
In the Matter of:

The Resource Management Act
1991

and

In the Matter of:

The Ruakura Variation to the
Proposed District Plan

As Notified By:

**Hamilton City Council
(11 November 2015)**

**Statement of Evidence of:
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15 July 2016

Statement of Evidence of Mark John Apeldoorn, BE(Hons), FIPENZ, CPEng, Dip.Bus.Eng.Mgmt, NZCE.

Introduction

1. My full name is Mark John Apeldoorn. I am a Director at Traffic Design Group (TDG) responsible for the Waikato, Bay of Plenty and NSW Regions. I hold a Bachelor's degree with honours in Civil Engineering, a postgraduate Certificate of Proficiency in Transportation Planning and a postgraduate Diploma in Business Management, all from the University of Auckland. I am a Chartered Professional Engineer (CPEng), a Fellow of the Institution of Professional Engineers of New Zealand (FIPENZ), an International Professional Engineer (IntPE), and a member of the Institute of Transportation Engineers (ITE America).
2. I have 25 years' experience as a practising traffic and transportation engineer. I have worked as a local authority engineer and currently as a traffic engineering consultant. As a consultant, I have been engaged by local authorities, and private individuals or organisations to advise on traffic and roading development issues covering safety, management and planning matters of many kinds.
3. I have read the Code of Conduct for Expert Witnesses in the Environment Court Consolidated Practice Note (2014). I agree to comply with this Code of Conduct. This evidence is within my area of expertise, except where I state I am relying on what I have been told by another person. I have not omitted to consider material facts known to me that might alter or detract from the opinions that I express.

Evidence Summary

4. In this matter, I have been asked by Tainui Group Holdings Ltd (TGH) to assess and describe matters relating to traffic and transportation in the Variation. I led and undertook the traffic and transportation assessments and also presented expert evidence on these matters for TGH and Chedworth Properties (CP) through the Board of Inquiry proceedings. Detailed transportation modelling analyses were undertaken and presented by my colleague (Ms Anna Wilkins) under my direction through the same proceedings. In these proceedings I present evidence across both the traffic and transportation areas.
5. The matters I address are as follows:

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Table 1: Table of Contents

6. By way of a summary I have concluded the proposed objectives, policies and rules, with the further recommendations I make, will ensure an appropriate provision of strategic transport infrastructure and further more will establish a planning environment that properly manages and controls the potential for traffic and transport effects arising from land development.
7. The key recommendations for change I make are summarised as follows:
- (i) **Rule 3.7.1.7 Transportation Network d)** (Regarding the Spine Road (central)): Delete *“The form and function of this road is to primarily service residential and industrial development through intersection access.”*
 - (ii) **Rule 3.7.3.3 d) and e) and Rule 3.7.1.7 d):** Delete Rule 3.7.3.3 d) and e) and also the cross reference in the last sentence of 3.7.1.7 d), as rules which unnecessarily tie the construction of the Spine Road to certain LDP areas.
 - (iii) **Rezone** the CPL triangular area to the east of the Spine Road and north of Greenhill Link Road from General Residential to Medium Density Residential as is addressed by Mr Hall.

Board of Inquiry (BOI) Assessment Summary

8. The Ruakura Plan Change Proposal has involved significant traffic and transport assessment. I led the investigation, analysis, design, assessment, mitigation and recommendation phases. The evaluation and reporting processes included in-depth consultation with local and regional authorities, the road controlling authorities (including NZTA), transport and accessibility advocacy groups, special interest community groups and

members of the public. There was comprehensive policy and rules assessment and expert joint witness conferencing which contributed to the agreed transport infrastructure and staged land release rules.

9. At the outset of the assessment a multi-agency Transport Reference Group (TRG) was established to jointly scope and instruct transportation modelling experts and assessment of the potential network effects. This included assessments at regional, district, corridor and intersection levels of detail. Its purpose was recorded as:

“The Transport Subcommittee is to provide a forum for key stakeholders to work through the transportation related issues with the development of the Ruakura Structure Plan area. The objective is to define all the in principle issues and identify conceptual solutions..... to input into the District Plan review process.”

10. The Reference Group comprised representation from Hamilton City Council (HCC) (Planning and Engineering), Waikato District Council (WDC), Waikato Regional Council (WRC), NZ Transport Agency (NZTA), Tainui Group Holdings incorporating Chedworth Properties Ltd (TGH), Traffic Design Group (TDG), Boffa Miskell and Latitude Planning (for Local Authority Shared Services (LASS)). The Reference Group was an integral part of the Future Proof planning and reporting structure. It was chaired by NZTA and reported to the Future Proof Transport Reference Committee, and through to the Future Proof CEO’s committee.
11. I briefly summarise the key traffic and transport assessments that have been undertaken in the following paragraphs.
12. A comprehensive Transportation Assessment was undertaken and report prepared for the Proposal (dated June 2013). While the specific Plan Change proposal at the Board of Inquiry related to only part of Ruakura, the assessment was based on the whole¹ of the Ruakura area. I have included the Table of Contents of that assessment as **Appendix A** to this evidence. Broadly, the evaluation assessed:
- (i) Existing and future transport environments;
 - (ii) Road safety effects;
 - (iii) Multi-modal transport and land use interactions;
 - (iv) Traffic generation, parking, access and loading effects and mitigation;

¹ Transportation Assessment Report, section 7.1, paragraph 1

- (v) Road corridor and design standards; and
 - (vi) Transport policy.
13. A separate and detailed Transportation Modelling Report (December 2013) was prepared based on the TRG modelling analyses. I attach the Table of Contents of that assessment as **Appendix B** to this evidence. Again, the assessment was based on the whole of the Ruakura area. By way of a summary the analyses included:
- (i) A Base Case assuming no development in the Ruakura Structure Plan area;
 - (ii) Evaluations both with and without the Hamilton Section of the Waikato Expressway at 2021;
 - (iii) A future year assessment at 2041;
 - (iv) A further “capacity” assessment of the Regional Policy Statement (RPS) release area at 2041;
 - (v) Staging and timing evaluations with and without the Expressway and Structure Plan Spine Road;
 - (vi) Heavy vehicle impacts assessment;
 - (vii) Alternate outcomes in respect of the Ruakura Interchange location on the Expressway; and
 - (viii) Assessment of the staging of mitigation measures.
14. Following these assessments, evidence was prepared and presented to the BOI. The BOI process included expert witness conferencing and the signing of a Joint Witness Statement on Transport, dated 4 April 2014. Representation in this conferencing included TGH, Chedworth Properties Ltd (CPL), Hamilton City Council (HCC), Waikato District Council (WDC), Waikato Regional Council (WRC) and the NZ Transport Agency (NZTA). Broadly, the matters assessed included:
- (i) The Integrated Transport Assessment (ITA) framework and related activity status, triggers and definitions;
 - (ii) Staging of the Plan Change and related infrastructure;
 - (iii) Alignment of planning provisions and modelling assumptions;
 - (iv) Plan Change traffic effects and relationship with the interchange at Ruakura;

- (v) Traffic effects notification rules;
 - (vi) Grade separation of the Spine Road from the railway line;
 - (vii) Safe and efficient transport for existing residents; and
 - (viii) Sequencing of changes to access.
15. The BOI ultimately determined the Proposal on the basis of substantive traffic and transport assessment, and a collaborative multi-agency/party approach.

Changes to the Transport Environment

16. With the passing of time since the BOI decision there have been some changes to the road network that warrant reflection in the Variation. I address the changes, in in further detail later in my evidence, however the key and physical transport network changes are summarised as follows:
- (i) Wairere Drive extension from Ruakura Road south to Clyde Street and further on to Cambridge Road has been completed. The short section from Cambridge Road south to link with Cobham Drive remains unformed.
 - (ii) Chedworth Properties Ltd has constructed a section of the Greenhill Link Road extending east from the Wairere Dr / Gordonton Road roundabout towards the planned Waikato Expressway. Design for the signalised intersection of the Link Road with the northern extent of the Spine Road is currently underway. The roading structure for the CPL Medium Density Residential zoned subdivision north of the Link Road is also substantially constructed.

Traffic and Transport Rules in the Variation

17. The traffic and transport Rules are primarily imbedded in section 3.7 of the Variation. The major transport mitigation works are identified as Significant Infrastructure. The broader and multi-modal transport networks demonstrate sound integration with established infrastructure. This is demonstrated on Figures 2-15 and 2-18 of the Variation.
18. Development of the Rules has been based on extensive transport network effects modelling, independent agency interpretation, and collaborative evaluation through the TRG and expert witness conferencing. Rule 3.7.3.3 *Staging and Traffic Requirements* Rule

describes measures established to enable development to proceed while ensuring appropriate protection of and capacity within the transport network.

19. The effects assessments are, in my opinion, appropriately aligned with the strategic traffic and transport infrastructure responses described in Rule 3.7. The requirement for Land Development Plans, which in turn establish a need for further *Integrated Transport Assessment*, appropriately provides for activity specific and localised development area effects to be assessed at a finer level of detail, and also for the development intensity controls to be confirmed.

20. The potential for traffic and transport effects to adversely affect the transport network has been assessed on the basis of full development of the Variation area. Departures from the assessed land uses are subject to resource consent, and in the case of larger trip generating developments (those generating greater than 1,500 trips per day) the 3.7.3.2.2² *Notification Rule* applies. Notwithstanding the higher trip generating activities, those other activities identified with an asterisk (*)³ are Restricted Discretionary and required to have regard to the list of 27 matters described at Appendix 1 of the PDP, section 1.3.3 *Restricted Discretionary, Discretionary and Non-Complying Assessment Criteria – G - Transportation*. These requirements are extensive and include having regard to ITA recommendations⁴.

21. I have reviewed the traffic and transport Rules of the Variation. Overall it is my conclusion that the Rules properly and appropriately reflect the mechanisms, works and controls necessary to deliver safe and effective outcomes for the transport network. I recommend a minor amendment that is deletion of Rule 3.7.3.3.4 a), as is shown on the Council Track Changes – Extracted and collated.pdf. The reason for this recommendation is that the referred “*Development in excess of 150 dwellings can occur ... subject to a transport connection being established to the E1 Arterial Road at Wairere/Crosby/Gordonton Road roundabout.*” has already been constructed and is now part of the existing transport network.

² Council Track Changes – Extracted and collated.pdf

³ Section 3.7.3.2.3 Notification Rule, a)

⁴ Hamilton City Council PDP, Appendix 1, 1.3.3 Restricted Discretionary, Discretionary and Non-Complying Assessment Criteria – G3 – Integrated Transportation Assessment

Submissions

22. I have read and considered the Summary of Submissions as it relates to traffic and transport matters. Where relevant I have also reviewed the related specific submissions made. I address these in detail in my Appendix C, based on the Variation provision to which the submission relates. I record the submitter reference in brackets. The key matters at issue are also captured in the S42A reporting. I respond specifically to the S42A technical and traffic matters in my evidence that follows. In broad terms I have concluded there is reasonable alignment between my assessments and the Council’s Track Changes version of the Variation. Notwithstanding and for completeness I have given thorough consideration to the submissions at Appendix C.

S42A Report

23. I have reviewed and considered the most relevant parts of the Section 42A reports and the corresponding evidence pertaining to traffic and transport matters. I briefly respond on these matters in my evidence as follows.
24. In relation to the evidence and analysis of Mr Gray for Council, I can record that our assessments overall are strongly aligned. I would endorse his conclusion where he finds:
- “... the proposed combination of objectives, policies, rules and assessment criteria that relate to transportation are sufficient to manage adverse effects from transport, including cumulative effects on amenity, appropriately.”⁵*
25. While strongly aligned, there remain a few matters that I assess as warranting further assessment and consideration. I respond to these and clarify specific areas of alignment by way of reference to Mr Gray’s evidence in my following paragraphs.
26. Mr Gray concludes and I concur there are *“... few significant differences...”*, and that *“considerable investigation...”*⁶ went into the Plan Change. He also finds that *“Consistency would be desirable”*. I would concur in general with the objective for consistency in structure and integration of the Plan Change, however in relation to the Variation itself, I am of the opinion the purpose of and nature of a “variation” is that it enables something

⁵ Gray EIC, paragraph 30

⁶ Gray EIC paragraph 7

that is different from the Plan provisions as they exist, and therefore, based on the specific assessments and evidential bases, there can and should be reasonable expectation of some points of difference from the Plan.

27. I support Mr Gray's finding that *"In general, land use and transport network development appears to be consistent with that envisaged during the PDP and RPC processes to date."*⁷
28. At Mr Gray's EIC paragraphs 21 to 28 he addresses and responds to what he describes as the *"Key Issues"*. On the whole I concur with his assessments and findings with the following exceptions and further observations:
- (i) At his paragraph 26 Mr Gray indicates support for a new Rule 3.7.3.3 d) *"Construction of the relevant Spine Road sections is required prior to any activities other than access and utility infrastructure taking place in Land Development Plan areas."* I note the text proposed by Mr Gray, which makes specific reference to LDP areas D, F or P, is not included in the Council proposal for the Rule. Notwithstanding this, it is my assessment that Rule 3.7.3.3 d) is unnecessary and should not be included in the rule set defining Staging and Traffic Requirements. The Staging Rules were very carefully developed through expert witness conferencing at the BOI stage. They were developed to specifically manage the potential for traffic effects on the established transport network, but also and very importantly, they contained flexibility that enabled alternatives to be considered where they were subject to full and thorough assessment. Introduction of Rule 3.7.3.3 d) either as proposed by Council or with the further referencing by Mr Gray forces a significant road infrastructure investment in advance of any of the agreed staging Rules set out in Rules 3.7.3.3 a), b), or c). It does not enable the reasonable consideration of alternatives and does not recognise that the necessary Land Development Plan assessment requirements may identify any number of alternative staging and connection outcomes, the effects of which will require appropriate analysis and mitigation. My findings in this regard also relate to Rule 3.7.3.3 e) which is highly prescriptive about staging of development and formation of the Spine Road (central). Accordingly, I conclude it is inappropriate to include Rule 3.7.3.3 d) and e) and also the cross reference in the last sentence of 3.7.1.7 d) as proposed by Council.

⁷ Gray EIC paragraph 16

- (ii) At his paragraph 27 Mr Gray addresses the matter of traffic effects and connectivity for Ryburn and Percival Roads. I note a new Rule 3.7.3.3 f) is proposed by Council in relation to these matters. I concur with the merits, intent and form of this rule as written.

29. In Mr Gray's Attachment 2, he sets out his assessment of traffic and transport submissions. Again, we are generally and substantially aligned. I briefly comment and observe in relation to a few key matters as follows:

- (i) **Submission 37.07, Objective 3.7.2.4 and Rule 3.7.3.3 f).** This matter relates to alternative access provisions for Ruakura residents prior to closure of Ruakura Road. I concur with the need for Rule 3.7.3.3 f) as is proposed by Council.
- (ii) **Submission 43.10, Rule 3.7.3.1.7d) and Rule 3.7.3.3 d).** I concur with the definition of separate sections of the Spine Road as is proposed. However as I have described at my paragraph 28 (i) I conclude it is inappropriate to include Rule 3.7.3.3 d) and e) and also the cross reference in the last sentence of 3.7.1.7 d) as proposed by Council.
- (iii) **Submission 48.14, Rule 3.7.1.7 d).** I concur with Mr Gray's assessment of these matters with the exception of his finding in relation to specific inclusion of reference to "signalised" intersection at Rule 3.7.1.7 d). I concur that the ultimate 2041 form of the transport network and the assessments were based on an assumption of signalised intersections being established at some locations. The Rule 3.7.1.7 d) as proposed by Council is in my assessment more appropriate. It properly reflects the ultimate form and function of the Spine Road (central) and its intersection connections. The Rule as written enables LDP's to assess more efficient, safer and appropriate interim and staged intersection forms that may not result in signalisation in the first instance. In my opinion, this flexibility in the rule will enable better more efficient and appropriate network outcomes in the earlier stages of land development and not unnecessarily burden the first stages of implementation with high infrastructure costs.
- (iv) **Submission 17.01, Rule 3.7.1.7 f).** Council has proposed a refined wording of rule 3.7.1.7 f) that in my opinion more appropriately enables the staged introduction of infrastructure and its assessment through the LDP process.

- (v) **Submission 34.03, Rule 3.7.3.2.3.** An amended and renumbered Rule 3.7.3.2.2 Notification Rule is proposed by Council. In my assessment the rule appropriately establishes a threshold for activities generating 1,500 or more vehicles per day. This is consistent with the PDP Rule 25.14.4.3 as applied generally across the city and was established as part of the expert witness conferencing at BOI.
- (vi) **Submission 48.26, Rule 3.7.3.3 d).** I do not concur with Mr Gray or Council's findings in relation to a Spine Road construction trigger rule. I describe my reasons at my paragraph 28 (i), including that expert witness conferencing at the BOI very specifically and carefully established land use development thresholds, and existing network performance thresholds to manage the effects of transport. These thresholds are the effective trigger rules. The requirement they trigger however is not a direct need to establish the Spine Road (subject to the 5ha threshold at Rule 3.7.3.3.3 iv), but rather the **Rule 3.7.3.3 c) Staging and Traffic Requirements** and **Rule 3.7.3.3.3 iii.** *"Or Suitable arterial network capacity can be demonstrated or established in a manner that maintains the efficiency, safety and functioning of the transport network."* Accordingly I conclude it is inappropriate to include Rule 3.7.3.3 d) and e) and also the cross reference in the last sentence of Rule 3.7.1.7 d) as proposed by Council.
- (vii) **Submission 37.08, Rule 3.7.3.3.2.** The submission seeks a requirement in relation to the provision of the Spine Road and connection from Ryburn and Percival Roads to Ruakura Road. I confirm that I agree with Mr Gray's finding to reject this submission. Notably however I support Rule 3.7.3.3 f) which does address the connectivity south considerations for the Ruakura residents, which in my opinion addresses the primary concern. I note also that very clear and definitive thresholds are established at Rule 3.7.3.3.2 in relation to Industrial Land Stage 2 land releases between 2021 and 2041 that appropriately protect and manage the existing transport infrastructure.
- (viii) **Submission 37.06, Figure2-15A.** The submission seeks amendment to the figure to show a more direct indicative link between the Ruakura residents' land and Ruakura Road to the south. I concur with Mr Gray's assessments to support the submission and his recommendations, and note Figure 2-15 has been amended to reflect this and that Rule 3.7.3.3 f) is also proposed.

- (ix) **Submission 33.48, Figure 2-18.** The submission seeks for the Figure to be updated to reflect the infrastructure that is now part of the built and/or consented environment. I concur with Mr Gray's recommendation to "*Accept in part*" where it is demonstrated the Chedworth subdivisions are "*..approved and being implemented at a stage that cannot be changed.*"
- (x) **Submission 33.51.** The submission seeks to zone the Chedworth Property land to the east of the Spine Road and north of Greenhill Link Road from General Residential to Ruakura Medium Density Residential. Mr Gray rejects the submission citing "*no transport analysis*". I do not concur with Mr Gray's statement in full. While there has been no specific assessment of the change in traffic demands due to the submission, the overall effects on the transport network and in relation to significant transport infrastructure have been made and provide a substantive basis for decision making. I briefly set out these considerations, a more local and specific assessment as follows:
- a) The Transportation Modelling Report that accompanied the BOI application includes a full Ruakura area development. This included assessment of the subject area as a general residential traffic generating zone.
 - b) Rezoning to Ruakura Medium Density Residential is expected to increase the potential for dwelling development from 16 households (hh) per ha to 28 per ha.
 - c) In the base case general residential zoning the area has an assessed capacity for 208 households at 16hh/ha (assuming the whole area is available. I understand that in fact only a small section of it is now sought to be rezoned with the rest being established as Neighbourhood Reserve and / or stormwater management area.) Under a medium density residential zoning there is potential for the whole area to accommodate 364 households at 28hh/ha.
 - d) Evaluation of the NZTA Research Report 453: Trips and Parking Related to Land Use, Table 8.10 describes a comparison of trip generation rates by Country. For New Zealand it describes "Dwelling houses typically generating 10.7 daily and 1.3 peak hour trips / dwelling. Medium density residential flat developments correspondingly generate 6.8 daily and 0.8 peak hour trips. It is evident that as dwelling density increases the trip generation demand decreases.

- e) Based on these rates and densities, the following trip generation demand can be assessed:

Zoning	Households	Trip Rate	Trips	Additional Demand on the Network
General Residential	208	10.7 trips per hh per day	2,226	
General Residential	208	1.3 trips per hh per peak hour	270	
Medium Density Residential	364	6.8 trips per hh per day	2,475	249
Medium Density Residential	364	0.8 trips per hh per peak hour	291	21

Table 1: Assessment of Trip Generation Change as a Result of Zoning Change

- f) Table 1 shows the zoning change sought (assessed as if the full area was to be zoned) is expected to generate an additional 21 trips (two way total) in the peak hour and 249 additional trips per day. Having regard for the fact that only about 1/7th of it is shown rezoned on Mr Hall's amended Figure 2-14, it is reasonable to conclude that only an additional 3 to 5 trips is expected at peak.
- g) Assessment of the transport network effects set out in the Transportation Modelling Report for the various Scenarios at 2021 and 2041 with and without the Spine Road and as appropriate subject to the Waikato Expressway, it is evident that the primary network distribution point for traffic generated by the site is the roundabout controlled intersection of Wairere Drive with the Greenhill Road. In the worst case scenario the roundabout is forecast to operate at a Level of Service C⁸ in the morning peak at 2041. With a distribution of the whole area generating additional 21 trips (about 18 departing in the morning and 3 arriving) and on the assumption 100% of the movements passed through the roundabout the operating level of service is not expected to change. The addition of 21 trips to the 6,735⁹ trips at the roundabout at 2041 represents a change of just 0.3%. There will remain ample capacity within the roundabout to accommodate the change. The increased demand and its effect is in my opinion negligible.

⁸ Transportation Modelling Report, Section 8.3.4, Table 10 Detailed LOS Assessment Scenario 5.

⁹ Transportation Modelling Report, Section 8.3.4, Table 10 Detailed LOS Assessment Scenario 5.

- h) In relation to network connectivity for the area, this would remain the same as has been determined in the Variation. That is, all traffic connectivity is to be established through the intersection of the Spine Road (north) with the Greenhill Link Road.
- i) On the basis of these assessments I can conclude with a high degree of confidence that the zone change sought can be accommodated without any material change in traffic demand and with no altered demands in relation to the transport network infrastructure requirements.
- (xi) **Submission 05.03.** The submission seeks an amendment to clarify how vehicle and cycle access will be provided to the Ryburn / Percival Road area when Ruakura Road is closed. I note that Rule 3.7.3.3 f) is proposed and is supported both by Mr Gray and myself in relation to maintenance of access. I also note that Rule 3.7.3.2.1 Consent for Land Development requires a restricted discretionary consent for activities that includes “*construction of roads, pedestrian paths and cycle routes*”. Also Rule 3.7.2.4d ii) states that in respect of any road stopping procedures, the principles to be adhered to include assessment of “*A route which enables use of alternative modes of transport (particularly walking and cycling*”. On this basis I conclude that there is appropriate provision included within the rules as proposed to address the submission.
- (xii) **Submission 48.70, Figure 2-14.** The submission seeks amendment to the legend as follows “*Indicative Location and Extent of Ruakura Retail Centre*”. Mr Gray rejects the submission citing insufficient consideration of traffic effects. I acknowledge this position, however consider the matter can be more effectively considered as follows. The potential for traffic generation emanating from the Ruakura Retail Centre has been assessed and included as a contributing part of the overall traffic demands due to the Plan Change. The analyses that have been undertaken had for the most part assumed a connection point for that centre coinciding with the Ruakura Road / Knighton Road intersection. The transport network effects, including strategic infrastructure, arising from the Centre’s trip generation have been established, especially through the management controls specified at Rule 3.7.3.3.3 a) i – iii. The submission seeks some flexibility (while still contained within the Knowledge Zone Precinct C area) to enable options to be considered that most effectively locate the Retail Centre to service its community. Rule 3.7.3.3.3 a) iii enables that flexibility. It

states: “Or iii. Suitable arterial network capacity can be demonstrated or established in a manner that maintains the efficiency, safety and functioning of the transport network.” There is a well-established requirement for the more specific localised effects of any change to be assessed through the LDP processes. An amendment to the legend on Figure 2-14 as submitted will enable not only the assessment of “Suitable arterial network capacity ...” but also flexibility to consider alternate connection points to Ruakura Road, albeit within the same segment of the road environment. Given the ultimate transport network connection point remains within the same section of Ruakura Road as the Plan Change and Variation has relied on, and that the potential for trip generation has been assessed, I can conclude that the strategic infrastructure requirements can be expected to remain appropriate, and that any localised effects and related mitigation remains able to be addressed through the LDP Restricted Discretionary process. I have therefore concluded the Legend on Figure 2-14 should be amended to reflect “*Indicative Location and Extent of Ruakura Retail Centre*”.

Conclusions

30. On the basis of my assessments, and with the amendments I have recommended, I have concluded that the traffic and transport objectives, policies and rules appropriately require strategic infrastructure and appropriately achieve management and control of the potential for traffic and transportation generated effects resulting from land development.



Mark Apeldoorn
Traffic Design Group

15 July 2016

Appendix A

Ruakura Plan Change Proposal -
Transportation Assessment Report, Table
of Contents (June 2013)

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Appendix B: Transport Policy Assessment

Appendix C: Ruakura Strategic Transportation Modelling – Transportation Assessment Report

List of Diagrams Integrated into the Report

(For a list of Figures, refer to Appendix A cover sheet)

Diagram 1: The Plan Change in the context of the Hamilton Road Hierarchy

Diagram 2: Hamilton Bus Network

Diagram 3: North-East Section of Hamilton’s Walking and Cycling Network

Appendix B

Ruakura Structure Plan Environmental Protection Authority (EPA) – Transportation Modelling Report Table of Contents

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Appendix C

Response to Submissions

Submissions

31. I have read and considered the Summary of Submissions as it relates to traffic and transport matters. Where relevant I have also reviewed the related specific submissions made. I address these in my following evidence, based on the Variation provision to which the submission relates. I record the submitter reference in brackets.
32. **Rule 3.7.1.7 Transportation Network** (Jennifer West). The submission seeks: “... *monitoring of the traffic on Silverdale Road to assess effects of increasing HCV traffic, other vehicles and pedestrians.*”
33. In response I note as follows:
- (i) Both the Traffic and Modelling reports undertaken and lodged as part of the BOI processes made specific assessments of traffic and separately of heavy commercial vehicle movements to be expected on Silverdale Road. The overall structure of the hierarchical transport network and its connections were a critical part of the Structure Plan and in particular included the following:
 - a. Establishment of the hierarchical transport network that intentionally channels through traffic onto the Arterial routes such as the Spine Road and Fifth Avenue;
 - b. Recognition that Silverdale Road is a Collector Road in the City’s hierarchy, that it has a collector / distributor function;
 - c. Establishment of intersection connectivity between the new Ruakura Road and Silverdale Road to indicate the principal thoroughfares as being the Spine Road and to a lesser extent Ruakura Road to the west. In achieving this, Silverdale Road was separated from the main intersection, off-set from the principal access points to the Inland Port and the local turning design of its connection with the realigned Ruakura Road is such that it discourages accessibility for larger vehicles.
 - d. A Collector Road connection is also shown through the Land Development Plan Area C as intersecting with Silverdale Road. This is established to service as a local access road to and from the Industrial Zoned area and has been consciously aligned so as to avoid its potential attractiveness to through movements, other than those that originate from the Silverdale residential area to the west. It delivers efficient access to/from the Ruakura Interchange, and to/from work

within the Industrial or Logistics zoned areas for the Silverdale living environment.

34. Taking a wider network view, and in particular the expectations for traffic movements to and from southern areas of the region, it is evident that the Spine Road, Fifth Avenue and the Waikato Expressway will ultimately be the most efficient routes for strategic, through and heavy commercial vehicle movements. In the interim, the existing Ruakura Road connection to Holland Road (to the East) and distribution north and south from there is consistent with currently and frequently used heavy commercial vehicle routes. For travel to and from the western areas of the City, Ruakura Road and Fifth Ave via the Spine Road will both provide direct access to the City's Ring Road system (Wairere Drive) and the most efficient, convenient and cost minimised routes for heavy commercial vehicles.
35. In practical terms, heavy vehicle movements will be naturally delayed and discouraged from use of Silverdale Road due to its many access points, school and university carpark turning movements and the commercial area all contributing to a slow speed and less desirable travel route. Further, the route includes difficult and delayed turning at the Silverdale Road / Morrinsville Road (SH26) intersection, and also challenged turning at the Hillcrest Road roundabout. Overall, access south or west via Silverdale is less direct, less efficient and is expected to take longer, all of which are undesirable outcomes for heavy commercial vehicle movements that otherwise don't have business in the existing Silverdale area. Accordingly, I consider the matter to have been well thought through and planned and therefore conclude there is no reasonable transport reason to warrant the monitoring sought.
36. **Rule 3.7.1.7 Transportation Network** (Julian, Madarang, Fellowship Baptist Church, Cowie, Wang Y & K, Chibnall, Wang M, Masters). The submission seeks amendment to the Rule to exclude vehicle movements from any buffer or interface areas on Percival Road and also to avoid heavy vehicle access to the logistics or industrial sites via Percival or Ryburn Roads. In my assessment the matter of connectivity and heavy commercial vehicle movement is not one that requires definition as part of Rule 3.7.1.7. Rather I note the inclusion of Policy 3.7.2.4 d and e, which I support and which I consider appropriately addresses this submission.
37. **Rule 3.7.1.7 Transportation Network** (Alexander). The submission seeks amendment to the rule to provide a more direct link between the Percival / Ryburn Road area and Ruakura

Road to the south prior to closing Ruakura Road. I address this at my paragraphs 73 to 75 in response to submission 37.06.

38. **Rule 3.7.1.7 Transportation Network** (TGH, CPL). The submission references a change to the proposed road hierarchy, and amendment to detailed lane and intersection referencing.
39. At Rule **3.7.1.7 d)** the submission seeks to amend the road hierarchy for the section of the Spine Road (north of Fifth Avenue) from Minor Arterial to Collector Road. In relation to this matter, it is evident that traffic demands on the section of the Spine Road north of Fifth Avenue will be relatively minor in comparison to those typical of an arterial road. With forecast traffic demands in the order of 6,000 to 7,000vpd, the demands are ultimately aligned with the upper end of a Collector Road or the lower end of a Minor Arterial. The fully developed Variation traffic flow demands will clearly be well serviced by a two lane corridor in this area. This central section of the Spine Road is consciously classified as a lower order road when compared with the section to the south which establishes a strategic link between the Ruakura Interchange and the Fifth Ave Cross-City Arterial. This supports restricted use of it as a thoroughfare for external to external area movements and minimises its attractiveness for heavy vehicle through movements supporting a higher amenity outcome for adjoining property. Accordingly, while it could in volume terms be classified as a Collector Road, a more broad network integration based consideration can reasonably classify it as a Minor Arterial Road whose demands are expected to be well contained within a two lane cross section environment.
40. It also seeks to remove reference to this section of the Spine Road as primarily servicing the residential and industrial development. In my assessment the reference description detracts from the integrity of the purpose of the road section. The PDP contains definitions of road hierarchy that are consistent on a city wide basis, and it is in accord with this approach that the hierarchy for this section of road has been determined. On this basis, I conclude the reference should be deleted as submitted.
41. At Rule **3.7.1.7f)** the submission seeks removal of the reference to a four lane road bridge. While very early concepts and planning identified the potential need for a four lane road, more refined planning and transport modelling has identified that the provision of a two lane road is expected to readily accommodate the demands, having regard for the specific and materially lower traffic generation demands relating to logistics and inland port

activities. Notwithstanding this, recognising the potential for changing future demands, and to ensure the ultimate integrity of the transport network in this location a corridor provision that has the capacity to accommodate 4 lanes of traffic is to be established. Furthermore, the Land Development Plan stage is, in my assessment, an appropriate stage to evaluate the particular carriageway cross section detailing and its staged establishment. The Land Development Plan stage will include an Integrated Transport Assessment looking at least 10 years ahead and include forecast capacity development of the Variation with the benefit of some known activities and demands. Accordingly, I conclude the corridor provision appropriately ensures the future sustainability of the transport network and it is therefore not necessary to specify the particular characteristics of the ultimate formed carriageway in the Variation. This change is shown on the Council Track Changes – Extracted and collated.pdf

42. At **Rule 3.7.1.7h)** the submission seeks deletion of reference specifically to “*signalised intersections*”. The high level and ultimate capacity development planning for the Variation area has identified that signalised intersection control is a likely and probable outcome. However, more particular and local staged planning, such as will first require consent through the Land Development Plan processes, has identified there may be alternate, temporary and interim arrangements that better, more effectively and, more efficiently service the transport network. Accordingly I conclude, that while it is necessary and appropriate to retain intersection referencing, it will be a more efficient use of resources for the specific form of intersection to be removed, and for such staged and ultimate transport planning to be determined through the LDP consent processes.
43. **Rule 3.7.1.7 Transportation Network** (Bothwell). The submission seeks relocation of the Spine Road north of Fifth Avenue further east to separate it from the established residential areas. From a traffic and transport corridor planning perspective the alignment of the Spine Road was a critical part of the early planning processes. From an efficiency and safety perspective its relatively direct alignment between the northern and southern network integration points are important. Its design and location was developed having regard to existing and eventual topography, efficient land allocation and effective separation from existing neighbourhoods. I was a principal advisor on traffic and transport from this inception stage.
44. A wide corridor was developed and the road located within its eastern extent to optimise separation. Walking and cycling amenity and stormwater management features were

established between the carriageway and the residential areas, these facilities relating more effectively to residential integration. Relocating it further east will increase the curvature of its alignment and make it more complex to achieve suitable alignment integration and interchange separation at its northern Wairere Road connection. Similarly, it potentially off-sets its connection point at Fifth Ave and introduces inefficiencies in the Industrial Zone lot depth developed on the east of the corridor between the Spine Road and the Indicative Collector Road further east.

45. Moving the Spine Road further east, with residential development established between it and the established built environment to the west, introduces a likely need for additional access points directly to the Spine Road, or alternatively an inefficient use of land to establish a parallel service road for these properties. It introduces conflicts with the stormwater management scheme and conflict crossing points with the off-road walking and cycling facilities purposefully established in this unobstructed reserve space.
46. On the basis of my early involvement in the planning and Structure Plan development, and having reviewed the submission, I have concluded the Spine Road is currently located optimally with effective separation from the established residential area, safe and efficient alignment, effective integration with the surrounding transport network and in a way that delivers an efficient utilisation of land for productive purposes.
47. **Objective 3.7.2.4 An integrated and efficient pattern of land use** (WRC, KiwiRail, Gibbons, TGH, CPL). The submissions either support retention of the Policies or in the case of TGH and CPL seek amendment to Policy b and e (now f).
48. In broad and strategic transport terms, it is my assessment that an efficient transport network has been established to service all vehicle demands, including both motorised and non-motorised transport modes. The network will enable efficient public transport movement, accessibility and connectivity that aligns strongly with the Objective. In relation to referencing “*grade separate facilities*” in both the Policies, my opinion accords with that of Mr Parsons¹⁰. In my assessment it is inappropriate to require such significant infrastructure, particularly where it has the potential to lead to adverse outcomes. Rather, I consider it appropriate to recognise the need for walking, cycling, passenger transport and other facilities, but for the design of these to be developed appropriate to the environment

¹⁰ Parsons EIC, section 4.2

at detailed design stage. Accordingly, I am of the opinion the terms “*grade separate*” can be deleted from the Policies b and e (now f) in the Council Track Changes – Extracted and collated.pdf.

49. **Rule 3.7.3.3 Staging and Traffic Requirements** (TGH, CPL, HCC, Fairview Downs Residents and Owners Association, Jennifer West).
50. **In relation to sub-clause b)**, the submissions variably seek retention of the clause, amendment to include reference to market conditions for “logistics” uptake, and improved readability. From a traffic planning perspective I consider the amended text as proposed by HCC, and which reflects a need for staging flexibility within a controlled assessment regime to be appropriate. The Rules structure of the Variation establish assessment requirements through a Land Development Plan (LDP); for larger traffic generating developments; and for departures from the concept plans; that will appropriately provide for the identification of application specific effects and their related mitigation need. The broader concept on network integration and integrity has been well-established through the BOI assessment work undertaken. Accordingly, I assess the rules as being appropriate to accommodate the necessary flexibility to respond to variable market environments while ensuring appropriate management and protection of the established, and planning for the future transport network.
51. **In relation to sub-clause c)**, Fairview Downs Residents and Owners Association seek a requirement that development in the Knowledge zone (Precinct C) is subject to completion of the Waikato Expressway Hamilton section and its connection to the Ruakura Structure Plan or suitable arterial network capacity. I consider the rule where it requires suitable arterial network capacity to be an appropriate requirement to ensure protection and management of the traffic demands on other arterial and collector routes. This is consistent with the assessments I have made and which is included specifically in Rule 3.7.3.3.3.
52. The Rule is however not consistent with the BOI assessments I undertook, where it suggests that development of the Knowledge zone (Precinct C) is subject to the Waikato Expressway being completed. Precinct C should not be and was never determined to be subject to the Waikato Expressway. I have seen no established link or evidence to support this requirement and accordingly do not support it. Rule 3.7.3.3.3 was specifically developed on an evidence basis to correlate the potential for development of the Knowledge zone

(Precinct C) with its potential for effects generation. The activities that are planned to occur within it have a stronger local neighbourhood and employment connection and are not reliant on the strategic inter-regional, heavy commercial vehicle function and inter-Port connectivity the Waikato Expressway establishes.

53. Conversely, the Industrial Stage 2 area development does exhibit a reliance on the transport capacity and connectedness that the Waikato Expressway delivers. Accordingly I consider that link, as is established, within the Rules is appropriate in relation to the Industrial Stage 2 Area.
54. In my opinion, the Rule 3.7.3.3 c) as proposed and without the inclusion of reference to “*Precinct C within the Knowledge zone*” establishes appropriate network condition requirements, while enabling other alternatives to be considered, subject to specific assessment and if necessary specific alternate mitigation.
55. **In relation to sub-clause d)**, submissions seek its deletion and deletion of references to it. I support these deletion recommendations. The overall Structure Plan establishes a clear and hierarchical roading network and connectivity outcome. Staged development of areas will be subject to many factors. Transport access to any area will be subject to establishing suitable access and connection in terms of the Structure Plan for roading. With Land Development Plan Rules requiring an Integrated Transport Assessment¹¹, the manner and arrangement of staged connectivity is able to be assessed at the time development is planned and in a way that most effectively addresses the transport demands generated. The Rules at 3.7.3.3.1 to 3.7.3.3.7 in my opinion (and subject to my evidence) clearly establish mitigation requirements and connectivity in relation to the zone structure staging, with appropriate flexibility to enable unforeseen/anticipated development staging outcomes to be assessed and responded to. Accordingly, and with reliance on Rules 3.7.3.3.1 to 3.7.3.3.7, I have concluded that Rule 3.7.3.3 d) can be deleted.
56. **Rule 3.7.3.3.1 Industrial Land Stage Rules (TGH)**. TGH seeks consideration of the rule to reflect the current transport environment. Since the BOI decision there have been a number of changes to the road network. I have reviewed this rule in the context of those changes and have concluded there are no traffic or transport matters in the rule impacted by recent road network changes or land development plan consents.

¹¹ Ruakura Variation, Rule 3.7.2.4

57. **Rule 3.7.3.3.2 Industrial Land Stage 2 Rule (PRPS 2021 – 2041 Allocation)** (TGH, Ruakura Residents Group). The TGH submission seeks consideration of the rule to reflect the current transport environment. The Ruakura Residents Group submission seeks to review the traffic volume thresholds in sub-clause (a)(ii) of this rule. It also seeks to provide a more direct indicative link between the residents land and Ruakura Road to the south on Figure 2-15 and a supporting Objective at 3.7.2.4.
58. Having reviewed the rule in respect of the potential impact resulting from recent road development works I find there are no traffic or transport matters requiring amendment or alteration.
59. The rule 3.7.3.3.2 (a)(ii) as it's written establishes volume thresholds on Ruakura Road (east of Wairere Dr) and on Wairere Dr (south of Ruakura Rd) to ensure the long term protection of traffic generated demands on the existing transport network. It also establishes that in the event the thresholds are reached (either as a result of Structure Plan land development, or alternatively due to general City growth) then in order for further development to occur the Spine Road (between Ruakura Road and Fifth Ave) is to be constructed. This rule provides for additional Spine Road capacity to be established at the point when reasonable operating thresholds on the existing network are reached. In my assessment it would be an inefficient use of existing resources, and an unreasonable cost implication on the development of the Structure Plan area to require earlier construction of the Spine Road link, which includes a substantial bridge structure over the East Coast Main Trunk Rail line.
60. The thresholds are set at appropriate constraint levels that accord with good transport planning practice for efficient use and demands on transport networks. These were established at the time of the BOI in expert witness conferencing dated 4 April 2014. I have reviewed these thresholds. Theoretical lane capacity is well-established at 1,800vph un-interrupted. The thresholds established in the Rule and 1,200 (67%) and 1,400 (77%) vph appropriately reflect the current transport environments and their impact on the theoretical capacity. In my opinion there is no further evidence or corresponding reason to suggest the values be amended as is submitted by the Ruakura Residents Group.
61. In relation to the submission to show an alternate connection to the south between the Residents land and Ruakura Road, I address this at my paragraphs 75 to 76 in response to submission 37.06.

62. **Rule 3.7.3.3.3 The Knowledge Zone Precinct C (including the Ruakura Retail Centre, but excluding Precincts A, B and D) Staging Rule (TGH).** TGH seeks consideration of the rule to reflect the current transport environment. Since the BOI decision there have been a number of changes to the road network. I have reviewed this rule in the context of those changes and have concluded there are no traffic or transport matters in the rule impacted by recent road network changes or land development plan consents.
63. **Rule 3.7.3.3.4 Medium Density Residential Staging Rule.** I have considered the rule and find that sub-clause b) appears to be superfluous as a result of the works to which it relates having been recently completed. I describe the further works that have been undertaken under the heading “Changes to the Transport Environment” (paragraph 16) earlier in my evidence. With the works and the required connection to the E1 Arterial Road at the Wairere/Crosby/Gordonton Road roundabout now completed I recommend deletion of Rule 3.7.3.3.4 b). I recommend accepting the track changes to Rule 3.7.3.3.4 as shown on the Council Track Changes – Extracted and collated.pdf.
64. **Rule 3.7.3.3.7 Traffic Generation (NZTA, Fairview Downs Residents and Owners Association (FDROA), WRC).** The rule establishes a 1,500 vehicles per day (vpd) trigger for resource consents as a restricted discretionary activity. NZTA and WRC seek a requirement for affected party approval and NZTA seeks cross reference to the ITA rules. FDROA seeks a lower 250vpd threshold and application to temporary logistics activities.
65. The rule is derived from the expert witness traffic conferencing including representation for NZTA and WRC. Conferencing determined a detailed rule with associated thresholds. It established a 1,500vpd trigger requiring a Broad ITA to be undertaken, with some exceptions. The determination of 1,500vpd as the trigger aligns with the PDP City-wide *Rule 25.14.4.3 Integrated Transport Assessment Requirements* and the threshold for “Significant” activities in all areas. The Rule as proposed aligns with the BOI decision at 25H.12.7.1 (a) and (b) and is therefore consistent in that regard.
66. In my assessment, the 1,500vpd trigger threshold remains appropriate. I note that Land Development Plans are required for all areas as restricted discretionary activities, and include a requirement for traffic effects assessment. Notwithstanding this, the transportation network modelling and subsequent evaluation has identified key infrastructure and staging requirements with surplus capacity. Lower traffic generating activities will be well accommodated within the infrastructure and staging required.

67. Temporary activities are described in part b) of the rule as requiring traffic management plans to be approved by the road controlling authority. The PDP City-wide Rule 25.14.4.3 h) establishes City-wide exceptions to the ITA requirements. At i) the exception includes *“Events and Temporary Activities ... where a Transport Management Plan is required.”* These are defined terms. I do not therefore consider it necessary to provide any further reference to temporary logistics activities.
68. I conclude therefore that the rule as proposed in the Variation appropriately reflects the intent of the expert witness conferencing on Traffic. It properly and reasonably establishes a threshold applicable to those larger activities with a higher traffic generating potential, to capture those and require specific assessment. While demand levels are set at 1,500vpd (consistent with the PDP City-wide Rule) it needs to be kept in mind the peak hour demands remain relatively low. In a working / employment environment this generally and broadly correlates with about 150 vehicles per hour (vph) in the peak hour. When regard is had to distribution of the demand by arrival/departure and then by alternate directions on the transport network, it is quickly evident that movement effects beyond the site entrance are in the order of one (1) or fewer additional vehicle movements per minute per direction. The effect level is, in my opinion reasonably set and not unduly high.
69. In relation to the potential for effects I note that:
- (i) Full development of the land use potential has already been assessed and strategic infrastructure identified and required; and
 - (ii) Land Development Plans for areas require an Integrated Transport Assessment, with an expectation (in my opinion) it will only identify more localised activity specific mitigation (if any), unless there is a substantial departure from the forecast land use zoning assessed; and
 - (iii) Within Land Development Plan Areas larger specific activities generating more than 1,500vpd (or about 150vph) require further assessment, consistent with PDP expectations City-wide; and
 - (iv) It’s my conclusion that robust and appropriately balanced mechanisms are established within the rule as proposed.

70. **Rule 25 City-wide** (Jennifer West). The submission seeks a traffic assessment for the whole of the Structure Plan area and a review of the modelling done for the Variation.
71. In this regard I note the S32 Analysis report section 5.4.5.3 where it states:
“This rule (which comprises a series of staging rules) is expected to manage large increases in traffic that will require connections from greenfield areas to the existing City roading network. The Plan Change now provides for the effects on the transport network to be considered at the time approval is sought for a Land Development Plan. Rules relating to staging and triggers relating to increased traffic volumes will require certain actions to be taken as pre-conditions to further development of greenfield sites. The triggers themselves are derived from extensive modelling as part of the Waikato Regional Transportation Model overseen by FutureProof partners (Hamilton City Council, Waikato District Council, Waikato Regional Council, New Zealand Transport Agency) and as noted by the Board “it does not represent the interests of any one entity”.”
72. I can confirm this statement, in my capacity as Principal Transportation Engineer for TGH and CPL through the BOI process. The transport modelling undertaken reflected the RPS land use expectations and further developed these with the specific staging and land use proposed by the Structure Plan. The whole of the Variation area was considered and assessed, including the Structure Plan proposal. The ultimate (with all land in the Variation area fully developed) case was assessed and the strategic transport infrastructure determined. Accordingly I am of the opinion there has been substantive assessment of the traffic and transport effects and that these are appropriately addressed in the S32 Report.
73. **Submission Point 37.06 Figure 2-15A New Figure** (Ruakura Residents Group). The submission seeks amendment of the Figure to provide a more direct indicative link between the residents land and Ruakura Road to the south.
74. The TGH further submission opposes this citing:
“The closure of Ruakura Road and the provision of appropriate alternative routes will ultimately form part of the road closure process under the Local Government Act. It is unnecessary and potentially limits full consideration of alternatives in the future to include any greater specificity in the District Plan.”
75. The matter was similarly assessed and concluded in my evidence in chief (paragraphs 77 to 82) at the BOI hearing. The BOI decision addressed the matter at its section 7.6 and paragraphs 587 to 627. It concluded a further policy should be established in the Variation. That Policy has been established as Policy 3.7.2.4d and e of the Variation.
76. With regard to the matter of changing Figure 2-15A it's my assessment that a range of potential outcomes could result from the assessment requirements of Rule 3.7.2.4d and e.

It would therefore be inappropriate, in my opinion, to pre-empt that outcome by attempting to indicate one or a number of alternatives that have not been subject to assessment within the Strategic Infrastructure to be provided Figure.

77. **Submission Point 50.17 Figure 2-15A New Figure** (Jennifer West). The submission seeks monitoring of heavy vehicle traffic on Silverdale Road. I address this at my paragraphs 33 to 35.
78. **Submission Point 50.30 Integrated Transport Assessment** (Jennifer West). The submission seeks a traffic assessment of the whole of the Structure Plan and further modelling. It also seeks heavy vehicle monitoring on Silverdale Road. I assess and respond on the traffic assessment part at my paragraphs 70 to 72. I assess the submission in relation to Silverdale Road at my paragraphs 33 to 35.