

**ENVIRONMENT COURT OF NEW ZEALAND
WELLINGTON REGISTRY**

**I MUA I TE KOOTI TAIAO O AOTEAROA
TE WHANGANUI-A-TARA**

ENV-2023-WLG-000005

Under the Resource Management Act 1991

In the matter of the direct referral of applications for resource consent and notices of requirement under sections 87G and 198E of the Act for the Ōtaki to North of Levin Project

By Waka Kotahi NZ Transport Agency

**STATEMENT OF EVIDENCE OF PHILIP JEREMY PEET
ON BEHALF OF WAKA KOTAHI NZ TRANSPORT AGENCY**

TRANSPORT

Dated: 4 July 2023

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TABLE OF CONTENTS

INTRODUCTION	1
EXECUTIVE SUMMARY	2
The current transport network and its problems.....	3
Future problems: the 'Do Minimum'	4
The Ō2NL Project and its transport benefits	5
The Project's minor adverse transport effects.....	8
Construction effects.....	8
WORK SINCE LODGEMENT	9
Response to section 92 requests for further information.....	9
Any further survey / assessment work	10
Engagement with stakeholders.....	10
COMMENTS ON SUBMISSIONS	10
COMMENTS ON THE COUNCIL REPORTS.....	19
Tara-Ika Development.....	19
Scope of Ō2NL.....	19
<i>The approach to my effects assessment.....</i>	21
<i>Benefits of additional links for land use without PC4</i>	21
<i>Benefits of additional links once Tara-Ika is developed.....</i>	23
Conclusions.....	25
Southern Interchange.....	25
Scope of Ō2NL.....	26
<i>Benefits of the current concept design compared to the existing situation....</i>	27
<i>Adverse effects of the current concept design</i>	27
<i>No Interchange – benefits and effects.....</i>	28
<i>Full Half Interchange benefits and effects</i>	29
CONCLUSION	30

INTRODUCTION

1. My full name is **Philip Jeremy Peet**.
2. I am currently the Sector Leader for Transport Advisory for Stantec, leading this service line across New Zealand.
3. I prepared Technical Assessment A: Transport (**Technical Assessment A**) as part of Volume IV of the Assessment of Environmental Effects (**AEE**), which accompanied the application for resource consents and notices of requirement for designations (NoRs) lodged with Manawatū-Whanganui Regional Council (**Horizons**), Greater Wellington Regional Council (**GWRC**), Horowhenua District Council (**HDC**) and Kāpiti Coast District Council (**KCDC**) in November 2022 in respect of the Ōtaki to north of Levin highway Project (**Ō2NL Project** or **Project**).
4. My qualifications and experience are set out in paragraph 37 of Technical Assessment A. My evidence is supplementary to Technical Assessment A.
5. In preparing Technical Assessment A and my evidence:
 - (a) I have provided advice on transport matters related to the Project to Waka Kotahi since January 2011. I led the consultant transport planners, designers, and assessors through many stages of project development.
 - (b) I have attended the site many times, reviewed information and reports prepared by my team, and met stakeholders, landowners, and community representatives regularly.
 - (c) I led the development of the Indicative Business Case (**IBC**) and Detailed Business Case (**DBC**) for the Project, including reviewing their supporting technical addendum reports.
 - (d) I have helped to respond to section 92 further information requests, and helped respond to queries from property owners through submissions and through property discussions.
6. Since the consent applications and NoRs were lodged, and in addition to the above, I have also undertaken additional modelling and analysis in regards to the interaction between Tara-Ika and Ō2NL.

Code of conduct

7. I confirm that I have read the Code of Conduct for expert witnesses contained in section 9 of the Environment Court Practice Note 2023. This

evidence has been prepared in compliance with that Code. In particular, unless I state otherwise, this evidence is within my area of expertise and I have not omitted to consider material facts known to me that might alter or detract from the opinions I express.

Purpose and scope of the evidence

8. Technical Assessment A assesses the actual or potential effects of the construction and operation of the Ō2NL Project on the transport network.
9. My evidence does not repeat in detail the matters discussed in Technical Assessment A. Rather, in this evidence I:
 - (a) present the key findings of Technical Assessment A in an executive summary, updated to factor in the additional work carried out since lodgement;
 - (b) provide a more detailed description of the additional work carried out, information obtained, and discussions held since lodgement, and the implications for my assessment;
 - (c) comment on issues raised in submissions received in respect of the Project; and
 - (d) comment on the section 87F/198D reports prepared by Horizons, GWRC, HDC and KCDC (**council reports**).

EXECUTIVE SUMMARY

10. I summarise the key matters addressed in Technical Assessment A below.
11. Technical Assessment A considers the transport effects of the Ō2NL Project. To assess those effects, I considered and compared three scenarios:
 - (a) the "Current Transport Network", including the existing State Highway 1 (**SH1**) and State Highway 57 (**SH57**) (the **State Highways**) between just north of Ōtaki and just north of Levin, and the interaction of those highways with local roads and the North Island Main Trunk (**NIMT**) railway;
 - (b) the "Do Minimum", which is the assumed transport network in 2039 (including various already committed improvements including the Peka Peka to Ōtaki Expressway (**PP2Ō**)),¹ without the Ō2NL Project; and

¹ The PP2Ō project was not included in the "Current Transport Network" because it was under construction at the time of the assessment reported in Technical Assessment A.

- (c) the "With Project" scenario, which includes the Do Minimum with the Ō2NL Project in place as of 2039.
12. In considering these scenarios I applied a bespoke Ō2NL Project Traffic Model, and applied best practice safety and resilience assessments.

The current transport network and its problems

13. The sections of SH1 and SH57 between north of Ōtaki and north of Levin are crucial, nationally significant transport links for people and freight.
14. The rural sections of these highways are heavily trafficked, two-lane roads without median barriers. Drivers encounter high traffic volumes and numerous out-of-context horizontal curves, almost 40 intersections and over 400 accessways. The current transport network is therefore not fit-for-purpose, falling well below the standard expected of national state highways. This is demonstrated by the highways' very high safety risk, with published KiwiRAP² star ratings of 2 (out of 5), and ultimately by a history of high numbers of serious and fatal crashes, culminating in 72 deaths and serious injuries (DSIs) for the five year period 2017-2021 (as reported in Technical Assessment A).
15. A review of recorded crashes and injuries has been undertaken for 2022 to determine if there was any significant change since Technical Assessment A was completed. This showed that there were 26 DSIs in 2022, significantly more than the average of 14.4 for the previous five years. That highlights that the need for the Project is getting greater, and the safety benefits it will deliver will be increasing.
16. In addition to being unsafe, the existing state highway network lacks resilience to natural hazards, weather and traffic events. SH1 through the project area is at high risk of closure from earthquakes, flooding, and crashes. As outlined in Technical Assessment A, two recent large-scale events closed the highway between Ohau and Manakau; one for 90 minutes and the other for over 24 hours (the latter was when the approach to the Waikawa Bridge was washed away).
17. This is particularly problematic, for both local and inter-regional travellers, because SH1 is the only direct route between Manakau and Ohau (and therefore points further south or north). The highway is closed at least four

² KiwiRAP is a safety rating system used to identify the most dangerous sections of the road network. A 2 star road means that there are major deficiencies in some road features, such as poor roadside conditions and/or many minor deficiencies such as insufficient overtaking provision, narrow lanes, and/or poorly designed intersections at regular intervals.

times a year, and when an event occurs between Manakau and Ohau, the only alternative route is via the Wairarapa, which increases trip time by at least two hours, significantly more in peak hours.

18. There are also five bridges vulnerable to earthquakes, two of which will affect the railway below if they fail (cutting off all transport modes between Ōtaki and Levin).
19. Travel times between Ōtaki and SH1 north of Levin vary depending on travel periods but are on average 26 minutes in the evening peak. Access from side roads onto SH1 and SH57 typically takes less than 30 seconds, but there are a number of intersections which have delays up to 70 seconds. These delays can extend to several minutes on holiday weekends and other high traffic situations.
20. The regional active mode network is very limited with no safe ways to walk or cycle between Ōtaki and Levin; the rural sections of SH1 are not safe for either cyclists or pedestrians.

Future problems: the 'Do Minimum'

21. The future transport network (that is, the future transport environment without a new highway) will include the projects committed to by Waka Kotahi and local government. This includes the Peka Peka to Ōtaki Expressway (**PP2Ō**), speed limit changes, and other intersection and safety improvements on the state highway and local road networks (many of which were included in the Ō2NL Programme to provide safety improvements ahead of construction of the new highway). These are referred to as the Do-Minimum interventions.
22. The Do-Minimum interventions are expected to save approximately 27 DSIs in the Project area per 5-year period. This represents approximately a 30% reduction in DSIs on the State Highways and a 4% reduction on local roads (when compared to the 2039 'Do Nothing' scenario). However, whilst the improvements will have a marked decrease in the number of fatal and serious injuries on the corridor and a reduction in overall risk in the short term, escalating traffic volumes means that by 2039, the risk will increase again. The number of deaths and serious injuries on these state highways is expected to be the same in 2039 as today, even with the safety improvements in place.
23. The communities from Ōtaki to Levin are projected to grow considerably in the next 20 years, with an additional 15,000 people living in the Horowhenua

District and over 22,000 in the Kāpiti Coast District by 2040.³ As a result, significantly higher traffic volumes are predicted into the future, including by 2039. The benefits of the Do-Minimum interventions, which are in any event not intended to be a complete solution to the current problems with the state highway network, will reduce over time as a consequence of the increased traffic on the network.

24. Overall, the Do-Minimum improvements will not, of themselves, create a fit for purpose network. Increased population and traffic will put further pressure on the state highway network (between Ōtaki and north of Levin), resulting in more traffic incidents and delays.
25. In terms of safety, the general trend under the Do Minimum will be for a worsening safety risk over time. Safety issues associated with the level crossings of the NIMT will be heightened under the Do Minimum; traffic volumes will, under the Do-Minimum scenario, increase the risks at all level crossings, including the Tararua Road level crossing.
26. Travel times and delays will increase significantly under the Do-Minimum. On SH1 in peak periods, trips between Ōtaki and Central Levin and Ōtaki and SH1 North of Levin are expected to increase by 25% to 40% or around 6-7 additional minutes per journey. Trips between Ōtaki and SH57 north of Levin are forecast to increase by over 40% or 9 additional minutes per journey. Delays on side roads accessing SH1 are predicted to increase at 25 locations by over a minute on a typical evening trip.
27. The existing vulnerabilities of the network in terms of resilience will remain under the Do Minimum. Those vulnerabilities will be exacerbated by climate change, which will impact the reliability of the network as flood events are predicted to become more frequent.
28. Finally, the Do Minimum will not address the lack of a safe north-south cycling or walking route.

The Ō2NL Project and its transport benefits

29. The Ō2NL Project has been conceived and designed to address the current and future problems with the network (and with the Do Minimum). That is reflected in the Project objectives, which focus on safety, resilience, connections to the local network and urban areas, provision of a north-south

³ Horowhenua District Council and Kāpiti Coast District Council population forecasts are based on (separate) 75th percentile Sense Partners Population Projections.

cycling and walking facility and supporting growth through improved movement of people and freight.

30. The Ō2NL Project involves the construction, operation, use, maintenance, and improvement of approximately 24km of new four-lane state highway between Taylors Road (to the north of Ōtaki) and SH1 and SH57 north of Levin, along with a dedicated north-south Shared User Path (**SUP**). The new Ō2NL route, which will become SH1, will be a modern, high-quality highway, and will address the fundamental safety and resilience problems impacting the current transport network and result in quicker and more reliable trips for users.
31. On completion, approximately 35 DSIs are expected to be saved per 5-year period following its opening. When coupled with the online safety improvements in the Do-Minimum scenario as described above, a total of approximately 60 DSIs will be saved per 5-year period. This is achieved by attracting through traffic off the substandard sections of state highway (between Ōtaki and north of Levin) and shifting them to a high quality, median divided road (which will have a KiwiRAP 4 star or higher rating).
32. In addition, there will be significantly less traffic across almost all the existing NIMT level crossings, which in turn will improve the safety at those crossings. Traffic volumes will increase at the Tararua Road and Liverpool Street level crossings. Improvements are proposed by the Project at the Tararua Road level crossing, which will provide a significant safety benefit at this crossing point and that also supports planned urban growth to the east of Levin and planned commercial development on Tararua Road. KiwiRail are also planning improvements to the Liverpool Street crossing to improve the safety risk. Overall safety at level crossings will ensure they remain at least as safe as under the Do Minimum scenario.
33. The number of crash related closures on the future state highway network will be at least 50% less than the current network. The Ō2NL Project, in conjunction with the old (current) state highway, will ensure that detour routes for any incidents are significantly shorter,⁴ as a parallel alternative second route will exist. The Ō2NL Project will ensure the resilience of this critical national transport route, for example, flooding, crashes, and bridge problems,

⁴ Journeys impacted between Wellington and Levin would reduce in length by at least 60% (95 km Do Min, 256 km detour (via Saddle Road), 97km Ō2NL). However, a journey impacted between Manakau and Ohau would reduce by 90% (6.6km Do Min, 306km detour, 30km Ō2NL). If there is a major crash/breakdown event on Ō2NL, the old SH1 will likely be available. However, for larger natural events, if Ō2NL is unavailable, the availability of the old SH1 cannot be guaranteed.

including from earthquakes, on the old SH1 route will no longer affect highway traffic, and local traffic will be able to reroute.

34. The forecast travel time savings are significant compared to the Do Minimum in the evening peak, with 11-15 minute reductions for trips from Ōtaki to destinations north of Levin and 6 minute savings for trips to Levin. In addition, journey time reliability for these routes is improved as the additional capacity provided eases congestion and mitigates the impact of unplanned events, such as breakdowns. A more reliable system enables network users, including freight and logistics companies, to better plan beyond their travel and become more efficient. This is especially important as the route between Wellington and Palmerston North is a critical freight link.
35. Side road delays will reduce to negligible levels, except for a couple of intersections in urban Levin.
36. Community connectivity will be improved through reduced journey times. While the location of the Ō2NL Project will result in some increased journey distances for a minor number of local trips, these do not result in increased travel times due to the Ō2NL Project reducing congestion, improving road connections, and allowing higher speeds on the new highway.
37. The SUP will provide a high-quality facility between Ōtaki and Levin, that will be appropriate for commuting and recreational use and is easily and conveniently accessible to adjacent communities. The SUP can be directly accessed from Levin, Manakau, Ohau and all roads that cross the alignment. This facility will become the north-south active mode spine through Horowhenua (where none currently exists) and, therefore, a key part of the regional active mode network that connects through to Kāpiti.
38. Public transport will benefit from the Ō2NL Project creating a quieter 'old highway', with fewer vehicles that may enable investment in more frequent and attractive public transport options for surrounding communities. Ō2NL also provides a new route that could be used for longer distance public transport trips.
39. Currently, the high volume of traffic through the centre of Levin is reducing the attractiveness of the main retail area. The reduction in traffic through Levin, particularly trucks, will help create a thriving and vibrant town centre.

The Project's minor adverse transport effects

40. The effects of the Ō2NL Project are overwhelmingly positive in transport terms. That said, there are some minor adverse effects relating to travel times and property access for certain locations.
41. In a small number of locations, access and travel times would be adversely affected by the Ō2NL Project. These include:
 - (a) the residual parcels of land on the eastern side of the alignment south of Kuku East Road (although none of these have a dwelling on them);
 - (b) the Kimberley Road / McLeavey Road area for short trips from one side of the highway to the other (trips north to Levin or south to Ohau are not affected);⁵
 - (c) Waihou Road residents who will be diverted up to MacDonald Road; and
 - (d) Avenue North Road, whose access north is being severed to improve safety at the northern connection back into the old SH1.
42. The Ō2NL Project will result in increased traffic on the network compared to the Do-Minimum. A proportion of this is due to the release of some of the 'suppressed' trips,⁶ but others are due to the increased attractiveness of the Ō2NL Project. These suppressed network trips have been considered in the overall evaluation of travel time, safety and resilience impacts in this report.

Construction effects

43. As with all major transport projects, construction of the Ō2NL Project will have impacts on the existing transport network. In this case, the potential effects are minimised by the fact that the Ō2NL Project is an 'offline' highway, largely being constructed away from the old SH1 and SH57.
44. There will still, however, be effects, relating to heavy vehicle movements and site accesses, that will need to be managed appropriately over the duration of construction. This will be achieved through designation conditions, with detailed methodology to be provided through a Construction Traffic Management Plan (CTMP). This will ensure site access routes and access arrangements are managed in a safe and efficient manner. It will also outline

⁵ Walking and cycling trips are affected by a slightly greater area due to limited connectivity across the Project between Queen Street East and Muhunua East Road.

⁶ Trips which are not predicted to be made on the Do-Minimum network due to delays and congestion.

details of how pedestrian and cycle routes, and property accesses, are maintained throughout the construction period.

WORK SINCE LODGEMENT

45. Since the application was lodged, I have been involved in further work related to transport as set out below.
46. I revisited the crash history as presented in Technical Assessment A to check whether this has significantly changed. As presented above, deaths and serious injuries increased in 2022 compared to the average of the previous five years.

Response to section 92 requests for further information

47. I have assisted with the response to further information requests from the Councils related to Technical Assessment A.
48. The detail of the further information request and the response can be seen in the documentation,⁷ but much of the information requested in relation to transport matters was around travel patterns, the integration with Tara-Ika and the Southern connection (near Taylors Road).
49. In relation to travel patterns, I summarised in the response to the further information request that two thirds of trips represented in the traffic model have an origin or destination in the area encompassing Ōtaki and Levin (17% of trips stay within this area and 49% have one trip end in this area). One third of trips travel all the way through this (Ōtaki and Levin) area. COVID-19 was seen to have only a minor impact in relation to traffic volumes but is not likely to have an impact on long term traffic projections.
50. In relation to Tara-Ika, I confirmed that the Ō2NL Project does not preclude the East West Arterial (EWA) or other transport links servicing Tara-Ika from occurring, nor does the Ō2NL Project require these links to be in place. However, it is assumed that these links will be needed to service the full Tara-Ika development.
51. I confirmed that the preferred option for the Southern connection was a half interchange as that provides significantly better connectivity for the wider community and has a range of other benefits. This option has very little impact on the traffic volumes on the old SH1 through Ōtaki, when compared

⁷ <https://www.horizons.govt.nz/HRC/Waka-Kotahi-New-Zealand-Transport-Agency-O2NL/Planning%20Appendix%2014%20-%20Regional%20Councils%20Response%20to%20combined%20request%20for%20information%20under%20section%2092.pdf>

to the Do Minimum. This Project includes direct connectivity of the proposed Ō2NL shared use path to the PP2Ō shared use path.

52. The Southern connection, and the EWA / other links to Tara-Ika are addressed in my responses to the Council reports below.

Any further survey / assessment work

53. Further transport modelling has been undertaken to determine the impacts of the potential East West Arterial (EWA). This is covered in the response to Council Reports at the end of my evidence.

Engagement with stakeholders

54. I have also been involved in ongoing post-lodgement engagement with Mr Tim Kelly and Mr David Dunlop, the Technical Experts for HDC and KCDC respectively.
55. Conversations to date have been focussed on the issues which are discussed later in this evidence.

COMMENTS ON SUBMISSIONS

56. I address the submissions that raise transport specific points below.

The SUP and provision of a bridle path

57. A number of submitters requested the inclusion of a bridle path as part of the Project (either as part of the SUP, or as a separate facility).
58. I am not aware of any effect that the Ō2NL Project may have on any equestrian facilities including existing bridle paths or trails. As such, this Project does not have the same impact as the Kāpiti expressway (the Mackays to Peka Peka and Peka Peka to Ōtaki projects) where these projects severed existing bridle path connections and routes.
59. Further, over the past 20 years there have been no recorded traffic crashes on the part of the state highway between Ōtaki and north of Levin that have involved horses or equestrian users (aside from one crash that involved an empty horse float).
60. In addition, **Mr Alan Jamieson** requested in his submission that any shared use facility connect to key destinations and be extended further to Foxton and Shannon. The proposed SUP provides full connectivity to all key destinations for refreshments and accommodation as it ties into all side roads and into all three urban areas of Manakau, Ohau and Levin. Extensions to

the SUP to Shannon and Foxton are outside the scope of this Project, but as the path connects into SH1 and SH57, users can use these highways to access these other destinations. I understand Mr Jamieson (who has joined the Court proceedings) is no longer pursuing this point.

61. Finally, I understand Mr Jamieson would prefer that the SUP is provided on a route with closer proximity to existing cafes and other amenities (such as along the current SH1). The location of the proposed SUP largely reflects the route of the proposed designations, and is in my view an appropriate north-south route with good connections into local communities. Whether the current SH1 might in future more actively provide for walking and cycling is a matter for the revocation process.

Wendy McAlister-Miles and Dion Miles, and Janice Jakeman, 195 and 197 Muhunoa East Road

62. The submitters are concerned about the effects of the Project on the access to their properties at 195 and 197 Muhunoa East Road. The Project design in relation to these properties is shown in Drawing No 310203848-01-100-C1008 – General Arrangement Plan Sheet 9 in Volume III of the AEE. A snip of this location is shown in the Figure below.



Figure 1: Project Design in relation to 195 and 197 Muhunoa East Road

63. I can confirm that access to these properties will not be restricted.
64. During construction, there could be small delays, including stop/go traffic control and there could be additional impacts including contractor vehicles using Muhunoa East Road.
65. Once work is complete, access to the property will not be more difficult than it is currently. Muhunoa East Road is being realigned at this point, but access from 195 and 197 will be onto a stub piece of remaining Muhunoa East Road (which will serve only a few properties). This in turn will intersect with the realigned Muhunoa East Road.
66. The new highway will not result in a change in traffic volumes on Muhunoa East Road.
67. Mrs Jakeman also requests a turning bay. **Mr Jamie Povall**, in his evidence outlines the potential design of the accessway and explains that the accessway can be designed with sufficient sight distances to provide an adequately safe access to the property. He also notes that a turning bay is not warranted based on the level of through and turning traffic at this location..

Dakin and Ally Bramwell, 289 Tararua Road

68. The submitter is concerned about the high amount of traffic and impact on the access to their property. I have assumed that the property they are referring to is 289 Tararua Road.
69. As this property is to the east of the designation, I do not expect a direct impact on their accessway. The Project will not result in increased traffic volumes past their accessway, but traffic volumes would increase as a result of the anticipated Tara-Ika development.
70. There will be some disruption to Tararua Road during construction. There could be small delays, including stop/go traffic control at some times and there could be additional impacts including contractor vehicles using Tararua Road west of the new alignment. These are relatively minor and will not at any stage prevent access. The CTMP will manage these effects.

Kevin Daly, 257 / 267 Tararua Road

71. This submitter is concerned about the limited connectivity across Ō2NL between Tara-Ika and Levin. This is in relation to pedestrians and cyclists at Tararua Road and between Tararua Road and Queen Street, and all vehicles within the vicinity of Liverpool Street.

72. HDC does not have an agreed, published walking and cycling network and therefore Tararua Road is not identified as a key pedestrian or cycle route.
73. Due to the limited attractors in the area, the current demand at this location would be very low. I am not aware of any walking and cycling counts undertaken at this location, but I have a good knowledge of the area and have considered data captured by the popular Strava mobile app.⁸ From this data there are almost no walking trips on Tararua Road crossing SH57. There are low numbers of cycling trips in this area, but the data is not clear on whether they are crossing SH57 at Tararua Road. All walking and cycling trips that are recorded are noted as being for leisure and are relatively long-distance; i.e., they appear to be for the purposes of exercise and not for access.
74. In terms of key destinations on the west of the new highway, Levin and Ohau are catered for by active mode connections over the new highway at Queen Street East and Muhunoa East Road respectively. The only key destination on the east of the new highway is the Kohitere forest trails including the Trig walkway and connections to Gladstone Road. I acknowledge that not having a crossing at Tararua Road may impact on a small number of recreational users accessing this area. However, the area would still be accessible through a slight change in cyclists' loop trips, and these journeys would be safer due to the provision of the SUP. In my view, the level of benefit achieved by creating a connection at Tararua Road would be very small. **Mr Povall** also discusses the rationale for not including dedicated pedestrian and cycle facilities at the Tararua Interchange.
75. Additional walking and cycling facilities over Ō2NL between Tararua Road and Queen Street are discussed later in my evidence. I believe that the northern active mode connection envisaged by HDC Proposed Plan Change 4 (**PC4**) would provide additional community connectivity benefits; however, the driver for those facilities would be the future Tara-Ika development, and so the provision of that facility should be addressed as growth at Tara-Ika occurs.
76. I have considered the East West Arterial (**EWA**), a new road connection over Ō2NL in the vicinity of Liverpool Street, as shown on the PC4 Structure Plan, and it is my understanding that this will be the subject of a separate resource consent process by HDC. Nevertheless, I discuss this later in my evidence.

⁸ Strava is an app for individuals to track their walking and cycling activity using GPS data. The information is collected, de-identified, aggregated and summarised and is available to interrogate for trends via Strava Metro.

The Ō2NL Project does not prevent the EWA or the active mode connections being developed.

Emma and Carl Chalmers

77. This submitter is concerned about the limited walking connectivity across Ō2NL in the vicinity of Kimberley Road. This is in relation to pedestrians on the western side of the new highway at this location wanting to access destinations on Kimberley Road and Muhunua Road East, east of the new highway.
78. HDC does not have an agreed, published walking and cycling network and therefore Kimberley Road and Muhunua Road East, at the location of the Ō2NL Project, are not identified as key pedestrian or cycle routes. Due to the limited attractors in the area, the current demand at this location for east-west routes would be very low. The only attractor to the east is the Kimberley Reserve picnic area; no wider network connectivity exists at the eastern end of Kimberley Road or Muhunua East Road. Trips between Kimberley Reserve and Levin and Ohau are catered for by the SUP and crossings at Queen Street East and Muhunua East Road, and therefore these trips are not affected.
79. I acknowledge that walking distances would be increased for the currently short trip between Kimberley Road to the west and Kimberley Road / Muhunua East Road to the east of the Ō2NL Project, however, in my opinion the demand would be significantly less than what would be required to justify investment in a grade separated connection.

Roger McLeay; and Errol Christiansen, Whanganui

80. Mr McLeay and Mr Christiansen fundamentally support the scheme but they propose some alterations to its form.
81. The submitters comment on the design standards and ask whether this road could have a 110km/h speed limit and for all curves to be greater than 1100m radii. Mr Povall addresses the design of the highway and confirms that it has been designed so that a 110km/h speed limit is possible and I understand that is also the case with the Kāpiti Expressway. However, a decision on whether to implement this higher speed limit will be made by Waka Kotahi closer to the time of opening. My current assumption is that the speed limit will be 100km/h, to match the current speed limits on the expressways to the south.

82. The form of the proposed SH1/SH57 at the northern end of the Project intersection is queried by the submitters. They request that the intersection is grade separated, with the predominant movement being the SH57 route as this has higher traffic volumes.
83. A grade separated interchange was considered at this location through the multi-criteria analysis (**MCA**) processes, but a roundabout was preferred for a number of reasons as reported in the MCA Report⁹ including:
- (a) Future long-term adaptability and flexibility. It is likely that SH57 will need to be upgraded at some point in the future to improve safety and cater for increased traffic volumes. Providing a grade separated interchange limits the alignment options that could be investigated for these improvements.
 - (b) A roundabout would have a significantly lower cost than a grade-separated interchange, and still provide similar / acceptable levels of customer service (from a through and local traffic movement and safety perspective). Detailed SIDRA traffic modelling has shown that even in the 2039 PM peak, all approaches operate at Level of Service A or B, which means delays per vehicle are less than 20 seconds.
 - (c) The need to appropriately signal the end of the grade-separated standard highway with a gateway type feature, particularly for northbound traffic continuing onward towards Palmerston North, by requiring an at-grade slow speed movement and deliberate change in road environment.
 - (d) A roundabout form was more likely to have lesser environmental impacts than a grade separated interchange, given it would have a significantly smaller footprint in comparison, and
 - (e) A roundabout would integrate efficiently with the indicative highway alignment and would be compatible with existing local road connections.
84. I believe a roundabout at this location is, on balance, the best safe system solution. Whilst it may not be as safe as a full grade separated interchange at the intersection itself, such an interchange would put traffic onto SH57 at high speeds which will have significantly worse safety impacts downstream

⁹ Ōtaki to north of Levin: Vol 1: Consideration of Alternatives Multi Criteria Analysis Summary Report (Detailed Business Case Phase) – January 2023 (nzta.govt.nz). Refer page 35, 83, 91 – 101, for example.

and could result in high severity injuries (fatal and serious), compared to low severity (minor and non-injury) at the roundabout due to the speed of traffic.

85. The submitters also question why the new highway ends at Heatherlea East Road rather than at the Manawatū River. A longer project was considered in early investigations into route options but was discounted as, fundamentally, it was unaffordable and provided a poor return on investment when compared to the shorter current scheme. This was because of the lower number of crashes and the lower traffic volumes compared to the section east and south of Levin. Approximately half of through traffic at this point leaves SH1 to travel on SH57, meaning that this is a natural end point for the project.
86. The wider Ō2NL programme includes safety improvements to address the safety concerns that still exist along the stretch of SH1 north of the Project and these are currently being progressed through the Speed and Infrastructure Programme (**SIP**). The current scope of this project, or SIP, does not prevent extension of the Ō2NL project to the Manawatu River or further north at some time in the future, but I do not believe there is the need for that level of investment at this time.

Jan Windleburn, 269 Kimberley Road, Levin

87. This submitter opposes the disconnection of Kimberley and Arapaepae Roads and seeks elevation of the proposed highway to be over these roads.
88. Elevation of the highway at this location is not being progressed due to the significant cost associated with such an option, however, a variety of local road connections in the Kimberley Road area were considered. Two options were developed in depth and have been the subject of public consultation, and the option preferred by the community has been included in the Project scope.
89. The two options presented for ensuring Kimberley Road connectivity are shown in Figure 2 below.



OPTION A

Favoured option in community feedback

This option has no re-connection of Kimberley Road, but connections from Kimberley Road east up to Tararua Road and down to Muhunoa East Road via Arapaepae Road instead. This option will require additional land purchase requirements, some of which would be outside the preferred corridor.



OPTION B

This option is a reconnection of Kimberley Road, which would enable east-west movements along this road. There would be no north-south connectivity parallel to the offline highway.

Figure 2: Kimberley Road Options from Consultation Material June 2021

90. Ultimately, the north and south parallel road option (Option A) presented fewer difficulties and received better feedback from the community and was therefore preferred. Road users travelling north-south along Arapaepae Road will have little disruption in their journey. Instead of a direct north-south bridge, the Project includes a crossing of the new highway at the Tararua Road interchange. This enables full connectivity with very little increase in journey time or distance.
91. It is acknowledged that road users travelling between Kimberley Road east of the proposed new highway and Kimberley Road west of the proposed new highway will have to travel up to Tararua Road to cross the highway, but the volume of users doing this is expected to be very low. Movements from Kimberley Road east are more likely to be to Ōhau or Levin, and these movements are not significantly disrupted by the new highway, as crossings of the new highway are provided at Muhunoa East Road and Tararua Road.
92. If future growth is such that this demand is created over time, consideration could be given to implementing another overbridge when the need is proven.

James McDonnell Limited

93. This submitter raises the provision of connections to the Tara-Ika area. I address that issue in detail in my response to Mr Kelly (expert for HDC) below.

KiwiRail

94. KiwiRail is concerned about the effects of having traffic entering / existing the expressway crossing a proposed level crossing at Tararua Road. Its submission expressed a preference for a grade separated crossing.
95. A Level Crossing Safety Impact Assessment was undertaken on the Tararua Road crossing as it currently exists.¹⁰ This identified that there are numerous existing safety issues associated with this crossing, which has a Level Crossing Safety Score Risk Band of Medium High.
96. As part of the Ō2NL Project, safety improvements are planned to mitigate the increased safety risk at this location. The work undertaken identified a realigned level crossing with signalised interchange as the preferred option and this is the option that is included in the Project scope.
97. Whilst a grade separated solution would be safer, it comes at a very high cost. A “So Far as Reasonably Practical” assessment (aligned with KiwiRail requirements) was undertaken by an independent consultant which confirmed that a grade separated solution is not practicable as its cost would be ‘grossly disproportionate’ to the benefits (grade separation would need to cost \$18M or less to justify the safety benefits but current estimates range from \$85-\$140M). This report was signed off by KiwiRail, HDC and Waka Kotahi.
98. The at-grade intersection was therefore confirmed as part of the Project. This is shown in Drawing No 310203848-01-100-C1018 – General Arrangement Plan Sheet 19 in Volume III of the AEE.
99. I do believe that there needs to be further investigation into the long-term role of rail in Levin and how the railway line can be treated to maximise urban amenity and urban development opportunities. However, this would be outside the scope of the Ō2NL Project.
100. KiwiRail also raised safety concerns in relation to construction traffic traversing existing rail crossings. My transport assessment identified four rail

¹⁰ LCSIA's assess the level of crash risk of existing and new / upgraded level crossing designs. It considers a range of design, crash history, site specific and local knowledge factors and the process includes KiwiRail, Waka Kotahi, Local Council and consultant personnel.

crossings that could be affected by construction traffic; Heatherlea East Road, North Manakau Road, South Manakau Road and Bishops Road. In all instances, I believe that the risk at the crossings can be appropriately managed, and that this will be done via the proposed Construction Traffic Management Plan, which is a proposed condition of the Project.

101. I understand that the intention is that management of these crossings will be confirmed via an agreement between Waka Kotahi and KiwiRail.

COMMENTS ON THE COUNCIL REPORTS

102. The Councils' transport experts, Mr Tim Kelly (for HDC) and Mr David Dunlop (for KCDC), stated that they agree with the analysis and conclusions reached in my evidence with the exception of two matters. These are:

- (a) the integration of the Ō2NL alignment as it passes through the Tara-Ika development area (Mr Kelly); and
- (b) the design of the Taylors Road Interchange (Mr Dunlop).

Tara-Ika Development

103. Mr Kelly believes that the "*notice of requirement presents a confusing and contradictory approach to the Tara-Ika development, and particularly the provision of three future crossings over Ō2NL which are crucial to the Tara-Ika development*" and that constructing Ō2NL without this connectivity "*would result in significant changes to the overall volumes and distribution of traffic activity leading to development itself being stifled*".

104. In this part of my evidence I will outline my response to his report including:

- (a) what the Ō2NL Project is proposing in terms of connectivity and why;
- (b) the approach to the effects assessment;
- (c) what providing the East West Link and additional walking and cycling links would achieve for current and consented land use;
- (d) what providing the East West Link and additional walking and cycling links would achieve for Tara-Ika once 'built out'; and
- (e) my conclusions from this analysis.

Scope of Ō2NL

105. The Project scope in relation to connectivity over the Ō2NL highway east of Levin, comprises the reconnection of Queen Street East and Tararua Road. No existing connections in this vicinity are severed.

106. This proposal replicates the existing transport network and is aligned with what has been presented to the community during public and stakeholder consultation. I believe it is appropriate for the current land use in this vicinity, which is rural with some scattered rural residential activity.
107. Over the last few years, HDC has been investigating land use changes to the east of Levin to enable more intensive development. PC4 seeks to operationalise this intensification east of Arapaepae Road between Queen Street East and Tararua Road. The Structure Plan associated with PC4 is shown below.

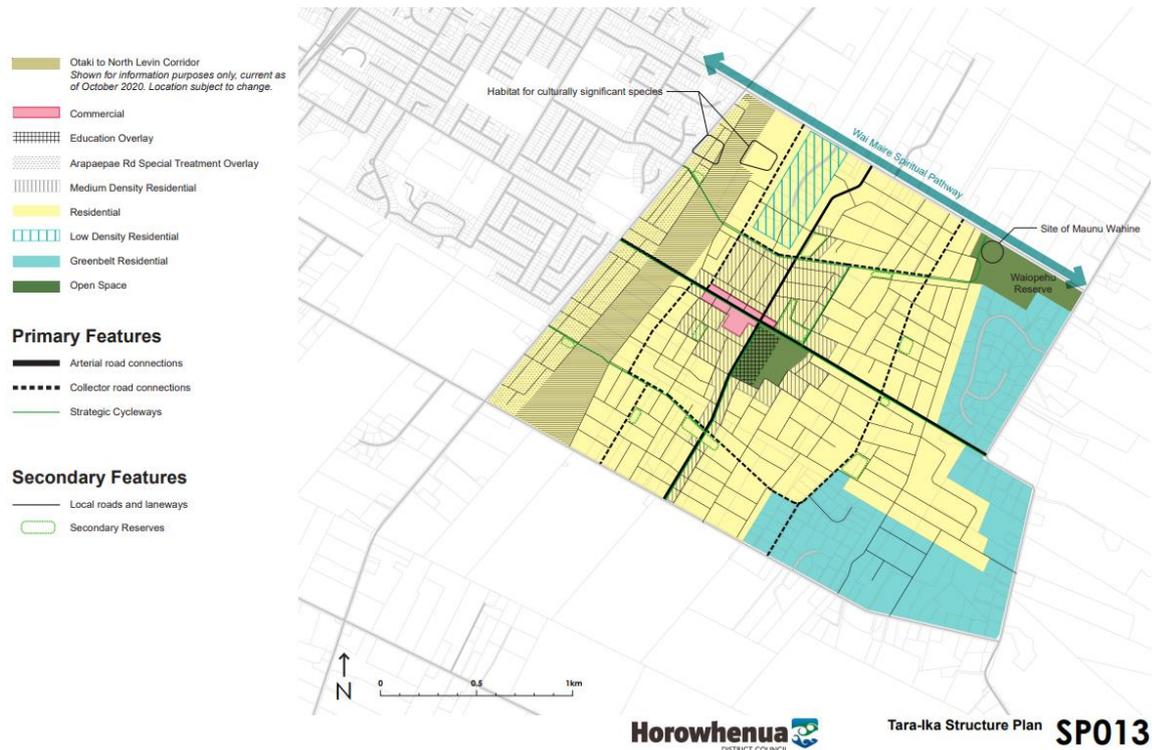


Figure 3: Tara-Ika Structure Plan

108. The Structure plan shows the Ō2NL corridor. It also shows additional routes over the Ō2NL corridor to increase connectivity between Levin and Tara-Ika. These are:

- (a) EWA – a new arterial road parallel to, and half-way between, Queen Street East and Tararua Road. It would terminate at Arapaepae Road; PC4 does not specifically include any connection onto Liverpool Street on the western side of Arapaepae Road, and I understand that there are significant property issues that would need to be resolved to enable that connection.

- (b) Two additional walking and cycling routes north and south of the EWA. The northern route would tie into Meadowvale Drive, but the southern route would terminate at Arapaepae Road.

The approach to my effects assessment

109. Whilst the scope of the Ō2NL Project does not include these east-west links, my effects assessment assumes the EWA is in place by 2039. This is because my effects assessment necessarily must consider the impacts at a future year, where additional growth and infrastructure improvements will have occurred. Assumptions in relation to these aspects were included in the Traffic Modelling Assumptions File Note which I circulated to HDC and KCDC representatives, including Mr Kelly, to get confirmation that the assumptions in relation to infrastructure and timing were correct. This specifically noted the inclusion of Tara-Ika in the growth assumptions and the EWA in the 'with Project' future scenario.¹¹ Both Mr Kelly and Mr Dunlop, representatives of HDC and KCDC respectively, advised that they agreed with the memorandum.
110. The inclusion of the EWA in the 'with Project' scenario is appropriate as at the time of preparing my evidence, I was aware that a Notice of Requirement and Resource Consents were being drafted by HDC for the EWA, and I understood that lodgement was planned to occur alongside the Ō2NL Project. Whilst this did not happen, I still believe it is HDC's intention to ensure that this link is in place as part of Tara-Ika.

Benefits of additional links for land use without PC4

111. The need for the EWA for this scenario can be inferred from modelling already undertaken. It has been assessed without Ō2NL initially as this has the greatest volume of traffic on the existing network and therefore the potential for the greatest delays that may need mitigation.
112. Consistent with my Technical Assessment A, the Level of Service (LoS) plots shown in this evidence provide a simple representation of likely delay by using Level of Service categories, based on the US Department of Transport Highways Capacity Manual 2010.¹²

¹¹ EWA was not included in the 'without Project' scenario as it was considered unlikely that Tara-Ika could be completely built out without Ō2NL in place, as network delays were too great.

¹² Note that delays of less than 25 seconds are not shown on the plots.

Level of Service	Description	Delay (s)
A – C	Free flowing / Acceptable delays	<30
D	Unsettled / Tolerable delays	31-50
E	Significant delays	51-70
F	Congested / Queues	>70

Figure 4: Levels of Service Thresholds

113. The image below shows delays on the transport network in the 2039 PM Peak without the Ō2NL Project, and with approximately 1,240 households in the Tara-Ika area (i.e., the absolute maximum that could be developed without a plan change).

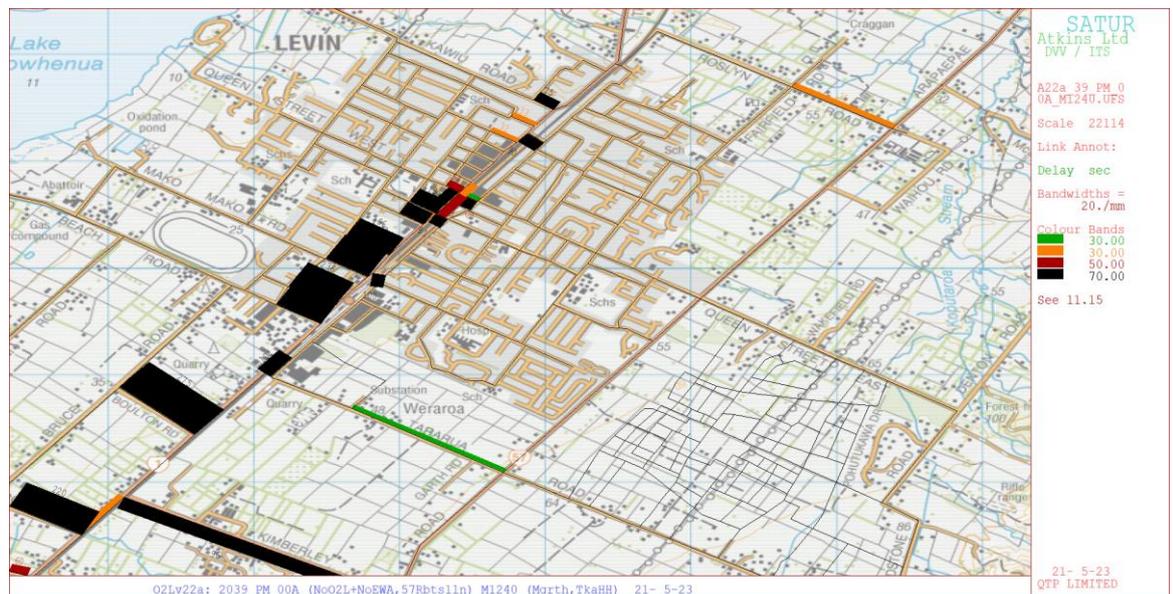


Figure 5: 2039 PM Peak LoS with 1240hh in Tara-Ika but no Ō2NL or EWA

114. The figures show that the housing growth causes significant delays on the current SH1. The figure also shows no significant delays in the Tara-Ika area and therefore the EWA would not provide significant travel time benefit. In addition, as the EWA would terminate at Arapaepae Road, users would need to divert to Queen Street East or Tararua Road, or wind their way through to central Levin via Meadowvale Drive and other local roads. There would be no impact to the severe delays that are seen on the current SH1 that is being caused by the housing growth east of Levin.

115. In relation to safety, the EWA would also not solve any traffic safety issues. Without the EWA, traffic would be funnelled through the Queen Street East and Tararua Road intersections with Arapaepae Road. These are, or are proposed to be, roundabouts which are 'safe system' compliant as they reduce conflict points and the risk of fatal and serious crashes. It has been

assumed that the EWA would also connect to Arapaepae Road with a roundabout, but it will increase turning movements at Meadowvale Drive where conflicts and safety will need to be assessed and mitigated, or an increase in safety risk will occur. This is consistent with Mr. Kelly's Integrated Traffic Assessment for Tara-Ika.¹³

116. Accordingly, the EWA would not be needed to solve a traffic capacity or safety issue if additional development was to occur in the Tara-Ika area in line with the current District Plan.
117. In relation to the two walking and cycling links within PC4, there is currently very little demand for such facilities and no adjacent road network to support them, so their provision would not be needed.

Benefits of additional links once Tara-Ika is developed

118. Modelling has been undertaken to compare the performance with and without the EWA. Initially, model runs were undertaken to determine if there will be traffic delays on the network in the scenario with Tara-Ika fully built out (3,700 households) and Ō2NL in place, but without EWA. A comparative scenario was modelled with the EWA in place.
119. Figure 6 and 7 below show the LoS in the PM Peak hour in 2049 for these scenarios. The 2049 year is presented rather than 2039 (which was used in my Transport Assessment), as it includes the greatest demand which would be expected to show the greatest need for additional capacity. The 'with EWA' scenario also includes restrictions on movements at the Meadowvale Drive intersection to left in left out only (LILO) to manage the potential increase in safety risk at this location.

¹³ Appendix 11 to the Proposes Plan Change 4 Section 42A Report
<https://www.horowhenua.govt.nz/files/assets/public/districtplan2015/ppc4/proposed-plan-change-4-tara-ika-growth-area-s42a-report-appendices.pdf>

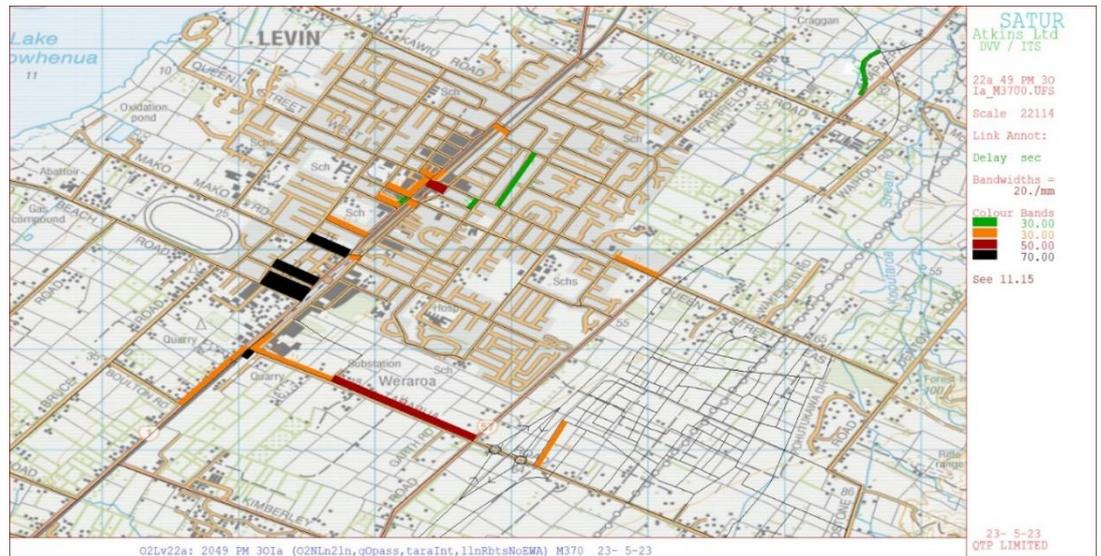


Figure 6: 2049 PM Peak LoS with O2NL and Tara-Ika but no EWA



Figure 7: 2049 PM Peak LoS with O2NL, Tara-Ika, EWA and Meadowvale LILo

120. The plots above show that without the EWA, there is only one road in and around Tara-Ika that is predicted to operate at LOS E (delays of 51-70 seconds) and two at LoS D (delays of 31-50 seconds), which I would argue is an acceptable level of delay in the peak hour for an urban transport network 20 years post construction.
121. With the EWA in place, the traffic delays are very similar to the network without EWA. Whilst traffic relocates onto the EWA east of Arapaepae Road, the traffic distribution west of Arapaepae Road would be very similar to the without EWA scenario, with traffic volumes on Queen Street East and Tararua Road only changing slightly.

122. Accordingly, the EWA would not be needed to solve a traffic capacity or safety issue if Ō2NL was in place and Tara-Ika was completely built out.
123. In relation to the southern of the two walking and cycling links envisaged by PC4, this would not provide any benefit for these users as it does not connect to any road or walking and cycling facilities to the west of Arapaepae Road. The shared use path provided as part of Ō2NL would enable pedestrians and cyclists to travel north and south to crossings of Ō2NL which better connect to facilities to the west.
124. The northern of the two walking and cycling links envisaged by PC4 would be more beneficial as it would connect into Meadowvale Drive and also enables a more direct connection to schools in east Levin.

Conclusions

125. Based on the above, my conclusion is that the EWA is not required to mitigate a traffic capacity or safety issue. It is also not needed to mitigate any transport effects created by the Ō2NL Project. In response to Mr. Kelly's concern, based on the traffic modelling, I do not believe that constructing Ō2NL without the EWA will result in significant changes to traffic volumes, and therefore any stifling of development.
126. I do acknowledge that an additional connection from the centre of Tara-Ika into Levin would be beneficial in terms of community connectivity. However, the benefits of the EWA are severely limited without any additional direct connectivity from Arapaepae Road via Liverpool Street to the current SH1, as traffic would need to filter through existing indirect road connections.
127. The northern active mode connection envisaged in PC4 would provide additional community connectivity benefits as it connects directly to the existing transport network and would be the most direct route to schools.
128. Ō2NL does not prevent any of these crossings being constructed in the future. It may be easier to construct them at the same time when there is no traffic on the new highway, but in my opinion, they would not be required to mitigate any effect caused by Ō2NL.

Southern Interchange

129. Mr Dunlop raises concerns in relation to the form and function of the proposed Southern Interchange (at Taylors Road). Mr Dunlop states that a continuous local arterial should be provided parallel to the new highway and

that conditions should be included that enable different options to be progressed at this location.

130. In this part of my evidence I will outline my response to his report including:

- (a) what the Ō2NL Project is proposing at this location and why;
- (b) the positive effects of the current concept design;
- (c) the potential adverse effects of the current concept design; and
- (d) the benefits and issues with Mr Dunlop's proposed alternative options.

Scope of Ō2NL

131. The project scope at this location includes connectivity on and off the highway with south facing ramps near Taylors Road. Taylors Road will be reconnected north onto the old SH1 (this movement is currently blocked) and from there to the new state highway, for movements to and from the south, via the Southern Interchange. This is shown in the image below.

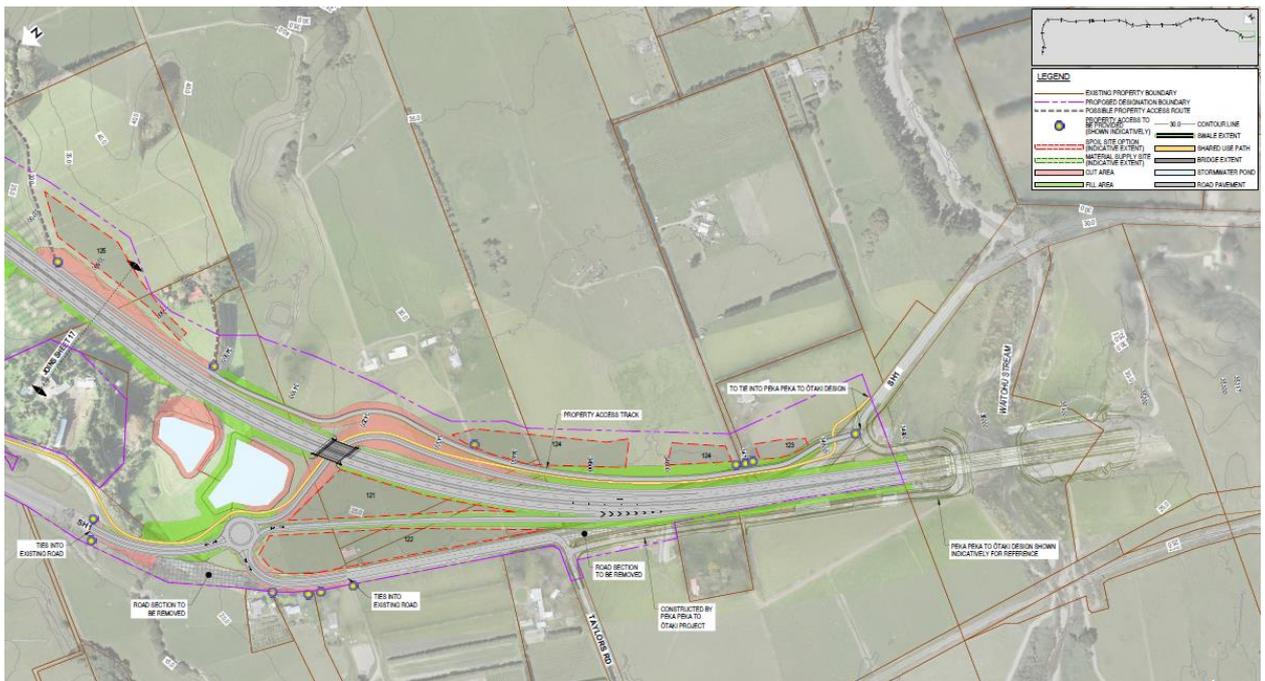


Figure 8: Ō2NL General Arrangement Plan of the Southern Interchange

132. This layout enables the following movements:

- (a) traffic travelling south from Ohau / Manakau on the old highway can access the new highway north of Ōtaki and therefore avoid having to travel through Ōtaki.

- (b) traffic on the PP2Ō expressway travelling north to Manakau / Ohau can leave the new highway north of Ōtaki and therefore also avoid having to travel through Ōtaki.

Benefits of the current concept design compared to the existing situation

- 133. Community Connectivity: As a result of the PP2Ō Project, properties on Taylors Road (which number greater than 30) currently travel south to the Ōtaki north interchange to turn around to travel north, and have to travel even further south to the Ōtaki south interchange to access the highway network to the south. With the current Ō2NL concept design and the access provided by the Southern Interchange, those properties have significantly improved access north and south.
- 134. Safety: Taking traffic off the current highway in this location has safety benefits, as the design of the new highway removes conflicts and significantly reduces the chances of fatal or serious injuries.
- 135. Resilience: The new highway significantly reduces the chances of closure due to flooding and crashes. A continuous parallel route is also created for use if the highway is closed due to an unplanned event, albeit one that uses the Taylors Road Link under the Waitohu Stream Bridge. To my knowledge, and the knowledge of the PP2Ō team, there have been no crashes associated with this link since it opened.

Adverse effects of the current concept design

- 136. Community Connectivity: Properties on the southern side of SH1 and the new highway in the vicinity of Taylors Road (approximately six in total) will have to travel south to the Ōtaki northern interchange in order to turn around and travel north.
- 137. Community Connectivity: Mr Dunlop states that with the Project there will be a gap in the parallel local arterial from Raumati through to north of Levin. This gap is not created by the project, it is there now (with the caveat that Waitohu Valley Road is present now and will be in the future, but further away from the highway). As identified above, the Project is increasing the resilience of this highway route and is not creating additional issues. It is noted that trips to Ōtaki from southern Horowhenua, including Ohau, Manakau and Taylors Road, have to briefly travel on the new highway between the Ō2NL Southern Interchange and the Ōtaki north interchange, but this is not an adverse transport effect.

138. Safety: Mr Dunlop considers that interchange spacing is an issue, but I disagree. The current spacing of 2km is relatively short; however, local conditions need to be taken into account. The volume of traffic using these ramps will be low and drivers are expected to be primarily locals. As Mr. Dunlop notes, the intersection spacing concerns have been properly considered by my colleagues, Waka Kotahi experts and through a Road Safety Audit, and the current design has been judged to be acceptable.
139. In summary, the current concept design provides a number of benefits compared to the current situation and creates only one minor issue for a few local residents; overall access is improved.

No Interchange – benefits and effects

140. Mr Dunlop raises the potential for a layout without connectivity at this location. The project scope in this location would simply comprise a new highway, with a parallel two-way local arterial road that would pass underneath the new highway and provide access to local roads and properties. There would be no connectivity between the two. This option was considered by the project team through the investigations.¹⁴ It would provide the majority of the safety and resilience benefits of the current concept design, but there are some differences as follows.
141. Safety: This option does not have the same benefits as the current concept design as it removes fewer vehicles from the old state highway. The concept design Southern Interchange is more consistent with Road to Zero Safe System Principles as locating vehicles on the new highway reduces conflicts, and the potential for harm, including with pedestrians and cyclists in Ōtaki. This is both a Project Objective and a key Government priority as identified in the Government Policy Statement on Land Transport Funding.
142. Resilience: This option has greater chance of needing detour, and that detour is significantly longer when compared to the current concept design. With the current concept design, a detour onto the local access link would only be needed if an incident was to occur on the 4km stretch of proposed highway between Ōtaki south and Taylors Road, but without an interchange a detour onto local roads would be required for any incident between Ōtaki south and Tararua Road, a distance of approximately 20km, five times longer.

¹⁴ Refer page 113-115 of Ōtaki to north of Levin: Vol 1: Consideration of Alternatives Multi Criteria Analysis Summary Report (Detailed Business Case Phase) – January 2023 (nzta.govt.nz) for summary.

143. Community Connectivity: The only advantage of this solution compared to the current concept design is that drivers travelling to Ōtaki from southern Horowhenua, including Ohau, Manakau and Taylors Road, can use the parallel route rather than having to briefly travel on the new highway between the Ō2NL Southern Interchange and Ōtaki. This is a matter of preference rather than a change in accessibility.
144. Access: Without highway connectivity at this location, road users with an origin or destination in southern Horowhenua, would have to travel through the Ōtaki township when Ō2NL opens. This is different to the current situation where users are able to use the PP2Ō expressway to bypass Ōtaki.
145. In summary, a 'no Southern Interchange' option would reduce the safety and resilience benefits of the current concept design. There are also differences in terms of community connectivity and access. Overall, I consider the Southern Interchange as set out in the concept design to be preferable to a 'no Southern Interchange' outcome. That said, I consider the 'no Southern Interchange' outcome would still be an acceptable solution that could be implemented within the proposed designation area.

Full Half Interchange benefits and effects

146. Mr Dunlop also raises a potential option to retain the connectivity but to have a two-way route underneath the new highway to create a parallel local arterial road. I comment on the key differences in terms of effects between that approach and the Southern Interchange as proposed in the concept design below.
147. Access and Community Connectivity: This option would have the connectivity advantages of the current concept design and the minor advantage of enabling those who did not want to travel on the new highway to Ōtaki to use a parallel route. It would also provide access to the five properties located to the north of the new state highway with a more direct access to the new state highway.
148. Safety: This option would have the same safety benefits as the current concept design.
149. Resilience: This option would have the benefits of the current concept design and the minor advantage of the alternative route being of a higher standard.

150. The project team did consider layouts similar to this option as part of the project investigations, including options with and without roundabouts. The design team determined that providing a full half interchange at this location has a number of constraints:
- (a) Longer ramps may be required as traffic would be starting from a lower speed.
 - (b) Roundabouts may need to be further from the new highway to ensure adequate approach sight distance.
 - (c) There could be grade issues incorporating the additional elements as the new roundabout would need to connect to roads of different heights.
 - (d) The layout of the roundabout legs would need to be legible so that it would be intuitive for approaching drivers.
151. To develop a layout that would resolve the geometric concerns above, a greater Project footprint is required; greater than that assumed by Mr Dunlop. This therefore requires additional land, over and above what is currently subject to this NoR. That includes land from a Māori-owned land parcel, and the project is seeking to minimise Māori land take. Beyond pure property acquisition impacts, the additional footprint would also likely have other environmental effects (though I make no comment on what those might be).

Conclusion

152. From the work that I and others undertook during the project development phases, the Project has large safety and resilience benefits by taking traffic off the current state highway in this location. There are also minor benefits in providing ramps to enable greater connectivity in this area, however, these benefits are not large.
153. The current concept design enables these minor benefits to be realised, whilst not increasing the Project footprint beyond an option that provides no connectivity.
154. The only transport effect created by the current concept design in this area is the additional travel distances that would be created for approximately five properties.
155. A full half interchange option would have minor additional transport benefits, but would require a greater footprint (and therefore land acquisition), and would be more expensive than the concept design. In my view this additional

investment is not warranted to mitigate the less than minor connectivity effects on five properties.

Philip Jeremy Peet

4 July 2023