

**BEFORE THE TARANAKI REGIONAL COUNCIL AND NEW PLYMOUTH
DISTRICT COUNCIL**

MT MESSENGER BYPASS PROJECT

In the matter of the Resource Management Act 1991

and

In the matter of applications for resource consents, and a notice of requirement by the NZ Transport Agency for an alteration to the State Highway 3 designation in the New Plymouth District Plan, to carry out the Mt Messenger Bypass Project

**STATEMENT OF EVIDENCE OF PETER ANTHONY ROAN
(ASSESSMENT OF ALTERNATIVE OPTIONS: MCA PROCESSES)
ON BEHALF OF THE NZ TRANSPORT AGENCY**

25 May 2018

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QUALIFICATIONS AND EXPERIENCE

1. My full name is Peter Anthony Roan. I am a Principal of the firm Tonkin & Taylor Ltd, Environmental & Engineering Consultants, and hold the position of Discipline Director of Planning. I lead the Company's Resource Management Planning team and have been employed by Tonkin & Taylor for 25 years.
2. I hold the qualifications of BSc and MSc (1st Class Honours) from the University of Auckland. I am an Associate member of the New Zealand Planning Institute and a member of the Resource Management Law Association.
3. I have over 27 years' experience in resource management planning and environmental management and have worked on a wide range of resource management consenting projects. Much of my career has been spent managing the Assessment of Effects on the Environment ("**AEE**") process for development related projects and the associated designation and resource consent approvals process. I have been involved in leading and providing expert technical inputs on infrastructure related projects across a broad range of sectors, including the transportation, water and wastewater, energy, local government, defence and land development sectors.
4. I have led or been involved in the assessment of alternatives process for infrastructure projects as follows:
 - (a) I led the assessment of alternatives process to confirm the route alignment and construction sites for Watercare's Central Interceptor project, a 13 km long tunnel under the Auckland Isthmus;
 - (b) I led the assessment of alternatives process to confirm the location of the Army Bay wastewater discharge and outfall associated with Auckland's third largest wastewater treatment plant;
 - (c) I led the assessment of alternatives process to confirm the route alignment and construction sites for Watercare's Project Hobson, a 3 km long tunnel under Parnell, Remuera and Orakei in Auckland;
 - (d) I led the assessment of alternatives process to confirm the location of Auckland Transport's Onehunga Rail Station, on the re-livening Onehunga Branch line;
 - (e) I provided expert alternatives assessment inputs and technical review throughout the assessment of alternatives process for selecting Watercare's new western water treatment plant;
5. I confirm that I have read the 'Code of Conduct' for expert witnesses contained in the Environment Court Practice Note 2014. My evidence has been prepared in compliance with that Code. In particular, unless I state otherwise, this evidence is within my sphere of expertise and I have not omitted to

consider material facts known to me that might alter or detract from the opinions I express.

BACKGROUND AND ROLE

6. In March 2017, the New Zealand Transport Agency ("**Transport Agency**") appointed an Alliance to progress the design (including options assessment), consenting and construction of the Mt Messenger Bypass Project ("**Project**") to improve the section of State Highway 3 ("**SH3**") between Ahititi and Uruti, to the north of New Plymouth. The Alliance includes the Transport Agency, Downer Construction, Heb Construction, Opus International Consultants, and Tonkin and Taylor (my employer).
7. I have been involved in the Project since early 2017 and hold the role of Planning and Environment Manager in the Alliance. In this role I have coordinated and led the route selection / assessment of alternatives process, which has involved assisting with developing options, developing the multi-criteria analysis ("**MCA**") assessment methodology, facilitating the two expert assessment MCA workshops and assessment process for the longlist route options assessment (also referred to as "MCA1") and shortlist route options assessment (also referred to as "MCA2"). I reviewed the outcomes of the assessments, applied weighting to sensitivity test the option evaluation process and provided recommendations on the options to the Transport Agency.
8. I am also the lead author of the AEE report and coordinated preparation of the supporting documentation, as I have outlined in my other brief of evidence.
9. I have been based in the Alliance Project office in Wellington since March of 2017. I am very familiar with the area that the Project covers and the State Highway and local roading network in the vicinity of the Project. I have visited the site and the wider area around Mt Messenger on numerous occasions.
10. In preparing this evidence, I have read the submissions lodged in relation to the Project.

SCOPE OF EVIDENCE

11. The purpose of this statement of evidence is to discuss the MCA assessments that were carried out in 2017 as a key part of the Transport Agency's assessment of alternative options for the Project. My evidence addresses:
 - (a) The statutory context for the consideration of alternatives;
 - (b) An overview of the methodology adopted for the MCA process
 - (c) The 2017 "longlist" MCA assessment;
 - (d) Steps taken by the Transport Agency and Alliance following the longlist MCA process and leading into the 2017 "shortlist" MCA assessment;

- (e) The 2017 shortlist MCA assessment;
 - (f) Steps taken following the shortlist MCA assessment, and the Transport Agency's decision to pursue the Project in the form set out in the consent applications and Notice of Requirement (“**NOR**”); and
 - (g) Responses to the section 42A reports and submissions in respect of the MCA assessments.
12. I have prepared a separate statement of evidence that addresses the environmental effects of the Project (relying on the evidence provided by other witnesses) and the proposed conditions and management plans for the Project.
13. In preparing this evidence I am relying in particular on the following statements of evidence:
- (a) The evidence of Mr Rob Napier (on behalf of the Transport Agency) in respect of defining the objectives for the Project and outlining how the outcomes of the MCA assessment have informed decision making of the Transport Agency on the preferred option;
 - (b) The evidence of Mr Ken Boam in respect of the options design development process and the process of refinement of the shortlist options;
 - (c) The evidence of Mr Bruce Symmans in respect of the geological and associated geotechnical engineering considerations; and
 - (d) The evidence of Mr Milliken in respect of constructability issues.

EXECUTIVE SUMMARY

14. My involvement with the assessment of alternatives commenced in March 2017. I have been responsible for the designing and co-ordinating the MCA of the corridor options for the Project and providing an analysis of the results of the options assessment by the various subject matter experts.
15. A two-stage MCA process has been undertaken to consider and evaluate options for the Project, comprising a longlist and shortlist assessment process. The MCA methodology has been consistent across the longlist and shortlist assessment. In summary, the process has comprised the following steps:
- (a) generation of options to be evaluated by subject matter experts;
 - (b) development of assessment criteria by which the corridor options would be evaluated in both the longlist and shortlist assessments (i.e. a two-step evaluation process was applied);

- (c) the application of a consistent scoring system by which all criteria would be assessed (providing for both positive and negative impacts);
 - (d) specialist briefing on the options and scoring methodology, and subsequent expert scoring of options;
 - (e) workshop(s) to assess and evaluate the options against the consistent scoring criteria and identify positive and adverse effects;
 - (f) analysis of the options assessment, including weighting and sensitivity analysis; and
 - (g) reporting of the MCA outcomes and presentation of results to the Transport Agency as the decision maker responsible for selection of the preferred option.
16. This process has been used to evaluate 24 corridor options (the longlist evaluation) to identify a shortlist of five corridor options (the shortlist evaluation) and then to further evaluate that shortlist. The process was designed to be repeatable through the two step evaluation process, and enable transparency in scoring and analysis
17. In my opinion the alternatives assessment process has been robust, consistently applied between the longlist and shortlist stages, is transparent in the scoring given to options and the reasons for scoring, and was and is repeatable. It has involved subject matter experts relevant to the effects of the Project, including scoring of cultural matters by Ngāti Tama representatives. The process has informed the Transport Agency's decision making to help identify its preferred option for the Project.

STATUTORY CONTEXT

18. The consideration of alternative sites, routes and methods is relevant to both the NOR and the applications for resource consent for the Project. The relevant Resource Management Act ("**RMA**") requirements are discussed below.

Section 171(1)(b): NOR

19. Section 171(1) of the RMA provides that a territorial authority, when considering the NOR and any submissions received, must "*subject to Part 2, consider the effects on the environment of allowing the requirement, having particular regard to*" a number of listed matters, including (under s171(1)(b):

"whether adequate consideration has been given to alternative sites, routes, or methods of undertaking the work if -

- (i) the requiring authority does not have an interest in the land sufficient for undertaking the work; or*

(ii) *it is likely that the work will have a significant adverse effect on the environment."*

20. As identified by Mr Napier in his evidence, the Transport Agency does not at this time have all the property interests necessary to allow it to undertake the work. It is likely that the Project will have significant adverse effects on the environment (before mitigation and offsets are taken into account). This means New Plymouth District Council ("**NPDC**") is required to have particular regard to the adequacy of the consideration of alternatives by the Transport Agency.¹
21. In my opinion, the alternatives that need to be considered by the Transport Agency are those that are within its powers to undertake. The alternatives have focused on significantly improving the section of SH3 between Ahititi and to the north of Uruti, which is the scope of the Project being undertaken by the Transport Agency. The process for assessing these alternatives is presented in my evidence below.

Resource consent applications

22. Schedule 4 of the RMA requires that alternative locations or methods of undertaking an activity be described, where the proposed activity is likely to have any significant adverse effects on the environment. In my opinion, the Transport Agency has met this requirement when carrying out its consideration of alternative options for the NOR, as discussed below.
23. In addition, s105 of the RMA requires decision-makers on applications for discharge permits to have regard to matters including *"any possible alternative methods of discharge, including discharge into any other receiving environment."*
24. Discharge permits are being sought in respect of stormwater runoff from earthworks; and the discharge of dust during the construction of the Project. Detailed consideration has been given to methods for addressing any potential adverse effects of these discharges, and appropriate methods have been adopted (including through design and construction methods (refer Sections 4 and 5 of the AEE) and construction management plans (refer Section 10 of the AEE and Volume 5 of the Application, and my other statement of evidence) to ensure effects are appropriately managed.
25. The statutory assessment of the Project is addressed in the evidence of Mr Sam Dixon.

OVERVIEW OF THE 2017 MCA METHODOLOGY

26. In 2016, in the previous phase of the Project, the Transport Agency carried out an investigation into possible options for bypassing the Mt Messenger section

¹ For this Project, the hearing commissioner will be acting on behalf of NPDC in this respect.

of SH3. Nineteen options were considered through a MCA process. The 2016 options assessment built on earlier options assessment work completed by Transit New Zealand (the Transport Agency's pre-cursor organisation) in 2002, and considered a range of potential options (both 'online' improvements within the current SH3 designation, and bypass options).

27. It is my understanding that the 2016 options assessment work was carried out in respect of options with a lower level of design development compared to the 2017 MCA process, was largely desktop based, and was without cultural scoring of options.
28. With the appointment of the Mt Messenger Alliance in March 2017, it was recognised that further, more detailed assessment of alternative options for the Project was required.
29. Given the number of possible route options for the Project and complex considerations involved, in my opinion, MCA provided a useful and robust tool to aid in distinguishing between alternative options.
30. MCA is essentially a decision support tool, enabling options to be scored in a transparent and independent fashion against predetermined assessment criteria. The process assists in assessing the relative merits of options, making explicit the key considerations and the values attributed to them. The process generates a score for an option, relative to other options (with sub-scoring for selected groupings of criteria also possible), from which it is possible to rank options in relation to each other. It is possible to apply weightings to score to either factor their importance (or not) in the assessment process, and also to apply sensitivity testing (using weightings) to test for the sensitivity of scoring results to certain criteria.
31. As I note, MCA is a tool to support decision making. Ultimately, the Transport Agency as requiring authority is responsible for selecting the preferred option. That decision should take into account the results of the MCA, in conjunction with any other considerations the Transport Agency considers to be relevant (including in this case investment levels required for each option).
32. With that overall decision-making process in mind, the MCA (and my reporting on the MCA) did not necessarily seek to identify a single "best" performing option. Even if it did, the Transport Agency, as requiring authority, was not required to choose the "best" performing option from the MCA.
33. The results of the longlist and shortlist MCA processes are reported on in detail in the Multicriteria Analysis: Longlist Report ("**Longlist Report**") and Multicriteria Analysis: Shortlist Report ("**Shortlist Report**") included in Volume 4 of the Application materials. Section 6 of the AEE provides a shorter summary.

The 2017 MCA Methodology

34. Alternative routes for bypassing the Mt Messenger section of SH3 were assessed utilising a MCA process. Central to that assessment process has been a detailed two-stage MCA process carried out in 2017, comprising:
- (a) an initial assessment of 'longlist' options to develop a shortlist (MCA1); and
 - (b) a subsequent assessment of a refined list of 'shortlist' options to support a decision on a preferred option (MCA2).
35. To ensure consistency of approach and repeatability for the MCA assessment, the same overall MCA methodology was applied in the longlist and the shortlist stages. In summary, the methodology for the alternatives assessment process has involved:
- (a) generation of options to be evaluated by subject matter experts;
 - (b) development of assessment criteria by which the corridor options would be evaluated in both the longlist and shortlist assessments (i.e. a two-step evaluation process was applied);
 - (c) the application of a consistent scoring system by which all criteria would be assessed (providing for both positive and negative impacts);
 - (d) specialist briefing on the options and scoring methodology, and subsequent expert scoring of options;
 - (e) workshop(s) to assess and evaluate the options against the consistent scoring criteria and identify positive and adverse effects;
 - (f) analysis of the options assessment, with expert planning analysis, including weighting and sensitivity analysis; and
 - (g) reporting of the MCA outcomes and presentation of results to the Transport Agency as the decision makers, responsible for selection of the preferred option.
36. The MCA methodology is summarised in the following paragraphs.

Generation of the longlist of route options

37. Mr Boam's design team developed options for MCA assessment, as noted in his evidence. These comprised 11 route corridors to the west and east of the current SH3 alignment (the offline options), along with two route corridors that were located largely within the existing SH3 alignment and Transport Agency landownership and SH3 designation (the online options). As has been described in the Longlist Report, designs for each option were developed to a

sufficient level to enable an appropriate understanding of the potential impacts of each option to be assessed.

38. For each of the 11 offline corridors, two different design approaches were developed (for the same corridor):
 - (a) an 'earthworks' option, which relied on cuts and fills to cross valleys and ridges, based on the assumption that cut and fill options would be cheaper and should therefore be tested through the MCA process; and
 - (b) a 'structures' option, utilising a combination of bridges and tunnels to avoid or minimise effects on the valleys and ridges.
39. This effectively meant that 22 offline options were established at the longlist stage (structural options carried a 1 suffix, e.g. A1, while earthworks options were suffixed 2, e.g. B2).
40. Two online options were assessed as part of the longlist MCA process (Options Z2 and Z4). Both options involved a series of bridges and a tunnel.
41. In total 24 route options were considered at the longlist stage, as shown on Figure 1 (attached to my evidence as **Attachment 1**).

Development of assessment criteria

42. Assessment criteria were developed across a range of environmental, social, cultural and constructability subject areas. I developed and selected the criteria taking into consideration relevant statutory matters, the Transport Agency's project objectives, the likely effects of the Project, and experience from other projects.
43. For the MCA1 assessment, nine assessment criteria were used, covering the following key environmental and transport issues:
 - (a) constructability: the difficulty of constructing the option;
 - (b) transport;
 - (c) resilience: major event resilience including instability, earthquake, liquefaction and lateral spread and flood and storm damage;
 - (d) landscape;
 - (e) historic heritage: focussing on archaeology in particular;
 - (f) community: at the longlist stage, this was a high-level assessment of impacts on known recreational activities in the area and 'way of life' for people directly impacted;
 - (g) property: focussing on the extent and nature of property that would need to be acquired for each option;

- (h) ecology; and
 - (i) cultural heritage: impact on cultural heritage and values.
44. For the MCA2 assessment, the same criteria were used, with the following exceptions:
- (a) The ecology criterion from MCA1 was split into two separate criteria: terrestrial ecology and water environment. This was a result of the MCA1 process highlighting that different routes tended to have different levels of effects on the terrestrial and water environment; and also as more information was available on effects on the water environment at the shortlist stage (including specialist erosion and sediment control inputs).
 - (b) The community criterion was adjusted to provide for input from recreation, social and noise / vibration assessments. Sub-criteria scores were provided by experts in each of those separate subject matters, with an overall community criterion score then agreed between those experts.

Development of the scoring methodology

45. Subject matter experts were appointed to assess and score each of the options at longlist and shortlist stages. Experts were provided with a 9 point scale (+4 to -4, plus 'fatal flaw'²), based on the level of effects (adverse or positive) and asked to apply expert judgement to assess and score each option in relation to the relevant criteria. The same scoring approach was adopted for the MCA1 and MCA2 assessments.

Specialist briefing

46. The subject matter experts were all provided with an information pack outlining the corridor options and the scoring methodology (this briefing material is provided in Appendix B of the Longlist Report and Shortlist Report).

Assessment of routes against criteria

47. The experts then assessed each option against the criteria relevant to their area of expertise, and provided an overall score and recorded reasons for the given score.

MCA workshops

48. Scores were presented and critically examined at a two-day MCA workshop (the overall two-step process involved two, two-day workshops, the first for MCA1 and the second for MCA2). At the commencement of the workshops

² The scoring scale provided for a "fatal flaw" negative score. This score was to be used only where the expert considered that there are unacceptable adverse effects associated with the option, and that there was no reasonable way to appropriately avoid, remedy or mitigate (including through offsetting) those effects.

the engineering designers provided a detailed run-through of each option, which provided an opportunity for clarification / confirmation of the nature of all the options for the experts in assigning their final scores. Each expert presented their assessments, including their scores for each option, and fielded any questions from other attendees. While discussion and challenge of scoring within each workshop was encouraged, each expert was responsible for confirming their scoring of options.

49. Importantly, Ngāti Tama representatives attended both MCA1 and MCA2 workshops and provided scores for the cultural heritage criterion.

Analysis and weighting of scores

50. By adding the scores assigned by the experts for each criteria, an overall total 'raw' score was arrived at for each option.
51. The raw scores were also subject to three additional weighting systems (which I developed) as follows:
 - (a) an overall or RMA weighting. This was developed from analysis of the RMA and statutory documents and an eye to the RMA consenting process and the weight likely to be given to relevant statutory provisions. This weighting took particular account of the key matters reflected in the provisions of Part 2 of the RMA, the relevant statutory documents and the Project objectives;
 - (b) an 'environmental' sensitivity analysis weighting, which prioritised those criteria that relate most directly to effects on the natural environment, including as represented in effects on cultural heritage values; and
 - (c) a 'transport' sensitivity analysis weighting, which prioritised those criteria that relate most directly to the transport performance of the route.
52. The intention of the weightings was to apply three varying but realistic perspectives to the relative importance of the various criteria, to test the sensitivity of the options scoring and ranking. This provided for further comparative analysis of the performance of the various options, all of which in turn gave the Transport Agency additional information to base its final decision on.

Presentation of MCA results

53. Details on the MCA methodology, the options, expert assessments and scoring, and the analysis and findings from the MCA process are presented in the Longlist Report and Shortlist Report. A shorter summary is set out in section 6 of the AEE.

54. Subsequent to the longlist and shortlist MCA assessments, design refinements were made to selected options to test engineering. Costings for all options were also prepared as part of this process.
55. The results of the longlist and shortlist MCA process, the design refinements and estimated costs were provided to the Transport Agency, as the decision makers in the selection of the preferred option for the Project.

THE 2017 LONGLIST MCA ASSESSMENT

56. The 24 longlist options summarised above (refer to Figure 1 in **Attachment 1**) were evaluated against the pre-established assessment criteria in a two-day MCA workshop held on 11-12 May 2017 (MCA1). The workshop was attended by the experts responsible for carrying out the assessments and providing the scores for each criterion, along with members of the project team (including designers), and Ngāti Tama representatives to provide scores for the 'cultural heritage' criterion.
57. My role was to facilitate the workshop with the assessment of options against each criteria led by the nominated subject matter expert.³ Following the workshop, I was responsible for tallying the scores for each option to generate the overall raw scores.
58. As described above, I then applied weightings to test sensitivity. The detailed results of the longlist assessment, including all scores assigned to all options, are set out in the Longlist Report and summarised in Section 6.3.3.3 of the AEE.
59. The key conclusions from the longlist assessment process were:
 - (a) the two online options (Z2 and Z4) were the two best performing options overall, providing a strong basis on which to consider at least one online option in the shortlist MCA process;
 - (b) for all corridors, the earthworks options performed more poorly than the structures options, due largely to the higher level of adverse environmental effects the earthworks options would bring;
 - (c) a group of offline 'structures' options performed relatively well. A1, C1, D1 and E1 received the 3rd - 6th best sum totals of scores (in some order) under all weightings (and raw scores). These options provided a mix of routes to both the west and east of the existing SH3 corridor for potential consideration through the shortlist MCA process;
 - (d) the other offline structures options (B1, F1, G1, H1 and K1) did not score as well. However, as none of those options received a fatal flaw score, it

³ I also prepared and presented the analysis and scoring for the "community" criterion.

was considered that it would not be unreasonable to take one or more of these options forward to the shortlist;

- (e) nine of the options received a fatal flaw score under one or more of the ecology, cultural heritage, and landscape criteria. This included all four of the far western and coastal options (J1, J2, L1, L2), as well as the 'earthworks' options A2, B2, C2, F2, and G2. Options receiving a fatal flaw score were discarded from further consideration based on those unacceptable adverse effects; and
- (f) of the offline earthworks options that did not receive fatal flaw scores, options E2 and H2 performed better than D2 and K2.

STEPS FOLLOWING THE LONGLIST MCA

- 60. The outcomes of the MCA1 workshop and the scores assigned for options were analysed further by the Project team, along with other factors including cost estimates prepared for each of the longlisted options, to enable the establishment of a shortlist of options. This further analysis was not part of the expert MCA process (in particular, I note that cost was specifically and deliberately not part of the MCA assessment of the options).
- 61. In total, five options were subsequently taken through to the shortlist stage. It is important to note that in shortlisting the options, further refinement of the option corridors was completed by Mr Boam and the design team. Part of this refinement process also involved input from Mr Conrad O'Carroll, a Ngāti Tama runanga member who has local knowledge of the land to the west of SH3. The shortlisted options are summarised as follows and shown in Figure 2 (refer **Attachment 2**):
 - (a) Option A: was a refined version of longlist Option A1. Mr Boam's design team refined the option to account an area of geotechnical instability on the southern ridgeline above the Waipingao Valley identified post MCA1.
 - (b) Option E: was a refined version of longlist Option E1. The refinements to this option included the addition of a bridge structure to avoid effects on the high-value Mimi swamp forest.
 - (c) Option F: was a refined version of longlist Option F1. Between the MCA1 and MCA2 workshops, the design team carried out further refinements to this option.
 - (d) Option P: this option was established with input from Mr O'Carroll and assessment by Mr Boam. The option comprised a combination of the B, F and G corridors, which traversed similar routes. While close to Option F, this option avoided a stand of podocarps on the southern ridgeline of the western Parininihi land, and was deemed worthy of further consideration.

- (e) Option Z: was the 'online' option for the shortlist assessment. Option Z2, Z4, and the D corridor were represented in the shortlist through this option. Work was carried out by Mr Boam's design team to refine this online option prior to the shortlist options assessment.
62. These shortlisted options provided a representative selection of the better performing options from the longlist options assessment process. The shortlisted options also provided for a geographic spread, while omitting the poorer performing western most (J, L) and eastern most (K) corridors.
63. It is my opinion that, at the end of the longlist assessment process and further refinement work described above, the longlist options had been examined in a robust manner and that the shortlisted corridor options represented an appropriate range of options to be taken forward for further assessed in the shortlist stage.

Consultation on shortlisted options

64. In mid-June 2017, public consultation was undertaken to gain input from local communities and key stakeholders on the five shortlisted options. That process is described in Section 7.5.4 of the AEE and in the evidence of Mr Napier. The key themes from the feedback included:
- (a) a strong focus on travel reliability, safety, and long-term resilience;
 - (b) concern about environmental (particularly native bush and wetlands) and cultural impacts; and
 - (c) the economic benefits of a new route.
65. Public feedback was broadly in favour of Option A (western option),⁴ with the general consensus of views being that this option provided the best transport outcome. While the feedback from this engagement process was shared with workshop participants in the shortlist MCA assessment, it was not directly used in the scoring of options in the shortlist MCA process.

THE 2017 SHORTLIST MCA ASSESSMENT

66. The shortlisted options were subject to an assessment process using the same methodology applied in the longlist stage. A two-day MCA workshop was held on 26 - 27 June 2017 (MCA2). The workshop was attended by the experts responsible for carrying out the assessments and providing the scores for each criterion, along with members of the project team (including designers), and Ngāti Tama representatives to provide scores for the 'cultural heritage' criterion. Two representatives from the Department of Conservation also attended the MCA2 workshop as observers.

⁴ I note that a different system of identifying the options was used in the public consultation process as that used in the MCA process. For simplicity I have referred to the MCA2 lettering, which is that "Option A" was the furthest west option.

67. As for the longlist assessment process, my role was to facilitate the MCA2 workshop and then, following the workshop, tally scores and apply weightings to test sensitivity and establish an overall weighted score. The shortlisted options were examined using the same criteria (with the refinements to the ecology and social criteria, as outlined above) and the same weightings used in MCA1. In this regard I note that there is an error in the recorded scoring sheets in Appendix M of the Shortlist report, where MCA1 weightings for some of the scoring criteria in the 'Environment' and 'Transport' sensitivity testing were not correctly transposed. The corrected sheets are attached to my evidence as **Attachment 3**.
68. The detailed results of the assessment, including all scores assigned to all options, are set out in the Shortlist Report and in Section 6.3.3.3 of the AEE. Scores for the shortlisted options are presented in Table 1 and 2 in **Attachment 4**. Option rankings under the various weightings were not affected by the transposition error noted above.
69. As an overall comment, I would note that the tallied scores for four of the five options were relatively close (with three of the five options receiving equal best raw score totals).⁵ This is perhaps not surprising given the shortlist MCA process followed an earlier, fulsome longlist process, where a range of clearly inappropriate options were subsequently filtered out.
70. In the Shortlist Report, I presented a summary of the performance of each of the five options in the shortlist MCA process. I have attempted to capture some of the key points below:
- (a) While **Option A** received the best transport score, it consistently scored the worst out of all the options on overall scores in MCA2. In particular, Option A scored relatively poorly for Landscape, Resilience, Property, Constructability, Ecology and Cultural scores. These scores reflected the location of Option A being furthest into the sensitive Waipingao Valley. Option A would bisect a regionally significant landscape area, and would disrupt the southern ridgeline landscape feature. Additionally, Option A scored relatively poorly for Resilience and for Constructability due to a significant landslide feature identified after MCA1 on the southern side of the Waipingao Valley, and construction of the 600m long bridge with the southern abutment adjacent to the landslide. Ngāti Tama's cultural scoring indicated this option would have a very high / very significant adverse effect.
 - (b) **Option F** ranked consistently fourth on raw score and on all weighted scores. The overall raw and weighted scores for Option F are relatively close to Options Z, E and P; and better than Option A. Option F has a very similar alignment to Option P, with the exception that F has a large fill in the southern valley above the existing SH3. The fill area in the

⁵ Option A performed substantially worse than the other options.

valley and the adjacent land in the Waipingao Valley results in the loss of substantially more significant trees than Option P. Overall, Terrestrial Ecology and Landscape scores were the worst of any options and these drive the overall scoring for this option (in terms of Option F ultimately receiving a worse overall score than Options Z, E and P). Ngāti Tama's cultural scoring indicated this option would have a very high / very significant adverse effect.

- (c) **Option P** follows a similar alignment to Option F, and scored similarly for most criteria. The exception is for Terrestrial Ecology and Landscape scores, where Option P avoided an area in the Waipingao Valley affected by Option F, which contains a large number of significant trees. Option P was the third ranked option when the overall / RMA weighting is applied, noting that despite the avoidance of these significant trees, there are still ecological and landscape effects associated with its location in the sensitive Waipingao Valley and associated landscape effects on adjoining ridgelines. Ngāti Tama's cultural scoring indicated this option would have a very high / very significant adverse effect.
- (d) **Option Z** scored first equal on raw score (with Options E and P), and first under two of the three weighting systems (overall / RMA and Environment). A large portion of the alignment is located on or adjacent to the existing SH3 route and it scored relatively favourably from a landscape and water environment perspective. As with the other options, there would be high adverse effects on Terrestrial Ecology, in this case due particularly to the loss of high value vegetation at the southern end of this option. Ngāti Tama's cultural scoring indicated this option would have a very high / very significant adverse effect. Option Z scored poorly from a constructability perspective due to construction interactions with the existing SH3 road corridor. The northern end of the option runs adjacent to / through a large landslide feature, which is described in the evidence of Mr Symmans. Significant ground improvement works (some 1.5km of retaining wall) were incorporated into the design to isolate the alignment through this section from the landslide.
- (e) **Option E** ranked first equal with Options P and Z based on the raw scores, and consistently ranked second across all weighted scorings. Option E avoided the significant landscape, ecological and cultural features in the Waipingao Valley and avoided effects on the high value Mimi swamp forest through incorporation of a bridge to reduce terrestrial ecological effects. However, Option E would result in the loss of lower value terrestrial vegetation but a high number of significant trees, and was hence considered by the experts to have high adverse effects on terrestrial ecology. From a water environment perspective, Option E also scored poorly due to the length of streams affected, particularly in

the northern component of this option. From a landscape perspective, the location of the road within the already modified area around SH3 and the farmed Mangapepeke Valley moderated landscape effects. From a cultural perspective, Ngāti Tama's cultural scoring indicated this option would have a very high / very significant adverse effect.

71. The Shortlist Report did not identify a 'recommended option' for the Transport Agency to progress - as noted above, and recorded in the Shortlist Report, the purpose of the shortlist MCA was to provide the Transport Agency with a range of information in considering which option to select. I did, however, record the following recommendations:
- (a) Option A should not be progressed as the preferred option, given it was fairly clearly the 'worst' performed in the MCA2 process, and would in my view present significant consenting risks;
 - (b) Option F should also not be progressed given it was very similar to Option P, but performed worse on the important terrestrial ecology and landscape criteria; and
 - (c) The other three options (Z, P and E) should all be considered when determining a Project option.
72. In my view, if the Transport Agency had based its decision solely on the MCA2 results and analysis, it would have been reasonable to choose any of Options Z, P or E. All scored equally in terms of raw scores, which reflects that each of those options had different strengths and weaknesses in MCA performance. Having said that, I note (and it was made clear in the Shortlist Report) that Option Z received the highest tallied score across two of the three weighting systems. In any event, it was always expected the Transport Agency would consider cost (and potentially other factors) in deciding which option to progress.

STEPS FOLLOWING THE SHORTLIST MCA

73. Following the MCA2 workshop, further work was undertaken by Mr Boam and the design team to establish whether more cost effective solutions were available, or whether refinements might address the matters identified through the MCA2 process.
74. For Option F it was considered that further analysis or refinement work would not be undertaken on the basis that it was a similar route to Option P, but performed worse in the MCA2 assessment (in line with my recommendation in the Shortlist Report).
75. As noted above, Option A performed poorly through MCA2, however it was subject to further analysis as the public feedback process I described above identified that Option A was generally the public preference of the five options.

In my view this was a reasonable response following the public feedback exercise (notwithstanding my Shortlist Report recommendation). For Option A, the key matters driving scoring in the MCA2 analysis related to crossing the Waipingao Valley. While refinement to the alignment north of the tunnel (i.e. north of the Waipingao Valley) was considered, it was not possible to refine Option A in a way that would address the effects in the Waipingao Valley section of the alignment. Accordingly, it was determined that Option A would not be considered further.

76. A similar refinement north of the tunnel was also possible for Option P, however it was not possible to refine Option P in a way that would address the matters driving the MCA2 scoring associated with crossing the Waipingao Valley.
77. For Option Z, the ground engineering required to isolate the alignment from the landslide feature meant that this option carried the highest cost of the five shortlisted options. Refinements to this alignment were considered, however no refinement was identified that would either avoid the landslide or meet the Transport Agency's engineering requirements.
78. Refinement to Option E was made particularly in relation to the section down the northern Mangapepeke Valley, which shifted the alignment from the western part of the valley floor to the eastern valley flanks, avoiding poorer soil conditions in the valley floor.
79. Cost estimates for the shortlisted options following the refinement process described were prepared (refer **Attachment 5**). This analysis indicated that Option E was the lowest cost option, while Option Z was the highest cost option.
80. I consider that at the end of the alternatives assessment process, corridor options for the Project had been thoroughly examined.
81. As Mr Napier explains in his evidence, following the analysis of the results of the MCA2 process, the subsequent refinement work, and having regard to the cost estimates, the Transport Agency determined that Option E would be taken forward as the Project option.
82. While the 2017 MCA process I describe here in my evidence was fundamental to the Transport Agency's robust assessment of alternatives, I acknowledge that the decision as to what form the Project would take was not made directly through the 2017 MCA process. Rather, the 2017 MCA process and results were utilised by the Transport Agency as an important tool in making decisions as to the nature of the Project.
83. Ultimately, it was the Transport Agency as Requiring Authority that determined the form of the Project as set out in the NoR and resource consent applications and in the AEE. In my view that decision had due regard to the

results of the MCA (including the fact that Option Z scored first across the three weighting systems).

84. The Transport Agency's preferred option (Option E) is reflected in the Project as proposed in the NOR and associated plans and application documents. I note that the Option E alignment has been subject to further analysis and design development following selection as the preferred option, and leading up to lodgement of the NOR and resource consent applications as is reflected in the Application.

RESPONSES TO SECTION 42A REPORT

85. Paragraph 101 in the NPDC 42A report questions why the Transport Agency did not select the online option (Option Z). Specifically, the report at this paragraph records that *"a key question for the hearing of the NoR is to understand why the on-line route was rejected in MCA2"*.
86. On this point I note that MCA2 did not reject Option Z. As I describe above, the Shortlist report did not identify a recommended option. Based on the outcome of MCA2, it would have been reasonable to choose any of Options Z, P or E. All options scored equally in terms of raw scores, which reflects that each had different strengths and weaknesses. The Shortlist report records that Option Z was the best performing MCA outcome, when taking into account overall scores.
87. As I note, MCA is a tool to support decision making. Ultimately, the Transport Agency as requiring authority is responsible for selecting the preferred option. That decision needed to take into account the results of the alternatives assessment process (the MCA), in conjunction with any other matters the Transport Agency considered relevant.
88. Mr Symmans' evidence describes the geotechnical issues relating to the Option Z alignment, and the ground improvements that would be required to meet the Transport Agency's engineering standards. These engineering requirements meant that the cost of Option Z was significantly higher than both Options P and E (some \$112M higher than Option E).
89. Mr Milliken's evidence describes the constructability issues associated with Option Z. I note that the MCA process weighted constructability a lower consideration in the sensitivity analysis of 'overall / RMA' scoring and 'Environment' scoring, and a higher consideration in the 'Transport' scoring. Regardless of how this scoring was addressed through the MCA process, constructability (and effect on the highway network) is a relevant matter for consideration by the Transport Agency. Mr Milliken's evidence highlights the difficulties of constructing Option Z.
90. Overall, and in relation to the matters raised in the 42A report, the final decision on a preferred option was made by the Transport Agency. As

Mr Napier concludes, following the analysis of the results of the MCA2 process, the subsequent refinement work, and having regard to the cost estimates, the Transport Agency determined that Option E would be taken forward as the Project option.

91. On the matter of s171(1)(b) and whether adequate consideration has been given to alternatives, it is my view that the assessment process that I have led meets this test. The assessment process considered a wide range of realistic and feasible options, is robust and consistent between the longlist and shortlist stages, is transparent in the scoring given to options and the reasons for scoring, and was and is repeatable. The 42A report records concurs and at paragraphs 110 notes that in relation to s171(1)(b) matters, adequate consideration has been given to alternatives.

RESPONSE TO SUBMISSIONS

92. I have read and considered the submissions addressing the assessment of alternatives and MCA process on the Project. My responses to key themes and issues raised in the submissions is set out below.

Theme: Inclusion of tunnel in alignment design

93. A number of submitters state that they would prefer an alignment that did not include a tunnel.⁶ Some of these submitters identified that this preference was due to the restrictions of the current tunnel at Mt Messenger on the movement of large loads to and from the Taranaki region.
94. In my opinion, robust consideration has been given to route options that included and excluded a tunnel. As outlined above, for each corridor assessed in the longlist MCA, a structural solution and an earthworks solution was developed by the design team. The structural solutions featured tunnels under ridges in environmentally sensitive areas. The earthworks solution for each corridor comprised of cuttings and embankments, and was based on the assumption that cut and fill options would be cheaper and should therefore be tested through the MCA process.
95. The assessment of alternatives process considered the performance of these options, which were reported to the Transport Agency in a robust and transparent manner. I note that the earthworks options generally performed poorly in the MCA process, due largely to the higher level of adverse ecology, cultural and landscape effects when compared to the structural options. I rely on the evidence of Mr Ken Boam in respect of the design of the tunnel to cater for over-dimension vehicles and large loads.

⁶ Helen Piper (Submission 7657025), Dawn Bendall (Submission 7657050), Sydney Baker (Submission 7657075) and Saralie Cryer (Submission 7654595).

Theme: Option over the top of Mt Messenger

96. Several submissions⁷ state that a road over the top of Mt Messenger would be a better option, resulting in reduced ecological effects, reduced risk of slips and maintenance. Mr Ross Soffe⁸ also notes that a route over the top to the west of Mt Messenger would be cheaper and may provide opportunity for improved passing lanes.
97. Mr Soffe acknowledges the need for improvements to SH3 at Mt Messenger, however, raises issues with the consideration of alternatives in respect of the preferred alignment and the resulting adverse environmental effects and costs, noted in the submission as being higher than other options.
98. In my opinion, robust consideration has been given to the assessment of alternatives for the Project. The potential impacts of all options were robustly assessed against nine assessment criteria, covering a range of environmental, transport, social and constructability criteria and weighted against an overall / RMA weighting, an environmental sensitivity analysis and transport sensitivity analysis weighting that provided further comparative analysis of the options. All options presented technical and environmental challenges, including in respect of effects on ecological, landscape and cultural values.
99. The assessment process does identify that the online option (Option Z) scored best under the three weighting systems applied in MCA2. However, the Requiring Authority, when taking into consideration the MCA process findings and other matters, has determined that the preferred option is Option E. Option E ranked second through the MCA process and was the lowest cost option of the shortlisted options. Option Z was the highest cost option.

Peter Roan
25 May 2018

⁷ Sydney Baker (Submission 7657075), Ross Soffe (Submission 7654520).

⁸ Ross Soffe (Submission 7654520).

ATTACHMENT 1: LONGLIST OPTIONS

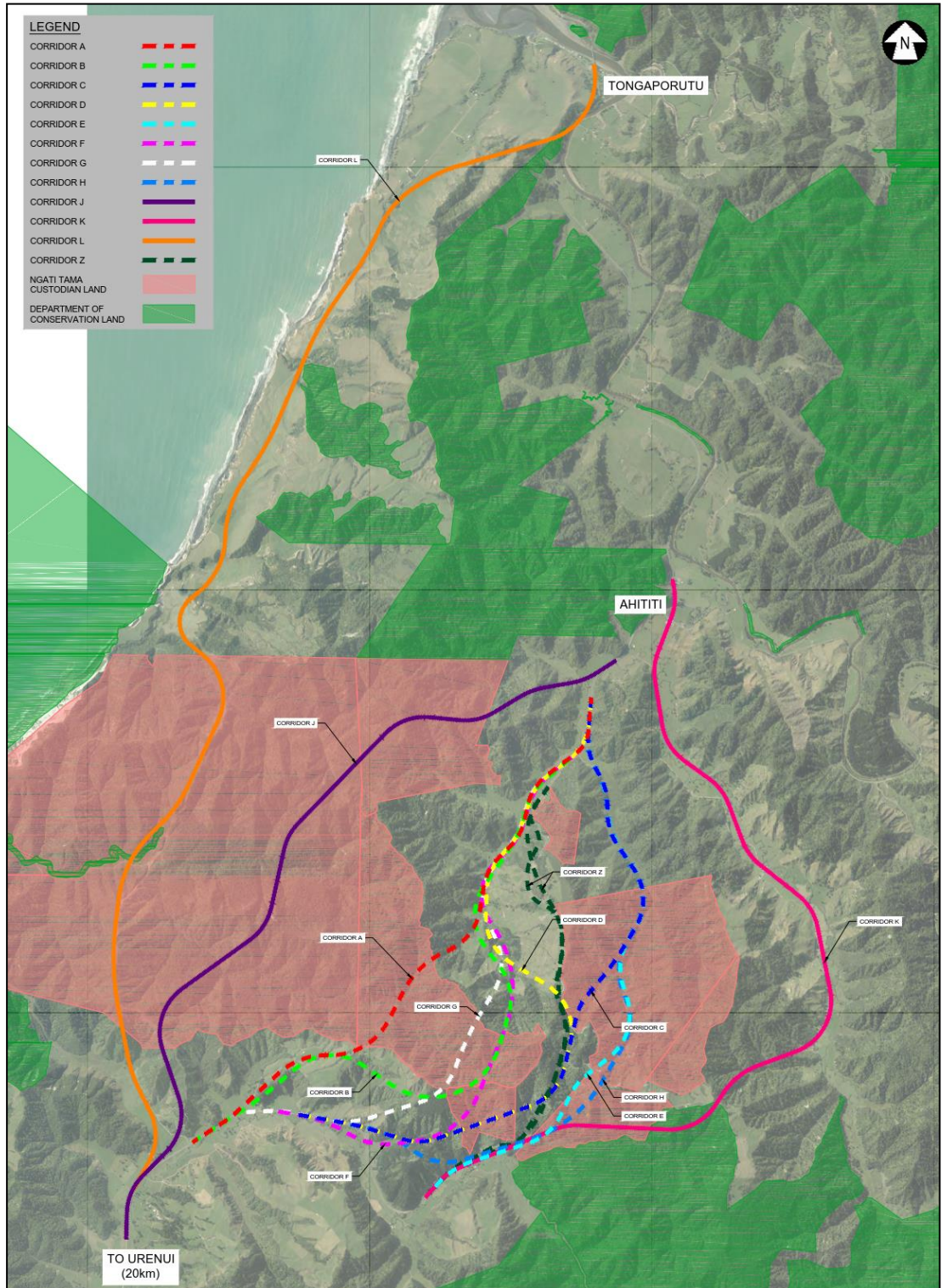


Figure 1: Longlist options

ATTACHMENT 2: SHORTLIST OPTIONS

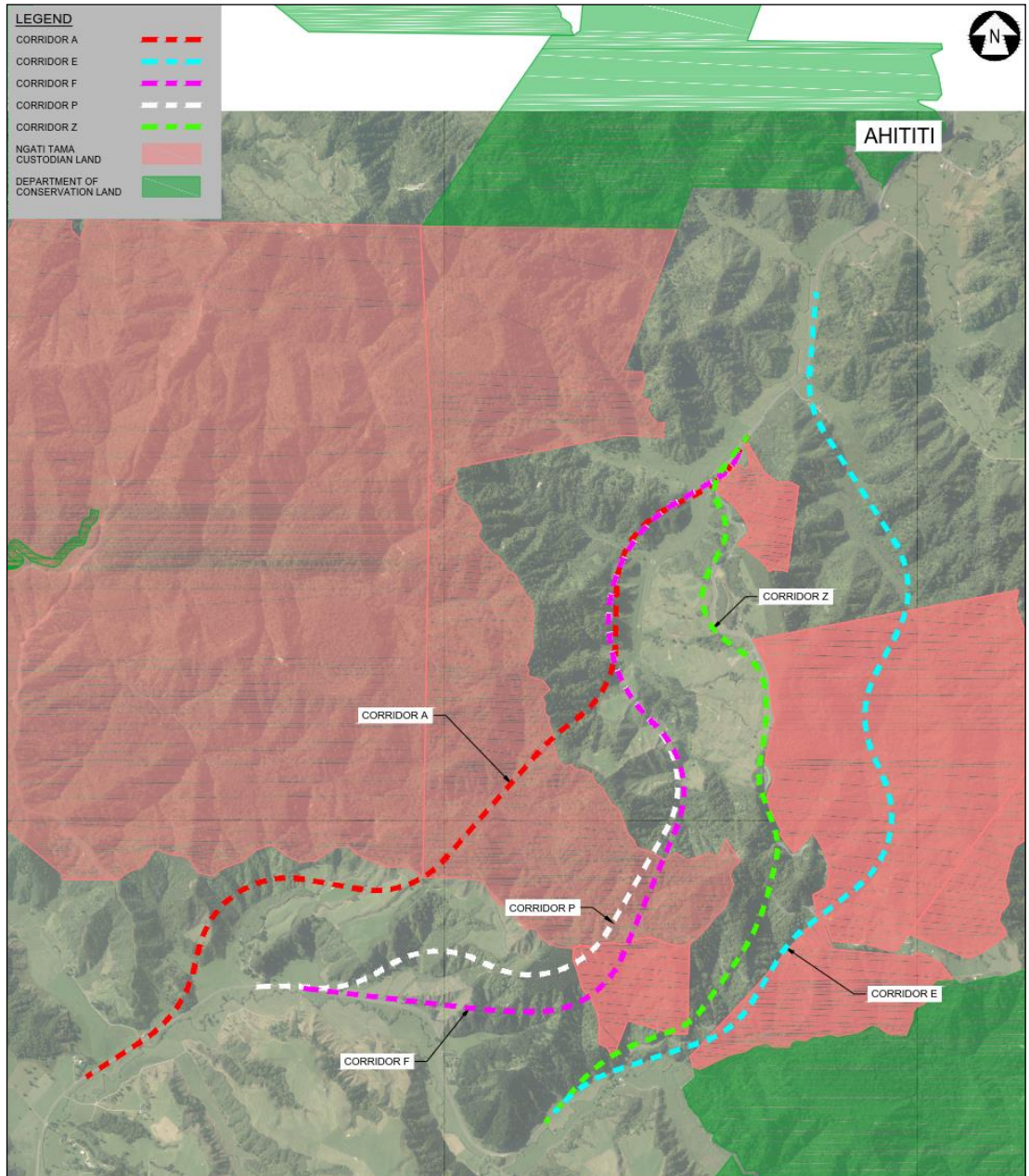


Figure 2: Shortlist options

ATTACHMENT 3: CORRECTED ENVIRONMENT AND TRANSPORT WEIGHTED SCORE SHEETS

Corrected Environment and Transport weighted score sheets from Appendix M of Shortlist report

Weighted score: Environment						
Criteria	Weighting	Option A	Option E	Option F	Option P	Option Z
		Weighted score	Weighted score	Weighted score	Weighted score	Weighted score
Constructability	0.5	-2	-1.5	-1	-1	-2
Transport	0.6	1.8	1.2	1.2	1.2	1.2
Resilience	0.6	-1.8	0.6	1.2	1.2	0.6
Landscape	0.9	-2.7	-0.9	-3.6	-2.7	-0.9
Historic heritage	0.6	-1.2	-0.6	-0.6	-0.6	-0.6
Community	0.6	0.6	0.6	0.6	0.6	0
Property	0.2	-0.6	-0.6	-0.6	-0.6	-0.4
Terrestrial ecology	1	-3	-3	-4	-3	-3
Water environment	1	-3	-3	-3	-3	-2
Cultural heritage	1	-4	-4	-4	-4	-4
TOTAL		-15.9	-11.2	-13.8	-11.9	-11.1
RANK		5	2	4	3	1

Weighted score: Transport						
Criteria	Weighting	Option A	Option E	Option F	Option P	Option Z
		Weighted score	Weighted score	Weighted score	Weighted score	Weighted score
Constructability	0.8	-3.2	-2.4	-1.6	-1.6	-3.2
Transport	0.9	2.7	1.8	1.8	1.8	1.8
Resilience	0.9	-2.7	0.9	1.8	1.8	0.9
Landscape	0.7	-2.1	-0.7	-2.8	-2.1	-0.7
Historic heritage	0.5	-1	-0.5	-0.5	-0.5	-0.5
Community	0.5	0.5	0.5	0.5	0.5	0
Property	0.5	-1.5	-1.5	-1.5	-1.5	-1
Terrestrial ecology	0.7	-2.1	-2.1	-2.8	-2.1	-2.1
Water environment	0.7	-2.1	-2.1	-2.1	-2.1	-1.4
Cultural heritage	0.8	-3.2	-3.2	-3.2	-3.2	-3.2
TOTAL		-14.7	-9.3	-10.4	-9	-9.4
RANK		5	2	4	1	3

ATTACHMENT 4: SHORTLIST OPTION SCORES

(Shortlist option scores)

Table 1: MCA2 raw scores

Criteria	Option A	Option E	Option F	Option P	Option Z
Constructability	-4	-3	-2	-2	-4
Transport	3	2	2	2	2
Resilience	-3	1	2	2	1
Landscape	-3	-1	-4	-3	-1
Historic heritage	-2	-1	-1	-1	-1
Community	1	1	1	1	0
Property	-3	-3	-3	-3	-2
Terrestrial ecology	-3	-3	-4	-3	-3
Water environment	-3	-3	-3	-3	-2
Cultural heritage	-4	-4	-4	-4	-4
Total Raw Score	-21	-14	-16	-14	-14
Raw Score Rank	5	1	4	1	1

Table 2: Relative option ranking from MCA2 process

Option	Option Rank: Raw score	Option Rank: Overall RMA Weighting	Option Rank: Environmental sensitivity analysis weighting	Option Rank: Transport sensitivity analysis weighting
A	5	5	5	5
E	1=	2	2	2
F	4	4	4	4
P	1=	3	3	1
Z	1=	1	1	3

ATTACHMENT 5: COST ESTIMATES FOR MCA2 OPTIONS

(Cost estimates)

Cost estimates for MCA2 options⁹

Option	A	E	P	F	Z (online)
Base	\$228.0M	\$174.5M	\$211.4M	\$209.1M	\$364.4M
Expected	\$251.3M	\$199.6M	\$231.3M	\$234.9M	\$382.5M
P ₉₅	\$293.3M	\$218.7M	\$274.2M	\$276.4M	\$430.1M

⁹ Cost estimates prepared in accordance with the Transport Agency 'Cost estimation manual' SM014.
Base = total sum of the elements that make up an estimate but not including a contingency.
Expected = base estimate including an allowance for contingency calculated as per SM014.
P₉₅ = The expected estimate plus an allowance for funding risk, calculated as per SM014.