

Before Independent Commissioners

In Taupō

Under the Resource Management Act 1991 (the Act)

In the matter of Plan Change 37 – Nukuhau

**Statement of evidence of David John Robert Smith for the Taupō
District Council (Transport)**

Dated 30th September 2021

1 Introduction

- 1.1 My name is David John Robert Smith.
- 1.2 I hold a Bachelor of Technology (with Honours) in Industrial Operations Research and Master of Philosophy in Operations Research from Massey University. I am a Chartered Member of the Institute of Logistics and Transport (CMILT), a member of Engineering New Zealand (MEngNZ) and a member of the NZ Modelling User Group sub-group of ENZ. I have been appointed to the NZ Transport Agency Independent Professional Advisors panel for Transportation Modelling. I am also certified as a Hearings Commissioner having complete the Making Good Decisions course in 2019.
- 1.3 I hold the position of Technical Director of Transportation Planning at Abley. I have been in this position since 2018 and have been at Abley for over nine years. I lead a range of development planning and transportation planning projects for both public and private sector clients.
- 1.4 My previous work experience includes 21 years of transportation planning and engineering experience. I have managed and led numerous projects related to transportation business cases, transportation research and Resource Management Act (RMA) related matters for public and private sector clients. As an expert witness I was engaged by the Environmental Protection Authority (EPA) to provide transportation advice and evidence directly to the Board of Inquiry presiding over the Basin Bridge hearing. I have also recently represented Foodstuffs South Island Limited, Auckland Council, Selwyn District Council, Queenstown-Lakes District Council, Ports of Auckland and Fonterra as an expert witness.
- 1.5 My role in relation to Private Plan Change 37 (PPC37) to rezone approximately 78 hectares of land and enable 780 new residential lots and neighbourhood centre is as an independent expert witness to Taupō District Council on traffic and transportation matters.
- 1.6 In my assessment I have reviewed the following documents:
 - a Nukuhau: Private Plan Change Request to the Taupō District Plan prepared by WSP dated 26 January 2021;
 - b Nukuhau Private Plan Change Traffic Impact Assessment prepared by WSP dated 28 October 2020 (referred to as 'TIA' in my evidence);

- c transport-related submissions;
- d planning provisions relevant to my area of expertise; and
- e WSP 'Proposed Nukuhau Plan Change' letter and 'Nukuhau Plan Change' traffic note dated 22 September 2021.

2 Code of conduct

- 2.1 While this is not a hearing before the Environment Court, I confirm that I have read the Code of Conduct for expert witnesses contained in the Environment Court of New Zealand Practice Note 2014 and that I have complied with it when preparing my evidence. Other than when I state I am relying on the advice of another person, this evidence is within my area of expertise. I have not omitted to consider material facts known to me that might alter or detract from the opinions that I express.

3 Scope of evidence

- 3.1 I have prepared evidence in relationship to:
- a Review of the Traffic Impact Assessment report;
 - b Review of WSP letter and traffic note dated 22 September 2021;
 - c Matters raised through submissions; and
 - d Conclusions.
- 3.2 I have not undertaken a site visit at the time of preparing this evidence but am familiar with the Taupō urban area having been involved in transportation planning in the District since 2001. I have familiarised myself with the site through online aerial and street view imagery and will undertake a site visit prior to the hearing.

4 Review of Traffic Impact Assessment

- 4.1 I have reviewed the TIA prepared by WSP dated 28 October 2020 in the context of the wider Plan Change application. Key findings from this review are included in the paragraphs below by theme. I also refer to the TIA contents in addressing further matters raised through submissions in section 6.

Pedestrian and Cycle Connectivity and Mode Choice

4.2 The Outline Development Plan (ODP) for PC37 includes pedestrian and cycle infrastructure as shown in Figure 5-2 of the TIA which is shown in the below Figure 1.

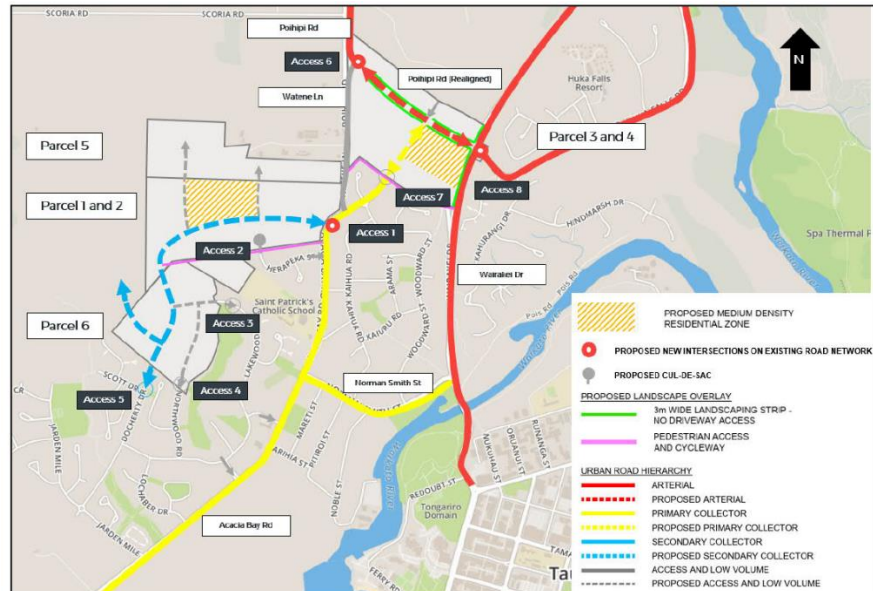


Figure 1 Proposed Access and Network Connection (figure 5-2 from TIA)

4.3 I consider the two purple shared paths are the critical new pieces of infrastructure but they do not connect the western portion of the development or to the wider cycle network shown in TDC's Cycling and Walking Strategy and shown in Figure 2 below (also included as figure 5-3 of the TIA).



Figure 2 TDC Proposed Cycle and Shared Path Facilities (figure 5-3 from TIA)

4.4 I consider that an additional shared path facility is required along Acacia Bay Rd/Watene Lane on the boundary of the PC37 site, to connect the two purple shared paths from Figure 1 and I recommend that the ODP should be amended

accordingly. I have highlighted this in yellow on Figure 2 and note that this is included in an updated walking and cycling plan supplied by WSP dated 19 September 2021 and re-produced at the end of section 5 of this statement of evidence as Figure 3. I further consider that it would also be advantageous to continue cycle lanes further south along Acacia Bay Road to connect to the proposed facility (shown by dashed red lines) on Norman Smith Street but acknowledge that this is outside of the Plan Change site and that there are other local road connections that may be preferable for cycling. Accordingly, this matter is raised in terms of the Taupo District Council's wider role in terms of facilitating modal choice.

- 4.5 I also note that the Taupō District Council Long Term Plan (LTP) 2021-31 includes \$317,000 for cycle facilities 2021/2 through 2023/4 demonstrating a commitment to improve facilities across the District. I consider that the infrastructure proposed in the Plan Change with the addition of the link I have identified along Acacia Bay Rd/Watene Lane will integrate well with the wider walking and cycling network and support modal and active transport choices.
- 4.6 The location of the Plan Change site is approximately 2-3km from the edge of the Taupō town centre¹, which is an approximate 30 minute walk or 10 minute cycle ride from the town centre. I consider that this is well within the capabilities of most capable pedestrians and cyclists, and this reinforces the importance of providing excellent connectivity and high-quality infrastructure for these modes. I also note that the Plan Change site is well located to be serviced by public transport as referenced in section 5.5 of the TIA, and in doing so can be supported from the perspective of providing for sustainable modes of transportation.

Transport Network Capacity Assessment

- 4.7 The future traffic performance assessment presented in chapter 8 of the TIA is based on transportation modelling using the Taupō Traffic Model and individual Sidra intersection models. I am familiar with the Taupō Traffic Model having undertaken modelling work as far back as 2001 in assessing the East Taupō Arterial and most recently undertaken modelling for Council to support the development of the Taupo Transport Strategy.
- 4.8 Whilst I generally support the assessment methodology undertaken to determine the likely future network performance, there is no information provided to demonstrate that the modelling has been calibrated or validated to reflect current

¹ Intersection of Tongariro Street and Spa Road

observed network performance, especially noting the current congestion experienced in the vicinity of the Control Gates Bridge.

- 4.9 Specifically, the TIA does not provide a detailed assessment of the current capacity or performance of the Control Gate Bridge (CGB) although it states in section 8.14 that *“it is evident that by 2031, another bridge crossing will be required to cope with the traffic demand in Taupō with or without the Nukuhau Development”*. This conclusion is based on transportation modelling using the Taupō Tracks Transportation Model and I note the TIA does not provide any detail as to the current performance of the adjacent transport network or the extent of calibration or validation of the model.
- 4.10 I have undertaken my own assessment of the capacity and performance of the CGB and adjacent intersections which is included as Annexure A to this evidence. This is based on analysis of traffic counts collected in August 2020 by Taupō District Council and travel times extracted from the Google API (by my colleagues under my direction) in June 2021.
- 4.11 On the basis of this assessment I have concluded that:
- a the capacity of the bridge is approximately 1550-1600 vehicles per lane per hour;
 - b in the morning peak hour in the southbound direction the bridge operates at 93% of its maximum capacity;
 - c in the evening peak hour in the northbound direction the bridge operates at 79% of its maximum capacity;
 - d congestion in the morning peak manifests itself as queuing and delays back from the merge at the northern end of the bridge with delays in the order of 1.5 minutes observed;
 - e congestion in the evening peak primarily manifests itself as queuing back from the Tongariro Street/ Spa Road roundabout along the Spa Road corridor with corresponding delays of up to 3 minutes, and there are delays on the northbound Tongariro Street corridor in the order of 20-40 seconds; and
 - f the length of time associated with the morning and evening peaks when this extent of congestion is experienced is currently in the order of 30 minutes.

- 4.12 In my view any additional residential development to the north of the CGB will exacerbate this congestion and a cautious approach should be taken in that regard. I have requested details from Taupō District Council officers as to the quantum of additional development which may occur on the north side of the bridge under current zoning. The results are as follows:
- a Approximately 1000 lots are zoned and can be developed;
 - b A further 400 undeveloped sections are formed and available for development; and
 - c 150 hectares are zoned as “new residential” land which have been assumed in my assessment to yield at least 150 lots.
- 4.13 A total of up to 1550 additional lots is likely to result in a significant increase in peak period traffic flow across the CGB which would be observed on the network either as a lengthening of traffic queues and travel times, and spreading out of these current approximate 30-minute periods of congestion for over an hour or more in the morning and evening peak periods.
- 4.14 I note that if the Plan Change were to be approved, the development potential to the north of the CGB would increase by a further 780 lots such that up to 2330 further lots could be developable.
- 4.15 I have analysed Statistics New Zealand 2018 census data to calculate the number of households in 2018 in Statistical Areas to the north of the bridge (Acacia Bay, Mapara, Brentwood and Nukuhau-Rangatira Park). A total of 3,174 occupied dwellings were counted in the 2018 census across this area so there is the potential for nearly 50% or 70% more households in this catchment without the Plan Change and with the Plan Change respectively.
- 4.16 I further note that there is a small commercial centre proposed as part of the Plan Change which has the potential to reduce reliance on the Taupō town centre for retail and associated service activities for residents within the Plan Change site as well as existing residential areas to the north of the CGB.
- 4.17 My view is that it is reasonable to assume that a second CGB (or duplication of existing bridge) will be part of the future receiving environment. This project has been signalled in many strategic planning documents including the Taupō Urban Commercial and Industrial Structure Plan² and Taupō Transport Strategy

² <https://www.taupodc.govt.nz/council/plans-and-strategies/structure-plans/taupo-urban-commercial-and-industrial-structure-plan>

(Connecting Taupō 2020-50)³. However, there is uncertainty as to the timing and staging of PC37 development, other development which is currently zoned, the timing of the construction of the second river crossing and the impact of the small commercial centre on reducing reliance on the town centre. I recommend a cautious approach be taken towards the impacts of additional traffic due to the Plan Change.

- 4.18 To address the uncertainty around the timing of development and delivery of a second bridge, one option is that provision be included within the Plan Change such that traffic impacts in the vicinity of the river crossing be a matter of discretion for all resource consent applications relating to the Plan Change site. This would be addressed by the preparation of an Integrated Transportation Assessment (ITA) as part of any future resource consent application including an assessment of the impacts of development on the performance and operation of the network on the CGB, the bridge approaches and adjacent intersections. Future ITAs would assess the incremental impact of development on this critical infrastructure taking into account other consented development at that time.
- 4.19 Key considerations in the assessment of the performance and operation of the network should include travel times northbound and southbound on Wairakei Drive and delays and queue lengths at the intersection of Wairakei Drive / Norman Smith Street and Spa Road / Tongariro Street. These are the metrics by which I have assessed the current performance of the bridge in Annexure 1 and are also considered in the WSP Traffic Note dated 22 September 2021. Any worsening in the performance of the CGB and adjacent intersections is in my view unacceptable due to the current high delays and travel times experienced at peak times in the tidal flow direction as stated in paragraphs 4.10d and 4.10e of my evidence.
- 4.20 There is scope within the Plan Change for commercial development at the proposed neighbourhood centre. This would provide more shopping and employment choice in the vicinity of Nukuhau for existing residents and has the potential to reduce morning or evening peak tidal flow volumes across the CGB. I note that other activities that may provide a degree of self-sufficiency and reduce reliance on the town centre such as schools and pre-schools could also be accommodated without worsening the current traffic performance as they would not add to tidal flow traffic.

³

<https://www.taupodc.govt.nz/repository/libraries/id:25026fn3317q9slqygym/hierarchy/Council/Consultation/Transport%20strategy/Adopted%20Revised%20Transport%20Strategy%20%28tracked%20changes%29.pdf>

- 4.21 A further approach would be to consider deferred development of the Plan Change site until additional capacity is available in the vicinity of the CGB. This would provide confidence that residential development could not occur that would exacerbate existing delays and queue lengths on the network. In short, under this scenario sufficient 'supply' in terms of capacity on the network would need to be provided prior to 'demand' driven by development of PC37. However, this approach does not provide the flexibility to enable commercial development which has the potential to provide employment and shopping opportunities in the vicinity of Nukuhau, reducing reliance on the town centre for those currently living to the north and west of the CGB.
- 4.22 I also note that the applicant has undertaken a further modelling assessment which is presented in the WSP Traffic Note dated 22 September 2021. I address this in section 5 of this statement of evidence.

Poihipi Road / Huka Falls Road / Wairakei Drive Intersection

- 4.23 In section 8 of the TIA, an assessment of a realigned Poihipi Road / Huka Falls Road / Wairakei Drive intersection is undertaken, and demonstrated that a signalised intersection here would operate with satisfactory Level of Service. I consider that an appropriately designed roundabout is another intersection configuration that should be considered and assessed in addition to traffic signals.
- 4.24 In my view the proposed upgrade at this new four leg intersection will improve road safety and a roundabout has the potential to have better safety outcomes compared to signals if safe provision for pedestrians can be incorporated into the design. I expect that the choice of intersection form and concept design are matters that would be addressed at resource consent stage, and consider that either configuration could be accommodated. No change is recommended to the Plan Provisions accordingly.

5 Review of September 2021 WSP Letter and Traffic Note

- 5.1 I have read the WSP letter dated 22 September 2021 and wish to comment on two transport-related matters arising from engagement between the applicant and Contact Energy.
- 5.2 With respect to Contact Energy consultation point 1, the letter states that any future design of a realigned Poihipi Road intersection with Wairakei Drive would need to meet the design standards specified by Taupō District Council. Expanding on this point, in my experience the intersection design process would

consider the intersection capacity requirements and appropriate layout and geometry based on likely future travel demands, including those from existing development as well as known and likely future consented development. I would expect this to include consideration of Contact Energy's future intentions if these were consented or clearly signalled and most likely to occur in the foreseeable future.

- 5.3 With respect to Contact Energy consultation point 2, the construction phase of the Wairakei Drive / realigned Poihipi Rd / Huka Falls Road intersection upgrade would require the preparation of a Traffic Management Plan which meets the requirements of Waka Kotahi's Code of Practice for Temporary Traffic Management⁴.
- 5.4 The purpose of a TMP according to the Waka Kotahi document is to "*support the safe and efficient operation of the transport network*" and this would include ensuring there is sufficient access for residents and businesses in the vicinity. I would expect that to achieve these requirements this would necessitate the existing intersection Wairakei Drive / Poihipi Rd intersection remaining open for some or all traffic movements throughout the duration of the build as well as catering for pedestrians and cyclist who may be affected.
- 5.5 Should physical works associated with the new intersection construction require closure of the existing intersection, I would expect this to be managed overnight or at off-peak times when traffic demands would be lighter than those experienced in peak conditions, and the safe and efficient operation of the transport network can be maintained.
- 5.6 I note that the concerns raised by Contact Energy with respect to the intersection upgrade would be less relevant if the development of the Plan Change area and subsequent upgrade were to occur after Contact Energy's intended future upgrade was realised.
- 5.7 I also wish to comment on the Bike Taupo engagement summarised in page 3 of the WSP letter. Bike Taupo has raised concerns regarding the existing sub-standard cycle infrastructure on parts of the network which a point of agreement with the applicant.
- 5.8 The future construction of a second bridge or duplication of the existing CGB would require consideration of provision for and safety for all modes. I expect this would result in improved provision for cyclists including consideration of

⁴ <https://www.nzta.govt.nz/roads-and-rail/code-of-practice-for-temporary-traffic-management/>

connectivity with other dedicated cycle infrastructure to the north and west of the bridge and in the vicinity of the town centre. My view is that residential development on PC37 should not occur until such time as a second bridge has been constructed, by which time I expect a higher standard of provision external to the site to be delivered through the second bridge improvements and other investment in cycle infrastructure included that funded through the Taupo District LTP 2021-31.

- 5.9 I have reviewed the Traffic Note prepared by WSP dated 22 September 2021. The Traffic Note presents the outcomes of a modelling assessment of the Control Gates Bridge (CGB), Norman Smith Street / Wairakei Drive signalised intersection and Spa Road / Tongariro roundabout. This assessment focuses on the cumulative effects of development on this infrastructure including permitted residential development based on current zoning.
- 5.10 The modelling outputs present conclusions with respect to the capacity of the CGB and delays and queue lengths at the adjacent intersections. Whilst I retain concerns about the extent of calibration and validation work undertaken to ensure the model reflects current network performance, my interpretation of key points arising from this assessment are as follows:
- a The CGB is currently at (in the morning) or near (in the evening) capacity;
 - b By 2025 the CGB will be over-capacity irrespective of this Plan Change traffic in both the morning and evening peak with the bridge performing at LoS F and lengthy delays on key tidal flow movements at adjacent intersections; and
 - c By 2030 the CGB and adjacent intersections worsen with delays in excess of 10 minutes and traffic queues of up to 2km across the peak hour irrespective of any traffic associated with this Plan Change.
- 5.11 I note that the travel times in Table 7 of the Traffic Note do not correspond to the levels of delay in the prior tables but continue to demonstrate deteriorating performance on the local network with or without the Plan Change out to 2030.
- 5.12 This assessment reinforces my view that residential development should not occur on the Plan Change site until such time as more capacity is provided to connect the Plan Change site to the town centre. The levels of development that are currently zoned and are located occur to the north and west of the CGB are extensive, and the subsequent impact on the performance of the network will

result in lengthy delays and queuing, and these adverse effects will deteriorate quickly.

- 5.13 I note that the Traffic Note includes staging scenarios that 40% of PC37 be developed by 2025 and 80% of PC37 be developed by 2030, however does not draw conclusions with respect to whether the effects of these are acceptable or otherwise.
- 5.14 The WSP assessment in my view very clearly demonstrates the cumulative effects of continued development prior to additional network capacity being provided at the CGB. However as stated in paragraph 4.6, I consider that the location of PC37 is within walking and cycling distance of the town centre and can be readily serviced by public transport. In doing so, subject to providing high-quality infrastructure, the location 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 such as Acacia Bay, Mapara Road and Kinloch.
- 5.15 I further note that the Cycling and Walking Routes drawing included with the 22 September 2021 letter and traffic note includes improved walking and cycling provision including a connection along Watene Lane to connect to Acacia Bay Road as shown in Figure 3. This addition is supported and addresses my concerns raised in paragraphs 4.3-4.5.

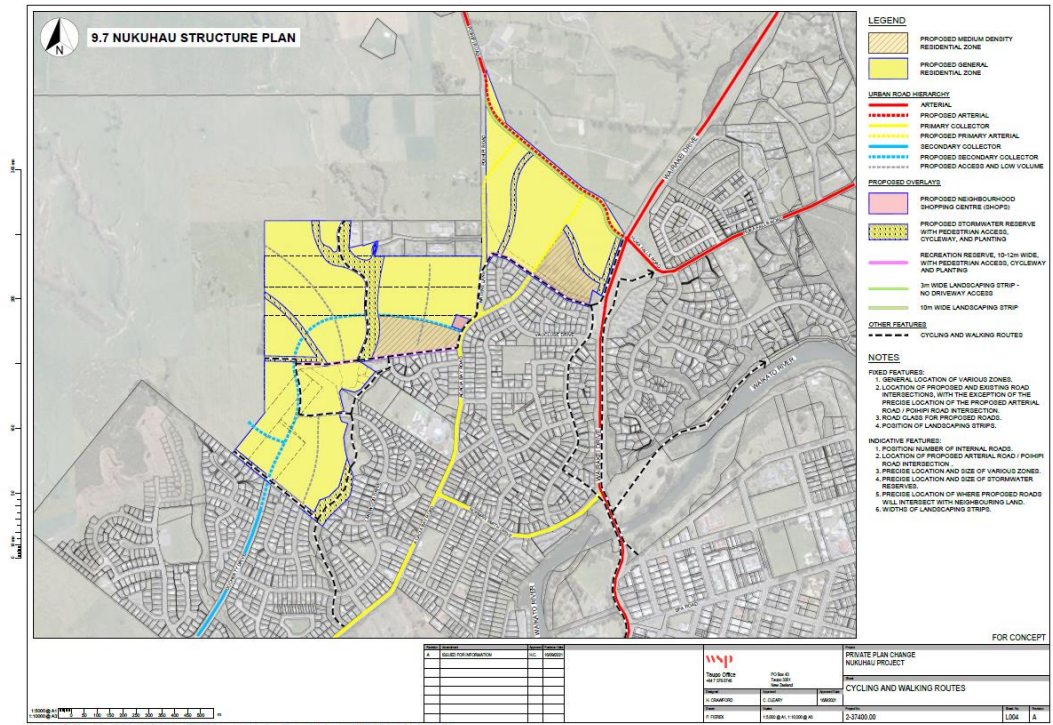


Figure 3 Cycling and Walking Routes (prepared by WSP 16/9/2021)

6 Transport-related submissions

- 6.1 I have grouped the transport-related submissions into common themes and addressed these in the subsequent sections as follows:
- a CGB performance and need for second bridge (submissions 7-13, 15-17, 20-29, 32, 35, 37, 39-42, 45, 52, 57-58);
 - b Wairakei Drive / Poihipi Road intersection and realignment of Poihipi Road (submissions 11, 15, 17-18, 31, 41-42, 47-48, 54);
 - c Walking and cycling provision (submissions 3, 11, 13, 18-19, 34, 41, 44);
 - d Parking availability (submissions 32, 27);
 - e Road safety (submissions 13, 18, 38);
 - f Adequacy of modelling assessment (submissions 9, 19, 42);
 - g Public transport provision (submissions 11, 43);
 - h Intersection forms in structure plan (submission 10); and
 - i Provision of schools in structure plan area (submission 19).

CGB and the need for a second bridge

- 6.2 Submissions 7-13, 15-17, 20-29, 32, 35, 37, 39-42, 45, 52 and 57-58 have raised concerns regarding the capacity and performance of the existing CGB on Tongariro Street which crosses the Waikato River. This is currently the only river crossing within the existing urban area with the nearest crossing being on SH1/5 East Taupō Arterial approximately 6 km ('as the crow flies') to the northeast.
- 6.3 I have not responded to individual submissions as they all raise concerns about a lack of capacity and need for infrastructure at this location. I note that some submissions extend to request that no further development occur until such time as capacity issues on the bridge are addressed – that is the existing bridge is four laned or a second bridge is constructed.
- 6.4 The *Taupō District Council Asset and Activity Management Plan – Transport 2021* (refer section 7.5.3) states the planning and investigation of a second bridge crossing is planned to occur by 2030/31 with funding budgeted for 2033/34. I note that funding is allocated in 2030/31 for planning and investigation in the Taupō District's LTP 2021-31

6.5 Further submission FS60 also raises concerns regarding development occurring prior to a second bridge being constructed, and seeks a first stage of residential development off Lakewood Drive (that is the southern end of the Plan Change site) but for all other development to be deferred. I do not have a view on the appropriateness of this southern end as a first stage, but reiterate that all residential development on the Plan Change site is expected to add traffic to the CGB in the peak tidal flow direction. I consider that my proposed inclusion of a provision requiring an ITA to be prepared for all resource consent applications is appropriate to address the effects of a first stage of development such as that proposed on FS60 point 12.

Wairakei Drive / Poihipi Road intersection and realignment of Poihipi Road

6.6 Submissions 11, 15, 17-18, 31, 41-42, 47-48 and 54 address the proposed upgrade to the intersection of Wairakei Drive and Poihipi Road and/or realignment of Poihipi Road to the north of its existing alignment. Four submissions (11, 18, 41 and 42) support the proposed realignment and formation of a signalised four-leg intersection at the existing Wairakei Drive / Huka Falls Road intersection whereas the remainder seek to oppose or amend the proposal.

6.7 Contact Energy (submission 48) request that the realignment be shifted to the northern extent of the Plan Change site, based on concerns about construction traffic associated with the construction of Stage 2 of the Te Mihi Power Station and providing a wide landscaping buffer. I support this proposed amendment as this will reduce severance through the northernmost residential area in the Plan Change site. This also has the potential to improve safety outcomes by reducing the need for vulnerable road users to cross the realigned Poihipi Road when moving through the residential area. I also agree with the submitter's concerns about heavy vehicles moving through a residential area.

6.8 I note that the updated ODP provided by the Applicant on 22 September 2021 includes this change in alignment. I support this change.

6.9 Phil White (submission 47) seeks an amendment such that Docherty Drive which is proposed to be extended as a secondary collector road through the site (refer Figure 5-1 of the TIA) to connect to Acacia Bay Road to the south of Watene Lane, be realigned further to the north. My view is that the location of the current alignment is intuitive and provides direct access to the proposed commercial centre within the Plan Change site. Whilst a realignment further to the north may benefit some road users choosing to connect to the north, the current alignment

is suitable and connects to a location on Acacia Bay Road which connects the development well with the surrounding network.

- 6.10 Think Taupō (submission 54) requests that roundabouts be considered for new intersections in particular highlighting this as a preferred option for the Wairakei Drive / realigned Poihipi Road / Huka Falls Road intersection. I support the consideration of a roundabout at this location as roundabouts are an appropriate intersection treatment on an urban/rural boundary due to their ability to reduce traffic speeds entering urban areas. There are pros and cons in terms of efficiency and safety between installing a roundabout and traffic signals, and I would support a comparative assessment to determine the most appropriate intersection form including consideration of pedestrian and cycle connectivity and safety. Such an assessment may also address the request from submitter 15 to provide better traffic management/mitigation at this intersection.
- 6.11 Submission 17 opposes the new road proposed to replace Poihipi Road and submission 31 opposes the resultant redirection of traffic onto Watene Lane, seeking the existing Poihipi Road corridor to be retained. I consider that the realignment of Poihipi Road to the north has considerable merit, primarily due to the consolidation of two current intersections into a single intersection at Huka Falls Road. This reduces the number of conflict points along the Wairakei Drive corridor and I believe that an appropriately designed signalised intersection or roundabout at this location will result in better safety outcomes than the current layout.
- 6.12 With regard to the appropriateness of re-routing traffic along Watene Lane, my interpretation of the Sidra intersection outputs included in Appendix B of the TIA is that the Watene Lane corridor will attract approximately 400 two-way vehicles per hour in 2041 peak hour with the inclusion of Plan Change traffic. This corresponds to one vehicle every nine seconds (two way) and is well within the capacity of Watene Lane as it is currently configured.

Walking and cycling provision / accessibility

- 6.13 Submissions 3, 11, 13, 18-19, 34, 41 and 44 address walking and cycling provision and/or accessibility. Submissions 11, 13 and 41 support the Plan Change and refer to the importance of incorporating walk and/or cycle facilities into the local area.
- 6.14 Submission 3 seeks to remove the secondary collector road extending from the north of Docherty Drive through the Plan Change site and replace it with a

walking and cycling link. I note that Docherty Drive is a collector road and therefore would have provision of footpaths for pedestrians, and there is intended future cycling and walking infrastructure in the vicinity signalled by the Taupō Transport Strategy and included within the PC37 ODP. I consider this to be an important roading connection and support its inclusion within the structure plan as a secondary collector road.

- 6.15 Submission 18 requests improved cycle facilities including installation of an overbridge, separated cycleways on new streets and grade separated links across gullies to avoid crossing streets. These types of facilities would be the 'gold standard' for cycling infrastructure and would be very expensive to deliver. In time if there is sufficient uptake of cycling there may be scope to provide for grade separated crossings and separated facilities in parts of the Taupō urban area. My view is that the Plan Change should deliver a standard of facilities which integrate well with the existing and proposed walking and cycling wider network as signalled in the Taupō Walking and Cycling Strategy and included in figure 5-3 of the TIA.
- 6.16 Submission 19 seeks cohesive networks of pedestrian and cycle routes are developed as viable primary travel options, and also request that the existing lack of 'safe' routes between Nukuhau and Rangatira Park be remedied. I have reviewed the provision and connectivity of pedestrian and cyclist links proposed in the Plan Change site including consideration of integration with existing and proposed infrastructure. I have identified deficiencies in paragraphs 4.3-4.5 of this evidence and highlighted the importance of safe provision for active modes across Wairakei Drive at the realigned Poihipi Road / Huka Falls intersection. I consider that with the addition of these connections the Plan Change will be well serviced and connected for pedestrian and cyclists seeking to access the town centre and Rangatira Park.
- 6.17 Submission 34 submits that ease of cycle and pedestrian movement should be given priority over vehicle movement. The Plan Change site is within a comfortable walking and cycling distance of the Taupō Town centre so there is an opportunity here through the provision of safe and high-quality infrastructure to make active travel an attractive and convenient travel option.
- 6.18 Submission 44 puts forward multiple submission points in relation to cycling. The submission seeks the following:
- a a positive effect on cycle safety through the provision of infrastructure within and around the Plan Change site.

- b an assessment of increased levels of traffic on cycle safety especially at the Norman Smith and Acacia Bay Road intersection.
 - c cycle access proposed for new stormwater and recreation reserves to be retained.
 - d any decision in relation to PC37 to be cognisant of section 3 of the Taupō District Transport Strategy 2020.
 - e consideration of the cycle safety effects at key intersections and around the school.
 - f for the formation of cycle lanes on Acacia Bay Rd and Norman Smith Street prior to development.
 - g provide clarity on how the development will encourage uptake of sustainable transport modes and link to the wider shared path network.
 - h consider the impact of cyclists and pedestrians using and crossing roads within the transport assessment.
 - i clarify how the development will address effects on the use of existing roadways by cyclists.
 - j consider the safe functioning of infrastructure in the context of cycle safety (referencing DP objectives 3e.2.2 policy v and 3e.2.3 policy iv).
 - k Support the installation of traffic lights at Wairakei Drive / realigned Poihipi Road / Huka Falls Road intersection.
- 6.19 I have reviewed the provision of walking and cycling infrastructure in paragraphs 4.3-4.5 of this statement of evidence and identified several improvements which will lead to improved outcomes for pedestrians and cyclists. This includes a mix of on-road and off-road facilities which provide a good standard of connectivity to the key destinations including the town centre. All new infrastructure will be required to undergo a detailed design process which will include safety audits to ensure that they are designed for the safety of all future users.
- 6.20 Many of the matters raised in submission 44 will be addressed through the detailed design and safety audit processes. I note that a further assessment of effects including an assessment of cycling safety is expected within an Integrated Transport Assessment (ITA). I am recommending that an ITA is prepared for any resource consent application within the Plan Change site.

- 6.21 There are two District Plan policies matters raised by the submitter in the context of cycling safety which are as follows:
- a 3e.2.2 policy v - Ensure that the planning and development of Urban Growth Areas adequately takes into account the efficient and effective functioning of supporting and surrounding infrastructure.
 - b 3e.2.3 policy iv - Avoid, remedy or mitigate the adverse effects of new development and activities on the safe and efficient functioning of the existing and future roading networks including those identified through the Taupō District Structure Plan Process.
- 6.22 I consider that both of these policies can be adequately met by a combination of:
- a controls to restrict additional traffic on the CGB until such time as more capacity is available such as those I discussed in paragraphs 4.18-4.21,
 - b providing high-quality connected infrastructure as in the updated ODP shown in Figure 3, and
 - c subsequent detailed design and safety audit processes in line with industry best practice.
- 6.23 I further support the adoption of safe speeds throughout the Plan Change area and connecting to the wider network especially where traffic is sharing roads with cyclists and where there is a high volume of pedestrian activity. These have the potential to further improve safety outcomes for pedestrians and cyclists, however the speed limit setting process is one for Taupō District Council in their role as the Road Controlling Authority and is not an RMA matter.

Parking availability

- 6.24 Submissions 27 and 32 raise concerns about the adequacy of parking in the Taupō town centre. I have recently led the development of a parking strategy and management plan for Taupō District Council. This included analysing a survey undertaken earlier in 2021 of the parking supply and availability of public on-street and off-street parking in the town centre. I concluded that the peak on-street parking occupancy was 57% across the wider town centre but noted that there are small pockets of the town centre where visitors can not park in close proximity to their chosen destination. I further concluded that there is ample parking availability to meet the future needs of Taupō residents and visitors but there are measures which can be implemented to improve the management of

parking. I am currently assisting Council with the implementation phase of the parking strategy and do not agree with the concerns raised in these submissions relating to parking.

Road safety

- 6.25 Submission 13 requests the installation of 'speed bumps' to reduce speeds along the Docherty Drive extension in the vicinity of The Grove. I note this is intended to be a secondary collector road under the proposed structure plan and provides connectivity to the wider road network for residents and activities in the Plan Change area and Brentwood. The design of this corridor should be in keeping with its function and it may be beneficial to install design features such as raised platforms or threshold treatments to reduce speeds and deter through traffic from the corridor. Submission 18 similarly requests consideration of 'speed bumps' and other speed control mechanisms. This is a matter I would expect to be addressed in subsequent resource consent applications and note that the matter of setting appropriate speed limits is for Council to address in their role as the Road Controlling Authority.
- 6.26 The Ministry of Education (submission 38) seeks consideration of safe transport routes and access to and from schools within the area. Currently the only school in the vicinity of the Plan Change site is St Patrick's Catholic School on Acacia Bay Road which is a state-integrated full primary school with all other schools in the Taupō urban area being located to the south of the CGB. I agree that providing safe access to schools such that children can safely walk and cycle to school is very important. I have highlighted opportunities for improved walking and cycling connectivity and address the benefits of providing more schools in the vicinity of the Plan Change site in paragraphs 6.34-6.36 but note this is outside of the scope of the Plan Change.
- 6.27 I also note that recent reductions in speed limits along Wairakei Drive have resulted in improved safety performance on the local network. I support further measures to implement safe speeds for all road users.

Adequacy of traffic assessment

- 6.28 Submissions 9, 19 and 42 raise concerns about the adequacy of the transportation assessment presented in the TIA.
- 6.29 Submission 9 requests that the TIA be redone with development scenarios and stated that this should be properly assessed with the addition of the 780 residential units. Submission 19 seeks a peer review of the TIA and raises

concerns about the modelling being outdated. I have reviewed the TIA including the underlying transportation modelling in paragraphs 4.7-4.22 of this evidence, which I believe addresses the concerns raised in these submissions.

- 6.30 Submission 42 requests further work be undertaken to aim to reduce traffic volumes especially in relation to current climate change concerns. I am of the view that the location of this development being approximately 2-3km from the edge of the town centre (Spa Road / Tongariro Street intersection), is well within the reach of able-bodied pedestrians and cyclists and would take approximately 30 minutes to walk and 10 minutes to cycle to the edge of the town centre.
- 6.31 The Plan Change site is generally closer to the town centre than other developing greenfield sites in the Taupō urban area on the southern or eastern edges of town. This provides an opportunity for relatively high levels of active transport mode share which would require excellent provision for these modes. I have also concluded in paragraph 6.32 that the Plan Change could readily be serviced with public transport.

Public transport provision

- 6.32 Submissions 11 and 43 support the consideration of public transport to service the Plan Change area. I note that the provision of services is a matter for the Waikato Regional Council (WRC) and not a matter for the Plan Change proponent. The inclusion of the proposed secondary collector road which extends from the end of Guthrie Drive and the extension of Acacia Bay to the realigned Poihipi Road both provide a suitable level of connectivity to enable public transport services to travel through the Plan Change site at some stage in the future. In my view the current structure plan does not preclude the establishment of bus services should WRC choose to introduce them.

Intersection forms in structure plan

- 6.33 Submission 10 requests that new major roads feeding into existing roads should have roundabouts at intersections. Roundabouts have an important role in reducing vehicle speeds and managing conflicts between traffic movements but must also be appropriately designed to provide safe movement for cyclists and pedestrians. Consideration of the most appropriate form if intersections would typically be assessed at resource consent stage and does not need to be resolved within the Plan Change. In my view the current road hierarchy map included as Figure 5-1 of the TIA does not preclude the installation of roundabouts where it may be appropriate to do so.

Provision of schools in structure plan area

- 6.34 Submission 19 suggests that the provision of one or more schools to the north of the bridge would have a positive impact on reducing traffic across the CGB. Currently the only school in the vicinity of the Plan Change site is St Patrick's Catholic School on Acacia Bay Road which is a state-integrated full primary school.
- 6.35 I have analysed Statistics New Zealand 2018 census data using the Waka Commuter website⁵ and observed that from the Statistical Areas to the north of the bridge (Acacia Bay, Mapara, Brentwood and Nukuhau-Rangatira Park) there are a total of 912 student trips from the north of the bridge to the south of the bridge recorded in the census. Whilst some of these trips were by active transport or bus, approximately 60% or 543 trips were undertaken by private vehicle. This data includes travel to primary, secondary and tertiary education and does not isolate the potential impact of a primary school on the north of the bridge, however I consider that there would be a substantial reduction in private travel across the CGB if a primary school were established in the vicinity of the Plan Change site.
- 6.36 As residential development increases on the north side of the bridge I would consider there is an increased likelihood of the Ministry of Education establishing a public school in the vicinity. However, the provision of a school is outside of the scope of the Plan Change and whilst it would likely have a positive effect in reducing cross-river travel demand is outside of the control of the applicant. It is noted that there is a small commercial centre which could enable the establishment of preschool activities.

7 Conclusions

- 7.1 I have reviewed the TIA, submissions and an updated traffic note prepared by the Applicant's traffic engineers. I acknowledge and support the improved walking and cycling connectivity and realignment of Poihipi Road in the updated plans lodged as part of the application on 22 September 2021. I also support the consideration of a roundabout at the proposed intersection of realigned Poihipi Road / Huka Falls Road / Wairakei which could be assessed further at resource consent stage.
- 7.2 I consider that the Plan Change site is well located in terms of its proximity to the Taupo town centre which can be accessed by an approximate 30 minute walk or

⁵ <https://commuter.waka.app/>

10 minute cycle ride, which 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. On this basis I consider that PC37 is well located for residential development compared to many other development areas which are located further away from the town centre.

- 7.3 I have concluded that there is currently insufficient capacity in the vicinity of the CGB to accommodate traffic associated with the Plan Change. My own assessment of capacity as well as that presented in the WSP traffic note demonstrates that the bridge is operating at or near capacity and further development which is currently zones will extend delays and queues at the bridge and adjacent intersections.
- 7.4 I do not support residential development from being established on the Plan Change site as it would expect this would exacerbate current congestion levels in the morning and evening peak tidal flow directions. I do not consider it appropriate for residential development to occur until such time as a second bridge is operating or the existing bridge is duplicated with associated intersection improvements and note that this is not programmed within the current LTP. However, I consider that commercial development on the site including any future schools or pre-schools may provide opportunities to reduce reliance on the town centre and may lessen rather than exacerbate current congestion levels.
- 7.5 I recommend provision could be made within the Plan Change to address this matter. One approach is for traffic impacts in the vicinity of the river crossing to be a matter of discretion for any and all resource consent applications relating to the Plan Change site. This would be addressed by the future preparation of an Integrated Transportation Assessment including an assessment of the impacts of development on travel times, delays and queue lengths on the CGB, bridge approaches and adjacent intersections. I also note that deferred development options may also provide a suitable mechanism to protect the capacity of the transport network.
- 7.6 I consider that transportation matters raised through submissions are resolved and the Plan Change application can be supported subject to:
- a The inclusion of a dedicated walking and cycling facility along Watene Lane and Acacia Bay Road within the ODP to connect the proposed walking and cycling infrastructure.

- b Addressing the lack of capacity of the Control Gate Bridge through Discretionary Activity consent status or deferment until such time as a second bridge or duplicated CGB is available.

David John Robert Smith

30 September 2021

Annexure 1: Assessment of Capacity and Performance of Control Gate Bridge

Control Gate Bridge Traffic Analysis Note

Prepared for: Taupo District Council
Job Number: TDC-J013
Revision: Final
Issue Date: 18 June 2021
Prepared by: Jared White, Principal Transport Engineer
Reviewed by: Dave Smith, Technical Director

Introduction

Abley are providing expert traffic advice to Taupo District Council for Private Plan Change 37. This technical note has been prepared to document the existing traffic data performance in the immediate vicinity of the Tongariro Street control gate bridge crossing the Waikato River. The purpose is to understand the current capacity and performance of the bridge in the context of the plan change. An assessment of effects of the plan change is not included in this note.

Traffic Flows

A traffic count was carried out on the control gate bridge over three weeks from 11 August 2020 to 1 September 2020 which classifies the total number of vehicles into 10km/h speed ranges during each hour of the day. The count is directional and reports the hourly average speed and 85th percentile speed.

The maximum traffic flows over the control gate bridge in this three-week period occur in the southbound direction during the weekday morning peak hour of 8-9am and ranged from 1423 to 1588 vph (vehicles per hour), with an average of 1490 vph. In the northbound direction the peak flows are lower and typically occurs in the evening peak hour of 5-6pm with a range of 1176 to 1407 vph and an average of 1280 vph. From this data the maximum throughput of the bridge is estimated to be in the range of 1550-1600 vph per lane. This is broadly consistent with theoretical lane capacity in urban areas with limited or no capacity from Austroads Guide to Traffic Management Part 3 guidance.

The middle week of survey data has been summarised in a series of graphs in this technical note. The average weekday traffic flows and observed speeds are shown in figure 1 and 3 for southbound (towards Taupo) and northbound (away from Taupo) travel respectively. The columns in the graphs have been colour coded to show the speed ranges of the traffic within each hour of the day in increments of 10km/h beginning at 10km/hr. The proportion of traffic which fall into each speed range is presented in figure 2 and 4 for southbound (towards Taupo) and northbound (away from Taupo) travel respectively.

The southbound peak flows occur in the morning in line with the observed tidal flows. The average weekday has 1478 vehicles southbound in the 8-9am hour with 863 vehicles (58%) doing less than 30km/hr and around half of those crossing the bridge at less than 20km/hr. The mean speed in the 8-9am hour is 30km/hr and 85th percentile speed is 46 km/hr in the southbound direction. Based on the maximum observed flow, the average weekday southbound traffic flow on the bridge has a volume-to-capacity ratio (V/C) of 0.93 and is very close to capacity. The V/C in the hour prior and following are 0.60 and 0.57 respectively so the peak is limited to no more than one hour and there is ample spare capacity in the shoulder hours.

The northbound peak flow is from 5-6pm but are 15-20% lower than the morning peak. This may be due to capacity constraints related to the existing Spa Road roundabout or be reflective of the underlying traffic demands during the afternoon/evening peak period. Based on the maximum observed flow the average weekday northbound traffic flow on the bridge has a V/C of 0.79 and has some reserve capacity. The volume capacity ratio in the hour prior and following

are 0.73 and 0.39 respectively demonstrating ample spare bridge capacity. It is observed that future plans to improve the current Spa/Tongariro roundabout as part of the Town Centre Transformation Masterplan may have a bearing on northbound traffic profiles.

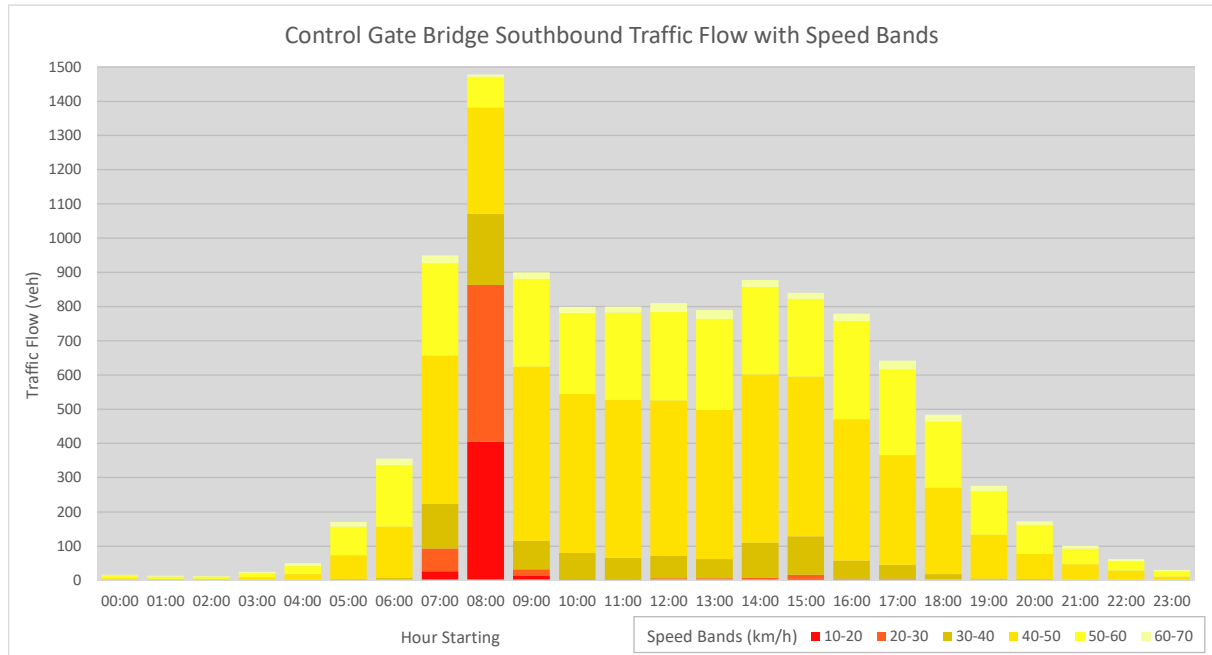


Figure 1 Southbound traffic flow and speed by hour

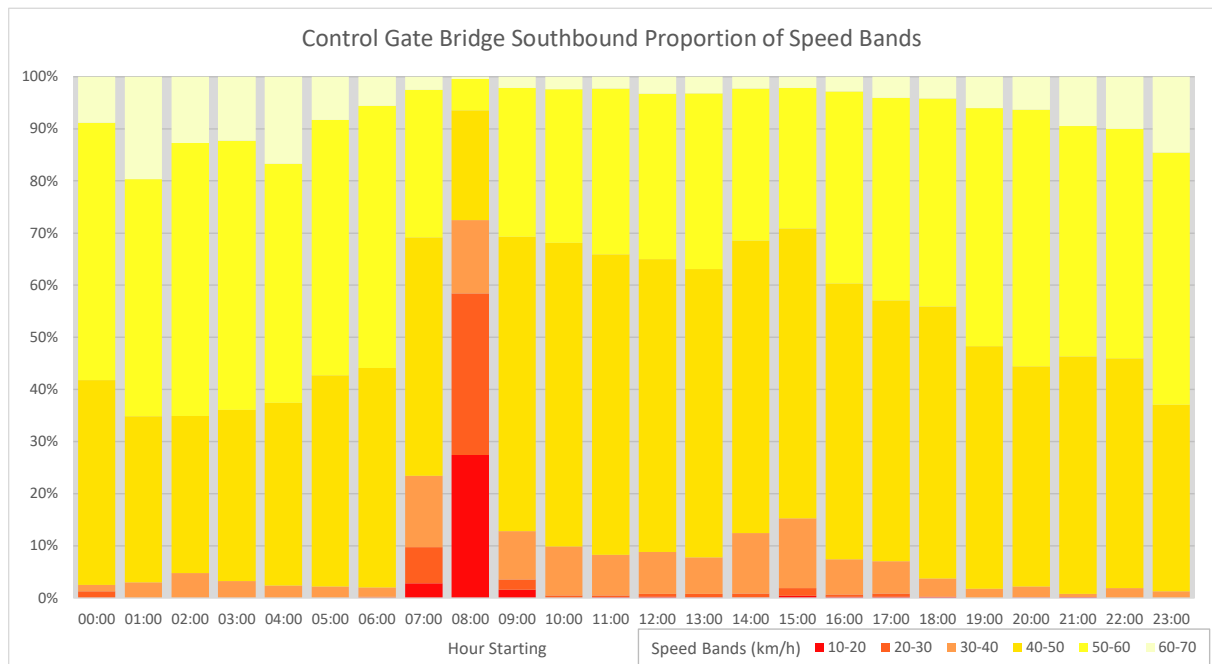


Figure 2 Southbound proportion of traffic by speed by hour

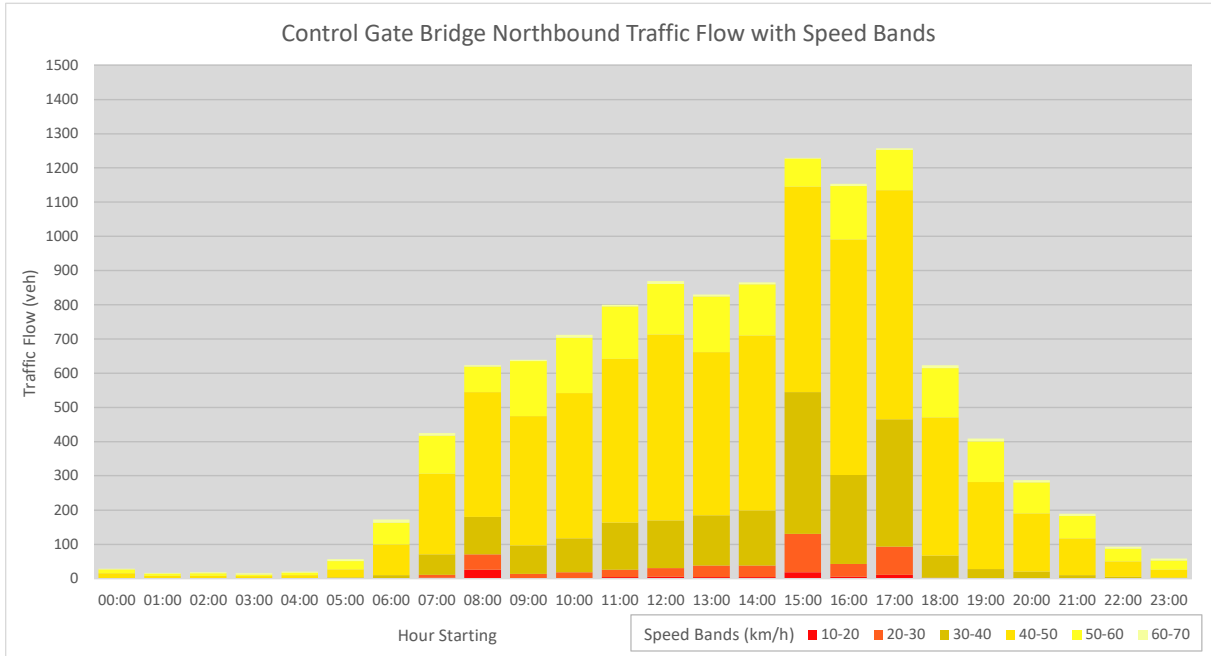


Figure 3 Northbound traffic flow and speed by hour

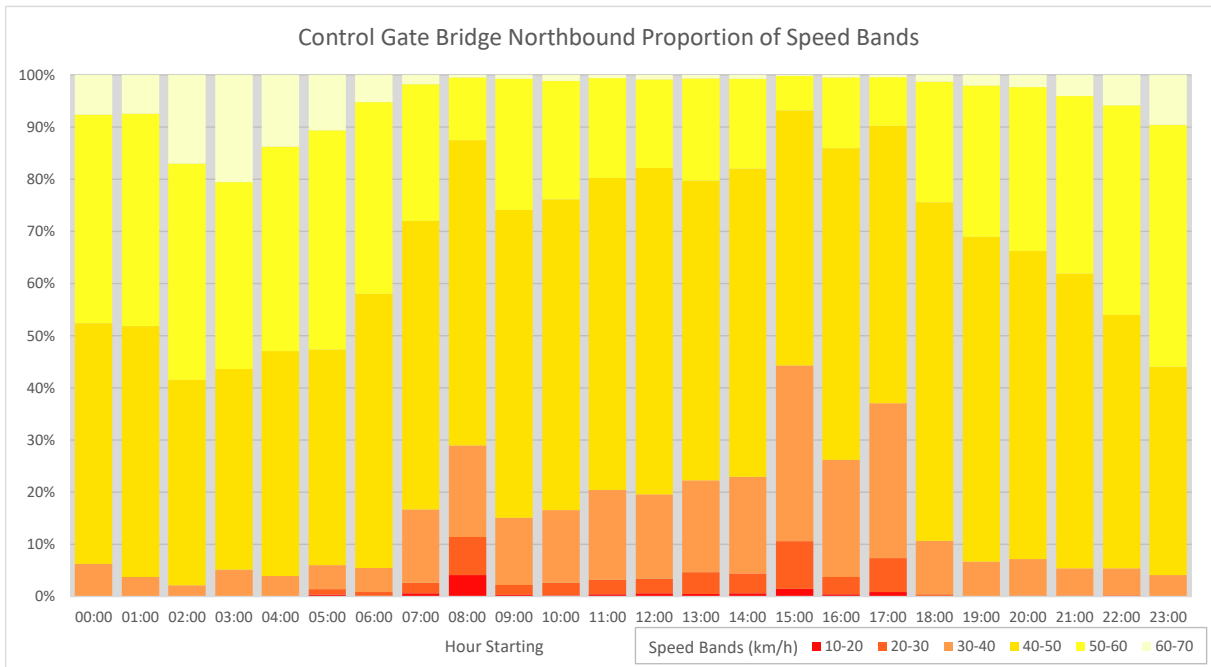


Figure 4 Northbound proportion of traffic by speed by hour

Travel Times

Observed travel times along the Wairakei Drive corridor have been collected using the Google Travel Time API. This is the feature that informs current travel times on Google Maps when undertaking a travel direction search query. A real time extraction from the Google API was undertaken on Wednesday 16 June 2021 from 7am to 9am and 4pm to 6pm. The API works by drawing down the 'live' travel times for pre-specified journeys every 15 minutes over the period and the average speeds can be calculated based on the route length. The two routes that were extracted are as shown in figure 5.

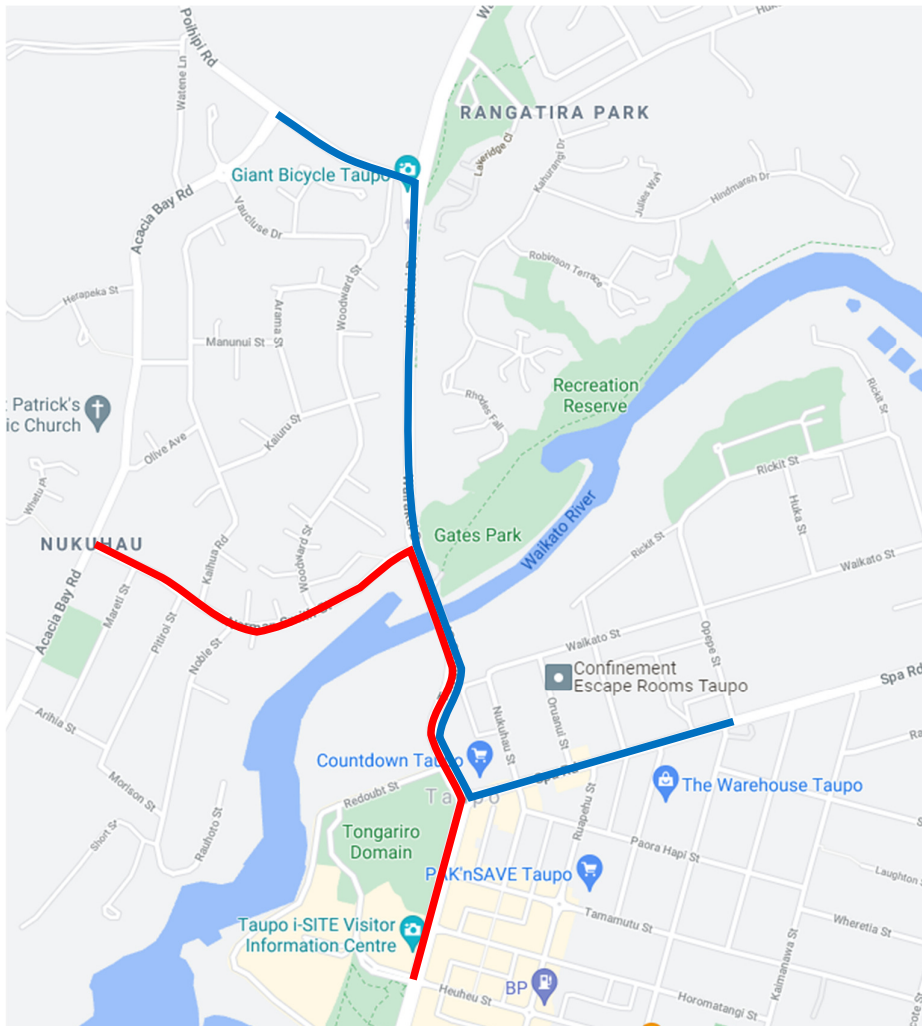


Figure 5 Travel time routes for Google API data collection

Given the tidal nature of the traffic flows only the southbound results of both routes are reported in the morning period and northbound in the evening period. The following charts show how the average travel times (and resultant average speed) change over the peak periods. Figure 6 and figure 7 correspond to the red (Acacia Bay Road to Heuheu Street) and blue (Poihipi Road to Opepe Street) southbound routes in the morning peak and figure 8 and 9 correspond to red and blue northbound routes in the evening peak period.

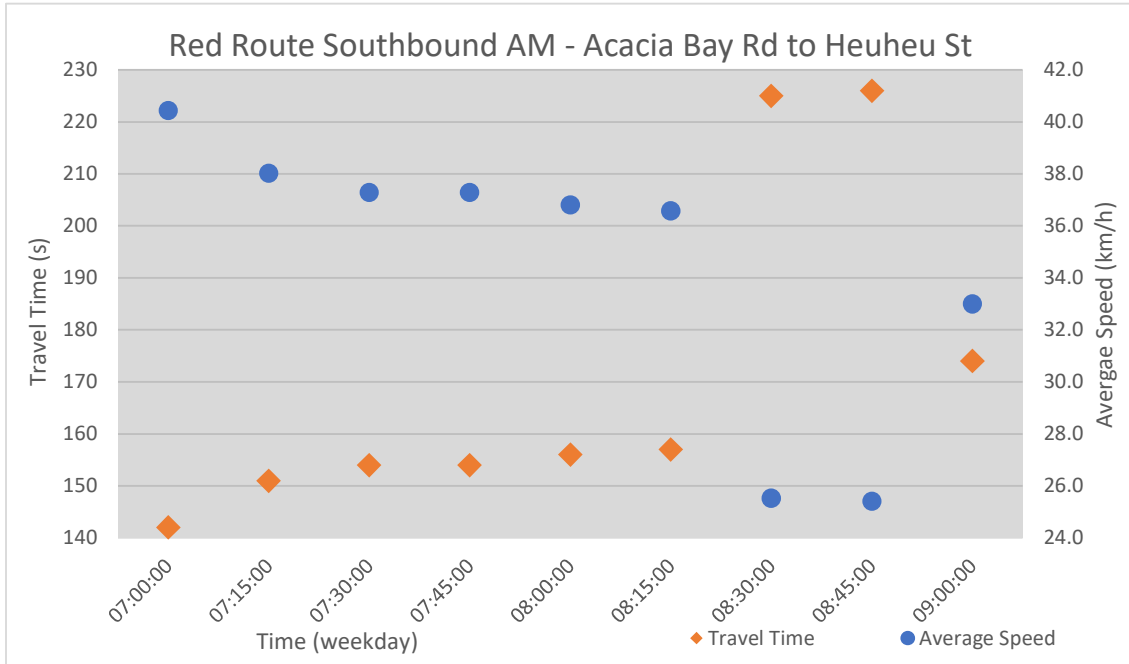


Figure 6 Southbound morning peak travel times and speeds – Acacia Bay Rd to Heuheu St

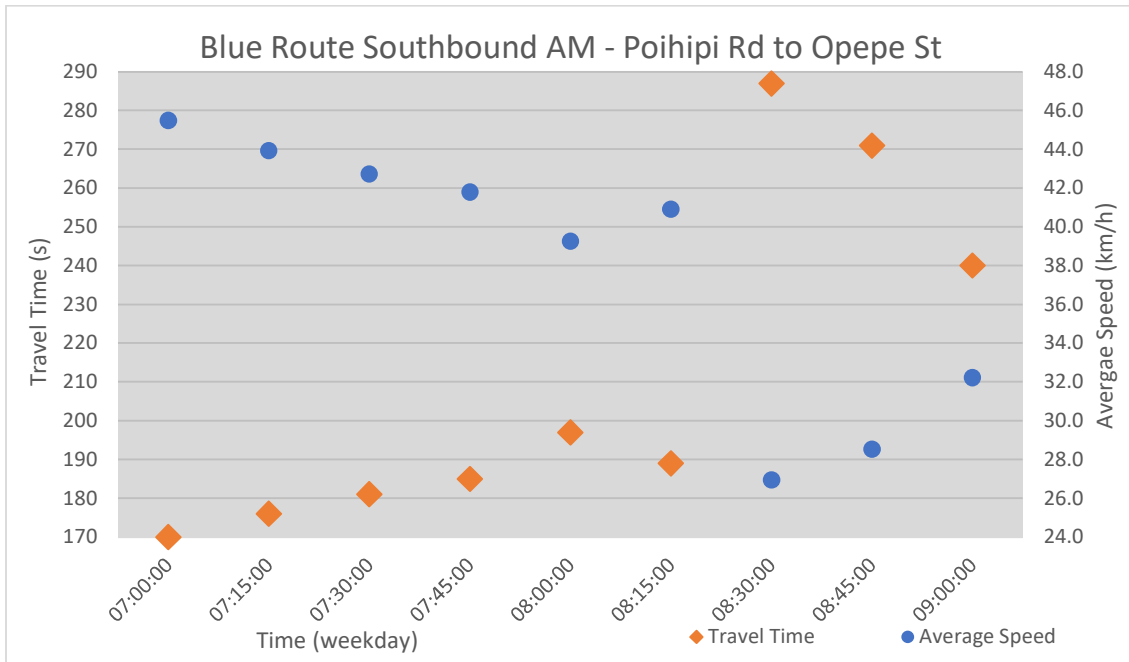


Figure 7 Southbound morning peak travel times and speeds – Poihipi Rd to Opepe St

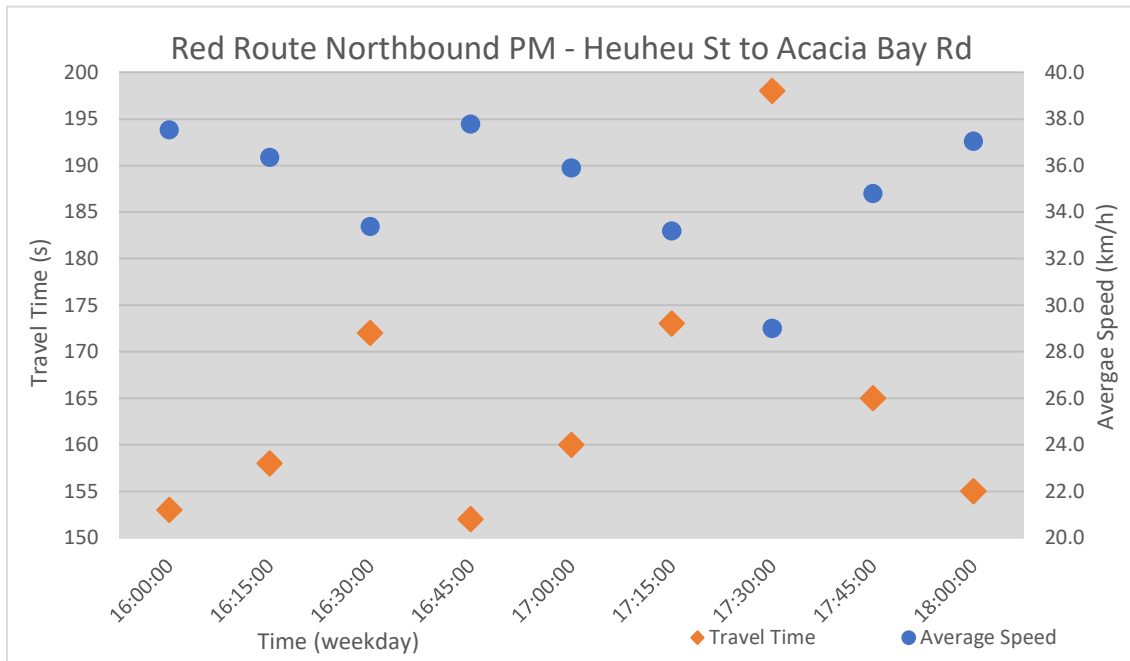


Figure 8 Northbound evening peak travel times and speeds – Acacia Bay Rd to Heuheu St

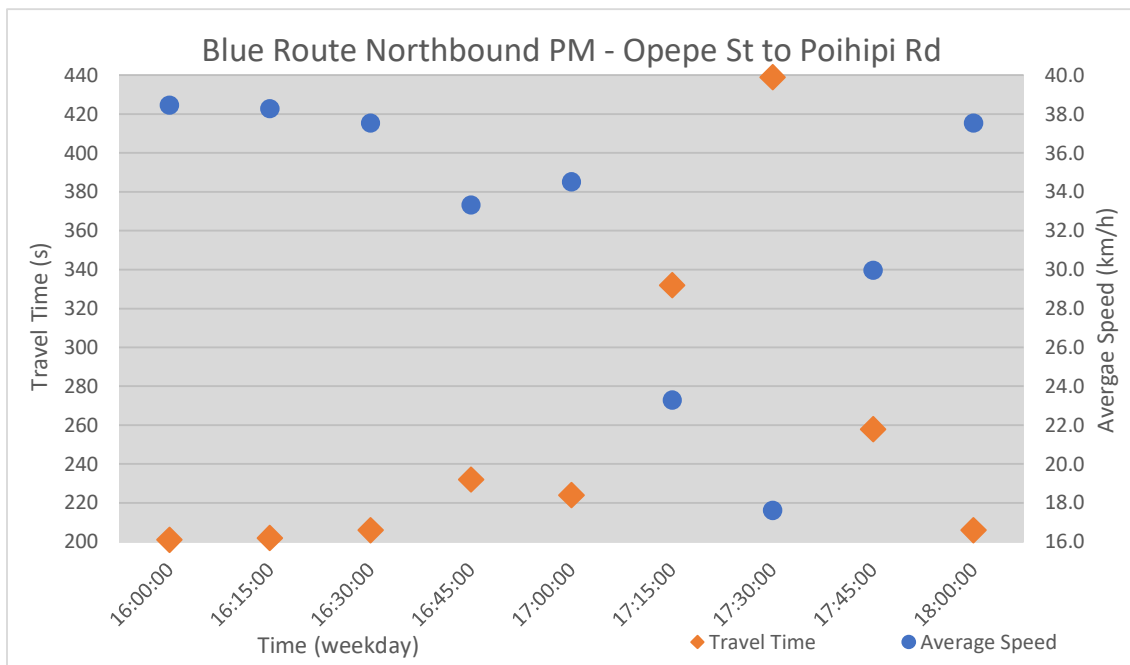


Figure 9 Northbound evening peak travel times and speeds – Poihipi Rd to Opepe St

In the southbound direction both routes show that travel times increase after 8:15am with an approximate 50% increase in travel time across the journey. The peak travel times are experienced at 8:30am and 8:45am and have largely recovered by 9am. This implies that the current peak extends for approximately 30 minutes. The additional delay over free flow speed during this peak demonstrates that there is an approximate 1.5 minutes of additional travel time due to congestion. The average speeds across the peak half hour are not inconsistent with those observed on the traffic count on the control gate bridge for the southbound direction but do represent average speed across the entire journey shown in figure 5.

In the northbound direction both routes show travel times after 5pm with an increase of 20% for the route starting along Tongariro Street but doubling by 5:30pm on the Spa Road corridor. The deterioration of performance of the journey along Spa Road likely is a consequence of the performance of the Spa Road / Tongariro Street roundabout. Peak travel times have recovered somewhat by 5:45pm and are back to freeflow speeds by 6pm such that the evening peak congestion is in the order of 30 minutes in length.

This implies that the delay for Tongariro Street traffic heading north over the control gate bridge is in the order of 20-40 seconds and delays of up to three minutes are experienced along Spa Road which would be expected to be significantly improved with planned and funded improvements to the Spa Road corridor including a reconfigured Spa/Tongariro intersection.