

Before: the Kapiti Coast District Council Hearings Panel

District Plan Review: Infrastructure

Under the Resource Management Act 1991 ('**RMA**' or '**Act**')

In the matter of a submission by the New Zealand Transport Agency
(submitter number 457) on the Proposed District Plan

and in the matter of Chapter 11 - Infrastructure

**Primary statement of evidence of Anthony William Brennand is for
the New Zealand Transport Agency**

Dated 1 August 2016

Introduction

1. My full name is Anthony William Brennand. I am a Principal Transportation Engineer within the Highways and Network Operations Group of the New Zealand Transport Agency (**'Transport Agency'**).
2. I hold a Bachelor and Master of Engineering degrees from Auckland University specialising in analysis and mathematical modelling of engineering systems. I also have a Post Graduate Diploma in Business Administration and a Master of Management from Massey University. Amongst other activities this post graduate study included significant work in the area of multiple objective decision-making.
3. I am a Fellow of the Institution of Highways and Transportation (United Kingdom) and a member of the Institute of Transportation Engineers. I am a Fellow of the Chartered Institute of Logistics and Transport, New Zealand. I am a member and former Board member of the Road Engineering Association of Asia and Australasia and a member of the Australian New Zealand Institute of Applied Mathematics. I am currently a member of the National Executive, and formerly the National Chairman, of the Institution of Professional Engineers New Zealand Transportation Group. I am the Chairman of the Australasian Trips Data Bureau and on the National Executive of the New Zealand Modellers User Group.
4. I have 35 years of professional experience which have been largely in the disciplines of Transportation Engineering and Traffic Engineering. This includes significant spells in the public and private sectors. In addition to general Transportation Planning work I have specialised in the disciplines of Transportation Modelling and Transport Economics. I currently am a lead expert in Transportation Modelling and Transport Economics within the Transport Agency.
5. I have worked for the Transport Agency since 2009 and previously held the position of acting National Manager Transport Planning within the Highways and Network Operations Group. I have also worked for the Wellington Regional Council where I held the positions of Manager,

Transport Planning and Policy and then Manager, Strategic Direction, Transport.

6. I confirm that I have the authority to give evidence on behalf of the Agency.

Code of Conduct

7. I have read the Environment Court's Code of Conduct for Expert Witnesses and agree to comply with it. My qualifications as an expert are set out above. I confirm that the issues addressed in this brief of evidence are within my areas of expertise. I have not omitted to consider material facts known to me that might alter or detract from the opinions expressed. I understand the Code of Conduct requires me to assist the Hearings Panel impartially on matters within my expertise, and not to advocate for the Transport Agency.

Scope of evidence

8. My evidence will focus on:
 - a. The interests of the Transport Agency as it relates to the wider network;
 - b. A description of the analysis approach and analytical tools;
 - c. Description of the scenarios for future economic growth and development on the Kapiti Coast; and
 - d. Conclusions and implications of the analysis of these future scenarios for the planning framework and vice versa.

The Interests of the Transport Agency

9. Transport is a critical part of daily life for all New Zealanders, enabling a range of activities. It makes a significant contribution to the country's economic growth and productivity. The Land Transport Management Act 2003 requires the Transport Agency's activities to contribute to economic growth and improve productivity.

10. In particular, the Government Policy Statement on Land Transport (2015/16-2024/25) requires the Transport Agency to give effect to delivering the Wellington Northern Corridor which is one of the seven Road of National Significance. This passes through the Kapiti District in the form of an expressway (Mackays to Peka Peka ('**M2PP**' or '**Expressway**')).
11. The Wellington Northern Corridor will contribute to economic development by facilitating connectivity of one district with another and within districts to enable the effective and efficient flow of people and goods. This connectivity not only requires an efficient high capacity road spine but also must have local roads and interchanges that allow economic activities to efficiently access and be accessed by this same road spine.
12. The local road network, interchanges, and M2PP are designed to connect Paraparaumu with the rest of Wellington and the Horowhenua. The Transport Agency seeks to protect this connectivity to and from the Expressway to ensure the function of the Expressway is not compromised - contributing to economic development and improved productivity of Wellington, Porirua, Kapiti and the Horowhenua.
13. On completion of M2PP, it is expected that the section of the State highway from Poplar Avenue to Peka Peka Road will be revoked to a local road status within 24 months. The Transport Agency and Kapiti Coast District Council ('**Council**') are in discussions to determine the form and function of the current State Highway 1 following its revocation. Proposals to extend Ihakara Street to provide relief to Kapiti Road as a consequence of land development at the Airport will affect and be effected by the form and function of the revoked State highway.

Analysis Approach and Analytical Tools

14. The Transport Agency and the Council have had discussions with the Kapiti Airport and its consultant regarding the likely form, timelines and location of development at the airport. The Airport's advice was that development would be market led and that they were unable to advise regarding the likely form, timelines and location of the development.

15. This situation is problematic in determining the impacts of the Airport development on the local network performance, the performance of the M2PP interchange and the performance of M2PP itself. Further it poses significant uncertainties around the timing of the Ihakara Street extension in order to optimise the relief it would bring to the performance of the wider Kapiti network. This also brings uncertainties around the form and function of the revoked State Highway 1 which the Ihakara Street extension would connect into.
16. It was agreed, between the Transport Agency, the Council and the Kapiti Airport, to develop a range of representative future development scenarios that incorporated underlying growth in the Kapiti District with various levels and distribution of development at the Airport. These scenarios would consider the consequences of having or not having the Ihakara Street extension. These scenarios are described below.
17. The Transport Agency has a network assignment model using a SATURN software platform which it has previously used to appraise the Kapiti Expressway. This model uses the four stage multimodal strategic model for the Wellington region, WTSM (which is owned and operated by the Greater Wellington Regional Council), as a parent model. WTSM provides the SATURN model both light and heavy vehicle demands between origins and destinations for the region focused to the geographical area covered by the Kapiti SATURN model.
18. The Kapiti SATURN model is a 145 zone assignment model and extends from north of Paekarariki to north of Otaki on State Highway 1. It is described as a meso-scopic model sitting at a level below the strategic model, WTSM, and above the micro-simulation model level VISSIM. It provides an intermediate level of network detail.
19. The SATURN model is operated by the consultants Beca Ltd. on behalf of the Transport Agency and the Council. For this investigation and the modelling of the various scenarios, Beca has adjusted the trip matrices for peak periods, including a SATURDAY peak, to be consistent with the level of development implied by the scenarios both at the Airport and surrounding district.

20. I have reviewed the validation and calibration of the Kapiti SATURN model and I am satisfied it is fit for the purpose of understanding the effects of development at the Airport. I have examined the trip rates implied by the development and I am satisfied that they are appropriate.
21. Beca has developed a more detailed network micro simulation model based on a VISSIM software platform. This represents the performance of individual intersections in greater detail. This model extends from south of Raumati Road on State Highway 1 to north of Paraparaumu town centre. Traffic volumes are passed from the Kapiti SATURN model to the VISSIM model for more detailed analysis.
22. I have reviewed the validation and calibration of the VISSIM model and I am satisfied it is fit for purpose.

Descriptions of the Economic Development Scenarios for the Kapiti Coast

23. The scenarios described below are designed to be “representative scenarios” of development on the Kapiti Coast used to understand the effects of various development strategies at Kapiti Airport. It is not intended that these scenarios be thought of as an absolute prediction of development at the Airport for the reasons described above, but a reasonable assessment of the potential given certain specified inputs including the levels of development.
24. Present day levels of development and network performance are replicated for the peak periods. These peak periods include weekday morning and afternoon; and Saturday. This scenario assumes the present 23,000m² development at the Airport. This scenario does not include the Ihakara Street extension. This scenario is nominally titled “2015”.
25. A set of scenarios nominally titled “2021” have been developed which assume a 103,000m² development at the Airport and district wide growth of 2.5 per cent per annum to represent underlying growth on the Kapiti Coast. A scenario which gives a more westerly development of the Airport is investigated as is one that develops more intensely towards the eastern side of the Airport. This scenario considers traffic volumes at

the weekday morning and afternoon peaks, and the Saturday peak. In these “2021” scenarios the Ihakara Street extension is not included.

26. A set of scenarios nominally titled “2031” have been developed which assume a further 250,000m² at the Airport over the 23,000m² and a continuation of district wide growth at the same rate as the “2021” scenario. A scenario which gives a more westerly development of the Airport is provided as is one that develops more intensely towards the eastern end of the Airport. The eastern scenario considers traffic volumes at the weekday morning and afternoon peaks, and the Saturday peak. In these “2031” scenarios the options of both with and without the Ihakara Street extension are tested. These sub-scenarios are titled “2031” and “2031Ext” accordingly.
27. The overall scenario titles “2021” and “2031” are nominal and refer to levels of development for modelling purposes. The important feature of these scenarios is the amount of development and not the numerical value of the year. If market uptake is faster than anticipated by these scenarios then the traffic effects will occur earlier than the numerical value of the year will imply. Similarly, if the market uptake is slower than anticipated by these scenarios the traffic effects will occur later than anticipated by these scenarios.

Conclusions and Implications of the Analysis of these Future Scenarios

28. The following summary of the network performance considers the implications of the nominal “2021” and “2031.” As discussed above the years “2021” and “2031” are nominal years which refer to the amount of development and not a point in time.
29. The opening of M2PP before the year 2021 provides considerable relief to traffic movements on the current State highway. This improves levels of service for north-south movements on the current State highway and results in improved levels of service at intersection of the current State highway and Kapiti Road particularly during the weekday morning, afternoon peaks and the Saturday peak.

30. The development levels of Kapiti Airport induce significant numbers of movements east-west on the Kapiti network particularly during the weekday morning, afternoon and Saturday peaks. Because of the attractiveness of the Expressway in efficiently connecting to other parts of Kapiti to the rest of Wellington and the Horowhenua, Kapiti Road intersections and the Interchange at the Expressway come under pressure under the “2021” scenario. Levels of service at these locations are on the cusp of failing at these peak times without further input.
31. The “2031” land development scenario overwhelms the network in the vicinity of the Airport during the weekday morning and afternoon peaks and Saturday peaks. The demands are unable to be met by the network capacity.
32. Addressing these issues on Kapiti Road will require an increase in the capacity of Kapiti Road. Sufficient capacity will be required at intersections and the Expressway interchange for key turning and through movements.
33. The Ihakara Street extension provides some relief to Kapiti Road and is more effective when the distribution of Airport land use development is directly accessed by Ihakara Street.
34. The conclusions I draw from these results are:
 - a. Development up to 103,000m² over the current 23,000m² represents the limit of development at the Airport before the performance of the Kapiti network, and in particular access to and from the Expressway from Kapiti Road is adversely affected.
 - b. Development beyond 103,000m² needs to be managed in conjunction with network improvements to avoid compromising access to and from the Expressway.
 - c. The precise nature of these network improvements may include the Ihakara Street extension, increased capacity on Kapiti Road or other. This will depend on the type of land use development, its scale and location within the Airport precinct.

- d. My colleague Robert Harris has indicated what might be required in planning terms to provide for the effects of such development.

Anthony Brennand

1 August 2016