Before Independent Commissioners

In Taupō

Under	the Resource Management Act 1991 (the Act)
In the matter of	Plan Change 36 – Whareroa North

Statement of evidence of Johan Kristoffer Hansson for the Taupō District Council (Transport)

Dated 22 April 2020

1 Executive summary

1.1 My evidence relates to Taupō District Council Plan Change 36 - Whareroa North ('**Project**').

1.2 My evidence is specific to the matters of Transport Planning and Traffic Engineering based on my 13 years' experience in the field. I also rely on my Bachelor of Science (Social Science) and Master in Civil Engineering Studies (Transportation) qualifications.

1.3 My evidence is based on a review of:

a Whareroa North Private Plan Change, The Trustees of Hauhungaroa #6: Infrastructure efficiency – potential cost to the community - Dated 28 September 2018.

b Whareroa North – Application to Change Taupō District Plan: Infrastructure Report Dated 7 December 2017 **"Infrastructure report"**

c Whareroa Animation HD.mp4

d Wastewater and Roading Submission Points Whareroa

1.4 In addition, I am familiar with the site and surrounds, but have not undertaken an explicit site visit given the Alert Level 4 Covid restrictions.

1.5 In summary, in terms of Transport:

a The proposal will increase traffic flows to and from Whareroa Village from an average of 193 vpd to 309 vpd with project fully developed. These flows will likely double in the holiday season. Kuratau Hydro Road, Whareroa Road and SH32/Kuratau Hydro Road has sufficient capacity to accommodate the anticipated increase in traffic. Accordingly, the project can be **supported** from a capacity perspective.

b The increased vehicular trips to/from Whareroa Village with the project in place will increase the exposure to crash risk. However, Kuratau Hydro Road, Whareroa Road and the SH32/Kuratau Hydro Road intersection are currently operating safely and can support the additional development traffic with less than minor impact on road safety. Accordingly, the project can be **supported** from a safety perspective.

c The project application is silent as to the legal mechanism by which public access in perpetuity over Whareroa Stream is to be achieved. From a traffic engineering perspective, the public access to and from the development needs to be legalised otherwise the project site could be potentially landlocked. Therefore, the project **cannot be supported** from an access perspective and the access arrangements to/from the project need to be legalised including the proposed bridge structure.

d It is not clear in the project application what pedestrian and walking provisions form part of the application. It is my **recommendation** that the proposed pedestrian and cyclist provisions that are part of this project is clarified and form part of the Plan Change.

1.6 There are potentially additional costs to the Taupō District Council associated with the project, including:

(a) Roading maintenance costs associated with servicing the development as a consequence of development;

(b) The need to clear vegetation within the road reserve on the northern side of the SH32/ Kuratau Hydro Road intersection in order to maximise sightlines for vehicles from the Kuratau Hydro Road approach – these costs are not determinative;

(c) Upgrade the SH32/ Kuratau Hydro Road intersection to Waka Kotahi's ('**NZ Transport Agency**') Diagram E Treatment.

2 Code of conduct

2.1 Although this matter is not before the Environment Court, I have read and am familiar with the Code of Conduct for Expert Witnesses in the current Environment Court Practice Note (2014). I have complied with the Code of Conduct in the preparation of this evidence and will follow the Code when presenting evidence to the Commissioners. My qualifications as an expert are set out below. I confirm that the matters addressed in this statement of evidence are within my area of expertise, except where I rely on the opinion or evidence of other witnesses, as stated. I have not omitted to consider material facts known to me that might alter or detract from the opinions I express.

3 Qualifications and experience

3.1 My full name is Johan Kristoffer Hansson.

3.2 I am the Transportation and Design Work Group manager for WSP in Tauranga and have been employed by WSP (previously Opus) for 10 years. I have practised in the field of civil engineering for 13 years, concentrating in the area of Transportation Planning and Transportation Engineering.

3.3 My relevant tertiary qualification includes a Bachelor of Science (Honours) (Social Science) from Kingston University of London (2007). I also have a Master in Civil Engineering Studies (Transportation) from the University of Auckland University (2018).

3.4 Over the last 13 years, I have been responsible for undertaking transport assessments, intersection traffic modelling, transportation economics, writing business cases, project management and peer reviewing traffic impact assessments on behalf of Waka Kotahi and a number of District Councils.

3.5 In my current role as the Transportation and Design Work Group Manager in Tauranga, I am regularly providing guidance and formal reviews of reports (including Traffic Impact Statements, Integrated Transport Assessments, intersection analysis and design) produced by members of my team.

3.6 My evidence relates to the Taupō District Plan 36 – Whareroa North (PC36) (**Project**).

4 Involvement with the Project

4.1 I have not been part of this project to date and my evidence relies on my 13 years experience in the field of Transport Planning and Traffic Engineering.

4.2 I have read the Whareroa North infrastructure report **"Infrastructure report"** dated 7th December 2017 which seeks to change the Taupō District Plan to familiarise myself with the project. I have also read the relevant transport related submissions to understand any safety or capacity concerns of the submitters that oppose this project.

4.3 I have not undertaken a site visit, due to Covid19 lockdown, but have familiarised myself with the site through google earth aerial and street view imagery. I have relied on common engineering practises to address the capacity and safety concerns of the project.

5 Scope of evidence

5.1 This evidence addresses the following matters:

a Background to the Project;

b Proposed development;

c Traffic and transportation effects;

d Mitigation measures.

6 Background

6.1 Whareroa Village is located approximately 33kms west of Turangi on the south western edge of Lake Taupō. The village is part of the Taupō District. The existing Whareroa Village has 202 residential allotments which are mainly used as holiday homes. I understand from Mr Bonis evidence that 47 of these 202 allotments remain undeveloped.

6.2 Whareroa Village is accessed off SH32, Kuratau Hydro Road and Whareroa Road. The combined length of Kuratau Hydro Road and Whareroa Road from the SH32 intersection to the Whareroa Village is approximately 9 km long and is the only road to and from the village.

6.3 The SH32/Kuratau Hydro Road Intersection is formed as a T-Intersection with the Kuratau Hydro Road approach being stop controlled. The intersection has single lane approaches with no dedicated turning lanes.

6.4 SH32 is classified as a primary collector road within the One Network Road Classification (ONRC) with an Average Annual Daily Traffic (AADT) of 834 vehicle per day (vpd) in 2019. Kuratau Hydro Road is classified as an access road with an AADT of 145 vpd (source: Mobile Road 2020).

6.5 The SH32/Kuratau Hydro Road intersection is located on the northern end of a short section of straight road. North of the intersection the SH32 alignment has a gentle horizontal curve that reduces the available sightlines for vehicles approaching the intersection from Kuratau Hydro Road.

6.6 Sight distances at the SH32/Kuratau Hydro Road intersection has been measured from Google Earth aerials and street views. The sight distance towards the north is around 160m and sight distance towards the south is around 280m. The sight distance towards the north is approximately 90 meters shorter than the recommended sight distance for a 100km/h road environment.

6.7 There are three residential property accesses that interfere with traffic movements to and from the SH32/Kuratau Hydro Road Intersection. Two

accesses are located on the western side of SH32 (one located opposite Kuratau Hydro Road and one located approximately 70 metres north of the intersection. The third access is located on the northern side of Kuratau Hydro Road approximately 10 metres from the intersection.

7 Proposed development

7.1 The development proposes a maximum of 160 lots located on the north side of the existing Whareroa Village increasing the total number of lots within the Whareroa village to 362 (an increase of around 80%). The proposed lots are to be located on the northern side of the Whareroa Stream.

7.2 The proposed development also includes a single span, two lane bridge (over Whareroa Stream) and a new spine road connecting the new development with the existing Whareroa Village.

7.3 The proposal does not include any upgrade of Whareroa Road, Kuratau Hydro Road or the SH32/Kuratau Hydro Road Intersection.

8 Traffic and transportation effects

Trip Generation

8.1 Trip generation to and from a development is considered to be a vital part of assessing any potential traffic effects, both in relation to safety and efficiency.

8.2 Based on the Graymatter letter dated 13 November 2017, 8-9% of the existing residential homes are permanently occupied with the remaining dwellings being holiday homes. This equated to 12-14 existing dwellings being permanently occupied.

8.3 The existing trip generation to and from the Whareroa Village has been assumed to be 145vpd which is based on the existing traffic volumes on Kuratau Hydro Road. This would equate to around 15 vehicles per hour (vph) in the peak hour based on the common traffic engineering assumption that 10% of the daily traffic volume occurs in the peak hour.

8.4 There are approximately 50 lots in the existing Whareroa Village that are undeveloped. Using a linear increase of the existing trip generation these lots would generate an additional 48 vpd.

8.5 The trip generation for the proposed development assumes that the 160 additional lots will have a similar proportion of permanent residents as the

existing village. Hence, the trip generation for the project is estimated to be 116 vpd.

8.6 The total cumulative trip generation (existing, undeveloped and proposed) is estimated to be 309 vpd or 31 vph for typical peak periods throughout the year.

Seasonal Peak

8.7 With the Whareroa Village being a holiday destination the trip generation to and from the village is expected to increase at certain times of the year.

8.8 The estimated change during holiday periods has been estimated based on the SH32 Telemetry Site 43. The telemetry data provides traffic counts for 365 days a year and analysis of this data throughout the year shows the change in traffic during holiday periods.

8.9 As stated above, the 2019 AADT on SH32 was 834 vpd. The average flows for the 20 highest days in 2019 was 1,636vpd, which is approximately double the average daily flow.

8.10 Based on this data it is estimated that during holiday periods the traffic to and from Whareroa Village would double. This would equal a flow of around 390 vpd to and from the existing Whareroa Village when fully developed, which would increase to 618 vpd with the proposed project.

Capacity

8.11 Both Kuratau Hydro Road and Whareroa Road are two lane sealed roads with a general seal width of 6m. The cross section comprises of 3m traffic lanes with a marked centre line. There are no marked shoulders. The alignment of both roads is generally flat and straight with a couple of gentle curves.

8.12 Based on calculations and using the Waka Kotahi's Economic Evaluation manual the capacity of the road with 13% Heavy Commercial Vehicles (HCV's), a seal width of 6m and 50/50 directional split the capacity of the road is 1,986 vph.

8.13 As stated above the daily traffic volumes with the project is estimated to be around 309 vpd during the majority of the year and 618 vpd during the holiday periods. The holiday peak scenario remains significantly lower than the theoretical road capacity of 1,986vph. Therefore, it is my opinion that no capacity issues would exist for this road with the proposed development in place.

8.14 No efficiency assessment or traffic modelling has been undertaken for the SH32/Kuratau Hydro Road Intersection because the flows on both SH32 and Kuratau Hydro Road are very low with and without the project. However, based on my professional experience, the delays and queue lengths at this intersection are likely to be very small and I consider that any potential effects from the project in relation to efficiency will be less than minor.

Safety

8.15 I recognise that the proposed development will generate additional traffic on both the local road and State Highway network and thereby increasing the exposure to potential vehicle conflicts. However, both the local road and State Highway network in the vicinity of the project have very low traffic volumes.

8.16 A crash search using the NZ Transport Agency Crash Analysis System for the last 10 years (1 January 2010 to 31 December 2019) shows that one crash has been recorded on Kuratau Hydro Road. This crash was from a single vehicle that lost control and resulted in a non-injury crash. No crashes were recorded within a 200m radius of the SH32/Kuratau Hydro Road Intersection during the last 10 years.

8.17 Based on the crash history, the SH32/ Kuratau Hydro Road does not appear to have any existing safety issues.

8.18 Using the NZ Transport Agency's Crash Estimation Compendium crash prediction models the crash rate for a typical high-speed priority intersection been calculated. Based on the existing flows the crash rate for the intersection is 0.02 crashes per year which is equivalent to 2 crashes over a 100-year period.

8.19 With the additional traffic from the proposed project the crash rate within the SH32/Kuratau Hydro intersection is predicted to increase from 0.02 to 0.03 crashes per year which is an increase of 1 additional crash over a 100-year period.

8.20 Therefore, it is my opinion that based on the current safety record and crash estimation, the SH32/Kuratau Hydro Road intersection is currently operating safely and the additional development traffic will not compromise road safety. Notwithstanding this, it is recommended that sightlines be improved and that the intersection be upgraded to Waka Kotahi's Diagram E Treatment to further improve safety. As this is not directly attributable to development enabled by the proposed Plan Change these works would need to be co-ordinated by and undertaken by the Council.

Vulnerable Road users

8.21 Both Kuratau Hydro Road and Whareroa Road has an average of 6m sealed carriageway with no shoulders. Each side of the road has approximately a 1m wide grass verge that can be used for pedestrians and horses. Cyclists are expected to utilise the road. Taking into consideration the rural nature of the surrounding environment, the low number of motor vehicles and the low number of vulnerable road users on Kuratau Hydro Road and Whareroa Road, this level of service is considered appropriate.

8.22 I understand from the concept plans in the Infrastructure report and watching the Whareroa Animation video that the project proposes pedestrian linkages (including provision on the bridge) as part of the development. This includes a pedestrian link through the native bush between the link road (north of the proposed stream crossing) and the Utility Reserve.

8.23 In my professional opinion, there is no certainty what pedestrian provisions are part of the plan change and how these provisions will tie into existing and proposed infrastructure. For example, what provisions will be provided on the proposed Stream Bridge, the proposed width of new footpaths along the new roads and the connectivity to existing infrastructure.

8.24 I believe pedestrian and cyclist connectivity between the project and the existing Whareroa Road Village is an important part of this project and needs to be developed further in the next phase of the project.

Legalisation of Structure Asset

8.25 In reading the Infrastructure Report I note that a bridge structure over the Whareroa Stream is proposed. However, the project application is silent as to the legal mechanism by which access over Whareroa Stream is to be achieved.

8.26 From a traffic engineering perspective, the public access to and from the development needs to be legalised. This would assist with both initial investment and avoiding future asset management costs.

9 Submission

9.1 I have read submission point number 2.1, 6.13, 7.1, 7.2, 13.4 and 14.3 that oppose the project because of capacity and safety reasons from the increase in vehicles associated with the project.

9.2 Based on my assessment above, I can comfortably state that the capacity, efficiency and safety of the supporting transport network can support the project and the trip generation generated from it. More specifically:

a There are no capacity issues on either Whareroa Road or Kuratau Hydro Road as a result of the proposed development;

b There are no capacity issues on the SH32/Kuratau Hydro Road Intersection with the proposed development in place;

c There is a potential decrease in safety of the SH32/Kuratau Hydro Road Intersection that equates to one additional crash every 100 years due to the proposed development. This increase in safety risk is considered less than minor.

10 Mitigation measures

10.1 To address any traffic effects the following mitigation measures are suggested:

a That the access arrangements to/from the project is legalised including the proposed bridge structure;

b Develop a pedestrian and cyclist connectivity plan that clearly states what pedestrian linkages and other provisions are proposed for this project.

10.2 The project results in infrastructure costs to Taupō District Council, as set out below:

a Road maintenance costs associated with servicing the development;

b Clearing vegetation within the road reserve on the northern side of the SH32/ Kuratau Hydro Road intersection in order to maximise sightlines for vehicles from the Kuratau Hydro Road approach – these costs are not determinative; and

c Upgrade the SH32/ Kuratau Hydro Road intersection to Waka Kotahi's ('**NZ Transport Agency**') Diagram E Treatment; This treatment will provide a more forgiving road environment at the SH32/Kuratau Hydro Road intersection and the three property accesses within the immediate vicinity.

10.3 These community costs are not considered to be material nor determinative.

11 Conclusion

11.1 I cannot support the Project given the residual uncertainty associated with access arrangements. Specifically, the Plan Change application is silent as to the legal mechanism by which access over Whareroa Stream is to be achieved.

11.2 From a traffic engineering perspective, the access arrangements to the project need to be legalised including the proposed bridge structure.

11.3 Apart from the legal access complication, I support the proposal from a transport perspective as the transport effects are less than minor and these effects can be suitably mitigated. The proposal will increase traffic flows to and from Whareroa Village from an average 193 vpd when fully occupied to 309 vpd with project. These flows will likely double in the holiday season. Kuratau Hydro Road, Whareroa Road and SH32/Kuratau Hydro Road has sufficient capacity to accommodate the anticipated increase in traffic.

11.4 The SH32/Kuratau Hydro Road intersection is currently operating safely and the additional development traffic will not compromise road safety. Notwithstanding this, it is recommended that sightlines be improved and that the intersection be upgraded to Waka Kotahi's Diagram E Treatment to further improve safety.

Johan Kristoffer Hansson
22 April 2020

Annexure 1: Diagram E Treatment