NZ TRANSPORT AGENCY
WAKA KOTAHI

**AGENDA NO.**
**6.3**

## BOARD PAPER

| | |
|---|---|
| **Paper no:** | 15/10/0957 |
| **Meeting date:** | 30 October 2015 |
| **Prepared by:** | Josephine Draper, Principal Transport Planner |
| **Recommended by:** | Tommy Parker, Group Manager, Highway and Network Operations |
| **Board function:** | Significant planning, investment and operational matters |
| **Subject:** | **Petone to Grenada - preferred option** |

## PURPOSE

1. To seek the NZ Transport Agency Board's approval to the preferred option for the Petone to Grenada (P2G) Link Road.

## SUMMARY

2. Project investigations have reached a point where a preferred alignment is identified for the P2G Link Road.
3. The preferred alignment is for the road to be between the existing Grenada/Tawa interchanges in the west and the existing Petone overhead bridge in the east. When additional capacity is required to the north, a managed motorway (predominantly within the existing motorway designation boundaries) will be implemented.
4. The preference will be subjected to a further assessment as part of the project's scheme assessment report. Approval for the final scheme assessment report will still need to be sought from the Transport Agency Board at its May 2016 meeting. If approved, Resource Management Act (RMA) applications are expected to be sought later in 2016.
5. A diagram illustrating the project development process for the P2G Link Road is attached at Appendix 1.

## RECOMMENDATIONS

6. That the NZ Transport Agency Board:

   a. **Approves** the preferred option for Section 1 of the P2G Link Road, known as P4;

   b. **Approves** the preferred option for Section 2 of the P2G Link Road, which is known as C (V1), Variant 1, with future-proofing option of a managed motorway between Tawa and Linden to be built within the existing motorway designation when required in the future;

   c. **Notes** that the NZ Transport Agency will manage future capacity demand on SH1 within the existing carriageway with only minor designation changes, and that the implementation of a managed motorway will only be when required; and

   d. **Approves** the delegation of the approval of the scheme assessment to the Chief Executive subject to its being consistent with the preferred option.

## BACKGROUND

7. In November 2009 the Board approved $42.2 million for investigation, design and property purchase for the Ngauranga to Linden improvements on SH1, at the same time as the Wellington Northern Corridor Roads of National Significance (RoNS) package of improvements. While the project is not part of the RoNS, it is a critical enabler to the release of benefits for the RoNS programme.

8. The project was commissioned prior to the commencement of the business case approach and due to the contractual terms with the lead consultant and the advanced development of the

project, it is being progressed through scheme assessment to consenting rather than being converted to the business case format.

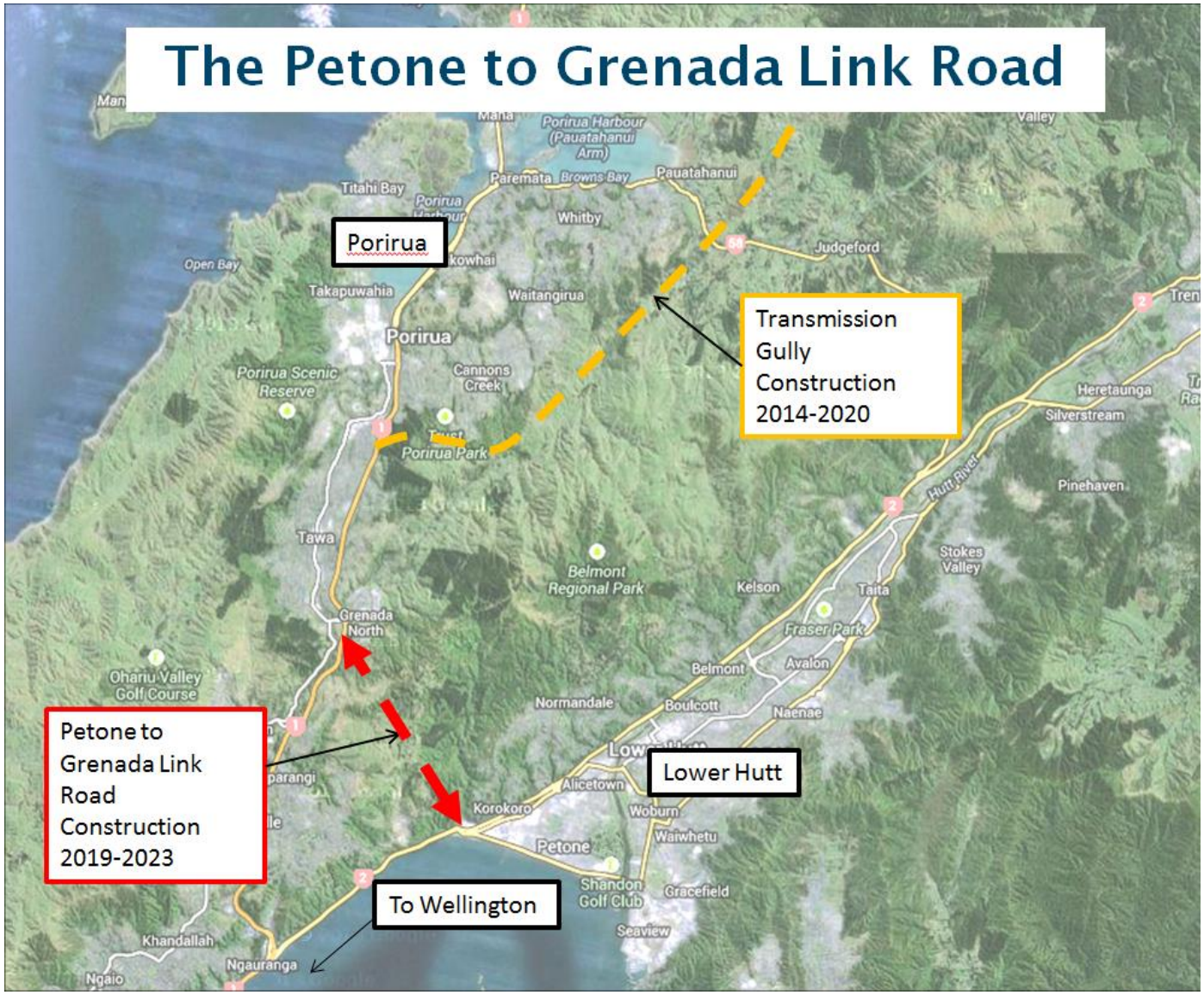
9. The P2G Link Road is proposed to be located between Petone and Tawa, to the north of Wellington City. It will provide a new east-west connection between State Highway 1 (SH1) and State Highway 2 (SH2), improving travel times on the most congested sections of the Wellington state highway network as well as significantly improving the region's resilience to day-to-day disruptions and natural events.

10. We commenced our investigation work in 2013. This work has included completing a project scoping options report and undertaking an extensive public and stakeholder engagement programme. As a result of public feedback, further options were investigated and evaluated in a multi-criteria analysis (MCA) process. As a consequence, we have now identified a preferred alignment for the P2G Link Road that is to be further refined as part of the project's scheme assessment report.

## PROJECT CONTEXT

11. We have been investigating the P2G Link Road, which is proposed to be located between Grenada/Tawa and Petone, to the north of Wellington City since 2013. The location is as set out over the page:

## Location Map



12. The P2G Link Road is funded as part of the Wellington Northern Corridor RoNS project. While not itself a RoNS project, it is operationally integral to the RoNS because it enables the benefits of the Wellington Northern Corridor to be realised through decongestion of SH1. Amongst other strategic benefits to the region, it will improve journey times on SH1 into Wellington City by around three minutes at peak times. This represents around 10% of the travel time benefits of the Wellington Northern Corridor.

13. The need for a new link road between Tawa and Petone has been identified in various strategic transport documents dating back to the 1970s. More recently the need was identified as a high priority project in the Wellington Regional Land Transport Plan 2015. It is a committed project prioritised 3 in the 2015-2018 National Land Transport Programme for the Wellington region.

14. Since commencing our investigation work we have completed a project scoping options report, an extensive public and stakeholder engagement programme, and detailed MCA report. As a consequence, we have identified a preferred alignment, which will now be taken forward for further assessment as part of the project's scheme assessment report.

15. For avoidance of doubt, we are satisfied that we have completed sufficient investigation work to be able to confirm the preferred alignment for the P2G Link Road. The work to be undertaken as part of the scheme assessment report will further refine the preferred option (e.g. refining the design of the cross section, intersections and cut slopes and the type of provision to be made for pedestrians and cyclists) within the preferred alignment corridor.

16. A summary of key features of the P2G Link Road is as follows over the page:

| Statistics about the P2G Link Road | |
|---|---|
| Length of new road | Around 7km |
| Journey time savings SH1 AM peak southbound | Around 3 minutes |
| Journey time savings SH2 AM peak southbound | Around 3 minutes |
| Journey time savings Tawa – Petone AM peak eastbound | Around 14 minutes |
| Journey time savings Petone – Tawa AM peak westbound | Around 12 minutes |
| Property impact | Around 100 land parcels and 45 owners affected (for preferred option) |
| Resilience | Significant improvement in resilience to local incidents and regional network recovery time. Time to provide road access to Hutt Valley after a major earthquake improves from several months to a few weeks. |

## PROJECT OPTION ASSESSMENT

17. In progressing this project, we have incorporated a number of lessons learned from the Basin Bridge Board of Inquiry and High Court decision, and have paid particular attention to guidance on the need for thorough alternatives assessments. An MCA process has been employed using a group of specialists in their fields to mitigate risk associated with the alternatives assessment process.

18. The P2G Link Road is split into two sections which converge at the crest of the Wellington escarpment. The first section is between Petone and the crest of the Wellington escarpment (referred to as Section 1), and the second section is between the crest of the Wellington escarpment and Grenada/Tawa (referred to as Section 2).

19. In early 2014 we engaged with the public on four short-listed alignment options for both sections of the P2G Link Road (P1 to P4 for Section 1 and A to D for Section 2). These alignment options reflected the broad corridor options identified during the scoping stage. A preferred alignment for Section 1 (P4), and two preferred alignment options for Section 2 were identified: (Option C (including widening of SH1 north of the Tawa/Grenada interchange) and Option D (including the Takapu link to Transmission Gully).

20. With the exception of some of the Section 1 variants, which are negative for resilience, a preferred route with any combined Section 1 and Section 2 option will result in significant resilience benefits, travel time improvements for journeys into and out of Wellington on SH1 or SH2 and between Porirua/Tawa and Petone through the creation of the new Link Road.

21. The public engagement programme has been high profile, with the majority of the feedback focused on the two preferred options proposed for Section 2. The options consulted on are illustrated at Appendix 2.

22. Key considerations in the Section 2 option selection are the level of service impact that the new link road would have between the Tawa/Grenada interchange and the future Transmission Gully Linden Interchanges on SH1, and environmental impact. The MCA process therefore assists in evaluating these and selecting between options.

23. Following public engagement, we then worked closely with the local and regional councils on the options we had proposed for Section 2 plus other alignment options that had been identified by the public and key stakeholders.

24. As a result of that feedback we have evaluated whether the need for capacity between the Tawa/Grenada and Linden interchanges could be met by public transport improvements and/or travel demand measures. This work was completed in mid-2015 and reported to the Wellington Regional Transport Committee (WRTC).

25. Since that time we have also evaluated the option of applying managed motorway technology to Section 2 Option C to limit future work required to increase network capacity within the currently designated carriageway. This is a suggestion WRTC initially raised in May 2014.

26. As part of the process for selecting a preferred option, the project objectives were refined and confirmed (see Appendix 3). Options were then assessed against the objectives. A strategic assessment of broad corridor options against project objectives was carried out, confirming the Petone to Grenada/Tawa corridor as the preferred broad option. The report on this process is known as the 'Strategic Options Assessment Workshop Report' and can be read at Board Books.

27. Following feedback from the WRTC, we completed an MCA process on all eight initially shortlisted options and variations on those options, totalling 29 options over the two route sections. The full 'Petone to Grenada Assessment of Alternative Routes' report, which outlines the MCA process and illustrates options can be read at Board Books. Tables showing the unweighted outcomes of the MCA are included in Appendix 4.

28. A feature of the MCA was for the MCA expert to undertake sensitivity tests by applying weightings to the 'raw' scores in order to prioritise different criteria, as follows over the page:

| Weighting system | Explanation |
|---|---|
| Business | |
| Transport | Transport and resilience |
| Built and human environment | Noise, urban design, recreation |
| Social | |
| Heritage and culture | Archaeology, built heritage, cultural |
| Natural environment | Land contamination, landscape/visual, ecology, water quality |
| Unweighted | |
| Workshop weighting | Consensus on weightings of each assessment area agreed by specialists at workshop |

**Section 1: Petone to crest of the Wellington escarpment**

29. Option P4 was identified as the preferred option for Section 1 as it scored best in respect of many environmental effects criteria and weightings (ecology, urban design, recreation, transport and cultural), including having no direct adverse impacts on the regionally significant Belmont Regional Park. P4 also scored well against the project objectives. Option P3 scores better for resilience since the recovery time from a major earthquake would be shorter than P4, but worse on all other criteria and weighting systems, notably because it would directly impact on Belmont Regional Park. The alignment for Option P4 is illustrated in more detail in Appendix 5.

30. A summary of the top three Section 1 options by each weighting system is illustrated below:

| Section 1 overall MCA ranking Summary by weighting[1] | | | |
|---|---|---|---|
| **Top three options by criteria** | **1st** | **2nd** | **3rd** |
| 1-Business | P4 | P3 | P2 |
| 2-Transport | P3 | P4 | P2 |
| 3-Built and human environment | P4 | P1 | P2 |
| 4-Social | P4 | P3 | P2 |
| 5-Culture and heritage | P4 | P3 | P2 |
| 6-Natural environment | P4 | P1 | P2 |
| 7-Unweighted | P4 | P3 | P2 |
| 8-Specialists workshop weighting | P4 | P3 | P2 |

## Section 2: crest of the Wellington escarpment to Grenada/Tawa

31. Routes based on the original Option C generally scored better than routes based on the original options A, B and D. Overall, route C(V1) Variant 1 with managed motorway is preferred (see Appendix 2) as it scored relatively well against the project objectives and a range of environmental criteria (including for example ecology, urban design and cultural).

32. Option D and its variations (the Takapu link) scored more positively for resilience because they deliver an additional alternative route between Tawa and Transmission Gully in the case of closures on SH1.

[1] Illustrations of the options are available as part of the 'Petone to Grenada Assessment of Alternative Routes', which is available at Board Books.

33. However, as noted above, any of the options will deliver significant resilience benefits, and the incremental resilience benefits associated with provision of an alternative route have been considered in the wider context of the MCA, noting that Option D was also generally inferior to Option C in terms of non-transport environmental effects (including landscape/visual and ecology).

34. The analysis also indicated that the preferred option for addressing any drop in level of service in the future between the Tawa/Grenada and Linden interchanges would be via a managed motorway predominantly within designation. The managed motorway would only be built when the need for additional capacity is confirmed by on-going monitoring of traffic volumes.

35. This approach is underpinned by recent transport modelling, which has confirmed that additional capacity is unlikely to be needed immediately following completion of the P2G Link Road. In addition, the managed motorway option will have minimal property acquisition impacts, but will be complex to construct. Therefore, the construction of the P2G Link Road between Petone to Grenada/Tawa will proceed initially, with addition of managed motorway when required at a later date.

36. A summary of the top three Section 2 options by each weighting system is illustrated over the page:

| Section 2 overall MCA ranking Summary by weighting[2] | | | |
|---|---|---|---|
| **Top Three Options by Criteria** | **1st** | **2nd** | **3rd** |
| 1-Business | C(10a,11a) | | C(10,11) |
| 2-Transport | D(23) | D(22) | D(8) |
| 3-Built and human environment | C(12a) | C(9a) | C(10a,11a) |
| 4-Social | C(10a,11a) | | C(10,11) |
| 5-Culture and heritage | C(10a,11a) | | C(10,11) |
| 6-Natural environment | C(18) | C(10a,11a) | |
| 7-Unweighted | C(10a,11a) | | C(10,11) |
| 8-Specialists workshop weighting | C(10a,11a) | | C(9a) |

## Preferred options

37. The preferred option for Section 1 is formally referred to as Option P4, while the preferred Option for Section 2 is known as C(V1), Variant 1, with managed motorway between Tawa and Linden on SH1 as a future proofing option (see Appendix 2). This provides for the link road to be between the existing Grenada/Tawa interchanges in the west and location of the existing Petone overhead bridge in the east. Modelling indicates that additional capacity may be required between Tawa/Grenada and the future Transmission Gully Linden interchanges on SH1 in the future. When this capacity is required, a managed motorway (to be located predominantly within the existing motorway designation boundaries) will be implemented.

[2] [2] Illustrations of the options are available as part of the 'Petone to Grenada Assessment of Alternative Routes', which is available at Board Books.

### Costs and benefits

38. Comparator cost estimates were developed during the scoping options process, which indicated the P2G Link Road would cost between $161million and $405 million[3] depending on the option selected. The costs, benefits and BCRs for the options are presented in Appendix 6. BCRs are presented for the combined route using either the cheapest (P1) or most expensive (P4) Section 1 option to illustrate the range. The expected BCRs including agglomeration benefits range from 3.4 to 5.1 with expected BCR for the preferred option around 3.4.

39. Incremental BCRs have also been calculated. The analysis indicated that the differences between most option BCRs were small. Therefore, costs were not considered to represent a material difference between options in the decision-making process which has instead focussed on the MCA process to differentiate between options. Details of the incremental analysis are available at Appendix 6.

## $ FINANCIAL IMPLICATIONS

40. There are no financial implications in approving the preferred alignment for the P2G Link Road. Funding for the scheme assessment report and RMA approvals will be sourced from the investigation and design funding approved for the Wellington Northern Corridor in November 2009.

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[3] Comparator cost estimates, from the 2014 scoping options report (identified as rough order costs in this report), were developed for each option and presented as a range between -30% to +30% of an estimated comparator cost. This range reflected the level of accuracy of these costs given that they were based on preliminary design information. Further comparator cost estimates for each option have since been developed. Scheme estimates, which will be based on a higher level of design, have not yet been developed.

41. Costs for the P2G Link Road remain similar to original project estimates and are affordable within the state highway programme.

## RISKS

42. Although the proposal for the P2G Link Road has been well received, the reaction for providing additional capacity between Tawa/Grenada and future Linden interchanges in Section 2 has been mixed. As such, it is expected that the decision to prefer Option C (with a 'wait and see' managed motorway proposal) will be subject to intense media and public scrutiny. We believe the process we have used to identify the preferred alignment has been robust.
43. All of the alignment options affect multiple private properties with consequent acquisition risk. However, the preferred option affects the fewest land parcels of all of the options, and therefore the least property acquisition is required.
44. The decision not to proceed with Option D (Takapu Link) may be received negatively by some key stakeholders (including Kapiti Coast Council) who have previously favoured this option from a transport and/or resilience perspective. However, there is no overall consensus between councils as to a preferred option for Section 2. We will work closely with these stakeholders to ensure they understand the reasoning for our assessment. Submissions received from Greater Wellington Regional Council and Kapiti Coast District Council, and from the Wellington Regional Transport Committee in May 2015 in response to consultation on Section 2 options are attached at Appendix 7.
45. We expect that some stakeholders will consider that the P2G Link Road will trigger the need for additional capacity between SH2 and the Seaview/Gracefield area in Lower Hutt. Some may call specifically for the Cross Valley Link (or an upgrade of Petone Esplanade) to be built as part

of the P2G Link Road. Our transport modelling has shown that the replacement of the Petone interchange will result in reduced travel times between Petone and Wellington (including along Petone Esplanade), and our recent study into transport links to Seaview indicated that the creation of a P2G Link Road does not trigger its need. We will work with Hutt City Council to resolve questions on this.

46. The implementation of a managed motorway between the Tawa/Grenada and Linden interchanges on SH1 is a possible future measure for the P2G Link Road, and will be implemented when the level of service on this section of SH1 deteriorates. However, more benefits would be gained from introducing a managed motorway for all of SH1 between the Ngauranga and Linden interchanges rather than just for an isolated section to the north of Tawa. This will need to be taken into account as part of the decision as to when to proceed with the managed motorway following construction of the Link Road itself.

47. The traffic modelling for the P2G Link Road continues to be queried by industry professionals. We are working with a modelling steering group to resolve issues. One outstanding issue to resolve is the design of the new Petone interchange and the impact of the P2G Link Road on SH2. We will be undertaking a detailed modelling exercise at scheme assessment to ensure the model is well calibrated to the satisfaction of our working group. While option selection does not affect the design or performance of the new Petone interchange, it may be necessary to consider wider mitigation measures, such as managed motorway, on SH2 (as well as on SH1) at some point in the future.

48. The MCA process has highlighted some consenting risks associated with the effects of certain options (for example the MCA indicates that consenting for Option D, and Options P3 or P2 would be challenging). The selection of the preferred options avoids the significant effects of these other routes and therefore reduces overall consenting risk.

49. Cyclists and pedestrians are a key consideration and specific cycling provision will be considered during the scheme assessment phase. However, providing for cycling on the link road will be challenging and could be expensive.

## COMMUNICATION AND ENGAGEMENT

50. We expect to announce the decision on the preferred alignment for the P2G Link Road in early to mid-November.

51. We expect to receive stakeholder and public support for the preferred alignment for Section 1 and a mixed reaction for the decision to pursue Option C for Section 2. With regards to the latter, some stakeholders will support the decision as it avoids impacting on property in Takapu Valley and along SH1. However, some stakeholders may be critical of the loss of the marginal resilience benefits from not pursuing Option D.

52. A detailed communication plan has been prepared for announcement of the preferred alignment. This focuses on moving the conversation beyond the preferred alignment to talking about the scheme assessment report and future RMA applications.

## NEXT STEPS

53. Following the announcement of the preferred alignment, we will complete the scheme assessment report. We expect to seek approval for this report from the Transport Agency Board in 2016.

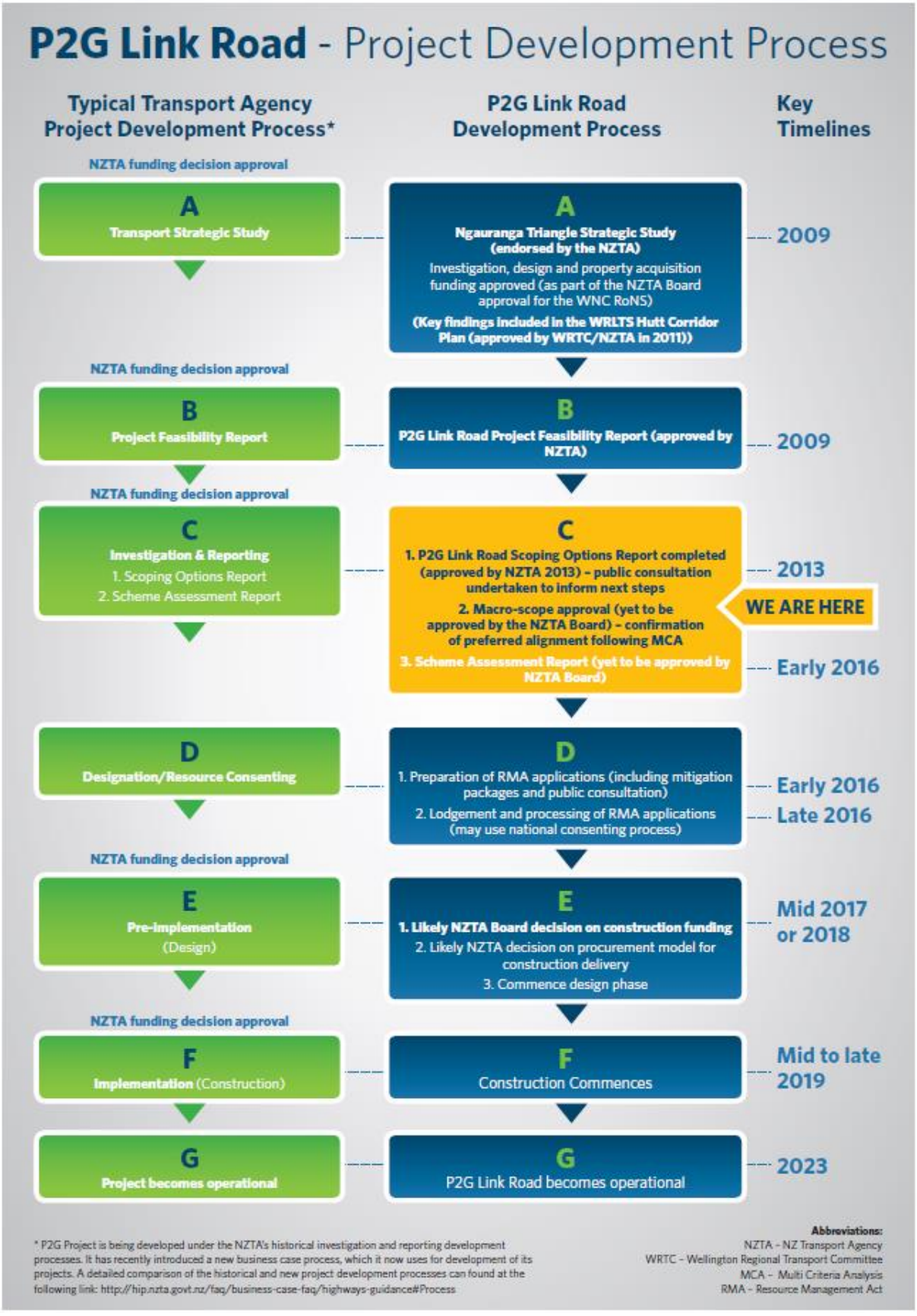
54. We expect to lodge the relevant RMA applications for the P2G Link Road in late 2016. Construction is programmed to commence in 2019.

## ATTACHMENTS

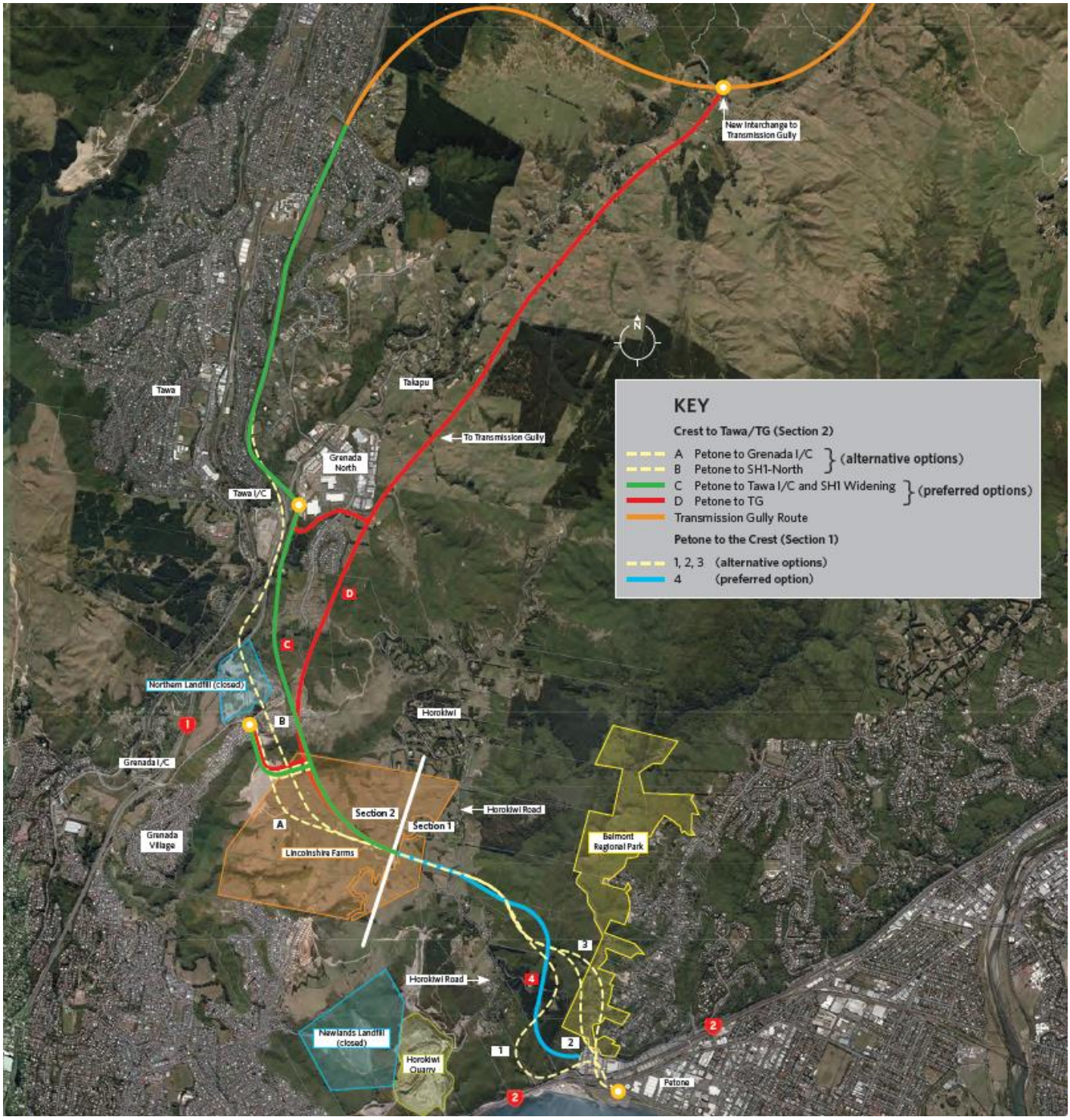
55. There are 7 attachments:

- Appendix 1 Project development process
- Appendix 2 2014 option consultation February 2014
- Appendix 3 Project objectives
- Appendix 4 MCA tables
- Appendix 5 Preferred options
- Appendix 6 Option costs and benefits
- Appendix 7 Submissions from councils and RTC (May 2015)

## Appendix 1 Project development process



# Appendix 2 Option consultation February 2014



## Appendix 3 Project objectives

The Project Objectives for the P2G Link Road are as follows:

a. To enhance local, regional and national economic growth and productivity for people and freight;

b. To improve connectivity between the lower Hutt Valley and Johnsonville and Porirua;

c. To reduce journey times and improve journey time reliability between the lower Hutt Valley, Ngauranga and Porirua, and on the Wellington state highway network;

d. To enhance safety of travel on the Wellington state highway network;

e. To enhance resilience of the Wellington state highway network; and

f. To manage the immediate and long term social, cultural, land use and other environmental impacts of the Project on the Wellington region and its communities by so far as practicable avoiding, remedying or mitigating any such effects through route and alignment selection, expressway design and conditions;

By developing and constructing a cost efficient new road alignment to expressway standards between SH2 in the lower Hutt Valley and SH1 north of Ngauranga.

## Appendix 4 MCA tables

Section 1 East of the Crest of the Escarpment - Unweighted

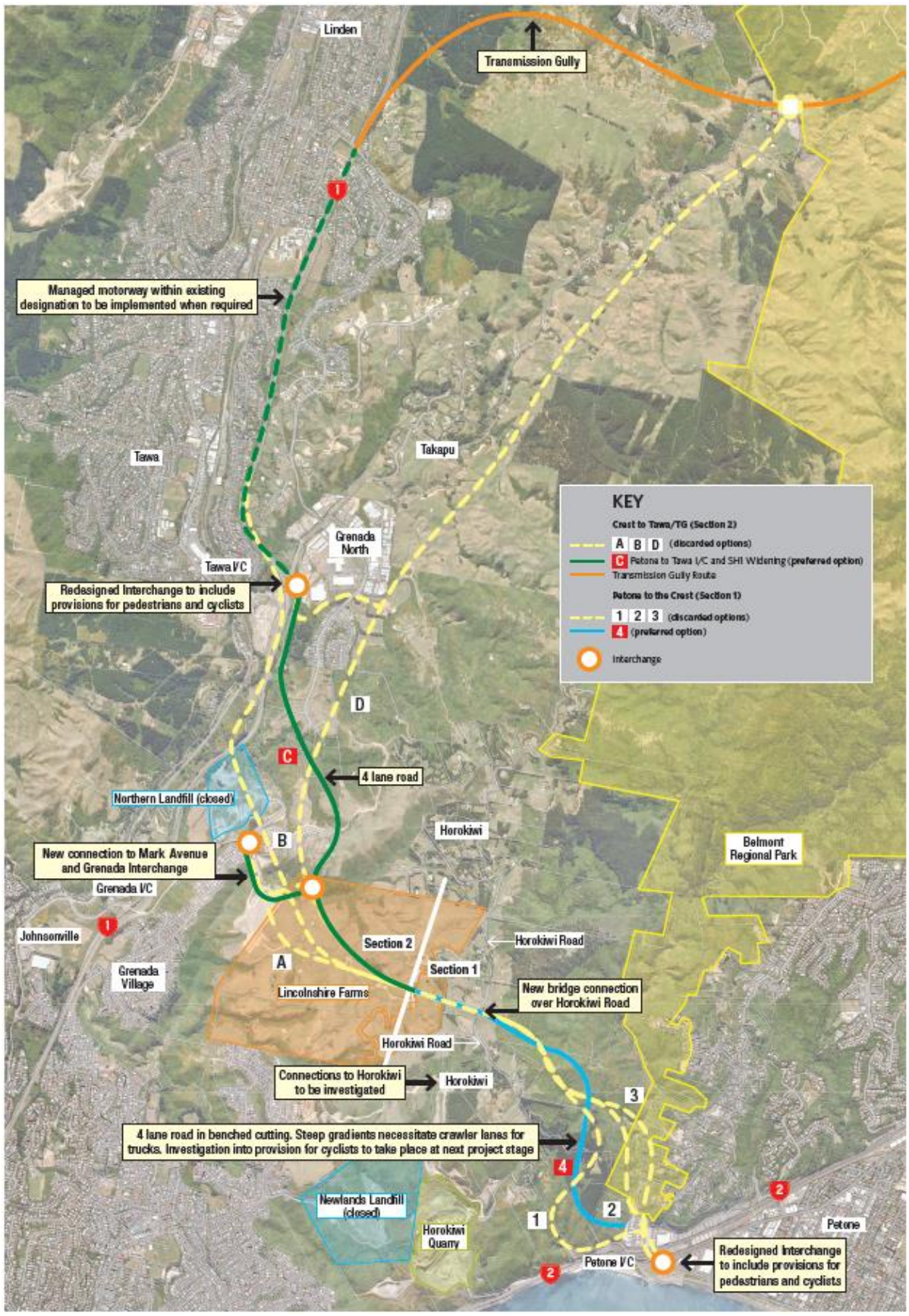
| No Weighting Applied (all individual crieria score equally at 10) | Individual MCA Criteria | Criteria Equal | 1. P1 | 1a. P1-Variant 1 | 1b. P1-Variant 2 | 2. P2 | 3. P3 | 4. P4 | Individual MCA Criteria |
|---|---|---|---|---|---|---|---|---|---|
| | | | Score | Score | Score | Score | Score | Score | |
| | | | Mitigated | Mitigated | Mitigated | Mitigated | Mitigated | Mitigated | |
| | | | We | We | We | We | We | We | |
| Business | Business | 1.00 | -1 | -1 | -1 | -1 | -1 | -1 | Business |
| Transport | Resilience | 1.00 | -3 | F | -3 | 0 | 3 | 2 | Natural Hazards and Network Resilience |
| | Transport | 1.00 | 2 | -1 | 0 | 0 | 2 | 2 | Transport |
| Built-Human Environment | Noise | 1.00 | -1 | -1 | -1 | -1 | -1 | -1 | Noise |
| | Urban Design | 1.00 | 2 | -2 | 2 | 0 | 0 | 1 | Urban Design |
| | Recreation | 1.00 | -1 | -2 | -3 | -1 | -2 | 0 | Recreation |
| Social | Social | 1.00 | -2 | -2 | -2 | -2 | -2 | -2 | Social |
| Culture and Heritage | Archaeology | 1.00 | -2 | -2 | -2 | -2 | -2 | -2 | Archaeology |
| | Built Heritage | 1.00 | 0 | 0 | 0 | 0 | 0 | 0 | Built Heritage |
| | Cultural | 1.00 | -1 | -3 | -3 | -1 | -1 | -1 | Cultural |
| Natural Environment and Contamination | Land Contamination | 1.00 | 0 | 0 | 0 | 0 | 0 | 0 | Land Contamination (potential |
| | Landscape and Visual | 1.00 | -3 | -2 | -2 | -3 | -3 | -3 | Landscape/Visual |
| | Ecology | 1.00 | 0 | 0 | 0 | -1 | -2 | 0 | Ecology |
| | Water Quality | 1.00 | -1 | -1 | -1 | -1 | -1 | -1 | Water Quality |
| | Overall scores | | -11 | F | -16 | -13 | -10 | -6 | Overall scores |
| | Ranking | | 3= | | | 3= | 2 | 1 | Ranking |
| | *Notes:* All Criteria Score 1 | | | | | | | | |

## Section 2 West of the Crest of the Wellington Escarpment - Unweighted

| No Weighting Applied (all individual criteria score equally at 10) | Individual MCA Criteria | Criteria Equal | 5. A | 6. B | 7. C | 8. D | 9. C(V1) | 9a. C(V1)-Variant 1 | 10. C(V1) MM1 | 10a. C(V1)-Variant 1 | 11. C(V1) MM2 | 11a. C(V1)-Variant 1 | 12. C(V1) No SH1 | 12a. C(V1)-Variant 1 | 13. C(V2) | 14. C(V2) MM1 | 15. C(V2) MM2 | 16. C(V2) No SH1 | 17. C Full Widening | 18. C MM1 | 19. C MM2 | 20. C No SH1 | 21. D Update | 22. D(V1) | 23. D(V2) | Criteria |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Score Mitigated We | Score Mitigated We | Score Mitigated We | Score Mitigated We | Score Mitigated We | Score Mitigated We | Score Mitigated We | Score Mitigated We | Score Mitigated We | Score Mitigated We | Score Mitigated We | Score Mitigated We | Score Mitigated We | Score Mitigated We | Score Mitigated We | Score Mitigated We | Score Mitigated We | Score Mitigated We | Score Mitigated We | Score Mitigated We | Score Mitigated We | Score Mitigated We | Score Mitigated We | |
| Business | Business | 1.00 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | Business |
| Transport | Natural Hazards and Network Resilience | 1.00 | 1 | 0 | 1 | 3 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 3 | 3 | 3 | Natural Hazards and Network Resilience |
| | Transport | 1.00 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 1 | 2 | 2 | 2 | 1 | 2 | 2 | 2 | 1 | 2 | 2 | 2 | Transport |
| Built and Human Environment | Noise | 1.00 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | Noise |
| | Urban Design | 1.00 | -2 | -2 | 0 | -2 | 2 | 3 | 2 | 3 | 2 | 3 | 2 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | -2 | 2 | 2 | Urban Design |
| | Recreation | 1.00 | 0 | 0 | -1 | -1 | -1 | 0 | -1 | -1 | -1 | -1 | 0 | 0 | 0 | 0 | 0 | 0 | -1 | -1 | -1 | 0 | -2 | -2 | -1 | Recreation |
| Social | Social | 1.00 | -2 | -2 | -2 | -2 | -2 | -2 | -1 | -1 | -1 | -1 | -1 | -1 | -2 | -1 | -1 | -1 | -2 | -1 | -1 | -1 | -2 | -2 | -2 | Social |
| Heritage and Culture | Archaeology | 1.00 | 0 | 0 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | Archaeology |
| | Built Heritage | 1.00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | Built Heritage |
| | Cultural | 1.00 | 0 | 0 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | Cultural |
| Natural Environment | Land Contamination (potential for) | 1.00 | 0 | F | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | -3 | -3 | -3 | -3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | Land Contamination (potential for) |
| | Landscape/Visual | 1.00 | -1 | -1 | -2 | -3 | -2 | -2 | -2 | -2 | -2 | -2 | -2 | -2 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -3 | -3 | -3 | Landscape/Visual |
| | Ecology | 1.00 | 0 | 0 | 0 | -3 | -1 | 0 | -1 | 0 | -1 | 0 | -1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | -3 | -3 | -3 | Ecology |
| | Water Quality | 1.00 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | Water Quality |
| | Overall scores | | -3 | F | -1 | -5 | 0 | 3 | 1 | 3 | 1 | 3 | 0 | 2 | -3 | -2 | -2 | -3 | 0 | 1 | 1 | 0 | -6 | -2 | -1 | Overall scores |
| | Ranking | | | | | | | 1= | | 1= | | 1= | | | | | | | | | | | | | | Ranking |
| | Notes: All Criteria Score 1 | | | | | | | | | | | | | | | | | | | | | | | | | |

## Appendix 5 Preferred options

Option P4 Option C (V1) Variant 1 with managed motorway



## Appendix 6 Option costs and benefits

The table below provides the preliminary costs for the Project Options. These are known as Comparator Cost Estimates or Rough Order Costs (ROCs).

### Comparator Cost Estimates (ROC)

| | Option | ROC ($m) |
|---|---|---|
| 1 | P1 | 100 (70 - 150) |
| 1a | P1 (Variant 1) | 100 (70 - 150) |
| 1b | P1 (Variant 2) | 100 (70 - 150) |
| 2 | P2 | 120 (84 - 180) |
| 3 | P3 | 120 (84 - 180) |
| 4 | P4 | 134 (94 - 201) |
| 5 | Option A | 130 (91 - 195) |
| 6 | Option B | 136 (95 - 204) |
| 7 | Option C | 120 (84 - 180) |
| 8 | Option D | 116 (81 -174) |
| 9 | C(V1) | 133 (93 - 200) |
| 9a | C(V1)-Variant 1 | 133 (93 - 200) |
| 10 | C(V1) MM1 | 155 (108 - 232) |
| 10a | C(V1)-Variant 1 MM1 | 155 (108 - 232) |
| 11 | C(V1) MM2 | 154 (108 - 230) |
| 11a | C(V1)-Variant 1 MM2 | 154 (108 - 230) |
| 12 | C(V1) No SH1 Upgrade | 101 (71 - 151) |
| 12a | C(V1)-Variant 1 No SH1 Upgrade | 101 (71 - 151) |
| 13 | C(V2) | 131 (91 - 196) |
| 14 | C(V2) MM1 | 152 (106 - 228) |
| 15 | C(V2) MM2 | 151 (106 - 226) |
| 16 | C(V2) No SH1 Upgrade | 98 (69 - 147) |
| 17 | C Full Widening | 124 (87 - 185) |
| 18 | C MM1 | 133 (93 - 200) |
| 19 | C MM2 | 132 (93 - 198) |
| 20 | C No SH1 Upgrade | 80 (56 - 119) |
| 21 | D Update Tawa I/C | 116 (81 - 173) |
| 22 | D(V1) | 117 (82 - 175) |
| 23 | D(V2) | 124 (87 - 186) |

Project Benefit Cost Ratios (BCRs) (Option P1 and Option P4 combined with Section 2 options)

| Options | | PV Costs P1 ($M) | PV Costs P4 ($M) | PV Benefits ($M) (P1 - P4) | Agglomeration Benefits ($M) (P1 - P4) | BCR (P1) | BCR (P4) |
|---|---|---|---|---|---|---|---|
| 5 | A | 146 | 167 | 336.3 | 330 | 4.6 | 4.0 |
| 6 | B | 149 | 171 | 260.1 | 330 | 4.0 | 3.5 |
| 7 | C | 139 | 161 | 332.3 | 330 | 4.8 | 4.1 |
| 8 | D | 137 | 158 | 322.7 | 330 | 4.8 | 4.1 |
| 9 | C (V1) Full SH1 Widening | 166 | 190 | 359 | 330 | 4.2 | 3.6 |
| 9a | C(V1)-Variant 1 Full SH1 Widening | 166 | 190 | 359 | 330 | 4.2 | 3.6 |
| 10 | C (V1) Managed Motorway 1 | 181 | 205 | 359 | 330 | 3.8 | 3.4 |
| 10a | C(V1)-Variant 1 Managed Motorway 1 | 181 | 205 | 359 | 330 | 3.8 | 3.4 |
| 11 | C (V1) Managed Motorway 2 | 180 | 205 | 359 | 330 | 3.8 | 3.4 |
| 11a | C(V1)-Variant 1 Managed Motorway 2 | 180 | 205 | 359 | 330 | 3.8 | 3.4 |
| 12 | C (V1) No SH1 Upgrade | 143 | 167 | 329 | 330 | 4.6 | 3.9 |
| 12a | C(V1)-Variant 1 No SH1 Upgrade | 143 | 167 | 329 | 330 | 4.6 | 3.9 |
| 13 | C (V2) Full SH1 Widening | 164 | 188 | 359 | 330 | 4.2 | 3.7 |
| 14 | C (V2) Managed Motorway 1 | 179 | 203 | 359 | 330 | 3.8 | 3.4 |
| 15 | C (V2) Managed Motorway 2 | 179 | 203 | 359 | 330 | 3.8 | 3.4 |
| 16 | C (V2) No SH1 Widening | 141 | 165 | 329 | 330 | 4.7 | 4.0 |
| 17 | C Full SH1 Widening | 159 | 183 | 359 | 330 | 4.3 | 3.8 |
| 18 | C Managed Motorway 1 | 166 | 190 | 359 | 330 | 4.2 | 3.6 |
| 19 | C Managed Motorway 2 | 165 | 189 | 359 | 330 | 4.2 | 3.6 |
| 20 | C No SH1 Widening | 128 | 152 | 329 | 330 | 5.1 | 4.3 |
| 21 | D Update Tawa IC | 153 | 178 | 366 | 330 | 4.5 | 3.9 |
| 22 | D (V1) | 154 | 178 | 366 | 330 | 4.5 | 3.9 |
| 23 | D (V2) | 159 | 183 | 366 | 330 | 4.4 | 3.8 |

Incremental Analysis

For Section 1 the transport and agglomeration benefits are identical, so no incremental BCR is necessary; the options are simply ordered by cost, ie P1, P2/P3 and P4 in that order. For Section 2 for simplicity incremental BCRs have been calculated for the four main options only, as below:

**Incremental Analysis of Section 2 BCRs**

| Base Option | Next Highest Cost Option | Incremental Costs ($M) | Incremental Benefits ($M) | Incremental BCR | Base Option for Next Step |
|---|---|---|---|---|---|
| D | C | 3.6 | 9.6 | 2.6 | C |
| C | A | 5.0 | 4.0 | 0.8 | C |
| C | B | 8.2 | -72.2 | -9 | C |

Options C and D are the most economic route options for P2G, but Option A is also very close, while Option B is poor in comparison (though it still has a positive BCR overall). Option C is slightly preferred to Option D, but this is within the margins of error for this analysis.

The incremental analysis above was undertaken on options including capacity improvements between Tawa and Linden. A separate incremental analysis (below) of SH1 widening or Takapu Link to Transmission Gully was also undertaken, indicating that the Takapu Link had an incremental BCR of 1.4 over no widening. Widening SH1 had an incremental BCR of 1.0 over no widening.

**Incremental Analysis for North of Tawa Options**

| Base Option | Next Highest Cost Option | Incremental Costs ($M) | Incremental Benefits ($M) | Incremental BCR | Base Option for Next Step |
|---|---|---|---|---|---|
| C (no SH1 widening) | D | 27.1 | 37.0 | 1.4 | D |
| D | C with SH1 | 3.8 | -6.1 | -1.6 | D |
| C (no SH1 widening) | C with SH1 | 30.9 | 30.9 | 1.0 | C with SH1 |

# Appendix 7 Submissions from councils (May 2015)

Rec 18/5/15 JT

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11 May 2015

File Ref: TP/03/29/03

Raewyn Bleakley
Regional Director Central
NZ Transport Agency
PO Box 5084
Lambton Quay
Wellington 6145

Dear Ms Bleakley

## GWRC feedback on NZTA's Petone to Grenada Road – Options north of Tawa

I am pleased to provide feedback from the Greater Wellington Regional Council (GWRC) on the proposed Petone to Grenada (P2G) Road, in particular the options north of Tawa.

GWRC's support in principle for a new east-west link between SH2 (Petone) and SH1 (Grenada) was confirmed through its submission to the NZ Transport Agency in May 2014.

However, GWRC's submission did not support the additional north-south road capacity proposed through widening State Highway 1 north of Tawa to 6 lanes or through construction of a new two-lane north-south link road through Takapu Valley. The Council sought further investigation and consideration of the range of multi-modal options for addressing the north-south congestion/capacity issues associated with the proposed P2G Road.

Since May 2014, GWRC has received several presentations from the NZ Transport Agency and GWRC officers with further detailed information on the proposed P2G Road, and the options north of Tawa.

GWRC met on the 29th April 2015 to consider a report setting out the latest modelling and analysis provided by the NZ Transport Agency in relation to the options north of Tawa, which comprise:

- **Option C2** – Widen SH1 between Tawa and Transmission Gully Interchange by adding two lanes (a total of six).
- **Option D** – Construct a new Takapu link (2 lane road) through Takapu Valley joining to Transmission Gully Motorway.
- **Option Wait and See** – No construction of any additional north-south capacity.

As a result of that consideration, I am pleased to provide feedback outlining the views of the Council on the P2G Road and options north of Tawa Interchange.

i. *GWRC reconfirmed the P2G Road as an important project for the future of the region based on an expectation that it will improve east-west connectivity, resilience, land use integration, freight efficiency, relieves severe congestion and delivers substantial economic benefits.*

ii. *GWRC notes the opportunity to use surplus fill from the P2G Road to support a seaward side option for the Wellington to Hutt Valley walking, cycling and resilience link.*

iii. *GWRC agrees to an integrated package of transport improvements, including a new Wellington to Hutt Valley walking and cycling link, a significant safety upgrade of SH58, SH2 corridor improvements and a new Cross Valley Link between SH2 and Seaview.*

Council noted in particular that the Cross Valley Link project is critical in addressing congestion and access issues on SH2 and Petone Esplanade, particularly following construction of the P2G Road, and emphasised the importance of the investigation work for the Cross Valley Link being progressed as quickly as possible.

iv. *GWRC encourages the NZ Transport Agency to bring forward sections of the P2G Road project to provide early benefits to the wider strategic road network, including a new grade separated intersection at Petone.*

v. *GWRC agrees that the preferred option for north of Tawa Interchange is 'Wait and See'.*

The Council considers that this approach, which would involve monitoring of actual traffic levels and congestion after the construction of the P2G Road, is the most appropriate response to possible future congestion on SH1 north of Tawa Interchange. This option would take into account the inherent uncertainties around transport modelling in predicting future travel patterns, many of which may depend on the speed and location of new land use development and jobs.

vi. *GWRC agrees that if increased road capacity is deemed necessary at some point in the future, that Option C2 (widening of SH1) is preferred.*

The Council's first preference, as stated in (v) above, is the option 'Wait and See'. However, if increased road capacity is deemed necessary, the greater transport benefits together with less significant landscape, character and ecological impacts mean Option C2 is preferred.

vii. *Opposes Option D (Takapu Link) and notes that this option delivers few transport benefits and has potentially significant ecological impacts.*

The Council expressed concern that environmental and ecological impacts were not given sufficient weight in the development and assessment of options. It is noted that the Porirua Stream and all its tributaries (including Takapu Stream) has been identified in the draft Natural Resource Plan as a site with significant indigenous biodiversity value, more specifically it is habitat for six or more migratory indigenous fish species, some of which are

threatened/at risk fish species. GWRC, along with Porirua City Council, Te Rūnanga o Toa Rangātira and Wellington City Council recently signed up to the Porirua Harbour and Catchment Strategy and Action Plan 2015. This seeks to protect the health of Porirua Harbour and its catchments by eliminating or minimising the adverse impacts of land uses, land management or development activities within the catchment. Option D (Takapu Link) could potentially have a significant impact on a largely untouched catchment that feeds the Porirua Stream.

viii. *Notes that the impact of a significant increase in the volume of vehicles entering Wellington city will require consideration of demand management options.*

In agreeing its preferred option 'Wait and See', the Council acknowledged that future increases in traffic flows as a result of all the new major road projects being constructed would need to be effective managed. A range of demand management tools and options should be investigated further. These may include, for example, accelerated public transport improvements, more park and ride options, parking charges or levies, and road pricing tools. GWRC noted and supported the resolutions of the Regional Transport Committee in relation to advocacy to central government for legislative changes to enable road pricing and the continued implementation of a comprehensive travel demand management programme across the region.

GWRC asks that the NZ Transport Agency takes account of this feedback when moving through the next stages of the development process for the Petone to Grenada Road project. We also ask that the NZ Transport Agency give further consideration to the most appropriate location for the interchange between the P2G Road and SH1, taking account of the feedback provided through public submissions. We note that the NZ Transport Agency will be undertaking a Multi-Criteria Analysis of all the options proposed for the Petone to Grenada Road project which involves evaluating all current and previously considered options against the project objectives before a decision on a preferred option is made.

GWRC officers have a key role in providing strategic transport advice on major projects in the region, as well as having considerable technical expertise in transport modelling. I urge you to use this expertise in the further investigation stages of this project.

Yours sincerely

**Fran Wilde**
Chair

cc. Lyndon Hammond, Regional Manager Planning and Investment - Central
Neil Walker, Acting State Highway Manager - Wellington

Kāpiti Coast DISTRICT COUNCIL

3 June 2015

Geoff Dangerfield
Chief Executive
New Zealand Transport Agency
Private Bag 6995
**WELLINGTON 6141**

**EMAIL:** geoff.dangerfield@nzta.govt.nz

Dear Geoff

I am writing to confirm the views I expressed at the recent Regional Transport Committee ("RTC") meeting on behalf of the Kāpiti Coast District regarding options around the Petone to Grenada ("P2G") link.

Once Transmission Gully ("TG") and the core P2G project are completed there is a real risk of a lack of capacity between Tawa and Grenada becoming starkly apparent. The debate at the RTC meeting focussed on three main options:

(1) Do nothing/wait and see;

(2) Increase capacity along the existing State Highway One ("SH1") between Tawa and Grenada (upgrade on line);

(3) Increase capacity by constructing a new link between TG and P2G (Takapu Valley).

Considering each of these options in turn:

1. <u>Do Nothing / Wait and See</u>

   The existing SH1 network between Wellington and Kāpiti operates very close to (or beyond) capacity on many days of the year. It requires very little to change or go wrong for the system to fail. This can be a cancellation of some rail services (e.g. tree on the line), an accident in the wrong place (e.g. truck fire) or minor localised flooding.

   Once Peka Peka to Ōtaki ("PP2O"), MacKays to Peka Peka ("M2PP"), TG and P2G are completed public expectations will be high and the length of SH1 between Tawa and Grenada will be exposed as the weakest link. The location of potential failures on the SH1 network will have moved and the risk may be slightly lower, but the consequence of failure will remain. This is completely unacceptable to us and presents a real reputational risk for the Transport Agency.

Ross Church BCA JP, Mayor Kāpiti Coast District | Private Bag 60 601 Paraparaumu 5254 | 04 296 4757 | 027 205 3600 | ross.church@kapiticoast.govt.nz

2. Upgrade on Line

While this option does address the issue of day to day capacity it does nothing to improve the number of effective road transport routes between Wellington and the Kāpiti Coast and all points further north.

What the recent flooding on 14 May demonstrated was the fragile nature and complete lack of resilience of the existing network. Upgrading on line still leaves all our eggs in one basket and is completely unacceptable for the capital city. It should be discarded on that point alone.

Another significant issue that must count against this option is the significant disruption to traffic flows that will occur while the construction work is underway. Our District is one of the few that has experienced this type of disruption. The delays caused by the construction of the MacKays Crossing over-bridge nearly ten years ago have become part of urban legend. More recently resealing of SH1 immediately north of Paekākāriki produced 2km long tailbacks every morning. Please remember this is the only practical route for our commuters to get in and out of Wellington each day.

I recall that this disruption issue was one of the factors that contributed to the Transport Agency Board deciding to construct M2PP off line rather than following the line of the existing SH1. 80 properties in Kāpiti were purchased and removed or demolished as a result.

3. Alternate Route along Takapu Valley

This is the preferred option from our District's point of view. It addresses all our concerns:

- It addresses day to day capacity issues.
- It improves transport resilience by offering an additional road link between Wellington and the Kāpiti Coast.
- It avoids delays and disruptions during the construction period.

I acknowledge that this option does affect the residents and environs within the Takapu Valley. However our experience (on a much larger scale) is that these impacts can be minimised through a sympathetic approach to mitigation through the consenting process and a proactive stance on land purchase.

I acknowledge that the decision of the RTC did not support our view but I respectfully submit that some of the Councils voting do not have our first hand understanding and experience of the issues.

I would be grateful if you could ensure your Board Members are made aware of our views as part of their decision making process.

Yours sincerely,

Ross Church BCA, JP
**MAYOR, KĀPITI COAST DISTRICT**

Rec: 18/5/15 JT

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11 May 2015

File Ref: TP/03/29/01

Raewyn Bleakley
Regional Director Central
NZ Transport Agency
PO Box 5084
Lambton Quay
Wellington 6145

Dear Ms Bleakley

## Wellington Regional Transport Committee feedback on NZTA's Petone to Grenada Road – Options north of Tawa

As you will be aware, the Wellington Regional Transport Committee (RTC) met on 9 March 2015 and considered the investigation work done on the Petone to Grenada Road over the past 12 months. At that meeting the RTC agreed to support the Petone to Grenada Road as part of a package of transport improvements, including a new Wellington City to Hutt Valley walking and cycling link, a significant safety upgrade of SH58, SH2 corridor improvements and a new Cross Valley Link between SH2 and Seaview.

The RTC also requested that the NZ Transport Agency prepare a detailed report on the results of analysis undertaken in relation to the options north of the Tawa Interchange, and report this back to the RTC.

The RTC subsequently met on the 28th April to discuss the further modelling and analysis information provided by the NZ Transport Agency in relation to the options north of Tawa, which comprise:

- **Option C** – Widen SH1 between Tawa and Transmission Gully Interchange by adding two lanes (a total of six).
- **Option D** – Construct a new Takapu link (2 lane road) through Takapu Valley joining to Transmission Gully Motorway.
- **Option Wait and See** – No construction of any additional north-south capacity, but with monitoring of actual traffic flows and congestion levels post construction of the Petone to Grenada Road.

After consideration of the further information provided, the RTC resolved to provide the following feedback to the NZ Transport Agency:

- The RTC agrees that there are forecast congestion impacts on State Highway 1 between the Tawa Interchange and the future Transmission Gully Motorway Interchange after the construction of the Petone to Grenada Road, but that the timing and severity of these is unknown.
- The RTC supports the investigation of demand management tools that might mitigate the forecast congestion and request that this be reported back to the Committee.
- The RTC agrees that if/when increased road capacity is deemed necessary, Option C (Widening of State Highway 1) is preferred.
- The RTC acknowledges that individual councils may submit separately to NZTA on this matter.
- The RTC notes that Greater Wellington Regional Council is investigating a direct public transport link between Petone and Tawa/Porirua using a new Petone to Grenada Link Road and supports this investigation.
- The RTC reinforces the need for the Cross Valley Link Road and agrees that it needs to be considered with the Petone to Grenada Road package to ease the additional traffic movements in the Hutt Valley.

The RTC asks that the NZ Transport Agency takes account of this feedback when moving through the next stages of the development process for the Petone to Grenada Road project.

We also support the NZ Transport Agency undertaking a Multi-Criteria Analysis of all the options proposed for the Petone to Grenada Road project, evaluating all current and previously considered options against the project objectives before a decision on a preferred option is made.

Yours sincerely

**Fran Wilde**
Chair of the Regional Transport Committee

cc. Lyndon Hammond, Regional Manager Planning and Investment - Central
Neil Walker, Acting State Highway Manager - Wellington