

APPENDIX A – PREVIOUS INVESTIGATIONS

Previous investigations

There have been a number of transport studies undertaken within the Ōtaki to north of Levin study area prior to the 2011. This project has looked at reports dating back to the mid-1980s. A review of these reports was presented in the Ōtaki to North of Levin Expressway Scoping Report (MWH, July 2012)¹¹¹ and summarises what has previously been identified as key concerns and the associated options and proposals to mitigate and address these concerns.

The reports reviewed are;

- Levin Bypass Scoping Report, 1989, Works Consultancy Services
- Levin Bypass Project Investigation, 1990, Works Consultancy Services
- Levin Transportation Study, 1995, Traffic Design Group
- SH1 Horowhenua District Strategy Study, 1996, Works Consultancy Services
- Himatangi to Waikanae - Review and Development Study, 2000, Worley
- Himatangi to Waikanae - Strategy, 2000, Worley
- SH1 Levin to Ōtaki Expressway – Proposed Designation Methodology, 2000, Meritec
- Roads of National Significance (RoNS) Wellington Airport to North of Levin Scoping – Taylors Road (Ōtaki) to North of Levin, 2010, NZTA
- Taylors Road to Pukehou Rail Overbridge – RoNS Corridor Study, 2010, Opus

In the early studies the recommended option was a western bypass and in the more recent studies an eastern one. The study team has considered this and has postulated several reasons for the change:

- Increasing cultural awareness now acknowledges the impact on local iwi of routes across land which is known to contain sites of cultural and historical significance. Areas to the west of Levin are expected to contain large numbers of such sites which have not yet been identified.
- The number of unknown cultural and historical sites is expected to decrease from west to east, thus impacts on these aspects are expected to be lower for an eastern bypass.
- Previously unused land between Levin and Lake Horowhenua has been developed for housing.
- The western route shortens the length of SH1, which used to carry most of the traffic north of Levin. Thus a western route was attractive economically. Changing traffic patterns have increased traffic volumes using SH57 relative to SH1; recent counts show more traffic using SH57 than using SH1 north of Levin. A western route will increase the travel distance for traffic using SH57, reducing the economic benefits of a western route significantly. Thus it has become increasingly attractive, economically speaking, to consider an eastern bypass,

¹¹¹ <https://www.nzta.govt.nz/projects/wellington-northern-corridor/Ōtaki-to-north-of-levin/technical-reports/>

which also benefits traffic on SH57. Considering the network as a whole leads to consideration of network benefits, not just benefits for SH1.

- Increasing environmental awareness has placed more emphasis on the environmental impacts of a western bypass, particularly close to Lake Horowhenua.
- Increasing awareness of the potential effects of earthquakes on a new expressway has prompted a move away from the lower ground and soft liquefiable sediments that occur on the western route. The land is higher to the east and is less prone to liquefaction in an earthquake.
- The last round of public consultation, carried out over ten years ago, was firmly in favour of an eastern bypass.

Ōtaki to North of Levin: Investigations undertaken to date

The Ōtaki to north of Levin project has been through a number of different investigation stages, as summarised by the figure below.

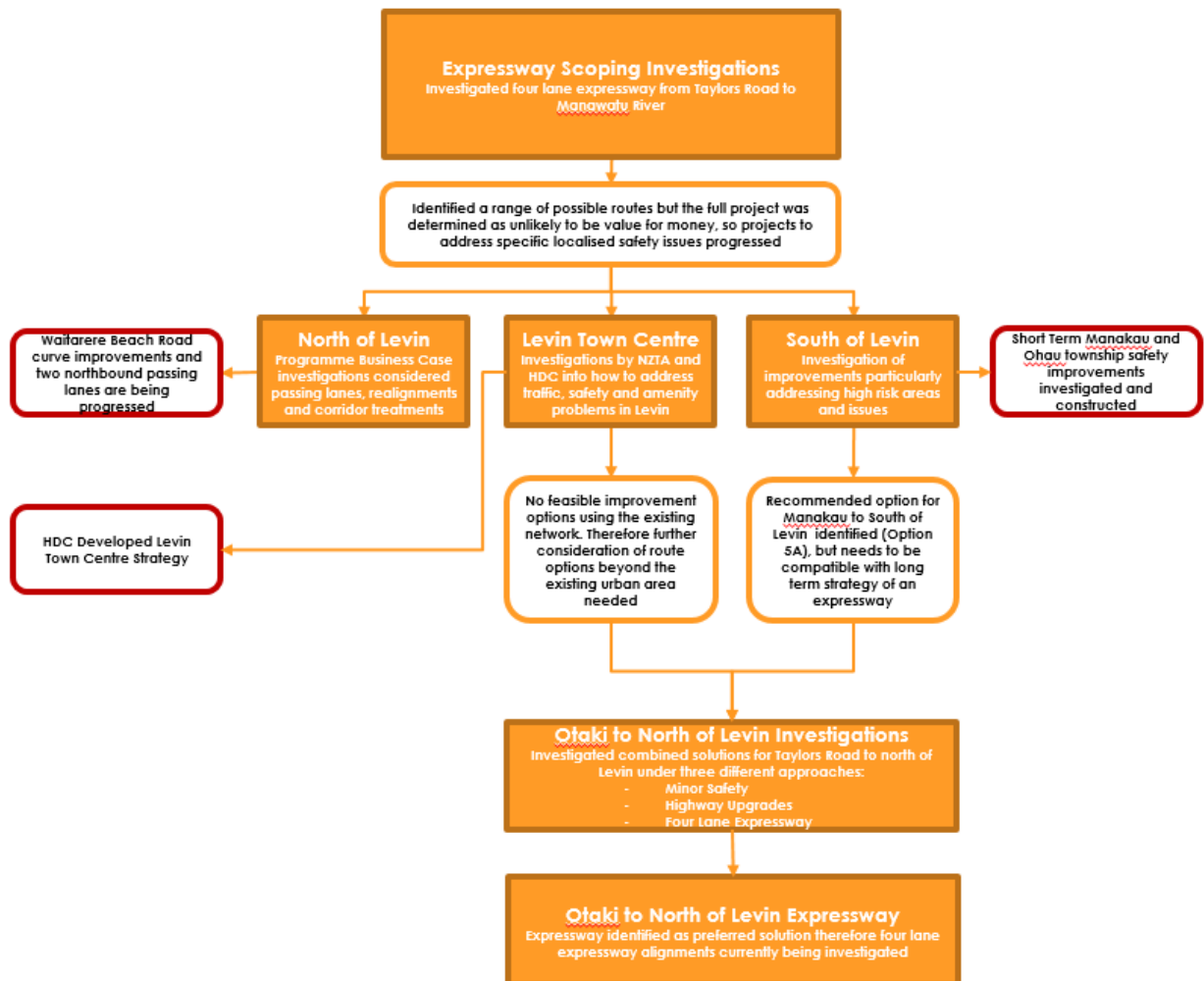


Figure A-1: History of investigation stages of O2NL project

Expressway Scoping Investigations

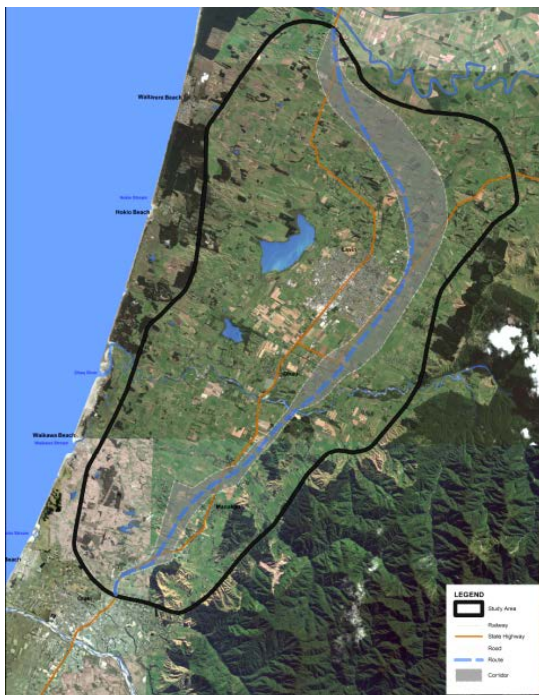
Expressway options from Taylors Road to the Manawatu River (i.e. the entire O2NL route) were originally considered in 2011 and 2012. At this stage 81 alignment options were considered to both the east and west of Levin and progressively narrowed down, through multi-criteria analysis, to a shortlist of four. These are presented, at a high level only, below.



Contiguous Corridor 64



Contiguous Corridor 66



Contiguous Corridor 73



Contiguous Corridor 75

Figure A-2: Ōtaki to North Levin –the four shortlisted routes

A full description of the options assessment process for this stage can be found in the Ōtaki to North of Levin Scoping Report (MWH, July 2012)¹¹².

Based on the economics of constructing a four lane expressway for the entire O2NL, the Transport Agency Board decided at that stage to proceed with progressive upgrades to create a combination of 2+1 and 4 lane sections with intersection and safety improvements that will achieve the project objectives of delivering a suitable level of travel time, safety and capacity improvement appropriate to future demands of this section of the SH1 corridor. Accordingly, attention was paid to focussing on known safety concerns on the state highway system in the project area. This comprised the problem locations of:

1. Forest Lakes
2. Manakau Settlement
3. Manakau and Ohau Rail Overbridges
4. Ohau Settlement
5. SH1/SH57 Intersection
6. SH57 Kimberley Road / Arapaepae Road intersection
7. Waitare Beach Road Curves



Figure A-3: Identified problem areas

¹¹² <https://www.nzta.govt.nz/projects/wellington-northern-corridor/Ōtaki-to-north-of-levin/technical-reports/>

Investigations commenced into all these areas. Preliminary investigations showed that the close proximity of the issues around Manakau, Ohau and SH57 intersections meant that they needed to be considered together, as otherwise the solutions would overlap.

Accordingly, options for a realignment between Manakau and SH57 were investigated.

South of Levin – SH1/SH57 connection

A Scoping Report¹¹³ investigated improvements to address the concerns between Manakau and SH57 by the creation of a new greenfield connection.

Five different alignment options were considered. These were all offline solutions as online upgrades to the existing state highway were not practical for the following reasons:

- The requirement for replacing four old sub-standard bridges (at the railway crossings and river crossings) meant that the new highway would need to be offline through those sections.
- To meet design standards whilst avoiding historical constraints, the highway would also need to be significantly realigned at the curve south of Kuku East Road.
- There are a large number of constraints adjacent to the existing alignment including Marae, Urupa, historic buildings and a large number of accessways and intersections which significantly limit opportunities for future four-laning.
- The current highway traverses through the Ohau Township; for this to become four lanes, an entire row of commercial / residential properties would need to be removed adjacent to the highway. Online four-laning would also cause very significant severance between the residential properties on the western side and the community facilities on the eastern side.

A multi-criteria analysis was undertaken of these alignments considering a range of social, environmental, cultural and economic impacts. Option 5A was deemed to be best performing as it had, on balance, the least impacts and met the project objectives. The figure below outlines the options considered.

¹¹³ SH1 - SH57 Connection Scoping Report, MWH, November 2013



Figure A-4: SH1 / SH57 Scoping Report Options

The alignment of Option 5A starts north of Manakau and continues north, staying on the western side of the railway line until north of the Ohau River where it splits; SH1 traffic continues north to re-join the current alignment and SH57 traffic traverses a new greenfield alignment before joining Arapaepae Road just north of Kimberley Road.

Taylor's Road to Ohau Four-Laning

During the development of Option 5A there was a concern that safe and efficient access to the local road network might not be able to be provided. This specifically related to the interchange at SH1/SH57 and the access to Kuku Beach Road, primarily due to the presence of the railway line and other constraints. To overcome these issues, consideration needed to be given to providing a full interchange for local movements. In turn, the long term alignment of the entire South of Levin section needed to be confirmed before a decision on interchange location could be made.

Critically, before it was finalised, the SH1/SH57 connection scheme also needed to be considered in light of the long term strategy to ensure the overall alignment fits with the long-term alignment between Taylor's Road and Levin.

A total of thirteen different route options between Taylor's Road and Ohau were developed¹¹⁴ with the various route options presented below.

¹¹⁴ Taylor's Road to Ohau River Four-Laning: Preliminary Options Report and Addendum, MWH, November 2014 (and addendum added April 2015), this was followed by the Taylor's Road to South Levin Four-Laning Indicative Business Case (IBC), MWH, September 2015.

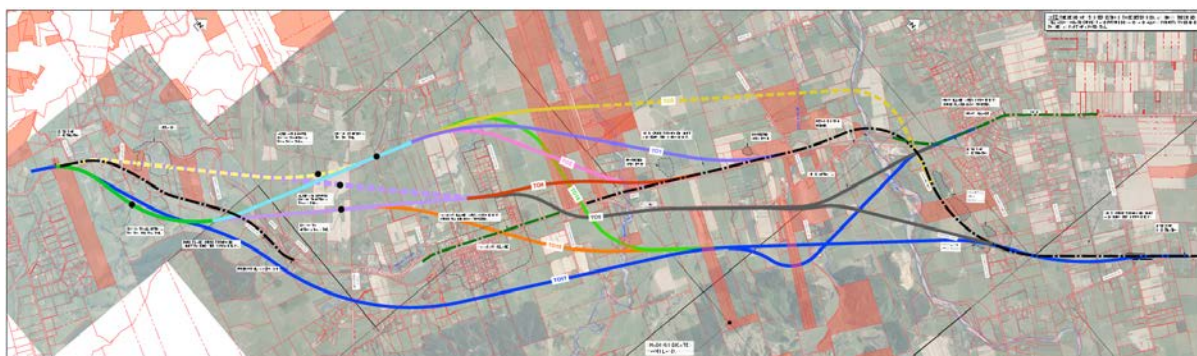


Figure A-5: Long list of options between Taylors Road and south Levin

These options all comprise an expressway standard link joining the Peka Peka to Ōtaki alignment to a new interchange at the SH1/SH57 split. All of the potential alignments are mostly offline from the current state highway. Four of the alignments mostly utilise the best performing route for the SH1/SH57 Connection project, Option 5A. One of the alignments utilises Option 7A from the SH1/SH57 Connection project.

Following on from the above alignments, it was considered that such a large investment needs to ensure it is future proofed in regards to the staged approach to deliver the full outcomes. In addition, a number of external factors came to light which warranted re-consideration of the extent of the project:

- HDC developed new population and economic growth projections that are significantly greater than previous projections;
- HDC started developing plans for a revitalisation of the Levin town centre;
- Promotion of other key transports north of the project area including Whirokino Trestle replacement and the Palmerston North Ring Road; and
- New transport trends indicated increasing freight movements on SH1 and on SH57 to Palmerston North;

Accordingly, options including a bypass of Levin were considered in the next stage of analysis.

Summary of Taylors to Ohau and Northern Connection Investigations

Investigations at this stage considered the routes south of Levin as well as routes to the east of Levin, tying back into SH57 and SH1 north of the urban area. The full list of options investigated at this stage is shown in the diagram below.



Figure A-6: Long list of options between Taylors Road and north of Levin

The investigation processes identified two routes in the South of Levin section and a further two routes in the northern section respectively. The analysis of these options resulted in four possible combinations of alignment for the full extent of the route;

- TO17 combined with NC4 or NC5, and;
- TO2, combined with NC4 or NC5.

There was a wide variety of interchange types and form considered for these combinations, with many permutations of interchange systems on the expressway alignment options. A full MCA was undertaken on 16 different interchange options across the four expressway alignments. Full details of this assessment can be found in the Taylors Road to Levin Identification & Assessment of Options Report (2016).

The four shortlisted options with potential interchange locations are shown below.

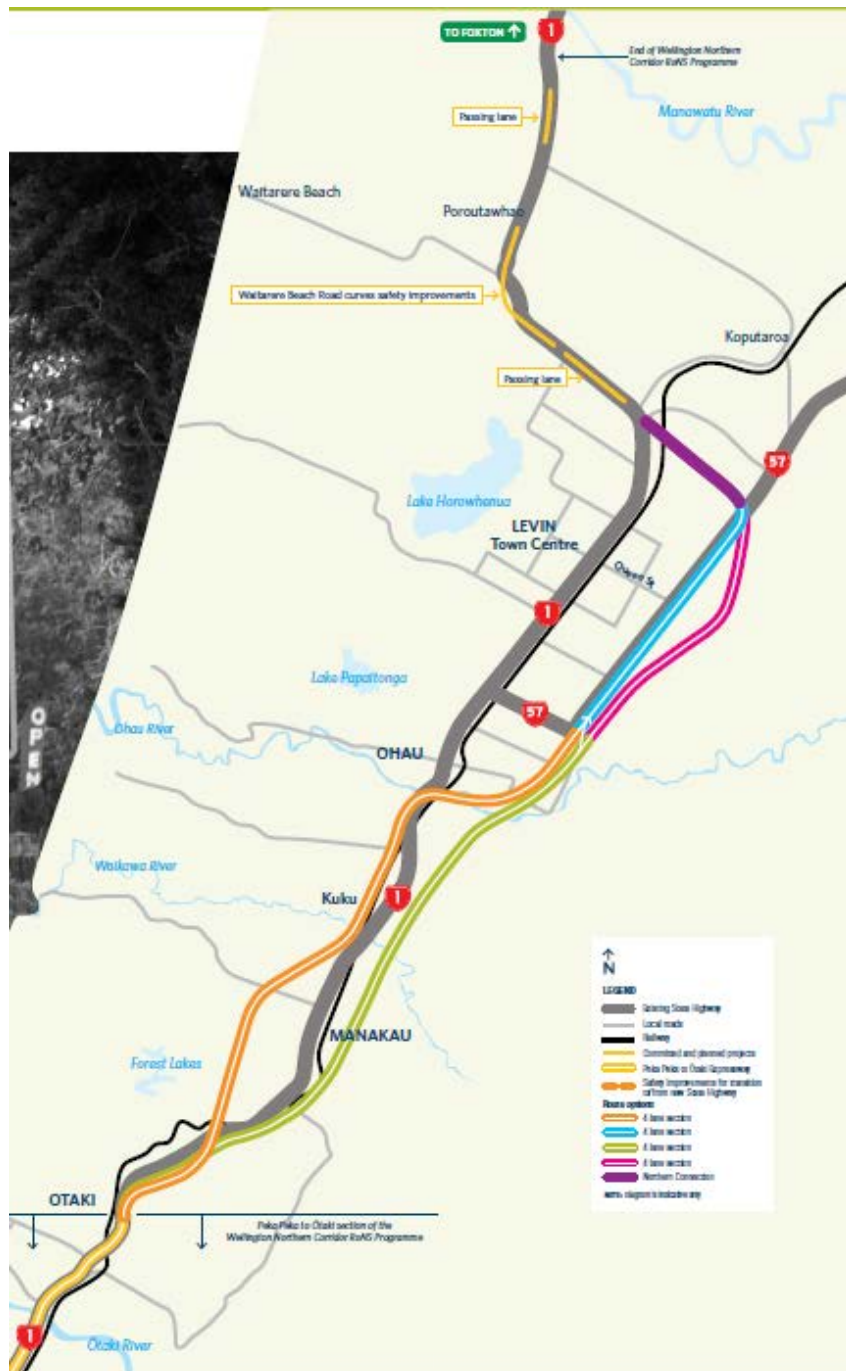


Figure A-7: Shortlisted Options Plan

The four options generated similar project outcomes, with all providing good travel time, safety and resilience benefits. On the basis of alignment analysis and the outcome of the

multiple MCA processes for South of Levin and the Northern Corridor, options including TO17 in the south (the green route in the diagram above) were identified as performing better in terms of benefits and impacts.