

IN THE MATTER of the Resource Management Act 1991

AND

IN THE MATTER Proposed Plan Change 37 - Nukuhau (private)
by AN Rajasingham LPT Trustees No 124
Limited to the Taupo District Council to
rezone c.78ha of land in the Nukuhau area
from Rural Environment to a mix of General
Residential and Mixed Density Residential
with a Neighbourhood Shopping Centre
overlay.

JOINT WITNESS STATEMENT OF EXPERTS IN RELATION TO TRANSPORTATION EFFECTS

1 Introduction

- 1.1 This Joint Witness Statement (JWS) records the outcomes of conferencing by the three traffic experts in attendance, as follows:
 - (a) Mr Swears – representing the Applicant
 - (b) Ms Cui – representing the Applicant
 - (c) Mr Smith – representing Taupō District Council
- 1.2 The three experts met via Microsoft Teams along with the Planners on 12th October 2021 from 10am-11:45am. They also met via Microsoft Teams, independently of the Planners, on 15th and 18th October 2021.
- 1.3 The structure of this document follows the format of Mr Smith’s evidence which was lodged with the Section 42A report. Mr Swears and Ms Cui have reviewed the evidence and listed the points with which that they are both in agreement and highlighted the matters where their view differs from that of Mr Smith. Paragraph references to Mr Smith’s evidence are also included in parentheses.

2 Review of Traffic Impact Assessment (DS 4)

2.1 With respect to walking and cycling and mode choice, the experts agree on the following:

- (a) Walking and cycling infrastructure within the PC37 site needs to connect with infrastructure beyond the boundaries of the site (DS 4.2).
- (b) Providing a connection along Acacia Bay Road and Watene Lane to the current alignment of Poihipi Road is an important component of the walking and cycling network (DS 4.4).
- (c) Because of its proximity to the Taupo town centre, the PC37 site presents a viable alternative to motor vehicle transport between the site and the CBD (DS 4.6).
- (d) In addition to the point above, the site is well located to be served by public transport (DS 4.6).

2.2 With respect to transport network capacity assessment, the experts agree on:

- (a) From a modelling perspective, it is preferable for a transport model to be calibrated or validated, and Mr Smith considers that calibrating and validating models to ensure they are consistent with observed traffic behavior and performance is best practice (DS 4.8).
- (b) The modelling in the TIA is not based on a calibrated or validated model (DS 4.9).
- (c) It is reasonable to adopt a volume of 1550-1600 vehicles per lane per day as the capacity for Control Gates Bridge (DS 4.11a).
- (d) Any additional residential development to the north of the bridge will exacerbate congestion observed at the bridge and on the approaches to the bridge (DS 4.12). In agreeing with this statement Mr Swears emphasised that he considers it is traffic generated by “additional development” that will exacerbate the congestion. He considers that if additional lots are available for development, but the amount of motor vehicle traffic (associated with the residential development) at any given location on the transport network is the same, the effect of the Plan Change on congestion will be no worse than

neutral. That is when directly compared to an alternative scenario with the same total amount of traffic generated by development occurring to the north of the bridge. Mr Smith agrees with this point.

- (e) Development and trip generation associated with 1500 or more additional lots north of the bridge is likely to result in a significant increase in peak period traffic flow (DS 4.13).
- (f) The Plan Change, if approved, would result in more development potential than presently exists north of the bridge (DS 4.13). However, the experts agree that because the potential exists, it does not necessarily mean the development will occur. The experts understand that much of this development would require resource consent to be granted prior to progressing. The experts also agree that analysis of rates and quantities of residential development are outside their area of expertise.
- (g) As traffic volumes increase and congestion increases there tends to be a spreading of the peak period to accommodate demand for constrained elements of a transport network (DS 4.13).
- (h) The provision of a small commercial centre as part of the Plan Change has the potential to reduce trip generation across the bridge (DS 4.16).
- (i) There should be analysis of the traffic impacts for resource consent applications relating to the Plan Change site (DS 4.18).
- (j) Mr Smith considers that development of the Plan Change site should not proceed until there is a second crossing of the river (DS 4.17). The experts have addressed this point in 2.2(d) of this statement.
- (k) Mr Smith considers that any worsening in the performance of the Control Gates Bridge and adjacent intersections is unacceptable (DS 4.19).
- (l) Mr Swears and Ms Cui consider that because land north of the bridge has already been zoned for residential development, increased traffic, and therefore worsening in the performance of the bridge has already been accepted by the Council. Mr Smith does not have a view on the accuracy of this statement as he has not been involved in previous rezoning and consent applications to the north of the bridge. Mr Smith also considers that this is a determination for the Planners and is not a transportation matter.

- (m) Establishment of additional services (such as schools and commercial activities) north of the bridge would reduce the demand for traffic flows across the bridge (DS 4.20 and 4.21).

2.3 With respect to the Poihipi Road / Huka Falls Road / Wairakei Drive intersection the experts are in agreement that:

- (a) The intersection could be signalised or roundabout controlled; there are advantages and disadvantages with each (DS 4.23).
- (b) Providing safe facilities for pedestrians and cyclists is an important component of any intersection design (DS 4.24).

3 Review of September 2021 WSP Letter and Traffic Note (DS 5)

3.1 With respect to Mr Smith's review of the WSP letter and the memorandum both dated 22 September 2021, the experts agree that:

- (a) The design of a new intersection at Poihipi Road / Huka Falls Road / Wairakei Drive should include provision for reasonably expected traffic volumes and vehicle configurations (DS 5.2).
- (b) Any construction works associated with the Plan Change that affect the normal operating condition of the road network should be managed through a Traffic Management Plan (DS 5.3 - 5.6).
- (c) There are existing shortcomings in the transport network regarding provision for cyclists. New facilities constructed (including a second bridge) should include consideration of the needs of all transport modes (DS 5.8).
- (d) Mr Smith considers that residential development on the PC37 should not occur until such time as a second bridge has been constructed (DS 5.8 and 5.12).
- (e) Mr Swears and Ms Cui consider that because PC37 is located closer to the Taupo town centre than most other residential development sites north of the bridge, the PC37 development should be permitted to proceed because it presents the best opportunity for a reduction in motor vehicle travel through promoting travel by active modes and public transport. Mr Smith agrees that PC37 is better placed to support uptake of active modes and public transport

compared to other development sites to the north of the bridge. Mr Smith considers that determining whether the Plan Change should be supported on this basis is not a transportation matter but is a planning issue.

- (f) The modelling completed by WSP demonstrates there are capacity constraints associated with the Norman Smith Street / Wairakei Drive signalised intersection, Control Gates Bridge, and the Spa Road roundabout (DS 5.9 and 5.10).
- (g) The location of the PC37 site “[...] supports the uptake of sustainable transport modes to a greater degree than other currently-zoned residential sites that are located further away from the town centre [...]” (DS 5.14).

4 Transport - Related Submissions (DS 6)

4.1 With respect to submissions relating to the Control Gates Bridge (CGB) and need for a second bridge, the experts agree that:

- (a) “[...] all residential development on the Plan Change site is expected to add traffic to the CGB in the peak tidal flow direction.” (DS 6.5). Mr Swears and Ms Cui consider that this additional traffic should be considered with reference to reductions in development (and associated trip generation) elsewhere as a result of the development on the PC37 site.

4.2 With respect to submissions relating to the Wairakei Drive / Poihipi Road Intersection and Realignment of Poihipi Road, the experts agree that:

- (a) From a transport engineering perspective, it is undesirable for the realigned Poihipi Road to pass between areas of residential development (DS 6.7).
- (b) The indicative alignment of the Doherty Drive extension is appropriate (DS 6.9).
- (c) “There are pros and cons in terms of efficiency and safety between installing a roundabout and traffic signals [...]”. However, the “best” intersection solution does not need to be determined at the Plan Change stage (DS 6.10).
- (d) The alignment to the north of the realigned Poihipi Road has merit (DS 6.11).

4.3 With respect to submissions relating to walking and cycling provision, and accessibility, the experts agree that:

- (a) Provision of a pedestrian overbridge does not appear to be required at this stage, but, in any case it should not be prioritised ahead of integration of existing and proposed walking and cycling network facilities (DS 6.15).
- (b) The new intersection at Huka Falls Road can be designed to provide a suitable walking and cycling connection between Nukuhau and Rangatira Park and this can be done at subdivision consent stage (DS 6.16).
- (c) The Plan Change site is within a comfortable walking and cycling distance of the Taupo town centre. With suitable infrastructure in place, the proximity of the site to the town centre presents attractive and convenient travel alternatives to private motor vehicles (DS 6.17).
- (d) The design and installation of all new infrastructure for walking and cycling should be subject to road safety audits (DS 6.19).
- (e) Noting that it is not an RMA matter, the experts consider that safe and appropriate speed limits should be adopted throughout the Plan Change area and ideally these would be consistent with the speed limits on the adjoining Taupo District road network (DS 6.23).

4.4 With respect to submissions relating to road safety, the experts agree that:

- (a) Speed management measures are not necessarily limited to “speed bumps”. Identification of road network features, including speed management measures, should be considered through the resource consent process rather than at the Plan Change stage (DS 6.25).

4.5 With respect to submissions relating to the adequacy of the traffic assessment, the experts agree that:

- (a) The Plan Change site “[...] is well within the reach of able-bodied pedestrians and cyclists [...]” (DS 6.30).
- (b) The proximity of the site to the Taupo town centre “[...] provides an opportunity for relatively high levels of active transport mode share [... the site also] could readily be serviced with public transport.” (DS 6.31 and 6.32).

4.6 With respect to submissions relating to intersection forms and structure plan, the experts agree that:

- (a) Consideration of the most appropriate form of intersections for the Plan Change site does not need to be determined at this stage because it can be assessed at resource consent stage (DS 6.33).

4.7 With respect to submissions relating to the provision of schools in the PC37 structure plan area, the experts agree that:

- (a) While provision of a school is outside the scope of the Plan Change, an additional school on the northern side of the river would reduce the number of motor vehicle trips across the CGB (DS 6.35).

5 Conclusions [Regarding Mr Smith's Evidence] (DS 7)

5.1 The experts conclude and agree that:

- (a) “[...] the Plan Change site is well located in terms of its proximity to the Taupo town centre [...] and] is well within the reach of most capable pedestrians and cyclists. There are also public transport options which could provide for further mode choice in the future [...]the PC37 site] is well located for residential development compared to many other development areas which are located further away from the town centre.” (DS 7.2).
- (b) The Control Gates Bridge “[...] is operating at or near capacity and further development [...] will extend delays and queues at the bridge and adjacent intersections.” (DS 7.3). The cause of the delay and queuing is not isolated to trips generated by the Plan Change site, but will also result from any additional development to the north of the bridge for which travel to and from the town centre is an important component of servicing that development.

5.2 Mr Smith considers that residential development on the Plan Change site should not occur until such time as a second bridge is operating or the existing bridge is duplicated with associated intersection improvements (DS 7.4). Mr Swears and Ms Cui consider that while trip generation associated with the Plan Change site will increase queuing and delay on the existing bridge and associated intersections, the Plan Change also presents the best opportunity for motor vehicle trips to be reduced through reassigning journeys to active modes and public transport. They consider that the Plan Change could be used as a method to mitigate the queuing and delay that will arise as a result of residential development (including, but not limited to, that associated with the Plan Change) north of the bridge. They also

consider that the additional traffic resulting from PC37 should be considered with reference to reductions in development (and associated trip generation) elsewhere as a result of the development on the PC37 site. However, they emphasise that they do not have expertise in residential land use development.

- 5.3 The experts agree that the relative attractiveness of PC37 compared to the outlying areas is not strictly a transportation matter. Other considerations including the price and type of housing offered are likely to be key determinants on the likelihood of these areas going ahead prior to or after PC37. However, the experts do not have expertise in these other matters.
- 5.4 Mr Smith also questions the extent to which development controls may provide assurance that PC37 development could be established rather than in other areas. Mr Smith defers to the Planners in terms of mechanisms to control development from occurring in some areas and replacing existing zoned residential development elsewhere to the north of the bridge. Mr Swears and Ms Cui acknowledge the question raised by Mr Smith and agree that mechanisms to control development, if required, would be best identified by the Planners.

6 Updated modelling assessment

- 6.1 An updated modelling assessment was presented by Ms Cui with results documented in the Nukuhau Plan Change memorandum dated 12 October 2021. This supersedes the previous assessment dated 22 September 2021.
- 6.2 Mr Smith notes that it is unclear how many years of demand each of the scenarios documented in Table 1 of the 12 October memorandum corresponds to. The modelling scenarios are agreed to represent an extent of development rather than correspond to a particular year. Mr Smith notes that, based on Waka Kotahi's Integrated Transportation Assessment guidelines, a Plan Change assessment would typically consider 10 years of background growth. It is unclear how many years of development each scenario corresponds to and more information is sought from the Applicant's team.
- 6.3 Mr Smith notes that the updated assessment does not include calibration and validation of the SIDRA Intersection or SIDRA Network models to match observed traffic delays, queue lengths or travel times. This means that the results may be under predicting or over predicting the levels of delays experienced. Based on Mr Smith's assessment in Annex 1 of his evidence in chief, Mr Smith notes that it is likely

that the actual performance is worse than that stated. Ms Cui notes that the lengths of the routes illustrated in Annex 1 of Mr Smith's evidence are different to those used in the SIDRA Network Models and should not be directly compared. Mr Swears and Ms Cui consider that, although the modelling results have not been calibrated or validated, they are appropriate to demonstrate the relative transport engineering effects of the different development scenarios considered.

- 6.4 The experts agree that no allowance has been made in the modelling for peak spreading beyond the peak hour, which would typically occur with the modelled levels of congestion. The experts note that peak spreading behaviour has been observed in other larger urban centres. The experts agree that peak spreading is the practice of road users adjusting their travel patterns so that congestion occurs over a longer period of time rather than being more intensive over a fixed, shorter peak period. As delay and travel time increase, peak spreading tends to occur. The experts agree that the maximum delay and travel time can reduce in a peak spreading situation, however, the total period of time over which the network is congested is greater than without peak spreading.
- 6.5 Regardless, the experts agree that the modelled delays and travel times are 'in the right ballpark' and accept those values as being appropriate for the purposes of assessing the likely effects of the Plan Change and other currently zoned residential development north of the bridge.
- 6.6 The experts consider that more reliance can be placed on the SIDRA Network results, which provide a more sophisticated and integrated assessment of the operation of the local network. On this basis, the experts have focused on the SIDRA Network results rather than the SIDRA Intersection results.
- 6.7 Mr Smith considers that cumulative effects are a key consideration at Plan Change stage and this modelling helpfully presents several scenarios to understand the cumulative effects of the PC37 in addition to existing zoned residential development. Mr Swears and Ms Cui agree that while the cumulative effects are a key consideration, it is also necessary to consider the incremental effects associated with PC37.
- 6.8 The experts agree that the most relevant comparisons from the update memorandum (dated 12 October 2021) are the travel times in Tables 23 and 25 for the 0/0/0, 100/60/0, 100/60/30 and 100/60/80 scenarios at 2030. By comparison

these scenarios show the incremental and cumulative effects of PC37 traffic over and above traffic associated with other zoned residential development to the north of the bridge. Further to the 12 October memo, Ms Cui prepared the tables below (adapted from Tables 23 and 25 in the memorandum) that allow for comparison between the 2030 AM (morning peak hour) and PM (evening peak hour) scenarios.

| Scenarios | AM En-route Travel Time (minutes) | | | |
|---------------------------------|-----------------------------------|---------|---------|---------|
| | Route 1 | Route 2 | Route 3 | Route 4 |
| 2030 Scenario #0 (0/0/0) | 2.8 | 2.7 | 2.8 | 2.8 |
| 2030 Scenario #1 (100/60/0) | 6.8 | 6.1 | 6.8 | 6.1 |
| 2030 Scenario #2 (100/60/30) | 6.3 | 7.9 | 6.3 | 7.9 |
| 2030 Scenario #3 (100/60/80) | 7.5 | 9.1 | 7.5 | 9.1 |

| Scenarios | PM En-route Travel Time (minutes) | | | |
|---------------------------------|-----------------------------------|---------|---------|---------|
| | Route 5 | Route 6 | Route 7 | Route 8 |
| 2030 Scenario #0 (0/0/0) | 3.5 | 3.3 | 2.8 | 2.6 |
| 2030 Scenario #1 (100/60/0) | 14.9 | 14.7 | 5.0 | 4.8 |
| 2030 Scenario #2 (100/60/30) | 16.0 | 15.8 | 6.2 | 6.0 |
| 2030 Scenario #3 (100/60/80) | 18.1 | 18.0 | 7.1 | 7.0 |

6.9 The tables below were also prepared to provide a comparison between the travel times along the various modelled routes. For example, the Scenario #0 row in the AM table below describes the 2.7-2.8 minute travel time for the four routes described in the corresponding row for the AM travel time table above. The tables below also describe the differences in travel time between the scenarios.

| Scenario | | Range (minutes) | AM Travel time | |
|----------|----------------------|--------------------|--|------------|
| No | Percentage Devel' | | Increase compared with other scenario | |
| | | | Compare | Increase |
| 0 | (0/0/0) | 2.7 - 2.8 | N/A | N/A |
| 1 | (100/60/0) | 6.1 - 6.8 | #0 | 3.3 - 4.0 |
| 2 | (100/60/30) | 6.3 - 7.9 | #1 | -0.5 - 1.8 |
| 2 | (100/60/30) | 6.3 - 7.9 | #0 | 3.5 - 5.1 |
| 3 | (100/60/80) | 7.5 - 9.1 | #1 | 0.7 - 3.0 |
| 3 | (100/60/80) | 7.5 - 9.1 | #0 | 4.7 - 6.3 |

| Scenario | | Range (minutes) | PM Travel time | |
|----------|----------------------|--------------------|--|------------|
| No | Percentage Devel' | | Increase compared with other scenario | |
| | | | Compare | Increase |
| 0 | (0/0/0) | 2.6 - 3.5 | N/A | N/A |
| 1 | (100/60/0) | 4.8 - 14.9 | #0 | 2.2 - 11.4 |
| 2 | (100/60/30) | 6.0 - 16.0 | #1 | 1.1 - 1.2 |
| 2 | (100/60/30) | 6.0 - 16.0 | #0 | 3.4 - 12.5 |
| 3 | (100/60/80) | 7.0 - 18.1 | #1 | 2.1 - 3.3 |
| 3 | (100/60/80) | 7.0 - 18.1 | #0 | 4.3 - 14.7 |

6.10 The experts agree that the above tables are a suitable basis for considering the cumulative and incremental effects of the Plan Change traffic on Control Gates Bridge and adjacent intersections. The PM peak period demonstrates the worst performance of the two modelled periods.

6.11 Mr Smith considers that the PM peak total travel times are the most relevant measure of network performance. The modelling estimates that in 2030 with no additional development to the north of the bridge, travel times in the PM peak will be in the order of 2.6-3.5 minutes. Depending on the route taken, this has the potential to increase by 2.2-11.4 minutes to 4.8-14.9 minutes as a result of other zoned residential development to the north of the bridge. The cumulative effect of this development and 30% or 80% of PC37 increases travel times further to a total of 6-16 minutes and 7-18.1 minutes respectively. Mr Smith notes that the cumulative

effect is a doubling to fivefold increase in travel time depending on the route and extent of development of PC37.

6.12 Mr Smith considers that these travel times and associated levels of delay in the PM peak would result in extensive queuing and blocking back of intersections and accesses across the town centre in the evening peak and wider network. Mr Smith is also of the view that this may result in cross-river traffic choosing to divert via the East Taupo Arterial and SH1/SH5/Wairakei Drive Intersection to avoid the congestion. Mr Smith further notes that whilst the impacts on travel times in the AM are not as extensive as the PM peak, the cumulative effect results in a doubling to threefold increase in travel times for traffic accessing the town centre. This would also result in extensive blocking back through neighbouring intersections and impede access to key corridors to the north of the bridge.

6.13 While Mr Swears and Ms Cui agree that Mr Smith has accurately identified the approximate magnitude of the proportional increases, they note that those increases are due to all development, not just due to PC37 development. They also note that developments other than PC37 create significant increases in base travel time values. In the 2030 AM peak the developments (excluding PC37) result in at least a doubling of the travel times for traffic accessing the town centre. In the PM peak the developments (excluding PC37) result in a doubling to fourfold increase in travel times for traffic exiting the town centre.

SIGNATURES:



Date: 18 October 2021

Dave Smith



Date: 18 October 2021

Emma Cui



Date: 18 October 2021

Robert Swears