

---

**NELSON SOUTHERN LINK INVESTIGATION**  
**PROGRAMME BUSINESS CASE**

Executive Summary

---

# NELSON SOUTHERN LINK INVESTIGATION

## PROGRAMME BUSINESS CASE

### Executive Summary recommendations

The Nelson Southern Link Investigation (NSLI) programme business case (PBC) recommends:

- A range of interim measures that optimise traffic flow on SH6 and Waimea Rd, followed by
- Development of a new arterial route, and
- Further consideration of improvements to Rocks Road.

The recommended programme is shown graphically in Figure 1.

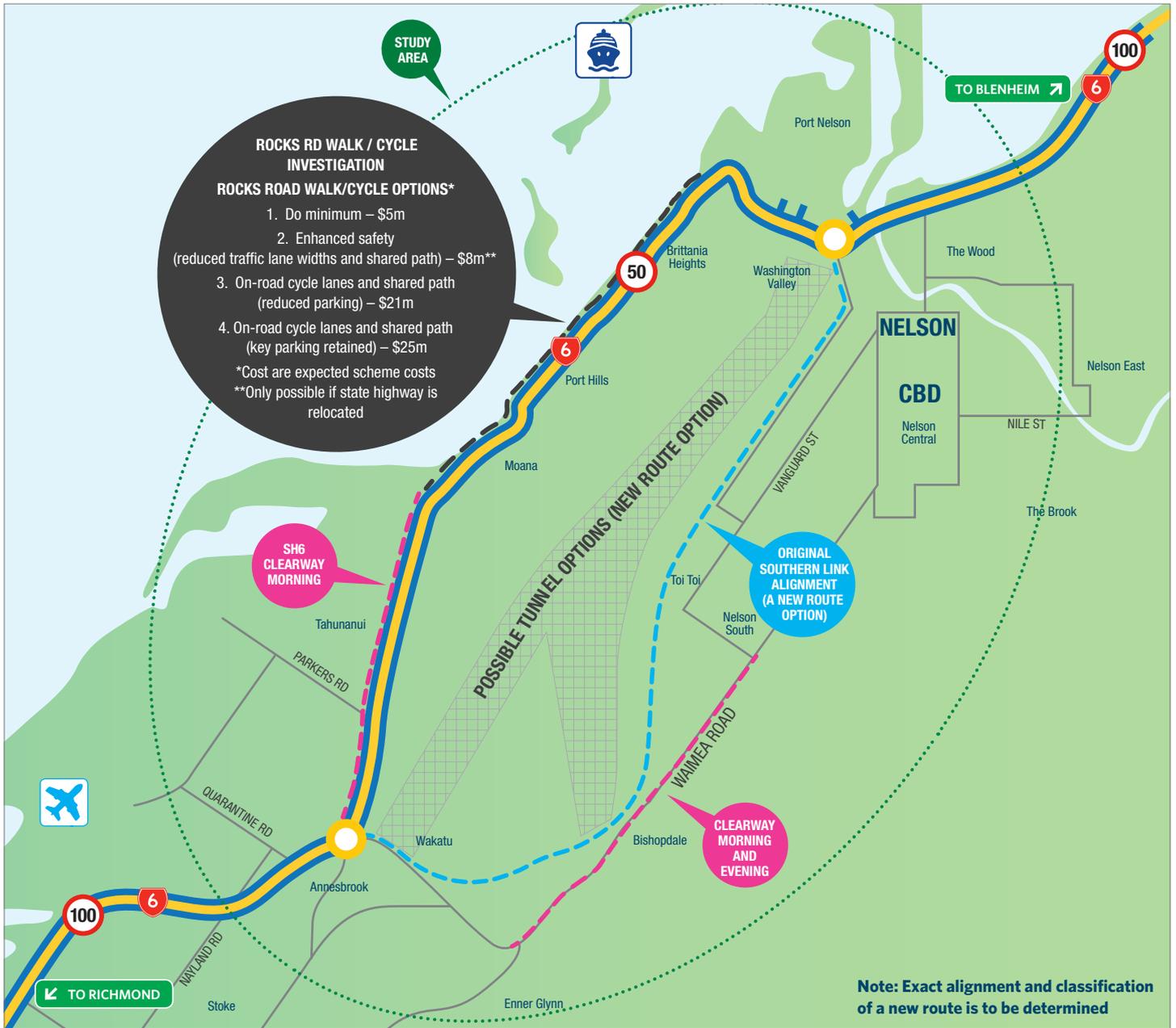
The recommended programme will achieve the following key stakeholder objectives for this project:

- eased congestion
- fewer walking and cycling deaths and serious injuries
- increased active transport and recreational activities on Rocks Road

Nelson's key arterial routes are experiencing longer than acceptable peak period journey times. As the region's population grows, traffic volumes are also likely to grow, making it a challenge to access and cross these arterials. The NZ Transport Agency is recommending a range of interim measures over the next few years to reduce peak period journey times until a new route is needed. These measures aim to make the most of the existing traffic network in the short and medium terms.

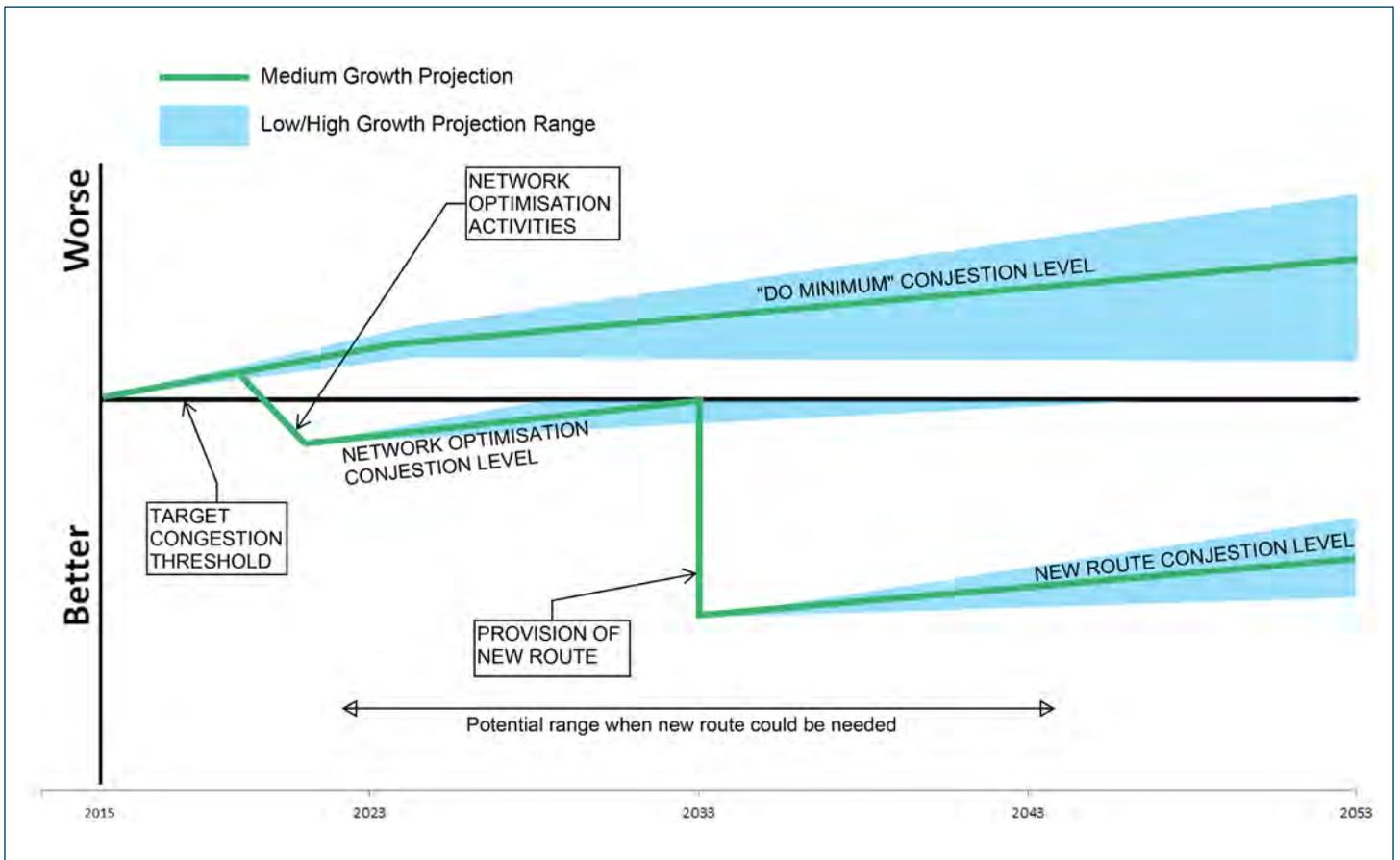
These interim measures include:

- adding a northbound clearway between Annesbrook roundabout and Bisley Avenue
- having two southbound lanes through the Bisley Avenue lights to increase traffic capacity on the state highway
- clearways and intersection changes between The Ridgeway and Motueka Street to increase traffic capacity along Waimea Road.
- enhanced public transport, and
- further encouragement of peak hour walking and cycling, land use controls, and travel demand management measures such as parking restrictions to reduce demand on the arterials.



**Figure 1 - NSLI Recommended Programme**

The timing for a new route depends on many factors. The scale of the efforts to optimise the network, the speed of regional growth and new technologies can all affect the timeline. For example, if optimisation measures perform better than expected, a new route could be delayed. If they perform worse than expected, a new route will be needed sooner. Preliminary modelling of some of the optimisation options suggests a new route will be needed early 2030s, although modelling is only one tool to guide decision making. Refer to Figure 2 for a graphical representation showing the timing considerations for a new route.



**Figure 2 - Recommended programme in relation to congestion objective target**

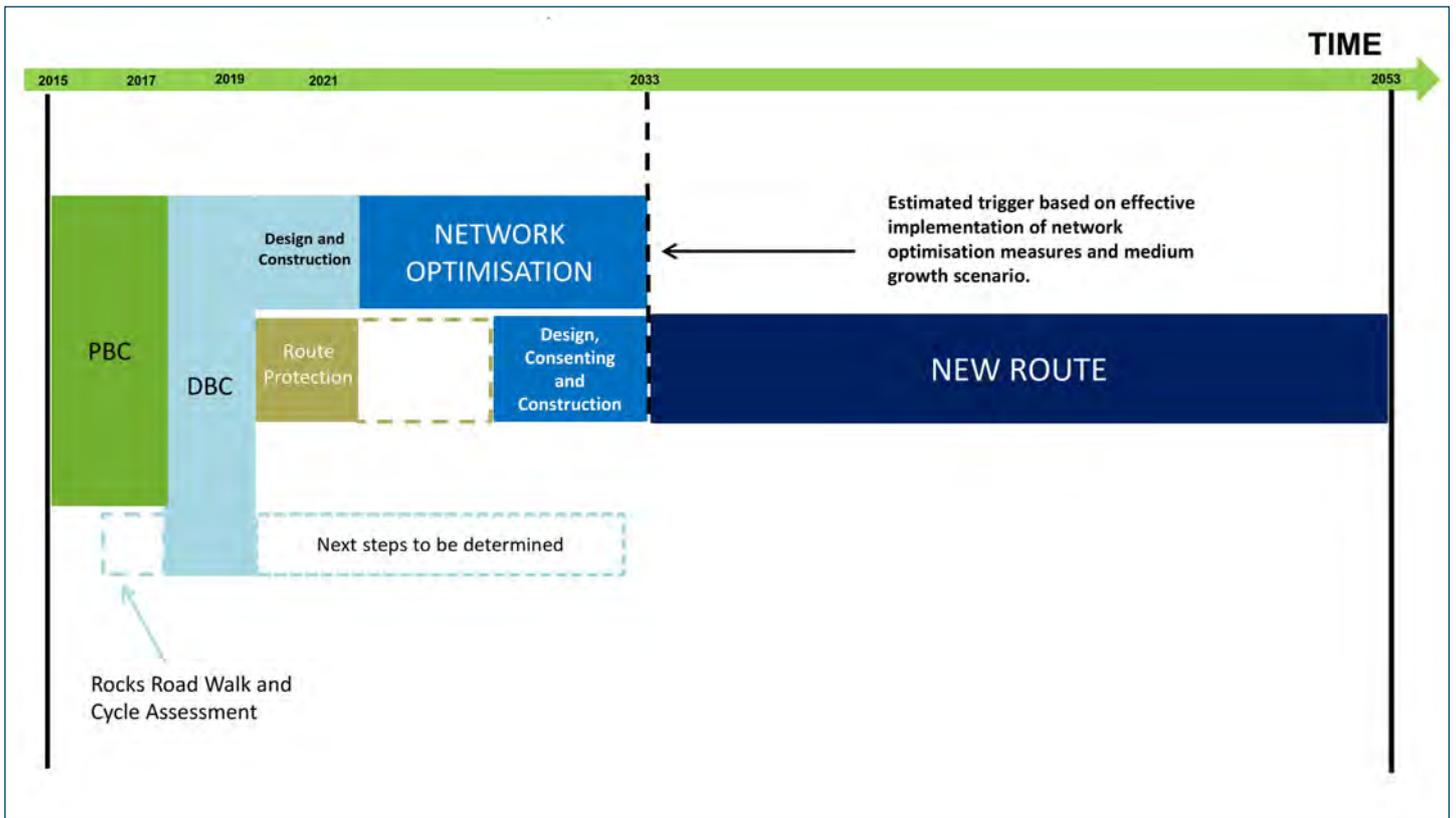
Before a new route is planned, key stakeholders need to make some fundamental decisions regarding the route's optimum location, alignment and its classification as either a state highway or local arterial. The Transport Agency and the Nelson City Council (NCC) will also have to consider the issues and opportunities for reverting the existing state highway to local authority ownership should the new route be classified as state highway.

Improvements on State Highway 6 Rocks Road have also been proposed to increase the use of active transport modes and recreational activities. The recommended programme includes a range of options for improvements. Before any decisions can be made, the Transport Agency has to finalise the location of State Highway 6, which now runs along Rocks Road but may change to the new route in the future. Firm recommendations for improvements to Rocks Road are expected during the next phase of the investigation, the Detailed Business Case (DBC).

Community feedback in March 2016 indicated 61% of respondents preferred a new route option, 21% preferred optimising the existing arterial routes, and 10% preferred widening the existing arterial routes.

At this stage in the investigation, the recommended programme has an estimated cost range of \$45m to \$300m. Network optimisation measures range from \$20m to \$40m and new arterial options from \$70m to \$300m. The range is wide because the options within it have not been investigated in detail. They will be narrowed down in the next phase of the investigation, (the DBC), and the cost range refined. The indicative benefit cost ratio for the recommended programme is between 0 and 2.2 and it has an investment assessment profile of M/M/L.

This initial economic analysis has only considered traditional transport benefits. The next phase of the project will also consider the potential wider economic benefits.



**Figure 3 - Recommended Programme Implementation Timeline**

Additional information from the DBC phase of the investigation will enable Government, the Transport Agency and NCC to make robust, evidence based and community supported decisions that will meet regulatory approval, if required.

During the DBC we will clarify:

- The effectiveness of the various network optimisation options, which will guide when a new route will be needed.
- Options for a new arterial route including any environmental effects that will inform decisions regarding alignment and classification.

- Route protection options such as land purchase, regulatory controls, planning activities by NCC and possible designation of a new route.
- Options for improvements on Rocks Road, dependent on the final location of the state highway.
- An assessment of the wider economic benefits of the preferred new route option.

The timeline for the next phase of the investigation is shown graphically in Figure 3.

## Background

State Highway 6 (SH6) is classified as a regional strategic state highway. It travels through Nelson City from Queen Elizabeth II (QEII) Drive onto Rocks Road and along the waterfront. It progresses into the Tahunanui suburb until it meets Whakatū Drive at the Annesbrook Roundabout and continues south towards Richmond.

Improvements to SH6 to the north and south of the project area have been completed, resulting in mostly free-flow conditions with travel speeds between 80 to 100km/h. However, for the central section (i.e. the investigation area), traffic travels within 50km/hr posted speed limits and 40km/hr variable school speed zones along roads characterised as two lane urban arterials.

Since the 1960s Nelson has been considering an additional Southern Link highway (shown as a blue dashed line in the Figure 4 below) to accommodate traffic growth. A number of significant infrastructure investments have been undertaken toward this end such as the upgrading of St. Vincent Street and the relocation of the Fire Station. The 2004 Environment Court declined the Southern Link Notice of Requirement and since then two further investigations found that there wasn't an immediate need for a new route. Both investigations, however, recommended monitoring of arterial traffic volumes and consideration of interventions when the arterial network required congestion relief.

There are approximately 45,000 vehicles a day across the two main north/south routes within the study area (SH6 Rocks Road and Waimea Rd). Traffic volumes have remained relatively constant over the past 10 years, possibly due to increases in walking, cycling and public transport investment and a period of slow growth. On SH6 the proportion of Heavy Commercial Vehicles (HCV's) is 6% which equates to approximately 1,300 HCV's per day.



Figure 4 - Extract from the Nelson Resource Management Plan (Original "Southern Link" alignment dashed blue)

## The Rocks Road Walk/Cycle Investigation

Prior to commencement of the Nelson Southern Link Investigation (NSLI) a Nelson City Council (NCC)/NZTA SH6 Rocks Road walk/cycle investigation was underway. That investigation supported a range of options costing up to \$25m, some widening into the Coastal Marine Area. The NSLI problem statements confirm the NSLI and the Rocks Road investigation are linked, with the outcome of the NSLI being critical to any investment decisions we make on the Rocks Road. Rocks Road forms a crucial 2km section of four sections of the 7.2km coastal cycle route being progressed as part of the Government's \$3m urban cycleway funding contribution for Nelson.

Contained within the March 2016 public engagement documentation there were four options for improving walking and cycling infrastructure along Rocks Road:

### • Option 1 - Minor improvements

This option includes committed improvements identified by the Transport Agency and NCC, such as resurfacing work to the road and footpath. It also involves incremental improvements to existing on-road facilities and the footpath. There is no widening on the seabed, the existing footpath, or cycle facilities. Cost is \$4.9 Million.

### • Option 2 - Safety enhancements with reduced lane widths

This includes the improvements outlined in Option 1 above and creates additional cycle and footpath width through narrowing the traffic lanes to 3m. This option can only be pursued if the state highway is relocated and large trucks are banned. Cost is \$8.2 Million.

### • Option 3 - On-road cycle lanes in both directions, shared path and reduced parking

This option involves widening the on-road cycle lanes in both directions and creating a 2.9m shared walking and cycling path on the seaward side. Parking between Victoria Road and Richardson Street would be removed. There would be significant seawall widening. Cost is \$21.3 Million.

### • Option 4 - On-road cycle lanes and shared path

This option involves widening on-road cycle lanes in both directions and creating a 2.9m shared walking and cycling path on the seaward side as in Option 3. Parking between Victoria Road and Richardson Street would be retained. This will require significant seawall widening. Cost is \$25.1 Million.

## Problems

The NSLI strategic case transport problems were reviewed and updated at the start of this Programme Business Case (PBC) to (along with their weightings in brackets):

**Problem 1 (70%):** The form and function of Nelson’s two arterial corridors results in congestion and delays.

**Problem 2 (30%):** Substandard infrastructure on Rocks Road, which is part of the Coastal Path, is constraining the growth in walking and cycling activities.

The evidence to support Problem 1 is principally based on the Bluetooth data collected from the third quarter in 2014 onwards. The data indicates:

- Average 15-minute travel time delays in the peak periods range between 2 and 8 minutes on SH6 and between 1 and 14 minutes on Waimea Road; and

- Peak hour volume to capacity ratios on Nelson’s two arterials range from 83% to 95%.

This information is shown graphically in Figures 3 and 4 for the SH6 route and Figures 5 and 6 for the Waimea Road route for a typical period. The solid lines indicate school term weeks and the dashed lines indicate holiday periods. Blue lines are for second quarter of 2015 and red lines are for second quarter 2016. Throughout most of 2016 there was significant traffic management on Waimea Road as Council made stormwater improvements, which increased traffic delays. The graphs indicate, with the exception of the southbound evening peak on SH6, that traffic delays are less significant in the holiday periods.

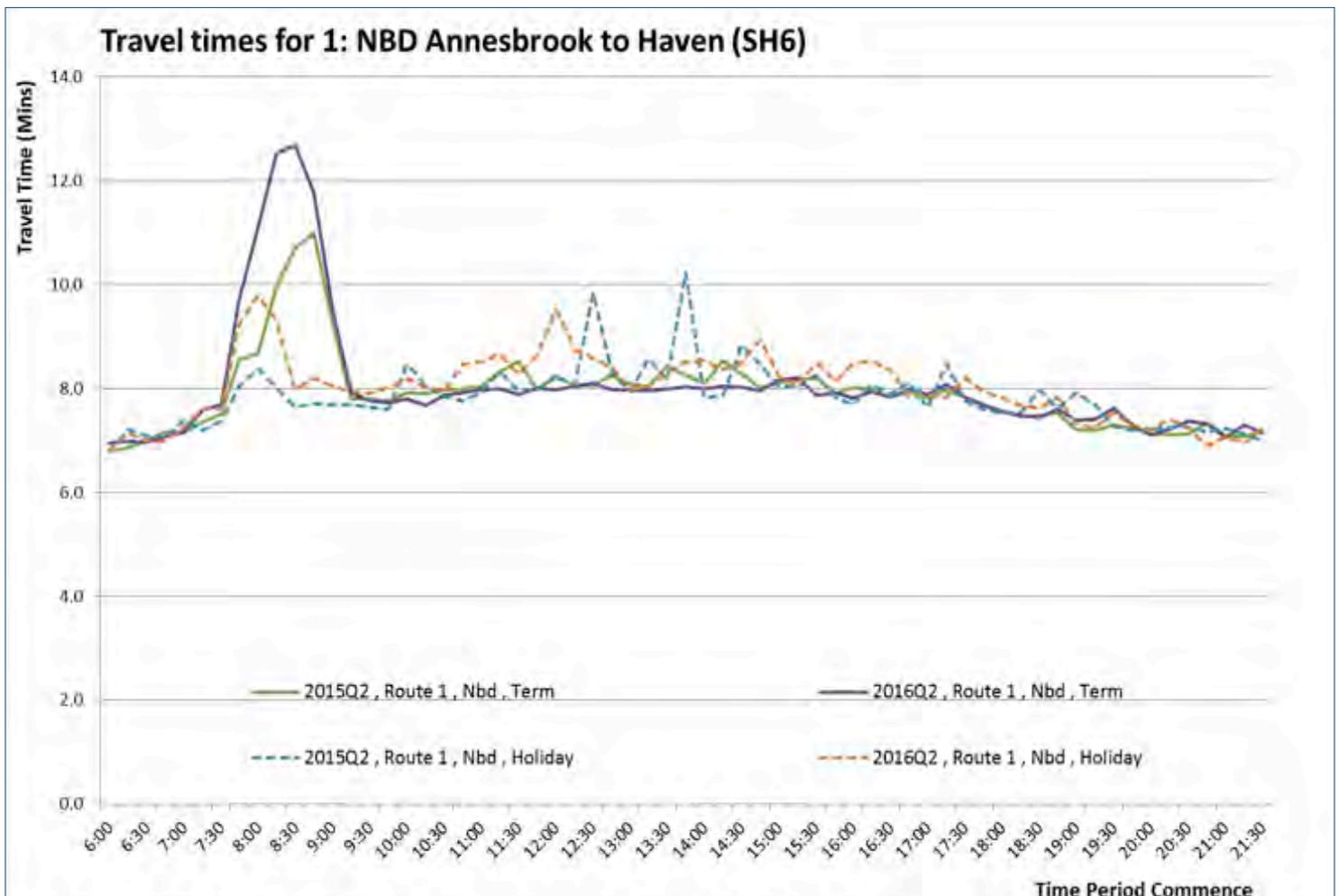


Figure 5 - 15min travel times on SH6 northbound

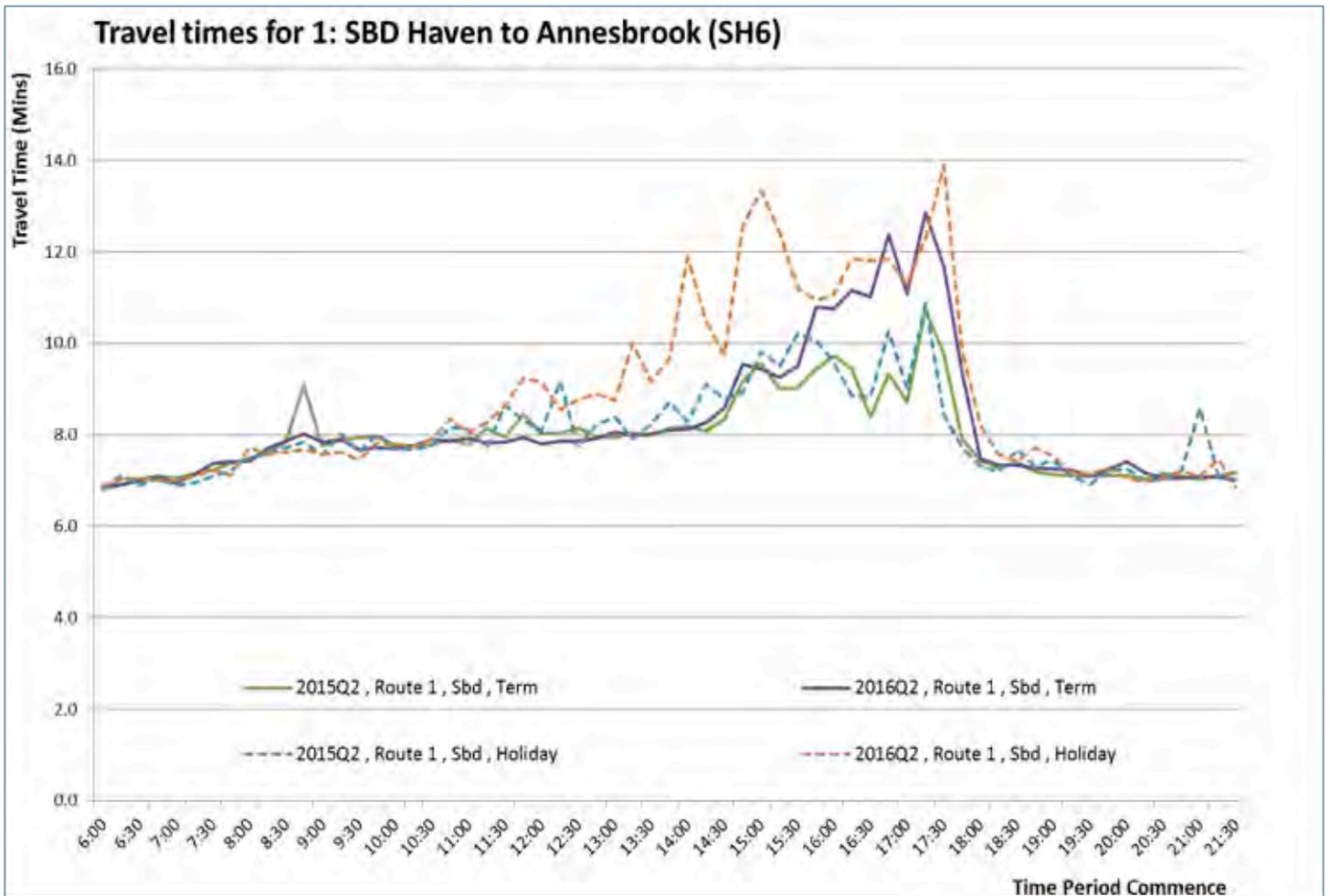


Figure 6 - 15min travel times on SH6 southbound

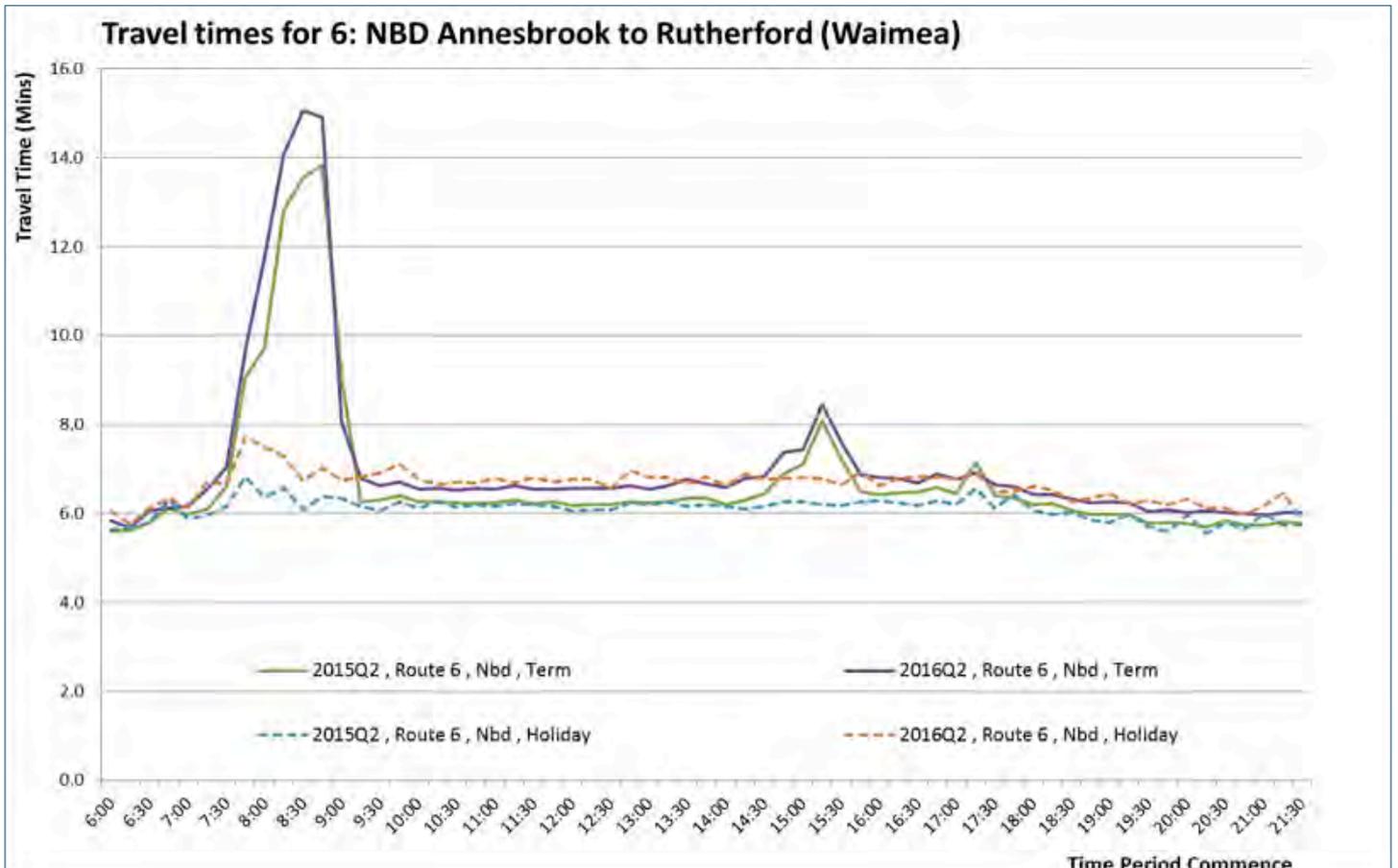


Figure 7 - 15min travel times on Waimea Road northbound

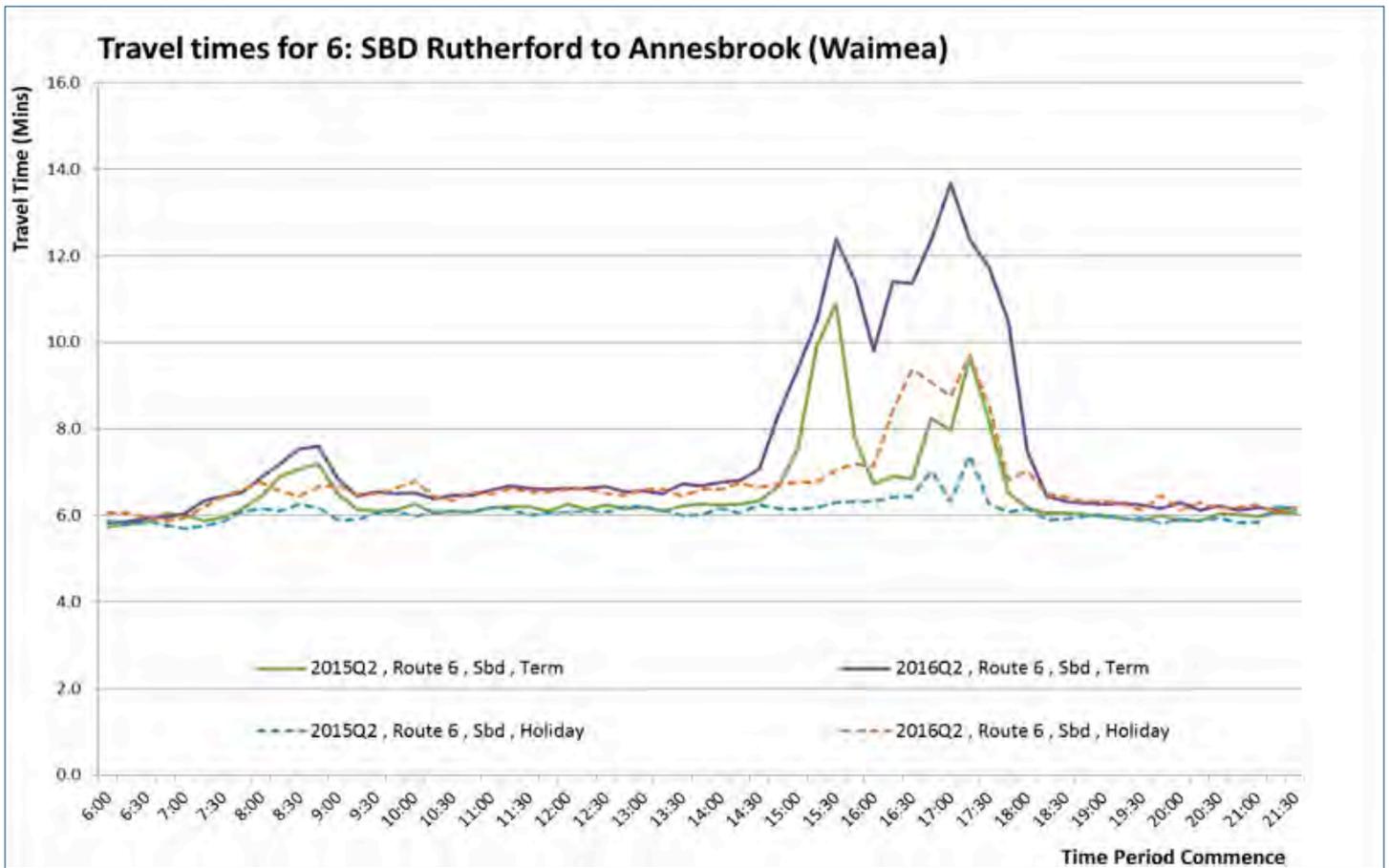


Figure 8 - 15min travel times on Waimea Road southbound

The evidence relating to the second problem is from Nelson City Council walking and cycling data and a comparison of the walking and cycling infrastructure on Rocks Road compared to current design standards. The growth in walking and cycling numbers along Rocks Road is less than half the overall growth for Nelson. When compared to the NCC Land Development Manual minimum standards, 60% of the seaward footpath is below the desired 2m width and 50% of existing cycle lanes meet the minimum 1.5m width. None of the existing cycle lanes met the desired width of 1.8m for cycling past parked cars.

The evidence indicates substandard infrastructure on SH6 Rocks Rd is a deterrent to walking and cycling growth.

### Benefits

The benefits of investing in solving the identified problems are:

- Benefit A (70%): Reduced journey times.
- Benefit B (15%): Improved safety for walking and cycling modes of travel.
- Benefit C (15%): Improved tourism, active transport and recreational activities on Rocks Road.

### Investment Objectives

The project's key stakeholders identified four Investment Objectives and their targets are:

- **Investment Objective 1**

Travel times on the two arterials no worse than 2015 for the life of the programme (40 years).

- **Investment Objective 2**

Peak hour volume to available capacity ratio of no more than 0.8 on the two arterials.

- **Investment Objective 3**

Zero walking and cycling crashes on the two arterials; and continuous decline in walking and cycling deaths and serious injuries on the two arterials for the life of the programme.

- **Investment Objective 4**

Five years after implementing an option on Rocks Road, double walking and cycling numbers per day and thereafter the growth rate is greater than elsewhere in Nelson.

Options, activities, approaches and strategic responses to address the problems, achieve the benefits and meet the investment objectives were determined through a collaborative process involving the Transport Agency, key stakeholders and the public.

### Public engagement

Community feedback in March 2016 indicated 61% preferred a new route option, 21% preferred optimisation the existing arterial routes and 10% preferred widening the existing arterial routes, although those who supported a new route option reduced to 46% in a statistically evaluated telephone survey.

## Programme Development and Assessment

Nine programmes were developed and tested against the investment objectives to see which would address the identified problems. These included:

- Network optimisation activities such as intersection improvements, clearways on sections of Waimea Road and Tahunanui and Annesbrook Drive, enhanced public transport, active transport and travel demand management measures on the state highway and local arterial roads,
- Widening the existing state highway and local arterials, rather than clearways

- A new arterial route, such as a Southern Link type route or tunnel options, and
- Combinations of the above, with enhanced public transport and four options to improve walking and cycling on SH6 Rocks Road

A range of enhancements for walking and cycling on Rocks Road were included in all programmes from programme 2 onwards, and these options can be revisited again when there is a greater understanding around the classification and timing of the new route.

**Table 1 - Programme Assessment Summary**

Approach	Programme	Brief description	Key reason for rejection
Making the most of the existing network	1	Do minimum	Doesn't not address the identified problems
	2	Network optimisation only	Doesn't address the walking and cycling investment objectives
	3	Network optimisation (as above) plus Rocks Road options	Uncertain performance over the longer term
	4	The same as Programme 3 with clearways options for public transport only	Insufficient PT demand to justify clearways for PT only
Widening the existing arterials	5	The same as Programme 3 (excluding clearways) plus road widening options on both arterials for use by public transport only	Implementation impacts and PT demand could not justify this programme
	6	The same as Programme 3 (excluding clearways) plus road widening options on both arterials for use by all traffic	Implementation impacts and poor stakeholder support
	6a	The same as Programme 3 (excluding clearways) plus road widening options for use by all traffic on Waimea Road and Rutherford Street only	Less effective than Option 7 and with similar impacts as Programme 6
Creating a new arterial	7	The same as Programme 3 (excluding clearways) plus a new route	Recommended programme
	8	The same as Programme 7 but the new route is for public transport only	Insufficient PT demand to justify

Key stakeholders held mixed views on the recommended programme, with some willing to trade off local access (i.e. local access and egress to side roads and accesses) along the two arterials to reduce congestion. The majority view was less traffic on Rocks Road, Waimea Road, and Rutherford Street was desirable and should be pursued.

Initial assessments of the programmes identified that long term optimisation, widening and options solely relying on public transport were less effective at addressing the identified problems.

The project team requested additional traffic modelling related to clearways and a new route. After assessing this new information, the project team decided the recommended programme (Programme 7) should consist of two activities:

- Network optimisation activities that change the current transport network to accommodate and manage the projected traffic growth, followed by;
- A new route to accommodate the projected traffic growth. The new route could include tunnels and alignments similar to the Southern Link, and could be classified either state highway or local road.

A summary of the programmes assessment along with the key reason for rejection is shown in Table 1 above.

## The Recommended Programme

Many options are still contained within the recommended programme, including improved public transport, more travel demand management and new route tunnel alignments. The next stage of the investigation will assess the options within the recommended programme in further detail, and select and refine those best to progress.

The recommended programme assessment is shown in Table 2 below.

The performance of the recommended programme against the project IO's is summarised in Table 3 below.

Programme / Activity Name		Programme
Programme Description		RECOMMENDED PROGRAMME
<b>Investment Objectives</b>		
Investment Objective 1	Travel times on the two arterials no worse than 2015 for the life of the Programme	High
Investment Objective 2	Volume to available capacity ratio on the two arterials no worse than 80% for the life of the Programme	High
Investment Objective 3	Zero walking and cycling crashes on the two arterials; Continuous decline in DSI's for the life of the programme	Medium
Investment Objective 4	Double walking and cycling numbers per day within 5 years of implementing a walking / cycling option on Rocks Road and thereafter the growth rate is greater than elsewhere in Nelson	Medium
Investment Cost		\$45M - \$300M
Time to Implement		1-15 yrs
Difficulty to Implement (low, medium, high)		Medium - high
Public and Stakeholder Risk of Acceptance		Medium
<b>Risks (Impacts using seven point scale)</b> +3 = major benefit +2 = moderate benefit +1 = minor benefit 0 = no impact or benefit -3 = major impact -2 = moderate impact -1 = minor impact		
Accessibility - to what extent does the programme affect accessibility for all modes of travel		+2 to +3
Safety - to what extent does the programme address safety of travellers for all modes of travel		-2 to +2
Economic - to what extent will the programme impact the Regional economy		-3 to +2
Environmental - to what extent will the programme affect water resources, resource efficiency and ecology		-2 to +1
Environmental - what will be the likely impact of the programme on noise and vibration levels if implemented		-1 to +3
Environmental - what will be the likely impact of the programme on air quality levels if implemented		-1 to +1
Social - what will be the likely impact of the programme on social outcomes if implemented		-3 to +2
Landscape / Urban design - what will be the likely impact of the programme on urban character, landscape character and visual amenity if implemented		-2 to +1
Culture - what will be the likely impact of the programme on areas of significance to Maori and known archaeological sites if implemented		-2 to 0
Built Heritage - what will be the likely impact of the programme on listed or other important heritage buildings/structures if implemented		-2 to 0
Indicative BCR		0 - 2.2
Indicative Programme Profile:		MML

Table 2 - NSLI Recommended Programme Assessment

Table 3 - Performance ratings of the recommended programme against the IO's

Investment Objectives		Recommended Programme (over the life of the programme)
1	Travel times on the two arterials no worse than 2015 for the life of the programme	greater than 70%
2	Peak hour volume to available capacity ratio of no more than 0.8 on the two arterials	greater than 70%
3	Zero walking and cycling crashes on the two arterials; and continuous decline in walking and cycling deaths and serious injuries on the two arterials for the life of the programme	30% to 70%
4	Five years after implementing an option on Rocks Road, double walking and cycling numbers per day and thereafter the growth rate is greater than elsewhere in Nelson	30% to 70%

**NB: The range of values in Table 3 illustrates the variability of the performance of the options within the recommended programme against the targets of each investment objective, whether singularly or in multiple different combinations. The work to find the optimal combination of options that achieves the highest performance across all investment objectives over time is to be undertaken in the IBC phase.**

## Uncertainties

The recommended programme contains a number of uncertainties and work to address these will take place in the DBC phase:

- traffic growth modelling
- the classification and alignment of a new route
- micro-modelling work to better determine locations and configurations of clearways and the new route
- costs associated with clearways and a new route

Traffic modelling shows that expected traffic delays and travel speeds on the two arterials will deteriorate under the medium growth scenario, shown in Figure 9. The scale of efforts to optimise the network, the speed of regional growth and new technologies, will determine when a new route is required.

- The recommended programme is based on a medium growth scenario, which projects network optimisation activities will become less effective at reducing travel delays and make it a challenge to access and cross the arterials sometime in the early 2030s
- Under a low growth scenario, traffic modelling indicates that a new route will not be required for another 40 years, but under a high growth scenario it will be required in the mid to late 2020s.

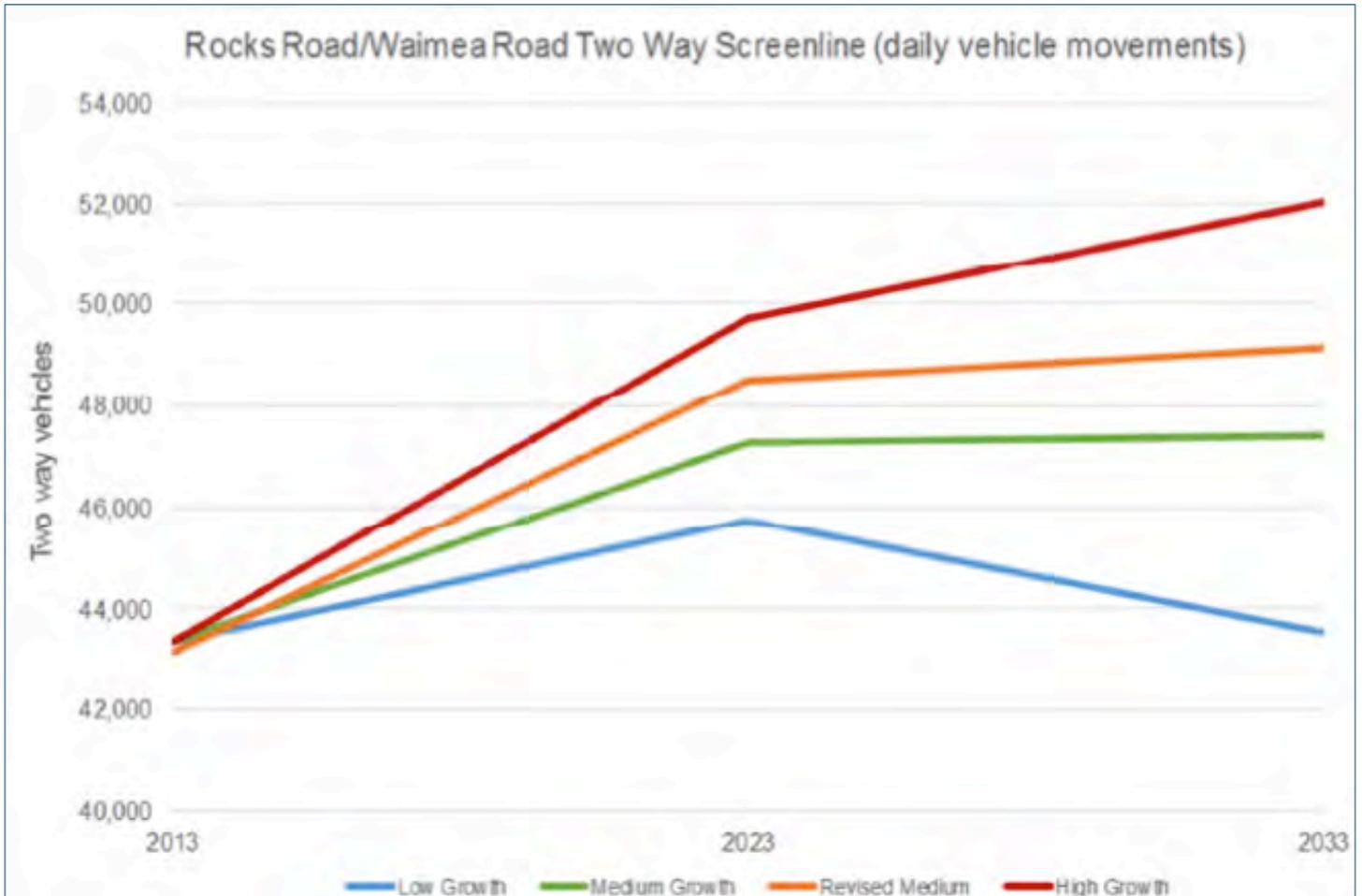


Figure 9 - Traffic growth Scenarios

## Risks

The project team identified the following critical risks associated with the implementation of the activities and options within the recommended programme:

- Organisational risk - The Transport Agency needs NCC's support for some of the activities and options within the recommended programme to enable implementation;
- Affordability - Detailed preferred option costs and assessments are required before they can be considered for inclusion in the National Land Transport Programme;
- Rocks Road consents - Obtaining permission for a Rocks Road option that requires reclamation into the coastal area presents significant but manageable challenges;
- New route consents - Obtaining permission for a new route, which includes designating it as a state highway or a local road presents significant manageable challenges;
- Operational risks include:
  - physical operation of the network
  - the integration with and operation of additional PT services, and
  - policy and systems operational aspects (eg traffic signal optimisation, parking charges).

Some of the operational risks will fall outside of the Transport Agency's sphere of responsibility (e.g. changing land use or changing school hours) and will need to be integrated across the delivery of the programme with the wider land use and transport system.

## Next steps

The next step in the investigation is the DBC. In the next phase the network optimisation activities and the new route will be investigated further. During the DBC more detail on options within the recommended programme will be available and the best options to progress further will be selected.

The timeline for the next phase of the investigation is shown graphically in Figure 3.

