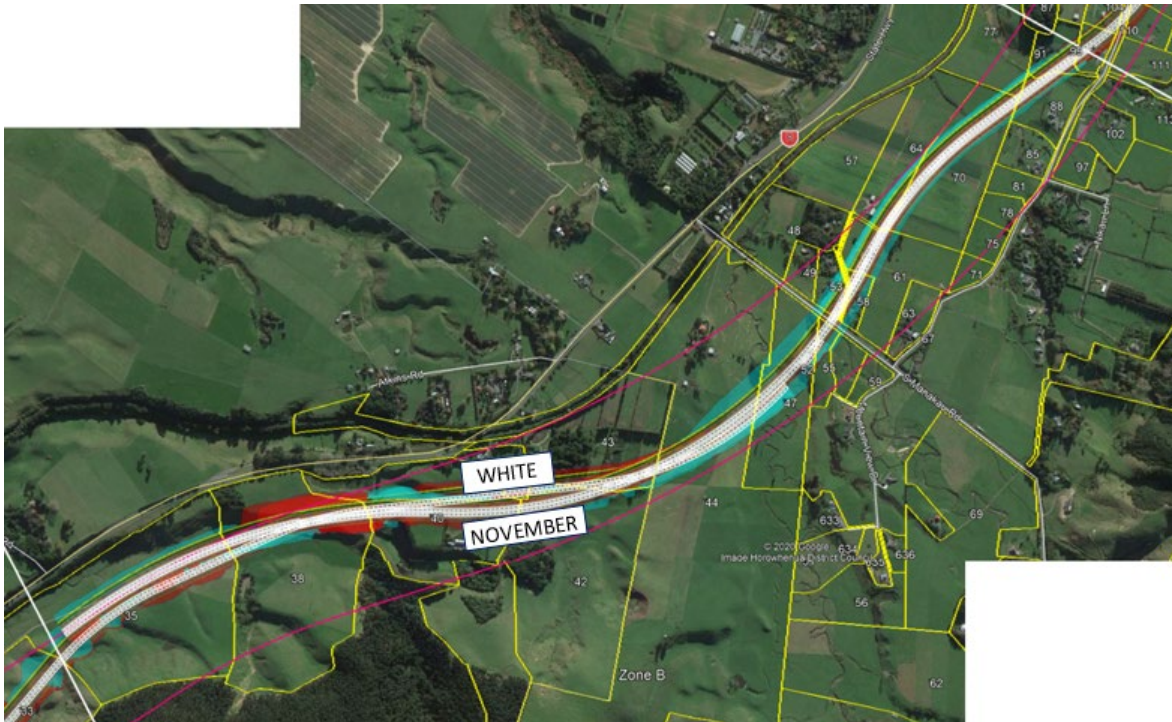
For Zone A, feedback was received requesting that an alignment to the west of the zone be considered. In summary, these requests were made on the basis that the alignment would be located further away from the toe of Pukehou and could minimise property acquisition requirements. Accordingly, a new (November 2020) alignment was evaluated for Zone A, which is set out below in Figure 12.



**Figure 12: New (November 2020) alignment and the original preferred alignment (green) for Zone A**

**7.1.1.2 Zone B**

For Zone B, feedback was received requesting that an alignment further to the west of the zone be considered (i.e. closer to Staples Bush). In summary, this request was made on the basis that such an alignment might help to reduce impacts on the Mountain View Drive community. Accordingly, a new (November 2020) alignment was evaluated for Zone B, which is set out below in Figure 13.



**Figure 13: New (November 2020) alignment and the original preferred alignment (white) for Zone B**

#### 7.1.1.3 Zone E

For Zone E, feedback was received requesting that an alignment further to the north / west of the zone be considered. In summary, this request was made on the basis that such an alignment might reduce property impacts. Accordingly, a new (November 2020) alignment was evaluated for Zone E, which is set out below in Figure 14.



**Figure 14: New (November 2020) alignment and the original preferred alignment (green) for Zone E**

#### 7.1.1.4 Zone K

For Zone K, feedback was received requesting that an alignment further to the north of the zone be considered. In summary, this request was made on the basis that such an alignment could help to minimise property impacts and improve connections to the proposed roundabout at the SH1 / 57 Split location. Accordingly, a new (November 2020) alignment was evaluated for Zone K, which is set out below in Figure 15.



**Figure 15: New (November 2020) alignment and the original preferred alignments (Yellow and Dark Blue) for Zone K**

#### 7.1.1.5 Zone L

For Zone L, feedback was received requesting that an alignment further to the south of the zone be considered. The feedback received focused on whether such an alignment could help to further minimise property impacts, improve connections to the proposed roundabouts at the SH1 / 57 Split and North Levin locations, and avoid difficult gully terrain. Accordingly, a new (November 2020) alignment was evaluated for Zone L, which is set out below in Figure 16.



**Figure 16: New (November 2020) alignment and the original preferred alignments (Orange and Black) for Zone L**

### 7.1.2 Honi Taipua Street Full Multi-Modal Connection Option

As set out in Section 6.1.6, Waka Kotahi received feedback via the public open days and the Manakau Community Reference Group that a full multi-modal connection at the Honi Taipua Street location should also be considered. Accordingly, the MCA assessors were asked to undertake a traffic light signal evaluation on a full multi-modal connection option in addition to providing a traffic signal for the active mode only option.

## 7.2 Updated Highway Alignment Evaluations

This section of the report summarises the MCA assessor updates to the original alignment option evaluations / scores (as recorded in the draft MCA Assessment Report 2020) following their consideration of any new information obtained through desktop / site investigations, iwi consultation and public engagement. The updated assessments also included the MCA assessor's evaluations of the new alignments proposed for Highway Zone's A, B, E, K and L.

This section also sets out Ngāti Raukawa ki te Tonga and Muaūpoko's evaluations of the public engagement alignment option. As noted above in Section 7.1, both Ngāti Raukawa ki te Tonga and Muaūpoko elected to only score the public engagement alignment option.

### 7.2.1 MCA Workshop 3

MCA Workshop 3 was held on 18 November 2020. The workshop was attended by the MCA assessors, representatives from Ngāti Raukawa ki te Tonga and Muaūpoko, key members of the Project Design Team and Waka Kotahi staff. The names of those who took part in MCA Workshop 3 are provided in **Appendix E**.

At this workshop, the MCA assessors provided presentations on the key results of their updated evaluations (i.e. responses to the tasks set out in Section 7.1 above) as well as their assessments for the new options proposed for Highway Zone's A, B, E, K and L. It is noted that



these assessments were undertaken against the alignments identified in the draft MCA Assessment Report 2020 to ensure consistency. In addition, both Ngāti Raukawa ki te Tonga and Muaūpoko presented their overall scores for the public engagement alignment option.

## 7.2.2 Updates to the Highway Alignment Option Evaluations

As set out in Section 7.1, each MCA assessor was asked to review their original option evaluations / scores following their consideration of the feedback received from the public engagement programme, the results of the engagement undertaken by the Ngāti Raukawa ki te Tonga and the Muaūpoko project teams as well as the additional investigation work that some of the assessors had undertaken.

Each MCA assessor's evaluation report, which includes their updated evaluations / scores for the new highway alignments in Highway Zone's A, B, E, K and L, are attached as appendices to this report. For ease of reference, and for avoidance of doubt, these are the combined MCA assessor reports for all of the MCA assessments they have undertaken for the Ō2NL DBC (that is, the assessor's reports prepared for the draft MCA Assessment Report 2020 have been included in these appendices).

At MCA Workshop 3, the following MCA assessors confirmed that there were no changes to their evaluations / scores for the alignment options from the draft MCA Assessment Report 2020:

- Landscape / Visual (see Appendix F)
- Social / Community / Recreation<sup>30</sup> (see Appendix G)
- Heritage<sup>31</sup> (see Appendix H)
- Noise / Vibration (see Appendix I)
- Productive Land Values (see Appendix J)
- Horowhenua District Development (see Appendix K)
- Fit with Local Road System (see Appendix K), and
- Engineering Degree of Difficulty (see Appendix L).

However, the MCA assessors for the Fit with Project Objectives, Ecology (terrestrial / freshwater), Kāpiti Coast District Development and PDoD assessment criteria, did update their original evaluations / scores. These updates were either a result of additional investigation works or because of scoring updates that occurred between MCA Workshop 1 and the completion of the draft MCA Assessment Report 2020.

### 7.2.2.1 Fit with Project Objectives

The MCA assessor advised that their initial alignment scores for Zone B had been updated. That is, the resilience objective score for the Cyan Alignment in Zone B was updated to a score of 1 (from 2), and the resilience score for the White Alignment was updated to a score of 2 (from 1). These scoring updates are reflected in the scoring tables below.

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<sup>30</sup>It is noted that at MCA Workshop 1, the social / community / recreation MCA assessor advised that their scores were provisional, and an independent social impact survey was needed before they could be confirmed. The survey was undertaken in June and July 2020 and consisted of the following activities: a resident survey; stakeholder interviews; further demographic analysis; additional site visits, and a review of the public engagement feedback data. Ultimately, and as set out in Appendix G, these investigations confirmed the MCA assessor's original alignment evaluations and scores (as identified in the draft MCA Assessment Report 2020)

<sup>31</sup> It is noted that at MCA Workshop 1, the heritage MCA assessor indicated that site visits of the following properties / buildings located near the preferred 300m corridor would be required in order to confirm their evaluation / scores: Manakau School; St Andrews Church; War Memorial Sarcophagus; Former Manakau Post Office; 114 State Highway; 1024 Queen Street East); 108 Arapaepae Road (Annandale House); 3 Manakau Hotel, and 76 North Manakau Road. As set out in Appendix H, following these the MCA assessors' original alignment evaluations and scores (as identified in the draft MCA Assessment Report 2020) were confirmed with no scoring adjustments made

All of the other original alignment scores for the Fit with Project Objectives criteria remained the same as recorded in the draft MCA Assessment Report 2020.

See Appendix A (Fit with Project Objectives Report) for further information.

#### **7.2.2.2 Ecology (Terrestrial)**

The MCA assessor advised that they had undertaken a site visit of Staples Bush in Zone B in early October 2020 to further ascertain its terrestrial values. Following this visit, the assessor reconfirmed that Staples Bush was pre-European forest and of high ecological value. The MCA assessor's view was that any impacts from the new highway on this bush area needed to be avoided or minimised. On this basis the assessor updated their original terrestrial ecology scores of 4s for the Cyan and White Alignments in Zone B to 5s (and these scores are reflected in the scoring tables below). All of the other terrestrial ecology alignment scores remained the same as recorded in the draft MCA Assessment Report 2020.

For avoidance of doubt, there were no changes / updates to the freshwater ecology scores as recorded in this report.

See **Appendix M** (Ecology Report) for further information.

#### **7.2.2.3 Kāpiti Coast District Development**

The MCA assessor advised that their initial alignment scores for Zone B had been updated. That is, the score for the Green Alignment was updated to 2 (from 1). This scoring update is reflected in the scoring tables below.

All of the other Kāpiti Coast District Development's alignment scores remained the same as recorded in the draft MCA Assessment Report 2020.

See **Appendix N** (Kāpiti Coast District Development memos) for further information.

#### **7.2.2.4 Property Degree of Difficulty**

The MCA assessor advised that their initial alignment scores for the White Alignment in Zone F had been updated. That is, the score for this alignment option was updated to a 3 (from 4). Updates were also made to all of the alignment scores in Zones K and L. For Zone K, all of the alignment scores were reduced from 5s to 4s. For Zone L, all of the alignment scores were reduced from 4s to 3s except for the Orange Alignment's score which remained a 3. These scoring updates are reflected in the scoring tables below.

All of the other PDoD original alignment scores remained the same as recorded in the draft MCA Assessment Report 2020.

See **Appendix O** (Property Degree of Difficulty Reports) for further information.

#### **7.2.2.5 Archaeology**

For the archaeology assessment criteria, the MCA assessor advised that they had undertaken geophysical surveys since completion of MCA Workshop 1 to further understand the potential impacts of the alignment options on local archaeological values at the following locations:

- Pukehou (i.e. Zone A), and
- Kohitere / Kimberley (i.e. Zones E and F).

As set out in **Appendix P**, the MCA assessor was able to confirm that their original alignment evaluations / scores for Zones A, E and F (as recorded in the draft MCA Assessment Report 2020) did not need updating.

See **Appendix P** (Archaeology Report) for further information.

### **7.2.3 Evaluations of the New Alignment Options for Zone's A, B, E, K and L**

#### **7.2.3.1 Fit with Project Objectives**

The MCA assessor's key evaluation comments / scores for the New (November 2020) Alignments proposed for Zone's A, B, E, K and L, along with how they compare with the

assessor's evaluations / scores for the other alignment options in these zones are provided below.

### **Zone A**

For Zone A, the MCA assessor recorded the same scores for the New (November 2020) Alignment as documented for the White and Green Alignments in the draft MCA Assessment Report 2020. That is, this alignment scored a 1 against all of the objectives, except for the resilience objective which was scored a 2 due to the New (November 2020) Alignment needing to cross a number of gullies (it is noted that all options scored a 2 for the resilience objective).

As recorded in the draft MCA Assessment Report 2020, the Green Alignment was the original overall preference for Zone A.

### **Zone B**

For Zone B, the MCA assessor scored the New (November 2020) Alignment a 1, which was the same score as recorded for the White and Green Alignments that were evaluated in the draft MCA Assessment Report 2020. This score was one point better than the score for the Cyan Alignment, which scored a 2 in this report.

As recorded in the draft MCA Assessment Report 2020, the White Alignment was the original overall preference for Zone B.

### **Zone E**

For Zone E, the MCA assessor recorded the same scores for the New (November 2020) Alignment as documented for the Cyan and Green Alignments in the draft MCA Assessment Report 2020. That is, it scored 1s for the enhanced movement, safety, and connections objectives and a 2 for the resilience objective (as with the other options, it was noted that the new alignment would also be located on liquefiable grounds).

As recorded in the draft MCA Assessment Report 2020, the Green Alignment was the original overall preference for Zone E.

### **Zone K**

For Zone K, the MCA assessor scored the New (November 2020) Alignment a 1, which was the same score as recorded for the Cyan, Dark Blue and Yellow Alignments that were evaluated in the draft MCA Assessment Report 2020.

As recorded in the draft MCA Assessment Report 2020, the Dark Blue and Yellow Alignments were the original overall preferences for Zone K.

### **Zone L**

For Zone L, the MCA assessor scored the New (November 2020) Alignment a 1, which was the same score as recorded for the Orange, Black, Green and Purple Alignments that were evaluated in the draft MCA Assessment Report 2020.

As recorded in the draft MCA Assessment Report 2020, the Orange and Black Alignments were the original overall preferences for Zone L.

#### **7.2.3.2 Landscape / Visual**

The MCA assessor's key evaluation comments / scores for the New (November 2020) Alignments proposed for Zone's A, B, E, K and L, along with how they compare with the assessor's evaluations / scores for the other alignment options in these zones are provided below.

## **Zone A**

For Zone A, the MCA assessor scored the New (November 2020) Alignment a 3, which was the same score as recorded for the Green Alignment, but one point more than the score of 2 for the White Alignment (as documented in the draft MCA Assessment Report 2020). The MCA assessor's preference for the White Alignment was based on it responding more "positively" to Pukehou and its better fit with local contours when compared to the other alignment options.

As recorded in the draft MCA Assessment Report 2020, the Green Alignment was the original overall preference for Zone A.

## **Zone B**

For Zone B, the MCA assessor scored the New (November 2020) Alignment a 2. This score was the same score as recorded for the White Alignment, but one point better than the Cyan Alignment's score of 3 and three points better than the Green Alignment (which scored a 5). The key reasons for scoring the New (November 2020) Alignment a 2 included that it would cross the Waiauti Stream at a good location, it had an elegant "S" alignment across the lower valley, it would maximise separation from Mountain View Drive and Manakau Heights and avoid Staples Bush.

As recorded in the draft MCA Assessment Report 2020, the White Alignment was the original overall preference for Zone B.

## **Zone E**

For Zone E, the MCA assessor scored the New (November 2020) Alignment a 3, which was the same score as recorded for the Cyan and Green Alignments. The MCA assessor noted the New (November 2020) Alignment would cross the Ohau River at a "sensible" location, it had a 'S' shape that suited the local landscape and its northern connection to Zone F was considered appropriate.

As recorded in the draft MCA Assessment Report 2020, the Green Alignment was the original overall preference for Zone E.

## **Zone K**

For Zone K, the MCA assessor scored the New (November 2020) Alignment a 3, which was one point better than the scores of 4 recorded for the Cyan, Yellow and Dark Blue Alignments that were evaluated in the draft MCA Assessment Report 2020. The MCA assessor considered the New (November 2020) Alignment was preferable for the following reasons:

- It had a "squarer grain" with Waihou Road (when compared to the other options)
- It had a defined curve north of Waihou Road, and would be tucked closer to the base of the hills when compared to the other options
- It approached the SH1 / SH57 Split interchange location at a square angle, which is a more elegant approach when compared to the other options, and
- Its integration with Waihou and McDonald Roads will be more elegant at this location (when compared to the other options).

As recorded in the draft MCA Assessment Report 2020, the Dark Blue and Yellow Alignments were the original overall preferences for Zone K.

## **Zone L**

For Zone L, the MCA assessor scored the New (November 2020) Alignment a 3, which was the same score as recorded for the Black and Orange Alignments, but two points better than the scores for the Green and Purple Alignments (which each scored 5) that were evaluated in the draft MCA Assessment Report 2020.

The New (November 2020) Alignment was scored a 3 as it was considered a "good fit" with the local terrain. The MCA assessor also noted that this alignment was likely to have more elegant curves and provide an easier approach to the North Levin roundabout when compared to the Black and Orange Alignments. However, the MCA assessor did note that the New (November

2020) Alignment may have greater visual effects on the houses located at the southern end of Sorensens Road.

As recorded in the draft MCA Assessment Report 2020, the Orange and Black Alignments were the original overall preferences for Zone L.

### **7.2.3.3 Ecology (Terrestrial and Freshwater / Wetland)**

The MCA assessor's key evaluation comments / scores for the New (November 2020) Alignments proposed for Zone's A, B, E, K and L, along with how these compare with the assessor's evaluations / scores for the other alignment options in these zones are provided below.

#### **Zone A**

For Zone A, and for both terrestrial and freshwater / wetland ecology, the MCA assessor scored the New (November 2020) Alignment the same as the White and Green Alignments that were evaluated in the draft MCA Assessment Report 2020. That is, 1s for the terrestrial criteria and 3s for the freshwater / wetland criteria (the latter scores were higher due to the number of interactions with existing first order waterways and pastoral wetlands).

As recorded in the draft MCA Assessment Report 2020, the Green Alignment was the original overall preference for Zone A.

#### **Zone B**

For Zone B, the MCA assessor scored the New (November 2020) Alignment a 2 for terrestrial ecology, which was the same score for the Green Alignment, but three points better than the scores of 5 for the White and Cyan Alignments. The key reason for scoring a 2 for the New (November 2020 Alignment) was it would have less impacts on Staples Bush (and nearby forests with similar vegetation) when compared to the latter two alignment options. As discussed above, the scores for both the Cyan and White Alignments were increased from 4s to 5s following the MCA assessors site visit to Staples Bush in early October 2020.

For freshwater / wetland ecology, the MCA assessor scored the New (November 2020) Alignment a 2, which was the same score as recorded for the Cyan, Green and White Alignments that were evaluated in the draft MCA Assessment Report 2020. Overall, the MCA assessor considered that all four alignments would have similar impacts on freshwater / wetland ecology.

As recorded in the draft MCA Assessment Report 2020, the White Alignment was the original overall preference for Zone B.

#### **Zone E**

For Zone E, and for both terrestrial and freshwater / wetland ecology, the MCA assessor scored the New (November 2020) Alignment the same as the Cyan and Green Alignments that were evaluated in the draft MCA Assessment Report 2020. That is, 1s for the terrestrial criteria and 2s for the freshwater / wetland criteria.

As recorded in the draft MCA Assessment Report 2020, the Green Alignment was the original overall preference for Zone E.

#### **Zone K**

For Zone K, and for both terrestrial and freshwater / wetland ecology, the MCA assessor scored the New (November 2020) Alignment the same as the Cyan, Dark Blue and Yellow Alignments that were evaluated in the draft MCA Assessment Report 2020. That is, 1s for the terrestrial criteria and 2s for the freshwater / wetland criteria.

As set out in the draft MCA Assessment Report 2020, it is noted that the Dark Blue and Yellow Alignments were preferred overall for Zone K.

#### **Zone L**

For Zone L, and for both terrestrial and freshwater / wetland ecology, the MCA assessor scored the New (November 2020) Alignment the same as the Black, Orange, Green and Purple Alignments that were evaluated in the draft MCA Assessment Report 2020. That is, 1s for the

terrestrial criteria and 2s for the freshwater / wetland criteria. The MCA assessor noted that the Orange Alignment was likely to have greater impacts on local waterways (but not enough to be scored differently).

As recorded in the draft MCA Assessment Report 2020, the Orange and Black Alignments were the original overall preferences for Zone L.

#### **7.2.3.4 Heritage**

The MCA assessor's key evaluation comments / scores for the New (November 2020) Alignments proposed for Zone's A, B, E, K and L, along with how these compare with the assessor's evaluations / scores for the other alignment options in these zones are provided below.

##### **Zone A**

For Zone A, the MCA assessor scored the New (November 2020) Alignment a 1, which was the same score as recorded for the White and Green Alignments that were evaluated in the draft MCA Assessment Report 2020.

As recorded in the draft MCA Assessment Report 2020, the Green Alignment was the original overall preference for Zone A.

##### **Zone B**

For Zone B, the MCA assessor scored the New (November 2020) Alignment a 1, which was the same score as recorded for the Cyan, White and Green Alignments that were evaluated in the draft MCA Assessment Report 2020.

As recorded in the draft MCA Assessment Report 2020, the White Alignment was the original overall preference for Zone B.

##### **Zone E**

For Zone E, the MCA assessor scored the New (November 2020) Alignment a 1, which was the same score as recorded for the Cyan and Green Alignments that were evaluated in the draft MCA Assessment Report 2020.

As recorded in the draft MCA Assessment Report 2020, the Green Alignment was the original overall preference for Zone E.

##### **Zone K**

For Zone K, the MCA assessor scored the New (November 2020) Alignment a 1, which was the same score as recorded for the Yellow, Dark Blue and Cyan Alignments that were evaluated in the draft MCA Assessment Report 2020.

As recorded in the draft MCA Assessment Report 2020, the Dark Blue and Yellow Alignments were the original overall preferences for Zone K.

##### **Zone L**

For Zone L, the MCA assessor scored the New (November 2020) Alignment a 1, which was the same score as recorded for the Black, Orange, Green and Purple Alignments that were evaluated in the draft MCA Assessment Report 2020.

As recorded in the draft MCA Assessment Report 2020, the Orange and Black Alignments were the original overall preferences for Zone L.

#### **7.2.3.5 Archaeology**

The MCA assessor's key evaluation comments / scores for the New (November 2020) Alignments proposed for Zone's A, B, E, K and L, along with how these compare with the assessor's evaluations / scores for the other alignment options in these zones are provided below.

## **Zone A**

For Zone A, the MCA assessor scored the New (November 2020) Alignment a 3, which was the same score as recorded for the White and Green Alignments that were evaluated in the draft MCA Assessment Report 2020.

As recorded in the draft MCA Assessment Report 2020, the Green Alignment was the original overall preference for Zone A.

## **Zone B**

For Zone B, the MCA assessor scored the New (November 2020) Alignment a 2, which was the same score as recorded for the Cyan, White and Green Alignments that were evaluated in the draft MCA Assessment Report 2020.

As recorded in the draft MCA Assessment Report 2020, the White Alignment was the original overall preference for Zone B.

## **Zone E**

For Zone E, the MCA assessor scored the New (November 2020) Alignment a 2, which was the same score as recorded for the Cyan and Green Alignments that were evaluated in the draft MCA Assessment Report 2020.

As recorded in the draft MCA Assessment Report 2020, the Green Alignment was the original overall preference for Zone E.

## **Zone K**

For Zone K, the MCA assessor scored the New (November 2020) Alignment a 3, which was the same score as recorded for the Cyan, Dark Blue and Yellow Alignments that were evaluated in the draft MCA Assessment Report 2020.

As recorded in the draft MCA Assessment Report 2020, the Dark Blue and Yellow Alignments were the original overall preferences for Zone K.

## **Zone L**

For Zone L, the MCA assessor scored the New (November 2020) Alignment a 3, which was the same score as recorded for the Black, Orange, Green and Purple Alignments that were evaluated in the draft MCA Assessment Report 2020.

As recorded in the draft MCA Assessment Report 2020, the Orange and Black Alignments were the original overall preferences for Zone L.

### **7.2.3.6 Noise / Vibration**

The MCA assessor's key evaluation comments / scores for the New (November 2020) Alignments proposed for Zone's A, B, E, K and L, along with how these compare with the assessor's evaluations / scores for the other alignment options in these zones are provided below.

## **Zone A**

For Zone A, the MCA assessor scored the New (November 2020) Alignment a 3, which was the same score as recorded for the White and Green Alignments that were evaluated in the draft MCA Assessment Report 2020. All three alignment options scored 3s as they were expected to impact on a similar number of Protected Premises and Facilities (PPF) located within the 75m and 75m to 100m "alignment noise zones".

As recorded in the draft MCA Assessment Report 2020, the Green Alignment was the original overall preference for Zone A.

## **Zone B**

For Zone B, the MCA assessor scored the New (November 2020) Alignment a 4, which was the same score as recorded for the Cyan, White and Green Alignments that were evaluated in the

draft MCA Assessment Report 2020. All alignment options scored 4s as they were expected to impact on a similar number of PPFs located within the 75m alignment noise zone.

As recorded in the draft MCA Assessment Report 2020, the White Alignment was the original overall preference for Zone B.

### **Zone E**

For Zone E, the MCA assessor scored the New (November 2020) Alignment a 3, which was the same score as recorded for the Cyan and Green Alignments that were evaluated in the draft MCA Assessment Report 2020. All alignment options scored 3s as they were expected to impact on a similar number of PPFs located within the 75m and 75m to 100m alignment noise zones.

As recorded in the draft MCA Assessment Report 2020, the Green Alignment was the original overall preference for Zone E.

### **Zone K**

For Zone K, the MCA assessor scored the New (November 2020) Alignment a 2, whereas the Cyan, Dark Blue and Yellow Alignments, which were evaluated in the draft MCA Assessment Report 2020, scored 3s and 4s. The key reason for the New (November) Alignment's superior score was that there are no PPFs located within its 75m noise zone (whereas there were PPFs located within this zone for the other alignments).

As recorded in the draft MCA Assessment Report 2020, the Dark Blue and Yellow Alignments were the original overall preferences for Zone K.

### **Zone L**

For Zone L, the MCA assessor scored the New (November 2020) Alignment a 4, which is one point worse than the scores of 3 recorded for the Black, Orange, Green and Purple Alignments that were evaluated in the draft MCA Assessment Report 2020.

The MCA assessor noted the key reason for the New (November 2020) Alignment's inferior score was that there would be more PPFs (located within both the 75m and 75m to 100m alignment noise zones) that would be impacted when compared to the other alignment options.

As recorded in the draft MCA Assessment Report 2020, the Orange and Black Alignments were the original overall preferences for Zone L.

#### **7.2.3.7 Productive Land Values**

The MCA assessor's key evaluation comments / scores for the New (November 2020) Alignments proposed for Zone's A, B, E, K and L, along with how these compare with the assessor's evaluations / scores for the other alignment options in these zones are provided below.

### **Zone A**

For Zone A, the MCA assessor scored the New (November 2020) Alignment a 3, which was the same score as recorded for the White and Green Alignments that were evaluated in the draft MCA Assessment Report 2020. These same scores were identified as they would all have similar impacts on existing Land Use Capability (LUC) Class 3 land.

As recorded in the draft MCA Assessment Report 2020, the Green Alignment was the original overall preference for Zone A.

### **Zone B**

For Zone B, the MCA assessor scored the New (November 2020) Alignment a 3, which was the same score as recorded for the Cyan, White and Green Alignments that were evaluated in the draft MCA Assessment Report 2020. These same scores were identified as they would all have similar impacts on existing LUC Class 1 and 2 land.

As recorded in the draft MCA Assessment Report 2020, the White Alignment was the original overall preference for Zone B.



## **Zone E**

For Zone E, the MCA assessor scored the New (November 2020) Alignment a 3, which was the same score as recorded for the Cyan and Green Alignments that were evaluated in the draft MCA Assessment Report 2020. These same scores were identified as they would all have similar impacts on existing LUC Class 1, 2 and 3 land.

As recorded in the draft MCA Assessment Report 2020, the Green Alignment was the original overall preference for Zone E.

## **Zone K**

For Zone K, the MCA assessor scored the New (November 2020) Alignment a 5, which was the same score as recorded for the Yellow, Dark Blue and Cyan Alignments that were evaluated in the draft MCA Assessment Report 2020. These same scores were identified as they would all have similar impacts on existing LUC Class 1 and 2 land.

As recorded in the draft MCA Assessment Report 2020, the Dark Blue and Yellow Alignments were the original overall preferences for Zone K.

## **Zone L**

For Zone L, the MCA assessor scored the New (November 2020) Alignment a 5, which is the same score as recorded for the Black, Orange, Green and Purple Alignments that were evaluated in the draft MCA Assessment Report 2020. These same scores were identified as they would have similar impacts on existing LUC Class 1 and 2 land.

As recorded in the draft MCA Assessment Report 2020, the Orange and Black Alignments were the original overall preferences for Zone L.

### **7.2.3.8 Social / Community / Recreation**

The MCA assessor's key evaluation comments / scores for the New (November 2020) Alignments proposed for Zone's A, B, E, K and L, along with how these compare with the assessor's evaluations / scores for the other alignment options in these zones are provided below.

## **Zone A**

For Zone A, the MCA assessor scored the New (November 2020) Alignment a 2, which was the same score as recorded for the White and Green Alignments that were evaluated in the draft MCA Assessment Report 2020.

The MCA assessor noted that the New (November 2020) Alignment may create a "small strip" of land between the new highway and the existing state highway, which could have negative amenity impacts on the remaining properties located to the west. The assessor also noted that there may be fewer "way-of-life" and "sustaining oneself" factors for the properties located to the east of the new alignment.

As recorded in the draft MCA Assessment Report 2020, the Green Alignment was the original overall preference for Zone A.

## **Zone B**

For Zone B, the MCA assessor scored the New (November 2020) Alignment a 2, which was the same score as recorded for the White Alignment that was evaluated in the draft MCA Assessment Report 2020. This score was one point better than the score of 3 for the Cyan Alignment and two points better than the score of 4 for the Green Alignment.

The MCA assessor noted that the New (November 2020) Alignment may create a "small strip" of land between the new highway and the existing state highway, which could have negative amenity impacts on the remaining properties to the west. The assessor also noted that there may be fewer way-of-life and sustaining oneself factors for the Manakau Heights' community.

As recorded in the draft MCA Assessment Report 2020, the White Alignment was the original overall preference for Zone B.

## **Zone E**

For Zone E, the MCA assessor scored the New (November 2020) Alignment a 3, which was the same score as recorded for the Cyan and Green Alignments that were evaluated in the draft MCA Assessment Report 2020.

The MCA assessor identified that the New (November 2020) Alignment would be located closer to Arapaepae Road, and therefore may create a narrow segment of land that could be potentially isolated. Consequently, such an outcome could reduce localised amenity values for the local community.

As recorded in the draft MCA Assessment Report 2020, the Green Alignment was the original overall preference for Zone E.

## **Zone K**

For Zone K, the MCA assessor scored the New (November 2020) Alignment a 3, which was one point worse than the scores of 4 for the Cyan, Dark Blue and Yellow Alignments in the draft MCA Assessment Report 2020. The key reason for its superior score was its easterly alignment was likely to result in better amenity outcomes for people and properties located between the new highway and the existing SH57 when compared to the other options.

As recorded in the draft MCA Assessment Report 2020, the Dark Blue and Yellow Alignments were the original overall preferences for Zone K.

## **Zone L**

For Zone L, the MCA assessor scored the New (November 2020) Alignment a 4, which was the same score as recorded for the Green and Purple Alignments, but one point more than the score of 3 for the Black and Orange Alignments.

The MCA assessor noted the key reason for the New (November 2020) Alignment's inferior score was that it would have greater severance impacts on the residents of Sorensens Road who would remain living on this road following construction of the new highway.

As recorded in the draft MCA Assessment Report 2020, the Orange and Black Alignments were the original overall preferences for Zone L.

### **7.2.3.9 Horowhenua District Development**

The MCA assessor's key evaluation comments / scores for the New (November 2020) Alignments proposed for Zone's B, E, K and L, along with how these compare with the assessor's evaluations / scores for the other alignment options in these zones are provided below.

It is noted that the MCA assessor did not evaluate Zone A as it is not located within the Horowhenua district.

## **Zone B**

For Zone B, the MCA assessor scored the New (November 2020) Alignment a 1, which was the same score as recorded for the Cyan, White and Green Alignments that were evaluated in the draft MCA Assessment Report 2020. The New (November) Alignment was scored a 1 as no identified growth areas would be impacted.

As recorded in the draft MCA Assessment Report 2020, the White Alignment was the original overall preference for Zone B.

## **Zone E**

For Zone E, the MCA assessor scored the New (November 2020) Alignment a 2, which is the same score as recorded for the Green Alignment in the draft MCA Assessment Report 2020, due to it having similar impacts on identified growth areas. However, the New (November 2020) Alignment's score was one point better than the score of 3 for the Cyan Alignment. This was because the latter alignment would have greater impacts on identified growth areas.

As recorded in the draft MCA Assessment Report 2020, the Green Alignment was the original overall preference for Zone E.

## **Zone K**

For Zone K, the MCA assessor scored the New (November 2020) Alignment a 2, which was the same score as recorded for the Cyan Alignment in the draft MCA Assessment Report 2020, due to it having similar impacts on identified growth areas.

The New (November 2020) Alignment's score of 2 was one point better than the scores of 3 for the Dark Blue and Yellow Alignments. Both of these alignments were considered to have greater impacts on identified growth areas.

As recorded in the draft MCA Assessment Report 2020, the Dark Blue and Yellow Alignments were the original overall preferences for Zone K.

## **Zone L**

For Zone L, the MCA assessor scored the New (November 2020) Alignment a 2, which was the same score as recorded for the Green and Purple Alignments in the draft MCA Assessment Report 2020, due to it having similar impacts on identified growth areas. However, the score of 2 for the New (November 2020) Alignment was one point better than the scores of 3 for the Black and Orange Alignments. The key reason for its superior score when compared to the latter alignments was it would have less impacts on the LN1 and LN2 growth areas.

As recorded in the draft MCA Assessment Report 2020, the Orange and Black Alignments were the original overall preferences for Zone L.

### **7.2.3.10 Kāpiti Coast District Development**

The MCA assessor advised that only Zones A and B were evaluated as they were the only zones located within the Kāpiti Coast District. The assessor's key evaluation comments / scores for the New (November 2020) Alignments proposed for Zone's A and B, along with how these compare with the assessor's evaluations / scores for the other alignment options in these zones are provided below.

#### **Zone A**

For Zone A, the MCA assessor scored the New (November 2020) Alignment a 2, which was the same score as recorded for the Green Alignment that was evaluated in the draft MCA Assessment Report 2020. However, the score of 2 for the New (November 2020) Alignment was two points better than the White Alignment's score of 4. The latter option's inferior score was due to it been in close proximity to the Proposed Kāpiti Coast District Plan's Special Amenity Feature 15 ('Pukehou'), and therefore this option may have negative impacts for the district.

As recorded in the draft MCA Assessment Report 2020, the Green Alignment was the original overall preference for Zone A.

#### **Zone B**

For Zone B, the MCA assessor scored the New (November 2020) Alignment a 1, which was the same score as recorded for the Green Alignment that was evaluated in the draft MCA Assessment Report 2020. However, its score of 1 was two points better than the scores of 3 for the Cyan and White Alignments. When compared to the latter two alignments, the key reason for its superior score was it would have less impacts on the ecologically significant areas K016 and K164 as identified in the Proposed Kāpiti Coast District Plan.

As recorded in the draft MCA Assessment Report 2020, the White Alignment was the original overall preference for Zone B.

### **7.2.3.11 Fit with Local Road System (Horowhenua District only)**

The MCA assessor's key evaluation comments / scores for the New (November 2020) Alignments proposed for Zone's B, E, K and L, along with how these compare with the assessor's evaluations / scores for the other alignment options in these zones are provided below.

It is noted that no fit with local road assessment was required for Zone A (and for avoidance of doubt, the reconnection options for Taylors Road was considered in the local road option assessment).

### **Zone B**

For Zone B, the MCA assessor scored the New (November 2020) Alignment a 3, which was the same score as recorded for the Cyan, White and Green Alignments that were evaluated in the draft MCA Assessment Report 2020. This score was identified as all the options would have similar impacts on the local road system.

As recorded in the draft MCA Assessment Report 2020, the White Alignment was the original overall preference for Zone B.

### **Zone E**

For Zone E, the MCA assessor scored the New (November 2020) Alignment a 3, which was the same score as recorded for the Cyan and Green Alignments that were evaluated in the draft MCA Assessment Report 2020. This score was identified as all the options would have similar impacts on the local road system.

As recorded in the draft MCA Assessment Report 2020, the Green Alignment was the original overall preference for Zone E.

### **Zone K**

For Zone K, the MCA assessor scored the New (November 2020) Alignment a 3, which was the same score as recorded for the Yellow, Dark Blue and Cyan Alignments that were evaluated in the draft MCA Assessment Report 2020. This score was identified as all the options would have similar impacts on the local road system.

As recorded in the draft MCA Assessment Report 2020, the Dark Blue and Yellow Alignments were the original overall preferences for Zone K.

### **Zone L**

For Zone L, the MCA assessor scored the New (November 2020) Alignment a 3, which was the same score as recorded for the Black, Orange, Green and Purple Alignments that were evaluated in the draft MCA Assessment Report 2020. This score was identified as all the options would have similar impacts on the local road system.

As recorded in the draft MCA Assessment Report 2020, the Orange and Black Alignments were the original overall preferences for Zone L.

#### **7.2.3.12 Engineering Degree of Difficulty**

The MCA assessor's key evaluation / score comments on the New (November 2020) Alignments proposed for Zone's A, B, E, K and L along with how these compare with the assessor's evaluations / scores for the other alignment options in these zones are provided below.

### **Zone A**

For Zone A, the MCA assessor scored the New (November 2020) Alignment a 3, which was the same score as recorded for the Green Alignment, but one point better than the White Alignment's score of 4 as identified in the draft MCA Assessment Report 2020. When compared to the latter alignment, the key reason for its superior score was due to it been located on better ground conditions, which would in turn require less earthworks.

As recorded in the draft MCA Assessment Report 2020, the Green Alignment was the original overall preference for Zone A.

### **Zone B**

For Zone B, the MCA assessor scored the New (November 2020) Alignment a 3, which was the same score as recorded for the Cyan and White Alignments that were evaluated in the draft MCA Assessment Report 2020, but one point better than the score of 4 for the Green

Alignment. When compared to the latter alignment, the key reason for its superior score was it would be less complex to reconnect the local road network.

As recorded in the draft MCA Assessment Report 2020, the White Alignment was the original overall preference for Zone B.

### **Zone E**

For Zone E, the MCA assessor scored the New (November 2020) Alignment a 2, which was the same score as recorded for the Cyan Alignment in the draft MCA Assessment Report 2020, but one point better than the score of 3 for the Green Alignment. When compared to the latter alignment, the key reason for the New (November 2020) Alignment's superior score was due to it having less watercourse interactions.

As recorded in the draft MCA Assessment Report 2020, the Green Alignment was the original overall preference for Zone E.

### **Zone K**

For Zone K, the MCA assessor scored the New (November 2020) Alignment a 2, which was the same score as recorded for the Cyan, Dark Blue, and Yellow Alignments that were evaluated in the draft MCA Assessment Report 2020. The same score was documented for all options as there were no material sub-criteria option differentiators.

As recorded in the draft MCA Assessment Report 2020, the Dark Blue and Yellow Alignments were the original overall preferences for Zone K.

### **Zone L**

For Zone L, the MCA assessor scored the New (November 2020) Alignment a 3, which was the same score as recorded for the Black and Orange Alignments as identified in the draft MCA Assessment Report 2020, but one point better than the score of 4 for the Green and Purple Alignments. When compared to the latter two alignments, the key reason for the New (November 2020) Alignment's superior score was it would have less local watercourse interactions and reconnecting local roads would be less complex.

The Project Design Team advised that it had identified some key considerations and challenges for Zone L, which meant that it strongly favoured the New (November 2020) Alignment over the other options.<sup>32</sup> The key considerations and challenges are summarised in more detail below:

- **Geometric design**

Any alignment must be carefully designed so that the roundabouts at the SH1 / 57 Split and North Levin locations and any associated queues are sufficiently visible for drivers to slow down and stop or give way. This is a particularly important issue for the North Levin roundabout approach due to the vertical curve over the North Island Main Trunk (NIMT) Line. The New (November 2020) Alignment takes account of these constraints and requirements and provides an appropriate standard for the combined vertical and horizontal geometry and for both roundabout approaches.

- **Geotechnical / earthworks**

The erosion of sandy materials in Zone L has created an undulating terrain with three or four water courses and ridges running parallel to the preferred 300m corridor. The New (November 2020) Alignment is a better fit with the existing terrain, by following much of the existing ridgeline and avoiding more of the deeper gullies. This reduces geotechnical risk by traversing material that is stronger and less erosion prone. Where existing gullies are crossed, this is often at an angle closer to the perpendicular, which simplifies the filling and associated drainage works (and reducing the likelihood of permanent watercourse diversions). The New (November 2020) Alignment will reduce the estimated cut volumes for Zone L by 50 per cent (which equates to about 100,000 cubic metres of less material

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<sup>32</sup> The MCA assessor advised that despite these been important considerations / challenges for Zone L, they weren't sufficient to change the scores under the 6 point scoring system's assessment criteria

needing to be moved). Accordingly, there are cost and environmental advantages for avoiding the need to excavate such a large volume of material.

As recorded in the draft MCA Assessment Report 2020, the Orange and Black Alignments were the original overall preferences for Zone L.

### **7.2.3.13 Property Degree of Difficulty**

The MCA assessor's key evaluation / score comments on the New (November 2020) Alignments proposed for Zone's A, B, E, K and L along with how these compare with the assessor's evaluations / scores for the other alignment options in these zones are provided below.

#### **Zone A**

For Zone A, the MCA assessor scored the New (November 2020) Alignment a 5, which was the same score as recorded for the White and Green Alignments that were evaluated in the draft MCA Assessment Report 2020. The assessor noted that the key reason for scoring 5s for the options was due to the identification of the potential need to acquire Māori Land in Zone A.

As recorded in the draft MCA Assessment Report 2020, the Green Alignment was the original overall preference for Zone A.

#### **Zone B**

For Zone B, the MCA assessor scored the New (November 2020) Alignment a 3, which was the same score recorded for the White Alignment as identified in the draft MCA Assessment Report 2020, but one point better than the score of 4 for the Green Alignment. When compared to the Green Alignment, the New (November 2020) Alignment had fewer complex property acquisition requirements.

As recorded in the draft MCA Assessment Report 2020, the White Alignment was the original overall preference for Zone B.

#### **Zone E**

For Zone E, the MCA assessor scored the New (November 2020) Alignment a 3, which was the same score as recorded for the Cyan and Green Alignments that were evaluated in the draft MCA Assessment Report 2020. These scores were the same as the property acquisition processes for all of the options would have similar complexity.

As recorded in the draft MCA Assessment Report 2020, the Green Alignment was the original overall preference for Zone E.

#### **Zone K**

For Zone K, the MCA assessor scored the New (November 2020) Alignment a 3, which was two points better than the scores of 4 for the Cyan, Dark Blue and Yellow Alignments that were evaluated in the draft MCA Assessment Report 2020. When compared to the other alignments, the New (November 2020) Alignment's superior score reflected its avoidance of a potentially complex chicken farm acquisition.

As recorded in the draft MCA Assessment Report 2020, the Dark Blue and Yellow Alignments were the original overall preferences for Zone K.

#### **Zone L**

For Zone L, the MCA assessor scored the New (November 2020) Alignment a 3, which is the same score as recorded for the Orange, Black, Green and Purple Alignments that were evaluated in the draft MCA Assessment Report 2020. All options scored 3 as they all had similar property acquisition requirements.

As recorded in the draft MCA Assessment Report 2020, the Orange and Black Alignments were the original overall preferences for Zone L.

## 7.2.4 Ngāti Raukawa ki te Tonga and Muaūpoko Evaluations of the Public Engagement Alignment Option

### 7.2.4.1 Ngāti Raukawa ki te Tonga

Ngāti Raukawa ki te Tonga advised at the beginning of MCA Workshop 3 that it had a strong preference for the IBC's eastern corridor location for the new highway (i.e. the preferred 300m corridor) over the alternative western corridor options. However, despite stating this corridor preference, Ngāti Raukawa ki te Tonga advised that it had evaluated the public engagement alignment option on a first principles basis. The key conclusions from its evaluation are as follows:

- The construction and operation of the new highway would result in a new cut through Ngāti Raukawa ki te Tonga's whenua (impacting on connections with whenua, ancestral lands, sites of significance and taonga)
- A large number of awa would be affected (awa are of major cultural and spiritual significance, and construction and operation of the new highway would affect the mauri of awa, which is already under significant pressure), and
- The alignment crosses a number of land parcels in Māori ownership, and this land is taonga (the land represents intergenerational connections to ancestors, and is of social and economic significance).

Ngāti Raukawa ki te Tonga advised that the sites of particular cultural importance for its hapū that will need to be considered as the Ō2NL Project is further developed included:

- Pukehou maunga is of cultural and spiritual significance
- Waikawa, Ohau, Waikokopu, Makorokio, Koputaroa awa are taonga, and are important mahinga kai areas. All awa are of cultural and spiritual significance, and Ngāti Raukawa ki te Tonga are concerned with potential disturbance and discharge effects
- Kuku East and Koputaroa Road intersections are important for facilitating social connections
- Kuku lands
- Tikorangi clearing
- Totara stumps near Ohau awa
- Boundary locations between rohe
- Mahinga kai sites, and
- Flora and fauna.

Ngāti Raukawa ki te Tonga scored the public engagement alignment option an overall 4.5. However, this score was subsequently rounded up to 5 by the Project Design Team to ensure a consistent scoring approach was recorded for all of the MCA assessors.

See **Appendix Q** (Ngāti Raukawa ki te Tonga Report) for further information.

### 7.2.4.2 Muaūpoko Tribal Authority

Muaūpoko advised at the beginning of MCA Workshop 3 that it had a strong preference for the IBC's eastern corridor location for the new highway (i.e. the preferred 300m corridor) over the alternative western corridor options. However, despite reiterating this corridor preference, Muaūpoko advised that it had evaluated the public engagement alignment option on a first principles basis. The key conclusions from its evaluation are as follows:

- Horowhenua is the heart of the Muaūpoko rohe, where its people have lived for centuries. The whenua is an essential part of Muaūpoko's identity. The alignment will leave a large and permanent scar on the whenua, and disturb connections from the maunga to the moana

- The alignment will cut across or disrupt awa and puna, which provide mauri, kai and charge the taonga lakes of Punahau and Waiwiri. Decades of development have already degraded water quality, and tribal members are concerned that further disruption could push its waterways to the brink
- The alignment area was a site of seasonal cultivation, hunting and birding for the Muaūpoko people, and construction may destroy remnants of these, and
- The alignment cuts across historical and spiritual pathways.

Muaūpoko advised that the sites of particular cultural importance for its membership that will need to be considered as the Ō2NL Project is further developed included:

- Pukehou – named after its ancestors; it is a site of historical birding, hunting and cultivation; it is part of a spiritual pathway; and was the location for tree forts
- Ohau awa – named after a significant ancestor; it is a source of kai and mauri; it is a historical pathway; and it is linked to maunga and sacred lakes, and
- Arapaepae – is part of a spiritual pathway leading north; it is a historical resting site for journeys into the Tararua ranges, where Muaūpoko would give karakia.

Muaūpoko scored the public engagement alignment option a 5. It did however score the following ‘sub-sections’ a mixture of 3s and 4s (however its overall score for the public engagement alignment option was recorded as a 5):

- Pukehou: Taylors Road to south Manakau Road
- Otararere: South Manakau Road to before the Ohau awa
- Ohau: Ohau awa to Muhunoa Road
- Arapaepae: Muhunoa Road up to Waihou Road, and
- Waihou: Waihou Road to Koputaroa.

See **Appendix R** (Muaūpoko Tribal Authority’s PowerPoint) for further information.

### **7.2.5 Updated MCA Scores for the New Highway Alignment Options**

Each MCA assessor’s updated alignment unweighted (i.e. raw) scores<sup>33</sup> for each highway zone, including for the New (November 2020) Alignment, are set out in Table 9 below.

For ease of reference, Table 10 (i.e. below Table 9) provides an overall summary of the MCA assessors unweighted scores for each alignment for each highway zone.


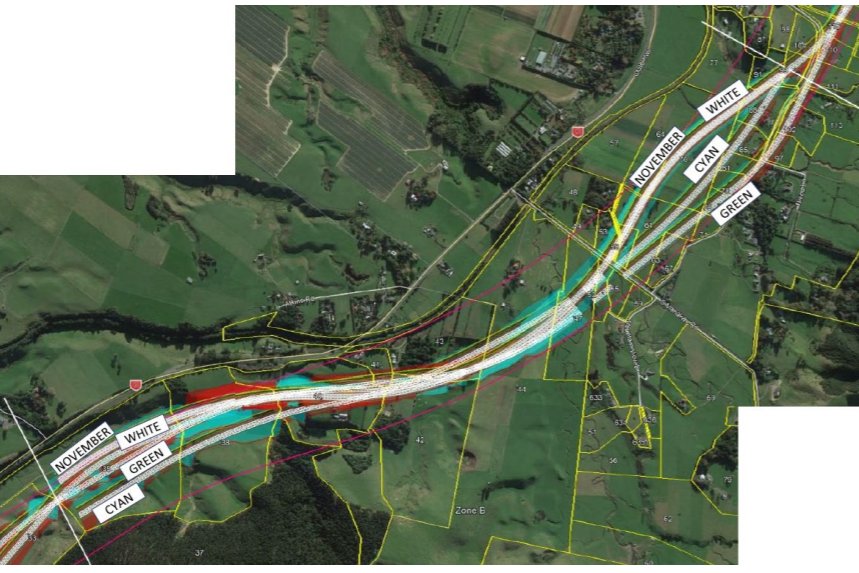
Both Table 9 and Table 10 provide the overall combined scores per alignment. In addition, Table 10 provides an overall ranking order for each alignment option (for each highway zone).

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<sup>33</sup> For avoidance of doubt, the unweighted or raw scores are equally weighted





**Table 9: MCA assessors unweighted scores for the alignment options for each highway zone**

Highway Zone	Short listed options assessed by the MCA assessors	Short listed option locations assessed by the MCA assessors	MCA assessors unweighted alignment scores and lwi overall scores for the public engagement alignment option <sup>34</sup>																																																																																																																														
A	A - Green A - White A - New (November 2020)		<table border="1"> <thead> <tr> <th>Alignment Options</th> <th>Enhanced movement</th> <th>Safety</th> <th>Resilience</th> <th>Connections</th> <th>Landscape / visual</th> <th>Ecological - Terrestrial</th> <th>Ecological - Freshwater &amp; Wetlands</th> <th>Heritage</th> <th>Archaeology</th> <th>Noise / vibration</th> <th>Productive land values</th> <th>Social / community / recreation</th> <th>Horowhenua district development</th> <th>Kāpiti Coast district development</th> <th>Fit with local road system</th> <th>Engineering degree of difficulty</th> <th>Property degree of difficulty</th> <th>Iwi Cultural Values Ngāti Raukawa ki te Tonga (public engagement)</th> <th>Iwi Cultural Values Muaūpoko (public engagement alignment score)</th> <th>Total Combined Score</th> </tr> </thead> <tbody> <tr> <td>A - Green*</td> <td>1</td><td>1</td><td>2</td><td>1</td><td>3</td><td>1</td><td>3</td><td>1</td><td>3</td><td>3</td><td>3</td><td>2</td><td>N/A</td><td>2</td><td>N/A</td><td>3</td><td>5</td><td></td><td></td><td>49</td> </tr> <tr> <td>A - White</td> <td>1</td><td>1</td><td>2</td><td>1</td><td>2</td><td>1</td><td>3</td><td>1</td><td>3</td><td>3</td><td>3</td><td>2</td><td>N/A</td><td>4</td><td>N/A</td><td>4</td><td>5</td><td></td><td></td><td>51</td> </tr> <tr> <td>A - New (November 2020)</td> <td>1</td><td>1</td><td>2</td><td>1</td><td>3</td><td>1</td><td>3</td><td>1</td><td>3</td><td>3</td><td>3</td><td>2</td><td>N/A</td><td>2</td><td>N/A</td><td>3</td><td>5</td><td></td><td></td><td>44</td> </tr> <tr> <td colspan="18"><b>A - Overall lwi scoring of public engagement alignment option</b></td> <td>5</td> <td>5</td> <td></td> </tr> </tbody> </table>	Alignment Options	Enhanced movement	Safety	Resilience	Connections	Landscape / visual	Ecological - Terrestrial	Ecological - Freshwater & Wetlands	Heritage	Archaeology	Noise / vibration	Productive land values	Social / community / recreation	Horowhenua district development	Kāpiti Coast district development	Fit with local road system	Engineering degree of difficulty	Property degree of difficulty	Iwi Cultural Values Ngāti Raukawa ki te Tonga (public engagement)	Iwi Cultural Values Muaūpoko (public engagement alignment score)	Total Combined Score	A - Green*	1	1	2	1	3	1	3	1	3	3	3	2	N/A	2	N/A	3	5			49	A - White	1	1	2	1	2	1	3	1	3	3	3	2	N/A	4	N/A	4	5			51	A - New (November 2020)	1	1	2	1	3	1	3	1	3	3	3	2	N/A	2	N/A	3	5			44	<b>A - Overall lwi scoring of public engagement alignment option</b>																		5	5																						
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Highway Zone	Short listed options assessed by the MCA assessors	Short listed option locations assessed by the MCA assessors	MCA assessors unweighted alignment scores and lwi overall scores for the public engagement alignment option <sup>34</sup>																																																																																																																																											
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L - New (November 2020)	1	1	1	1	3	1	2	1	3	4	5	4	2	N/A	3	3	3	48																																																																																																																												
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<sup>35</sup> It is noted that the zone descriptors (i.e. letters) are not always sequential due to the initial zone allocations requiring some zones to be combined

**Table 10: Summary of MCA assessors unweighted evaluation scores for each alignment option for each highway zone<sup>36</sup>**

Highway Zone and Alignment Option	Enhanced movement	Safety	Resilience	Connections	Landscape / visual	Ecological - Terrestrial	Ecological - Freshwater & Wetlands	Heritage	Archaeology	Noise / vibration	Productive land values	Social / community / recreation	Horowhenua district development	Kāpiti Coast district development	Fit with local road system	Engineering degree of difficulty	Property degree of difficulty	Iwi Cultural Values Ngāti Raukawa ki te Tonga (public engagement alignment score)	Iwi Cultural Values Muatipoko (public engagement alignment score)	Total Combined Score	Overall Unweighted Score Ranking
A – Green*	1	1	2	1	3	1	3	1	3	3	3	2	N/A	2	N/A	3	5			49	2
A - White	1	1	2	1	2	1	3	1	3	3	3	2	N/A	4	N/A	4	5			51	3
A - New (November 2020)	1	1	2	1	3	1	3	1	3	3	3	2	N/A	2	N/A	3	5			44	1
<b>A - Overall Iwi scoring of public engagement alignment option</b>																		5	5		
B - Cyan	1	1	2	1	3	5	2	1	2	4	3	3	1	3	3	3	4			52	4
B - Green	1	1	1	1	5	2	2	1	2	4	3	4	1	1	3	4	4			50	3
B – White*	1	1	1	1	2	5	2	1	2	4	3	2	1	3	3	3	3			48	2
B - New (November 2020)	1	1	1	1	2	2	2	1	2	4	3	2	1	1	3	3	3			43	1
<b>B - Overall Iwi scoring of public engagement alignment option</b>																		5	5		

<sup>36</sup> \*Denotes the draft preferred alignment(s) originally identified in the draft MCA Assessment Report 2020

Highway Zone and Alignment Option	Enhanced movement	Safety	Resilience	Connections	Landscape / visual	Ecological - Terrestrial	Ecological - Freshwater & Wetlands	Heritage	Archaeology	Noise / vibration	Productive land values	Social / community / recreation	Horowhenua district development	Kāpiti Coast district development	Fit with local road system	Engineering degree of difficulty	Property degree of difficulty	Iwi Cultural Values Ngāti Raukawa ki te Tonga (public engagement alignment score)	Iwi Cultural Values Muaūpoko (public engagement alignment score)	Total Combined Score	Overall Unweighted Ranking
C - Green	1	1	1	1	3	1	4	4	4	4	4	2	1	N/A	3	2	4			50	3
C - Purple	1	1	1	1	2	1	4	4	4	3	4	2	1	N/A	3	3	4			49	2
C – White*	1	1	2	1	3	1	2	4	5	3	3	2	1	N/A	3	2	4			48	1
<b>C - Overall Iwi scoring of public engagement alignment option</b>																		5	5		
D - Cyan	1	1	2	1	3	3	4	1	2	3	4	2	3	N/A	3	2	5			50	2
D - Dark Blue*	1	1	2	1	3	1	4	1	3	3	3	1	2	N/A	3	3	5			47	1
<b>D - Overall Iwi scoring of public engagement alignment option</b>																		5	5		
E - Cyan	1	1	2	1	3	1	2	1	2	3	3	3	3	N/A	3	2	3			44	2=
E – Green	1	1	2	1	3	1	2	1	2	3	3	3	2	N/A	3	3	3			44	2=
E - New (November 2020)	1	1	2	1	3	1	2	1	2	3	3	3	2	N/A	3	2	3			43	1
<b>E - Overall Iwi scoring of public engagement alignment option</b>																		5	5		
F – Orange*	1	1	1	1	3	1	1	2	3	3	4	3	3		3	2	3			45	1

Highway Zone and Alignment Option	Enhanced movement	Safety	Resilience	Connections	Landscape / visual	Ecological - Terrestrial	Ecological - Freshwater & Wetlands	Heritage	Archaeology	Noise / vibration	Productive land values	Social / community / recreation	Horowhenua district development	Kāpiti Coast district development	Fit with local road system	Engineering degree of difficulty	Property degree of difficulty	Iwi Cultural Values Ngāti Raukawa ki te Tonga (public engagement alignment score)	Iwi Cultural Values Muaūpoko (public engagement alignment score)	Total Combined Score	Overall Unweighted Score Ranking
F - Purple	1	1	1	1	5	1	1	2	3	4	4	3	3		3	2	4			49	3
F – White*	1	1	1	1	5	1	1	2	3	3	4	3	3		3	2	3			47	2
<b>F - Overall Iwi scoring of public engagement alignment option</b>																		5	5		
G - Cyan	1	1	1	1	3	1	1	2	3	2	3	2	4	N/A	3	1	3			42	2
G – Purple*	1	1	1	1	3	1	1	2	2	2	3	2	4	N/A	3	1	3			41	1
G - White	1	1	1	1	3	1	1	2	3	3	3	2	4	N/A	3	2	3			44	3
<b>G - Overall Iwi scoring of public engagement alignment option</b>																		5	5		
H – Cyan	1	1	1	1	3	1	1	2	1	3	5	2	2	N/A	3	1	3			41	1
H - Purple	1	1	1	1	3	1	1	2	1	3	5	2	2	N/A	3	1	4			42	2
<b>H - Overall Iwi scoring of public engagement alignment option</b>																		5	5		
K - Cyan	1	1	1	1	4	1	2	1	3	4	5	4	2	N/A	3	2	4			49	2=
K - Dark Blue*	1	1	1	1	4	1	2	1	3	3	5	4	3	N/A	3	2	4			49	2=



Highway Zone and Alignment Option	Enhanced movement	Safety	Resilience	Connections	Landscape / visual	Ecological - Terrestrial	Ecological - Freshwater & Wetlands	Heritage	Archaeology	Noise / vibration	Productive land values	Social / community / recreation	Horowhenua district development	Kāpiti Coast district development	Fit with local road system	Engineering degree of difficulty	Property degree of difficulty	Iwi Cultural Values Ngāti Raukawa ki te Tonga (public engagement alignment score)	Iwi Cultural Values Muaūpoko (public engagement alignment score)	Total Combined Score	Overall Unweighted Score Ranking
K – Yellow*	1	1	1	1	4	1	2	1	3	3	5	4	3	N/A	3	2	4			49	2=
K – New (November 2020)	1	1	1	1	3	1	2	1	3	2	5	3	2	N/A	3	2	3			44	1
<b>K - Overall Iwi scoring of public engagement alignment option</b>																		5	5		
L – Black*	1	1	1	1	3	1	2	1	3	3	5	3	3	N/A	3	3	3			47	1=
L – Green*	1	1	1	1	5	1	2	1	3	3	5	4	2	N/A	3	4	3			50	3=
L – Orange*	1	1	1	1	3	1	2	1	3	3	5	3	3	N/A	3	3	3			47	1=
L - Purple	1	1	1	1	5	1	2	1	3	3	5	4	2	N/A	3	4	3			50	3=
L - New (November 2020)	1	1	1	1	3	1	2	1	3	4	5	4	2	N/A	3	3	3			48	2
<b>L - Overall Iwi scoring of public engagement alignment option</b>																		5	5		

## 7.2.6 Summary of Unweighted Highway Alignment Preferences

Table 11 below provides a summary of the unweighted (or raw) highway alignment score preferences (i.e. based on the outcomes of Table 9 and Table 10 above).

**Table 11: Unweighted highway alignment score preferences**

Highway Zone	Unweighted alignment score preferences
A	New (November 2020) Alignment
B	New (November 2020) Alignment
C	White Alignment
D	Dark Blue Alignment
E	New (November 2020) Alignment
F	Orange Alignment
G	Purple Alignment
H	Cyan Alignment
K	New (November 2020) Alignment
L	Black and Orange Alignments

## 7.3 Highway Alignment MCA Weighting Scenario Assessments

As previously undertaken for the draft MCA Assessment Report 2020, the updated unweighted alignment option scores were subjected to the same weighting exercise. To recap, this exercise was design to test the sensitivities of the unweighted scores to matters considered, under various weightings, to be more important.

The same weighting scenarios evaluated in the draft MCA Assessment Report 2020<sup>37</sup> were also assessed again for the updated unweighted highway alignment scores (i.e. the scores set out in Table 9 and Table 10 above). To recap, the weightings that were used to sensitivity test the unweighted scores were as follows:

- Workshop weightings scenario

The workshop weightings (for this scenario) were determined collectively by the MCA assessors at MCA Workshop 1 (May 2020), and “reused” for the workshop weightings assessment for MCA Workshop 3<sup>38</sup>

<sup>37</sup> Draft MCA Assessment Report (July 2020), page 33

<sup>38</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)

- RMA Section 6 scenario

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 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 assessment criteria. All other assessment criteria were given a mixture of medium and low weighting values.<sup>39</sup>

- Quadruple bottom line scenarios<sup>40</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 same weighting scenario numerical values that were used in the draft MCA Assessment Report 2020 for sensitivity testing the unweighted highway alignment scores for each Highway

- 
- 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 Design 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>39</sup> It is noted that the individual numerical values were determined by the Project Design Team following completion of MCA Workshop 1

<sup>40</sup> This quadruple bottom-line weighting is a different type of evaluation from the Benefit Cost Ratio (BCR) evaluation normally undertaken by Waka Kotahi

Zone were “reused” for testing the updated alignment scores [i.e. the scores identified in Table 9 and Table 10 above, including for the New (November 2020) Alignment]. For ease of reference, the numerical values assigned to each weighting scenario from the draft MCA Assessment Report 2020 are replicated below in Table 12.

**Table 12: Numerical values assigned to each of the weighting scenario options<sup>41</sup>**

Assessment criteria	Workshop Weightings	RMA Section 6	Quadruple bottom line			
			Social	Environment	Cultural	Economic
Enhanced Movement	2	3	4	0	0	10
Safety	2	3	7	0	0	10
Resilience	2	8	4	0	0	10
Connections	2	3	8	0	0	10
Landscape / Visual	6	8	5	6	5	0
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
Kāpiti Coast District Development	2	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 Cultural Values Ngāti Raukawa ki te Tonga	10	10	8	8	10	2
Iwi Cultural Values Muaūpoko	10	10	8	8	10	2

For avoidance of doubt, it is noted that the Iwi values assessment criteria weightings (i.e. for both Ngāti Raukawa ki te Tonga and the Muaūpoko) were guided by the “weighting discussions” held at MCA Workshop 1.

<sup>41</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

## 7.4 Scenario Weightings Scores and Final Rankings for Alignment Options

Table 13 below sets out the weighted scores (and associated rankings) for each highway alignment option (per highway zone) for each weighting scenario (these scores were calculated<sup>42</sup> in accordance with the numerical values set out in Table 12 above). For ease of reference, Table 14 below provides an overall ranking for each alignment option scenario assessment's score (i.e. these are the "colour coded" rankings identified in Table 14 below).

In addition to examining the scores for each individual weighting scenario assessment, both Table 13 and Table 14 also provide overall combined scores and rankings as an alternative means of interpreting the weighting scenario assessment results as follows:

- The left hand light pink column in Table 13 provides an 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 14 provides a total score for all of the 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).

It is noted that Ngāti Raukawa ki te Tonga and Muaūpoko scores for the public engagement alignment option have not been included in Table 13 and Table 13. This action was required in order to remove any scoring inconsistencies due to the different scoring approaches used by both Iwi. That is, both Iwi provided an overall score for the public engagement alignment option whereas the MCA assessors provided scores for each alignment option identified for each of the highway zones.

**Table 13: Average scores for the highway alignment weighting scenarios**

Alignment option	Workshop Weighting	RMA Sec 6	Social	Environment	Cultural	Economic	Average Score	Overall Average Score Ranking
<b>Zone A</b>								
A - Green	1.92	1.63	1.64	1.57	1.53	1.81	1.68	1=
A - White	2	1.67	1.75	1.46	1.52	2.07	1.74	2
<b>A - New</b>	1.92	1.63	1.64	1.57	1.53	1.81	1.68	1=
<b>Zone B</b>								
B - Cyan	2.23	2.06	1.97	2.18	2	2.05	2.08	4
B - Green	2.21	1.96	1.95	1.90	1.85	1.93	1.97	3
B - White	2	1.86	1.75	2.01	1.80	1.80	1.87	2
<b>B - New</b>	1.74	1.54	1.55	1.46	1.38	1.64	1.55	1
<b>Zone C</b>								
C - Green	2.11	2.04	1.93	2.03	1.92	1.62	1.94	3
C - Purple	2.12	1.92	1.84	1.87	1.80	1.73	1.88	2
C - White	1.95	1.91	1.89	1.66	1.76	1.68	1.81	1
<b>Zone D</b>								
D - Cyan	2.30	1.89	1.80	2.07	1.80	2	1.97	2
D – Dark Blue	2.11	1.69	1.66	1.70	1.53	1.94	1.77	1

<sup>42</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

Alignment option	Workshop Weighting	RMA Sec 6	Social	Environment	Cultural	Economic	Average Score	Overall Average Score Ranking
<b>Zone E</b>								
E - Cyan	1.81	1.60	1.68	1.38	1.44	1.75	1.61	3
E - Green	1.83	1.58	1.64	1.38	1.41	1.79	1.60	2
<b>E - New</b>	1.73	1.56	1.61	1.38	1.41	1.68	1.56	1
<b>Zone F</b>								
F - Orange	1.85	1.67	1.77	1.31	1.49	1.70	1.63	1
F - Purple	2.09	1.91	1.98	1.59	1.68	1.81	1.84	3
F - White	1.97	1.82	1.87	1.53	1.64	1.70	1.75	2
<b>Zone G</b>								
G - Cyan	1.69	1.54	1.62	1.20	1.35	1.58	1.50	2
G - Purple	1.64	1.46	1.56	1.14	1.23	1.58	1.44	1
G - White	1.82	1.62	1.72	1.25	1.40	1.69	1.58	3
<b>Zone H</b>								
H - Cyan	1.57	1.4	1.49	1.14	1.10	1.53	1.37	1
H - Purple	1.66	1.41	1.53	1.14	1.10	1.64	1.42	2
<b>Zone K</b>								
K - Cyan	2.12	1.88	1.94	1.66	1.77	1.82	1.87	2=
K - Dark Blue	2.16	1.86	1.94	1.61	1.76	1.90	1.87	2=
K - Yellow	2.16	1.86	1.94	1.61	1.76	1.90	1.87	2=
<b>K - New</b>	1.85	1.58	1.63	1.38	1.49	1.68	1.60	1
<b>Zone L</b>								
L - Black	2.05	1.71	1.79	1.44	1.56	1.86	1.74	1=
L - Green	2.24	1.91	1.93	1.72	1.80	1.93	1.92	3=
L - Orange	2.05	1.71	1.79	1.44	1.56	1.86	1.74	1=
L - Purple	2.24	1.91	1.93	1.72	1.80	1.93	1.92	3=
<b>L - New</b>	2.06	1.80	1.88	1.55	1.70	1.82	1.8	2

Table 14: Weighting scenario ranking orders for the scores identified in Table 13

Alignment option	Workshop Weighting	RMA Sec 6	Social	Environment	Cultural	Economic	Total Ranking Score	Overall Ranking
<b>Zone A</b>								
A - Green	1	1	1	2	2	1	8	1=
A - White	3	3	3	1	1	3	14	2
<b>A - New</b>	1	1	1	2	2	1	8	1=
<b>Zone B</b>								
B - Cyan	4	4	4	4	4	4	24	4
B - Green	3	3	3	2	3	3	17	3
B - White	2	2	2	3	2	2	13	2
<b>B - New</b>	1	1	1	1	1	1	6	1
<b>Zone C</b>								
C - Green	2	3	3	3	3	1	15	3

Alignment option	Workshop Weighting	RMA Sec 6	Social	Environment	Cultural	Economic	Total Ranking Score	Overall Ranking
C - Purple	3	2	1	2	2	3	13	2
C - White	1	1	2	1	1	2	8	1
<b>Zone D</b>								
D - Cyan	2	2	2	2	2	2	12	2
D - Dark Blue	1	1	1	1	1	1	6	1
<b>Zone E</b>								
E - Cyan	2	3	3	1	3	2	14	3
E - Green	3	2	2	1	1	3	12	2
<b>E - New</b>	1	1	1	1	1	1	6	1
<b>Zone F</b>								
F - Orange	1	1	1	1	1	1	6	1
F - Purple	3	3	3	3	3	3	18	3
F - White	2	2	2	2	2	1	11	2
<b>Zone G</b>								
G - Cyan	2	2	2	2	2	1	11	2
G - Purple	1	1	1	1	1	1	6	1
G - White	3	3	3	3	3	3	18	3
<b>Zone H</b>								
H - Cyan	1	1	1	1	1	1	6	1
H - Purple	2	2	2	1	1	2	10	2
<b>Zone K</b>								
K - Cyan	2	4	2	4	4	2	18	3
K - Dark Blue	3	2	2	2	2	3	14	2=
K - Yellow	3	2	2	2	2	3	14	2=
<b>K - New</b>	1	1	1	1	1	1	6	1
<b>Zone L</b>								
L - Black	1	1	1	1	1	2	7	1=
L - Green	4	4	4	4	4	4	24	3=
L - Orange	1	1	1	1	1	2	7	1=
L - Purple	4	4	4	4	4	4	24	3=
<b>L - New</b>	3	3	3	3	3	1	16	2

#### 7.4.1 Summary of Highway Alignment Weighted Scenario Assessments

The ranking orders identified in Table 13 and Table 14 identified the same highway alignment preferences for each highway zone. These weighting assessment scenario preferences also aligned with the unweighted alignment preferences and associated rankings that were identified in Table 9 and Table 10.

### 7.5 Summary of MCA Highway Alignment Evaluations

#### 7.5.1 Zone A

The Green Alignment, which was indicatively preferred following the draft MCA Assessment Report 2020 (due to its superior Kāpiti Coast District Development and EDoD evaluations / scores). The

New (November 2020) Alignment were ranked equally under the unweighted and weighted scenario assessments. It is noted that the locational differences between the two alignment options is through the middle of Zone A (and is minor).

In summary, both the Green and New (November 2020) Alignments were ranked first equal (and ahead of the White Alignment) as they were both better technically performing from a Kāpiti Coast District Development and EDoD perspective.

The Kāpiti Coast District Development evaluation preferred the Green and New (November 2020) Alignments equally as they were located away from Pukehou (which is Special Amenity Feature 15 in the Proposed Kāpiti Coast District Plan) when compared to the White Alignment.

The EDoD evaluation ranked the Green and New (November 2020) Alignments equally (with no clear differentiator). The MCA assessor advised that the New (November 2020) Alignment's ground conditions were superior to the Green Alignment's (and would therefore involve less earthwork activities). However, the Green Alignment would have fewer watercourses to traverse and would therefore be less complex to construct.

It is noted that Zone A hosts some potential Māori land that could be impacted by all of the alignment options proposed for this highway zone. These impacts will need to be further investigated in the Ō2NL DBC.

### ***Recommendation***

It is recommended that the Green and the New (November 2020) Alignment be further investigated in the Ō2NL DBC (noting there are only minor alignment locational differences between the two options through the middle of Zone A).

## **7.5.2 Zone B**

The New (November 2020) Alignment was the indicatively preferred alignment under both the unweighted and weighted scenario assessment rankings. In summary, it was considered better performing than the previously indicatively preferred White Alignment (which was technically preferred in the draft MCA Assessment Report 2020<sup>43</sup>), from a Terrestrial Ecology and Kāpiti Coast District Development perspective.

For Terrestrial Ecology, the New (November 2020) Alignment scored a 2 whereas the White Alignment scored a 5. The key reason for the former option's superior score was due to the White Alignment potentially having greater impacts on the Pukehou Native Bush Area, including Staples Bush. The Kāpiti Coast District Development evaluation also preferred the New (November 2020) Alignment as it would have less impacts on the ecologically significant areas K016 and K164 as identified in the Proposed Kāpiti Coast District Plan.

### ***Recommendation***

It is recommended that the New (November 2020) Alignment be investigated further in the Ō2NL DBC.

## **7.5.3 Zone C**

There were no changes to the alignment scores for Zone C from the draft MCA Assessment Report 2020 following completion of MCA Workshop 3.

The scoring for the White and Purple Alignments was close, however the former (White) alignment was the technically strongest performing alignment under both the unweighted and weighted scenario assessments. The indicative preference for this alignment was largely due to it performing better in the following assessment areas:

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<sup>43</sup> The White Alignment was preferred in the draft MCA Assessment Report due to its Landscape / Visual, Social / Community / Recreation, EDoD and PDoD evaluations / scores. This alignment option did record a score of 4 for Terrestrial Ecology impacts due to its proximity to the Pukehou Native Bush Area



- Freshwater / Wetland Ecology (e.g. it was likely to have less interactions with waterways containing At Risk fish species when compared to the other alignments)
- Noise / Vibration (e.g. it would impact on fewer PPFs located within the 75m to 100m alignment noise zone when compared to the other alignments)
- Productive Land Values (e.g. it would require less LUC Class 1 land to be taken when compared to the other alignments), and
- EDoD (e.g. it would have fewer watercourses to traverse, would be located on better ground conditions and have less earthwork requirements).

### **Recommendation**

It is recommended that the White Alignment be investigated further in the Ō2NL DBC.

### **7.5.4 Zone D**

There were no changes to the alignment scores for Zone D from the draft MCA Assessment Report 2020 following completion of MCA Workshop 3.

The Dark Blue Alignment was considered the technically strongest performing alignment under both the unweighted and weighted scenario assessments. The indicative preference for this alignment was largely due to its high scores in the following assessment areas:

- Terrestrial Ecology (e.g. due to it avoiding an existing forest block, whereas the Cyan Alignment would directly impact on this forest block)
- Productive Land Values (e.g. it would require less LUC Class 1 and 2 land to be taken when compared to the Cyan Alignment)
- Social / Community / Recreation (e.g. it would result in less community / individual severance effects when compared to the Cyan Alignment), and
- Horowhenua District Development (e.g. it would have less interactions with identified growth areas when compared to the Cyan Alignment).

### **Recommendation**

It is recommended that the Dark Blue Alignment be investigated further in the Ō2NL DBC.

### **7.5.5 Zone E**

The New (November 2020) Alignment was ranked as the technically strongest performing option under both the unweighted and weighted scenario assessments.

The key option differentiator between all of the alignment options in Zone E, including the previously preferred Green Alignment (as per the draft MCA Assessment Report 2020) was the EDoD assessment criterion. The EDoD MCA assessor scored the New (November 2020) Alignment a 2, which was one point better than the assessor's score of 3 for the Green Alignment. The EDoD MCA assessor's higher evaluation / score for the New (November 2020) Alignment was due to it having fewer watercourses to traverse (and therefore would be less complex to construct).

### **Recommendation**

It is recommended that the New (November 2020) Alignment be investigated further in the Ō2NL DBC.

### **7.5.6 Zone F**

There were no changes to the alignment scores for Zone F from the draft MCA Assessment Report 2020 following MCA Workshop 3.

As recorded in the draft MCA Assessment Report 2020, the Orange Alignment was originally considered the technically strongest performing alignment under both the unweighted (raw) and weighted scenario assessments. This was due to it being indicatively preferred by the Landscape /

Visual (e.g. best fit with the landscape “grain” and fewer visual effects on nearby houses) and Noise / Vibration (e.g. less impacts on PPFs located within the alignment noise zones) assessment criteria. However, the draft MCA Assessment Report 2020 did identify that parts of the Orange Alignment were located outside of the preferred 300m corridor, and that this would result in new properties being impacted by the new highway. As such, the draft MCA Assessment Report 2020 recommended that the next technically strongest performing alignment option that was located within the preferred 300m corridor be advanced to public engagement, which was the White Alignment. This alignment was considered superior (including with respect to the alternative Purple Alignment) from a PDoD (e.g. fewer complex property acquisitions would be required) as well as Noise / Vibration (e.g. fewer impacts on PPFs located within the 75m alignment noise zone) evaluation perspective.

As the MCA assessors re-confirmed their original evaluations / scores, along with re-confirmation that the original preference for the new highway was to be located within the preferred 300m corridor, meant that the White Alignment was accordingly re-confirmed as the alignment preference for Zone F.

### **Recommendation**

It is recommended that the White Alignment be investigated further in the Ō2NL DBC.

### **7.5.7 Zone G**

There were no changes to the alignment scores for Zone G from the draft MCA Assessment Report 2020 following completion of MCA Workshop 3.

As documented in the draft MCA Assessment Report 2020, the Purple Alignment was considered the technically strongest performing alignment under both the unweighted and weighted scenario assessments. In particular, it was the technically better performing option in the Archaeology and EDoD assessment criterion. In terms of the former assessment criteria, it was considered better performing as it would be located further away from the historic Prouse Homestead. In terms of the latter assessment criteria, it was considered better performing as it would have less watercourses to traverse and would require fewer local road system reconfigurations.

### **Recommendation**

It is recommended that the Purple Alignment be investigated further in the Ō2NL DBC.

### **7.5.8 Zone H**

There were no changes to the alignment scores for Zone H from the draft MCA Assessment Report 2020 following completion of MCA Workshop 3.

As recorded in the draft MCA Assessment Report 2020, the Cyan Alignment was considered the technically strongest performing alignment under both the unweighted and weighted scenario assessments. It was indicatively preferred by the PDoD assessment as it would require fewer dwellings to be acquired for the Ō2NL Project.

### **Recommendation**

It is recommended that the Cyan Alignment be investigated further in the Ō2NL DBC.

### **7.5.9 Zone K**

The New (November 2020) Alignment was the technically strongest performing option under both the unweighted and weighting scenario assessments. It was favoured over the Dark Blue and Yellow Alignments that were identified as the best performing alignments in the draft MCA Assessment Report 2020.<sup>44</sup>

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<sup>44</sup> Both alignment options were equally preferred under both the unweighted (raw) and weighted scenario assessments

The New (November 2020) Alignment had higher scores than the other alignment options for Zone K in the following assessment areas:

- Landscape / Visual (e.g. it has a “square grain” with Waihou Road, and enables the roundabout at the SH1 / SH57 Split location to have a good “fit” with the local landscape)
- Noise / Vibration (e.g. it would impact on fewer PPFs located within the 75m to 100m alignment noise zone when compared to the other alignments)
- Social / Community / Recreation (e.g. its close proximity to Waihou Road would result in less community severance effects when compared to the other alignments)
- Horowhenua District Development (e.g. it would have less impacts on Growth Area LN2 compared to the other alignments), and
- PDoD (e.g. it avoids needing to undertake a complex chicken farm acquisition).

### **Recommendation**

It is recommended that the New (November 2020) Alignment be investigated further in the Ō2NL DBC.

### **7.5.10 Zone L**

The draft MCA Assessment Report 2020 identified the Orange and Black Alignments as the technically strongest performing alignment options under both the unweighted and weighted scenario assessments. Both scored well comparatively from a Landscape / Visual and Social / Community / Recreational perspective. The draft MCA Assessment Report did note that both the Orange and Black Alignments had segments located outside of the preferred 300m corridor and therefore would impact on properties that had not been previously affected.

The Post MCA Report 2020 also identified geometric design challenges with the Orange and Black Alignments including the need to accommodate the NIMT Line, and the need to overcome local terrain complexities (e.g. steep sided gullies). The alignment through this section also needed to connect safely and efficiently into the emerging preferred intersection forms at the SH57 / SH1 Split and North of Levin locations. For example, if roundabouts are ultimately confirmed for both locations, they would necessitate additional requirements to ensure appropriate horizontal and vertical highway alignments are achieved. These requirements would be vital for ensuring that there is adequate visibility at either intersection(s), particularly for any stationary queues. Accordingly, and as recorded in the Post MCA Report 2020, the New (November 2020) Alignment was developed to overcome these existing geometric, terrain and physical constraint issues (and therefore had a number of advantages over the Orange and Black Alignments).

The New (November 2020) Alignment scored well comparatively in all of the MCA assessment areas, except for the Orange and Black Alignments for the Noise / Vibration and Social / Community / Recreation evaluation criteria.

For the noise / vibration assessment criteria, the Orange and Black Alignments scored 3s, whereas the New (November 2020) Alignment scored a 4. The key reasons for the latter alignments inferior scoring included that it would impact on more PPFs located within the 75m alignment noise zone when compared to the Orange and Black Alignments. Similarly, for the social / community / recreation assessment criteria, the Orange and Black Alignments scored 3s, whereas the New (November 2020) Alignment scored a 4. The key reason for this scoring difference was the potential adverse amenity impacts the New (November) Alignment would have on the residences located at the southern end of Sorensens Road.

When considering the performance of the options against Noise and Social / Community / Recreational criteria and given the geometric, terrain and physical constraints, the Design Team considered that it was likely that the Noise and Social / Community / Recreational performance of the New (November 2020) Alignment option could be improved through the detailed design phases, including through development of mitigation. In addition, the Design Team considered that the geometric, terrain and physical constraints could not be reduced through the detailed design phases.

### Recommendation

It is recommended that the New (November 2020) Alignment be advanced to the Ō2NL DBC on the basis of it scoring well (in comparison to the Orange and Black Alignments) from a geometric, terrain and physical constraints perspective.

### 7.5.11 Summary of the Recommended Highway Alignment Preferences

Table 15 sets out the alignment preferences for each highway zone (following completion of the MCA Workshop 3 process) that are recommended to be advanced to the Ō2NL DBC.

**Table 15: Recommended highway alignment preferences**

Highway Zone	Recommended highway alignment preferences
A	Combined Green and New (November 2020) Alignment
B	New (November 2020) Alignment
C	White Alignment
D	Dark Blue Alignment
E	New (November 2020) Alignment
F	White Alignment
G	Purple Alignment
H	Cyan Alignment
K	New (November 2020) Alignment
L	New (November 2020) Alignment

## 7.6 Updated Interchange Option Evaluations

This section of the report summarises the MCA assessors' updates to their interchange location / form evaluations that were identified in the draft MCA Assessment Report 2020. The updates were based on the assessor's consideration of any new information that they obtained through additional desktop / site investigations, iwi consultation and public engagement. The MCA assessors updated assessments also included their evaluations of the half grade separated interchange option at Tararua, which they had not previously evaluated in the draft MCA Assessment Report 2020.

Both Ngāti Raukawa ki te Tonga and Muaūpoko chose not to evaluate the interchange options. However, both Iwi did make the following comments:

- Muaūpoko advised that Tararua Road was an important route for connecting maunga and moana (and carries the name of its maunga). Therefore, it would be important that any interchange at Tararua be designed to minimise visual impacts and maintain local connections, and
- Ngāti Raukawa ki te Tonga preferred that the interchange forms proposed for the SH1 / SH57 Split and North of Levin locations be grade separated (rather than at-grade roundabouts). Ngāti Raukawa ki te Tonga were concerned that the roundabout options at these two locations would impact on the principle of manaakitanga, and the desire for road users to be conveyed through the new highway safely and efficiently, with the greatest level of care and respect. The proposed roundabouts are seen as elements that will lead to local journey

delays for road users and will introduce new safety concerns into what will otherwise be a safe traffic environment.

### **7.6.1 Updates to the Original MCA Assessor Interchange Option Evaluations**

At MCA Workshop 3, the following MCA assessors confirmed that there were no changes to their original evaluations / scores for the interchange options (as identified in the draft MCA Assessment Report 2020):

- Fit with Project Objectives
- Landscape / Visual
- Archaeology
- Kāpiti Coast District Development
- Social / Community / Recreation
- Heritage
- Noise / Vibration
- Horowhenua District Development
- Fit with Local Road System
- EDoD, and
- PDoD.

However, the Terrestrial Ecology and Productive Land Values assessors did update their evaluations / scores. All scoring updates are set out below.

#### **7.6.1.1 Ecology (Terrestrial)**

The MCA assessor advised that updates had been made to their initial evaluations / scores for the interchange options for Terrestrial Ecology following completion of MCA Workshop 2. The key scoring changes included:

- The score for Option C: Kuku Roundabout was increased from 1 to 4 due to the potential loss of 0.34 ha of local forest remnants and loss of swamp forest (the MCA assessor did note that this score would reduce back to 1 if the impacts on the forest remnants / swamp could be avoided through design refinements), and
- The score for Option D: Kuku Grade Separation was increased from 1 to 5 due to the potential loss of 0.34 ha of local forest remnants and loss of swamp forest (the MCA assessor did note that this score would reduce back to 1 if the impacts on the forest remnants / swamp could be avoided through design refinements).

The above adjusted terrestrial ecology scores are reflected in the scoring tables below.

For avoidance of doubt, there were no changes to the freshwater / wetland ecology scores.

#### **7.6.1.2 Productive Land Values**

The following Productive Land Values scores were updated (because of scoring discrepancies) as follows:

- The score for Option A: South Manakau Roundabout was corrected to 4 (from 3)
- The score for Option B: South Manakau Grade Separation was corrected to 5 (from 4)
- The score for Option D: Kuku Grade Separation was corrected to 4 (from 5)
- The score for Option B: Roundabout at the SH1 / SH57 Split location was corrected to 4 (from 5), and

- The score for Option B: Grade Separation at North Levin location was corrected to 4 (from 5).

## **7.6.2 Tararua Half Grade Separated Interchange Evaluations**

The MCA assessors' evaluations of the half grade separated interchange option at Tararua are set out below. It is noted that all of the MCA assessors re-confirmed their preferences for an interchange at the Tararua location rather than at the Kimberley location at MCA Workshop 3.

### **7.6.2.1 Fit with Project Objectives**

For the enhanced movement objective, the MCA assessor scored the half grade separated interchange a 1. This score was the same score as recorded for the full grade separated interchange at Tararua, but one point better than the score of 2 for the Tararua roundabout option. The MCA assessor noted that the half interchange would not impact materially on travel times along key road corridors.

For the resilience objective, the MCA assessor scored the half grade separated interchange a 1. This score was the same score as recorded for the full grade separated interchange at Tararua, but one point better than the score of 2 for the Tararua roundabout option. The MCA assessor noted that it would provide resilience benefits due to the provision of grade separation and a good level of service to nearby high standard roads (e.g. the existing state highways).

For the safety objective, the MCA assessor scored the half grade separated interchange a 2. This score was one point worse than the score of 1 that had been recorded for the full interchange at Tararua, but one point better than the score of 3 for the Tararua roundabout option. The half interchange had an inferior score to the full interchange, as it would lead to more traffic, in particular heavy commercial vehicles, being on SH57. Its safety score was superior to the Tararua roundabout's score as it was likely to result in less multi-modal conflicts.

For the appropriate connections objective, the MCA assessor scored the half grade separated interchange a 2. This score was one point worse than the score recorded for the full interchange at Tararua (which scored a 1), but one point better than the score for the Tararua roundabout option (which scored a 3). The half interchange had an inferior score to the full interchange as it would not be as efficient for freight travelling between Palmerston North and the Tararua Industrial Park (rather freight would need to travel along SH57 via the SH1 / SH57 Split location to access the industrial park). It was however considered superior to the Tararua roundabout due to "highway users" expecting an "expressway" level of service at this location.

### **7.6.2.2 Landscape / Visual**

The MCA assessor scored the half grade separated interchange option a 2, which was the same score as recorded for the Tararua roundabout, but one point better than the score of 3 for the full grade separated interchange at Tararua.

The MCA assessor's preference for the half interchange over the full interchange was due to it having a smaller footprint and it would be less prominent (e.g. it wouldn't have elevated north facing ramps) and therefore have reduced impacts on the Tara-Ika Growth Area. The MCA assessor also noted that a half interchange would reduce accessibility to the Tararua Industrial Park and to the Tara-Ika Growth Area.

The Tararua roundabout was scored a 2 due to its simple form and fit with the local environment.

### **7.6.2.3 Ecology (Terrestrial and Freshwater / Wetland)**

The MCA assessor scored the half grade separated interchange a 1, which is the same score as recorded for the full grade separated interchange and roundabout options at Tararua. The MCA assessor noted that the half interchange would have minimal impacts on sensitive ecological systems.

### **7.6.2.4 Heritage**

The MCA assessor scored the half grade separated interchange a 1, which is the same score as recorded for the full grade separated interchange and roundabout options at Tararua. The MCA assessor noted that the half interchange would have minimal impacts on local heritage values.

#### **7.6.2.5 Archaeology**

The MCA assessor scored the half grade separated interchange a 1, which is the same score as recorded for the full grade separated interchange and roundabout options at Tararua. The MCA assessor noted that the half interchange would have minimal impacts on local archaeology values.

#### **7.6.2.6 Noise / Vibration**

The MCA assessor scored a 4 for the half grade separated interchange option, which was the same score as recorded for the full grade separated interchange option at Tararua, but one point better than the score of 5 for the Tararua roundabout option.

The key reason for scoring the half interchange the same as a full interchange was that similar traffic volumes could be expected to use both types of interchange, and therefore the same number of local road roundabouts would still be required. Accordingly, similar braking and acceleration noise effects on nearby PPFs could be expected. The roundabout was scored a 5 as it was likely to result in increased noise effects on PPFs due to the extra braking and acceleration from vehicles.

#### **7.6.2.7 Productive Land Values**

The MCA assessor scored a 3 for the half grade separated interchange option, which was the same score as recorded for the full grade separated interchange and roundabout options at Tararua. The MCA assessor noted that the impacts of these interchange options would require a similar amount of LUC Class 3 land to be taken, and therefore there were no material option differentiators.

#### **7.6.2.8 Social / Community / Recreation**

The MCA assessor scored a 3 for the half grade separated interchange option, which was the same score as recorded for the Tararua roundabout option, but one point worse than the score of 2 for the full grade separated interchange option at Tararua.

The key reason for the half interchange's inferior score when compared to the full interchange was it would provide less connectivity for the local community (particularly to the Tararua Industrial Park). The MCA assessor also noted that they had a general preference for grade separation at the Tararua location as it would be safer for active modes and therefore generate health and safety benefits (e.g. from an increase in cycling).

#### **7.6.2.9 Horowhenua District Development**

The MCA assessor scored the half grade separated interchange option a 5, which was four points worse than the scores of 1s recorded for the full grade separated interchange and roundabout options at Tararua.

The key reason for the half interchange's inferior score (when compared to the other interchange options) was due to its potential to reduce connectivity for state highway traffic to the Tararua Industrial Park. In addition, the assessor noted that it would encourage more heavy vehicles to use the local road network (when compared to the full interchange), which would impact on the amenity of the Levin Town Centre and surrounding residential areas.

#### **7.6.2.10 Fit with Local Road System**

The MCA assessor scored the half grade separated interchange option a 5, which was four points worse than the full grade separated interchange option's score of 1 and three points worse than the roundabout option's score of 2 at Tararua. The key reason for the half interchange's inferior score (when compared to the other options) was due to less traffic relocating from the existing SH57 onto the new highway.

#### **7.6.2.11 Engineering Degree of Difficulty**

The MCA assessor scored the half grade separated interchange option a 2, which was the same score as recorded for the full grade separated interchange at Tararua, but one point worse than the Tararua roundabout's score of 1.

The MCA assessor advised that both the half and full grade separated interchanges had inferior scores when compared to the roundabout option due to both forms having greater earthwork requirements and both would be more complex to integrate with the local road system.

#### **7.6.2.12 Property Degree of Difficulty**

The MCA assessor scored the half grade separated interchange option a 2, which was the same score as recorded for the full grade separated interchange and roundabout options at Tararua.

The MCA assessor advised that the half interchange option would have slightly less property acquisition requirements, but these requirements were not sufficient to reduce its overall score.

### **7.6.3 Updated MCA Scores for the Interchange Options**


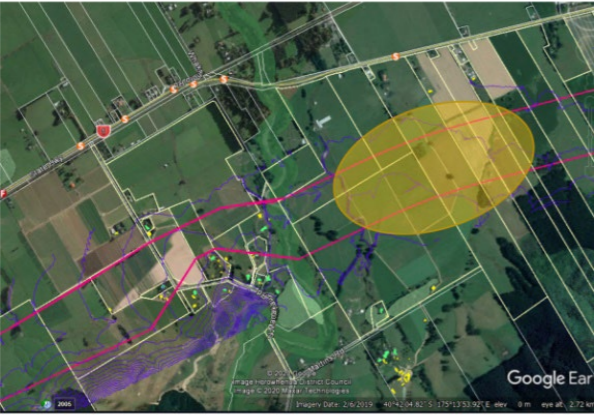
Table 16 to Table 19 provides a summary of the MCA assessors unweighted (or raw) scores for the interchange location and / or form options, including the scores for the Tararua half grade separated interchange option. Each table also provides an overall combined unweighted score for comparison purposes.

For ease of reference, Table 20 provides an overall summary of the interchange location / form unweighted scores for the interchange location and / or form options. This table also provides the overall total scores per interchange option plus the overall rankings for comparison purposes.

More information on the original interchange options evaluations / scores (as per the draft MCA Assessment Report 2020) can be found in Appendix C.

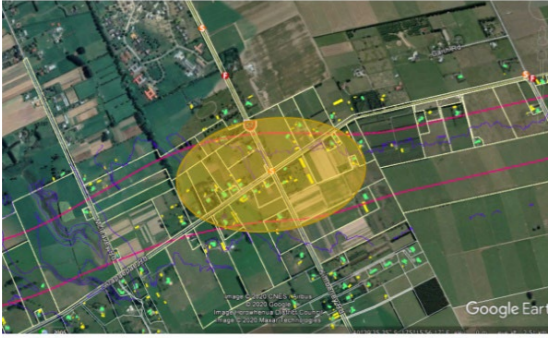



**Table 16: South Manakau and Kuku interchange location / form and no connection options**


Interchange locations	Interchange form options	MCA evaluation (unweighted) – location, form and no connection																																																																																																																
<p style="text-align: center;"><b>South Manakau</b></p>  <p style="text-align: center;"><b>South Kuku</b></p> 	<p style="text-align: center;"><b>South Manakau</b></p> <p>Option A: Roundabout</p> <p style="text-align: center;">or</p> <p>Option B: Full Grade Separation (i.e. Service Interchange)</p> <p style="text-align: center;">or</p> <p style="text-align: center;"><b>Kuku</b></p> <p>Option C: Roundabout</p> <p style="text-align: center;">or</p> <p>Option D: Full Grade Separation (i.e. Service Interchange)</p> <p style="text-align: center;">or</p> <p style="text-align: center;"><b>No connection</b></p> <p>Option E: No connection<sup>45</sup></p>	<table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th style="background-color: #cccccc;">Options</th> <th style="background-color: #cccccc;">Enhanced movement</th> <th style="background-color: #cccccc;">Safety</th> <th style="background-color: #cccccc;">Resilience</th> <th style="background-color: #cccccc;">Connections</th> <th style="background-color: #cccccc;">Landscape / visual</th> <th style="background-color: #cccccc;">Ecological - Terrestrial</th> <th style="background-color: #cccccc;">Ecological - Freshwater &amp; Wetlands</th> <th style="background-color: #cccccc;">Heritage</th> <th style="background-color: #cccccc;">Archaeology</th> <th style="background-color: #cccccc;">Noise and vibration</th> <th style="background-color: #cccccc;">Productive land values</th> <th style="background-color: #cccccc;">Social/community/recreation</th> <th style="background-color: #cccccc;">Horowhenua District development</th> <th style="background-color: #cccccc;">Fit with local road system</th> <th style="background-color: #cccccc;">Engineering degree of difficulty</th> <th style="background-color: #cccccc;">Property degree of difficulty</th> <th style="background-color: #cccccc;">Iwi Cultural Values Ngāti Raukawa ki te Tonga</th> <th style="background-color: #cccccc;">Iwi Cultural Values Muaupoko</th> <th style="background-color: #cccccc;">Total Combined Score</th> </tr> </thead> <tbody> <tr> <td style="background-color: #e0f2f1;">Option A: South Manakau Roundabout</td> <td>2</td><td>3</td><td>2</td><td>4</td><td>3</td><td>1</td><td>3</td><td>1</td><td>2</td><td>5</td><td>4</td><td>4</td><td>3</td><td>3</td><td>2</td><td>2</td> <td rowspan="5" style="background-color: #ffff00; vertical-align: middle;">Did not evaluate</td> <td></td> <td>44</td> </tr> <tr> <td style="background-color: #e0f2f1;">Option B: Full Grade Separation South at Manakau</td> <td>1</td><td>2</td><td>1</td><td>1</td><td>5</td><td>1</td><td>4</td><td>1</td><td>2</td><td>4</td><td>5</td><td>4</td><td>3</td><td>3</td><td>4</td><td>3</td> <td>44</td> </tr> <tr> <td style="background-color: #e0f2f1;">Option C: Kuku Roundabout</td> <td>2</td><td>3</td><td>2</td><td>4</td><td>2</td><td>4</td><td>1</td><td>1</td><td>2</td><td>3</td><td>4</td><td>3</td><td>3</td><td>3</td><td>2</td><td>1</td> <td>40</td> </tr> <tr> <td style="background-color: #e0f2f1;">Option D: Full Grade Separation at Kuku</td> <td>1</td><td>2</td><td>1</td><td>1</td><td>3</td><td>5</td><td>4</td><td>1</td><td>2</td><td>3</td><td>4</td><td>3</td><td>3</td><td>3</td><td>3</td><td>2</td> <td>41</td> </tr> <tr> <td style="background-color: #e0f2f1;">Option E: No Connection</td> <td>1</td><td>1</td><td>2</td><td>1</td><td>3</td><td>1</td><td>1</td><td>1</td><td>1</td><td>1</td><td>1</td><td>3</td><td>3</td><td>3</td><td>1</td><td>1</td> <td>25</td> </tr> </tbody> </table>	Options	Enhanced movement	Safety	Resilience	Connections	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	Iwi Cultural Values Ngāti Raukawa ki te Tonga	Iwi Cultural Values Muaupoko	Total Combined Score	Option A: South Manakau Roundabout	2	3	2	4	3	1	3	1	2	5	4	4	3	3	2	2	Did not evaluate		44	Option B: Full Grade Separation South at Manakau	1	2	1	1	5	1	4	1	2	4	5	4	3	3	4	3	44	Option C: Kuku Roundabout	2	3	2	4	2	4	1	1	2	3	4	3	3	3	2	1	40	Option D: Full Grade Separation at Kuku	1	2	1	1	3	5	4	1	2	3	4	3	3	3	3	2	41	Option E: No Connection	1	1	2	1	3	1	1	1	1	1	1	3	3	3	1	1	25
Options	Enhanced movement	Safety	Resilience	Connections	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	Iwi Cultural Values Ngāti Raukawa ki te Tonga	Iwi Cultural Values Muaupoko	Total Combined Score																																																																																															
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Option B: Full Grade Separation South at Manakau	1	2	1	1	5	1	4	1	2	4	5	4	3	3	4	3		44																																																																																																
Option C: Kuku Roundabout	2	3	2	4	2	4	1	1	2	3	4	3	3	3	2	1		40																																																																																																
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Option E: No Connection	1	1	2	1	3	1	1	1	1	1	1	3	3	3	1	1		25																																																																																																

<sup>45</sup> Refers to assessing a no interchange / connection scenario at the Manakau / Kuku locations

Table 17: Kimberley or Tararua interchange location / form

Interchange locations	Interchange form options	MCA evaluation (unweighted) – location and form																																																																																																															
<p style="text-align: center;"><b>Kimberley</b></p>  <p style="text-align: center;"><b>UK</b></p> <p style="text-align: center;"><b>Tararua</b></p> 	<p style="text-align: center;"><b>Kimberley</b></p> <p>Option A: Roundabout at Kimberley</p> <p style="text-align: center;">or</p> <p>Option B: Full Grade Separation Interchange at Kimberley</p> <p style="text-align: center;"><b>Tararua</b></p> <p>Option C: Roundabout at Tararua</p> <p style="text-align: center;">or</p> <p>Option D: Grade Separation Interchange at Tararua</p> <p style="text-align: center;">or</p> <p>Option E: Half Grade Separated Interchange at Tararua</p>	<table border="1"> <thead> <tr> <th>Option</th> <th>Enhanced movement</th> <th>Safety</th> <th>Resilience</th> <th>Connections</th> <th>Landscape / visual</th> <th>Ecological - Terrestrial</th> <th>Ecological – Freshwater / Wetlands</th> <th>Heritage</th> <th>Archaeology</th> <th>Noise and vibration</th> <th>Productive land values</th> <th>Social/community/recreation</th> <th>Horowhenua district development</th> <th>Fit with local road system</th> <th>Engineering degree of difficulty</th> <th>Property degree of difficulty</th> <th>Iwi Values Ngāti Raukawa ki te Tonga</th> <th>Iwi Cultural Values Muaiupoko</th> <th>Total Combined Score</th> </tr> </thead> <tbody> <tr> <td><b>Option A: Roundabout at Kimberley</b></td> <td>2</td><td>3</td><td>2</td><td>3</td><td>4</td><td>1</td><td>1</td><td>1</td><td>2</td><td>5</td><td>4</td><td>4</td><td>3</td><td>3</td><td>2</td><td>4</td> <td rowspan="5" style="background-color: yellow;">Did not evaluate</td> <td>44</td> </tr> <tr> <td><b>Option B: Full Grade Separation Interchange at Kimberley</b></td> <td>1</td><td>1</td><td>1</td><td>1</td><td>5</td><td>1</td><td>1</td><td>1</td><td>3</td><td>5</td><td>5</td><td>4</td><td>3</td><td>2</td><td>2</td><td>4</td> <td>40</td> </tr> <tr> <td><b>Option C: Roundabout at Tararua</b></td> <td>2</td><td>3</td><td>2</td><td>3</td><td>2</td><td>1</td><td>1</td><td>1</td><td>1</td><td>5</td><td>3</td><td>3</td><td>1</td><td>2</td><td>1</td><td>2</td> <td>33</td> </tr> <tr> <td><b>Option D: Full Grade Separation Interchange at Tararua</b></td> <td>1</td><td>1</td><td>1</td><td>1</td><td>3</td><td>1</td><td>1</td><td>1</td><td>1</td><td>4</td><td>3</td><td>2</td><td>1</td><td>1</td><td>2</td><td>2</td> <td>26</td> </tr> <tr> <td><b>Option E: Half Grade Separated Interchange at Tararua</b></td> <td>1</td><td>2</td><td>1</td><td>2</td><td>2</td><td>1</td><td>1</td><td>1</td><td>1</td><td>4</td><td>3</td><td>3</td><td>4</td><td>4</td><td>2</td><td>2</td> <td>34</td> </tr> </tbody> </table>	Option	Enhanced movement	Safety	Resilience	Connections	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	Iwi Values Ngāti Raukawa ki te Tonga	Iwi Cultural Values Muaiupoko	Total Combined Score	<b>Option A: Roundabout at Kimberley</b>	2	3	2	3	4	1	1	1	2	5	4	4	3	3	2	4	Did not evaluate	44	<b>Option B: Full Grade Separation Interchange at Kimberley</b>	1	1	1	1	5	1	1	1	3	5	5	4	3	2	2	4	40	<b>Option C: Roundabout at Tararua</b>	2	3	2	3	2	1	1	1	1	5	3	3	1	2	1	2	33	<b>Option D: Full Grade Separation Interchange at Tararua</b>	1	1	1	1	3	1	1	1	1	4	3	2	1	1	2	2	26	<b>Option E: Half Grade Separated Interchange at Tararua</b>	1	2	1	2	2	1	1	1	1	4	3	3	4	4	2	2	34
Option	Enhanced movement	Safety	Resilience	Connections	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	Iwi Values Ngāti Raukawa ki te Tonga	Iwi Cultural Values Muaiupoko	Total Combined Score																																																																																														
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<b>Option B: Full Grade Separation Interchange at Kimberley</b>	1	1	1	1	5	1	1	1	3	5	5	4	3	2	2	4		40																																																																																															
<b>Option C: Roundabout at Tararua</b>	2	3	2	3	2	1	1	1	1	5	3	3	1	2	1	2		33																																																																																															
<b>Option D: Full Grade Separation Interchange at Tararua</b>	1	1	1	1	3	1	1	1	1	4	3	2	1	1	2	2		26																																																																																															
<b>Option E: Half Grade Separated Interchange at Tararua</b>	1	2	1	2	2	1	1	1	1	4	3	3	4	4	2	2		34																																																																																															

**Table 18: SH1 / SH57 Split interchange form**

Interchange location	Interchange form options	MCA evaluation (unweighted) – form only																																																																																
	<p>Option A Bifurcation (i.e. System Interchange)</p> <p>or</p> <p>Option B Roundabout</p> <p>or</p> <p>Option C Full Grade Separation Interchange (i.e. Service interchange)</p>	<table border="1"> <thead> <tr> <th>Option</th> <th>Enhanced movement</th> <th>Safety</th> <th>Resilience</th> <th>Connections</th> <th>Landscape / visual</th> <th>Ecological - Terrestrial</th> <th>Ecological - Freshwater / Wetlands</th> <th>Heritage</th> <th>Archaeology</th> <th>Noise and vibration</th> <th>Productive land values</th> <th>Social/community/recreation</th> <th>Horowhenua District development</th> <th>Fit with local road system</th> <th>Engineering degree of difficulty</th> <th>Property degree of difficulty</th> <th>Iwi Values Ngāti Raukawa ki te Tonga</th> <th>Iwi Cultural Values Muaūpoko</th> <th>Total Combined Score</th> </tr> </thead> <tbody> <tr> <td>Option A: Bifurcation</td> <td>1</td> <td>3</td> <td>1</td> <td>2</td> <td>4</td> <td>2</td> <td>1</td> <td>1</td> <td>3</td> <td>3</td> <td>5</td> <td>2</td> <td>2</td> <td>3</td> <td>3</td> <td>2</td> <td rowspan="3">Did not evaluate</td> <td></td> <td>38</td> </tr> <tr> <td>Option B: Roundabout</td> <td>2</td> <td>1</td> <td>2</td> <td>1</td> <td>4</td> <td>2</td> <td>1</td> <td>1</td> <td>2</td> <td>5</td> <td>4</td> <td>4</td> <td>1</td> <td>2</td> <td>2</td> <td>2</td> <td rowspan="3">Did not evaluate</td> <td></td> <td>36</td> </tr> <tr> <td>Full Grade Separation Interchange</td> <td>1</td> <td>1</td> <td>1</td> <td>1</td> <td>4</td> <td>2</td> <td>1</td> <td>1</td> <td>3</td> <td>4</td> <td>5</td> <td>4</td> <td>2</td> <td>3</td> <td>3</td> <td>3</td> <td rowspan="3">Did not evaluate</td> <td></td> <td>39</td> </tr> </tbody> </table>	Option	Enhanced movement	Safety	Resilience	Connections	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	Iwi Values Ngāti Raukawa ki te Tonga	Iwi Cultural Values Muaūpoko	Total Combined Score	Option A: Bifurcation	1	3	1	2	4	2	1	1	3	3	5	2	2	3	3	2	Did not evaluate		38	Option B: Roundabout	2	1	2	1	4	2	1	1	2	5	4	4	1	2	2	2	Did not evaluate		36	Full Grade Separation Interchange	1	1	1	1	4	2	1	1	3	4	5	4	2	3	3	3	Did not evaluate		39
Option	Enhanced movement	Safety	Resilience	Connections	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	Iwi Values Ngāti Raukawa ki te Tonga	Iwi Cultural Values Muaūpoko	Total Combined Score																																																															
Option A: Bifurcation	1	3	1	2	4	2	1	1	3	3	5	2	2	3	3	2	Did not evaluate		38																																																															
Option B: Roundabout	2	1	2	1	4	2	1	1	2	5	4	4	1	2	2	2		Did not evaluate		36																																																														
Full Grade Separation Interchange	1	1	1	1	4	2	1	1	3	4	5	4	2	3	3	3			Did not evaluate		39																																																													

**Table 19: North Levin interchange form**


Interchange location	Interchange form options	MCA evaluation (unweighted) – form only																																																												
	<p>Option A: Roundabout</p> <p>or</p> <p>Option B: Full Grade Separated Interchange (i.e. Service Interchange)</p>	<table border="1"> <thead> <tr> <th>Option</th> <th>Enhanced movement</th> <th>Safety</th> <th>Resilience</th> <th>Connections</th> <th>Landscape / visual</th> <th>Ecological - Terrestrial</th> <th>Ecological - Freshwater / Wetlands</th> <th>Heritage</th> <th>Archaeology</th> <th>Noise and vibration</th> <th>Productive land values</th> <th>Social/community/recreation</th> <th>Horowhenua District development</th> <th>Fit with local road system</th> <th>Engineering degree of difficulty</th> <th>Property degree of difficulty</th> <th>Iwi Values Ngāti Raukawa ki te Tonga</th> <th>Iwi Cultural Values Muaūpoko</th> <th>Total Combined Score</th> </tr> </thead> <tbody> <tr> <td>Option A: Roundabout</td> <td>2</td> <td>1</td> <td>2</td> <td>1</td> <td>1</td> <td>1</td> <td>1</td> <td>1</td> <td>1</td> <td>5</td> <td>3</td> <td>3</td> <td>1</td> <td>1</td> <td>1</td> <td>2</td> <td rowspan="2">Did not evaluate</td> <td></td> <td>27</td> </tr> <tr> <td>Option B: Full Grade Separated Interchange</td> <td>1</td> <td>1</td> <td>1</td> <td>1</td> <td>1</td> <td>1</td> <td>1</td> <td>1</td> <td>1</td> <td>4</td> <td>4</td> <td>3</td> <td>3</td> <td>3</td> <td>1</td> <td>2</td> <td rowspan="2">Did not evaluate</td> <td></td> <td>29</td> </tr> </tbody> </table>	Option	Enhanced movement	Safety	Resilience	Connections	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	Iwi Values Ngāti Raukawa ki te Tonga	Iwi Cultural Values Muaūpoko	Total Combined Score	Option A: Roundabout	2	1	2	1	1	1	1	1	1	5	3	3	1	1	1	2	Did not evaluate		27	Option B: Full Grade Separated Interchange	1	1	1	1	1	1	1	1	1	4	4	3	3	3	1	2	Did not evaluate		29
Option	Enhanced movement	Safety	Resilience	Connections	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	Iwi Values Ngāti Raukawa ki te Tonga	Iwi Cultural Values Muaūpoko	Total Combined Score																																											
Option A: Roundabout	2	1	2	1	1	1	1	1	1	5	3	3	1	1	1	2	Did not evaluate		27																																											
Option B: Full Grade Separated Interchange	1	1	1	1	1	1	1	1	1	4	4	3	3	3	1	2		Did not evaluate		29																																										

Table 20: Summary of the MCA assessors unweighted evaluation scores for the interchange location / form options

Interchange Location / Form Options	Enhanced movement	Safety	Resilience	Connections	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	Iwi Values Ngāti Raukawa ki te Tonga	Iwi Cultural Values Muaūpoko	Total Combined Score	Overall Unweighted Score Ranking
<b>Manakau or Kuku Interchange Location and Form</b>																				
Option A: South Manakau Roundabout	2	3	2	4	3	1	3	1	2	5	4	4	3	3	2	2	Did not evaluate		44	4=
Option B: - Full Grade Separation at South at Manakau	1	2	1	1	5	1	4	1	2	4	5	4	3	3	4	3			44	4=
Option C: Kuku Roundabout	2	3	2	4	2	4	1	1	2	3	4	3	3	3	2	1			40	2
Option D: Full Grade Separation at Kuku	1	2	1	1	3	5	4	1	2	3	4	3	3	3	3	2			41	3
Option E: No Connection	1	1	2	1	3	1	1	1	1	1	1	3	3	3	1	1			25	1
<b>Kimberley or Tararua Interchange Location and Form</b>																				
Option A: Roundabout at Kimberley	2	3	2	3	4	1	1	1	2	5	4	4	3	3	2	4	Did not evaluate		44	5
Option B: Full Grade Separation at Kimberley	1	1	1	1	5	1	1	1	3	5	5	4	3	2	2	4			40	4
Option C: Roundabout at Tararua	2	3	2	3	2	1	1	1	1	5	3	3	1	2	1	2			33	2
Option D: Full Grade Separation Interchange at Tararua	1	1	1	1	3	1	1	1	1	4	3	2	1	1	2	2			26	1
Option E: Half Grade Separated Interchange at Tararua	1	2	1	2	2	1	1	1	1	4	3	3	4	4	2	2			34	3
<b>SH1/SH57 Split Interchange Form</b>																				

Interchange Location / Form Options	Enhanced movement	Safety	Resilience	Connections	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	Iwi Values Ngāti Raukawa ki te Tonga	Iwi Cultural Values Muaūpoko	Total Combined Score	Overall Unweighted Score Ranking
Option A: Bifurcation	1	3	1	2	4	2	1	1	3	3	5	2	2	3	3	2	Did not evaluate		38	2
Option B: Roundabout	2	1	2	1	4	2	1	1	2	5	4	4	1	2	2	2			36	1
Option C: Full Grade Separated Interchange	1	1	1	1	4	2	1	1	3	4	5	4	2	3	3	3			39	3
North of Levin Interchange Form																				
Option A: Roundabout	2	1	2	1	1	1	1	1	1	5	3	3	1	1	1	2	Did not evaluate		27	1
Option B: Full Grade Separated Interchange	1	1	1	1	1	1	1	1	1	4	4	3	3	3	1	2			29	2

## 7.7 Interchange MCA weighting Scenario Assessments

As previously undertaken for the draft MCA Assessment Report 2020, the updated unweighted or raw interchange scores were subjected to a weighting exercise. This exercise was design to test the sensitivities of the unweighted scores to matters considered, under various weightings, to be more important.

The same weighting scenarios evaluated in the draft MCA Assessment Report 2020<sup>46</sup> were also assessed again for the updated unweighted interchange scores (i.e. as set out in Table 16 to Table 20 above). 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), and “reused” for the workshop weightings assessment for MCA Workshop 3<sup>47</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>48</sup>

- Social, environment, cultural and economic scenarios:

To recap, the four scenarios below 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 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

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<sup>46</sup> Draft MCA Assessment Report (July 2020), page 54

<sup>47</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
  - Fit with 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 Design 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>48</sup> It is noted that the individual numerical values were determined by the Project Design Team following completion of MCA Workshop 2

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.

For ease of reference, the numerical values that were assigned for each weighting scenario from the draft MCA Assessment Report 2020 are set out in full below in Table 21.

**Table 21: Numerical values assigned to each of the weighting scenario options<sup>49</sup>**

Assessment criteria	Workshop weightings	RMA Section 6	Quadruple Bottom Line			
			Social	Environment	Cultural	Economic
Enhanced Movement	10	3	4	0	0	10
Safety	10	3	7	0	0	10
Resilience	4	8	4	0	0	10
Connections	10	3	8	0	0	10
Landscape / Visual	10	10	5	6	5	0
Ecological - Terrestrial	5	7	3	10	8	0
Ecological - Freshwater & Wetlands	5	7	3	10	8	0
Heritage	2	7	7	3	3	0
Archaeology	2	7	7	3	8	0
Noise / Vibration	10	5	7	3	3	0
Productive Land Values	5	2	3	0	0	5
Social / Community / Recreation	8	5	10	3	8	3
Horowhenua District Development	10	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	5	2	5	0	0	10
Iwi Cultural Values Ngāti Raukawa ki te Tonga	10	10	8	8	10	2
Iwi Cultural Values Muaūpoko	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. for both Ngāti Raukawa ki te Tonga and Muaūpoko) were guided by the “weighting discussions” held at MCA Workshop 2.

<sup>49</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

## 7.7.1 Interchange Weighted Scenario Scores and Rankings

Table 22 below sets out the weighted assessment scenario scores for each of the interchange location / form options (these scores were calculated<sup>50</sup> in accordance with the numerical values set out in Table 21), including for the half grade separated interchange option at Tararua. For ease of reference,

**Table 22: Average scores for the interchange weighting scenarios**

Interchange options	Workshop Weighting	RMA Sec 6	Social	Environment	Cultural	Economic	Average Score	Overall Average Score Ranking
<b>Manakau / Kuku Interchange Location and Form Options</b>								
Option A: South Manakau Roundabout	2.54	2.08	2.45	1.74	1.83	2.59	2.20	4
Option B: - Full Grade Separation South at Manakau	2.47	2.15	2.26	2.09	2.06	2.29	2.22	5
Option C: Kuku Roundabout	2.26	1.87	2.14	1.64	1.66	2.44	2	2
Option D: Full Grade Separation at Kuku	2.19	2.07	2.00	2.5	2.23	1.96	2.16	3
Option E: No Connection	1.44	1.32	1.37	1.03	1.15	1.42	1.29	1
<b>Kimberley or Tararua</b>								
Option A: Roundabout at Kimberley	2.54	2.05	2.46	1.48	1.66	2.71	2.15	5
Option B: Full Grade Separation at Kimberley	2.19	1.98	2.20	1.64	1.86	2	1.98	4
Option C: Roundabout at Tararua	1.91	1.52	1.87	1.14	1.2	2.03	1.61	2
Option D: Full Grade Separation Interchange at Tararua	1.46	1.28	1.38	1.14	1.10	1.34	1.28	1
Option E: Half Grade Separated Interchange at Tararua	2.18	1.58	1.97	1.09	1.27	2.19	1.71	3
<b>SH1/SH57 Split Interchange Form Options</b>								
Option A: Bifurcation	2.11	1.79	1.96	1.5	1.53	2.14	1.84	2
Option B: Roundabout	1.99	1.83	1.93	1.66	1.72	1.77	1.82	1
Option C: Full Grade Separation Interchange	2.12	1.87	2.05	1.66	1.83	1.97	1.92	3
<b>North of Levin Interchange Form Options</b>								
Option A: Roundabout	1.47	1.27	1.5	1.03	1.12	1.5	1.31	1

<sup>50</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



Interchange options	Workshop Weighting	RMA Sec 6	Social	Environment	Cultural	Economic	Average Score	Overall Average Score Ranking
Option B: Grade Separation	1.63	1.27	1.57	0.98	1.13	1.60	1.36	2

Table 23 below provides an overall ranking for each interchange option scenario assessment's score (i.e. these are the colour coded rankings identified in Table 23 below). In addition to examining the scores for each individual weighting scenario assessment, both Table 22 and Table 23 also provide overall scores and rankings as an alternative means of interpreting the weighting scenario assessment results as follows:

- The left hand light pink column in Table 22 provides an 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 23 provides a total score for all of the 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).

**Table 23: Weighted scenario ranking orders for the scores identified in Table 22**

Interchange options	Workshop Weighting	RMA Sec 6	Social	Environment	Cultural	Economic	Total Ranking Score	Overall Ranking
<b>Manakau / Kuku Interchange Location and Form Options</b>								
Option A: South Manakau Roundabout	5	4	5	3	3	5	25	5
Option B: - Full Grade Separation South at Manakau	4	5	4	4	4	3	24	4
Option C: Kuku Roundabout	3	2	3	2	2	4	16	2
Option D: Full Grade Separation at Kuku	2	3	2	5	5	2	19	3
Option E: No Connection	1	1	1	1	1	1	6	1
<b>Kimberley or Tararua</b>								
Option A: Roundabout at Kimberley	5	5	5	4	4	5	28	5
Option B: Full Grade Separation at Kimberley	4	4	4	5	5	2	24	4
Option C: Roundabout at Tararua	2	3	2	2	2	3	14	2
Option D: Full Grade Separation Interchange at Tararua	1	1	1	2	1	1	7	1

Interchange options	Workshop Weighting	RMA Sec 6	Social	Environment	Cultural	Economic	Total Ranking Score	Overall Ranking
<b>Option E: Half Grade Separated Interchange at Tararua</b>	3	2	2	1	3	4	15	3
<b>SH1/SH57 Split Interchange Form Options</b>								
<b>Option A: Bifurcation</b>	2	1	2	1	1	3	10	2
<b>Option B: Roundabout</b>	1	2	1	2	2	1	9	1
<b>Option C: Full Grade Separation Interchange</b>	3	3	3	2	3	2	16	3
<b>North of Levin Interchange Form Options</b>								
<b>Option A: Roundabout</b>	1	1	1	2	1	1	7	1
<b>Option B: Grade Separation</b>	2	1	2	1	2	2	10	2

## 7.7.2 Summary of Interchange Weighted Scenario Assessments

The two different ranking orders in both Table 22 and Table 23 show consistent interchange location / form preferences. These weighting assessment scenario preferences also align with the unweighted (or raw) interchange location / form preferences and associated rankings that were identified in Table 16 to Table 20.

## 7.8 Summary of MCA Evaluations for Interchange Location / Form

This section of the report summarises the outcomes of the MCA process for each interchange location / form option assessment.

### 7.8.1 Manakau / Kuku Location

The original weighting scenario and unweighted (raw) assessment ranking preference for the “no connection” option for the Manakau / Kuku location was re-confirmed through the MCA Workshop 3 process. As identified in the draft MCA Assessment Report 2020, and unlike the other interchange locations, provision of an interchange at this location was not originally proposed (as local transport connectivity demands for an interchange at this location suggested one was not warranted). However, at HDC’s request, a “no connections” option at the Manakau / Kuku location was evaluated in order to ensure its development and growth plans for the location were considered through the MCA process if no connection was provided.<sup>51</sup>

As with MCA Workshops 1 and 2, Waka Kotahi advised at MCA Workshop 3 that the new highway alignment through the Manakau / Kuku location could be future proofed for an interchange. In terms of future proofing, the Kuku location was generally preferred over the South Manakau location in the draft MCA Assessment Report 2020. This preference was re-confirmed through the MCA Workshop 3 process as there were no changes to the original key option assessment differentiators of landscape / visual, social / community / recreation and PDoD (i.e. which all favoured Kuku). It is noted that the updated terrestrial ecology assessment did ultimately score the Kuku interchange locations / forms 4s

<sup>51</sup> For avoidance of doubt, all of the other locations (i.e. Kimberley / Tararua, SH1 / SH57 Split and North Levin) are required to have interchanges. Accordingly, the option of a “no interchange option” was not assessed for these locations

and 5s due to the potential impact of an interchange at this location on local forest remnants and swamp forest (however, the MCA assessor did note that these scores would improve to 1 if the forest remnants / swamp forest areas could be avoided).

In terms of potential form, and for both the Manakau / Kuku locations, there was no clear preference between the full grade separated interchange and roundabout options (although for terrestrial ecology, the MCA assessor did score the roundabout option a 4 whereas the full grade separated option was scored a 5 due to it having fewer terrestrial ecology impacts). Accordingly, additional MCA processes to help determine form may be required in the future once a final decision is made on the need for an interchange at the Manakau / Kuku location.

### **Recommendation**

It is recommended that the “no connection” option at the Manakau / Kuku location be advanced to the Ō2NL DBC.

## **7.8.2 Kimberley or Tararua Location**

In terms of location, the draft MCA Assessment Report 2020 identified that the MCA assessors preferred an interchange at the Tararua location rather than at the Kimberley location. All of the assessors re-confirmed this preference at MCA Workshop 3.

To recap, the key assessment areas that favoured the Tararua location included:

- Landscape / Visual (e.g. a Kimberley interchange would have more visual impacts on nearby houses)
- Archaeology (e.g. higher potential to discover unknown archaeological sites at the Kimberley interchange location)
- Noise / Vibration (e.g. there would be more scope for noise mitigation for an interchange at Tararua when compared to an interchange at Kimberley)
- Productive Land Values (e.g. the Kimberley interchange location would have greater impacts on LUC 1, 2 and 3 land)
- Horowhenua District Development (e.g. the Tararua interchange location would provide a more direct connection to the Levin Town Centre when compared to a Kimberley location), and
- PDoD (e.g. the Kimberley interchange location would require complex property acquisitions).

In terms of the form of the Tararua interchange, a full grade separated interchange form was indicatively preferred in the draft MCA Assessment Report 2020. This preference was re-confirmed by the MCA assessors through the MCA Workshop 3 process, with this option being ranked first under both the unweighted and weighted scenario assessments. The key assessment areas preferring full grade separation included:

- Fit with Project Objectives (e.g. all project objectives were scored 1s for the full interchange with the key reasons including: full grade separation would provide increased travel efficiency benefits for through traffic at this location, increased ability to recover network connectivity following a breakdown, and it would be highly compatible with the level of service expected for a National High-Volume Road at this location)
- Social / Community / Recreation (e.g. it would provide greater local connectivity options, including a safer environment for active modes, which would in turn lead to increased health and safety benefits)
- Horowhenua District Development (e.g. it would open up transport access at Tararua and provide increased access to the Tara-Iki Growth Area, the Tararua Industrial Park (LS7) and to the Levin Town Centre when compared to the other options. The MCA assessor also noted that the additional land needed for a full interchange had been allowed for in the Tara-Iki master plan process), and
- Fit with Local Road System (e.g. provides full connectivity for the local road system).

It is noted that the half grade separated interchange option was included in the MCA Workshop 3 process (as a consequence of the outcomes of the Post MCA Report 2020 process). Ultimately, the half interchange was ranked third, behind the full grade separated interchange and the roundabout

options, under both the unweighted and weighting scenario assessments. The key MCA assessment areas where the half interchange option did not perform well (when compared to the other Tararua interchange options) included Horowhenua District Development (scored a 5), Fit with Local Road System (scored a 5), Landscape / Visual (scored a 3) and Social / Community / Recreation (scored a 3).

### **Recommendation**

It is recommended that a full grade separated interchange at the Tararua location be advanced to the Ō2NL DBC.

### **7.8.3 SH1 / SH57 Split Location**

For the SH1 / SH57 Split location, the draft MCA Assessment Report 2020 identified a need for an interchange to be located at this location but did not identify a preference for its form.

As identified in the draft MCA Report 2020, the scores between the roundabout and bifurcation options were close. However, as a consequence of the Post MCA 2020 process (see Section 5.5 above), the Project Design Team develop a preference to only progress the roundabout option at the SH1 / 57 Split location for the reasons set out in Section 5.5.2.2 above.

Through the MCA Workshop 3 processes, the preference for a roundabout at the SH1 / SH57 Split location was confirmed (as indicated by the unweighted and weighted scenario assessment scores / rankings). The key assessment areas preferring this option included:

- Archaeology (e.g. it would have a smaller footprint when compared to the other interchange options, and therefore was likely to have less impacts on any unidentified local archaeological sites)
- Productive Land Values (e.g. it was likely to require less LUC Class 1 land to be taken when compared to the other interchange form options)
- Horowhenua District Development (e.g. it would provide access to key northern growth areas, and a smaller interchange footprint was preferable in this location)
- Fit with Local Road System (e.g. it would provide full connectivity for the local road system), and
- EDoD (e.g. it would be geometrically less complex to connect into the local road network and was likely to require less earthwork volumes when compared to the other interchange form options).

### **Recommendation**

It is recommended that a roundabout option at the SH1 / SH57 Split location be advanced to the Ō2NL DBC.

### **7.8.4 North Levin location**

The scoring of these options in the draft MCA Assessment Report 2020 was close, however a roundabout option was favoured from a district development, fit with local road and productive land value perspective at that time. Through the MCA Workshop 3 process, and as per the unweighted and weighting scenario assessment scores / rankings, the preference for the roundabout option was re-confirmed. The MCA assessment areas preferring this option included:

- Horowhenua District Development (e.g. it would provide good access to the northern growth areas and was more likely to attract road users to the Levin Town Centre when compared to a grade separated option)
- Fit with the Local Road System (e.g. it would provide good connectivity for the local road system), and
- Productive Land Values (e.g. it would likely require less LUC Class 1 and 2 land to be taken when compared to the grade separation option).

### **Recommendation**

It is recommended that a roundabout option at the North Levin location be advanced to the Ō2NL DBC.

## 7.9 Recommended Interchange Location / Form Options

Table 24 sets out the interchange location / form option preferences that are recommended to be advanced to the Ō2NL DBC.

**Table 24: Recommended interchange location / form option preferences**

Interchange Location	Recommended interchange option preferences
Manakau / Kuku	<b>Option E:</b> No connection, but if a connection is to be provided in the future, then there is a preference for an interchange to be located at Kuku (form undecided)
Kimberley / Tararua	<b>Option D:</b> A full grade separated (compact diamond) interchange at Tararua
SH1 / SH57 Split	<b>Option B:</b> Roundabout
North Levin	<b>Option A:</b> Roundabout

## 7.10 Local Roads: Short List Assessment

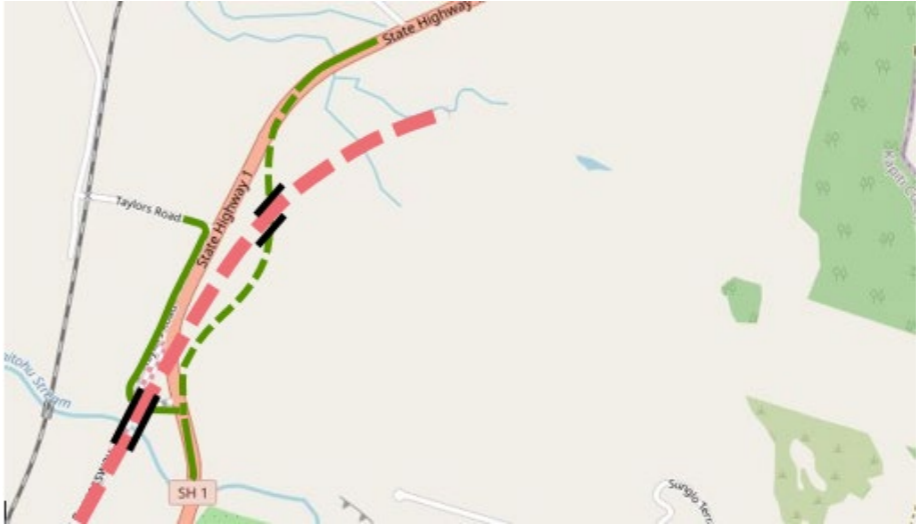


This section of the report summarises the MCA assessor's traffic light signal evaluations for the refined local road options that were identified in the Post MCA Report 2020<sup>52</sup> and in Waka Kotahi's public engagement material.




At MCA Workshop 3, the MCA assessors reviewed the refined local road options set out in Table 25 below. It is noted that for some of the Local Road Zones only one option was identified. However alternative options were identified for the Kimberley Road and Waihou / McDonald Road locations. It is further noted that following community feedback on the active mode option for Honi Taipua Street, it was decided by the Project Design Team that the MCA assessors should also evaluate an alternative low speed multi modal option.



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<sup>52</sup> Phase 2 Post MCA Report (August 2020), page 18

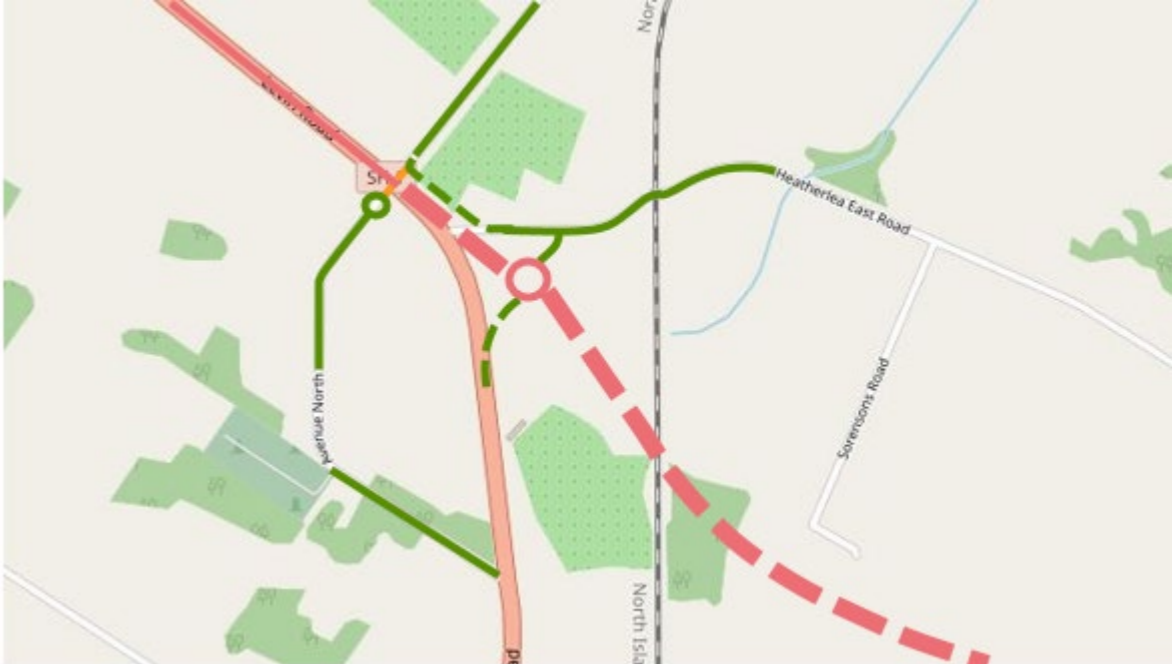
Table 25: Local Road options evaluated

Local Road Zone	Description of local road option	Location (approximate)
<p><b>A</b></p>	<p>Utilise new Taylors Road connection currently being built as part of the Peka Peka to Otaki Expressway (and reconfigure existing SH1) to access Taylors Road traffic only.</p> <p>Reconnect existing SH1 with a localised realignment and new grade-separated connection across expressway</p>	
<p><b>Combined B and C</b></p>	<p>Option A: South Manakau Road, and a pedestrian and cycling facility at Honi Taipua Street</p> <p>or</p> <p>Option A: South Manakau Road, and a low speed connection for all users at Honi Taipua Street</p>	 <p style="text-align: center;"><b>(Option A only)</b></p>
<p><b>D</b></p>	<p>Connection at Manakau North Road</p>	

Local Road Zone	Description of local road option	Location (approximate)
E	Connection at Kuku East Road	
<b>Combined F, G, H, I and J (Kimberley Road only)</b>	<p>Option A: Provide connections at Muhunua East Road and Tararua Road (no Kimberley Road bridge connection)</p> <p>or</p> <p>Option B: Provide connections at Muhunua East, Kimberley and Tararua Roads</p>	<div style="display: flex; justify-content: space-around;"> <div>  <p><b>Option A (no Kimberley Bridge)</b></p> </div> <div>  <p><b>Option B</b></p> </div> </div>
<b>J (Liverpool Street only)</b>	No option	N/A

Local Road Zone	Description of local road option	Location (approximate)
K	Connection at Queen Street	
L	<p>Option A: Provide a new connection between Waihou Road and McDonald Road</p> <p>or</p> <p>Option B: Provide a new connection between McDonald Waihou Road (East) and Wakefield Street</p>	 <p style="text-align: center;"><b>Option A</b> <span style="margin-left: 200px;"><b>Option B</b></span></p>



Local Road Zone	Description of local road option	Location (approximate)
<p><b>Combined N, P and Q</b></p>	<p>Provide supporting local connections for the proposed North Levin roundabout</p>	

At MCA Workshop 3, the MCA assessors provided their comments for each local road option, using the same traffic light signal evaluation system as previously used in the draft MCA Assessment Report 2020.

To recap, the traffic light signal evaluation system was used to record whether the MCA assessors had low, medium or high-level concerns with the options. The actual evaluation system used to record their support or concern was as follows:

- **Green** (or 1) if an option is likely to have only minor impacts or issues
- **Orange** (or 2) if an option is likely to have moderate impacts or issues, and
- **Red** (or 3) if an option is likely to have serious or significant negative impacts or issues.

Each MCA assessor's evaluation of the local road option(s) are summarised below, however more detailed information on their assessments are provided in their respective addendum reports (see the relevant appendices as identified above).

### **7.10.1 MCA Assessor Traffic Light Signal Evaluations**

The traffic light evaluations for each local road option for the new / combined Local Road Zones identified in the Post MCA Report 2020 (and in Waka Kotahi's public engagement material) are set out in Table 26 below. The commentary that follows this table focuses on the MCA assessors who signalled that they had orange or red traffic light concerns with the local road proposals or options proposed for each Local Road Zone.

It is noted that both Ngāti Raukawa ki te Tonga and Muaūpoko did not evaluate any of the local road options, and the MCA assessor for the Kāpiti Coast District Development assessment criteria only evaluated the options for Local Road Zone A.

Ngāti Raukawa ki te Tonga did note the importance of the local road connections for Koputaroa Road and Kuku East Road. To this end, Ngāti Raukawa advised the following

- Koputaroa Road is a significant access way for the day-to-day lives of whānau who access Kereru Marae, or who live or have land along this roadway, and
- Kuku East Road is a significant access way for the day-to-day lives of Ngāti Tūkorehe whānau who live or have land along this roadway.

Table 26: Local road option traffic signal evaluations

Local Road Zone	Local Road Option	Enhanced movement	Safety	Resilience	Connections	Landscape/visual	Ecological - Terrestrial	Ecological - Freshwater / Wetlands	Heritage	Archaeology	Noise and vibration	Productive land values	Social / community / recreation	Horowhenua District development	Kāpiti Coast district development	Fit with local road system	Engineering degree of difficulty	Property degree of difficulty	Iwi cultural Values Ngāti Raukawa ki te Tonga	Iwi Cultural Values Muaūpoko					
A	Utilise new Taylors Road connection currently being built as part of the Peka Peka to Otaki Expressway													Did not evaluate		Did not evaluate			Did not consider						
B and C	Honi Taipua Street Active Mode Only (and South Manakau Road)														Did not evaluate										
	Honi Taipua Street Full Connectivity (and South Manakau Road)																								
D	Connection at Manakau North Road																								
E	Connection at Kuku East Road																								
F to J	Kimberley Road Option A (no bridge)																								
	Kimberley Road Option B																								
K	Connection at Queen Street																								
L	Waihou / McDonald Road Option A																								
	Waihou / McDonald Road Option B (includes Wakefield Road connection)																								
N/P/Q	Supporting local connections for the proposed North Levin roundabout																								

## 7.10.2 Summary of Local Road Option Evaluations

This section of the report summarises the MCA assessors' **orange** or **red** traffic light signal comments for each of the local road option(s).

### 7.10.2.1 Local Road Zone A (Taylors Road)

#### Noise / Vibration

The MCA assessor evaluated the Taylors Road proposal as an **orange**. This was because there was likely to be operational traffic noise effects on nearby PPFs as a consequence of traffic "returning" to Ōtaki from the existing SH1.

#### Kāpiti Coast District Development

The MCA assessor evaluated the Taylors Road proposal as an **orange**. This was because the assessor had safety concerns regarding its geometric alignment (e.g. there would be a 90 degree bend under the new PP2Ō Waitohu Stream Bridge) and flooding risks.

#### Engineering Degree of Difficulty

The MCA assessor evaluated the Taylors Road option as an **orange** as the proposal would require a new structure to be built. However, the assessor did note that the connection was an appropriate layout for a local road.

### 7.10.2.2 Local Road Zone B ("Honi Taipua Street" options plus South Manakau Road<sup>53</sup>)

#### Fit with Project Objectives

The MCA assessor evaluated the resilience objective for the Honi Taipua Street active mode only option as an **orange** due to emergency services potentially not being able to utilise this connection (and noted that the other connections into Manakau also have resilience risks). The assessor evaluated the full connection option as a **green**.

#### Landscape / Visual

The MCA assessor evaluated both Honi Taipua Street options as **orange**. The key reason for this evaluation was to highlight the importance of keeping Manakau Heights connected with Manakau Village from an urban design perspective. The assessor favoured an overbridge over an underpass at this location as it could be configured (with realignment of Honi Taipua Street / Manakau Heights Drive) to make use of a future cutting for the main highway.

With regards to the South Manakau connection, the MCA assessor noted that a local road underpass was preferable as it was likely to be less intrusive when compared to an overpass.

#### Social / Community / Recreation

The MCA assessor evaluated the active mode only option as a **red**, and the full connectivity option as a **green**.

The MCA assessor noted that the connection between Manakau Heights and Manakau Village was important, and highlighted the following reasons for their **red** evaluation of the active mode only connection:

- Potential to create an isolated community at Manakau Heights, which could result in it becoming a dormitory suburb, and
- Community feedback had advised that an alternate connection into Manakau Village was required for local resilience purposes (e.g. emergency vehicles).

The MCA assessor also noted that the South Manakau Road connection (to the Manakau Village via the existing SH1) was crucial for the local community.

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<sup>53</sup> It is noted that there were no orange or red traffic light signals for the South Manakau Road connection, however the MCA assessors for the landscape / visual and social / community / recreation assessment criteria did comment on this connection. Their comments have been incorporated into this section of the report where relevant

## Horowhenua District Development and Fit with Local Road System

The MCA assessors for both Horowhenua District Development and Fit with Local Road System evaluated the Honi Taipua Street active mode only option as an **orange**. Both assessors advised that this option needed to be further developed before their evaluation results could be reviewed. The Fit with Local Road System assessor also noted that the existing Honi Taipua Street provided poor active mode level of service provision due to its narrow carriageway and lack of footpaths.

### 7.10.2.3 Local Road Zone D (Manakau North Road)

#### Social / Community / Recreation

The MCA assessor evaluated the Manakau Road proposal as **orange**. The assessor highlighted the importance of maintaining access between the local community and the Manakau Village to ensure continuity of way-of-life and for accessing recreation. The assessor advised that their preference for either an underpass or overpass at this location would be dependent on which option would best maintain social cohesion within the community and promote the use of walking and cycling.

### 7.10.2.4 Local Road Zone E (Kuku Road)

#### Social / Community / Recreation

The MCA assessor evaluated the Kuku Road proposal as **orange**. The assessor highlighted the importance of maintaining access between the local community and Kuku. In addition, the assessor noted this connection was important for providing access to the Te Iwi o Ngāti Tukorehe Marae. The assessor advised that their preference for either an underpass or overpass at this location would be dependent on which option would best maintain social cohesion within the community and promote the use of walking and cycling.

### 7.10.2.5 Local Road Zone F to J (“Kimberley Road” options)

#### Fit with Project Objectives

The MCA assessor evaluated the appropriate connections objective for Option B as an **orange** as it removes connectivity between Kimberley east and Muhunoa east.

#### Noise / Vibration

The MCA assessor for noise / vibration evaluated Option A as an **orange** as there would potentially be an increase in operational traffic noise impacts (e.g., braking and accelerating) on nearby PPFs from the local road roundabout that is proposed to be located near the Tararua Road intersection. The assessor did however consider that Option B was inferior, and evaluated it as a **red**. The assessor was particularly concerned that the local road roundabout proposed for the Kimberley / Arapaepae intersection would have adverse noise impacts on nearby PPFs from braking and accelerating vehicles.

#### Landscape / Visual

The MCA assessor evaluated Option B as an **orange** because it would cut off the area located along the north bank of the Ohau River from the north and would provide poorer connections to / from the Kimberley Reserve and the Tara-Ika Growth Area. The assessor evaluated Option A as a **green** noting that it would provide a link along the eastern side of the new highway, and potential links to the Tara-Ika development.

#### Archaeology

The MCA assessor evaluated Option A as an **orange** as the earthworks likely to be required for the road at the Kohitere clearing location might impact on 19<sup>th</sup> century houses located in the area. The MCA assessor evaluated Option B as a **green**.

#### Social / Community / Recreation

The MCA assessor evaluated both Options A and B as **orange**. The assessor highlighted that both options would impact on general access to recreation (e.g. rivers), connections between communities to the east of the new highway and Levin and connectivity for Arapaepae Road residents.

#### Fit with Local Road System

The MCA assessor evaluated Option B as an **orange**. The MCA assessor noted that movement would be restricted between Ohau and Muhunoa East Road to the new highway and to Levin, and this would force longer trips through dangerous existing SH1 intersections. The MCA assessor evaluated Option A as a **green**.

### Property Degree of Difficulty

The MCA assessor evaluated Option A as an **orange** and Option B as a **red**. The assessor advised that both options would require properties that had not been previously identified as being needed for the Ō2NL Project. Option B was evaluated as a red as it would also need a chicken farm to be acquired, which would be a highly complex property acquisition.

#### 7.10.2.6 Local Road Zone K (Queen Street)

##### Archaeology

The MCA assessor evaluated Option A as an **orange** due to its possible effects on the historic Prouse homestead.

##### Social / Community / Recreation

The MCA assessor evaluated the Queens Street proposal as an **orange**. The assessor noted a preference to retain Queen Street at street level as it was likely to result in enhanced recreational connectivity and better way-of-life outcomes (when compared to an overpass).

##### Engineering Degree of Difficulty

The MCA assessor evaluated the Queens Street proposal as an **orange**. The assessor noted that constructing a structure at this location would be complex.

#### 7.10.2.7 Local Road Zone L (“Waihou / McDonald Road” options)

##### Productive Land Values

The MCA assessor evaluated Option B as an **orange** due to its impacts on LUC Class 1 land. The assessor evaluated Option A as a **green**.

##### Social / Community / Recreation

The MCA assessor evaluated both Options A and B as **orange**. The assessor noted that both options would result in way-of-life changes for the local community.

#### 7.10.2.8 Local Road Zone N / P / Q (North Levin)

##### Archaeology

The MCA assessor evaluated the North Levin proposal as an **orange** due to its possible effects on a 19<sup>th</sup> century house that is located near the proposed North Levin roundabout.

##### Noise / Vibration

The MCA assessor evaluated the North Levin proposal as a **red**. This was primarily due to concerns with traffic operational noise effects on nearby PPFs from vehicles braking and accelerating on the local roads as they approached / departed the North Levin roundabout.

### 7.10.3 Summary of Local Road Option Assessments

This section of the report summarises the MCA assessor evaluations of the options proposed for the Honi Taipua Street, Kimberley Road, and Waihou / McDonald Roads locations.

It is recommended that the options identified for Local Road Zone’s D, E, K and N / P / Q (i.e. where only one option was proposed) be advanced for further discussions with HDC as part of the Ō2NL DBC.

#### 7.10.3.1 Local Road Zone B (Honi Taipua Street options)

All of the MCA assessors evaluated the full connectivity option for Honi Taipua Street as a **green**. There however was a mixture of **oranges** and **reds** recorded for the active mode connectivity option for the following assessment areas:

- Fit with Project Objectives
- Landscape / Visual
- Social / Community / Recreation (who assessed this option as a **red**), and
- Horowhenua District Development, and
- Fit with Local Road System.

Key concerns raised by the MCA assessors for the above assessment areas included the need to ensure that social connections between the Manakau Village and Manakau Heights communities were maintained, and the need to ensure emergency service access was not restricted. Feedback from the Manakau Community Reference Group also expressed a preference for full connectivity to be retained at this location.

### **Recommendation**

It is recommended that the option of providing full connectivity for the Honi Taipua Street connection be further considered in the Ō2NL DBC.

#### **7.10.3.2 Local Road Zone F to J (Kimberley Road options)**

A number of concerns were raised by the MCA assessors for both options.

Key concerns with Option A included: increased operational traffic noise; effects on the Kohitere clearing; potential effects on a 19<sup>th</sup> century house; changes to access across the district; and increased property acquisition requirements.

Key concerns with Option B included: increased operational traffic noise; longer local journey trips; landscape and visual effects; changes to east / west access across the district; may force longer trips through dangerous existing SH1 intersections; and a potential complex property acquisition.

Option B however had more **red / orange** signals than Option A (i.e. the appropriate connections objective, landscape / visual, noise / vibration, fit with local road system and PDoD assessment criterion all recorded **reds / oranges**). Option A was considered to have more concerns than Option B for archaeology.

Community feedback from Waka Kotahi's public engagement programme favoured Option A.

### **Recommendation**

It is recommended that Option A (no Kimberley bridge / connection) be further considered in the Ō2NL DBC.

If Option A is ultimately preferred, it is noted that further optioneering may be required to help identify the location of the local road alignment between Tararua and Kimberley Roads that would run in parallel with the new highway. This assessment was subsequently undertaken in Stage 5 (see Section 8.2.3 below).

#### **7.10.3.3 Local Road Zone L (Waihou / McDonald Road options)**

Most of the MCA assessors evaluated both Options A and B as **green** except for the productive land values and social / community / recreation assessors. The former assessor highlighted that Option B was likely to impact on LUC 1 and 2 land, whereas the latter assessor highlighted that both Options A and B would have way-of-life impacts because existing access arrangements would be changed for the local community.

Community feedback from Waka Kotahi's public engagement programme favoured Option A.

### **Recommendation**

It is recommended that Option A be further considered in the Ō2NL DBC.

## 7.11 Recommended Local Road Options

Table 27 sets out the local road option preferences that are recommended to be advanced to the Ō2NL DBC.

**Table 27: Recommended local road options**

Local Road Zones	Recommended local road options
<b>A</b>	Utilise new Taylors Road connection currently being built as part of the Peka Peka to Otaki Expressway (and reconfigure existing SH1) to access Taylors Road traffic only. Reconnect existing SH1 with a localised realignment and new grade-separated connection across expressway
<b>Combined B and C (referred to as B to C)</b>	Provide full multi- modal connectivity between Honi Taipua Street and Manakau Heights Drive
<b>D</b>	Connection at Manakau North Road
<b>E</b>	Connection at Kuku East Road
<b>Combined F, G, H, I and J (referred to as F to J)</b>	Option A: Provide connections at Muhunoa East Road and Tararua Road (no Kimberley Road connection but parallel local roads) See Section 8.2.3 for the recommendation on the Option A1 or Option A2 parallel local road alignment preference
<b>J (Liverpool Street only)</b>	No east-west connection to be provided as part of the new highway project
<b>K</b>	Connection at Queen Street
<b>L</b>	Option A: Provide a new connection between Waihou Road and McDonald Road and connection on to SH57
<b>Combined N, P and Q</b>	Provide supporting local connections for the proposed North Levin roundabout



## 8. Stage 5: Additional MCA Processes and Outcomes 2021

In March 2021, Waka Kotahi undertook additional MCA evaluations to help inform decision making on key design elements of the Ō2NL DBC as follows:

1. Taylors Road Half interchange
2. Tararua to Kimberley Option A local road
3. SH1 / Tararua Road intersection (Levin), and
4. “Levin Cutting” (new highway) – this MCA was subsequently deferred on the basis that further information was required on existing groundwater levels. This MCA was consequently renamed the East of Levin MCA, and its outcomes are reported separately in the Ō2NL DBC East of Levin MCA Report.

### 8.1 Additional MCA Assessment Instructions

Prior to MCA Workshop 4 for the *Additional MCAs*, three technical and instructional briefings were held with the same MCA assessors from MCA Workshops 1, 2 and 3 to set out their evaluation and scoring instructions.

The briefings were held via MS Teams on 26, 30 and 31 March 2021 respectively (the latter briefing was held specifically for Ngāti Raukawa ki te Tonga and Muaūpoko). At these briefings the MCA assessors were provided with technical information on the options to be evaluated for each Additional MCA option and the following key instructions:

- There would be a workshop held on 1 April 2021 (i.e. MCA Workshop 4) to evaluate all of the additional MCA options. Both Ngāti Raukawa ki te Tonga and Muaūpoko would attend as observers
- The approach for the MCA Workshop 4 would be predicated on the *Decision Conferencing* approach
- The 6 point scoring system (as per Table 3 above) was to be used for evaluating the Taylors Road Half Interchange options and the Tararua to Kimberley Road Option A local road options
- The traffic signal evaluation system was to be used to evaluate the SH1 / Tararua Road intersection options, and
- Weighting scenarios would be applied to the unweighted scores for sensitivity testing purposes (i.e. workshop weightings, RMA Section 6 matter weightings and the quadruple bottom line weightings).

### 8.2 Additional MCA Evaluations

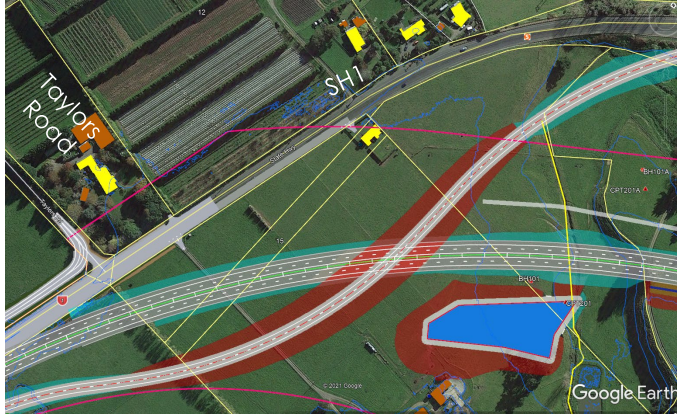
This section of the report summarises the MCA assessor evaluations / scores for the Taylors Road Half interchange, Tararua to Kimberley Option A local road and SH1 / Tararua Road intersection MCAs.

MCA Workshop 4 was held on 1 April 2021, and was attended by the MCA assessors, representatives from Ngāti Raukawa ki te Tonga and Muaūpoko, key members of the Project Design Team and Waka Kotahi staff. The names of those who took part in MCA Workshop 4 are provided in **Appendix S**.

#### 8.2.1 Taylors Road Half Interchange MCA Evaluation Summary

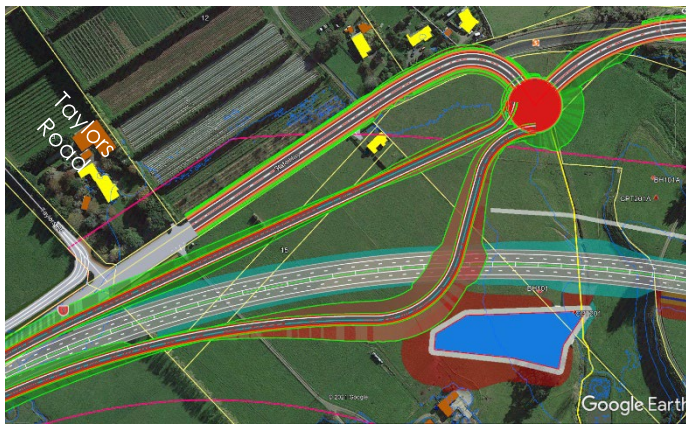
An opportunity to provide a half interchange at the Taylors Road location (to the north of the Ōtaki township) was identified by the Project Design Team in early 2021. In particular, the team identified that this option might provide improved local access to the new highway, help to reduce impacts on local Māori owned land in the Taylors Road locality and could help to reduce overall project costs (the interchange itself would provide a northbound off ramp, and a southbound on ramp). The alternative connection at this location was the preferred local road option identified above in Table 25 for Local Road Zone A (and therefore was the base case for this MCA). Accordingly, the following two options were evaluated:

- Option 1 – Local Road Zone A local road (see Figure 17 below), and



**Figure 17: Option 1**

- Option 2 – Taylors Road Half interchange (see Figure 18).



**Figure 18: Option 2**

Each MCA assessor's unweighted scores for Options 1 and 2 are set out in Table 28 below (this table also provides the total combined unweighted score and its associated preference ranking). A summary of each MCA assessor's individual evaluation is provided below Table 28.

Table 28: Taylors Road Half interchange unweighted (raw) scores

Taylors Road Half Interchange options	Enhanced movement	Safety	Resilience	Connections	Landscape/visual	Ecological - Terrestrial	Ecological - Freshwater & Wetlands	Heritage	Archaeology	Noise / vibration	Productive land values	Social / community / recreation	Horowhenua district development	Kāpiti Coast district development	(HDC) Fit with local road system	Engineering degree of difficulty	Property degree of difficulty	Iwi cultural Values Ngāti Raukawa ki te Tonga	Iwi Cultural Values Muaūpoko	Total Combined Score	Overall Unweighted Score Ranking
Option 1 (Local Road Zone A preference)	1	1	2	1	1	1	1	1	2	2	3	3	N/A	3	N/A	2	3	Did not evaluate	27	1	
Option 2 (Half interchange)	1	1	1	1	3	1	1	1	2	5	3	2	N/A	4	N/A	2	3		31	2	

### 8.2.1.1 Summary of MCA Assessor Evaluations

#### Fit with Project Objectives

For the enhanced movement objective, the MCA assessor scored both options a 1, but did note that Option 2 would provide improved access for those wishing to use the new highway from Manakau and Ohau to go to the south of Ōtaki.

For the resilience objective, the MCA assessor scored Option 1 a 2, but recorded a score of 1 for Option 2. The latter score is one point better than Option 1. The MCA assessor noted that Option 2 was likely to be superior from a resilience perspective as it would provide an additional connection to the existing SH1 and would reduce the amount of redirection of traffic if required.

For the appropriate connections objective, the MCA assessor scored 1s for both Options 1 and 2, as both were considered appropriate connection types for a National High-Volume Road.

For the safety objective, the MCA assessor scored both options a 1. The MCA assessor noted that Option 2's score (of 1) was premised on the outcomes of a Safety Audit.

See Appendix A (Fit with Project Objectives Report) for further information.

#### Landscape / Visual

The MCA assessor recorded a score of 1 for Option 1, but a score of 3 for Option 2. This latter score was two points worse than Option 1.

The MCA assessor noted that Option 1 would result in “flowing curves”, follow the historic existing SH1, and would form part of a legible local spine linking Ōtaki, Manakau, Kuku, Ohau, and Levin. The assessor noted that Option 2 was inferior as it would result in increased visual clutter (a mix of different forms with no aesthetic coherence) and the historic spine road between Levin and Ōtaki would be diverted through a circuitous and less legible route.<sup>54</sup> However, the MCA assessor did note that Option 2 would increase local access to the new highway.

During MCA Workshop 4, the MCA assessor promoted an alternative option that would require an additional underpass to be constructed (i.e. there would be separate underpasses for both northbound and southbound traffic). The assessor advised that this alternative design would keep the existing SH1 spine “more or less” on its historic alignment. This alternative design was considered, but rejected, by the Project Design Team. Its decision was premised on the basis that the alternative design would significantly increase construction costs, create safety issues (e.g. speeds were unlikely to be able to be safely controlled) and it would entail additional property impacts including on Māori land.

See Appendix F (Landscape / Visual Report) for further information.

#### Ecology (Terrestrial and Freshwater / Wetland)

The MCA assessor scored both Options 1 and 2 a 1 for both terrestrial and freshwater / wetland ecology. In terms of freshwater, the assessor noted that there would be some interaction with Waterway 2. With regard to terrestrial ecology, the assessor advised that each option's footprint was covered by exotic grass.

See Appendix M (Ecology Report) for further information.

#### Heritage

The MCA assessor scored both Options 1 and 2 a 1. The assessor noted that the new highway / interchanges would be visible from an existing storage building, which was potentially built in 1942 by the American Marines.

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<sup>54</sup> The poor legibility and lack of aesthetic coherence is the result of poor visual hierarchy, counterintuitive wayfinding, and inconsistent design language. By way of further explanation, (i) there is a lack of hierarchy with the straight alignment of the northbound off-ramp and curve of the main expressway, (ii) there is a contrast in design language between the north-bound and southbound on-ramps, (iii) the intersection of the two ramps in one corner of the roundabout appears crowded, (iv) the sharp corners and circuitous route of the third arm are characteristic of a minor local road rather than a spine, and (vi) its connection to the west of the roundabout is counterintuitive

See Appendix H (Heritage Report) for further information.

### **Archaeology**

The MCA assessor recorded scores of 2 for both Options 1 and 2. The assessor noted that the Ō2NL geophysical survey had indicated that it was highly unlikely that a papakainga or urupa would be located in the immediate vicinity of either option.

See Appendix P (Archaeology Report) for further information.

### **Noise / Vibration**

The MCA assessor scored Option 1 a 2, but recorded a score of 5 for Option 2. The latter score was four points worse than Option 1.

The MCA assessor's key reasons for recording a score of 5 for Option 2 was the likelihood of adverse noise / vibration impacts on nearby PPFs that would be created by traffic either stopping / starting at the roundabout and / or from vehicles weaving on the on / off ramps.

See Appendix I (Noise / Vibration Report) for further information.

### **Productive Land Values**

The MCA assessor recorded scores of 3s for both Options 1 and 2. The assessor noted that both options would impact on LUC 3.

See Appendix J (Productive Land Value Report) for further information.

### **Social / Community / Recreation**

The MCA assessor recorded a score of 3 for Option 1 and a score of 2 for Option 2. The latter option's score was one point better than Option 1.

The assessor noted that Option 2 would create more connectivity opportunities for the Manakau / Ohau / Kuku communities when compared to Option 1 (e.g. there would be improved way-of-life benefits for those wanting to commute to the south of Ōtaki). The assessor noted that they had assumed in their evaluation that active modes would be safely provided for at the roundabout, that locals would travel to Ōtaki on the existing SH1 when requiring services or for school / work but would choose the half interchange when travelling further.

See Appendix G (Social / Community / Recreation Report) for further information.

### **Horowhenua District Development**

The MCA assessor did not provide district development scores for the Taylors Road Half Interchange MCA as it is not located in the Horowhenua district.

### **Kāpiti Coast District Development**

The MCA assessor recorded a score of 3 for Option 1 and a score of 4 for Option 2. The latter option score was one point worse than for Option 1.

The MCA assessor advised that they had previously recorded an **orange** for Option 1 in the Local Road traffic light signal evaluation process (see Table 26). This traffic light signal was recorded due to safety concerns with the geometric alignment of Taylors Road (which was to be constructed as part of the PP2Ō Expressway) as well as potential flooding and sightline issues. These concerns were reiterated for Option 1 at MCA Workshop 4.

For Option 2, the MCA assessor advised that despite this option being superior from a local connectivity perspective (when compared to Option 1), they were concerned that it would leave the existing SH1 with a poor geometric alignment (e.g. three sharp bends, including two 90-degree bends), and would be unable to manage overland flood flows. The assessor also considered that this alignment would not be able to cater for through traffic and would not be in keeping with what is expected for a rural arterial road.

See Appendix N (Kāpiti District Development Report) for further information.

### **Fit with Local Road System (Horowhenua District only)**

The MCA assessor did not provide fit with local road scores for the Taylors Road Half Interchange MCA as it is not located in the Horowhenua district.

### **Engineering Degree of Difficulty**

The MCA assessor recorded scores of 2 for both Options 1 and 2.

For Option 1, the MCA assessor noted that a high-speed alignment (at least 80km / h) would require a larger two-lane skewed bridge, and there would be additional earthworks required.

For Option 2, the MCA assessor noted sight distance to the “nose” of the northbound exit ramp and the alignment of the exit may require a “stepped-out exit” (this could require additional retaining provision along the Taylors Road realignment). In addition, the assessor noted that there would be less flood plain impacts with this option.

See Appendix L (Engineering Degree of Difficulty Report) for further information.

### **Property Degree of Difficulty**

The MCA assessor recorded scores of 3s for both Options 1 and 2.

For Option 1, the MCA assessor noted that some of the land that is likely to be needed for this option had already been acquired for the PP20 Expressway, and that Māori land would be impacted by the new highway's alignment. The assessor also noted that the proposed potential wetland / retention area would require more land from already affected landowners.

For Option 2, the MCA assessor noted that some of the land needed had already been acquired for the PP20 Expressway, and that Māori land would be impacted by the new highway's alignment. The assessor also noted that additional land would be required for the roundabout and for the on / off ramps and the proposed potential wetland / retention area would require more land from already affected landowners. The assessor advised that whilst more land is required when compared to Option 1, the overall property impacts are similar (hence both options scoring 3s).

See Appendix O (Property Degree of Difficulty Report) for further information.

#### **8.2.1.2 Weighting Scenario Assessments**

The above unweighted scores for the Taylors Road Half Interchange Options were subjected to a weighting exercise using the interchange weightings and processes (as set out above in Section 7.7). The exercise was design to test the sensitivities of both Taylors Road Half interchange option's unweighted scores to matters considered, under various weightings, to be more important.

Table 29 below sets out the weighted assessment scenario scores for each Taylors Road Half interchange option (these scores were calculated<sup>55</sup> in accordance with the numerical values set out above in Table 21). For ease of reference, Table 30 below provides an overall ranking for each interchange option scenario assessment's score (i.e. these are the colour coded rankings identified in Table 30 below).

In addition to examining the scores for each individual weighting scenario assessment, both Table 29 and Table 30 also provide overall scores and rankings as an alternative means of interpreting the weighting scenario assessment results as follows:

- The left hand light pink column in Table 29 provides an 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

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<sup>55</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

- The left hand light pink column in Table 30 provides a total score for all of the 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).

**Table 29: Average scores for the Taylors Road options weighting scenarios**

Taylor Road Half Interchange options	Workshop Weighting	RMA Sec 6	Social	Environment	Cultural	Economic	Average Score	Overall Average Score Ranking
Option 1	1.39	1.23	1.39	0.92	1.07	1.65	1.28	1
Option 2	1.75	1.51	1.59	1.25	1.24	1.55	1.48	2

**Table 30: Weighting scenario ranking orders for the scores identified in Table 29**

Taylors Road Half Interchange options	Workshop Weighting	RMA Sec 6	Social	Environment	Cultural	Economic	Total Ranking Score	Overall Ranking
Option 1	1	1	1	1	1	2	7	1
Option 2	2	2	2	2	2	1	11	2

## 8.2.2 Summary of the MCA Evaluation for the Taylors Road Half Interchange

Option 1 was indicatively preferred under both the unweighted and weighted scenario assessments. This preference was due to the following MCA assessors' evaluations:

- Landscape / Visual:** The MCA assessor preferred Option 1 as it would result in "flowing curves" that would follow the existing SH1, and form part of a legible local spine linking Ōtaki, Manakau, Kuku, Ohau, and Levin. The assessor noted that Option 2 would result in increased visual clutter (i.e. a mixture of different forms with no aesthetic coherence) and the historic spine road between Levin and Ōtaki would be diverted through a circuitous and less legible route
- Noise / Vibration:** The MCA assessor preferred Option 1 over Option 2 as the latter option would have increased noise / vibration impacts on nearby PPFs because of vehicles stopping / starting at the new roundabout and weaving on the on and off ramps, and
- Kāpiti Coast District Development** – the MCA assessor noted they were concerned with both options from a safety and geometric perspective, but preferred Option 1 over Option 2. Key concerns cited for Option 2 included it would result in a poor geometric alignment (e.g. three sharp bends, including two 90-degree bends), would not cater with overland flood flows and would not be in keeping with what is expected for a rural arterial road. The MCA assessor did acknowledge that Option 2 would provide superior local connectivity for north Ōtaki to the new highway.

It is noted that Option 1 was first (or first equal) for each of the weighted scenario assessments, with the exception of the Economic scenario.

## Recommendation

Whilst Option 1 scored highest overall, it is recommended that both Option 1 and Option 2 be advanced to the Ō2NL DBC for further consideration. This is due to Option 2 scoring well against the Project Objectives and the potential for mitigation of some of the adverse effects.

### 8.2.3 Tararua to Kimberley Local Road Option A MCA Summary

As set out above in Section 7.10.3.2, for Local Road F to J (Kimberley Road options), Option A (no Kimberley bridge / connection) was recommended to be advanced to the Ō2NL DBC for further consideration. However, it was also noted that further optioneering to help identify a north / south alignment location preference for Option A may assist with future Ō2NL DBC considerations.

The Project Design Team identified two north / south local road locations for Option A between Tararua and Kimberley Roads as follows:

- Option A1 (“within corridor”) would be predominately located within the 300m corridor (see Figure 19)

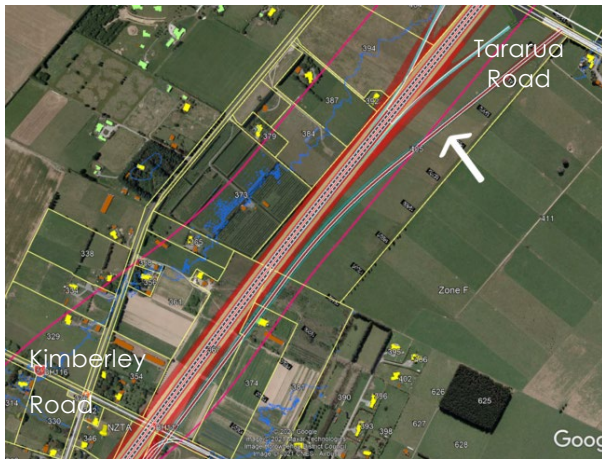


Figure 19: Option A1

- Option A2 (“offset from corridor”), would be located approximately 600m east of the eastern boundary of the 300m corridor (see Figure 20) and which could align with future urban development opportunities being considered by HDC, including the Tara-Ika Growth Area.

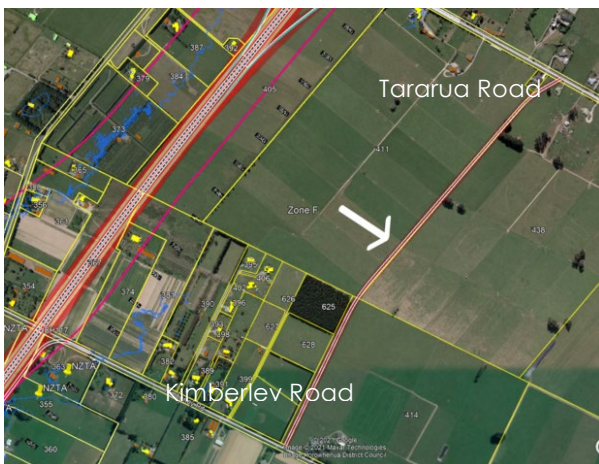


Figure 20: Option A2

Each MCA assessor’s unweighted scores for Options A1 and A2 are set out in Table 31 below (this table also provides the total combined unweighted score and its associated preference ranking). A summary of each MCA assessor’s individual evaluation is provided below Table 31.



**Table 31: Tararua to Kimberley local road Option A unweighted scores**

Tararua to Kimberly Road local options	Enhanced movement	Safety	Resilience	Connections	Landscape / visual	Ecological - Terrestrial	Ecological - Freshwater / Wetlands	Heritage	Archaeology	Noise / vibration	Productive land values	Social / community / recreation	Horowhenua district development	Kāpiti Coast district development	Fit with local road system	Engineering degree of difficulty	Property degree of difficulty	Iwi cultural Values Ngāti Raukawa ki te Tonga	Iwi Cultural Values Muaūpoko	Total Combined Score	Overall Unweighted Score Ranking
Option A1 (within corridor)	1	1	1	1	2	1	1	1	1	3	3	2	2	N/A	2	2	2	Did not evaluate		26	2
Option A2 (outside of corridor)	1	1	1	1	1	1	1	1	1	3	3	3	1	N/A	2	1	3			25	1

### **8.2.3.1 Summary of MCA Assessor Evaluations**

#### **Fit with Project Objectives**

For the enhanced movement objective, the MCA assessor scored both Options A1 and A2 a 1. The assessor noted that travel times to access the new highway would be similar under both options.

For the resilience objective, the MCA assessor scored both Options A1 and A2 a 1 and noted that there were no material resilience concerns with either option.

For the appropriate connections objective, the MCA assessor scored both Options A1 and A2 a 1. The MCA assessor advised that there would be negligible travel time differences between the two options.

For the safety objective, the MCA assessor scored a 1 for both Options A1 and A2. The MCA assessor noted that the design for each road, and its intersections, would be based on the same standards, and as such, there would be little difference between the options.

See Appendix A (Fit with Project Objectives Report) for further information.

#### **Landscape / Visual**

The MCA assessor recorded a score of 2 for Option A1 and a score of 1 for Option A2. As such, Option A2's score was one point better than the score for Option A1.

The MCA assessor noted that Option A1 recorded an inferior score due to its "awkward alignment" at the Tararua Road intersection (e.g. it would need to provide separation from the ramp intersections, which would in turn enlarge the footprint of the new highway).

The MCA assessor advised that Option A2 would provide a direct connection between Tara-Ika and Kimberley Reserve (whilst also maintaining local connectivity on the eastern side of the new highway between Levin, Kimberley Road, and Muhunoa East Road). This option would also be square with existing cadastral patterns and could serve properties on both sides of the road. It would also provide a possible north / south central spine that could provide opportunities for future development of the land.

See Appendix F (Landscape / Visual Report) for further information.

#### **Ecology (Terrestrial and Freshwater / Wetland)**

The MCA assessor scored both Options A1 and A2 a 1 for both terrestrial and freshwater / wetland ecology. The assessor noted that local ecology had been homogenised through existing land use and each option's footprint was covered by exotic grass.

See Appendix M (Ecology Report) for further information.

#### **Heritage**

The MCA assessor scored both Options A1 and A2 a 1. The assessor noted that there were no listed buildings or built heritage affected by either option.

See Appendix H (Heritage Report) for further information.

#### **Archaeology**

The MCA assessor scored both Options A1 and A2 a 1. The assessor noted that the historic bush tramway (that ran to the Bartholomews Mill) was unlikely to be affected by either option.

See Appendix P (Archaeology Report) for further information.

#### **Noise / Vibration**

The MCA assessor scored both Options A1 and A2 a 3. The assessor noted that the key reason for these scores was the adverse noise impacts on nearby PPFs from vehicles stopping / starting at intersections.

See Appendix I (Noise / Vibration report) for further information.

### **Productive Land Values**

The MCA assessor scored both Options A1 and A2 a 3. The assessor noted that both options would impact on LUC 3 land.

See Appendix J (Productive Land Values Report) for further information.

### **Social / Community / Recreation**

The MCA assessor scored Option A1 a 2, and Option A2 a 3. As such, Option A1's score was 1 point better than Option A2's score.

The key reasons for Option A2's score of 3 was as follows:

- Longer local journey times created that would impact negatively on way-of-life, and
- Negative amenity created for those people living between the new local road and the new highway.

See Appendix G (Social / Community / Recreation Report) for further information.

### **Horowhenua District Development**

The MCA assessor scored Option A1 a 2, and Option A2 a 1. As such, Option A2's score was 1 point better than Option A1's score. The MCA assessor advised that there may be benefits for future district development by locating the north / south local connector road outside of the 300m corridor.<sup>56</sup>

### **Fit with Local Road System (Horowhenua District only)**

The MCA assessor scored both Options A1 and A2 a 2. The MCA assessor did not provide any specific reasonings for their score.

### **Kāpiti Coast District Development**

It is noted that the MCA assessor did not provide district development scores for the Tararua to Kimberley Local Road options as the location is not located in the Kāpiti district.

### **Engineering Degree of Difficulty**

The MCA assessor scored Option A1 a 2, and Option A2 a 1. As such, Option A2's score was one point better than Option A1.

The key reasons for Option A1's score of 2 was the design complexity of the Tararua Interchange would be increased (e.g. four intersections or roundabouts would be located in close proximity), and space for stormwater and / or local drainage management would be limited.

See Appendix L (Engineering Degree of Difficulty Report) for further information.

### **Property Degree of Difficulty**

The MCA assessor scored Option A1 a 2, and Option A2 a 3. As such, Option A1's score was one point better than Option A2.

The key reasons for Option A2's score of 3 was due to two new property owners being affected. The MCA assessor noted that Option A1 would not affect any additional property owners.

See Appendix O (Property Degree of Difficulty Report) for further information.

### **8.2.3.2 Weighting Scenario Assessments**

The above unweighted scores for the Tararua to Kimberley Road Option A options were subjected to a weighting exercise using the "highway alignment" weightings and processes (as set out above in Section 7.3). The exercise was design to test the sensitivities of both local road option's unweighted scores to matters considered, under various weightings, to be more important.

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<sup>56</sup> The MCA assessor confirmed the reasoning for the scoring difference via email on 3 August 2021

Table 32 below sets out the weighted assessment scenario scores for each local road option (these scores were calculated<sup>57</sup> in accordance with the numerical values set out above in Table 12). For ease of reference, Table 33 below provides an overall ranking for each interchange option scenario assessment's score (i.e. these are the colour coded rankings identified in Table 33 below).

In addition to examining the scores for each individual weighting scenario assessment, both Table 32 and Table 33 also provide overall scores and rankings as an alternative means of interpreting the weighting scenario assessment results as follows:

- The left hand light pink column in Table 32 provides an 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 33 provides a total score for all of the 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).

**Table 32: Average scores for the Tararua to Kimberly Road local road option A weighting scenarios**

Tararua to Kimberly Road local options	Workshop Weighting	RMA Sec 6	Social	Environment	Cultural	Economic	Average Score	Overall Average Score Ranking
Option A1	1.35	1.19	1.27	0.98	0.98	1.37	1.19	2
Option A2	1.28	1.14	1.27	0.92	1	1.32	1.15	1

**Table 33: Weighting scenario ranking orders for the scores identified in Table 32**

Tararua to Kimberly Road local options	Workshop Weighting	RMA Sec 6	Social	Environment	Cultural	Economic	Total Ranking Score	Overall Ranking
Option A1	2	2	1	2	1	2	10	2
Option A2	1	1	1	1	2	1	7	1

<sup>57</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

## 8.2.4 Summary of MCA evaluations for the Tararua to Kimberley Road Option A Local Road Options

The scoring between both options was very close. However, Option A2 scored the highest under both the unweighted and weighted scenario assessments and was indicatively preferred. This preference was due to the following MCA assessors' evaluations:

- **Landscape / Visual:** The MCA assessor advised that Option A2 would provide a direct connection between Tara-Ika and Kimberley Reserve (whilst also maintaining local connectivity on the eastern side of the new highway between Levin, Kimberley Road, and Muhunua East Road). This option would also be square with existing cadastral patterns and could serve properties on both sides of the road. It would also provide a possible north / south central spine that could provide opportunities for future development of the land
- **Horowhenua District Development:** The MCA assessor advised that Option A2 could provide some benefits for future district development by locating the north / south local connector road outside of the 300m corridor, and
- **Engineering Degree of Difficulty:** The MCA assessor advised that the intersection design of Option A2 would not be complex (the assessor noted that Option A1 would have a more complex intersection design).

It is noted that Option A2 was first (or first equal) for each of the weighted scenario assessments.

It is however further noted the Social / Recreational / Community and PDoD assessment criterion scores were superior for Option A1.

### **Recommendation**

As the unweighted scores were very close, it is recommended that both Options A1 and A2 be advanced to the Ō2NL DBC for further consideration.

## 8.2.5 SH1 / Tararua Road Intersection Option MCA summary

The Project Design Team ascertained that there was a need to identify the intersection options with the highest scores for the Tararua Road / SH1 intersection to support design development of the Tararua Interchange (including for the possible future revocation of SH1). Five intersection options were identified as set out in Figure 22 to 25.

The MCA assessor's traffic light signal evaluations for each of the five intersection options are set out in Table 34.



Figure 22: Option 1: Do Nothing



Figure 21: Option 2: Traffic signals Tararua Extension

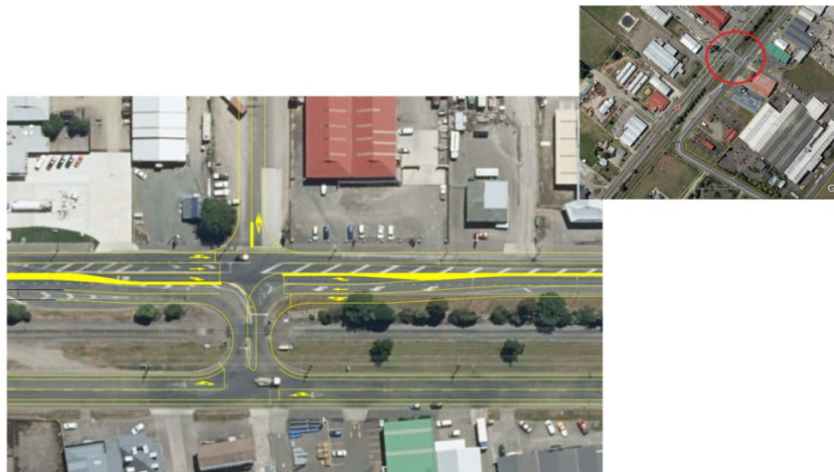


Figure 23: Option 3: Traffic signals existing crossing location



Figure 24: Option 4: Grade Separation A

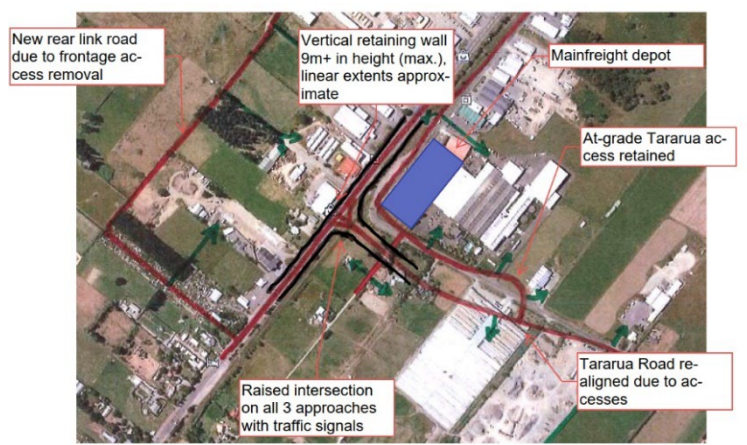


Figure 25: Option 5: Grade Separation B

**Table 34: SH1 / Tararua Road intersection option traffic signal evaluations**

SH1 / Tararua Road (Levin) intersection options	Enhanced movement	Safety	Resilience	Connections	Landscape/visual	Ecological - Terrestrial	Ecological - Freshwater / Wetlands	Heritage	Archaeology	Noise / vibration	Productive land values	Social / community / recreation	Horowhenua district development	Kāpiti Coast district development	Fit with local road system	Engineering degree of difficulty	Property degree of difficulty	Iwi cultural Values Ngāti Raukawa ki te Tonga	Iwi Cultural Values Muaūpoko						
Option 1 (do-nothing)	Green	Yellow	Green	Yellow	Yellow	Green	Green	Green	Green	Green	Green	Yellow	Red	N/A	Red	Green	Green	Did not evaluate							
Option 2 (Traffic signals Tararua extension)	Green	Yellow	Green	Green	Green	Green	Green	Green	Green	Yellow	Green	Green	Yellow	N/A	Yellow	Green	Green			Did not evaluate					
Option 3 (Traffic signals existing crossing location)	Yellow	Yellow	Green	Green	Yellow	Green	Green	Green	Green	Green	Green	Green	Yellow	N/A	Red	Yellow	Green					Did not evaluate			
Option 4 (Grade Separation A)	Green	Green	Green	Red	Red	Green	Green	Green	Yellow	Yellow	Green	Yellow	Yellow	N/A	Yellow	Red	Red							Did not evaluate	
Option 5 (Grade Separation B)	Green	Green	Green	Red	Red	Green	Green	Green	Yellow	Yellow	Green	Yellow	Yellow	N/A	Yellow	FF	Red								

### 8.2.5.1 Summary of MCA Assessor Evaluations

#### Fit with Project Objectives

For the enhanced movement objective, the MCA assessor's traffic light signal evaluations for the five intersection options were as follows:

- All options, except for Option 3, recorded **green** signals, and
- Option 3 scored an **orange** as it would introduce southbound delays and could result in some capacity restrictions for traffic crossing the NIMT Line in the westbound direction. It would have likely scored a **red** if HDC had not been constructing a new street between Cambridge and Rose Streets.

For the resilience objective, the MCA assessor noted that there were no resilience concerns with any of the intersection options (and all options recorded **green** signals).

For the safety objective, the MCA assessor advised that the scoring of the intersection options had been underpinned by a rail crossing assessment (which had considered crash history, near misses and traffic volumes). In summary, the MCA assessor's traffic light signal evaluations were as follows:

- Options 1, 2 and 3 recorded **orange** signals as they remained at-grade. The assessor noted that Option 1 was very close to being recorded a **red**, but there was no existing crash history to support such a score, and
- Options 4 and 5 recorded **green** signals as both would remove the rail conflict.

For the appropriate connections objective, the MCA assessor recorded the following traffic light signal evaluations:

- Option 1 was scored an **orange** as doing nothing would restrict movements onto SH1 and the existing concerns with limited control at the NIMT Line would continue
- Options 2 and 3 scored **green** signals as they would provide for all intersection movements and would improve controlled access when crossing the NIMT Line, and
- Options 4 to 5 scored **reds** as whilst they provided for full movements, the form of the structure would be out of context with the local road environment and would impact on connectivity to adjacent properties.

See Appendix A (Fit with Project Objectives Report) for further information.

#### Landscape / Visual

The MCA assessor's traffic light signal evaluations for the five intersection options were as follows:

- Option 1 scored an **orange** due to it been circuitous, having relatively poor legibility, and is constrained by the NIMT Line's level crossing
- Option 2 scored a **green** as it would align with the existing street grid, would remove an existing "dogleg", would be more legible and visually unobtrusive
- Option 3 scored an **orange**. The assessor noted while it might be safer and more efficient than Option 1 (from a transport perspective), it was otherwise similar to Option 1 from a landscape and urban design perspective
- Option 4 recorded a **red** signal. The assessor noted that its footprint would be disruptive and would impact on several commercial and residential properties (especially on the western side of existing SH1). The arrangement would be visually obtrusive for nearby properties<sup>58</sup> and local amenities. The route would be circuitous and not quite aligned with Tararua Road (and would therefore have poor legibility). It would also be poor in terms of distance, gradients, and amenity values for active modes, and

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<sup>58</sup> For example, for No's 2, 12 and 14 Tararua Road



- Option 5 recorded a **red** signal. The assessor advised it would be disruptive for properties on the western side of the existing SH1 (e.g. their existing street frontage and access would be replaced by a retaining wall). The arrangement would be visually obtrusive for nearby properties and local amenities. The overpass, elevated intersection, and ramps would be an unattractive southern gateway into Levin's town centre. The arrangement would be poor in terms of gradients and amenity values for active modes.

### Ecology

The MCA assessor noted that the footprint for all five intersection options was already heavily urbanised, and there were no notable ecological constraints / issues at this location. Accordingly, all options recorded **green** signals for terrestrial and freshwater / wetlands ecology.

See Appendix M (Ecology Report) for further information.

### Heritage

The MCA assessor recorded **green** signals for all five intersection options, noting that there were no listed sites / building or potential built heritage that would be affected by any of the options.

See Appendix H (Heritage Report) for further information.

### Archaeology

The MCA assessor recorded **green** signals for Options 1 to 3 on the basis that there were no, or only minor, earthworks needed for their implementation (and therefore there would be no disturbance of buried archaeological sites).

Both Options 4 and 5 recorded **orange** signals. The assessor noted that both options would require new earthworks in the former Weraroa clearing area, which might affect several potential archaeological sites.

See Appendix P (Archaeology Report) for further information.

### Noise / Vibration

The MCA assessor recorded **green** signals for Options 1 and 3, but **oranges** for Options 2, 4 and 5. The key reasons for recording **orange** signals for the latter was due to their potential noise impacts on nearby PPFs located to the south of each option's proposed footprint.

See Appendix I (Noise / Vibration report) for further information.

### Productive Land Values

The MCA assessor recorded **green** signals for Options 1 to 5 as there would be no productive land impacts.

See Appendix J (Productive Land Report) for further information.

### Social / Community / Recreation

The MCA assessor's traffic light signal evaluations were as follows:

- Option 1 recorded an **orange** due to future increased traffic growth creating social health and well-being, safety for road users and way-of-life impacts
- Options 2 and 3 recorded **greens** as it would result in minimal changes to the existing environment, but would still improve safety, and
- Options 4 and 5 recorded **oranges** due to way-of-life, ability to sustain oneself and health and wellbeing impacts. The assessor noted that they were close to recording **reds** for both options.

See Appendix G (Social / Community / Recreational Report) for further information.

### Horowhenua District Development

The MCA assessor noted that the SH1 / Tararua Road intersection is likely to become a critical "gateway" connection for the Levin town centre once the O2NL Project is open. The assessor recorded a mixture of **oranges** and **reds** for the five intersection options as follows:

- Option 1: Doing nothing recorded a **red** as the existing intersection arrangement does not perform well and is unlikely to have sufficient capacity to support future district development, and in particular the future development of the Tararua Industrial Park. This option was close to scoring a Fatal Flaw
- Option 2: This option recorded an **orange** as it would introduce access delays to and from the Tararua Industrial Park
- Option 3: This option recorded an **orange** as it would introduce access delays to and from the Tararua Industrial Park. Its adverse impacts are reduced due to the construction of the new street between Cambridge and Rose Streets
- Option 4: This option recorded an **orange** as it would have reduced network legibility, potentially require land from the Tararua Industrial Park and generate longer travelling distances. It could help to enable connectivity between Tararua Road and the southern end of Cambridge Street, and this could provide accessibility benefits for businesses on Cambridge, and
- Option 5: This option recorded an **orange** as it would potentially require land from the Tararua Industrial Park and could generate longer travelling distances. It would have the same benefits as outlined above for Option 4.

See Appendix K (Horowhenua District Development and Fit with Local Road System Report) for further information.

### Fit with Local Road System (Horowhenua District only)

The MCA assessor recorded a mixture of **oranges** and **reds** for the five intersection options as follows:

- Option 1: Doing nothing recorded a **red** as the existing intersection arrangement does not perform well and is unlikely to have sufficient capacity to support the future functioning of the local road network once growth has been taken into account
- Option 2: This option recorded an **orange** as it would introduce a new set of traffic signals that could potentially have negative impacts on the local road network (further information would be needed to better understand the impacts on the local road network)
- Option 3: This option recorded a **red** as it would introduce a new set of traffic signals at a problematic existing intersection, and is likely to have negative downstream impacts for the local road network, and
- Options 4 and 5: Both options recorded **oranges** as both were likely to generate longer travelling distances. As such, the impacts of these longer distances on local trips would need to be better understood. However, both options would provide grade separation, and thus a problematic at-grade rail crossing would be removed.

See Appendix K (Horowhenua District Development and Fit with Local Road System Report) for further information.

### Engineering Degree of Difficulty

The MCA assessor's traffic light signal evaluations for the five intersection options were as follows:

- Options 1 and 2 recorded **greens** due to both options having minimal construction impacts (although existing SH1 intersection may need to be modified to accommodate the NIMT Line)
- Option 3 recorded an **orange** due to the need to raise existing SH1 to the same level of the NIMT Line, and it might be difficult to integrate with the Cambridge Road T-intersection signal phasing
- Option 4 recorded a **red** due to potential geotechnical (e.g. major MSE or retaining), geometric (i.e. intersections / tight curves) and constructability issues, and
- Option 5 recorded a **"Fatal Flaw" red**. This negative evaluation was based on significant constructability challenges (e.g. it would be highly challenging to keep traffic volumes moving during construction), as well as the need to overcome highly challenging geotechnical, flooding and geometrical issues.

See Appendix L (Engineering Degree of Difficulty Report) for further information.

## Property Degree of Difficulty

The MCA assessor's traffic light signal evaluations were as follows:

- Options 1, 2 and 3 recorded **greens** as no property would be required from private landowners
- Option 4 recorded a **red** as eight properties would be impacted on both the eastern and western sides of the existing SH1. In terms of the properties on the western side, at least one of these would be a complex industrial / commercial business acquisition. In addition, the easement rights for the properties located to the north (with existing access off the western side of existing SH1) would be affected, and
- Option 5 recorded a **red** due to the following:
  - Eight properties on the eastern side of the existing SH1 would be impacted by the realignment of Tararua Road and the proposed link to the raised existing SH1
  - The construction of a retaining wall on the western side of the existing SH1 would adversely affect a number of industrial / commercial properties that currently obtain access from existing SH1, and
  - The new rear link road needed for alternative local access on the western side of existing SH1 is likely to involve acquisition of land from multiple properties with costly and complex negotiations.

See Appendix O (Property Degree of Difficulty Report) for further information.

### 8.2.6 Summary of SH1 / Tararua Road Intersection Options

Overall, there was a strong traffic light signal preference for the at-grade options over the grade separation options.

For the two grade separation options (i.e. Options 4 and 5), almost half of the MCA assessors recorded **reds** and **oranges**. In particular, **red** signals were recorded for the following assessment criteria:

- **Appropriate connections objective:** The form of both structures would be out of context with the local road environment and would impact on connectivity to adjacent properties
- **Landscape / Visual:** Both options would result in local access disruption, be visually obtrusive and create an unattractive southern gateway into Levin's town centre
- **EDoD:** Both options would be problematic to construct and there would be highly challenging geotechnical, flooding and geometric issues that would need to be overcome (it is noted that the EDoD recorded a fatal flaw "traffic signal" for Option 5), and
- **PDoD:** Both options would impact on a number of properties on either side of the existing SH1, and some properties / businesses would be problematic and costly to acquire.

**Oranges** were also recorded for the Social / Community / Recreation (e.g. impacts on way-of-life, ability to sustain oneself and health and wellbeing), archaeology (e.g. impacts on unknown archaeological sites) and noise / vibration (e.g. impacts on nearby PPFs) assessment criterion.

Accordingly, it is recommended that the grade separation options are not advanced to the Ō2NL DBC.

For Options 1, 2 and 3 (the at-grade options), **green** signals were mostly recorded by the MCA assessors, although some **oranges** were also recorded. To this end, several concerns were noted for the **orange** signals that will require further design consideration and discussion with KiwiRail (in relation to the NIMT Line). Accordingly, it is recommended that further design and consultation on the at-grade options is undertaken to help identify an option preference prior to a preferred option been identified for advancement.

#### **Recommendation**

It is recommended that at-grade Options 1, 2 and 3 be advanced to the Ō2NL DBC only (and the grade separated Options 4 and 5 be discarded).

## 8.3 Re-check of IBC Northern Section Corridor Options

The purpose of this section of the report is to document the recheck process undertaken of the evaluations / scores for the short-listed northern corridor options N4, N5 and N9 that were identified in the IBC in 2018. Waka Kotahi decided to undertake this process on the basis that it was possible that the Tara-Ika Plan Change 4 was likely to be fully operative prior to it lodging the relevant Resource Management Act authorisations for the Ō2NL Project.

### 8.3.1 Summary of Short Listed Northern Corridor Options

Section 2.1 of this report summarises the key steps undertaken in the IBC to identify a preferred northern corridor section. To recap, three northern corridor options were eventually short-listed in the IBC for final evaluation, these being Options N4, N5 and N9. All of these options were located to the north-east of SH57 and SH1.<sup>59</sup> Ultimately, the IBC recommended Option N4 be further investigated as part of the Ō2NL DBC.

### 8.3.2 MCA Assessor Re-check Tasks

An MCA assessor briefing on the key re-check tasks was held on 10 June 2021. At this briefing, the MCA assessors were asked to:

1. Review the 2017 MCA and 2018 IBC Reports to reacquaint themselves with the MCA processes previously undertaken, and the relevant specialist evaluations / scores
2. Review HDC's Plan Change 4 (Tara-Ika) documentation and become familiar with its overall intent, and
3. Provide a short review report on whether the 2017 and 2018 MCA evaluations and scores would be different for corridor options N4, N5 and N9, if Plan Change 4 had been in place.

In addition, each MCA assessor's review of the 2017 MCA evaluations (i.e. for their specialist areas) was to be undertaken on the following basis:

- Be limited to the short-listed northern section corridor options as identified in the 2018 IBC Report (i.e. Options N4, N5 and N9)
- The review of Options N4, N5 and N9 was to be undertaken on a "apples for apples" basis and as per the MCA instructions identified in the 2017 MCA Report. That is, the review was to be undertaken utilising the same corridor and assessment information that was available in 2017 (except for the "Tara-Ika Plan Change" assumption), and
- It was to be assumed that Tara-Ika Plan Change 4 was operative within the Horowhenua District Plan and could accommodate up to 2,500 houses, a small commercial area, new parks and reserves, and educational facilities.

### 8.3.3 Key Findings of the Re-check Process

The key findings of the re-check process for the short-listed northern corridor options are summarised in Table 35 below. The individual MCA assessor's reports are provided in **Appendix T** (Review of IBC Northern Section Corridor Options Report).

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<sup>59</sup> It is noted that northern eastern corridor option N8 was also evaluated. This option was discarded before public engagement in 2017 as it was identified that it would result in more traffic continuing to use the current state highway and therefore create a less safe network (i.e. when compared to the other northern corridor options). Option N8 was also shown not to materially improve access to Levin. Since completion of the IBC, more growth has been predicted, and updates have been made to the Ō2NL Traffic Model. This model was re-run with the additional growth predictions and similar network outcomes were identified. Accordingly, it was considered that the original decision to remove N8 was correct, and therefore did not require to be included in the recheck process

**Table 35: Summary of the outcomes of the MCA assessors re-check processes**

IBC MCA criteria	Overall evaluation outcome	Summary of MCA assessor's comments
<b>Project Objectives</b>	No evaluation / scoring change required	<p>The MCA assessor advised that there would be no change to the original project objective evaluations / scores. The assessor specifically noted:</p> <ul style="list-style-type: none"> <li>• There would be no significant change to the travel time for key routes</li> <li>• The safety performance of the new highway, or the proportion of traffic using the new highway rather than the old highway, would not be impacted</li> <li>• The resilience benefits of the new highway would be unchanged, and</li> <li>• The appropriateness of connection, if anything, is enhanced, but not to a level that would alter scores.</li> </ul>
<b>Landscape / Visual</b>	Potential increase to Options N5 and N9 scores	<p>The MCA assessor noted Option N4 was still the indicatively preferred option, and would have scored better now than it did in 2017 (as it allows the Tara-Ika Growth Area to be larger and more integrated around the local centre). Conversely, Options N5 and N9 would have scored worse now than they did in 2017 due to the impacts on the local centre and the negative disruption they would create for connectivity between the local centre and neighbours.</p>
<b>Ecological Impacts</b>	No evaluation / scoring change required	<p>The MCA assessor noted that there was no change to the original ecology evaluation. This was because the status of the land has no bearing on the degree to which ecologically sensitive sites located in the Tara-Ika area are at risk from the roading options.</p>
<b>Heritage</b>	No evaluation / scoring change required	<p>There are no heritage / archaeological sites listed within the Tara-Ika area (so no evaluation / scoring changes are required).</p>
<b>Productive Land Values</b>	No evaluation / scoring change required	<p>No change to the original evaluations / scores.</p>
<b>Impact on Dwellings</b>	No evaluation / scoring change required	<p>The MCA assessor specifically advised that the original score of 3 for Options N4, N5 and N9 would not change.</p>
<b>Social / Community / Recreation Impacts</b>	Potential increase to Options N5 and N9 scores	<p>The MCA assessor noted that their original scores for Options N5 and N9 would be higher due to the plan change (i.e. both options would have impacted more negatively on the way-of-life and community cohesion sub-evaluation criteria). There would be no change to Option N4's score.</p>
<b>Engineering Considerations</b>	No evaluation / scoring change required	<p>No change to the original evaluations / scores.</p>
<b>Cost</b>	No evaluation / scoring change required	<p>The assessor noted that if the Tara-Ika development had been fully constructed, this would have potentially impacted on the project's physical works' costs.</p>

IBC MCA criteria	Overall evaluation outcome	Summary of MCA assessor's comments
Noise	No evaluation / scoring change required	All three corridors have a similar amount of land within the Tara-Ika site, and therefore there is no differentiation between the corridor options.

### 8.3.4 Northern Section Corridor Option Re-check Recommendations

The overall outcome of Waka Kotahi's re-check of the original 2017 MCA and 2018 IBC Report's evaluation / scores for corridor options N4, N5 and N9 (if the Tara-Ika Plan Change 4 had been operative) was that there would be no material evaluation / scoring changes needed. That is, the IBC's recommendation of Option N4 would remain (and possibly be enhanced due to improved Landscape / Visual and Social / Community / Recreation evaluations / scores). It is noted that the recheck process recommended no further corridor option evaluation processes be undertaken as a result of proposed Plan Change 4.

## 9. Recommendations

The next step is for Waka Kotahi to further investigate the option preferences recommended in this report for the new highway's alignment, interchange and local roads through the Ō2NL DBC process.

It is important to note that the MCA outcomes are not the only factor that Waka Kotahi will consider in making decisions on the preferred alignment, interchange solutions and local road connections for the Ō2NL Project. Waka Kotahi may also consider a range of other matters including cost and funding availability, risk and opportunities, and the desired outcomes of Iwi and key stakeholders. Further, the DBC process will investigate the option preferences in more detail, including potentially making design changes to avoid or minimise effects. The outcomes of the next phase of investigations will be reported in the Ō2NL DBC.

The IBC's northern corridor recheck process recommended that no further corridor option evaluation processes be undertaken as a result of proposed Plan Change 4 (for the new Tara-Ika Growth Area) becoming operative prior to Waka Kotahi lodging the relevant Resource Management Act authorisations for the Ō2NL Project.

## 10. 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.

Following selection of the options described below, further detailed investigations occurred over 2021 and 2022. These included environmental effects assessments supported by on-site investigations, discussions and engagement with local community, land owners and stakeholders including Councils. These investigations have informed an iterative DBC design development process that have led to minor alterations to the design of options as compared with those described below. This reflects the level of design used for the MCA processes as compared to the improved / greater level of design that is required for Ō2NL DBC and RMA processes.

### 10.1 New Highway Alignment Options

Following completion of the MCA process for the new highway alignment(s), it was determined that there was no need for further option analysis / evaluation as part of development of the Ō2NL DBC. Accordingly, and as set out in Table 36 below, the new highway alignment options recommended in this report were selected for further investigation which informed an iterative design development process leading to a design that has ultimately been incorporated into the Ō2NL DBC.

**Table 36: Ō2NL DBC highway alignment options**

Highway Zone	Highway alignment preferences adopted into the Ō2NL DBC
A	Combined Green and New (November 2020 <sup>60</sup> ) Alignment
B	New (November 2020) Alignment
C	White Alignment
D	Dark Blue Alignment
E	New (November 2020) Alignment
F	White Alignment
G	Purple Alignment
H	Cyan Alignment
K	New (November 2020) Alignment
L	New (November 2020) Alignment

As described above, and following selection of the options above, further detailed investigations occurred over 2021 and 2022. This iterative design development and refinement process has assisted to avoid, reduce and manage effects overall, notably:

- Zone B: the recommended / adopted New (November 2020) Alignment, was moved slightly to the south / east to reduce impacts on Staples Bush, to improve stormwater management and to reduce potential impacts on property, and
- Zone C: the recommended / adopted White Alignment was move slightly west to avoid a building with heritage values as well as other residential properties and to allow improvement in the geometric alignment of the local road bridge (to efficiently reconnect North Manakau Road). For Zone C this process has caused a shift in the alignment towards the Purple Alignment, which had an overall similar score to the White Alignment.

## 10.2 Interchange Location / Form Options

Following completion of the MCA process for interchange locations and forms, it was determined that there was no need for further option analysis / evaluation as part of development of the Ō2NL DBC. Accordingly, and as set out in Table 37 below, the interchange options recommended in this report were selected for further investigation, which informed an iterative design development process leading to a design that has ultimately been incorporated into the Ō2NL DBC.

**Table 37: Ō2NL DBC interchange location / form options**

Interchange Location	Interchange option preferences adopted into the Ō2NL DBC
Manakau / Kuku	No connection needed
Kimberley or Tararua	A full grade separated (compact diamond) interchange at Tararua
SH1 / SH57 Split	Roundabout

<sup>60</sup> Reference is to the month that the option was assessed in 2020, which is specifically November 2020

North Levin	Roundabout
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### 10.3 Local Road Options

Following completion of the MCA process for local roads, and with the exception of the additional option analysis to identify a preferred alignment for the recommended local road option for Local Road Zone F, G, H, I and J, it was determined that there was no need for further option evaluation as part of development of the Ō2NL DBC. Table 38 below summarises the local road options selected for further investigation, which informed an iterative design development process leading to a design that has ultimately been incorporated into the Ō2NL DBC.

**Table 38: Ō2NL DBC local road options**

Local Road Zones	Local road options adopted into the Ō2NL DBC
<b>A</b>	Utilise new Taylors Road connection currently being built as part of the Peka Peka to Ōtaki Expressway (and reconfigure existing SH1) to access Taylors Road traffic only. Reconnect existing SH1 with a localised realignment and new grade-separated connection across expressway
<b>Combined B and C (referred to as B to C)</b>	Provide full multi-modal connectivity between Honi Taipua Street and Manakau Heights Drive
<b>D</b>	Connection at Manakau North Road
<b>E</b>	Connection at Kuku East Road
<b>Combined F, G, H, I and J (referred to as F to J)</b>	Option A: Provide connections at Muhunoa East Road and Tararua Road (no Kimberley Road connection but parallel local roads)  <i>See Section 10.3.1 below for the parallel local road alignment option adopted into the Ō2NL DBC</i>
<b>J (Liverpool Street only)</b>	The east-west connection is not needed for the new Ō2NL Project
<b>K</b>	Connection at Queen Street
<b>L</b>	Option A: Provide a new connection between Waihou Road and McDonald Road and connection on to SH57
<b>Combined N, P and Q</b>	Provide supporting local connections for the proposed North Levin roundabout

#### 10.3.1 Tararua to Kimberley Local Road Options

As set out in Section 8.2.4 above, it was recommended that both Options A1 and A2 be advanced to the Ō2NL DBC for further consideration. This was because there was very little difference in performance or effects between the options identified through the MCA. For example, the unweighted scores did not deviate by more than one point for any criterion with Option A1 scoring slightly better under Social / Community / Recreation and PDoD and Option A2 option scoring better under Landscape / Visual and EDoD.

For the Ō2NL DBC, Waka Kotahi adopted A1 on the basis that it could be readily developed within the overall Ō2NL Project corridor (and would therefore have reduced property impacts) and would not preclude further urban form / growth planning that may be advanced by HDC.



## 10.4 Taylors Road Half Interchange

Following completion of the MCA process for the Taylors Road Half Interchange, it was recommended that both Option 1 and Option 2 be advanced to the Ō2NL DBC for further consideration. This was because while Option 1 performed the best overall, Option 2 had similar scores (performing well) and there was potential for some of Option 2's impacts to be further mitigated. Accordingly, further investigation was undertaken as part of the Ō2NL DBC, including further engagement with KCDC. These investigations revealed the following key considerations for comparing the two options:

- **Resilience:** Option 1 would result in a large distance between interchanges from south of Ōtaki to Tararua Road. If there was to be an incident on the highway within this 20km length then all vehicles would need to use the old highway for the entire distance, including through Ōtaki. Option 2 reduces this distance to 16km, and importantly removes the need to detour through Ōtaki
- **Maintaining traffic patterns:** Once the PP2Ō Expressway is open, it will tie into the existing SH1 north of Ōtaki creating a direct connection. If the new highway opens with Option 1, all traffic from the old SH1 north of Ōtaki will revert back onto the old SH1 through Ōtaki. These motorists are likely to be from the Manakau and Ohau areas and would have become used to using the PP2Ō Expressway over time (i.e. about 7 to 8 years) and, are therefore, likely to have developed an expectation of continuing to use the Peka Peka to Ōtaki Expressway to bypass Ōtaki
- **Removing traffic from the Ōtaki township:** Option 2 would result in about 1,000 fewer vehicles per day on the old SH1 through Ōtaki (i.e. these would be through trips rather than being a specific trip to Ōtaki)
- **Allowing more direct access from Manakau and Ohau:** Drivers would be able to leave the highway to access Manakau and Ohau north of Ōtaki for Option 2, rather than to the south of Ōtaki for Option 1 (entailing a journey through Ōtaki itself)
- **Noise and Vibration:** Option 1 was preferable as it would have fewer noise effects on nearby properties than Option 2 due to traffic on the new Ō2NL highway and existing SH1 traffic being free flow whereas traffic would need to slow down / accelerate at the Option 2 roundabout. There are however only about half a dozen properties located near the Option 2 roundabout that are expected to be impacted by new noise effects. Overall, the volume of traffic close to these properties for both options will reduce as compared to a "without project scenario", so they are likely to experience a small reduction in traffic noise compared to the existing situation (with traffic moving onto the new highway)
- **Visual:** Option 1 is preferable as it would have less visual clutter and retains the historic spine road between Levin and Ōtaki without going through a less legible route
- **Māori Land:** Option 2 can be delivered with less impact on Māori land as it allows tighter curves under the new highway
- **Costs:** Option 2 can be delivered for less cost (when compared to Option 1) as the major structural elements have reduced complexity and size, which more than offsets the additional roadbuilding costs, and
- **Future Proofing:** The provision of access onto the Kāpiti Expressway without traversing Ōtaki will enable growth in southern Horowhenua without an interchange in the Manakau area. It is likely that this will delay the need for an interchange in this area compared to not delivering the half interchange.

Waka Kotahi preferred Option 2 as it would remove through traffic from the Ōtaki township and would allow more direct access to the highway from Manakau and Ohau. More specifically Option 2 would maintain strategic traffic patterns and similar levels of connectivity for road users that become available with the opening of the Peka Peka to Ōtaki Expressway and would provide better connections to Manakau (helping with concerns about the lack of an interchange at Manakau). Safety improvements to this section of SH1 are also planned, which will help connections to and from Manakau / Kuku (both north and south). Option 2 was also preferable from a resilience perspective. Waka Kotahi's decision was subsequently adopted for further investigation, which informed an iterative design development process leading to a design that has ultimately been incorporated into the Ō2NL DBC.

## 10.5 SH1 / Tararua Road Intersection Options

The traffic light signal evaluation process for the SH1 / Tararua Road intersection recommended that the grade separated Options 4 and 5 be disregarded<sup>61</sup>, but at-grade Options 1, 2 and 3 be progressed to the Ō2NL DBC. This recommendation was adopted as part of the Ō2NL DBC investigations and design development process.

To help differentiate further between the at-options, a Level Crossing Safety Impact Assessment (LCSIA) was completed for the SH1 / Tararua Road Intersection.

The LCSIA noted some significant safety risks with the existing intersection crossing including limited space for traffic to queue, grounding out (steep up and down over the railway line itself, which can cause vehicles to ground out), layout of intersection and poor approach angles. On this basis, at-grade Option 1 was not considered feasible, as it would put more traffic through this intersection thus further exacerbating existing safety issues. Accordingly, Option 1 was disregarded from further consideration.

For Option 3, and although considered superior to Option 1, the following safety concerns were identified:

- Increased intersection complexity as there are more approach roads
- Reduced readability of intersection due to more movement types
- More acute approach angles
- Reduced ability to fix grounding out issues
- Presence of additional accessways, and
- Safety during construction as there would be a need to keep the crossing open as much as possible.

It was considered that there were fewer safety concerns for Option 2 (as compared with other at grade options). The traffic light signal evaluation showed that Option 2 was the strongest performing from an Enhanced Movements and Landscape / Visual perspective. Accordingly, Waka Kotahi resolved to continue investigating Option 2, as part of an iterative design development process, for incorporation into the Ō2NL DBC. A key part of the next stages of investigation will include discussions and collaboration with KiwiRail and HDC in relation to the detailed design of the proposed Option 2 improvements.

## 10.6 Northern Section Corridor Option Recheck Recommendations

The overall outcome of the recheck of the original 2017 MCA and 2018 IBC Report's evaluation / scores for corridor options N4, N5 and N9 (if the Tara-Ika Plan Growth Area Plan Change 4 was considered to be operative) was that there would be no material evaluation / scoring changes needed. That is, the IBC's recommended preference for Option N4 would remain [and possibly be enhanced due to improved Landscape / Visual and Social / Community / Recreation evaluations / scores for this option (as compared with the original scores)]. Accordingly, no further corridor option evaluation processes were undertaken to support the development of the Ō2NL DBC.

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<sup>61</sup> It is noted that a formal level crossing application has been agreed in principle with KiwiRail. After undertaking their own assessment, KiwiRail concluded that any grade separated solution at the SH1 / Tararua Road location would not be reasonably practicable

# CREATING COMMUNITIES

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