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AECOM Consulting Services (NZ) Ltd +64 4 896 6000 tel
Level 3, 80 The Terrace +64 4 896 6001 fax
Wellington 6011
PO Box 27277
Wellington 6141
New Zealand
www.aecom.com

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Rachelle McBeth
Senior Environmental Planner - Consents
New Plymouth District Council
Private Bag 2025
New Plymouth 4342

Dear Rachelle

SH3 Mt Messenger Bypass
Peer Review of the Notice of Requirement for Resource Consent

I, Graeme Keith Doherty, CPEng, ME (Transp), NZCE (Civil), CMENZ, at the request of New Plymouth District Council (NPDC), have undertaken a review of the following documents, which form part of a Resource Consent application by the New Zealand Transport Agency for a designation for a new state highway route in the location known as Mt Messenger in North Taranaki.

- Technical Report 1 – Strategic Transport Assessment;
- Volume 4A – Longlist report;
- Volume 4B – Shortlist Report;
- Technical Report 2 – Traffic and Transport Assessment.

The following are my findings and related questions from my review of the transport and constructability aspects.

Technical Report 1 – Strategic Transport Assessment

I agree with the conclusions reached in this report related to removing an impediment to, and improving the quality of, access to and from New Plymouth and the wider Taranaki Region along the SH3 route to and from the north. It is my opinion that a new route to improve the road at Mt Messenger is necessary to meet the stated objectives.

In considering the transport and constructability aspects in particular, I do not, however, think it has been clearly demonstrated that the route chosen by the applicant, (Option E as shown in Volume 2: Drawing Set), is reasonably necessary when consideration is given to the alternative routes investigated. My reasons for reaching this conclusion are set out below in my review of Volumes 4A and 4B of the lodged documents.

Volume 4A – Longlist Report

The NPDC asked me to review this report in the context of the requirements of whether the applicant had given adequate consideration to the transport and constructability aspects of the alternative sites, routes, or methods of undertaking the work.

The NZ Transport Agency uses a Multi Criteria Analysis (MCA) as one of the tools for assessing alternative sites, routes or methods of undertaking the work to ensure they meet the objectives set out in the application. The following is my assessment of the work associated with transport and constructability aspects and the questions that arise.

1. Nine assessment criteria were developed. Section 5.2.3 of the report states that the options were not assessed against the project objectives, as these were deemed to be captured through the nine criteria. However, the report states that one criterion (transport) contains three of the project objectives. With reference to Table 5.1, it is difficult to understand the rationale for having one criterion (transport) for three project objectives (safety, journey time reliability and reduced journey times) and a number of criteria for one project objective (managing the cultural, social, land use and other environmental effects). I would expect the assessment of alternative

routes to be conducted against individual objectives and if necessary those objectives further sub-divided into multiple criteria (as the applicant did for objective 4) as part of the assessment to determine reasonableness of the application against the objectives sought by the applicant. From my review, I would question whether the scoring in the MCA favours transport over other criteria?

2. As cost was not a criteria within the MCA process, the applicant should be asked to explain why a tunnel under Mt Messenger wasn't one of the options considered? For example, if cost is not a consideration at this stage, a tunnel would most likely achieve all the objectives, whilst having minimal adverse effect during construction.

3. Within Appendix F (transport) of the Longlist MCA report (volume 4A) it is difficult to understand how the percentage weightings for the transport sub-criteria were developed (40% for road safety, 10% for operational efficiency and travel time savings and 40% for operational resilience). These three criteria align with three of the objectives sought by the applicant, which do not appear to be weighted. The applicant should be asked for further information to provide an understanding (and therefore enable an assessment by the Territorial Authority) of:
   - Why the applicant effectively assigned weightings to objectives;
   - Why the applicant appears to have assigned a higher weighting for objectives 1 and 3 (road safety and travel time savings) over objective 2 (resilience);
   - With reference to Section 3.1 and the last paragraph on page 3, why the shoulders of the options that include structures could not be widened to meet the same standard as those options without structures, thereby having equal scoring in terms of safety for all options?
   - The 4th paragraph of Section 3.1 states that options that have vertical grades greater than 8% would have passing lanes (ie this appears to be an explicit assumption for all options). With reference to the Appendix B (Quantity Summary) of Volume 4A Longlist Report, Z options are described with an uphill grade of 9% and a downhill grade of 7%, however no passing lane was specified for the uphill section. The applicant should be questioned as to whether the inclusion of a passing lane would alter the scoring of operational efficiency (refer to Section 3 of Appendix F of Volume 4A) for the Z options from zero to positive 3 or 4?

4. Within Section 3.1 of Appendix F (Transport) of the Longlist Report (Volume 4A), the applicant should be questioned over how travel times were calculated for the routes and whether they have been correctly scored when correlating their "length" as reported in Section 4.4 of Volume 4A Longlist Report?

5. Within Section 3.1 of Appendix F (Transport) of the Longlist Report (Volume 4A), the applicant should be questioned over how the scoring for operational resilience was determined and how it reached the conclusion that "off-line options would have greater ability to be established to a higher standard than the online options (which are restricted to the existing designation, which in some sections are relatively constrained)"? Additionally, the applicant should be questioned over how the applicant determined that "structures options" would have a high positive score over "earthworks options" with a moderate score?

6. Within Section 3 of Appendix F (Transport) in Volume 4A Longlist Report, it is difficult to understand how the scoring for the sub-criteria associated with online, earthworks and structures options were derived and why there is a significant difference in the range of scores (0 to positive 3) between options for "Operational Efficiency", "Travel Time" and "Operational resilience". The applicant should be asked to explain and clarify this scoring and provide the justification for the wide range of scores.

7. Constructability – with reference to quantities provided in Section 4.4 of Volume 4A Longlist Report and acknowledging that the MCA process assumes best endeavours to mitigate effects, the scoring of Constructability (Appendix N of Volume 4A Longlist Report) identifies the raw scores for the Z options as a negative 4 overall, which appears to result primarily from interactions with existing SH3. One would assume best endeavours would be applied to manage these conflicts to a degree that would have a lesser score, especially when correlated

to the quantum of work overall, which has Options Z2 and Z4 with considerably less areas of land affected by construction activities when compared to other options. The applicant should be asked for further information as to how the negative 4 score is justified?

8. With reference to Appendix N of Volume 4A and cross-referencing to Sections 6 and 7 of Volume 4A Longlist report, the applicant should be asked to clarify why Option C1 was not progressed to the short list investigations.

Volume 4B – Shortlist Report

The NPDC asked me to review this report in the context of the requirements of whether the applicant had given adequate consideration to the transport and constructability aspects of the alternative sites, routes, or methods of undertaking the work. The work undertaken in the Shortlist Report is a continuation of the work undertaken in Volume 4A to determine a preferred route. The following is my assessment of the work associated with transport and constructability aspects in Volume 4B and the questions that arise.

1. Comments and questions from number 1 above from my review of Volume 4A Longlist Report are also relevant to Section 3.4 of Volume 4A Shortlist Report.

2. Comments and questions from number 7 above from my review of Volume 4A Longlist Report are also relevant to the scoring of "Constructability" in Table 4.1 of Volume 4B Shortlist Report.

3. With reference to Section 4.3.8 of the Volume 4B Shortlist Report, it is difficult to understand the change in cost to Option Z ($360M base estimate), from that given in Volume 4A Longlist Report (approximately $220M base estimate). The applicant should be asked to explain and clarify the difference.

4. With reference to Sections 3.1 and 3.2 in Appendix D of Volume 4B Shortlist Report, the scoring is correlated to the overall reduction in length of the corridor between Tongaporutu and Uriti. However, none of the options considered extend past Ahiti. The applicant should be asked to explain why the applicant used a length of road between Tongaporotu and Uriti in assessing road safety and travel time/efficiency, whereas the application and options assessment is for a designation over Mt Messenger which is the location of the new route and for which the assessment of any criteria should apply?

5. With reference to Section 3.2 of Appendix D in Volume 4B Shortlist Report, the report notes that travel time savings less than 200 seconds represents a minor benefit. It is difficult to understand how a saving of 3 minutes (179 secs for Option Z) of travel time could be considered "minor". UK evaluation procedures, (WebTAG Unit A3.1 (DfT 2017)) identifies the following bands when appraising options – 0 to 2 minutes, 2 to 5 minutes and greater than 5 minutes. I consider that a travel time saving of nearly 3 minutes represents a moderate benefit and therefore would assume that Option Z would have a travel time saving score of positive 4. The applicant should be asked to produce the documentation that supports their criteria for 200 seconds being the point at which travel time savings move from a minor to moderate benefit and where that guidance documentation has been used elsewhere for state highway projects in New Zealand?

6. Taking into account any changes to the scoring of the options that could arise from the points raised above in my assessment of Volumes 4A and 4B, and with reference to Section 5 and Appendix M in Volume 4B Shortlist Report, the applicant should be asked to explain why Option E (without passing lanes) is the option for which a designation is being sought, whereas the outcome of the MCA processes indicates that Option Z is the preferred option?

Technical Report 2 - Transport and Traffic Assessment

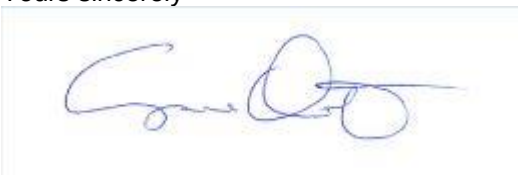
1. It is noted that the option put forward in the application (Option E) is different (in plan) to the E options in the longlist and short list reports. When comparing the alignment as presented in Volume 2 of the application documents with Appendix A of Appendix C in the longlist report and 3D views of options in Appendix B of Appendix B in the shortlist report, differences are noted, particularly on the north side of Mt Messenger. The area potentially affected by construction activities is 44.4 hectares in the application as opposed to approximately 30 hectares considered in the Longlist and Shortlist reports. Noting these differences, would the scoring of constructability in the MCA process be different if Option E from the application, being 44.4 hectares, was scored?

2. Section 3.1 of the report specifies 1.2m shoulders within the tunnel. I would question whether the width provides the claimed safety benefits when correlating near side shy line requirements adjacent to the barrier protection within the tunnel and a 100 km/hr design speed.

3. The width of the access point into the escape tunnel and the width of the escape tunnel should be checked to ensure that it is wide enough to provide mobility impaired access.

4. With regard to Section 6 of the report, I recommend that a Haulage diagram be included to understand where earthwork vehicles will interface with the existing state highway to enable an assessment of construction effects on the existing state highway to be reviewed.

Yours sincerely



Graeme Doherty

graeme.doherty@aecom.com

Mobile: +64 21 923 153
Direct Dial: +64 4 896 6084