

BEFORE THE BOARD OF INQUIRY

IN THE MATTER

of the Resource Management Act 1991

AND

IN THE MATTER

of applications for resource consent and notices of requirement by Transpower New Zealand Limited for the North Island Grid Upgrade Project.

**STATEMENT OF EVIDENCE
OF PETER BERNARD HASSELL**

Introduction

1. My name is Peter Bernard Hassell. I am a Director of The Answer Company International Limited (“TAC”), and have been since early 2005.
2. I have been requested by Waipa District Council to review and comment on:
 - The decision by Transpower New Zealand (“Transpower”) to use “systematic multi-criteria analysis” (“MCA”) to evaluate the route decision; and
 - The actual MCA process used by Transpower as recorded in the Environmental Phase 2 Report on Interim Route Decision Part 1: Report dated May 2005 (“the Interim Route Report”).
3. I have read and am familiar with the Code of Conduct for Expert Witnesses in the Environment Court Consolidated Practice Note (2006).

Qualifications

4. I have the following academic qualifications:
 - Bachelor of Arts from the University of Cape Town;

- Bachelor of Law from the University of Zimbabwe;
 - Master of Public Management from Victoria University of Wellington.
5. I was admitted as a barrister and solicitor in New Zealand in 1978 and practised for almost 20 years until 1997, the last 10 as a commercial partner in Buddle Findlay, Auckland.
6. Soon after I retired from the law, I joined Infrastructure Auckland (“IA”) as Grants Manager. IA was the statutory body established in 1998 to succeed to many of the assets of one my major clients (the Auckland Regional Services Trust) and use the proceeds to make grants to transport and stormwater projects in the Auckland Region. The assets administered by Infrastructure Auckland were valued at approximately \$1 billion.
7. Before deciding whether or not to contribute funds to any project IA was required to evaluate the project according to 11 criteria specified in a Deed approved by the Minister of Local Government and set out in an Order in Council (sections 707ZZK And 707ZZZA of the Local Government Act 1974). These criteria were intended to guide IA in deciding the extent to which *“any projects or parts of projects generate benefits to the community generally in addition to any benefits that accrue to any identifiable persons or groups of persons”* (section 707ZZK (1) of the Local Government Act 1974). The criteria included a mix of financial, economic, social and environmental matters, and also other matters such as consistency with various regional strategies, risk and urgency. Soon after it was established IA developed a multi-criteria evaluation process designed to ensure that:
- (i) IA obtained adequate information to enable it to evaluate every project seeking a grant in accordance with the prescribed criteria;
 - (ii) The Board of IA, which was responsible for every decision as to whether or not to make a grant, determined the weights to be given to each criteria in the evaluation;
 - (iii) The process itself was transparent, so that all applicants could understand what information was required, how it was evaluated, and the outcome of the evaluation;
 - (iv) All projects were evaluated on a consistent basis in accordance with the legislation; and

- (v) The evaluations enabled the Board to compare the benefits and disbenefits of competing projects.
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- 8. As Grants Manager, my role was to lead the team of employees and consultants who developed and applied that process. As part of the development, IA commissioned an extensive search both in New Zealand and overseas to identify similar processes that it could copy. We were unable to find any other multi criteria evaluation process used in New Zealand. The IA process was documented in a comprehensive Multi Criteria Evaluation ("MCE") Procedures Manual, which was first published in early 1999 and updated from time to time. Over the period until 30 June 2004 (when IA was abolished) the MCE Process was used to evaluate projects having a combined value of more than \$1.5 billion, and to support grants of approximately \$350 million.
 - 9. Richard Maher (the other Director of TAC, and formerly chief executive of IA) and I presented a paper on IA's experience in using multi criteria decision analysis over the period from 1998 to 2004 to the 19th International Conference on Multi Criteria Decision Making "MCDM for Sustainable Energy and Transportation Systems", which was held at Auckland University School of Engineering in January 2008.
 - 10. I left IA at the end of 2000 and was employed for a time in the Department of Prime Minister and Cabinet as a policy advisor on transport, local government and Auckland issues, and then established an independent consultancy, which involved providing advice to IA from time to time.
 - 11. TAC was established in 2004, soon after the dissolution of Infrastructure Auckland, and specialises in project evaluation, using multi-criteria analysis to assist clients to evaluate the social, economic, environmental and cultural effects of projects. TAC has two directors, Richard Maher and myself. Richard Maher is a Chartered Accountant and was previously chief executive of Infrastructure Auckland. While the company has no actual employees we have established close working relationships with a number of independent consultants who have particular skills relevant to our business, including social science, market research, environmental science, economics and project management. Some of the projects we have worked on over the past three years include:

- Developing a multi criteria decision analysis process for Waitakere City to evaluate and support projects proposed for inclusion in annual and long term plans;
- Developing a multi criteria decision analysis process to assess quadruple bottom line community benefits for use by the Infrastructure Fund about to be established by Environment Bay of Plenty, a Regional Council;
- Developing a funding strategy for the New Lynn transport and town centre upgrade, on behalf of Waitakere City, using a mix of public and private capital.
- Developing an infrastructure funding strategy for the Northern Strategic Growth Area, on behalf of Waitakere City, again using a mix of both public and private capital;
- Advising the University of Auckland, Tamaki Campus on the development of its proposed Tech Park, including a process for assessing potential co-locators, and a template for a financial and commercial structure;
- Advising Auckland Regional Holdings on the governance of its waterfront investments; and
- Assisting Environment Bay of Plenty to develop a Regional Economic Development Strategy and the appropriate governance structure and systems.

Transpower's Decision to use MCA

12. I have reviewed the Interim Route Report, and consider that:

- (i) Transpower carried out a thorough review of decision-making processes (see Appendix 1 to that Report); and
- (ii) Transpower's decision to use MCA as an evaluation method for the interim route decision (as recorded in paragraph 4.3 General Approach) was an appropriate one.

13. Before going any further I should note that the terms multi-criteria analysis (MCA), multi-criteria evaluation ("MCE") and multi-criteria decision analysis ("MCDA") and multi-criteria decision-making ("MCDM") are all used to describe the same or very similar processes. For example, IA used the term MCE to describe its evaluation process and the Conference referred to in paragraph 6 was organised by the International Society for MCDM. In this evidence I will use the term used by Transpower, MCA.

14. MCA provides a disciplined process for comparing the extent to which two or more alternatives achieve specified objectives. Typically it involves:

- (i) Identifying the objectives that the decision-makers are bound (in the case of a public body) or wish (in the case of a private body) to pursue;
- (ii) Identifying criteria (or as Transpower describe them, 'aspects') which will enable decision-makers to understand and compare the extent to which each alternative under consideration achieves, or contributes towards, the stated objectives;
- (iii) Deciding appropriate measures for each aspect. The measure for financial and economic aspects is typically dollars, but measures for other aspects are sometimes not so easy to determine;
- (iv) Deciding whether, and if so how, to convert the different measures into a common unit: in other words a scoring system;
- (v) Deciding the process for setting the weights to be given to each aspect, and setting the weights;
- (vi) Gathering information in relation to each aspect for each option;
- (vii) Scoring each aspect, applying the weights, and calculating the final score for each option; and
- (viii) Checking the sensitivity of the results to changes in weights and the risk of key assumptions being inaccurate.

15. In the following paragraphs I discuss, in relation to each of the steps outlined in paragraph 11, how Transpower has used MCA to evaluate the two alternative routes, as described in the Interim Route Report.

The MCA Process used by Transpower

16. MCA is only a tool, albeit a valuable one. The results it produces depend on how the steps described in paragraph 11 are implemented. Accordingly before we can say that one of two alternatives compared through an MCA process is better than another, we must understand, and approve, that process.

Identifying Objectives

17. Normally I would expect the aspects selected for evaluation to be such as will ensure that the decision-maker satisfies all its obligations under any relevant legislation.
18. Clearly any decision-maker that is a public body with objectives and obligations that it is bound to comply with needs to satisfy itself that it has considered, and given appropriate weight to, all the matters it is required to consider. If I had designed the MCA process used by Transpower in this application, I would have begun by identifying all of the matters Transpower was required to consider, and demonstrated how the aspects selected for evaluation were linked to, and covered, all those matters, and that each matter was given the appropriate weight.
19. The discussion of how the aspects for analysis were selected in Section 5.1 of the Interim Route Report does not specifically mention Transpower's obligations under, for example, the State Owned Enterprises Act 1986, the Electricity Act 1992 and the Resource Management Act 1991, but simply links each aspect to one of the four well-beings: social, economic, environmental and cultural. This is not to say that Transpower has not considered all its obligations under those, or any other statutes, simply that there is no easy way to be satisfied that it has done so.

Choosing Aspects

20. The aspects chosen for evaluation must:
 - (i) First, provide an accurate guide to how any option will impact on one or more identified objectives. As mentioned in paragraph 16, the Interim Route Report links each aspect to one of the four well-beings, but not to Transpower's specific legal obligations.
 - (ii) Secondly, enable the various options under consideration to be distinguished from one another. There is little point in including in the evaluation aspects that every option must satisfy in order to be considered at all, and where it is unlikely that there will be a significant difference in performance among the options. In these circumstances, the options are likely to score the same, and including the aspect will merely narrow the range of difference among the options.

21. As regards the second point, the discussion in the Interim Route Report makes it clear that Transpower has adopted this approach. For example, Section 4.3 discusses the use of indicators as a “*short-hand way of assessing the relative importance or extent of an issue*” (page 23) and Section 5.3 notes that “*aspects that were very pervasive and would not assist in choosing between routes were not considered appropriate to include in the route option evaluation*” (page 31).

Deciding Appropriate Measures

22. MCA requires each aspect considered in the evaluation to be measured consistently across all options. However, it does not require the same measure to be used for all aspects.

23. Transpower has deliberately avoided applying dollar values to every aspect (Section 4.3 page 24), and in general I agree this is sensible: some environmental, cultural and social aspects are simply not amenable to being measured in monetary terms.

24. However, I do not support Transpower’s decision to use non-monetary measures for some economic aspects, in particular “*Engineering Degree of Difficulty*” and “*Property Compensation Costs*”. I accept that it may be far too early to say with any certainty what the actual engineering or compensation costs of either option may be, but Transpower must have made at least a rough estimation, and in my opinion, it would make the evaluation more transparent if we knew the range of cost differences between the two options on each section of the route.

A Scoring System

25. Scoring the various aspects used in the evaluation is a way to convert the different measures used for the aspects into common units, so that the overall performance of each option can then be compared. MCA does not require the measures used for various aspects to be converted to scores: it is quite possible to do the comparison using the raw measures. However, converting all measures to scores enables the scores to be summed and makes it easier to compare the overall performance of each option.

26. However, converting measures to scores has some problems.
27. Generally, the first step is to establish a scale for the scoring system, with a clear statement of what is the lowest value (which will score zero or possible 1, on the scale), and what is the highest value (which will score the highest number on the scale). Transpower have used a five point scale, which is common and reasonable. A larger range enables finer differentiation of the qualities within the aspect, but makes judging those qualities more difficult, and sometimes arbitrary. The Beaufort Scale of sea conditions is a well known example of a 12 point scale.
28. The range of values incorporated within a scale can have a significant impact on the final scores given to each option, particularly where only two options are to be evaluated. For example, using a five point scale and assuming one option has 3 schools on the route, and the other has 6:
- (i) If we use a local scale, where the parameters are set by reference to the best and worst results in the options under consideration, then 3 is the lowest negative impact and 6 is the highest. On this scale, the first option will score 1 and the other 5; but
 - (ii) If we use a global scale, where the parameters are set by determining the ideal and worst possible results by reference to some external criteria (which can be difficult to determine) then we could arrive at a scale where no schools is the lowest impact, and 10 is the highest. On this scale, the first option will score 1.5 and the other 3.

Obviously, increasing or narrowing the range of scores in this manner can make a crucial difference when the scores are summed and the two options are finally compared.

29. The scale adopted by Transpower for the evaluation is described in Appendix 7 of the Interim Route Report is a qualitative value scale, which is commonly used where it is not possible to find a convenient way to measure one or more aspects. Qualitative value scales can also be local or global. The scale described is a 5 point scale where each route section is assessed in relation to each aspect as presenting “few” (1), “only minor” (2), “reasonable” (3), “extensive” (4) or “extreme” (5) difficulties for the achievement of Transpower’s objective, namely the passage of a

400kV line.

30. This scale has the advantage that it provides a constant reference point: the passage of a 400kV line. However, in my view has two important disadvantages, discussed in the following paragraphs.
31. First, it introduces an unnecessary element of subjectivity into the scoring of, at least, those aspects that use indicators that have clear measures based on facts that can be objectively determined. This is the case with measures for the following aspects:
- (i) Number of Dwellings – a physical count;
 - (ii) Sensitive Landuses – number and proximity of schools;
 - (iii) Impact on Aerial Topdressing – number and proximity of air strips;
 - (iv) Engineering Degree of Difficulty – dollars; and
 - (v) Property Compensation Costs – dollars.
32. This element of subjectivity is apparent when we examine how the scores for some of these aspects have been set. For example:
- (i) The scores for Number of Dwellings in Table 2 are based on the Count of Dwellings within Route Sections in Appendix 3. This shows that the maximum number of houses within any Route Section is 30 (10-E+W), and the minimum 0 (8E and 9W). However, the only sections of the Route that score 5 (most impact) are S1E (9 houses) and S5E (26 houses). S11W (10 houses) scores only 2. It is very hard to understand why one section with 9 houses should score 5 and another with 10 only 2, especially when the houses are spread in a similar fashion across the bands. SE11 has only 2 houses, but scores 1. Clearly there are factors other than the number of houses being taken into account in the evaluation that anyone who did not participate in the scoring workshops cannot ascertain.
 - (ii) The scores for Sensitive Landuses are based on the proximity of schools and the current and projected school roll. Appendix 4 shows S5E has one school with 48 people “*within the route*” and S13W has one school with 77 people “*within the route*”. However, S5E is scored 4 and S13W only 3, signifying less impact, when logic would suggest it should score at least as high as S5E. Again there must factors other than the number of schools and their rolls being taken into account.

33. Secondly, the use of a value scale is easier to justify where the information is based on assessments by experts, or the community, against a range of factors that are not readily quantifiable. However, in these circumstances it is vital to document:
- (i) The range of factors taken into account in relation to each aspect; and
 - (ii) Where experts make the assessment, how each aspect rated in relation to each of the factors considered.
34. Generally Transpower have identified the range of factors taken into account in relation to each aspect (for example, the list of other rural landuses in Appendix 6) but I have found it almost impossible to find clear statements explaining why the particular scores in Table 2 were given for particular aspects in relation to particular Sections of the Route. It seems that the process followed to establish the scores – decision conferencing by experts - may well be appropriate, but without a record of why the scores were allocated as in Table 2, the scores cannot be validated, and must be open to challenge.
35. For example, S12W, which crosses Lake Karapiro and SH1, and is described in the summary (Section 2 page 15) as “*very sensitive*” scores 4 on Visual Impact/Landscape Values, whereas S12E (which is not so described) scores 5.

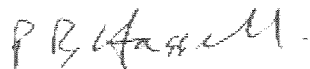
Weights

36. The weight applied to each aspect reflects the decision-makers obligations or (where the decision-makers obligations are not ranked by the statute) preferences. Transpower used four different weightings that are described on pages 38 to 41 of the Interim Route Report. The Report contains no discussion of Transpower’s statutory obligations and how these might affect the calculation of weights. However, the variety of systems used would appear to be sufficient to cover all possibilities.
37. Overall while it will certainly be possible to argue with the weighting of particular aspects, I consider the process by which the weights were set is consistent with best practice.

Analysis

38. The final analysis of the scores in Section 6.5 of the Interim Route Report (on pages 41-45) shows that the choice between the east and west options in sections 11-14 (which includes the areas in which Waipa District Council is primarily interested) is "*finely balanced*" and the community evaluation favours the east . That balance could change if the scores in those sections were re-evaluated. For example, the score for the Number of Dwellings on S11W, Visual Impact/Landscape Values in S12W and Sensitive Landuses in S13W are clearly anomalous.

Signed:

A handwritten signature in black ink, appearing to read "P B Hassell". The signature is written in a cursive, slightly slanted style.

Peter Bernard Hassell