Before the Board of Inquiry
Waterview Connection Project

---

in the matter of: the Resource Management Act 1991

and

in the matter of: a Board of Inquiry appointed under s 149J of the Resource Management Act 1991 to decide notices of requirement and resource consent applications by the NZ Transport Agency for the Waterview Connection Project

Rebuttal evidence of **Michael Copeland (Economics)** on behalf of the **NZ Transport Agency**

Dated: 1 February 2011

Hearing start date: 7 February 2011

REFERENCE: Suzanne Janissen (suzanne.janissen@chapmantripp.com)
Cameron Law (cameron.law@chapmantripp.com)

Chapman Tripp
T: +64 9 357 9000
F: +64 9 357 9099

23 Albert Street
PO Box 2206, Auckland 1140
New Zealand

www.chapmantripp.com
Auckland, Wellington,
Christchurch

INDEX

REBUTTAL EVIDENCE OF MICHAEL COPELAND ON BEHALF OF THE NZ TRANSPORT AGENCY

INTRODUCTION

1 My full name is **Michael Copeland.** I refer the Board of Inquiry to the statement of my qualifications and experience set out in my evidence in chief (EIC) (dated 11 November 2010).

2 I repeat the confirmation given in that statement that I have read and agree to comply with the Code of Conduct for Expert Witnesses in the Environment Court.

PURPOSE OF EVIDENCE

3 The purpose of this rebuttal evidence is to respond to certain aspects of the evidence lodged by submitters. Specifically, my evidence will respond to the evidence of:

3.1 Professor Tim Hazledine (Submitter No. 15-1);

3.2 Mr Duncan McKenzie for Living Communities (Submitter No. 167-3);

3.3 Mr David Mead (Submitter No. 130-1);

3.4 Ms Norma de Langen (Submitter No. 183-1);

3.5 Ms Hiltrud Gruger for Springhleigh Residents Association (Submitter No. 43-1);

3.6 Mr Robert Black (Submitter No. 186-1);

3.7 Mr Bill McKay for the North Western Community Association (Submitter No. 185-1); and

3.8 Ms Belinda Chase (Submitter No. 126-1).

4 My rebuttal evidence addresses issues raised in submitter evidence relevant to my area of expertise (economics). Where other submitters have raised the same or similar issues, this is referenced in footnotes to my evidence.

5 In addition, I will comment on relevant aspects of the section 42A Reports prepared by Environmental Management Services (EMS) dated 7 and 20 December 2010.

PROFESSOR TIM HAZLEDINE

Congestion Charges

6 Professor Hazledine (paragraph 16) suggests, as an alternative to the Waterview Project, the introduction of a congestion charge to encourage low value users of the road network in Auckland to change their travel plans, thereby reducing congestion on the network. In paragraphs 31 to 54 he describes an analysis he has undertaken which suggests a congestion charge of between 50 cents and $1 per trip would lead to an equivalent reduction in congestion as the Waterview Project.

7 The rebuttal evidence of Mr Tommy Parker and Mr Andrew Murray list a number of reasons why congestion charges are not an equivalent alternative to the Waterview Project. Mr Parker lists various objectives of the Project which would not be met by congestion charges, whilst Mr Murray identifies that 62% of the Waterview Project's estimated benefits are not related to peak period congestion reductions but are savings in vehicle operating costs and travel times during non-peak periods.

8 Also I would note that congestion charging and other variable road prices[1] have been rejected politically in New Zealand. In the 1990's significant work was undertaken by the Ministry of Transport, Treasury, predecessors of the NZTA and other government departments to establish a more appropriate system of road prices in New Zealand than the current mix of fuel taxes, vehicle registration fees and road user charges. However the proposals were eventually rejected by the Government.[2]

9 As an economist I accept that potential exists for significant efficiency gains from adopting more appropriate road prices (including congestion charges) than the current system. Whilst it is clear that not undertaking the Waterview Project and other road improvement projects will lead to increases in congestion, and perhaps increased pressure for a more appropriate system of road pricing to be adopted, it cannot be assumed that congestion charges in Auckland will be part of the without Waterview Project scenario.

10 Like Professor Hazledine himself, I am surprised that the congestion charge estimated by him is so small. I cannot follow the procedures he has adopted or the data used from his evidence.[3] However, because congestion charging is not considered an appropriate option

---

1 There is limited acceptance of road tolls on routes to recover the average costs of specific road improvement works, but these can only be imposed where an alternative non-tolled route exists.

2 During this period I was engaged as an economic consultant to assist Transfund New Zealand with various streams of work associated with the Land Transport Pricing Study.

3 I requested, but did not receive, the spreadsheets showing Professor Hazledine's analysis.

to meet the Project objectives, I have not attempted to analyse his calculations in detail.

Professor Hazledine's Criticisms of NZTA's Cost Benefit Analysis

11 Adequacy of Benefit Cost Ratio (BCR). In a number of places in his evidence, Professor Hazledine[4] suggests that the BCR is marginal or inadequate. For example, in paragraph 9, he says the discounted future flows of benefits are roughly equivalent to the net present value (NPV) of predicted construction costs; in paragraph 20, he implies the Project's BCR hovers just above 1; and in paragraph 22, he questions acceptance of a BCR of 1.2 as adequate support for the Project.

12 In response, I would note that:

12.1 The BCR of 1.2 excludes wider economic benefits such as agglomeration economies.

12.2 Even a BCR of only 1.2 significantly exceeds the 8% real (i.e. net of inflation) opportunity cost of funds that has been set by the NZTA.

12.3 At a BCR of 1.2 the present value of Project benefits exceeds the present value of Project costs by $300 million. At a BCR of 2.1 the present value of Project benefits exceeds Project costs by $1,500 million.[5]

13 Therefore I do not accept that the BCRs that have been estimated for the Waterview Project are marginal or inadequate.

14 Uncertainty. Professor Hazledine[6] (in paragraphs 21-25) suggests that the BCR for the Project should be discounted because of the risks associated with the Project and the possibility of bias from "enthusiastic proponents of the Project". In response I note that all feasibility studies of projects (including one assessing the likely effects of introducing congestion charges) will suffer from the absence of hard data and all investment projects will be subject to varying levels of risk. Contingencies will I expect have been built into Project cost estimates and sensitivity testing can (and has)[7] been undertaken across important variables. In my opinion, just as it is not appropriate for arbitrary levels of optimism or pessimism to be built into estimates of project costs and benefits by project analysts, nor should similarly arbitrary adjustments be built into decision criteria.

---

4 See also the evidence of Mr Duncan McKenzie (paragraph 2.7), Mr David Mead (paragraph 4.3, Ms Norma de Langen (paragraph 9) and Mr Bill McKay (paragraph 6.1).

5 Refer Mr Murray's rebuttal evidence.

6 See also the evidence of Mr David Mead (paragraphs 2.2 (a) and 5.3).

7 Personal communication from Mr Andrew Murray.

15 Therefore I do not believe that the estimated BCRs for the Waterview Project should be discounted to account for risk and uncertainty.

16 Opportunity Cost of Funds. Professor Hazledine's concern about the opportunity cost of funds being taken into account (see his paragraph 26) is addressed in part through the use of the 8% real cost of funds and via the decision making process of the NZTA. Contrary to Professor Hazledine's suggestion that costs should be based on the value of the next best use of resources, I have never seen in New Zealand or overseas the substitution of alternative project benefits in the costs stream for a particular project to account for the opportunity cost of funds. Both mutually exclusive options for the same project and other projects that might be financed from the same budget are compared on the basis of measures of efficiency (e.g. BCRs, internal rates of return and net present values), as well as other criteria including intangible costs and benefits that are not quantified in monetary terms. I therefore do not agree with Professor Hazledine that the costs in the denominator of the Waterview Project's BCR should be replaced with estimated opportunity costs based on the value of the next best use of the resources required.

17 Agglomeration Economies. Professor Hazledine appears to be somewhat sceptical about agglomeration economies, saying in his evidence at paragraph 60:

"Agglomeration economies have become something of a holy grail for urban development enthusiasts – in economic terms, a gigantic free lunch."

18 He also states (paragraph 61) that agglomeration economies are believed to be generated mostly in the Central Business Districts (CBDs) of large urban areas and his evidence appears to restrict the possibility of agglomeration economies arising only in Auckland's CBD (see his paragraphs 62 to 67).

19 In response, I would note, firstly, that no agglomeration economies or other so called wider economic benefits are included in the lower end BCR estimate of 1.2. Including estimates for agglomeration economies lifts the estimated BCR to the higher end of the 1.2 to 2.1 range (see the EIC of Mr Tommy Parker, paragraphs 83 to 85).

20 Secondly, agglomeration economies arise not just by concentrating commercial activities within a single centre such as Auckland's CBD, but also from improvements in accessibility between and within commercial centres. The Waterview Project is designed to improve accessibility between and within a number of commercial centres in various parts of the Auckland region including Auckland City, the North Shore, Manakau and Waitakere (see the EIC of Mr Tommy Parker, paragraph 85).

21 Therefore, whilst my EIC (paragraph 38) states that there is some uncertainty about the quantification of wider economic benefits including agglomeration economies, I do not share Professor Hazledine's views that agglomeration economies are "a gigantic free lunch" or that they will arise only from the concentration of economic activity within Auckland's CBD.

Summary

22 Professor Hazledine's evidence does not alter the conclusions of my EIC that the Waterview Project will enable people and communities to provide for their economic wellbeing and represents an efficient use of resources.

HILTRUD GRUGER FOR THE SPRINGHLEIGH RESIDENTS ASSOCIATION

Exclusion of Other Effects from Cost Benefit Analysis

23 In Section 17 (paragraphs 17.1 to 17.3) of her evidence, Ms Gruger is critical of the cost benefit analysis of the Waterview Project because it does not include all community and environmental effects.[8] Ms Gruger is of the view that these effects can be quantified in monetary terms and should have been included in the calculation of the Project's benefit cost ratio.

24 I am aware of various methods which can be used to quantify such effects in monetary terms. However in my experience such effects are seldom quantified in monetary terms and must be considered in addition to the results of the cost benefit analysis. The cost benefit ratio is not a single measure which can incorporate all positive and negative effects of a project. Among the reasons for this are:

24.1 Other witnesses with specific expertise relating to these other effects are providing quantitative and qualitative evidence relating to these effects. To also attempt to include estimated dollar values for these other effects in the cost benefit analysis would involve double counting; and

24.2 The available methods to quantify environmental and other effects in money terms are not well established in practice and are likely to be subject to uncertainty and controversy. Therefore in my opinion they will be of limited, if any, value to decision makers.

[8] See also the evidence of Mr David Mead (paragraph 4.9), Mr Robert Black (paragraph 2), Ms Belinda Chase (paragraph 56.0) and Norma de Langen (paragraphs 12 to 15). Ms de Langen refers to existence values, bequest values, option values and ecosystem values for open spaces and suggests that it is not difficult to place dollar values on these and include them in the cost benefit analysis. Whist I am aware of some of the academic literature which discusses these topics, it is my experience that in practice these values are generally considered in the decision making process as intangibles – i.e. not assigned monetary values – and handled separately from quantitative cost benefit analysis.

25 I therefore do not accept that the BCRs estimated for the Project are deficient because they exclude environmental and other effects.

Project Favours Industries Relying on Transport

26 In paragraph 17.4 of her evidence, Ms Gruger says that the Waterview Project favours industries that rely on transport costs and that such industries may gain an advantage over competitors by reducing their distribution costs with the help of public subsidies. Although New Zealand's system of road pricing is by no means perfect, I do not believe the Waterview Project will lead to significant economic distortions of this sort. Road users as a group meet the costs of expanding and maintaining the road network via road user charges and fuel taxes. Users of the Waterview Project will therefore make a contribution towards its costs and will not be subsidized by taxpayers.[9]

Congestion Costs Not Comparable to Production Costs

27 In paragraphs 17.5 to 17.8 of her evidence, Ms Gruger expresses concern about congestion cost savings being treated as equivalent to production cost savings even though no cash surpluses for investment are produced, and concern about private motorist benefits being treated the same as commercial motorist benefits. In fact:

27.1 The NZTA cost benefit analysis procedures include different assumptions in relation to vehicle operating and time cost savings for private and commercial motorists;

27.2 In the case of vehicle cost savings for both private and commercial motorists and time savings for commercial motorists, cash surpluses are created by the Project; and

27.3 In any event it is not necessary for monetary amounts to be produced for investment before they can be included in the analysis.

28 Therefore I do not accept these criticisms by Ms Gruger of the cost benefit analysis, which has been undertaken for the Waterview Project.

Resources Better Invested in Other Projects

29 Ms Gruger (paragraphs 17.3 and 17.10) and other submitters[10] claim that the resources required to be invested in the Waterview Project would be better utilised in other transport or non-transport projects. In my opinion, it is impossible for the Board of Inquiry to make such an assessment since it will not have sufficient information about

---

[9] It could be argued that beneficiaries of the Waterview Project are being subsidized by other road users (rather than taxpayers). This could only be overcome by replacing the current system of fuel taxes and road user charges with a more complex road pricing system.

[10] See for example Mr Bill McKay (paragraph 6.1), Mr Robert Black (paragraph 2), and Ms Belinda Chase (paragraph 56.0).

alternative investment opportunities. It is also my understanding that, in having regard to the efficient use and development of resources, the Resource Management Act 1991 does not require a particular project to be the "best" or "most efficient" use of resources. Also I would note that:

30.1 NZTA's cost benefit analysis procedures, including the use of the 8% real discount rate, provide a basis for comparing the returns from alternative transport investment projects; and

30.2 The funds which will be used for the Waterview Project come from NZTA's budget and are not available for investment in non-transport projects.

MR DAVID MEAD

Comparing the Project with the Do Minimum Scenario

30 Although not suggesting the BCR needs to be revised (see paragraph 4.11), Mr Mead (paragraphs 5.2 to 5.8) argues that the cost benefit analysis of the Waterview Project incorrectly compares the Project with the do minimum option[11] and that the cost benefit analysis also incorrectly assumes the Project will not have an impact on land use patterns.

31 In my opinion, comparing the Project with the do minimum option is appropriate. Whilst a comparison with another alternative may lead to smaller additional benefits, it will also lead to smaller additional costs. Therefore the Waterview Project has not been incorrectly favoured by comparing it with the do minimum option.

32 I also note that Mr Murray in his rebuttal evidence confirms that the transport modelling work with and without the Waterview Project has adopted desired changes in land use patterns according to various planning documents (Mr Murray's rebuttal evidence, paragraphs 54 and 55). These are the same for both the with and without Project scenarios, but Project induced changes in travel patterns are taken into account. I agree with Mr Mead that the Waterview Project may enhance land use development and this might be claimed as an additional benefit of the Project. However it is likely such additional benefits will be difficult to measure. Also there is a danger of double-counting benefits – i.e. the benefits from additional land development in certain areas may have already been accounted for in vehicle operating and travel cost savings.

[11] The do minimum option is the without Project option, which involves the least capital expenditure in the future. It is not the "do nothing" option in that it will still involve ongoing maintenance expenditure and perhaps periodic investment to maintain the integrity of the assets – e.g. reseals, sign replacement, etc.

COMMENTS ON SECTION 42A REPORT

33 Paragraph 7.3.2 of the EMS section 42A Report dated 7 December 2010 questions why the AEE did not consider the opportunities for communities associated with the construction period of the Waterview Project.[12]

34 In my view excluding economic opportunities associated with the construction of the Project is a conservative approach but appropriate. During the construction period of such projects, the local regional economy might expect to benefit from increases in expenditure, employment and incomes as a result of increased construction activity. However should the Waterview Project not proceed, it is possible that investment will be made in other road improvement projects within the Auckland region[13] and, if this is the case, the Waterview Project proceeding does not involve an injection of additional economic activity into the local economy.

35 Should the without Waterview Project scenario instead involve the use of the freed up NZTA funds in road improvement works outside of the Auckland region, then the Waterview Project will contribute additional expenditure, employment and incomes for the local economy.[14] Because it is not possible to be certain where the funds would be spent if the Waterview Project did not proceed, it is an appropriate conservative approach to exclude benefits from increased construction activity for the local community from the BCR analysis.

36 Also as indicators of levels of economic activity, economic impacts (in terms of expenditure, incomes and employment) are not in themselves measures of improvements in economic welfare or economic wellbeing. However, there are economic welfare enhancing benefits associated with increased levels of economic activity. These relate to one or more of:

36.1 Increased economies of scale: Businesses and public sector agencies are able to provide increased amounts of outputs with lower unit costs, hence increasing profitability or lowering prices;

36.2 Increased competition: Increases in the demand for goods and services allows a greater number of providers of goods

[12] I have also reviewed the EMS s42A Addendum Report dated 20 December 2010, which does not raise any new issues relating to economics.

[13] Or at least these other road improvement projects will be brought forward in time.

[14] Because NZTA's project evaluation procedures require the national viewpoint to be adopted, no account is taken of construction impacts. At the national level, the choice of one project over alternative uses of the same funds will not lead to net additional expenditure, employment or incomes.

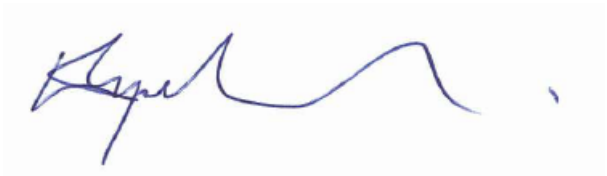
and services to enter markets and there are efficiency benefits from increased levels of competition;

36.3 Reduced unemployment and underemployment[15] of resources: To the extent resources (including labour) would be otherwise unemployed or underemployed, increases in economic activity can bring efficiency benefits when there is a reduction in unemployment and underemployment. The extent of such gains is of course a function of the extent of underutilized resources within the local economy at the time, and the match of resource requirements of a project and those resources unemployed or underemployed within the local economy; and

36.4 Increased quality of central government provided services: Sometimes the quality of services provided by central government (such as education and health care) are a function of population levels and the quality of such services in a community can be increased if increased economic activity maintains or enhances population levels.

37 It is reasonable to assume that any increases in economic activity (i.e. expenditures, incomes and employment) as a consequence of increased road construction activity in Auckland will give rise to one or more of these four welfare enhancing economic benefits at the local regional level.

38 Therefore even if the Waterview Project results in additional levels of economic activity in Auckland during its construction period, the additional economic efficiency benefits will be overstated by measures of increased expenditure, employment and incomes. This reinforces my view that excluding the economic opportunities associated with construction of the Project from the BCR analysis is an appropriate conservative approach.[16]



M C Copeland
February 2011

[15] Underemployment differs from unemployment in that resources are employed but not at their maximum worth; e.g. in the case of labour, it can be employed at a higher skill and/or productivity level, reflected in higher wage rates.

[16] Finally, I note that the s42A report suggests (at paragraph 7.2.25) that it would be useful for more economic assessment information to be provided. This issue is addressed in the rebuttal evidence of Mr Parker.