

# Nelson Future Access Detailed Business Case

08-Oct-2021

## Nelson Future Access Detailed Business Case

Client: Waka Kotahi

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Prepared by

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## Glossary

| Abbreviation      | Term                                                   |
|-------------------|--------------------------------------------------------|
| AADT              | Annual Average Daily Traffic                           |
| AEP               | Annual exceedance probability                          |
| ARI               | Average return interval                                |
| BCR               | Benefit cost ratio                                     |
| CARR              | Communities At Risk Register                           |
| CAS               | Crash Analysis System                                  |
| CBD               | Central Business District                              |
| CO <sub>2</sub> e | Carbon equivalent global warming potential             |
| DSI               | Deaths and serious injury                              |
| FDS               | Future development strategy                            |
| FLoS              | Functional level of service                            |
| GHG               | Greenhouse gas emissions                               |
| GIS               | Geographic information system                          |
| GPS               | Government Policy Statement for Land Transport Funding |
| HPMV              | High productivity motor vehicle                        |
| HUD               | Household unit of demand                               |
| IAP2              | International Association of Public Participation      |
| ILM               | Investment logic mapping                               |
| Kph               | Kilometres per hour                                    |
| LTP               | Long-term plan                                         |
| MCA               | Multi-criteria analysis                                |
| MCBM              | Monetised Benefits and Costs Manual                    |
| MoU               | Memorandum of understanding                            |
| NCC               | Nelson City Council                                    |
| NFA               | Nelson Future Access                                   |
| NLTF              | National land transport fund                           |
| NLTP              | National Land Transport Programme                      |
| NOH               | Network operating hierarchy                            |
| NPS-UD            | National policy statement – urban development          |

| Abbreviation | Term                                                       |
|--------------|------------------------------------------------------------|
| NPV          | Net present value                                          |
| NRMP         | Nelson Resource Management Plan                            |
| NRTM         | Nelson Regional Transport Model                            |
| NTSM         | Nelson Tasman SATURN Model                                 |
| NTTTM        | Nelson Tasman TRACKS Transport model                       |
| ONRC         | One network road classification                            |
| PBC          | Programme Business Case                                    |
| PRG          | Project reference group                                    |
| PT           | Public transport                                           |
| RCP          | Representative Concentration Pathway                       |
| RMA          | Resource Management Act                                    |
| RPTP         | Regional Public Transport Plan                             |
| RTC          | Regional Transport Committee                               |
| SH           | State highway                                              |
| SiD          | Safety in Design                                           |
| SMART        | Specific, measurable, achievable, realistic and time-bound |
| TDC          | Tasman District Council                                    |
| TDM          | Travel demand management                                   |
| TLA          | Territorial authority                                      |
| TREIS        | Traffic Road Event Information System                      |
| VPD          | Vehicles per day                                           |
| WG           | Working group                                              |

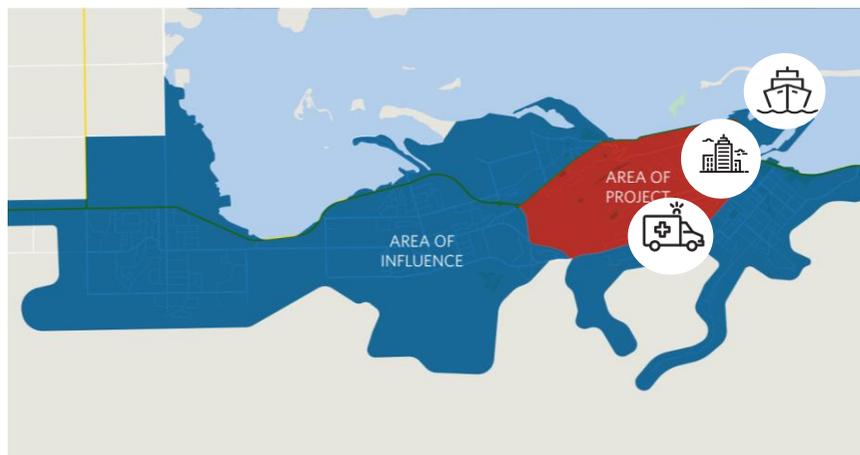
## Executive Summary

Nelson is the commercial and social centre to the Te Tāuihu - Top of the South region, with the Port, Airport, Regional Hospital and commercial heart all in the centre of Nelson. Strong residential growth coupled with the region's economy being driven by primary produce and marine research, education and industry is making Nelson an even more important economic centre for New Zealand.

Nelson City is forecast to experience a high level of residential growth with 12,000 new houses in the next 30 years. Freight is also forecast to grow by 53% over the next 15 years. In the absence of significant changes to the transport system, access, safety, travel times and the reliability of the transport system will deteriorate.

To help manage this growth safely whilst reducing carbon emissions and efficiently managing freight movements to and from the Port there is a need to plan for the whole transport system. Having this plan will help maintain access and improve the liveability of residential areas, the waterfront and the city centre. This plan will also need to consider the behavioral change required to manage this growth.

This Business Case responds to the above pressures with a focus on the area shown in red below, noting that the area of influence is a much larger area.



In 2017, the Nelson Southern Link Programme Business Case concluded that a range of activities could be implemented in the short to medium term to optimise Nelson's transport system. The short term recommendations focused on improving traffic performance along with improving amenity and walking and cycling facilities on Rocks Road. In the longer term it recommended that the need for a new road link be monitored, with an indicative implementation timeframe in the 2030's.

The Nelson Future Access Project (NFAP) builds on the Programme Business Case (PBC) and is the next step in the project development process. Key changes since the PBC was published in 2017 that have helped to shape the current business case are:

- The Future Development Strategy which includes areas of growth and intensification of residential housing in Nelson City, supported by the National Policy Statement on Urban Development Capacity (NPS-UD)
- The declaration of a climate emergency by NCC supported by the Government's Zero Carbon Bill
- Change in direction of the Government Policy Statement on Transport to provide for better travel options and transitioning to a low carbon transport system
- This involves a wider transport system approach
- New information on climate change and sea level rise
- Rapidly developing and changing transport technologies

## The Case for Change

The two existing arterial corridors, Waimea Road and SH6 have enabled freight, general traffic, bus and active modes to share the same space to access the city and port. As Nelson grows it is becoming increasingly clear that this arrangement is causing community severance, poor amenity outcomes, unreliable travel, reduced livability of the city and low active mode growth.

Key Stakeholders are aligned on the need to address the forecasted problems and the need to capitalise on the opportunities that may be realised by investment as summarised below:

## Problems:

***The inability of Nelsons transport network to support the increasing movement of people and freight between Stoke and Nelson city centre is constraining economic growth and social well-being of the region***

The business case found travel to Nelson City Centre and Nelson South in the morning peak travel is forecast to increase by ~32% to over 7,000 people per hour in the morning peak period and that the existing levels of congestion which result in poor reliability are of similar scale to our large metropolitan centres

***Conflicting uses and inappropriate use of the network severs neighbourhoods reducing their amenity and safety***

The business case shows that the network caters for private vehicles to reach a wider range of destinations at the expense of other modes and the amenity of the surrounding environment. This impacts the connection between the city and the waterfront along Rocks Road and the residential amenity of the suburban areas due to drivers seeking faster alternative routes to the arterials.

There are a high number of crashes on the two arterials of SH6, Waimea Road, and key roads around the CBD. In particular for SH6 Rocks Road the real and perceived safety issues create severance with the waterfront. This severance significantly decreases the amenity values for this outstanding area.

Amenity values and safety are further compromised within the study area with increasing vehicle trips and conflicts with vulnerable users.

***The susceptibility of the arterial network to natural events of increasing severity and a greater number increases the risk of significant economic shock to Nelson and the wider region***

The evidence indicates that Rocks Road has a catastrophic risk of being closed for an extended period of time to facilitate its rebuild following a high-impact low probability event such as an earthquake or tsunami. During other events (including storm events), the duration of closure whilst inconvenient is in line with national standards.

## Opportunities

- In addition to the problems identified above, the NFAP considers how to take advantage of the following opportunities:

- Key opportunities exist to enhance the amenity, heritage and cultural values within the project for the benefit of the city. SH6 Rocks Road is located along the waterfront and adjacent to an outstanding natural rock outcrop as well as significant heritage and cultural values. The community has expressed a strong desire to connect meaningfully with this area.
- Increase walking and cycling as census data and traffic modelling shows 60% of trips in the study area are local, 5km or less.
- Reduce carbon emission and continue to lead the country in active modes and public transport use for a small urban metro.
- Assisting Council's vision of a smart little city by creating liveable places

## Interventions

To address the problems and realise the opportunities, the project team considered a wide range of interventions which were collated into themed programmes. In collating the interventions, it was clear that improving walking and cycling on Rocks Road in isolation could restrict the opportunities available for the rest of the transport system. The Rocks Road component was thus considered alongside the broader programmes.

To provide balanced and effective programmes for further assessment, a wide range of interventions including a focus on safety, amenity, access, capacity and resilience using the land use proposed by the 2019 Nelson Tasman Future Development Strategy as a guiding assumption. The interventions and programmes were evaluated against the investment objectives, key principles, implementability, economics, effects and integration criteria to understand their performance and ability to create lasting positive change

## Recommended Programme

The Recommended Programme, designed with stakeholders, includes investment in a range of different activities within Nelson City over the next 30 years. The programme increases the availability of attractive walking and cycling paths and public transport options close to areas of planned dense urban living, focuses on reliable journeys to support regional economic development, improves safety for everyone and makes urban neighbourhoods more liveable.

Overall, the programme when compared against the status quo of no NFAP investment will:

- Have a core focus on shifting people to alternative modes to private vehicles by encouraging the uptake of walking, cycling and public transport
- Make it easier for people to choose to ride a bike, walk or catch PT. We estimate we can shift 6-8% from private vehicle trips to other lower carbon and healthier modes by 2048.
- Bring forward the replacement of the seawall along Rocks Road in order to provide for the active mode corridor which has secondary benefits of reducing the risks of climate change sea level rise and improving resilience of this key freight route to the Port.
- Significantly improve the amenity of the waterfront along SH6 Rocks Road by widening for walking and cycling. Heritage and cultural values will also be respected through the design of the upgraded facilities, and the appeal of the waterfront will be enhanced for active mode users recognising its place as an outstanding landscape.
- Reduce greenhouse gas emissions by reducing private vehicle use. Our modelling based on existing behaviours has forecast a 12% daily reduction in CO2 in the first ten years increasing to 16% by 2048. Changing behaviours outside of the modelling provides an opportunity to further achieve a much greater CO2 reduction potential.<sup>1</sup>
- Prioritise buses through the use of priority lanes to maintain a 40 minute journey time between Richmond and Nelson into the future. This builds on the shorter-term investment in Public Transport Services as outlined in the NCC Regional Public Transport Plan. This plan reduces fares, increases frequency and the number of people living within 500 metres of a bus stop.
- Increase the overall accessibility between residential suburbs with the CBD, hospital campus, schools and the waterfront with the completion of the key walking and cycling networks. This includes 12.5km of new cycle paths plus improvements to 6.5km of existing cycle facilities plus

many new and improved crossing points using refuges and signals to facilitate easier and safer crossing.

- Increasing CBD amenity and safety by reducing the number of private vehicles entering, moving and parking close to the city centre during the commuter peaks.
- Provide a strong focus on integrating land use and the transport system to provide high-quality transport choices and a liveable city.
- Address safety issues on the network by targeting the high safety risk routes on the two key arterials for all modes to achieve a significant reduction in crashes resulting in death and serious injuries. This includes addressing perceived safety risks as this is just as important as safety performance.
- Make travel times for general traffic on SH6 and Waimea Road slower in the order of 1-3 minutes but more reliable. These increases can be largely attributed to the additional delay incurred by new traffic signals for through traffic, however those signals will enable people to cross and access the arterials easier and safer.

The recommended programme of investment has a BCR of 1.6. The majority of the economic benefits for the recommended programme are derived from vehicle and public transport travel time savings across the network (64%) followed by the health benefits from increased uptake in active mode trips (21%).

## Delivered in Stages

Implementation of the programme has been sequenced to match the increasing transport demand and assist with value for money as follows:

- Near-term (Years 0-3) - The near-term programme focusses on optimisation improvements to improve efficiency, connectivity and safety on the network. Near term activities have a high priority with a lower cost and complexity for delivery. Includes the pre-implementation – detailed design and consenting phase for Rocks Road.

<sup>1</sup> The reduction in GHG emissions has been calculated against the reduction in vehicle emissions based on the current fleet and forecast mode shift away from private vehicles. The overall reduction in GHG emissions calculated is conservative

as further reductions can be expected through the adoption of new technologies such as EV's, and social changes such as technology that promotes remote working reducing travel demand.

- Short-term (Years 4-10) - The short-term activities further embed optimisation improvements on the network with a focus on active mode provision to capitalise on the significant number of short journeys within the study area that could be shifted to alternative modes. SH6 Rocks Road is the significant project in this period with a focus on improving the connectivity and amenity of the waterfront.
- Medium to Long-term (Years 11-30) - The medium to long term programme focuses on improving the efficiency of public transport journeys across the network including the provision of priority lanes in select locations on the two arterial routes, and continued investment to provide for active mode trips.

The network will be monitored, and the programme has flexibility to be sequenced overtime should the growth assumptions, transport demand or funding constraints or opportunities change significantly.

In refining the proposal significant risks posed by consenting in the coastal marine area, the degree of uncertainty in relation to sea level rise and earthquakes in the long term (beyond 2050) were considered. The project scope excluded considerations beyond 2050 for the current State Highway 6 corridor between Tāhunanui and QEII Drive. These three risks support the retention of the Inland Route as a 'Transport Corridor' in the long term. Accordingly, included in the Recommended Programme is retention of the Inland Route. The Inland Route is the future long term resilience option. It would be considered only after the network is optimised and the priority lane work is completed, and associated land use, parking and transport price tension has been applied. The programme is shown graphically on the following maps:

Figure 1: Recommended Programme excluding Rocks Road and Priority Lanes



Figure 2: Rocks Road Walking and Cycling Detail

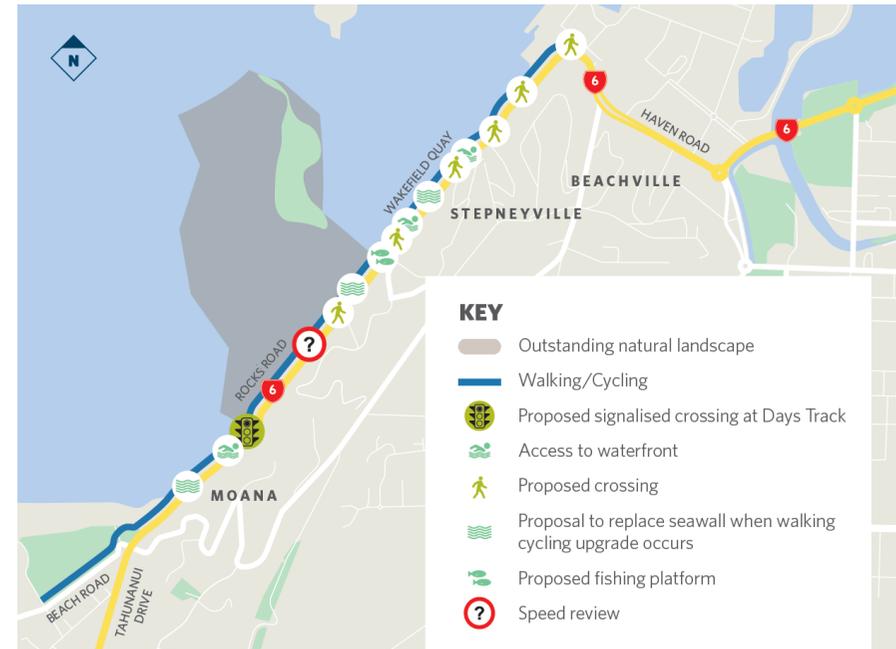
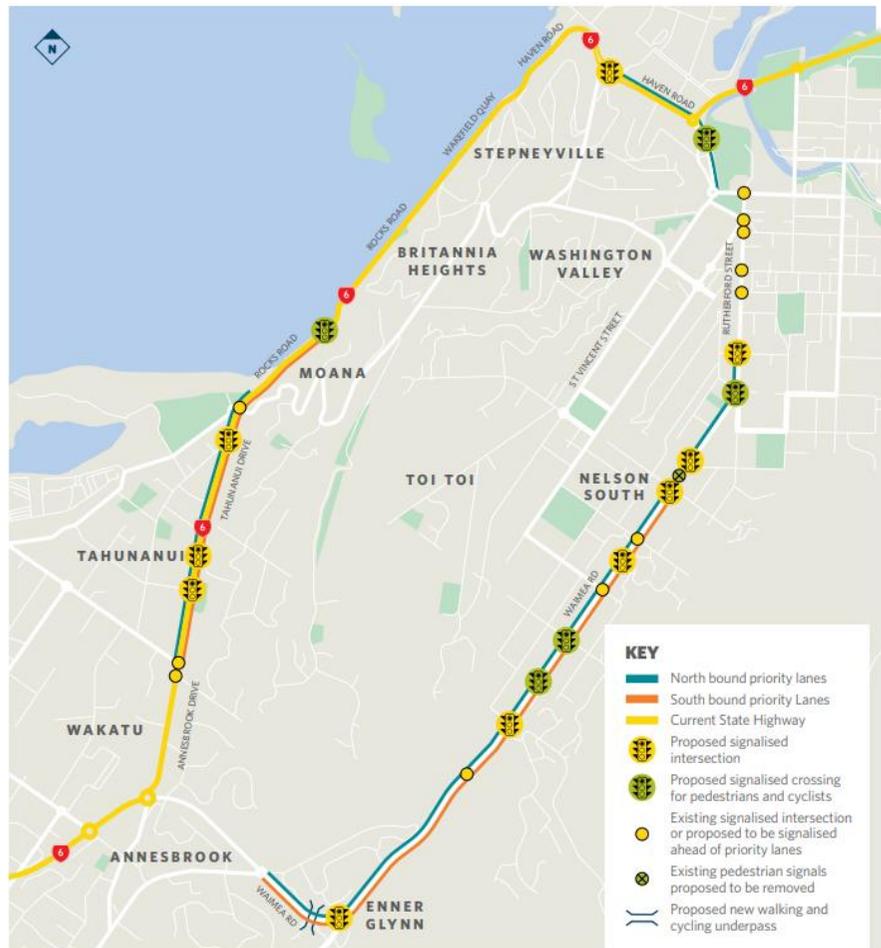


Figure 3: Priority Lanes Detail



## Partner, Public, and Stakeholder Engagement

Key stakeholders have been engaged through the development of this business case through their participation as part of the Project Working Group. This group includes our Iwi partners from Te Taihū.

Two rounds of public engagement were undertaken to obtain feedback from the community.. The public engagement showed a high level of engagement in the proposal and broad support for the recommended programme with the exception of the priority lanes and clearways through Tāhunanui. The public engagement has also informed changes to the recommended programme, such as adding preferred crossing points for pedestrians and an extension to the Rocks Road walk cycle facility to connect it to the recently completed Muritai Street cycle path.

## Recommended Programme Costs

The total recommended programme cost is estimated between **\$309M and \$510M, with an expected cost of \$426M**. The range reflects the risks and uncertainties that exist at this early stage of project development.

| Phase                             | Expected Base Estimate (\$M)   | Contingency (\$M)        | Funding Risk (\$M) |
|-----------------------------------|--------------------------------|--------------------------|--------------------|
| <b>Nett Project Property Cost</b> | \$ 12.692                      | \$ 3.917                 | \$ 3.407           |
| <b>Project Development</b>        | \$ 11.521                      | \$ 3.456                 | \$ 2.304           |
| <b>Pre-Implementation</b>         | \$ 26.424                      | \$ 7.927                 | \$ 5.574           |
| <b>Implementation</b>             | \$ 258.545                     | \$ 101.209               | \$ 72.866          |
| <b>Total Base Estimate</b>        | <b>\$ 309.182</b>              | \$ 116.510               | \$ 84.151          |
|                                   | <b>Total Expected Estimate</b> | <b>\$ 425.692</b>        |                    |
|                                   |                                | <b>\$95%ile estimate</b> | <b>\$ 509.843</b>  |

The likely cost by each organisation for the Near-term (0-3 years), Short-term (4-10) years, and Medium to Long-term periods (11-30 years) are detailed below.

| Period      | Organisation                 | Base estimate (\$M) | Project estimate (\$M) | 95th percentile estimate (\$M) |
|-------------|------------------------------|---------------------|------------------------|--------------------------------|
| Near-term   | NCC – Local Road 49%         | \$ 8.641            | \$ 11.556              | \$ 14.275                      |
|             | Waka Kotahi – Local Road 51% | \$ 8.994            | \$ 12.028              | \$ 14.856                      |
|             | Waka Kotahi – State Highway  | \$ 3.897            | \$ 4.639               | \$ 5.759                       |
| Short       | NCC – Local Road 49%         | \$ 21.315           | \$ 27.735              | \$ 33.139                      |
|             | Waka Kotahi – Local Road 51% | \$ 22.184           | \$ 28.868              | \$ 33.709                      |
|             | Waka Kotahi – State Highway  | \$ 90.510           | \$ 140.345             | \$ 166.482                     |
| Medium-Long | NCC – Local Road 49%         | \$ 55.751           | \$ 72.458              | \$ 86.325                      |
|             | Waka Kotahi – Local Road 51% | \$ 57.563           | \$ 74.952              | \$ 88.643                      |
|             | Waka Kotahi – State Highway  | \$ 40.516           | \$ 53.111              | \$ 66.654                      |
|             | <b>Total</b>                 | <b>\$ 309.182</b>   | <b>\$ 425.692</b>      | <b>\$ 509.843</b>              |

The estimates **exclude** Waka Kotahi indirect and admin costs of 8%. All cost estimates quoted exclude GST and escalation.

## Next Steps

In order to progress funding opportunities it is critical to have an approved business case.

The near term activities and the Rocks Road walk and cycle boulevard have been developed to a higher level of detail than the remainder of the programme and are able to now be progressed, subject to funding, to pre implementation and delivery.

Funding of the recommended programme is still to be determined but will likely include the National Land Transport Fund, Nelson City Council local share, and potential funding opportunities through alternative crown funding sources as they arise over time.

Monitoring of the transport network should be undertaken in order to understand the actual effectiveness of the activities delivered and inform and refine the interventions. Modifications to the sequencing of the activities to match actual funding availability and growth demands could become very relevant if large residential developments to meet the housing affordability crisis are brought forward in time.

## Risks

The key programme risks have been identified as follows:

- That the funding available to implement business case recommendations, and the recommendations, do not align.

Mitigation of this risk has been through developing a programme that aligns with the current GPS and sets a clear direction for future investment in the Nelson transport network. For example, there are low cost optimisation activities which is in line with the Waka Kotahi intervention hierarchy through the focus on integrated planning interventions and making best use of the existing transport system first. The business case has been developed to take advantage of future funding opportunities outside the NLTF as well.

- That the heritage, cultural, visual and ecological values associated with the Rocks Road walking and cycling component of the

programme requires considerably more time and cost to resolve than allowed for.

The cost estimate for Rocks Rd provides a range which covers the most challenging options from a cost perspective. The programme identifies that the detailed design and consenting work for Rocks Rd should start in the 2021-24 NLTP as it is recognised this work may take some time given the risk identified above.

- That the programme needs to be accelerated to meet increased transport demand from significant residential development in response to the housing crisis.
- The programme is structured so elements can be accelerated in response to triggers that create increased transport demand.
- Poor transport outcomes could result if complimentary activities across the whole Nelson Richmond urban area are not progressed.
- A shared oversight across both projects will ensure complimentary activities across both Richmond and Nelson are progressed so maximum benefits from both programmes can be generated. This will form the strategic leadership of the programme for the future and will retain focus on the agreed outcomes.

## 1.0 Introduction

The purpose of the Nelson Future Access Business Case (business case) is to understand the problems with the mobility of people and goods within the city, and to define the optimal investment strategy over the immediate, short, medium and long-term time periods. To define the optimal investment strategy for Nelson City Council, Waka Kotahi and investment partners, the business case considers all modes, defines the changes in level of service, assessed the place function for the waterfront and Rocks Road, provides a detailed investment strategy for the immediate and short-term, and provides guidance for the medium to long-term periods.

Nelson is a medium sized city at the Top of the South Island intimately linked to the surrounding region of Tasman/Marlborough socially and economically. The city is a key area of employment through the presence of the port, agglomeration of businesses in the central city, and the activity that comes through the density of people. People choose to live there because of the environment and work options, with a variety of employment options. The earning power is less than the NZ average, but this is offset by relative property and living costs. People are attracted by the natural environment, work options and recreational activities available.

Travel outside work and education is important as people access community and medical services, and recreational opportunities.

The business case interrogates the evidence base and the case for change. Key problem statements and benefits of investment have been refined from the preceding Programme Business Case and agreed with the investment partners and stakeholders to ensure investment is scoped appropriately. Investment programmes containing a range of activities have been developed that have then been further refined into the Recommended Programme of activities for Council, Waka Kotahi and partners to pursue.

To optimise the benefits of the investment, the development and assessment of options considered other related or directly dependent initiatives and transport modes. Therefore, the business case accounts for other current and planned initiatives within the study area.

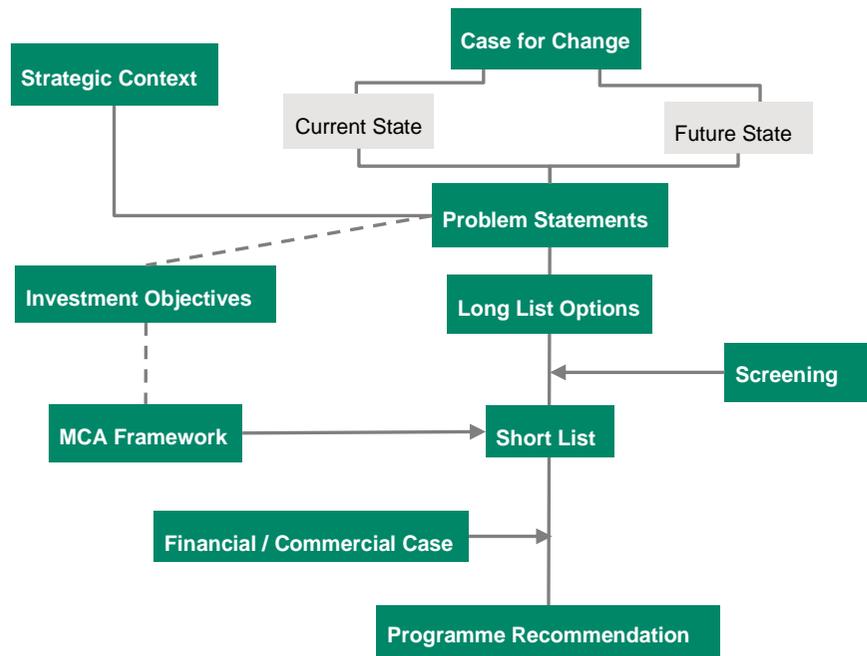
## 2.0 Scope

This business case:

- Refines problem statements and benefits of investment based on the evidence collected;
- Tests and reconfirms the need to invest and the clear case for change;
- Develops options to a point where they can be objectively evaluated (including a clear base-case 'do minimum' option);
- Provides an evaluation of options and those synergies between groups of different options across time;
- Identifies and justifies a solution for investment that directly addresses the agreed problems in the study area;
- Assesses the financial implications, risks and economic viability of the recommended solution(s);
- Sets out a clear roadmap through which the project or programme of activities can be advanced within target timeframes

The process for determining the business case is shown in Figure 4.

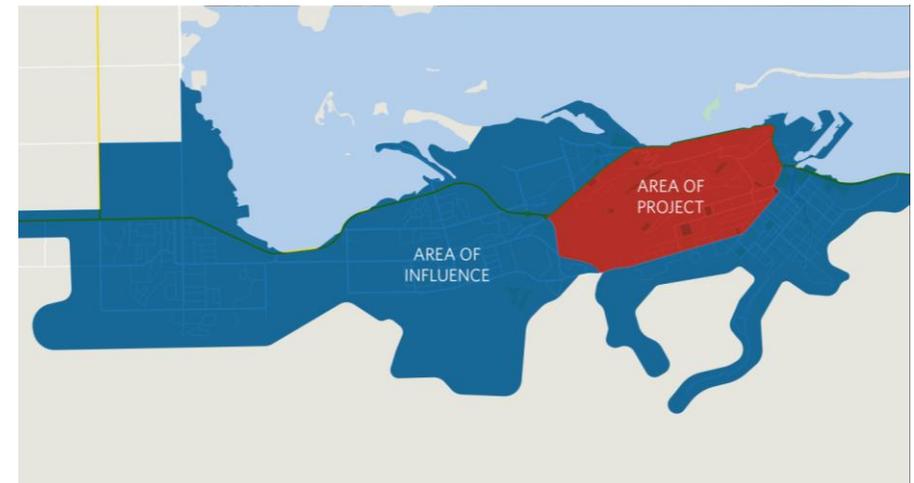
Figure 4: NFA development steps



## 2.1 Scope Area

The area where the business case is focussed is shown in Figure 5 and highlighted in Red, with the area of influence for the project highlighted in Blue.

Figure 5: Project area and area of influence



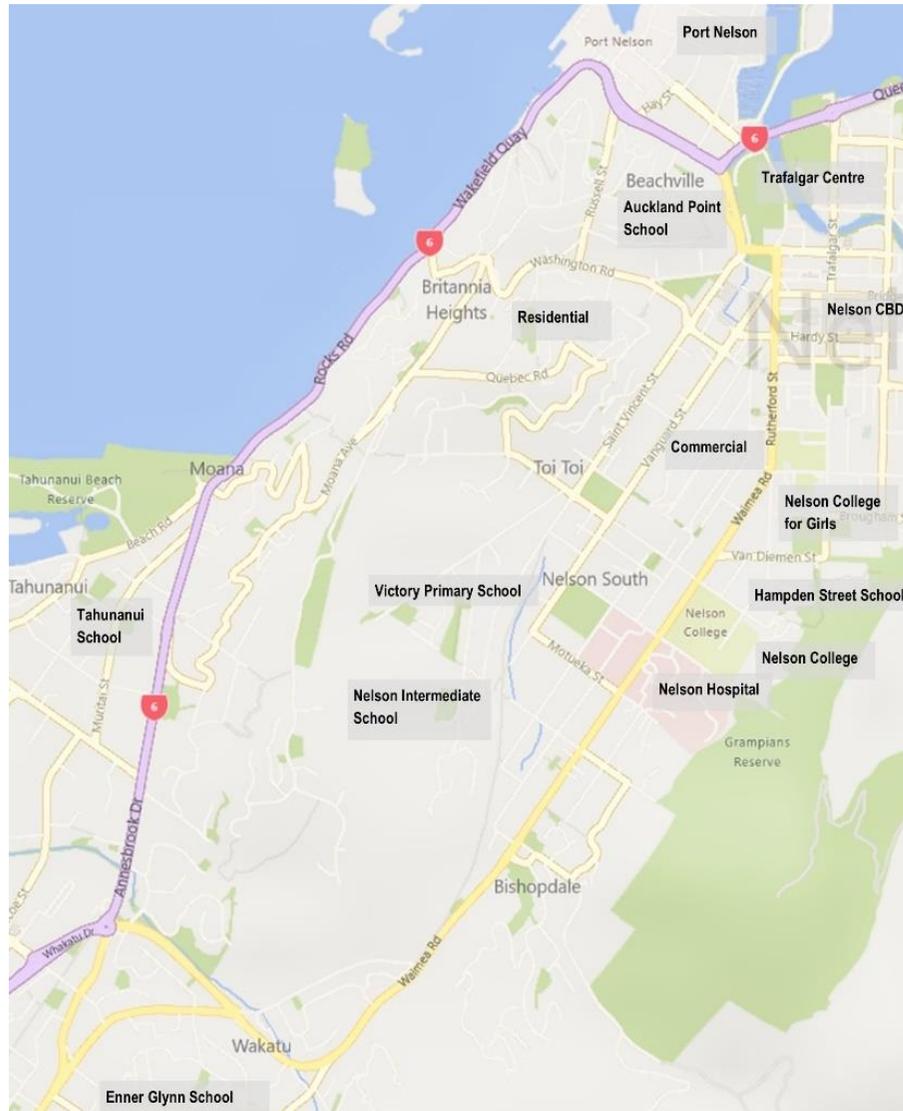
The boundaries of the Red area includes:

- SH6 Rocks Road, Tāhunanui Drive and Annesbrook Drive fronting the harbour
- Waimea Road and Whakatu Drive

The project area is shown in more detail in Figure 6. The area includes the Nelson hospital campus, Nelson colleges, primary and intermediate schools, commercial, retail and residential areas.

The area of influence is defined as those areas within Nelson City and Tasman that impacts mobility within the project area. This includes the suburb of Richmond on the boundary with Nelson City, Nelson CBD and commercial areas, residential suburbs, Airport and Seaport.

Figure 6: Project area



## 2.2 Status of the Evidence Base

A number of different datasets were used to understand the impacts of the transport network. These are described in Table 1.

Table 1: Status of the evidence base

| Data Source                       | Details                                                                                                                                                        |
|-----------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Crash Data</b>                 | Waka Kotahi’s Crash Analysis System (CAS), was used to extract crash data for the last five years                                                              |
| <b>Traffic forecasts</b>          | Traffic forecasts have been derived from the Nelson City Saturn traffic model which uses census population, Journeys to work, and normal residence data sets   |
| <b>Land use forecasts</b>         | NCC and TDC have developed a joint approach to the pattern of urban development over the next 30 years through the adoption of the Future Development Strategy |
| <b>Freight forecasts</b>          | The National Freight Demands Study, and South Island Freight study were referenced to understand freight demands for Nelson Port, and for Nelson City.         |
| <b>Updated traffic counts</b>     | Traffic survey data has been provided by NCC and Waka Kotahi                                                                                                   |
| <b>Active mode counts</b>         | Pedestrian and cyclist counts have been provided by NCC                                                                                                        |
| <b>Public transport patronage</b> | Patronage data has been provided by NCC; public transport modelling to inform future demand                                                                    |
| <b>State highway closure</b>      | Data from the Traffic Road Event Information System (TREIS) was sourced for the previous 10 years for State Highway 6                                          |

## 3.0 Strategic Context

### 3.1 Partners

The Nelson Future Access Project is being developed in collaboration between Waka Kotahi and Nelson City Council as outlined in Table 2.

Table 2: Key partners to the business case

| Partner                                             | Relationship to the Business Case                                                                                                                                                                                                                                                                                                                                                                                            |
|-----------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Waka Kotahi The New Zealand Transport Agency</b> | <p>Management and operation of State Highway 6</p> <p>Co-investor in the maintenance and operation of the Nelson City transport network</p> <p>Co-investor for new and upgraded transport infrastructure where it aligns with the strategic intent</p>                                                                                                                                                                       |
| <b>Nelson City Council</b>                          | <p>The project study area is within the NCC unitary territory</p> <p>Co-investor in NCC transport system with Waka Kotahi</p> <p>Strategic transport planning for the region</p> <p>Provision and operation of the local road network</p> <p>Unitary authority – plans for and manages the effects of the use and development of land</p> <p>Provision and operation of Public Transport Service in partnership with TDC</p> |

Waka Kotahi and Nelson City Council embrace Iwi as partners and are actively engaged for collaboration. For this project the team have actively engaged Iwi in the decision-making process and to identify any cultural values and issues of significance in the area.

Table 3: Mana Whenua and Iwi organisations

| Mana Whenua and Iwi organisations                                                                                                                                                            | Relationship with the Nelson Future Access Project                                                                                                                      |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>Te Tau Ihu Māori:</p> <p>Ngāti Kuia</p> <p>Rangitāne</p> <p>Ngāti Apa ki te Rā Tō</p> <p>Ngāti Koata</p> <p>Ngāti Rārua</p> <p>Ngāti Toa Rangatira</p> <p>Ngāti Tama</p> <p>Te Ātiawa</p> | <ul style="list-style-type: none"> <li>• Crown Treaty Partners</li> <li>• Cultural input to the project</li> <li>• Understanding history and sensitive sites</li> </ul> |

## 3.2 Key Changes

The Programme Business Case (PBC) was completed in 2017 and since then a number of key strategic changes have occurred that influence this business case. Table 4 below highlights the key changes:

Table 4: Key changes since 2017

| Change                                                                     | Impact                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|----------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Government Policy Statement for Land Transport Funding (2018) (GPS)</b> | Provides a greater focus on safety, accessibility, resilient and liveable cities, the environment (including reducing GHG emissions), mode neutrality, reducing dependency on private vehicles (non-commercial), and realising the role of the transport system in improving access to economic and social opportunities                                                                                                                                                                                                                                                                                                                                |
| <b>Government Policy Statement for Land Transport Funding (2021) (GPS)</b> | <p>The updated GPS has identified four strategic priorities for land transport investment to best contribute to improving our communities' wellbeing and liveability:</p> <p><b>Safety:</b> developing a transport system in which no one is killed or seriously injured</p> <p><b>Better travel options:</b> providing people with better transport options to help them access social and economic opportunities</p> <p><b>Improving freight connections:</b> to support economic development</p> <p><b>Climate change:</b> transitioning to a low carbon transport system that supports other Government initiatives to reduce harmful emissions</p> |
| <b>National Policy Statement on Urban Development Capacity (NPS-UD)</b>    | Identified the Nelson Urban Area as a medium growth area. The NPS-UD has provided a greater density of urban development within key urban growth areas and reducing the requirements for residential on-site parking.                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>Future Development Strategy (FDS)</b>                                   | Nelson and Tasman have developed a joint approach to the pattern of urban development over the next 30 years through the adoption of the Future Development Strategy. The FDS supports the intensification around the existing urban settlements of Nelson City Centre, Nelson South, Tāhunanui, Stoke and Richmond. The future development is anticipated to be along, and connected to, an existing well-                                                                                                                                                                                                                                             |

| Change                                                                                     | Impact                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|--------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                            | defined road transport network that provides both opportunities to enhance transport choice and address potential issues if the future transport network to support growth is car-based.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>Climate Emergency</b>                                                                   | In May 2018, Nelson City Council declared a State of Climate Emergency in recognition of the mounting advice from scientists and the United Nations that there is a small window for action to avoid the most damaging effects of climate change                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>Zero Carbon Bill</b>                                                                    | The government has also passed the Zero Carbon bill which will drive meaningful climate action in New Zealand. The act will commit New Zealand to zero carbon emission by 2050 or sooner to address the long-term challenge of climate change. This will require rapid and far reaching transitions in energy, land and infrastructure including freight and general transport                                                                                                                                                                                                                                                                                               |
| <b>Arataki Version 2 – Waka Kotahi’s 10 year view for land transport investment (2020)</b> | The current Arataki Version 2 strategy (2020) provides guidance to meet the objectives and need of the land transport system over the longer term. Version 2 provides a deeper understanding of the potential impacts of Covid19 nationally and by region. The Top of the South Regional summary outlines the focus for Nelson Marlborough and Tasman, “help create a safer, more resilient land transport system. One that supports the recovery from the impacts of COVID-19 on community wellbeing, encourages increased use of public transport, walking and cycling in the main urban centres and provides appropriate levels of service across all transport networks” |
| <b>Keeping cities moving – Waka Kotahi’s plan for encouraging mode shift (2019)</b>        | This national action plan identifies key interventions to implement at a ‘systemwide’ level, directly or in partnership with others to encourage mode shift away from private vehicles. These include special in place-based planning, policy and regulatory settings, investment in infrastructure, platform, services, and economic tools                                                                                                                                                                                                                                                                                                                                  |
| <b>Te Taihu (Top of the South) Regional</b>                                                | Provides the vision to have a safe and connected region that is liveable, accessible and sustainable. Sets out the plan for responding to the growth pressures from population and                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |

| Change                                           | Impact                                                                                                                                                                                                                                                                                                             |
|--------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Land Transport Plan 2021-31</b>               | freight for the Top of South regions including Nelson City., and Waka Kotahi. This business case aligns with the vision and intent of the RLTP.                                                                                                                                                                    |
| <b>National Land Transport Programme 2021-24</b> | Outlines the investment programme funded om the NLTF, and targeted crown funding, over the next three years for delivering on the GPS strategic priorities. Endorsement of this Nelson Future Business Case has been identified in the NLTP as critical for unlocking future funding for activities from the NLTF. |

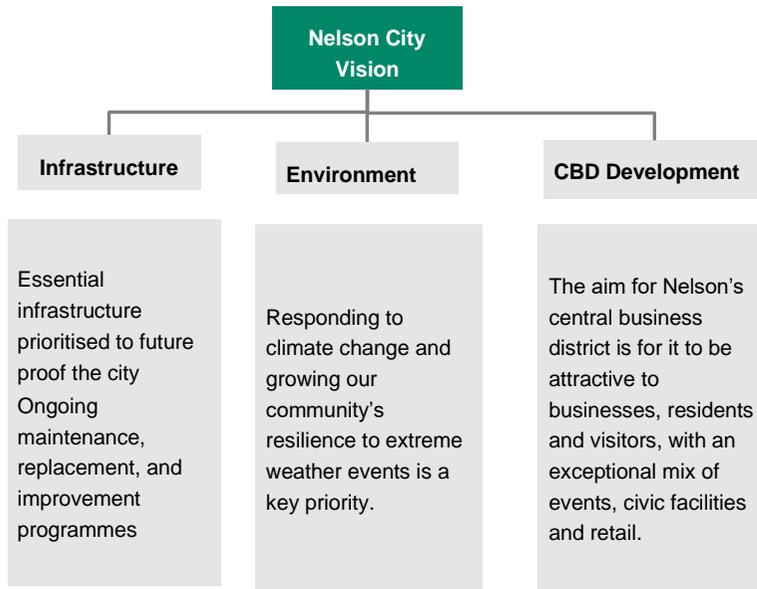
### 3.3 The Future for Nelson City

#### 3.3.1 Long-Term Plan

The vision for Nelson is set out in the Long-Term Plan, as follows: “Nelson is a vibrant place where we are deeply connected with, and committed to, our natural, social and cultural environment. Clever business and innovation help us thrive. We enjoy living fulfilled lives in smart, sustainable communities”.

Achieving this vision is built on the following priorities relevant for this Business Case outlined in Figure 7.

Figure 7: Nelson City vision priorities



**3.3.2 A Thriving Waterfront**

Nelson City and its citizens have a desire to develop the waterfront area along SH6 Rocks Road as a key recreational destination for residents and visitors. The corridor will provide opportunities for walking and cycling, and enhanced links for those modes into the central city. The creation of a high-quality space along the Rocks Road corridor needs to consider the trade-offs between the movement of people and freight by different modes to achieve the world-class waterfront vision that Nelson City Council wants to achieve.

**3.3.3 Residential Amenity**

The amenity values for the residential areas within the study area are valued by the community. This is an important factor for Nelson which attracts new residents and is valued by existing residents. The FDS requires better management of traffic conflicts by ensuring the right road for the right volume of traffic. Elevated vehicle

volumes on lower classificational residential streets can adversely affect the health and well-being of the people who live within the area.

In the past Nelson City has used structure plans to help guide development. This overall plan provides direction for all the elements that contribute to a quality urban environment. Within the study Tāhunanui has had a structure plan in place since 2004<sup>2</sup>. Figure 8 shows the proposed road hierarchy from the structure plan. This information would provide part of the baseline information for considering options in this business case.

Figure 8: Tāhunanui structure plan road hierarchy (2004)

Figure 6 Road Hierarchy Plan



Further context regarding the urban form, and amenity has been undertaken through a Baseline Urban and Landscape Design Framework (ULDF). The ULDF can be viewed in Appendix I. The report notes:

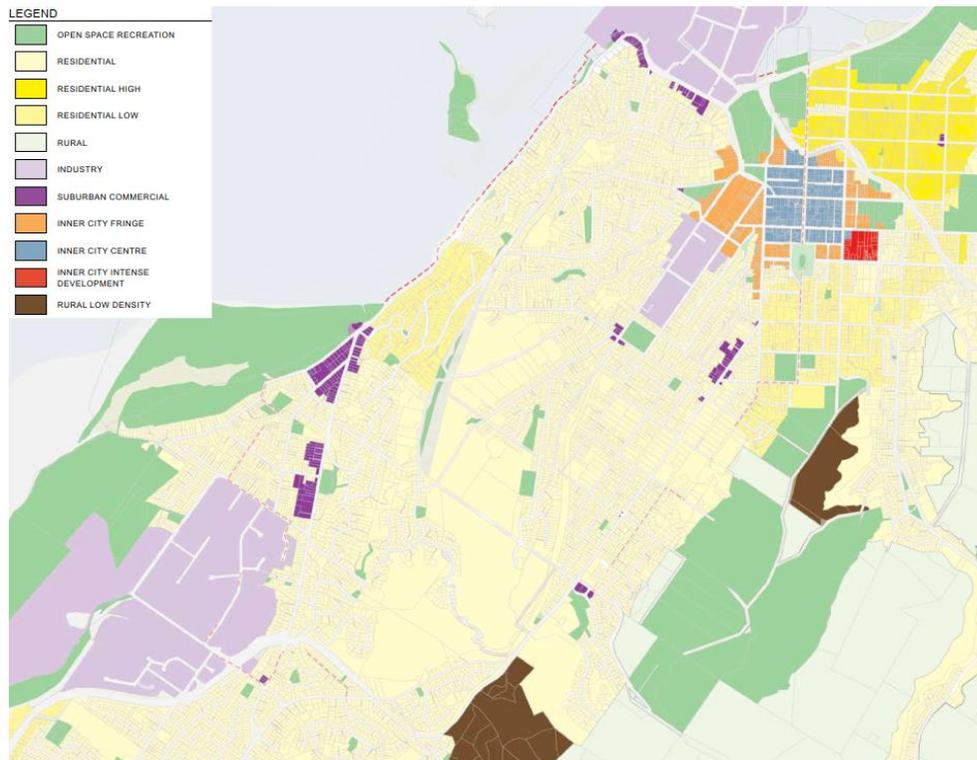
The built form and character of the streets largely reflects the land use, with the land use patterns of Nelson clearly informed by key influencing factors:

<sup>2</sup> <http://www.nelson.govt.nz/council/plans-strategies-policies/strategies-plans-policies-reports-and-studies-a-z/tahunanui-structure-plan/>

- topography, elevation and orientation (valley, ridge or flat)
- natural hazards and flooding risk
- proximity to the city centre
- transport connections and centres and other infrastructure

Figure 9 shows the land-use zoning for Nelson City for the project area reflecting the mixed use.

Figure 9: Landuse zones

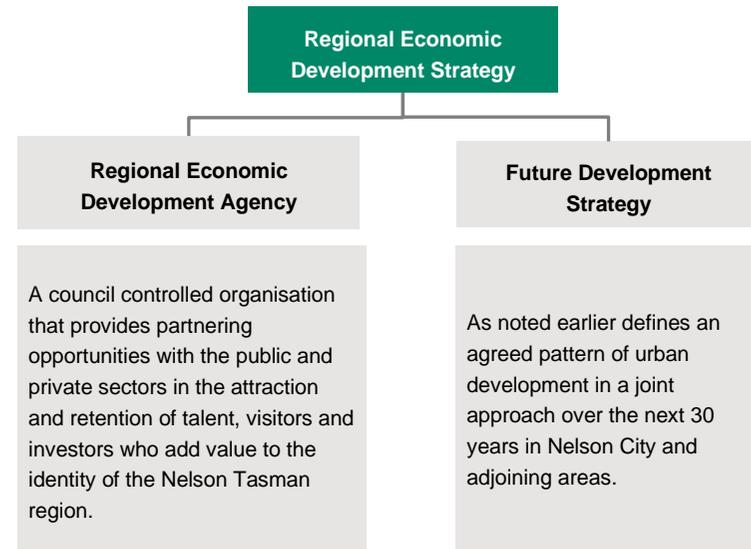


**3.3.4 Economy**

Nelson City forms a common economy with the adjoining Marlborough and Tasman regions, defined as the ‘Top of the South’.

Figure 10 shows how Nelson City manages economic growth and change as part of the ‘Top of the South’ councils.

Figure 10: Economic management



The Top of the South Island contributes approximately 3% of NZ’s GDP, with Tasman and Marlborough Districts being highly export focussed and reliant on factories and manufacturing in both Nelson and Tasman for export.

**A. Freight and the role of Port Nelson**

Port Nelson is the biggest fishing port in Australasia and is the only container port in the Top of the South Island. The port services key local industries which include forestry, fishing and pip fruit, and supplies all fuel for the Top of the South Island. It plays an important role in getting the regions goods to market. Prior to COVID-19, Ministry of Transport’s outlook forecast:

- Continued strong growth at 3.5% per annum in the export of logs through to mid-2030’s but drops off nationwide between 2033 and 2043.
- Continued growth in non-log import and exports (0.5% per annum growth in imports and with 2.5% growth per annum in non-log exports) through to 2043.

Port Nelson does not have a rail connection, with the railway line decommissioned in the 1950’s, and therefore, access to the Port can only be undertaken by road. As a consequence, truck volumes are likely to increase proportionally to the growth (~53% growth in log carrying trucks in the next 15 years, 25% carrying

imports and 62.5% in export carrying trucks) based on the current operating models. Figure 11 highlights the performance of the Port in 2020.

**Figure 11: Port Nelson 2020 performance<sup>3</sup>**



**B. Tourism**

Tourism across the top of the South Island is increasingly important to the regional economy, with a high proportion of self-drive visitors. Nelson’s proximity to three national parks, and an increasing awareness of the region’s cycling and mountain biking trails is enhancing the Top of the South’s reputation as a destination for both domestic and international tourism. Tourism has contributed between approximately 7 to 10 per cent to the Nelson / Tasman GDP in the past 10 years,

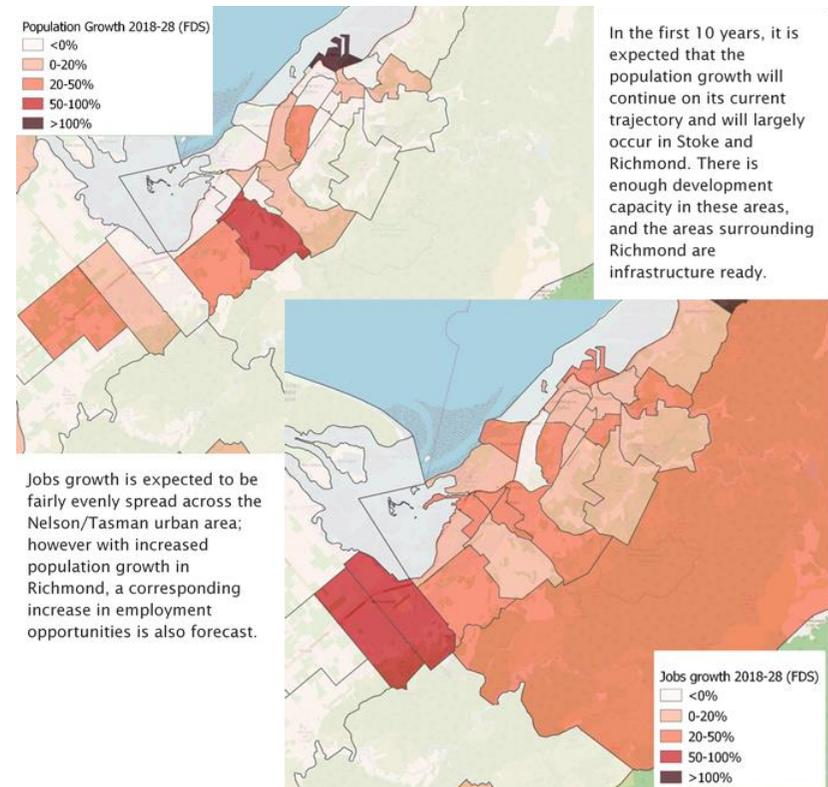
Nelson Airport recorded a total of 1.06 million passengers in 2018, a record for Nelson Airport. Both the Ministry of Transport outlook and the Nelson Airport masterplan predicted 2-3% growth through to the mid-2030’s which could see another 800,000 passengers annually passing through Nelson Airport, and also see a corresponding increase in employment opportunities.

**C. Accommodating Population and Jobs Growth**

Population forecasts indicate that up to 30,000 additional people will call Nelson or Tasman home over the next 25 - 30 years. Catering for this growth requires more local services, shops, offices and space for industrial premises. Approximately half of the capacity for dwelling growth is being planned for the Nelson/Richmond urban area which could mean another 15,000 people.

Figure 12 and Figure 13 show the spatial allocation of the population growth over the next 30 years, from the NTTTM developed for assessing the effects of the Future Development Strategy.

**Figure 12: Population and Jobs Growth between 2018 and 2028 at Census Area Unit Level**



<sup>3</sup> Port Nelson, Annual Report 2020

Figure 13: Population and Jobs Growth between 2028 and 2048

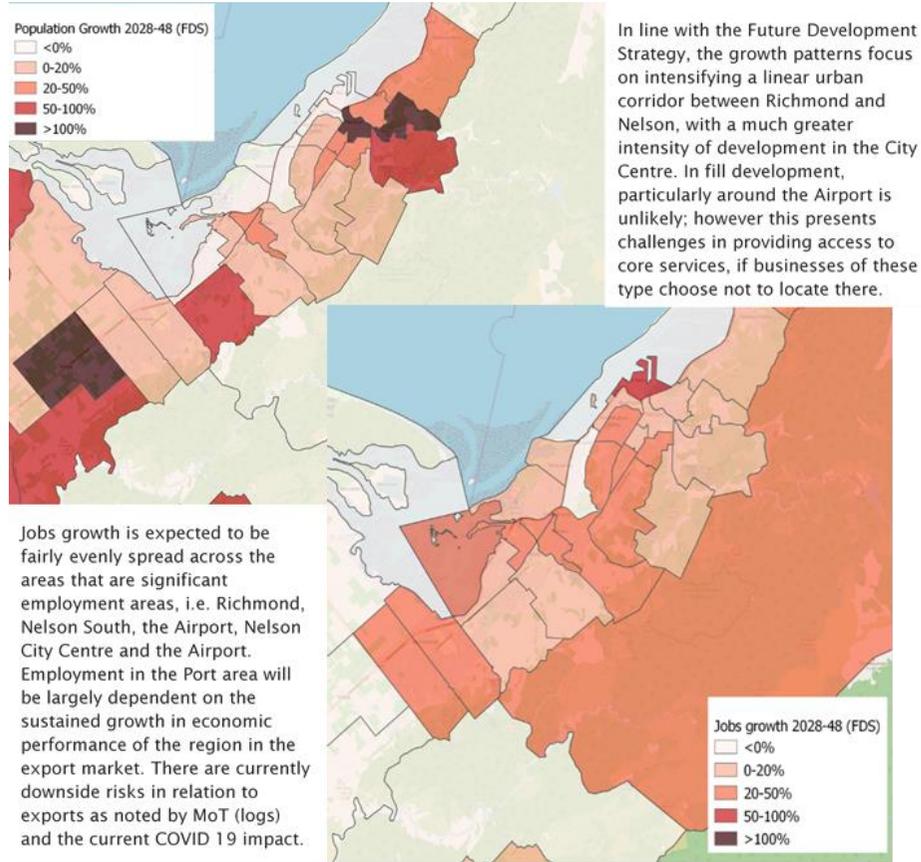
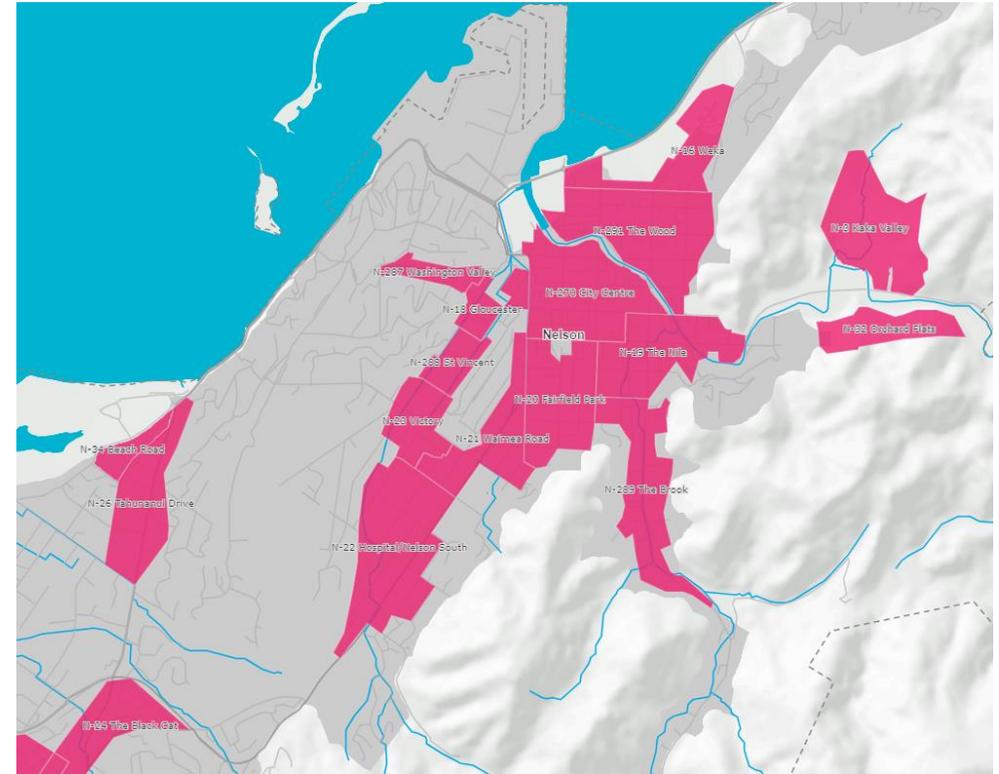


Figure 14: FDS Urban Intensification Areas



**3.3.5 Future Travel Demand**

The forecast demands using previous population forecasts (pre-Future Development Strategy) indicated that the demand for travel in the morning peak and throughout the daytime was expected to increase by ~10% and ~15%, respectively, through to 2048. The 2019 Future Development Strategy forecasts indicate that the growth in morning peak period travel across the network is expected to increase by approximately 52%, with the majority of this expected to be beyond 2028 (in line with the Future Development Strategy planning scenario).

There is a large increase in short trips undertaken by private vehicle over this time. This is due to a lack of alternatives to private vehicle and has a significant impact of the time taken to make trips due to increasing congestion, transfer to alternative

modes, safety impacts particularly for vulnerable users, and locally generated air emissions.

### 3.3.6 Covid19 Impacts

Waka Kotahi's Arataki Top of the South Regional summary considers the consequence of COVID-19 on the economy, employment, and forecast growth. The following is noted:

- Impacts of COVID-19 on employment will result in a decrease of 6.7% in Nelson jobs and this is line with the national average. Nelson is projected to have the strongest job growth over the medium-term and employment levels should return to near BAU by 2025.
- Economic drivers are expected to remain consistent with employment in the service sector concentrated in the larger urban centres.
- International tourism was forecast to grow but will be impacted by COVID-19, at least in the short to medium-term. Domestic tourism may increase in the short-term, offsetting some of the decline.

### 3.3.7 Urgency

The need for this business case now is to understand the scale of the transport problems and guide the future planning and funding for addressing these problems. Funding from the NLTF requires a business case to be completed and endorsed. In the absence of approval for funding from the NLTF the full funding burden would fall on Nelson City Council and its ratepayers. With the growth in population and freight over the next 10-30 years it is necessary for the Council in partnership with Waka Kotahi to understand what the scale of the problems in the future will be, and what activities will be effective for addressing them. Co-funding between the parties is contingent on the activities being aligned to the strategic priorities of the GPS, and how the activities are then prioritised in the NLTP.

The FDS provides the guidance for the growth and density of residential and commercial development in the city. In the absence of a comprehensive plan for addressing the transport issues created by these new developments the Council and Waka Kotahi will be forced into reactive measures. This will be accentuated if developments are fast-tracked for different reasons meaning that there is less time available to properly plan, design, consent and implement measures to mitigate the transport impacts.

## 4.0 Problems and Opportunities

To understand the key problems and opportunities for investing in changes to the transport network an Investment Logic Mapping (ILM) workshop was undertaken. The ILM workshop was held on 20 May 2019 with key stakeholders and the following key problems were agreed for this business case:

**Problem 1:** The inability of Nelsons transport network to support the increasing movement of people and freight between Stoke and Nelson city centre is constraining the economic growth and social well-being of the region.

**Problem 2:** Conflicting uses and inappropriate use of the network severs neighbourhoods reducing their safety and amenity.

**Problem 3:** The susceptibility of the arterial network to natural events of increasing severity and a greater number increases the risk of significant economic shock to Nelson and the wider region.

The following key benefits were agreed from resolving these problems:

**Benefit 1:** Nelson's transport system is more effective in moving people and freight.

**Benefit 2:** Nelson is more accessible.

**Benefit 3:** Nelson's transport system contributes to quality urban environments.

**Benefit 4:** Nelson's transport system feels safer and is safer.

**Benefit 5:** Nelson's transport system is more resilient.

It was agreed through the development of the benefit statements that these would form also the Investment Objectives for this business case.

The Problems and Benefits agreed have been refined from the previous statements identified in the PBC. The changes were primarily focussed on refining the key problems and benefits of investing into the underlying causes, and the overall impacts on the city.

PBC Problems and Benefits:

**Problem 1:** The form and function of Nelson's two arterial corridors results in congestion and delays.

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

**Benefit A:** reduced journey times.

**Benefit B:** Improved safety for walking and cycling modes of travel.

**Benefit C:** Improved tourism, active transport and recreational activities on Rocks Road.

### 4.1 Problem 1: Ability to Move People and Freight

Waimea Road and Rocks Road currently experiences congestion levels that are worse than other regional cities. The evidence indicates that the arterials could provide more reliable vehicular travel throughout the day. This would require the general traffic and heavy vehicle volumes using the existing two-lane arterials to be kept at the current observed peak volumes per lane during the winter months (approximately 10% less than the current summer volumes).

The resulting impact of growth without good modal alternatives is realised in car-dominated mode share (which increases with distance from Nelson City’s CBD), congestion on Waimea Road and SH6 Rocks Road, an increase in the use of the local roads (rat-running), increased long-stay parking on suburban streets throughout the day, and Rocks Road and Waimea Road being classified as having a medium-high collective safety risk.

Failure to address the ability to move people and freight more effectively will increase the cost of moving freight to markets, potentially increase the costs of travel for businesses who rely on the transport system for trade, could impact on the desirability of Nelson as an attractive place to move to for those wanting a location with a better lifestyle that is easier to get around, and could increase vehicle emissions and particulate matters in sensitive air quality areas.

Table 5 summarises the causes and consequence associated with Problem 1.

**Table 5: Summary of causes and consequences for Problem 1**

|                                                                                                                                                                                                                                                     |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Cause</b>                                                                                                                                                                                                                                        |
| <b>Problem 1: The inability for Nelson’s transport network to support the increasing movement of people and freight between Stoke and Nelson City Centre</b>                                                                                        |
| <b>Demand side issues</b>                                                                                                                                                                                                                           |
| Population and employment growth in Nelson and Tasman increasing the demands for travel to Nelson City Centre and Nelson south in the morning peak travel by ~32% to over 7,000 people per hour in the morning peak period (Source: TRACKS models). |

|                                                                                                                                                                                                                                                                                                                                                |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Higher demands for travel between October and March (up to 10%) associated with an increase in economic activity which is not confined to holiday periods leading to an average 5-7 minute increase in peak direction travel on Waimea Road and Rocks Road (SH6) (more than doubling the travel times).                                        |
| <b>Supply side issues: Limited Alternatives</b>                                                                                                                                                                                                                                                                                                |
| The main public transport services are limited to Main Road (Richmond – Stoke) (15 minute frequency) then via Waimea Road or Rocks Road (30 mins frequency).                                                                                                                                                                                   |
| People moving capacity on routes to Nelson City Centre (Waimea Road and SH6 at Tāhunanui) is lower than the capacity of the roads and streets approaching these routes creating bottlenecks.                                                                                                                                                   |
| Parking is generally accessible and cheap making it easier to drive to the City Centre, with ~4,000 on-street and off-street parking spaces available.                                                                                                                                                                                         |
| <b>Consequence</b>                                                                                                                                                                                                                                                                                                                             |
| <b>Constrains economic growth and the social wellbeing of the region</b>                                                                                                                                                                                                                                                                       |
| High car mode share from areas that are further away from Nelson City.                                                                                                                                                                                                                                                                         |
| Low public transport patronage (1% of workers Census, 2013 and 2018) compared to what would be needed to manage road congestion in a reliable manner (~10% of observed current demands for Waimea Road and Rocks Road). Feedback suggests that the low public transport mode share is due to the timetable and routes not being comprehensive. |
| High use of available parking at the expense of short-stay parking for retail activity or other more productive uses.                                                                                                                                                                                                                          |
| Congestion and variability of travel beyond the peak hour leading to declining access to the City Centre by car and public transport, and to the Port for freight. In the afternoon the peak period is between 3pm and 6pm reflecting the peak hour spread beyond a typical 2-hour period.                                                     |
| Impact on the reliability of freight movement, therefore increasing costs of moving goods due to the time that is allowed to arrive on schedule                                                                                                                                                                                                |
| Increasing variability means fewer trips that are made therefore impacting on the economic growth of the region not only for moving freight, but for all other services reliant on the transport system.                                                                                                                                       |

The “off-peak” window through the day is reducing, which has a direct impact to the productivity for business related travel and services

**4.1.1 Current Mode Share**

Commuting to work in a private vehicle is still the dominant mode in Nelson city. People who drive or are a passenger in a vehicle account for 72% of the people commuting to work. This compares to 73% nationally. For the comparative districts and cities, Tasman District has 68% through to Napier City which has 79% of people commuting by driving.

Nelson city has a high proportion of active mode travel to work and school relative to the national average. Figure 15 shows that the percentage number of people traveling to work by active mode in Nelson city for the 2018 census was 13%. This is compared to the NZ average of 7%.

While higher than the national average it falls below the policy expectations for people traveling to work by active modes. The Out and About (2015) policy has an aspirational target for 25% of commuters to work choosing an active mode with the more recent Regional Land Transport Plan having a desired trend of ‘increasing’.

Public transport use is low in Nelson City at 0.7%. This is below the national average of 4.2%, but is on trend with the surrounding districts and comparative cities all being below 1% patronage.

**Figure 15: Travel to work mode share 2018**

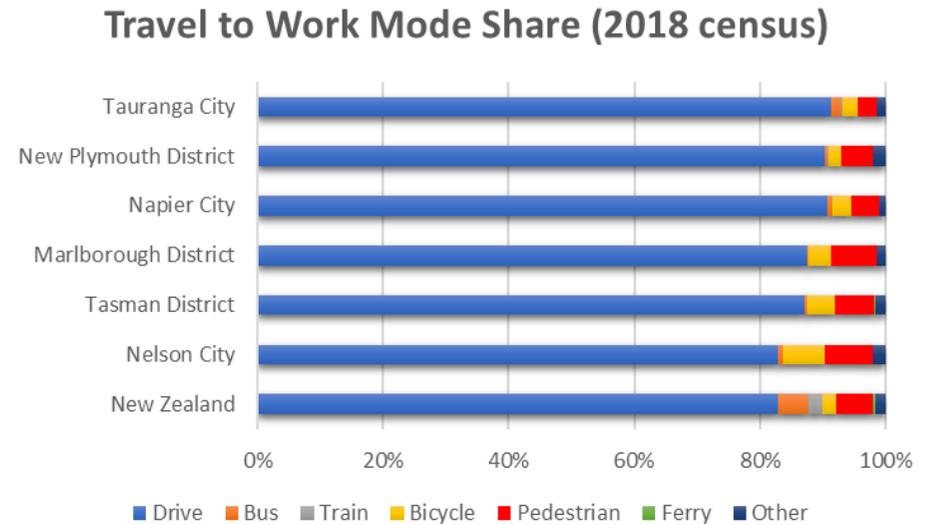


Figure 16 shows a comparison of the change in mode share between 2001, 2006 and 2013 census periods. The comparison between these periods show there is little change in mode share for people commuting to work compared to 2018 for Nelson City.

Figure 16: Travel to work mode share comparison 2001-2013



Figure 17: Travel to education mode share 2018

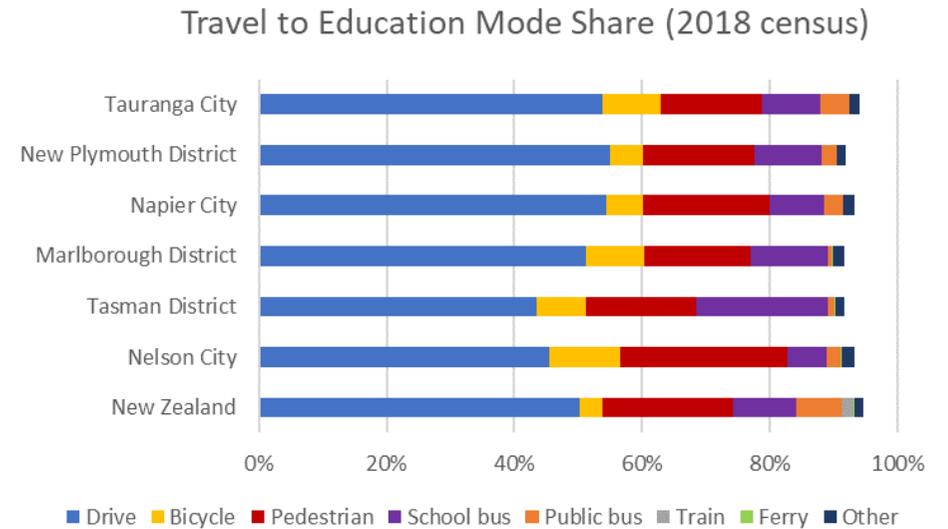


Figure 17 shows students traveling to education by active mode in Nelson city from the 2018 census was 37%. This is compared to the NZ average of 24%, and the surrounding districts and comparator cities that are 25% to 26% active mode share respectively.

Travel to school by school bus and public bus in Nelson city is 8%. This is below the national average of 17% and below the surrounding districts and comparative areas which range from 12% for Napier City, and 22% for the Tasman District.

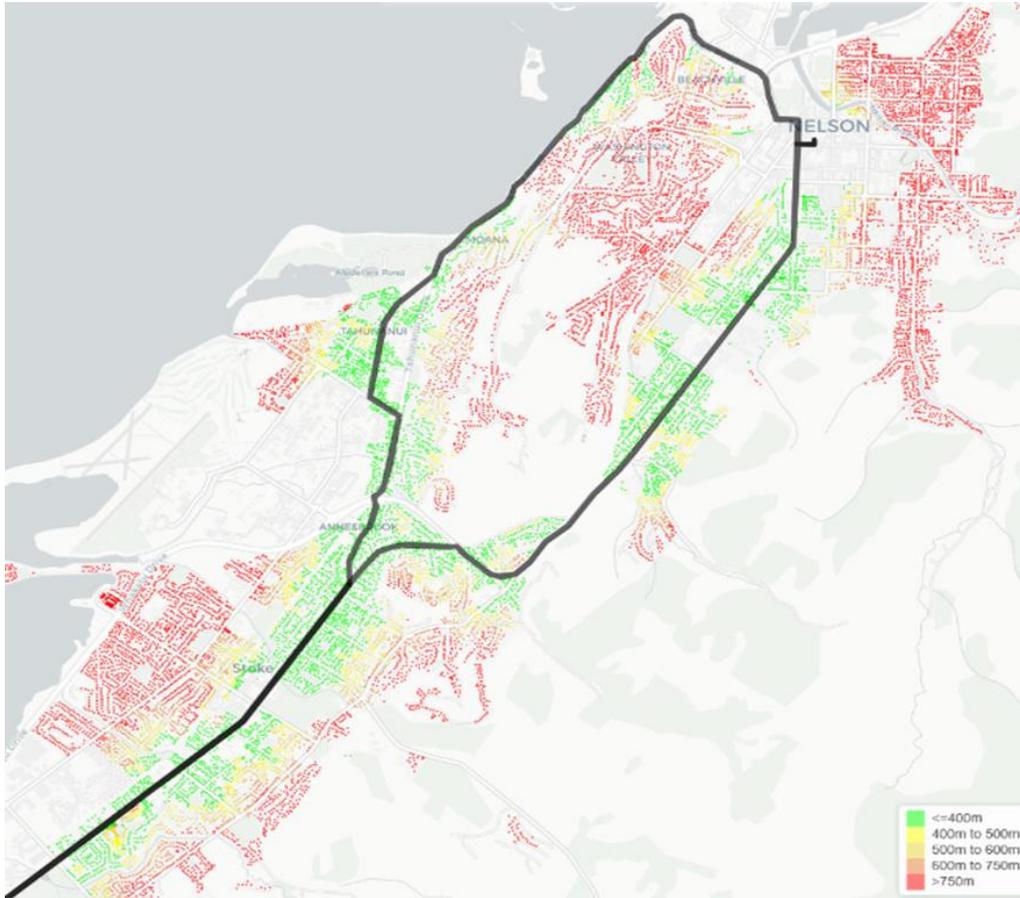
**4.1.2 Bus public transport**

As noted in Section 4.1.1, bus public transport has a very low percentage mode share in Nelson City. Key reasons include the accessibility to a bus public transport route from surrounding residential areas, the frequency of bus movements along the route in the peak periods, and the level of service of the journey compared to private vehicle. Level of service for this purpose is defined by travel time.

Accessibility to public transport for routes one and two that traverses the study area is shown in Figure 18. Based on an appropriate 85th percentile walk time to public transport, a 10- minute walk catchment equates to approximately a 750m access trip length. A walking trip less than 400 metres is considered highly accessible. Walking distance in excess of 750 meters results in a steep drop-off of people choosing to take a bus from their origin. Previous research shows that 75% of walk-to-bus trips were less than 500m, and internationally were between 400m and 800m.<sup>4</sup>

<sup>4</sup> Wedderburn, M (2013) Improving the cost-benefit analysis of integrated PT, walking and cycling. NZ Transport Agency research report 537

Figure 18: Proximity public transport services (Routes 1 and 2)



The Regional Public Transport Plan 2021-31 has been informed by customer surveys undertaken to test the quality of the public transport service in the region. There was generally good consensus about what people didn't like about the service and what they would change in Figure 19 and Figure 20. A high proportion of the responses disliked the times and tables and the routes, and this translated to the majority of feedback focusing on changes to these two elements.

Figure 19: What survey respondents dislike about the bus PT network

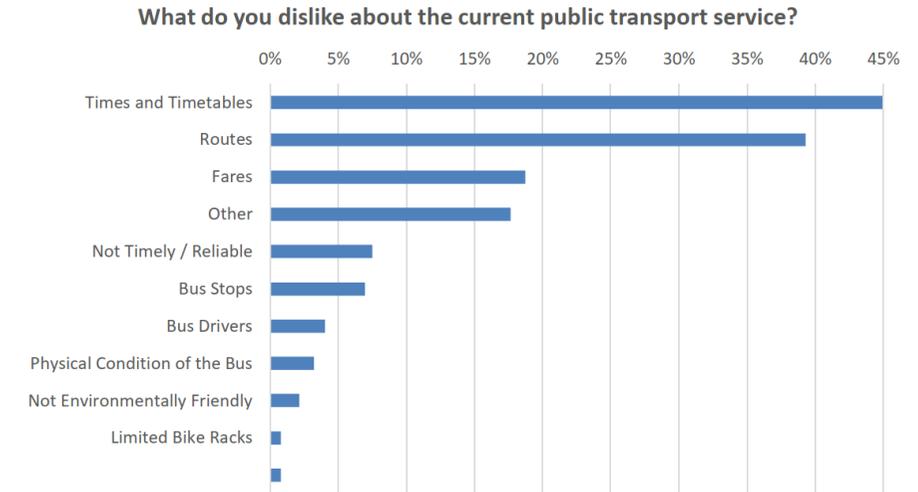
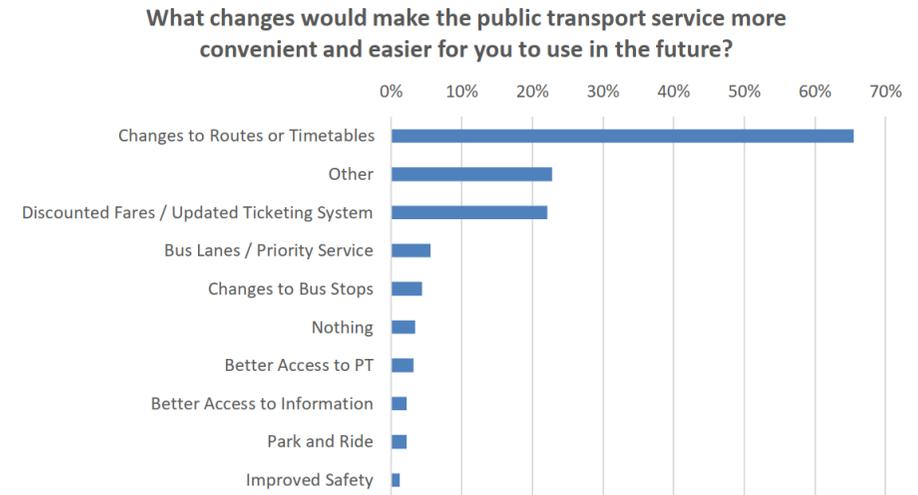


Figure 20: What survey respondents would change about the bus PT network



Recent changes to the regional public transport service include reducing the fare structure from four zones to three zones, and the introduction of the Bee Card. The consolidation of the four zones was undertaken by collapsing the previous zones one and two and replaced by three zones shown in Figure 21. The Bee Card is a

tag-on tag-off prepaid travel card that replaces the previous paper based ticketing system.

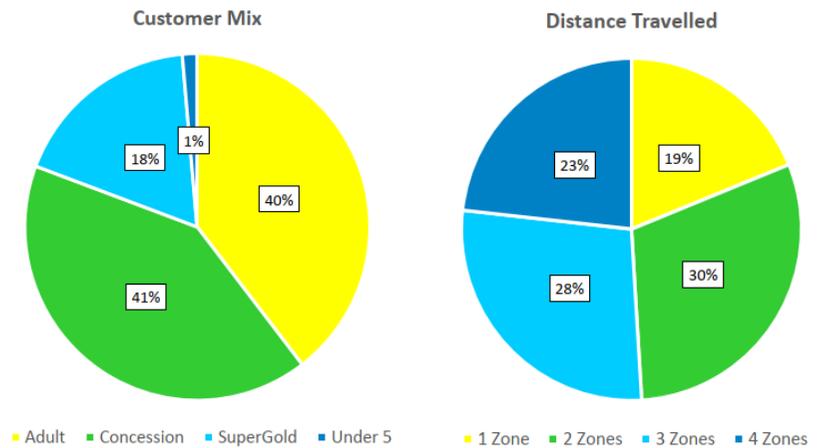
Figure 21: Fare Zones



Adult and concession fare users each account for around 40% of current customers, with the balance being primarily SuperGold Card holders. Concession fares are available to children, students, and Community Services Card holders.

The typical distance travelled by customers under the previous four-zone fare structure is shown in Figure 22. It indicates that more than two thirds of customers travelled more than one zone, even though it is only possible to do this on routes 1 and 2. This suggests that the network is predominantly used for longer journeys to destinations that fall outside of a reasonable journey by active modes, highlighting a potential issue with most of the routes, which fall within one zone and thus only provide for short distance transfer-free travel.

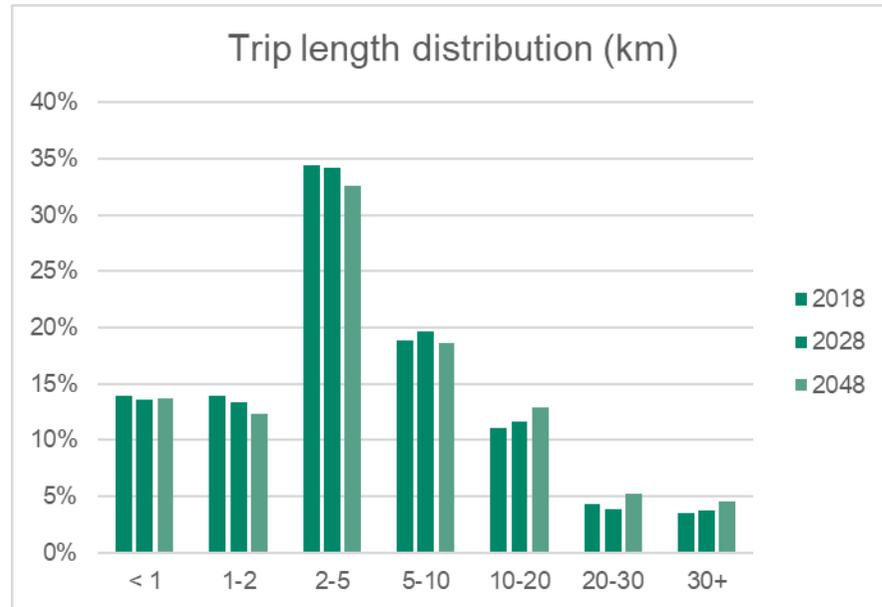
Figure 22: Customer mix and distance travelled on public transport



This is supported by the transport modelling. From the public transport component of the models, nearly all the modelled public transport trips are within the 5km – 20km range (longer distance travel), which indicates that the potential target market for increasing public transport patronage is for those longer distance trips from Stoke and areas further south, as well as increasing PT and active mode share for shorter trips.

Further analysis of the modelling indicates that ~90% of the public transport patronage is captured when the equivalent road travel time is between 5 mins and 30 mins (essentially where the walk time & wait times are a lower proportion of the overall travel time). In essence the opportunity exists for a greater uptake of public transport for travel into the Nelson/Nelson South area with greater spatial coverage of public transport and increased frequencies.

Figure 23: Trip Length Distribution of car travel



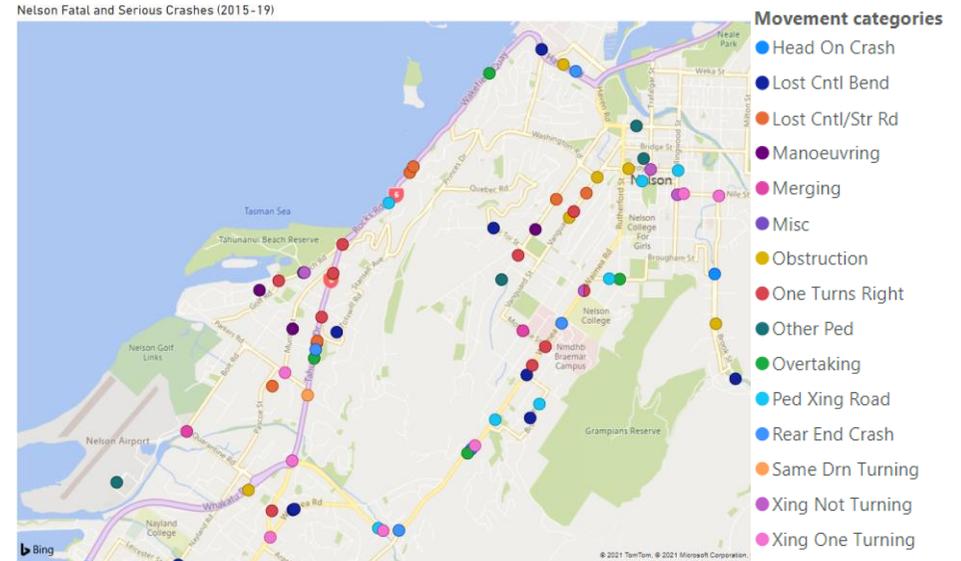
4.1.3 Network Demand

Journeys between Nelson City’s CBD, Waterfront, Airport, Port and Richmond are made largely via SH6 Rocks Road or Waimea Road, both of which are key arterial routes collectively carrying approximately 45,000 vehicles per day (approximately 55,000 people per day based on 25% of vehicles having more than one occupant<sup>5</sup>).

Both arterials are currently operating either at or above their sustainable mid-block capacity during peak and are identified as having a collective medium-high safety risk (the exposure, likelihood and severity of a crash at a point in time using the previous five year actual crash history). This indicates that conflicts are not being safely managed under high traffic volumes.

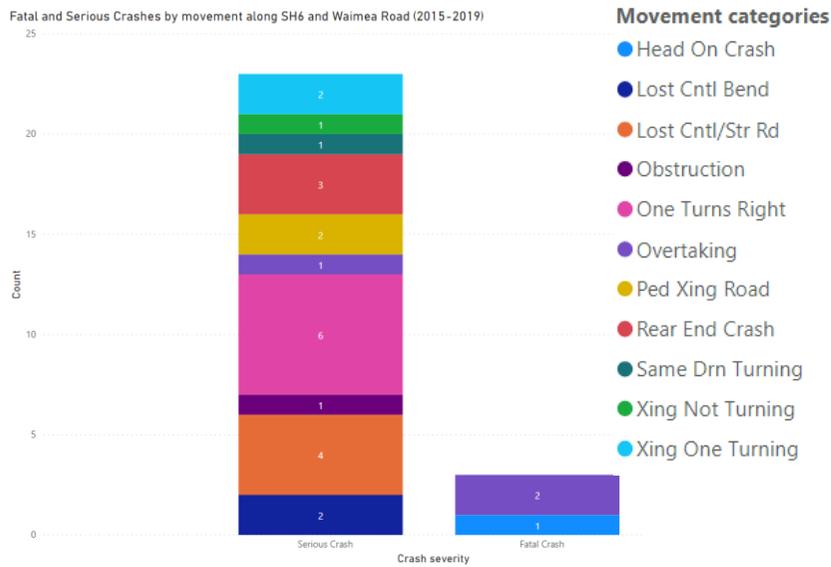
Figure 24 and Figure 25 shows the fatal and serious crashes within the study area between 2015-2019. The majority of these crashes occur on the two key arterials of SH6 and Waimea Road. Crash types cover a wide range of movements, with crashes occurring at intersections and mid-block sections of the corridors.

Figure 24: Fatal and Serious Crashes (2015-2019)



<sup>5</sup> Vehicle occupancy surveys

Figure 25: Proportion of movement categories by crash severity

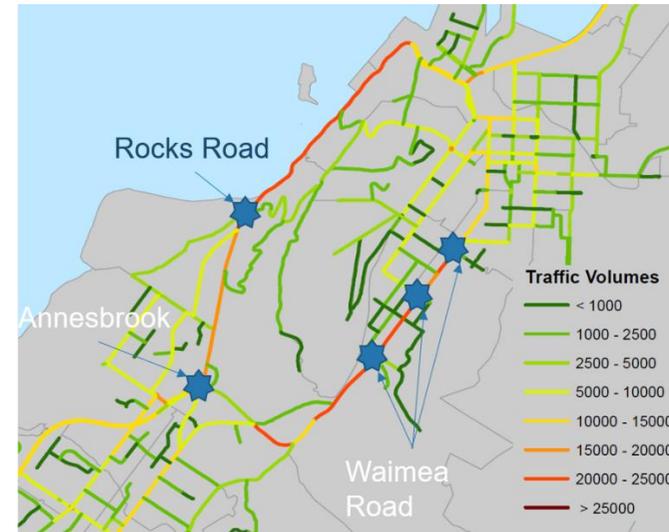


Growth in population and activity are likely to mean that the daily demand to move people and freight between Nelson City to and from areas to the south and west increases by up to 32% by 2048<sup>6</sup>. The ability to move people and goods safely along these corridors is expected to diminish in the foreseeable future without intervention.

There are several bottlenecks along the two arterial roads (Waimea and Rocks Road) that cause delay during peak periods. These have been identified in Figure 26.

Parking surveys undertaken by NCC show over 80% of on-street car parking in the Nelson city CBD is occupied between 10:00 and 15:00 in weekdays, and it is understood that approximately 25% of the short-term parking spaces are occupied by long term stay parking. The current availability of long term parking spaces is facilitating private vehicle use.

Figure 26 Nelson arterial bottlenecks (vehicles per day)



4.1.4 Impact on Reliability

During peak periods there is a substantial increase in congestion on SH6 Rocks Road and Waimea Road. Waimea Road in particular exhibits characteristics typical of an urban commuter route with distinct peaks associated with work travel and school travel. During the day, SH6 Rocks Road (the only road providing access to and from the Port for freight) is within 10% of being congested from 11am through to 6pm, largely due to the intersection delays at Tāhunanui. This impacts on the reliability and costs of moving freight because operators need to allow more time per trip, therefore fewer trips per day can be completed.

It is forecasted that under the do minimum scenario congestion will significantly impact travel reliability along SH6 Rocks and Waimea Road. Levels of service have been used to describe the delay and driver impact.

<sup>6</sup> TRACKS models

Table 6: Level of Service Description

| Level of service | Description                                            |
|------------------|--------------------------------------------------------|
| <b>A</b>         | Highest driver comfort; free flowing                   |
| <b>B</b>         | High degree of driver comfort; little delay            |
| <b>C</b>         | Acceptable level of driver comfort; some delay         |
| <b>D</b>         | Some driver frustration; moderate delay                |
| <b>E</b>         | High level of driver frustration; high levels of delay |
| <b>F</b>         | Highest level of driver frustration; excessive delays  |

The modelled results presented in Table 7 forecast a significant deterioration in the reliability of travel by vehicle with significant delays resulting in Level of Service E to F in the morning and evening peak. Table 8 shows that the increase in travel time and decrease in the evening peak period is broadly 100%.

Table 7: Impact of car demands on level of service

|                                            | Measure                     | 2018-19<br>(modelled)<br>LoS | 2048<br>LoS |
|--------------------------------------------|-----------------------------|------------------------------|-------------|
| SH6 Rocks Road – Northbound (Morning Peak) | Average                     | C                            | C           |
|                                            | 85 <sup>th</sup> percentile | D                            | E           |
| Waimea Road – Northbound (Morning Peak)    | Average                     | C                            | C           |
|                                            | 85 <sup>th</sup> percentile | D                            | D           |
| SH6 Rocks Road – Southbound (Evening Peak) | Average                     | B                            | E           |
|                                            | 85 <sup>th</sup> percentile | C                            | F           |
| Waimea Road – Southbound (Evening Peak)    | Average                     | B                            | F           |
|                                            | 85 <sup>th</sup> percentile | C                            | F           |

Table 8: Impact of car demands on the reliability of travel on the arterials

|                                            | Measure                     | 2018/9<br>(Modelled) | 2048            | Difference      |
|--------------------------------------------|-----------------------------|----------------------|-----------------|-----------------|
| SH6 Rocks Road – Northbound (Morning Peak) | Average                     | 13 min / 29 kph      | 16 min / 25 kph | +3min / -3kph   |
|                                            | 85 <sup>th</sup> percentile | 18 min / 21 kph      | 22 min / 18 kph | +4min / -3kph   |
| Waimea Road – Northbound (Morning Peak)    | Average                     | 11 min / 29 kph      | 13 min / 25 kph | +2min / -4kph   |
|                                            | 85 <sup>th</sup> percentile | 14 min / 22 kph      | 18 min / 18 kph | +4min / -4kph   |
| SH6 Rocks Road – Southbound (Evening Peak) | Average                     | 11 min / 35 kph      | 20 min / 19 kph | +9min / -16kph  |
|                                            | 85 <sup>th</sup> percentile | 14 min / 28 kph      | 30 min / 13 kph | +16min / -15kph |
| Waimea Road – Southbound (Evening Peak)    | Average                     | 8 min / 39 kph       | 22 min / 14 kph | +14min / -25kph |
|                                            | 85 <sup>th</sup> percentile | 10 min / 32 kph      | 34 min / 9 kph  | +14min / -23kph |

#### 4.1.5 Do minimum Traffic Modelling

In addition to the TRACKS modelling Waka Kotahi commissioned the development of a Saturn traffic model to understand the consequences of land use growth over time on the operation of the road network in Nelson and Richmond, and to test network improvements to address this growth.

The base year Nelson-Tasman SATURN Model (NTSM) was developed to a 2018 'average' weekday for three peak periods; the AM peak (8:00 to 9:00), Inter peak (average of 11:00 to 13:00) and PM peak (17:00 to 18:00).

The 2028 and 2048 forecast NTSM was developed on top of the validated and peer reviewed base year 2018 NTSM which in turn was developed with demand inputs from the regional TRACKS model, the Nelson-Tasman TRACKS Transport model (NTTTM). The NTTTM matrices were updated in December 2019 to reflect the land use development outlook as set out in the Nelson Tasman Future

Development Strategy (FDS) adopted by Nelson City Council (NCC) and Tasman District Council (TDC) in July 2019.

Figure 28 shows the plots from the traffic modelling related to the vehicle/capacity ratio, which is used to define a reasonable level of service (generally accepted as being below 0.85), with orange being 0.8 to 0.9, red being 0.8 to 1.0 and black being greater than 1.0.

Figure 27: Arterial road level of service description

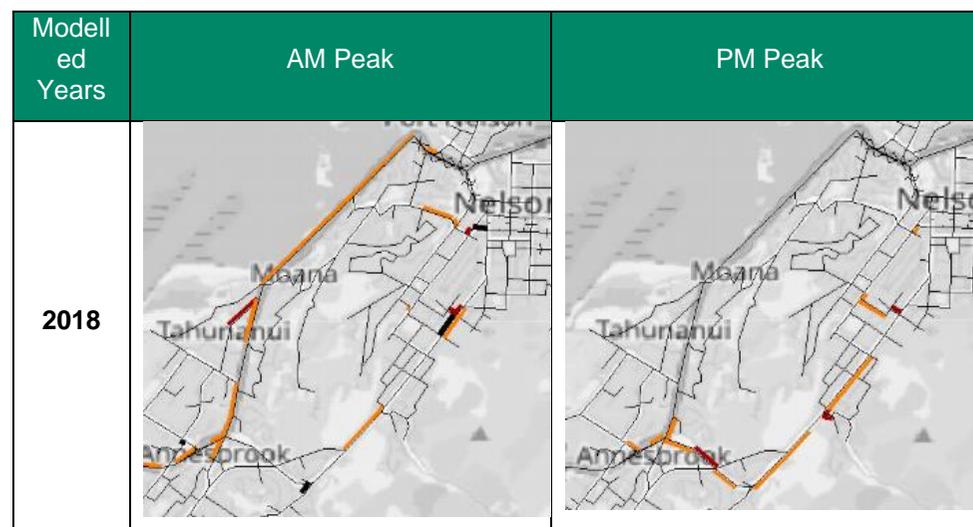
| Level of service | V/C Ratio         | Description                                                                                                                                                 |
|------------------|-------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>A</b>         | 0.00 to 0.60      | Free-flow conditions with unimpeded manoeuvrability. Stopped delay at signalised intersection is minimal.                                                   |
| <b>B</b>         | 0.61 to 0.70      | Reasonably unimpeded operations with slightly restricted manoeuvrability. Stopped delays are not bothersome.                                                |
| <b>C</b>         | 0.71 to 0.80      | Stable operations with somewhat more restrictions in making mid-block lane changes than LOS B. Motorists will experience appreciable tension while driving. |
| <b>D</b>         | 0.81 to 0.90      | Approaching unstable operations where small increases in volume produce substantial increases in delay and decreases in speed.                              |
| <b>E</b>         | 0.91 to 1.00      | Operations with significant intersection approach delays and low average speeds.                                                                            |
| <b>F</b>         | Greater Than 1.00 | Operations with extremely low speeds caused by intersection congestion, high delay, and adverse signal progression.                                         |

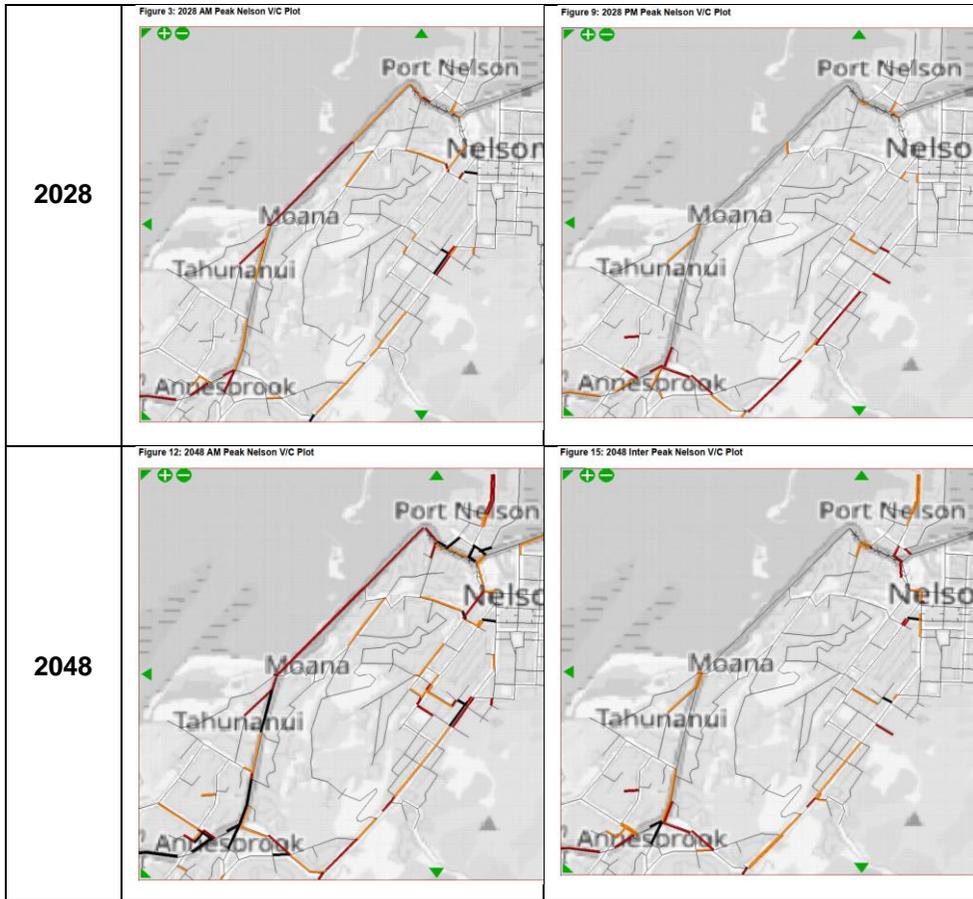
The FDS demand matrices are around 5% and 24% larger in 2028 and 2048 model years respectively than the NTTTM demand matrices from the initial modelling undertaken using land use assumptions contained with Tasman and Nelson’s 2018 Long Term Plans. Averaged over the three peak hours modelled (AM, Inter, and PM peak) the total growth in travel demand is forecast to increase by 17% by 2028 and 51% by 2048.

This growth in travel demand results in a similar growth in total network vehicle kilometres travelled as individual trip distances are not forecast to increase significantly. The total travel time expressed in vehicle-hours travelled is, however, forecast to increase more rapidly than the distance travelled as the links in the network become more congested in the future.

Around two thirds of the growth is forecast between 2028 and 2048 and as a result the increase in congested travel in the 2048 peak hour models is most evident especially in the PM peak.

Figure 28: Do minimum congestion plots 2018, 2028 and 2048





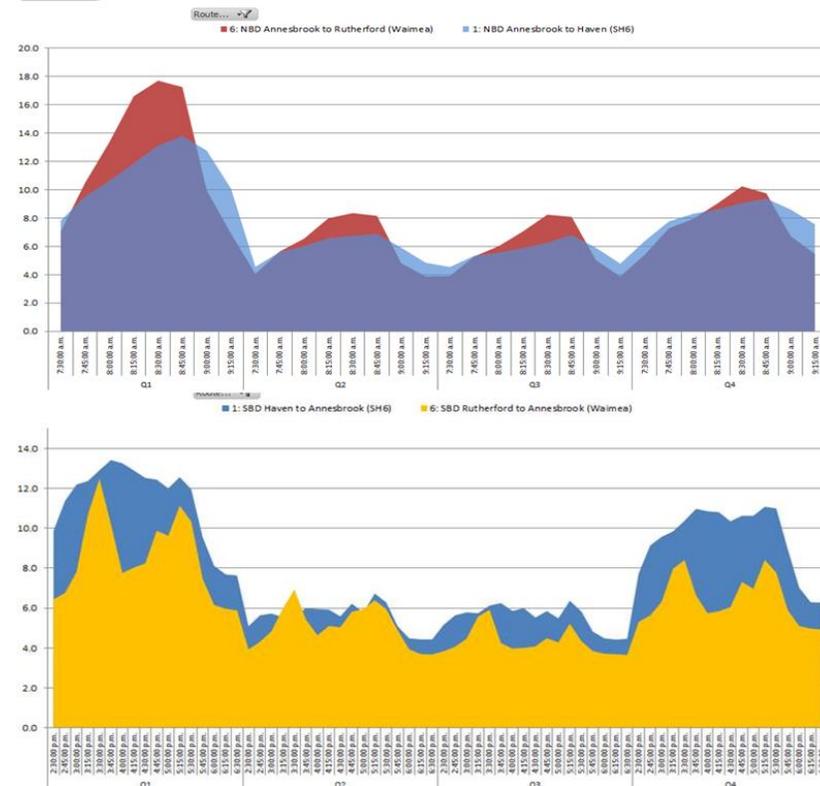
Without any intervention, the journey time analyses suggest that the major north-south arterials, including both Rocks Road and Waimea Road, will be over capacity during the PM peak period by 2048 with travel times more than doubling.

The do minimum traffic modelling was independently peer reviewed and validated, with the forecast years also being independently reviewed and verified. The modelling included in the base year (2018) and the 2028 and 2048 future forecast years.

### 4.1.6 Impact of Seasonal Demands in Average Travel Times

Variability in travel times is more apparent in summer where the demands for travel increases by up to 10% over the daily averages on the arterials, presumably due to tourism. Figure 29 below shows the quarterly median travel times averaged over the last 5 years, with the top figure being the northbound in the morning peak period (7:30 – 9:30) and the bottom figure being the southbound in the afternoon and evening peak period (14:30 – 18:30). These figures provide a reasonable estimate of what could occur with additional growth in travel should it continue to follow the current trends. An increase of up to 10% demand in car travel results in a doubling of travel time. This reflects the impact that growth in traffic volumes will have during the winter periods. With the peaks in the summer periods more likely to spread even further. Rat-running will further increase and the reliability of freight and business trips throughout the day will continue to decline.

Figure 29: Quarterly median travel times (5-year average)



#### 4.1.7 Impact on Greenhouse Gas Emissions

The impact on greenhouse gas emissions based on current vehicle technology has been estimated using the methodology prescribed in the Economic Evaluation Manual (using fleet composition and age, speed and engine size to provide dollars per km by vehicle type) and based on the outputs from the traffic models. Broadly speaking it is anticipated that in the modelled area between 2018 and 2048 there will be:

- ~40% increase in carbon monoxide
- ~15% increase in carbon dioxide; and,
- A near doubling of nitrous oxides and hydrocarbons

Table 9 summarises the carbon equivalent global warming potential (CO<sub>2</sub>e) across these gas types. This results in a 15-18% increase in 2028, and a 37-50% increase in 2048.

**Table 9: Estimated CO<sub>2</sub>e global warming potential (100 years)**

| Year | Time Period | CO <sub>2</sub> e |
|------|-------------|-------------------|
| 2018 | AM          | 6461              |
|      | IP          | 5570              |
|      | PM          | 6043              |
|      | Daily       | 69505             |
| 2028 | AM          | 7415              |
|      | IP          | 6394              |
|      | PM          | 7159              |
|      | Daily       | 80366             |
| 2048 | AM          | 8828              |
|      | IP          | 7719              |
|      | PM          | 9051              |
|      | Daily       | 97566             |

#### 4.2 Problem 2: Conflicting Use

The evidence shows that the network caters for vehicles to reach a wider range of destinations at the expense of other modes and the amenity of the surrounding environment. This impacts the connection between the city and the waterfront along Rocks Road and the residential amenity of the suburban areas.

Nelson's transport system caters primarily for vehicle movement, with the roads being located along established and emerging places without prioritisation or segregation in many aspects. The prevalent form of street (with some exceptions, largely in the CBD) is a two-lane two-way road with on-street parking and space for turning. Except for a few streets within the study area there are no cycling facilities, and there is no bus or high-occupancy vehicle priority of any form across the network. Furthermore, the facilities for active mode crossings are either sparsely located or not suitable (particularly at intersections).

Addressing this alongside the implementation of the Future Development Strategy provides the opportunity to provide a much more pleasant environment for people of all ages and abilities to walk and cycle in Nelson, to capitalise on the opportunity to stimulate the retail and hospitality presence of the Nelson CBD, and to promote the Waterfront precinct as a recreation, tourist and dining destination.

**Table 7: Summary of causes and consequences for Problem 2**

| Cause                                                                                                                                                                                                                   |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Problem 2: Conflicting uses and inappropriate use of the network</b>                                                                                                                                                 |
| <b>Demand side issues</b>                                                                                                                                                                                               |
| High volume roads (SH6, Waimea Road, St Vincent Street and Vanguard Street) create barriers for local activity at Tāhunanui, Waterfront, City Centre and fringe.                                                        |
| High pedestrian and cyclist activity within the City Centre and fringe are expected to grow with greater intensification of residential areas on the fringe.                                                            |
| <b>Supply side issues</b>                                                                                                                                                                                               |
| Ease of access via local street network to bypass congestion on the arterial corridors                                                                                                                                  |
| Urban corridors are providing movement for all modes and access to adjacent properties and local streets in a largely "unmanaged" environment.                                                                          |
| Lack of protected walking and cycling crossing facilities at many intersections and between intersections across the network                                                                                            |
| Narrow walking and cycling facilities (including lack of a buffer or physical separation) on high volumes roads (particularly SH6 and Waimea Road) that are neither suitable for commuter travel nor recreational users |
| Ease of parking on the fringes of the city and along arterial corridors city for long stay parking, conflict with other uses for those corridors                                                                        |

|                                                                                                                                                                                                                                               |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Posted speeds on local streets are higher than the “safe and appropriate” speeds                                                                                                                                                              |
| Constraint: Narrow road corridors with the majority being 20 – 22m wide (boundary to boundary) making it difficult to provide all travel needs                                                                                                |
| <b>Consequence<br/>severs neighbourhoods reducing their safety and amenity</b>                                                                                                                                                                |
| Increasing traffic volumes on local streets as the areas south of the city centre grow, combined with the disparity between speed and the “safe and appropriate speed” reducing their amenity and increasing the crash risk                   |
| Increasing conflict between pedestrians, cyclists, vehicles, buses and trucks on SH6 and Waimea Road                                                                                                                                          |
| Increasing use of the city centre streets and local streets extending further out from the City Centre for long stay parking                                                                                                                  |
| Increasing conflict with people accessing the arterial network and those travelling along the arterial network resulting in high collective risk arterial corridors (Rocks Road and Waimea Road)                                              |
| Increasing conflict with people in high activity areas (e.g. Nelson City Centre, Tāhunanui, schools and hospital) resulting in high personal risk (high probability that a serious injury will occur in an accident).                         |
| Missing the opportunity to increase the recreational, tourism and amenity potential of the Waterfront and City Centre by improving the quality of facilities and lowering the barriers for travelling along and across the arterial corridors |
| Missing the opportunity to provide better connections for active modes for everyday travel between residential areas, City Centre, schools and major employment nodes such as Hospital, Port, NMIT                                            |
| Missing the opportunity to capitalise on the growth in cycling travel (and attractiveness of Nelson as a potential cycling destination for tourism)                                                                                           |
|                                                                                                                                                                                                                                               |

**4.2.1 Street Form and Function**

As a consequence of the car-dominated mode share and street form, Nelson has a number of roads with high traffic volumes (greater than 15,000 vehicles per day including Waimea Road, Rutherford St, SH6 Haven Road, Vanguard Street and St Vincent Street). These roads without good facilities creates barriers for people

needing to access or cross the roads whether it be walking, cycling, moped, car or other mode. It also detracts from the potential to create a pleasant urban environment for people to use. Key examples include:

- Waimea Road has a high movement and place function around the Nelson Hospital and Nelson College. Strong demand for traffic movements combined with pedestrian and cyclist access has resulted in poor safety outcomes due to the form and function of Waimea Road, being identified as having a medium-high collective risk.
- Rocks Road has a high movement function supporting freight and regional vehicle trips and place and amenity function around the Waterfront restaurant precinct.

An online risk assessment tool has been developed by Waka Kotahi to determine the ‘safe and appropriate speed’ limit for roads across New Zealand, based on a range of factors such as crash history, road conditions, surrounding land use and traffic volumes. For Nelson, the safe and appropriate speed on the local street network is 30 or 40kph with only Waimea Road (south of the City Centre), SH6 and streets near the Airport having a safe and appropriate speed of 50kph or more (as outlined in Figure 30). However, a comparison of the posted speed limit of these streets (Figure 31) reveals that most of these streets are operating at the general urban speed limit of 50km/h.

**Figure 30: Safe and appropriate speed limit**

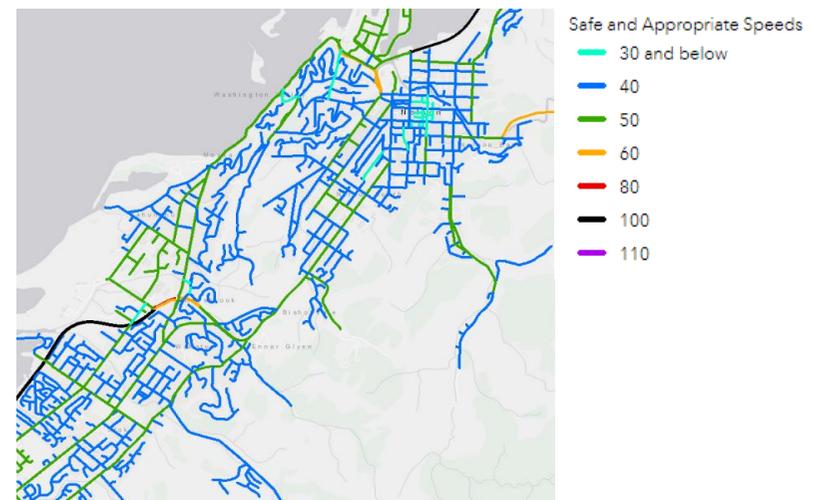
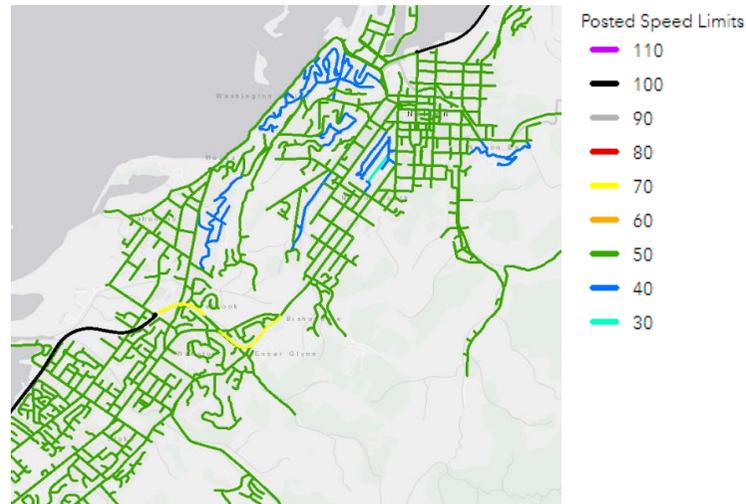


Figure 31: Posted speed limit



#### 4.2.2 Right Traffic Right Road

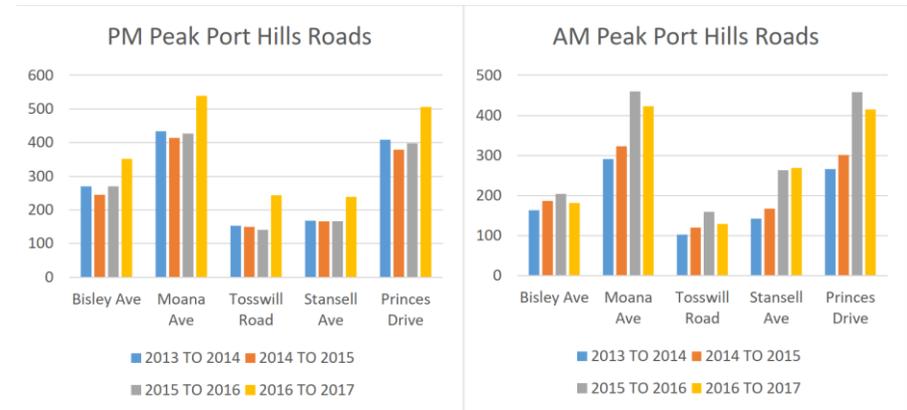
The growth in travel across the network already sees a substantial amount of the network carrying volumes greater than their intended function (the ONRC Road Classification).

There has been a large increase in traffic using alternative streets to the main arterials. This was highlighted in the 2018 Transport Asset Management Plan where the significant growth in traffic volume on the routes that provide an alternative to the arterials of SH6 and Waimea Road during the am and pm peak, were followed by increased complaints by affected residents.

A snap-shot of a selection of roads in the Port Hills that provide an alternative to SH6 Rocks Road and included in the AMP is shown in Figure 32. The AMP notes however that the trend is not confined to this particular section of network as there are several other routes across the city that are also experiencing increases as a result of the increase in arterial road demand.

The customer complaints Council receives highlights the concerns for safety and amenity due to drivers using these residential streets to avoid the arterial roads for through movements. Safety is compromised due to the traffic often travelling faster than the appropriate speed environment to maximise their travel time benefit. Loss of amenity results from increased traffic noise that affects the peaceful enjoyment of the neighbourhood.

Figure 32: Rat run Traffic Volumes on Port Hills Roads



In 2018, traffic counts show that approximately half of the streets within the study area carried more traffic than the recommended maximum for their classification, with the key streets including Washington Road and the local streets between Waimea Road and St Vincent Street (Figure 33).

By 2048, this is expected to increase to approximately 70% of the city's streets and if allowed to continue, could perpetuate the car dominated environment of many of the residential streets (Figure 34).

Figure 33: Links carrying traffic volumes that exceed their classification in 2018

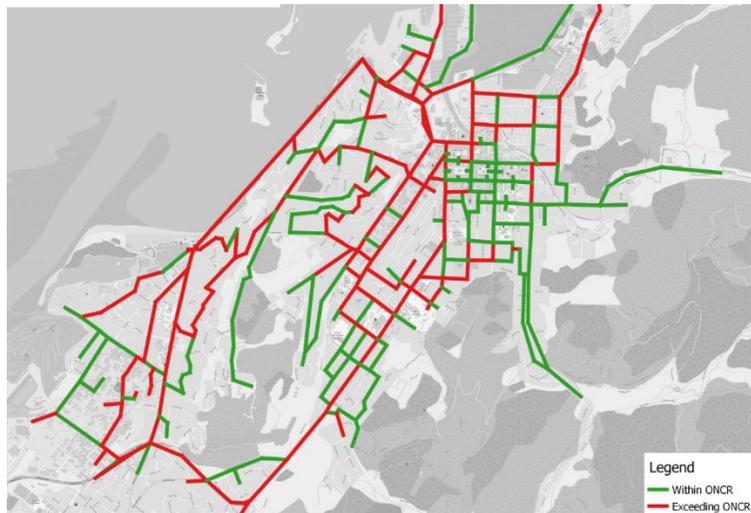


Figure 34: Links carrying traffic volumes that exceed their classification in 2048



### 4.2.3 Active Mode Facilities

A review of Nelson City Council's RAMM data shows that 76% of the existing walking network does not meet the target footpath Level of Service for width being a minimum 2m wide, with 82% not meeting the cycling Level of Service being cycle paths are separated from general traffic. These percentages are representative of both our project area and the whole of Nelson City.

In addition, a lack of safe controlled crossing facilities mid-block and at the intersections are a feature of the network, particularly outside of the CBD. Examples include roundabouts and uncontrolled intersections without zebra crossings or signalised pedestrian crossings nearby. Other features like flush medians and pedestrian refuges create space but will require people to cross/leave the adjacent traffic lanes which can also increase their safety risk compared to the other measures. The key exception is on SH6 Rocks Road between Tāhunanui and Wakefield Quay along the Waterfront which has a very narrow footpath and creates a hostile environment where people are unlikely to want to walk.

The higher areas of pedestrian activity at the northern end of the CBD, along St Vincent Street to Toi Toi Street exhibit a high degree of personal risk. This means that given the overall road profile there is a high chance of a death or serious injury if a pedestrian is involved in a crash with a vehicle.

Where Nelson differs from other areas is that nearly 20% of residents reported walking or cycling to work, which is one of the highest portions of active mode share in the country. However, this is largely skewed by the high proportion of people who live in The Wood, with the rest of the region more in line with the national averages (3-5%). Despite these figures, the City aspires to continue to grow its active mode share for journeys to work of 25% by 2027/28<sup>7</sup>.

Bi-annual monitoring (winter and summer) at five locations on Nelson's cycle network confirms that the Railway Reserve shared path (a former railway reserve linking Nelson to Richmond) is the most popular route of the five monitoring sites. Between 2009 and 2018, there has been, on average, 4.3% p.a. overall growth in cycling on these routes, with the Railway Reserve count sites recording an average growth of 9.8% p.a.

<sup>7</sup> Out and About (2015)

Figure 35: Cycle count data from five sites between 2009 and 2018 (Summer count data)

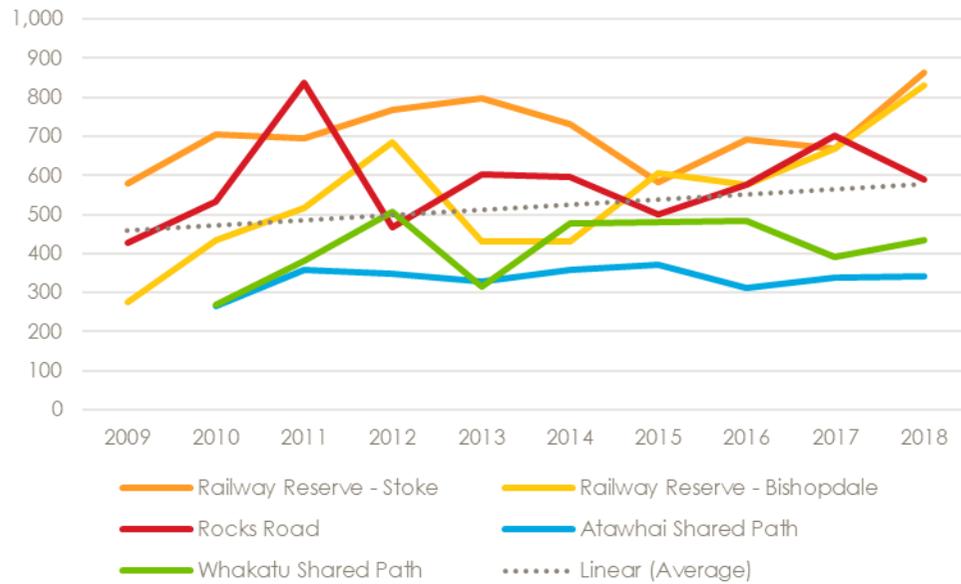


Figure 36: Shared and separated path facilities



Nelson’s cycle network consists of a variety of facility types, including on-road cycle lanes, shared paths, off-road recreational trails and mountain bike tracks. A former railway reserve linking Nelson to Richmond forms a safe, separated off-road shared path that forms the spine of Nelson City’s cycle network. However, much of the city’s existing network has been constructed where it has been easier to deliver. Some of the safer routes may not provide direct routes to where people want to go, while other more direct routes have been squeezed onto constrained arterial roads that are challenging and uncomfortable for most users.

An important observation from the data set in Figure 35 is that cycle facilities that are separated from traffic (as on the Railway Reserve), with either priority over vehicles or zero to minimal road and access crossings have increasing rates of use by people cycling. This is compared to those facilities that are on road or have conflict points e.g. (Rocks Rd and involved Shared Paths).

Figure 37: Waimea Road and Rocks Road

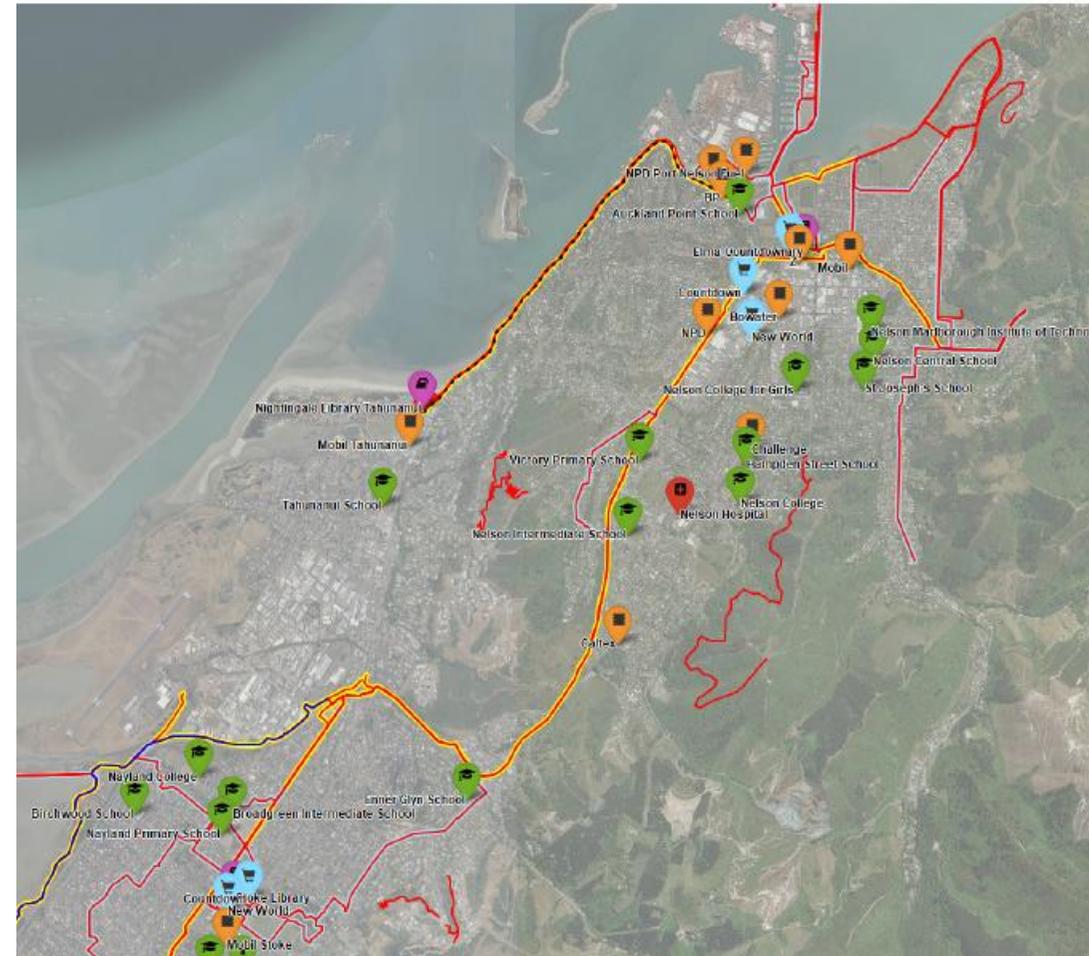


Key gaps exist between the proposed network and cycle access to key corridors and destinations. These include Waimea Road, access to Stoke CBD and limited coverage across Nelson’s CBD. Nelson City’s Out and About Active Travel and Pathway-based Recreation Policy identifies some of the key issues and concerns for active travel. For cycling, these included:

- Unsatisfied demand for cycle trips as a result of poor connectivity and limited network coverage
- Congestion on existing shared paths resulting in conflict
- Inconsistent infrastructure that doesn’t align with the needs of the target audience

- Poor cycle facility design

Figure 38: Existing Cycling Network



Appendix F shows the network operating hierarchy gap analysis as assessed from the RAMM dataset for roads within the project area and includes footpaths and cycle facilities. Of note are the gaps for these modes identified along both SH6 and Waimea Road, both key arterials through the project area.

A primary and secondary walking and cycling network has been developed as part of the Nelson Future Access study to detail the ideal hierarchy and to target future investment to achieve the needed level of service. These are shown in Figure 39 and Figure 40.

Figure 39: Proposed Pedestrian Network

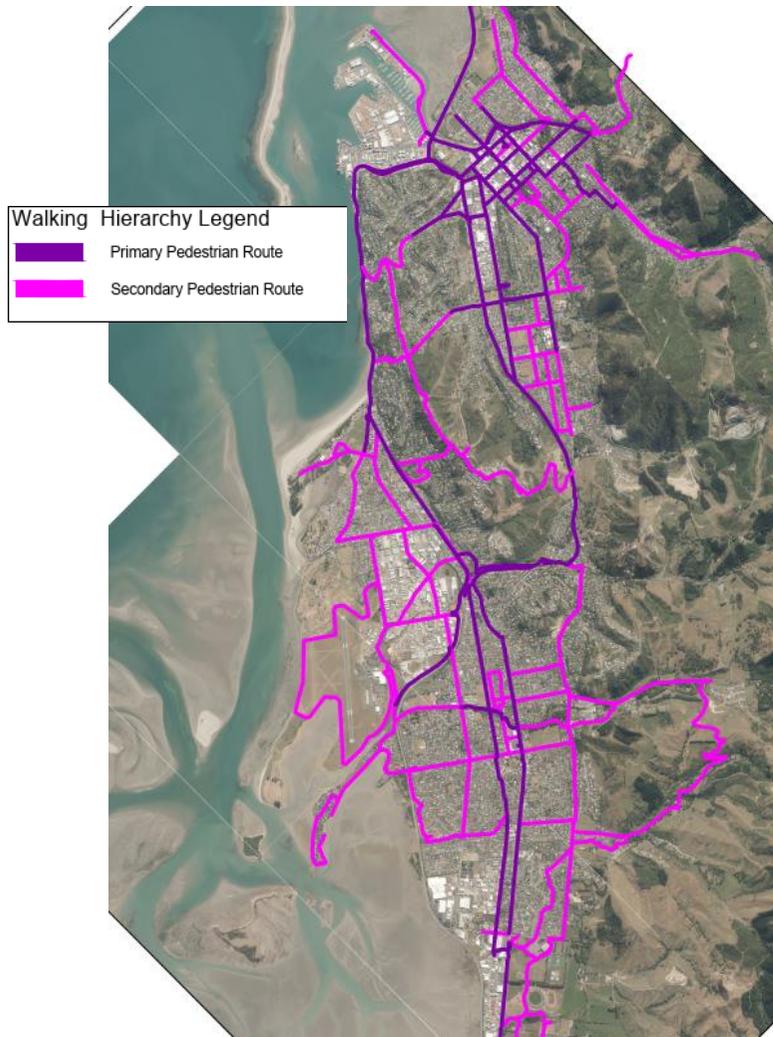
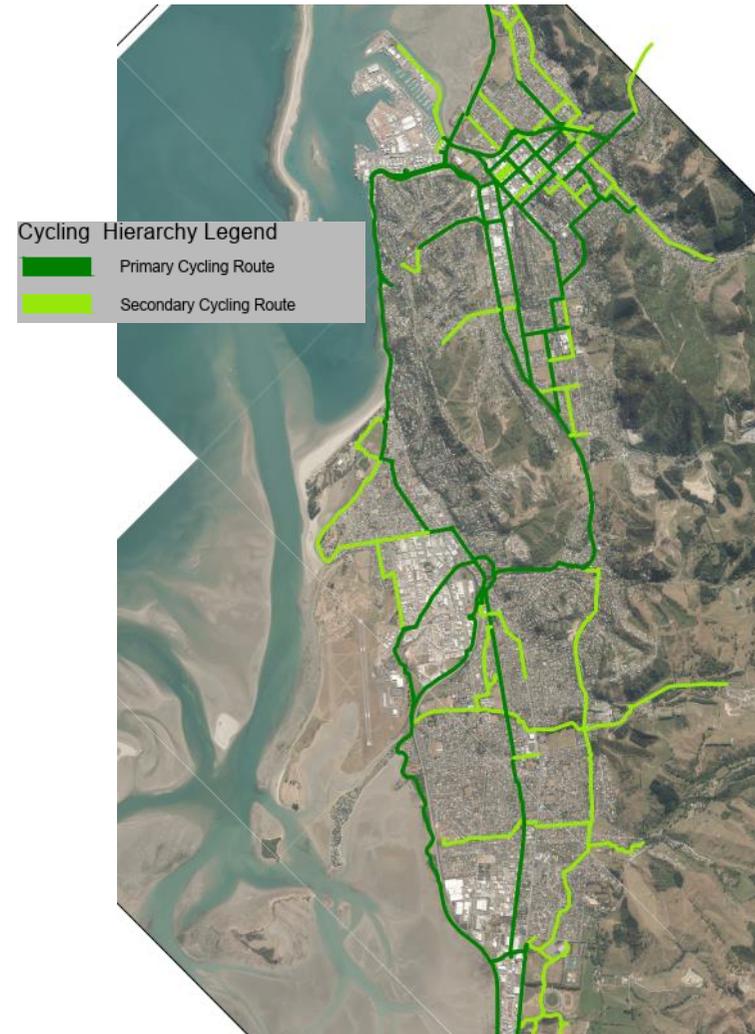


Figure 40: Proposed Cycling Network



#### 4.2.4 Commuter Parking v Short Stay Parking

The conflict between long-stay and short-stay parking may have a significant impact on retail trade and hospitality for those who may choose Nelson as their

destination. The prevalence of short distance trips indicates that day-to-day activities are completed at their nearest location, hence the desirability for Nelson as a destination for these types of activities may be limited to areas bordered by the hills. Hence the ability to stimulate the retail and hospitality presence in the CBD may in part be a function of both access to Nelson CBD (by whichever mode) and the ease at which people can park.

The current charging regime for parking encourages long term parking around the fringe of the CBD, which in turn encourages car journeys. Parking charges are a key tool for effecting mode shift for the shorter length journeys.

A recent change in 2020 to 'pay by plate' has had an impact on parking behaviour in the CBD. After the introduction of the new pay by plate parking a 42% decrease in free hour parking occurred. This is attributed to workers parking elsewhere. This prioritises City Centre carparks for retail customers and shorter-term parking users generates a higher turnover of available parking.

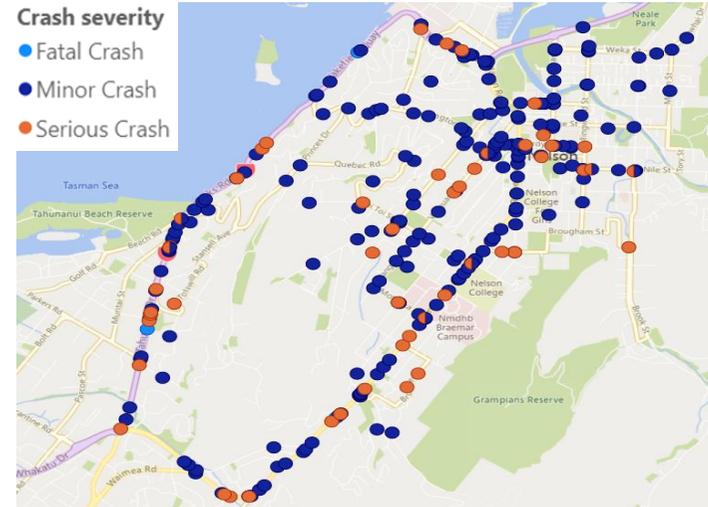
**4.2.5 Road Safety**

The road network south of Annesbrook provides extensive spatial coverage of the area, however to the north these routes are funnelled into two roads due to topography constraints. Rocks Road/SH6 provides access to the port and the coast, while Waimea Road provides more direct access to Nelson CBD.

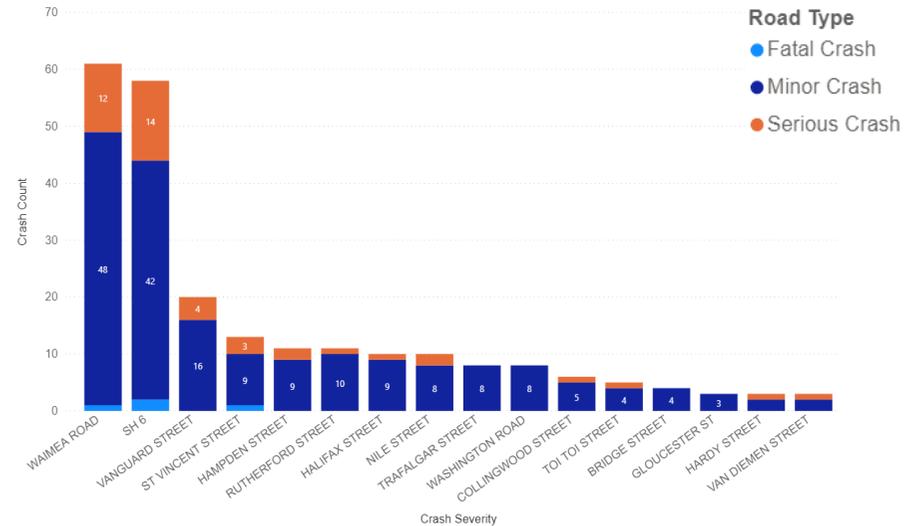
Figure 41 shows the injury crash locations for the five-year period between 2015 and 2019. Figure 42 shows that the majority of injury crashes have occurred along SH 6 and Waimea Road. These are the longest, and most highly trafficked routes through the study area.

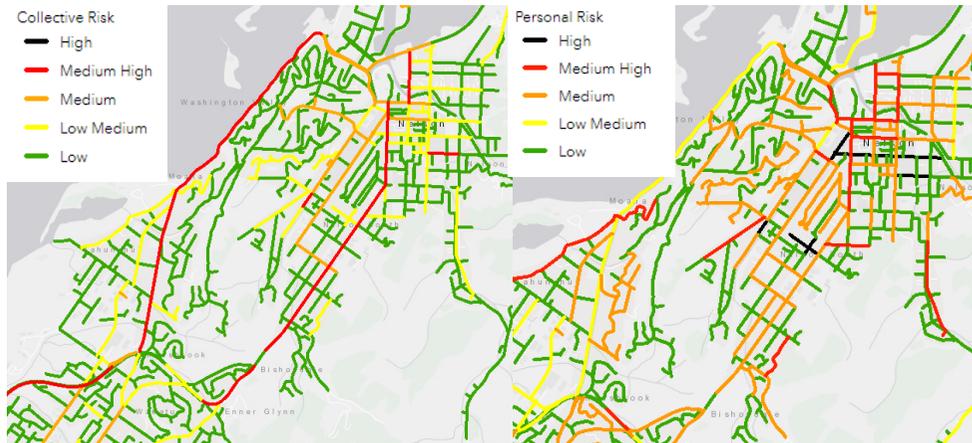
The movement function of Waimea Road is high, with around 14,000 vehicles per day near the CBD and up to 30,000vpd at Bishopdale Saddle, however this conflicts with the place function of the corridor given that Nelson Hospital, Nelson College for Girls, Rutherford Street Kindergarten, Hampden Street Primary School and Nelson College are located close to Waimea Road. Strong demand for traffic movements combined with pedestrian and cyclist access has resulted in poor safety outcomes, with Waimea Road and SH6 identified as having a medium-high collective safety risk. Corridors with identified high personal risk include Toi Toi Street, Emano Street, St Vincent Street, Hampden Street, Halifax Street and Hardy Street. (Figure 43).

**Figure 41: 2015-2019 injury crash locations**



**Figure 42: 2015-2019 injury crashes by street**



**Figure 43: Collective and personal risk ratings**

Waka Kotahi have identified the top 10% of streets across the country that are anticipated to provide the highest DSI benefits. For Nelson City the following streets have been identified that fit this criteria that are located within the study area:

- Toi Toi Road,
- Washington Road/ Gloucester Street,
- Halifax Street,
- Rutherford Street,
- Collingwood Street
- Waimea/Whakatu Road between Quarantine Road and Beatson Road.

The Communities At Risk Register (CARR) is a road safety ranking that is used to identify the road user groups that are over-represented based on road safety risk for each TLA. For Nelson City, three road user groups are considered either high or medium risk. These are:

- Cyclists (high risk). Ranked 6th highest TLA
- Motorcyclists (medium risk). Ranked 11th highest TLA
- Older road users (medium risk). Ranked 19th highest TLA

Nelson has a goal of reducing the percentage of the network rated at a Medium-High and High personal and collective risk over the next ten years<sup>8</sup>. This aligns

with Waka Kotahi's Road to Zero strategy which focuses the biggest changes on areas where the most injury crashes occur.

Figure 44 shows the crash locations involving vulnerable users within the study area (pedestrians, cyclists, skateboard/inline skate, wheeled pedestrian/scooters). Most of the crashes are located along the key arterials and clustered within the CBD area.

Figure 45 shows the vulnerable user crashes by severity at intersection and midblock locations. The majority of crashes occur at intersections, but a fair proportion also occur at mid-block locations. Crashes at intersections result in higher proportions of minor and serious injuries. The single fatal crash involving a vulnerable user occurs at a midblock location.

Figure 46 shows that majority of crashes involve people cycling. They account for the largest proportion of injury and non-injury crashes. The single fatal crash involving a vulnerable user involved a person cycling.

<sup>8</sup> Nelson City Transport Asset Management Plan 2018-2028

Figure 44: 2015-2019 vulnerable user crashes

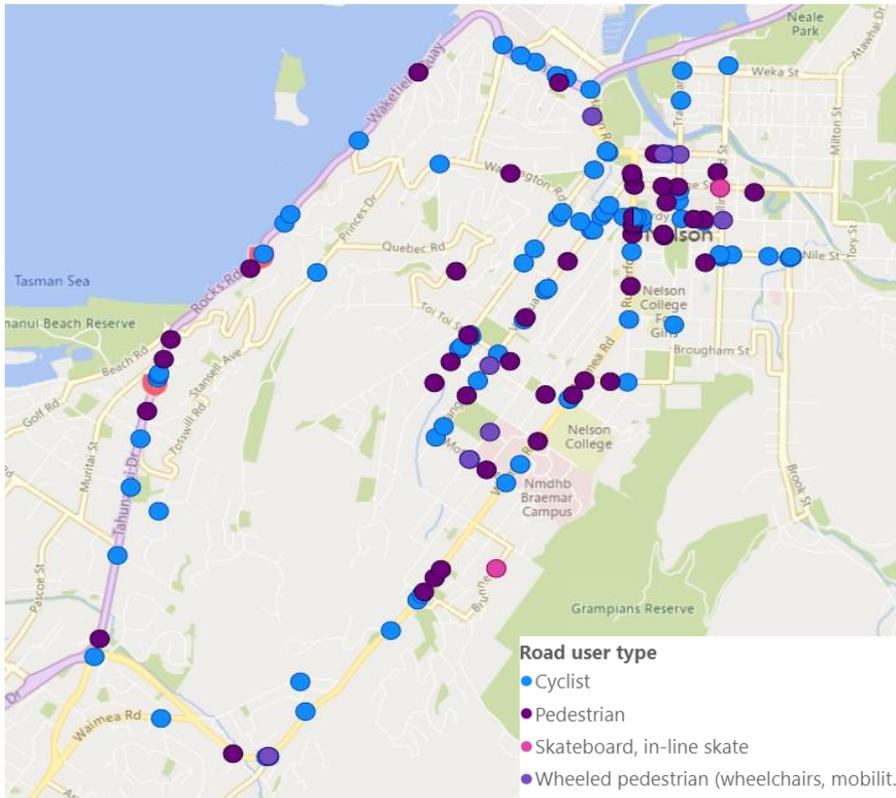


Figure 45: 2015-2019 vulnerable crashes by intersection/midblock

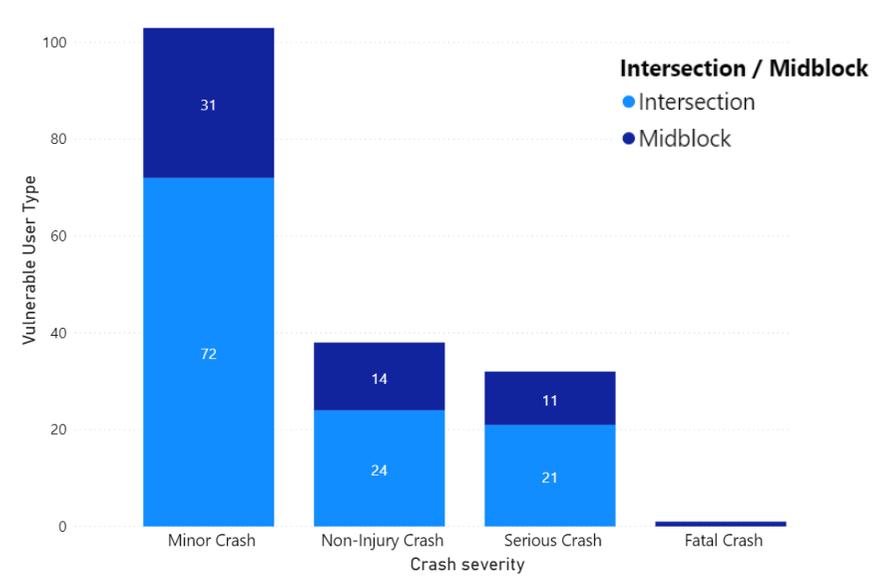


Figure 46: 2015-2019 vulnerable user crashes by severity

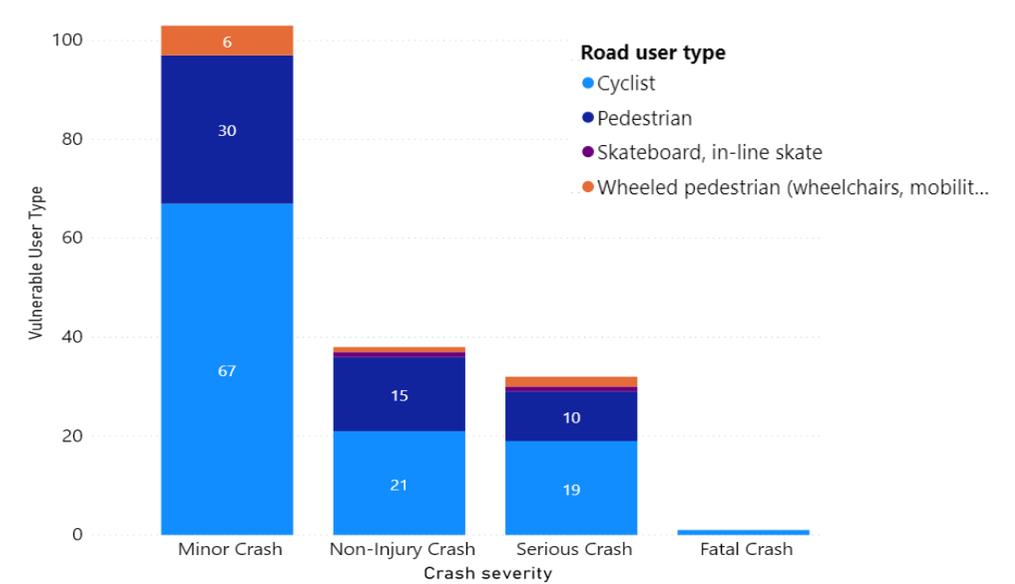
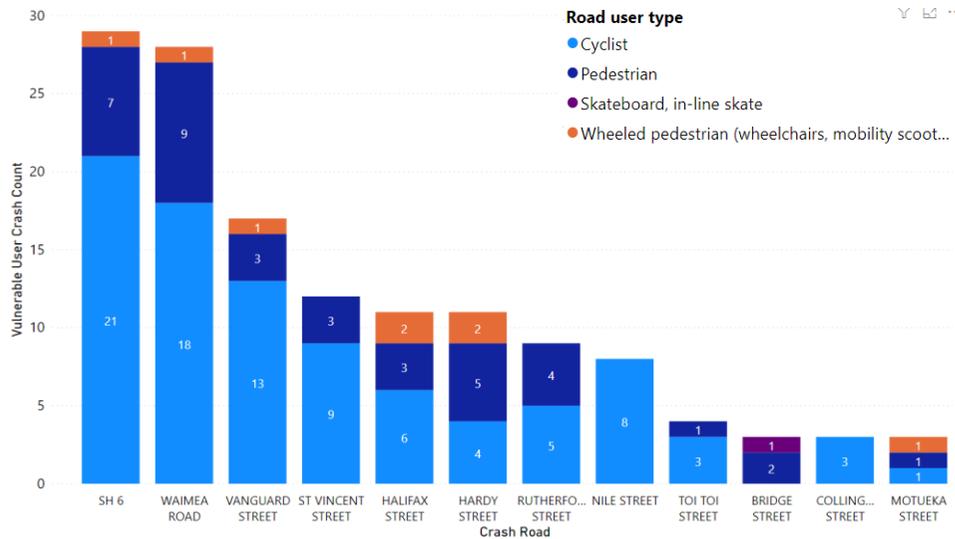


Figure 47 shows that the majority of crashes involving vulnerable users occur on SH 6 and Waimea Road. This also reflects the overall crash rate and shows the exposure hazard for vulnerable users travelling on highly trafficked roads. Vanguard Street and key streets around the CBD also feature a significant number of vulnerable user crashes.

Figure 47: 2015-2019 vulnerable user crashes by street



Further assessment of these crashes by intersection and midblock are shown in Figure 48 and Figure 49. This shows that the majority of crashes on these streets are located at intersections. Waimea Road features a high proportion of midblock pedestrian crashes, with SH 6, Vanguard and St Vincent Streets featuring a high proportion of midblock crashes involving people cycling.

Figure 48: 2015-2019 vulnerable user intersections crashes

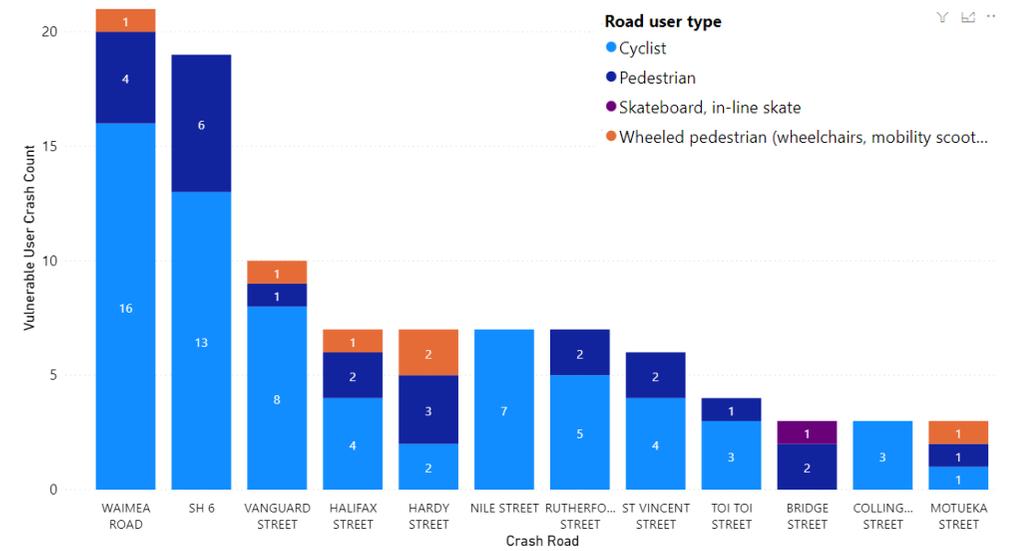
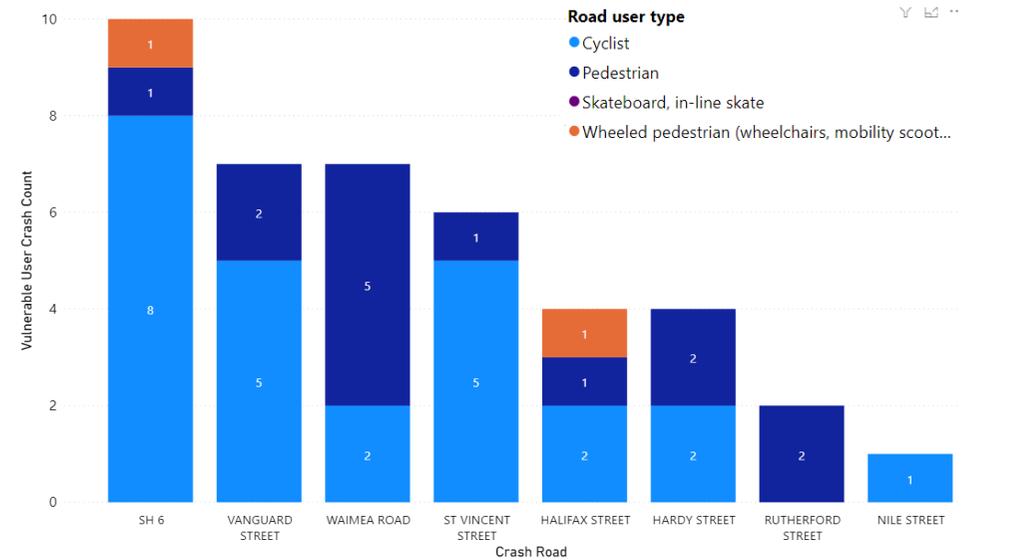


Figure 49: 2015-2019 vulnerable user midblock



### 4.3 Problem 3: Resilience

The evidence indicates that Rocks Road has a catastrophic risk of being closed for an extended period of time during a high-impact low probability event such as an earthquake or Tsunami or structural failure of the seawall if closure of Rocks Road is required to facilitate its rebuild. However, during other events (including storm events), the duration of closure is considered acceptable in line with Waka Kotahi's resilience planning guidelines. When there are events on Rocks Road, there is not sufficient redundancy in the transport system to move all of the daily demands between Nelson (including the Port) and areas to the south, along Waimea Road as the alternate route does not have the required capacity.

**Table 10: Summary of causes and consequences for Problem 3**

|                                                                                                                                                                                                                                                               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Cause</b>                                                                                                                                                                                                                                                  |
| <b>Problem 3: The susceptibility of the arterial network to natural events of increasing severity and a greater number.</b>                                                                                                                                   |
| <b>Demand side issues</b>                                                                                                                                                                                                                                     |
| Connectivity for freight to access the port from the south                                                                                                                                                                                                    |
| High volumes of traffic during the peak periods                                                                                                                                                                                                               |
| Growing traffic and active mode demand with greater intensification of residential areas on the fringe.                                                                                                                                                       |
| <b>Supply side issues</b>                                                                                                                                                                                                                                     |
| SH6 Rocks Road is the key arterial susceptible to short-term closure during wave overtopping, or slip event                                                                                                                                                   |
| Waimea Road acts as the arterial road alternative when SH6 is closed. Waimea Road currently does not have the capacity to move all of the daily demands between Nelson (including the Port) and areas to the south and maintain a reasonable level of service |
| <b>Consequence</b>                                                                                                                                                                                                                                            |
| <b>Risk of significant economic shock to Nelson and the wider region.</b>                                                                                                                                                                                     |
| Past closures of Rocks Road due to natural events are infrequent (1-2 per annum), and short-lived (<2 hours). The economic impact is not significant                                                                                                          |
| Future events are not forecast to significantly impact Rocks Road beyond current. Renewal of the sea wall as included in the do minimum will improve resilience to coastal hazards.                                                                           |

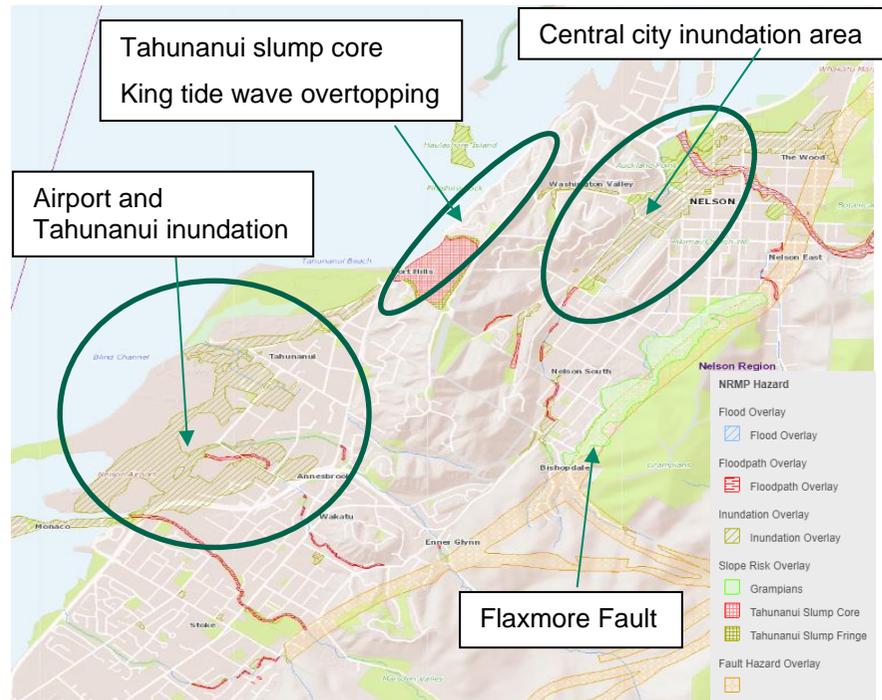
#### 4.3.1 Physical Context

Nelson's central city area is bounded by the sea and low foothills as shown in Figure 50. The Maitai River, Brook Stream and York Stream flow through this area. Substantial parts of the city are built on land reclaimed from the sea and historical foreshore. Because of the close proximity of the Nelson foothills and the encroachment of development on the flood plains and riparian margins, the stream and river catchments are relatively short, narrow and steep leading to rapid storm water runoff and a risk of flash flooding in higher intensity rain events. Extreme weather events can also cause storm surges and rock fall along Rocks Road (SH6) leading to occasional road closures.

Much of Nelson's coastal communities including the Central City area, Tāhunanui and Airport is currently susceptible to inundation and will be affected by sea level rise in the future. Most of the community's critical economic infrastructure is located within the coastal environment, including arterial road links, the Port and Airport, and potentially exposed to the effects of climate change.

Earthquakes are a major contributor to the high impact low occurrence risk to resilience. Within the study area the Flaxmore is located along the base of the Grampians, a group of hills rising steeply behind central Nelson. It is part of the Waimea-Flaxmore Fault System and it passes through Nelson and Richmond. The Flaxmore Fault is identified in Figure 50. It is intersecting an area at the base of the Grampians where there is a high risk of slope instability. The fault hazard areas are subject to planning controls restricting building within the zone due to the risk of ground displacement from a significant earthquake.

Figure 50: Environmental Context (Source: NRMP)



### 4.3.2 Rocks Road (SH6) – Slope Stability

A further challenge for Rocks Road lies in its resilience to major weather events and climate change as experienced in recent years. Cliff failure risks are present along the entire length of Rocks Road to Tāhunanui<sup>9</sup>; however, the risks of failure are being managed through a cliff management strategy, developed in 2008 and updated in 2012 following a 1 in 250 year storm event causing major slips and forcing the closure of Rocks Road.

In the last 5 years there have been two cyclone events that have been similar in scale to the 2011 event (Cyclone Fehi and Cyclone Gita both in 2018 and equivalent to between 1 in 200 and 1 in 300 year events respectively), both of which led to the closure of Rocks Road for between 4 and 6 hours.

However there has only been one closure of Rocks Road in the last 5 years attributed to rock falls, and its duration was less than 4 hours. Figure 51 shows the duration of incidents where the slope stability may be a contributing factor (these include lane closures and where the road remains open). The figure indicates that the majority are minor and cleared within the hour.

Figure 52 shows that the majority of incidents potentially resulting from slope stability and resulting in caution warnings, delays for >12 hours are prior to 2017. The sea cliffs have had substantial rock stability work completed in early 2016 along the cliff face and this helped to mitigate large closure events. However small slips still occur and impact the roadway in the absence of a catch fence.

Delays for commuters are expected to be minor in the event of a short-term or partial closure of SH 6. Waimea Road provides the alternative route to SH 6 which allows continued travel to key destinations, but which will also be slower due to capacity constraints along this corridor. Waimea Road does not currently allow High Productivity Motor Vehicles (HPMV) use, but under an emergency event these vehicles could be enabled to use Waimea Road to access the Port. Journey information and warnings are supplied through Waka Kotahi and Nelson Cities digital toolkit (website, Facebook, mobile advisory signs etc) to keep the public informed.

<sup>9</sup> Opus Report (cliff Management Strategy)

Figure 51: Incidents between 2014 and September 2019 where slope instability may be contributing to road network impact

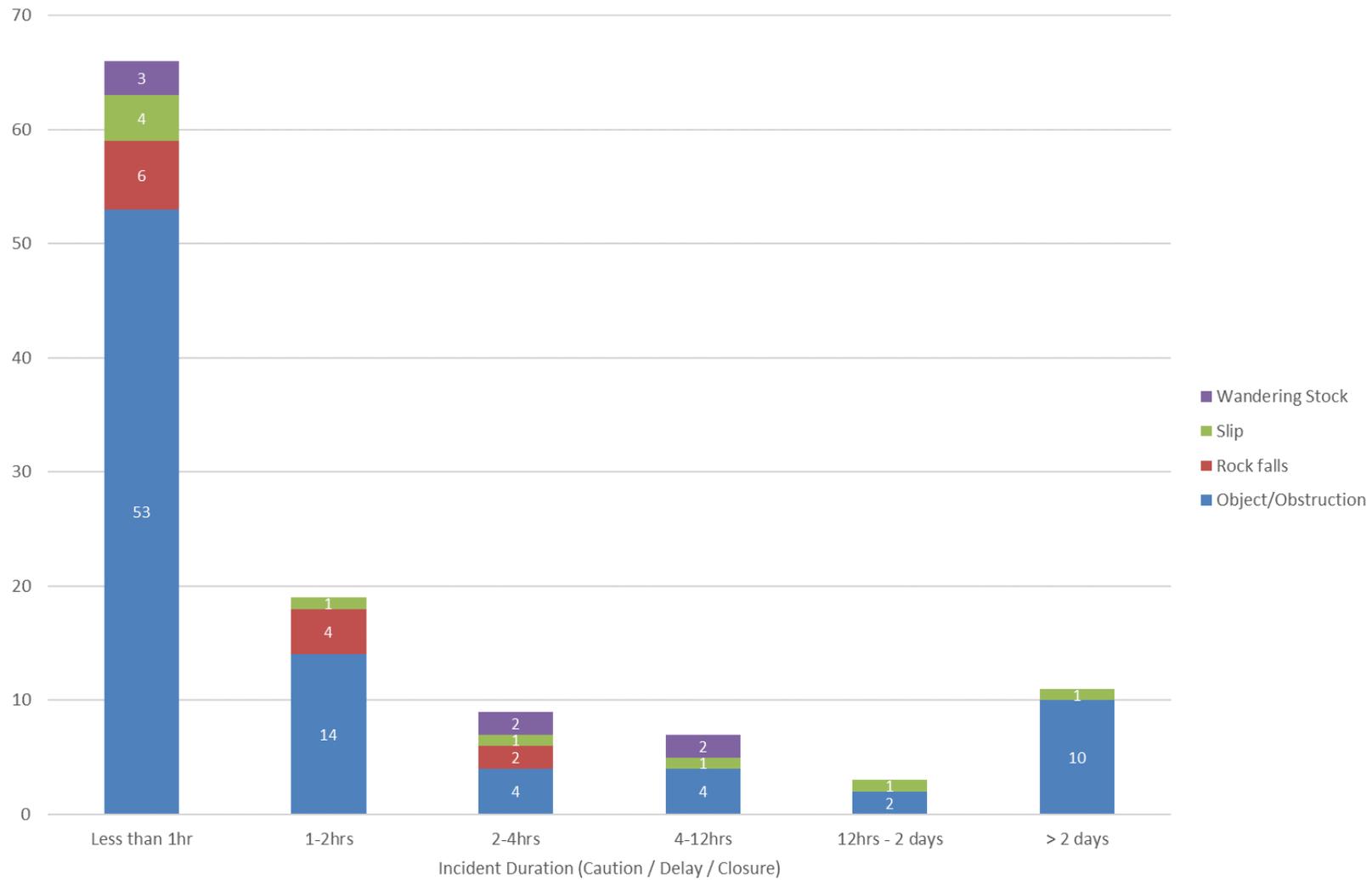
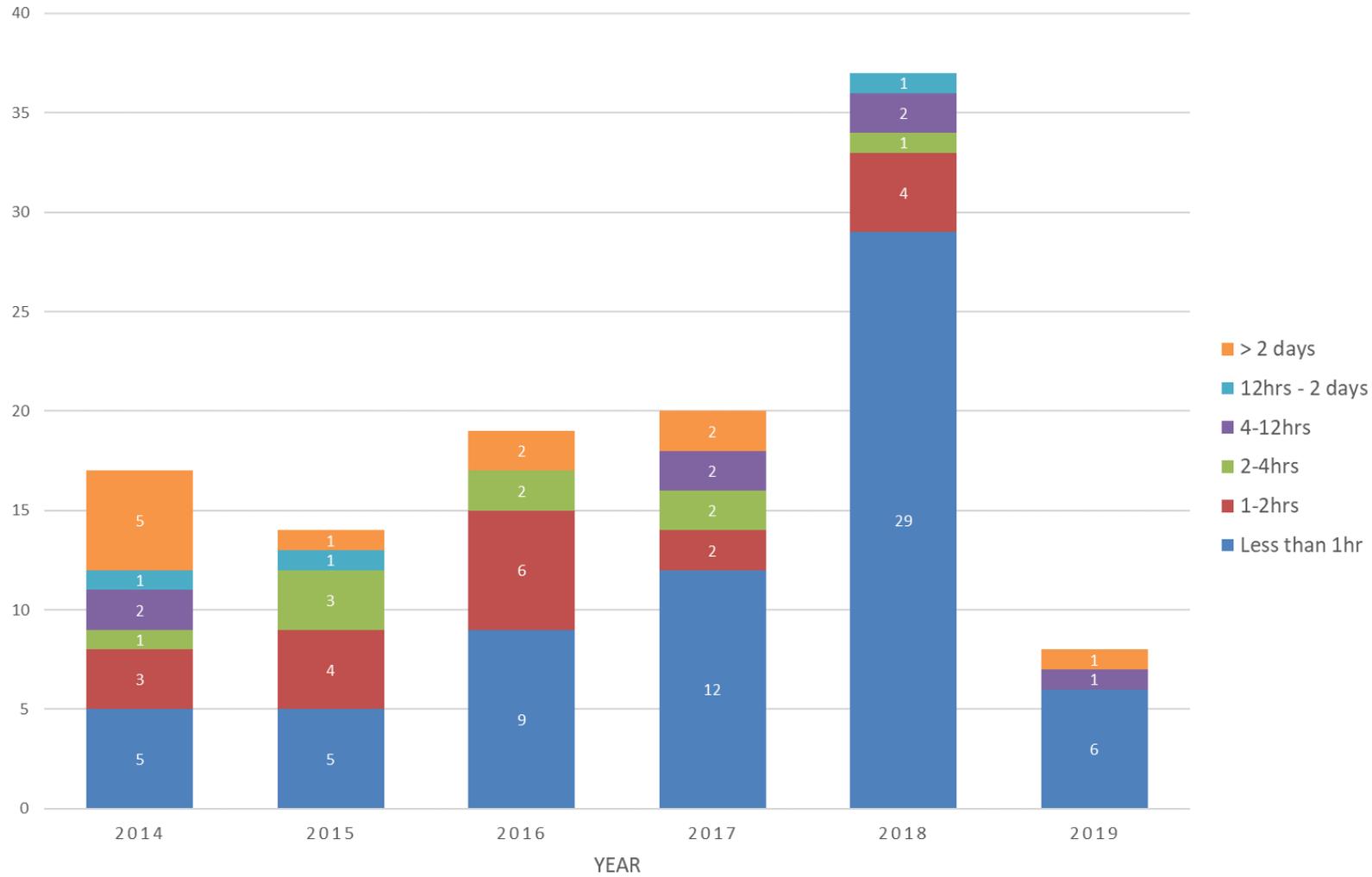


Figure 52: Year and duration of incidents where slope instability may be contributing to road network impact



### 4.3.3 Rocks Road (SH6) – Seawall

Rocks Road Seawall construction dates back to pre-1890, where the first iteration of the wall was constructed with locally sourced granite rock along Wakefield Quay. Since then, there have been a number of modifications and improvements installed.

The Rocks Road Seawall presents varied seismic risks due to the configuration of different types of wall, i.e. reinforced concrete, unreinforced masonry, and combinations of these. It also appears to be vulnerable to slope instability from the cliff faces, between the Basin Reserve and Magazine Point.

The condition of the seawall varies along its length essentially due to the age of the structure in each section. In some locations it is exhibiting signs of scouring and undermining, which may become more problematic over time. Previous condition assessment indicates that the remaining useful service life of the seawall ranges from 15-50 years<sup>10</sup>.

While closure of Rocks Road does cause significant inconvenience and travel-time delays, it is not currently relied upon as a life-line route due to its history of susceptibility to slope instability, especially those related to storm events.

Should the wall fail, whether due to its condition, or a high impact low probability event, the closure required to facilitate building the seawall has the potential to be in the order of months, therefore access between Nelson and other areas would be totally reliant on Waimea Road for an extended period of time. It is this lack of redundancy in the transport system (i.e. lack of alternative route to move people and freight) should an event occur that will impact the region, given the economic link to the port and key commerce in the CBD.

### 4.3.4 Sea Level Rise and Overtopping

AECOM<sup>11</sup> has completed a wave overtopping assessment for Rocks Road as part of this investigation (noting that with sea level rise there will be parts of the City Centre and Tāhunanui that will be susceptible to tidal inundation).

This assessment indicates that flooding of Rocks Road will become more frequent, due to the continuing effects of climate change and sea-level rise. In general, the overtopping rate increases at Rocks Road as time progresses. It is anticipated that Rocks Road could experience more frequent closure during the design extreme condition in the future, which is based on Mean High Water Spring plus extreme

wave height. For comparison, Cyclone Fehi was approximately a 1 in 300-year ARI event, whose return period in the future will represent a 1 in 100-year event.

In summary, for the 10 year ARI event (10% AEP) and the 1 in 100 year event (1% AEP), there is likely to be some minor flooding, that would likely affect the movement of active modes with some vehicle damage, but not have a significant effect on the movement of general traffic and freight with sea level rise of 1.44m (expected at year 2070). At a 1 in 200-year event (under all sea level rise scenarios), closure of the road and structural damage of the wall (at 1.44m sea level rise) could be expected.

However, this technical assessment needs to be counted by the network management of the route which tends to close Rocks Road specially to light vehicles as soon as significant spray is occurring due to vehicles shying away from the spray onto the incoming lane.

### 4.3.5 Risk Analysis - High Impact Low Probability Events

Waka Kotahi's resilience framework indicates that should a major storm (1 in 100 year), earthquake (1 in 1000 years) or Tsunami (1 in 2,500 year) occur, the risk of major impact is extreme to catastrophic.

The sea level rise, increased risk of more severe storms, degrading condition of the seawall (with a remaining service life of 15 – 50 years, despite showing signs of deterioration and undercutting) and the stability of the escarpment are issues that make Rocks Road more susceptible to impact, and the resulting shock.

### 4.3.6 Resilience Level of Service Assessment

The following Figure 53 and Figure 54 outline the reported incidents on SH6 between Haven Road and Annesbrook roundabout. This data indicates that there have been 12 closures out of a total of 227 incidents (excluding road works, potholes, traffic signal faults and congestion). Five of the closures were due to crashes, which typically took longer than an hour to clear. Of the 227 recorded incidents (approximately 1 per week), more than 75% took longer than 2 hours to resolve (note: this information relies on the accuracy of the reporting).

Figure 55 shows the acceptable average length of closure for a national high-volume state highway. SH6 is identified as a Regional State Highway through Nelson. Closures of 2-4 hours, 5-12 hours and 13 hours to 2 days have averaged

<sup>10</sup> Rocks Road Investigation Report

<sup>11</sup> AECOM Wave Overtopping Assessment

0.4 for each of the metrics. Excluding crash related closures this lowers to an average of 0.2 to 0 which complies with a better than acceptable score.

Figure 53: Closures on SH6 – Haven Road to Annesbrook Roundabout (2014 - 2018)

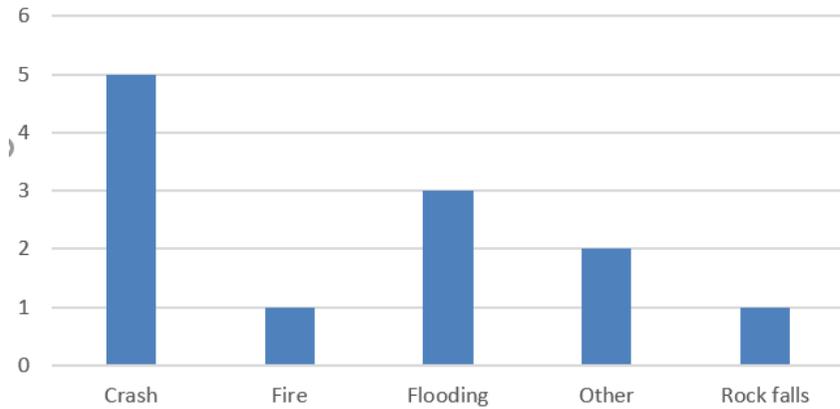


Figure 54: Duration of closures by type on SH6 – Haven Road to Annesbrook Roundabout (2014 - 2018)

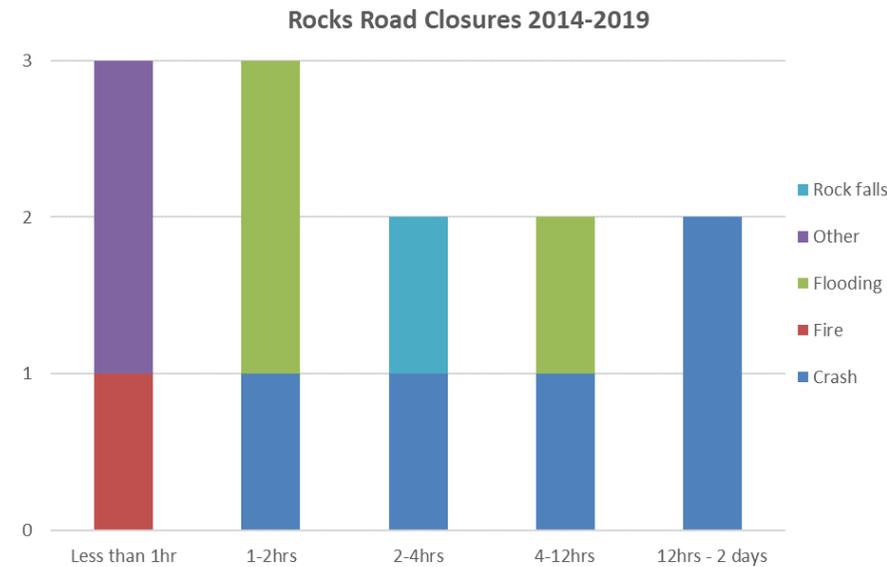
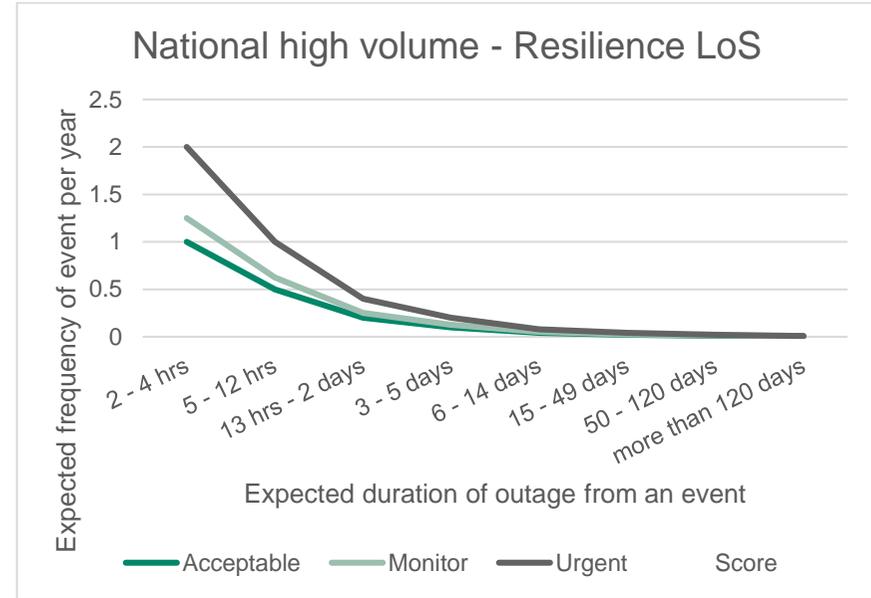


Figure 55: Resilience Level of Service Assessment



### 4.4 Problem Significance

The key findings and conclusions of this strategic assessment have been summarised in Table 11.

Table 11: Summary and Conclusions

| Problems identified in the ILM                       | Key findings in the strategic case                                                                                                                                                                                                                                                        | Conclusions                                                                                                                                                                                                  |
|------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Problem 1: Ability to Move People and Freight</b> | The evidence indicates that the arterials could provide more reliable travel throughout the day and better access Nelson for those who do not have good alternatives if the traffic and truck volumes using the existing two-lane arterials are held at the current observed peak volumes | Opportunities exists to look at the optimisation and use of the network and investigate options to manage the demand for travel and the selection of mode with a focus on PT, walking and cycling as well as |

| Problems identified in the ILM        | Key findings in the strategic case                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Conclusions                                                                                                                                                                                                                                                                                                                                                                                           |
|---------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                       | per lane during the winter months.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | increasing the capacity of the network.                                                                                                                                                                                                                                                                                                                                                               |
| <b>Problem 2:<br/>Conflicting Use</b> | A dominance of vehicle use on the Nelson Network conflicts with the safe transfer of people to alternative modes. The initial evidence indicates that the network caters for vehicles to reach a wider range of destinations at the expense of other modes and the amenity of the surrounding environment. Addressing this alongside the implementation of the Future Development Strategy provides the opportunity to provide a much more pleasant and safer environment for people of all ages and abilities to walk and cycle in Nelson, to capitalise on the opportunity to stimulate the retail presence of the Nelson CBD, and to promote the Waterfront precinct as a recreation, tourist and dining destination. | Opportunities exist for resolving conflicting uses along key routes and across the network. Of particular opportunity is resolving conflicting activities along the Waimea and Rocks Road Corridors through supply and demand management interventions. Without these vehicle use will increasingly transfer from the primary arterial roads to 'rat' run' along lower classification suburban roads. |
| <b>Problem 3:<br/>Resilience</b>      | The evidence indicates that Rocks Road has a catastrophic risk of being closed for an extended period of time during a high-impact low probability event such as an earthquake or Tsunami or structural failure of the seawall if closure of Rocks Road is required to facilitate its rebuild. However, during other                                                                                                                                                                                                                                                                                                                                                                                                     | This is a high impact, low occurrence risk and there are likely opportunities to manage this risk as a co-benefit of other network wide interventions.                                                                                                                                                                                                                                                |

| Problems identified in the ILM | Key findings in the strategic case                                                                                                                                                                                                                                                                                                                                                                  | Conclusions |
|--------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|
|                                | events (including storm events), the duration of closure is considered acceptable in line with Waka Kotahi's resilience planning guidelines. However, when there are events on Rocks Road there is not sufficient redundancy in the transport system, in that Waimea Road does not have the capability to move all of the daily demands between Nelson (including the Port) and areas to the south. |             |

## 4.5 Issues and Constraints

Table 15 displays factors of uncertainty that may influence the outcomes of this Business Case. These were further developed through the Business Case, outlining the risks associated with implementation of the preferred option described in more detail at the completion of the Business Case.

**Table 12: Key Issues and constraints land-use**

| Land-use                                    | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|---------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Integrated implementation of the FDS</b> | There are uncertainties about the scale of growth planned and the ability to implement the proposed development pattern given the three waters infrastructure deficit that Nelson has and the appetite of homeowners to live in areas of high-density housing. Tasman is largely development ready and the likelihood of achieving the intensified development pattern particularly in the short to medium term may not be realised. The development pattern differs from previous work with greater levels of intensification in Nelson Central compared with previous plans. |
| <b>Population forecasts</b>                 | The current evidence base indicates only a modest (~5%) increase in working age population in Nelson and Tasman and a slight decline (~10%) in school age population, based on the current planning scenario with high growth to 2028 and medium                                                                                                                                                                                                                                                                                                                               |

| Land-use | Description                                                                                                                                                                                                                                                                |
|----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|          | growth from 2028 – 2048. Should there be a larger growth in working age population, and an increase in the school age population (with more families moving to the region, the forecast demand for travel may be higher than anticipated in the current planning scenario. |

Table 13: Key issues and constraints for project delivery

| Project Delivery      | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|-----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Consenting</b>     | There is currently the potential for the preferred network to re-confirm the need and timing for a new link road, without demonstrating enough change in the proposal to what was heard by the Environment Court in 2004. The risk is that the preferred network may again be rejected through the legal processes, and therefore limit the potential to realise the benefits of investing in the transport system as a whole. The widening of Rocks Road has additional consenting challenges associated with the widening into the coastal marine area.                                          |
| <b>Rocks Road</b>     | <p>There is a risk that the preferred option will require a significant investment in the Rocks Road seawall and possibly revocation of the state highway (if the preferred network includes a new state highway link). This may impact on the affordability of a new state highway link or place a significant financial burden on Nelson City Council.</p> <p>Obtaining statutory consents for a Rocks Road option that requires reclamation into the coastal area presents significant challenges, which will need to be considered through the options development and assessment process.</p> |
| <b>Implementation</b> | Interventions will be delivered by different agencies (e.g. state highway improvements, school travel plans, PT improvements, parking strategies etc across NCC and TDC boundaries) and will need to be integrated across the delivery of the programme with the wider land use and transport system across funding priorities through successive GPS periods, to ensure that the benefits can be fully realised. TDC is currently a stakeholder; however, the                                                                                                                                     |

|  |                                                                                                                                                                                                                                                                                                  |
|--|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | potential infrastructure changes needed to support the wider region may fall within their area of responsibility (for example infrastructure to support a more frequent, accessible and reliable public transport network, or infrastructure to support a greater amount of walking and cycling) |
|--|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

#### 4.5.1 Key Dependencies and Interfaces

Table 14 outlines the key dependencies and interfaces with the NFA business case.

Table 14: Key dependencies and interfaces

| Project                               | Description                                                                                                                                                                                 |
|---------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Regional Public Transport Plan</b> | Provides the future operational changes for the Tasman District and Nelson City bus network.                                                                                                |
| <b>Nelson Hospital Redevelopment</b>  | A business case for a significant redevelopment the Nelson Hospital campus (estimate >\$700m) is currently being developed, with implementation intended to occur within the next 10-years. |
| <b>Nelson City Centre Programme</b>   | The programme is seeking to revitalise the Nelson CBD based on eight transformative actions.                                                                                                |
| <b>Three waters upgrades</b>          | Significant upgrades to three waters infrastructure are intended to occur driven by the Three Waters reform programme.                                                                      |

Table 15: Summary of Investment Risks

| Risk                                        | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|---------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Integrated implementation of the FDS</b> | There are uncertainties about the scale of growth planned and the ability to implement the proposed development pattern given the three waters infrastructure deficit that Nelson has and the appetite of homeowners to live in areas of high-density housing. Tasman is largely development ready and the likelihood of achieving the intensified development pattern particularly in the short to medium term may not be realised. The development pattern differs from |

| Risk                        | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|-----------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                             | previous work with greater levels of intensification in Nelson Central compared with previous plans.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>Population forecasts</b> | The current evidence base indicates only a modest (~5%) increase in working age population in Nelson and Tasman and a slight decline (~10%) in school age population, based on the current planning scenario with high growth to 2028 and medium growth from 2028 – 2048. Should there be a larger growth in working age population, and an increase in the school age population (with more families moving to the region, the forecast demand for travel may be higher than anticipated in the current planning scenario.                                                                        |
| <b>Consenting</b>           | There is currently the potential for the preferred network to re-confirm the need and timing for a new link road, without demonstrating enough change in the proposal to what was heard by the Environment Court in 2004. The risk is that the preferred network may again be rejected through the legal processes, and therefore limit the potential to realise the benefits of investing in the transport system as a whole. The widening of Rocks Road has additional consenting challenges associated with the widening into the coastal marine area.                                          |
| <b>Rocks Road</b>           | <p>There is a risk that the preferred option will require a significant investment in the Rocks Road seawall and possibly revocation of the state highway (if the preferred network includes a new state highway link). This may impact on the affordability of a new state highway link or place a significant financial burden on Nelson City Council.</p> <p>Obtaining statutory consents for a Rocks Road option that requires reclamation into the coastal area presents significant challenges, which will need to be considered through the options development and assessment process.</p> |
| <b>Implementation</b>       | Interventions will be delivered by different agencies (e.g. state highway improvements, school travel plans, PT improvements, parking strategies etc across NCC and TDC boundaries) and will need to be integrated across the delivery of the programme with the wider land use and                                                                                                                                                                                                                                                                                                                |

| Risk | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|      | transport system across funding priorities through successive GPS periods, to ensure that the benefits can be fully realised. TDC is currently a stakeholder; however, the potential infrastructure changes needed to support the wider region may fall within their area of responsibility (for example infrastructure to support a more frequent, accessible and reliable public transport network, or infrastructure to support a greater amount of walking and cycling) |

## 4.6 Project Outcomes

An earlier stage of the business case process (Programme Business Case) outlined outcomes centred about addressing traffic congestion and delays on two main arterial roads and the substandard infrastructure on Rocks Road constraining the growth in walking and cycling activities. The project objectives for the PBC were:

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

Since the PBC, the Government has revised their priorities through the GPS for the transport system to support transport and land use planning that reduces the need to travel by private vehicle (especially single occupancy vehicles), more frequent and highly patronised public transport services, extending greater priority on urban and rural routes for walking, cycling and public transport, and better management of parking.

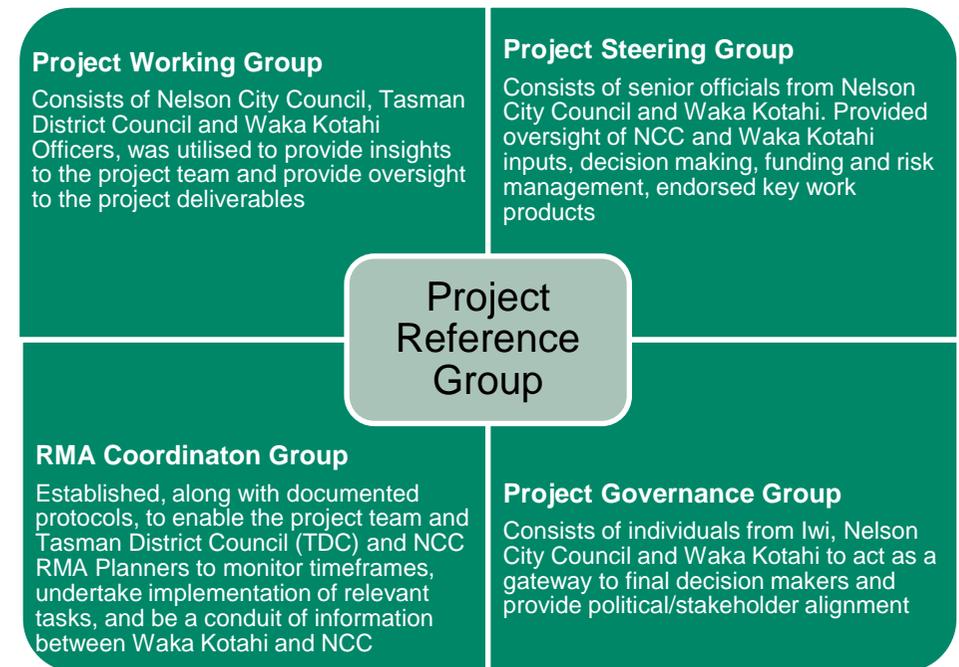
The project outcomes for this DBC have been revisited to align with the GPS 2018 and GPS 2021, to develop a detailed multi-modal transport system investment programme that supports community aspirations for a thriving CBD, a world-class waterfront and a healthy environment and provides a safe, accessible and resilient transport system, whilst meeting the diverse needs of customers and communities. The project seeks to:

1. Identify and respond to customer needs and growth pressures in the study area.

2. Define the existing and future function of key transport corridors (for all modes) in the study area, to deliver a safe, accessible and resilient network cognisant of Nelson City Council's (NCC) goals, the needs of customers and the wider community.
3. Make best use of existing infrastructure and services as well as new/emerging technologies.
4. Ensure integration of land use and transport systems to reduce the dependency on private single occupancy motor vehicles.
5. Investigate and identify a package of measures that could be progressed on SH6 Rocks Road in the near to short-term which enhances walking and cycling and supports NCC's vision for a world-class waterfront.
6. Investigate and make recommendations in respect of the key journeys between Nelson City's CBD, waterfront, airport, port and Richmond including the need for, and if appropriate the timing and/or triggers for an alternative arterial route to Rocks Road and Waimea Road, to resolve long standing uncertainty about the Nelson Southern Link.

## 5.0 Stakeholders

Key stakeholders, together with a diverse group of community representatives and interested parties and organisations was formed into a Project Reference Group (PRG). Membership of the PRG was determined by NCC and Waka Kotahi through the identification of interested parties during the Programme Business Case and the years preceding the commencement of this DBC. All eight iwi from Te Taihū were invited to the PRG. Under their agreed terms of reference, the PRG provided key stakeholder and community inputs and insights to the project team and partner organisations during the project. The figure below shows the other groups formed to support the DBC.



## 5.1 Consultation and communication approach

Engagement with stakeholders and the public is an important role in preparing this business case. It has been used as an input into the business case development process from the start to ensure that the direction of the business case takes the aspirations of the community into account, allows meaningful feedback on different options and packages of options developed, and ultimately tests the recommended programme for community acceptance.

Appendix E provides a Stakeholder Engagement Plan that sets out in detail the consultation and communication approach undertaken for the project. It details the key stakeholders; business groups; other statutory organisations, resident, community and recreation groups; primary industry organisations; road and transport providers; health providers; active and public transport representatives; and representatives from the emergency services engaged with.

The Stakeholder and Public Engagement Plan was based on nine key principles:

- Engagement will build on previous work and feedback from past related projects;
- Consultation will be based on commitment to open and honest communications with stakeholders and the wider community;
- Consultation is the discussion of a proposal not yet decided upon;
- Provision of regular and relevant information on the Project to inform affected parties and the wider community, and minimise the risk of misinformation;
- Sufficient time for consultation must be allowed;
- Opportunities for feedback must be provided;
- The views received in the feedback must be taken into account;
- Every effort will be made to resolve any issues raised by stakeholders or members of the wider public in a proactive, timely and appropriate manner; and
- The consultation approach should be flexible and able to be adapted if required.

Additionally, the consultation and communication process adopted the principles of the International Association of Public Participation (IAP2).

A consultation team consisting of personnel from the partner organisations and project team members was established and undertook engagement with the PRG and public through the use of:

- Targeted meetings;
- Open days;
- Newsletters;
- Media releases;
- Project website, social pinpoint, phone and an email address

## 6.0 Alternative and Option Assessment

The methodology adopted to define and investigate alternatives and options for addressing the previously identified problems and realising the desired benefits for the NFAP was to build on the work undertaken in the Programme Business Case. It takes a broader perspective of the potential for the transport system to contribute

to delivering on Nelson's vision for a vibrant CBD, a people focussed world class waterfront, a healthy environment and supporting smart and resilient infrastructure.

The GPS forms the overarching direction for government investment in the land transport system in New Zealand, with Waka Kotahi's Planning and Investment Principles giving effect to the outcomes sought by the GPS.

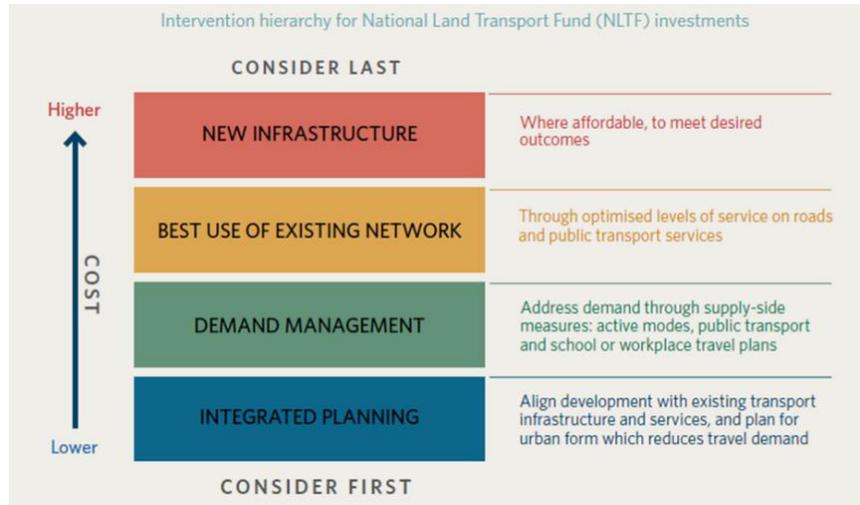
The project area was assessed to understand the current and future gaps in the network. To understand these a Multi-Modal Network Operating Hierarchy was developed, along with additional transport modelling. This provided information for the project team to input into the identification of candidate long-list options.

The GPS 2018 principles, combined with the level of service gaps, guided the project team to develop alternatives and options aligned to Waka Kotahi's intervention hierarchy starting with lowest cost alternatives and options, then making the best use of existing transport capacity, before considering higher cost alternatives and options through:

- Understanding the current and future land use patterns and how that impacts the existing transport network;
- Identifying opportunities to manage traffic growth by utilising the network more efficiently and providing appropriate mode choice;
- Considering investment in new infrastructure, matching the levels of service provided against affordability and realistic need.

The process undertaken was to identify a long list of options, followed by packaging those options into main themes of activities, correlated to the intervention hierarchy of:

Figure 56: Intervention Hierarchy



The sub-sections below set out the work involved in developing packages of alternatives aligned to the intervention hierarchy above, the assessments of those packages and the findings of those assessments.

## 6.1 Multi-Modal Network Operating Hierarchy

A Working Group (WG), containing Officers from Nelson City and Tasman District Councils established by the project Partners, together with the NFAP team, established a multi-modal network operating hierarchy (NOH) for Nelson city, from Stoke in the south to the SH6 / Atawhai Road junction in the north. A NOH focuses on a hierarchy based on the users of the road network. Giving each transport mode priority on roads across a network helps to assess options for resolving competing demands for road space, by addressing current and future network gaps in the functional level of service (FLoS).

These gaps in the FLoS allowed the working group to identify options that would improve the user experience for each mode over the medium term (5-15 years). These modes included:

- General traffic;
- Freight;
- Public transport;

- Walking (including micro-mobility);
- Cycling

In developing the NOH, a working assumption about Nelson in 2048 was agreed as a basis for developing the future network hierarchy being:

- Nelson City in 2048 will have the current places remain in their current location e.g. the airport, port, hospital, schools etc remain where they are and that places do not relocate or expand to new locations.
- In 2048, the current mean sea level will have risen by between 0.44m and 0.3m, which is correlated to the RCP 8.5H+ and RCP 2.6 scenarios respectively as advised by the Ministry for Environment
- In 2048 the housing locations and numbers will have grown by between half and the total amount forecast in the Nelson Tasman Future Development Strategy.

The FLoS was developed primarily to assign a desired width for the walking and cycling primary and secondary network, and to identify existing parts of the active mode network with deficient width or missing links.

Existing road widths for general traffic and freight were compared to the Nelson / Tasman Land Development Manual and compared to the desired hierarchy, with width gaps and excessive traffic volumes (rat running) identified.

Places were prioritised, as were the modes that link them, to identify the preferred sequencing (short term 0 – 5 yrs, medium term 5- 15 yrs, long term >15yrs) of options to support a multi-modal transport system within the project area.

Appendix F contains maps showing the NOH (by mode), gap analysis maps, priority places, intervention types to address the gaps, spreadsheets and maps identifying location-specific interventions for the project area, maps defining the network hierarchy and the primary and secondary walking and cycling networks proposed for Nelson

The proposed hierarchies have been developed to link the main places within and adjacent to the Project Area and these have been prioritised as:

The places that were prioritised for walking and cycling facilities are:

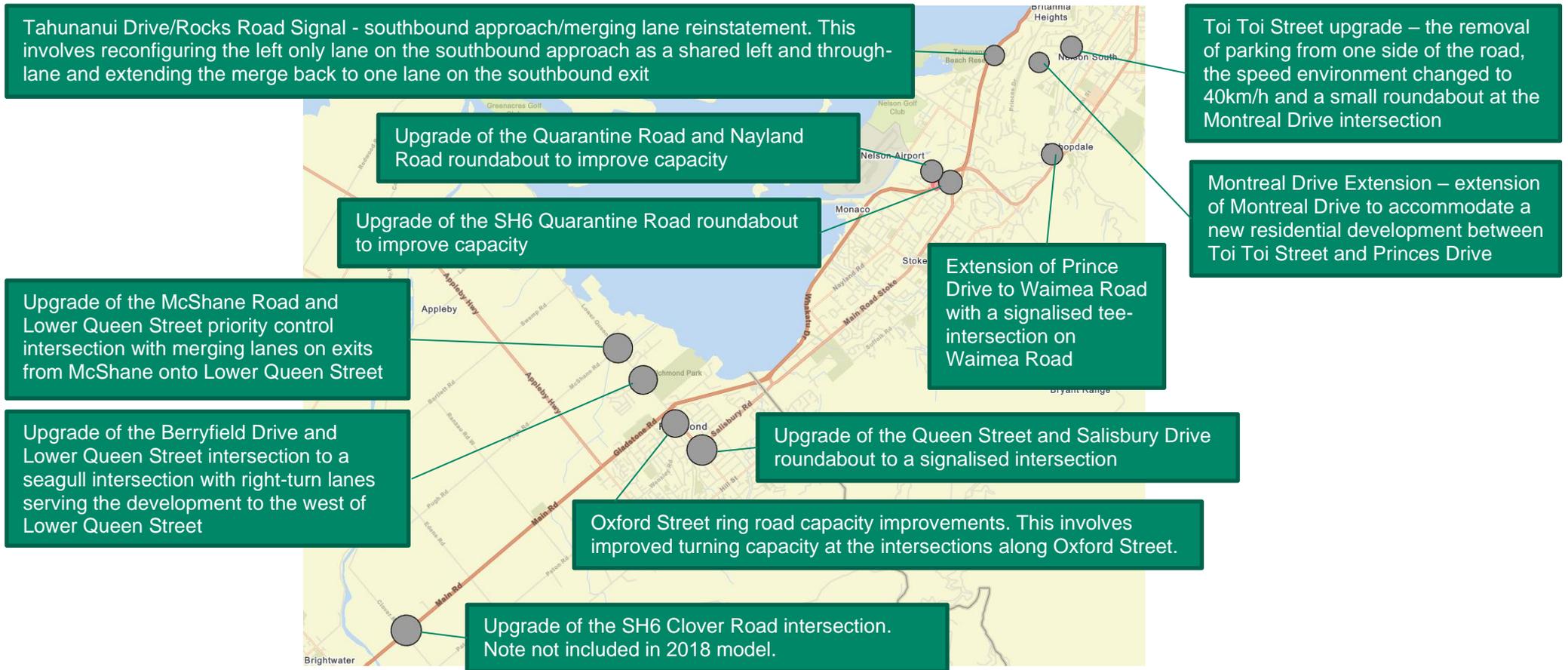
- Priority 1 – CBD, Schools, Hospital, Tāhunanui
- Priority 2 – Everything else

## 6.2 Do minimum

The Do Minimum future year network assumptions were developed through extensive consultation with the client representatives from NZTA, NCC and TDC. Consistent with the EEM methodology, the Do Minimum network was assumed to include only those projects for which funding and programming has been committed to maintain an appropriate level of service.

The projects identified through consultation are all expected to be implemented before 2028 and are therefore in both the 2028 and 2048 future networks, include:

Figure 57: Do minimum activities



While highlighted as a key project, the Hill Street Extension has been left out of the Do Minimum network as uncertainty remains around the exact location, as well as the form and function.

The do-minimum also assumes that the existing seawall along Rocks Road is replaced between 2050 and 2060 (based on current structural and sea level rise assessments). The whole wall would be replaced as one project rather than multiple projects (consented, designed and constructed), taking an adaptive pathways approach to sea level rise for the next 100 years, but with no additional width other than that needed to retain the existing wall for heritage purposes.

### 6.3 Long-list options

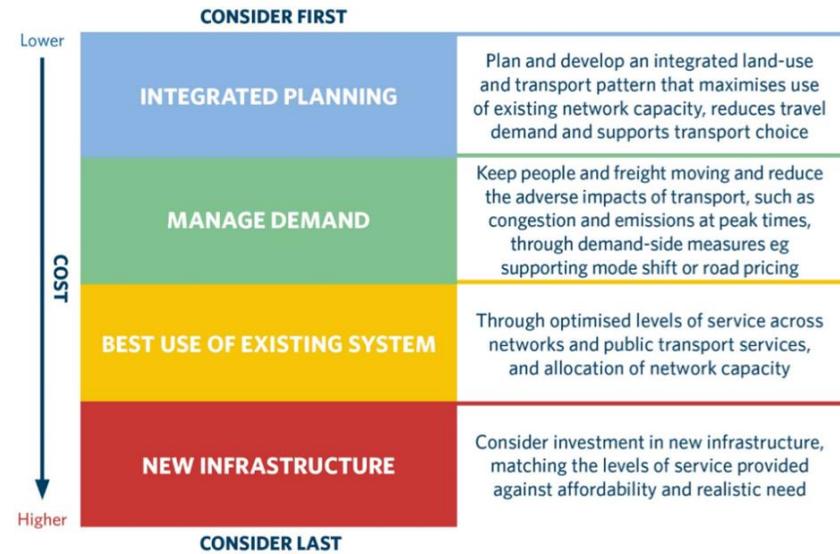
To address the identified problems, a long list of options was developed by the project partners, iwi and PRG members by utilising the long list from the PBC and adding further insights, options and suggestions to address the identified problems.

Appendix C contains the long-list of options within the outputs from PRG Workshop 1.

The consideration on non-infrastructure and infrastructure options was included in the development of the long-list options and followed the intervention hierarchy as shown in Figure 58. This was to understand what options would be complementary to each other, as well as understanding how they would perform individually. These options varied in scale from low-cost/low complexity through to high cost/high complexity.

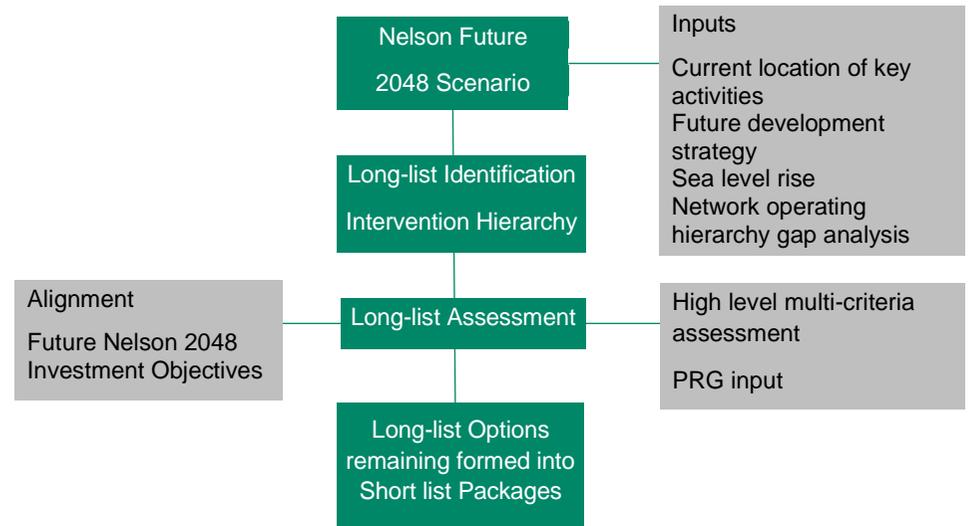
In considering the hierarchy the integrated planning considerations were led by the FDS. The FDS sets out the desired pattern of development within Nelson City and transport options were identified that looked to support this development over the next 30-years. The FDS seeks to increase density within the city, with managed growth areas.

Figure 58: Intervention Hierarchy



Assessment of the long-list options focussed on the following:

Figure 59: Long-list assessment process



A summary of the long-list options assessed and included in the short-list packages are included in Table 16:

**Table 16: Summary of the long-list options assessment**

| Options Summary                               | #  |
|-----------------------------------------------|----|
| Long-list options identified and assessed     | 80 |
| Options were included in one or more packages | 43 |
| Options excluded                              | 25 |
| Options categorised as BAU                    | 11 |

Of the options included, the majority would be classed as *Manage Demand* and *Best Use of Existing System* in the intervention hierarchy. The notable activities included are the coastal widening and enhanced SH6, Rocks Road shared path and the new inland route that would be classified as *New Infrastructure*.

Long-list options were excluded from further consideration for a number of key reasons summarised in Table 17:

**Table 17: Summary of the long-list options excluded**

| Theme                                                     | Examples                                                                                                                                                                             |
|-----------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Poor value for money relative to the scale of the problem | Tunnels<br>Light / grade separated rail<br>Gondola                                                                                                                                   |
| Outside study area                                        | Inland port / barge                                                                                                                                                                  |
| Requires third party approvals / legislation              | Congestion charging<br>Changing school hours<br>School zoning<br>Adjust retailing hours<br>Increase truck carrying capacity<br>Longer election terms to provide longer term planning |
| Included in PT review                                     | On-demand service                                                                                                                                                                    |

The complementary activities that were not excluded were then developed into short-list packages of interventions.

## 6.4 Short-list Packages of Improvements

Using the long-list of options and themes correlated to the intervention hierarchy packages of activities and interventions (options) were created. This was based on themes determined by the large interchangeable investments being the coastal widening project to enhance SH6, bus priority/clearways, and the new inland route. As noted, the Short-term package includes multiple activities that could be delivered early, is assessed independently, and included in the bus priority and new inland route packages.

The main packages (themes) were assigned names and numbers being:

**Table 18: Short-list packages**

| Package # | Named      | Description                                                                                                                                                                                                                                                                                                                                                                                               |
|-----------|------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1         | Do minimum | The improvements required to maintain the minimum level of service. Improvements identified are committed projects with funding allocated by Waka Kotahi and NCC. Refer to Figure 57 to view the individual activities.                                                                                                                                                                                   |
| 2         | Short-term | This package is included in Packages 3 to 5 and includes:<br>Minor bus network improvements including ticketing improvements;<br>Local area traffic calming measures to make our streets safer and our neighbourhoods more liveable.<br>Intersection upgrades to support better vehicle movement including prioritisation of buses.<br>Speed management on parts of the network to make our neighbourhood |

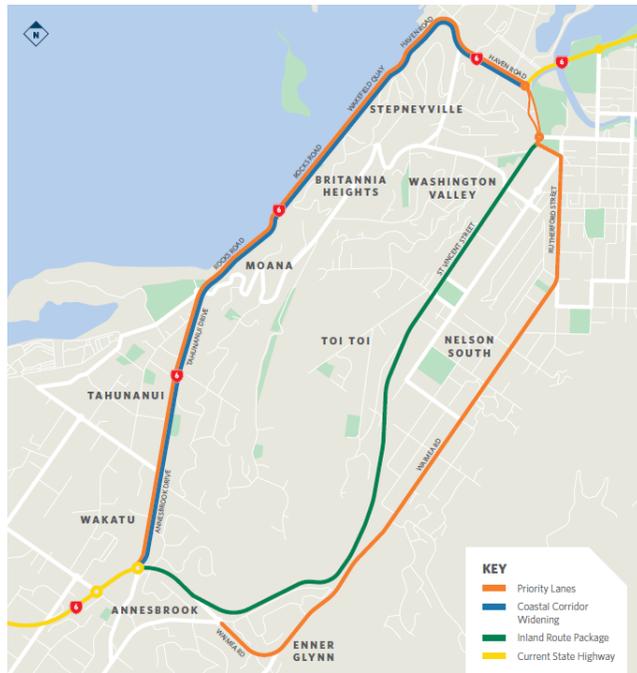
| Package # | Named                      | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|-----------|----------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           |                            | <p>vibrant places to live and safer for people walking and cycling.</p> <p>Revising parking and public transport fares to encourage walking, cycling and using the bus.</p> <p>Marketing and promotion of different ways to travel to work and school.</p> <p>The cost estimate for this package is \$150m to \$190m. This includes Rocks Road cycling facility estimated at \$50m to \$60m. This facility includes a new seawall in response to sea level rise and the long-term integrity of the existing wall, is included within the cost.</p> <p>No short-term interventions along Sh6 Rocks Road have been assessed independently as it was determined that none would provide any immediate network or corridor benefits.</p> |
| 3         | Priority Lanes             | <p>In addition to Package 2 this package includes; widening to provide peak period priority lanes for buses and other approved vehicles on key arterials, signalised intersection upgrades to provide for the priority lanes, waterfront improvements along Rocks Road, and extra bus stop provision.</p> <p>The indicative costs range from \$220m to \$250m (excluding Package 2 costs).</p>                                                                                                                                                                                                                                                                                                                                       |
| 4         | Coastal Widening (Enhanced | <p>In addition to Package 2 this package includes;</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |

| Package # | Named            | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|-----------|------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           | state highway)   | <p>Significant road widening to four lanes for general traffic on SH6 between Annesbrook and Haven Road roundabouts.</p> <p>Includes widening Rocks Road to provide a 5m walking and cycling facility which would be separated from the traffic by landscaping and/or parking.</p> <p>The indicative cost estimates range from \$500m to \$540m (excluding Package 2 costs).</p>                                                                                                                                                                                                                                                                                                                                                  |
| 5         | New Inland Route | <p>In addition to Package 2 this package includes: Using the old railway alignment and St Vincent Street corridor (prior Nelson-Southern link corridor) to cater for the predicted long-term increase in transport demand.</p> <p>Includes a new road which could be configured in a number of ways.</p> <p>Includes improving the existing connection between St Vincent Street and the city centre.</p> <p>The new road would come with facilities such as pedestrian crossings, treatments that reduce noise such as smooth surfaces and noise walls and safe speed zones.</p> <p>The existing cycle facility would be maintained or enhanced.</p> <p>The indicative cost is \$190m to \$230m (excluding Package 2 costs).</p> |

The long list options progressed were then assigned to the above packages. Refer to Appendix C for the long-list of options screened into packages and those options that were not included.

The general location of the short-list packages is shown in Figure 60. The short-term package provides for activities and interventions across the city of Nelson but only those associated with the Nelson Future Access Project have been progressed via this business case. The general location of the Short-Term Package is contained within or directly adjacent to the area bounded by the Priority Lanes Package.

Figure 60: Short-list package locations



Sub-packages were derived to arrive at a final short-list of packages for assessment under a project specific Multi-Criteria Analysis framework being:

Table 19: Short-list package descriptions

| Short-list Option                                    | Sub-Option                                                                                                            |
|------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------|
| Package 1: Do Minimum                                | None                                                                                                                  |
| Package 2: Short Term Package                        | None                                                                                                                  |
| Package 3: Priority Lanes                            | P3: Priority Lanes for buses via Peak Period Clearways + Package 2                                                    |
|                                                      | P3B: Peak Period Clearways for General Traffic + Package 2                                                            |
|                                                      | P3Ba: Peak Period Contraflow lane for General Traffic + Package 2                                                     |
|                                                      | P3C: Peak Period Clearways for General Traffic - excludes Package 2                                                   |
|                                                      | P3Ca: Peak Period Contraflow lane for General Traffic - excludes Package 2                                            |
| Package 4: Coastal Widening (Enhanced state highway) | P4: Enhanced Rocks Road as a State Highway + Package 2                                                                |
|                                                      | P4B: Enhanced Rocks Road as a State Highway - excludes Package 2                                                      |
| Package 5: New Inland Route                          | P5: New Inland Arterial Route + P2                                                                                    |
|                                                      | P5ab: New route (no freight) with cut and cover at Toi Toi intersection for priority traffic (bus and T3) + Package 2 |
|                                                      | P5B: New Arterial Route - excludes Package 2                                                                          |
|                                                      | P5Ba: New SH Route with cut and cover at Toi Toi intersection - excludes Package 2                                    |

| Short-list Option | Sub-Option                                                                                                                      |
|-------------------|---------------------------------------------------------------------------------------------------------------------------------|
|                   | P5Bab: New route (no freight) with cut and cover at Toi Toi intersection for priority traffic (bus and T3) - excludes Package 2 |

Further descriptions of the packages and sub-packages can be found in Appendix G as part of the MCA process.

A high-level sieve was undertaken to further refine the short-list packages for assessment. Figure 61 shows the packages that were progressed for further assessment, and the sub-packages that were not progressed. The sub-packages not progressed were the packages excluding Package 2: Short-term activities because these are inconsistent with the key strategic documents such as the GPS, FDS, the intent of the Intervention hierarchy and recent climate emergency declaration by NCC.

Figure 61: Short-list package high-level sieve

| PACKAGES                                                                   | SUB PACKAGES                                                                               | DO NOT PROCEED                                                                                                                                                                                                                                                    | PROCEED                                                                                                                                                                     |
|----------------------------------------------------------------------------|--------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| PACKAGE 1<br>Do minimum <del>incl</del><br>committed projects              | NA                                                                                         |                                                                                                                                                                                                                                                                   | Committed activities                                                                                                                                                        |
| PACKAGE 2<br>Short-term options                                            | NA                                                                                         |                                                                                                                                                                                                                                                                   | Positive impact for active modes and mode shift                                                                                                                             |
| PACKAGE 3<br>Priority lanes and clearways                                  | PACKAGES 3/3B/3Ba (Mix of priority lanes, clearways + Package 2)                           |                                                                                                                                                                                                                                                                   | Positive impact for PT, mode shift and transport network impacts. Enabler for improving the vibrancy of the CBD and urban environment y reduced parking and vehicle demand. |
|                                                                            | PACKAGES 3C/3Ca (Mix of priority lanes, clearways excluding Package 2)                     | <br>Performs poorly compared to packages that include Package 2 because infrastructure to accommodate mode shift to active modes is not available, encouraging more trips by vehicle with corresponding negative impacts to the transport network and liveability |                                                                                                                                                                             |
| PACKAGE 4<br>Coastal Widening (Enhanced Rocks Road as a State              | PACKAGE 4<br>Includes Package 2                                                            |                                                                                                                                                                                                                                                                   | Positive impact for PT, mode shift and quality waterfront                                                                                                                   |
|                                                                            | PACKAGE 4b<br>Excludes Package 2                                                           | <br>Performs poorly compared to packages that include Package 2 as noted above                                                                                                                                                                                    |                                                                                                                                                                             |
| PACKAGE 5<br>Inland route (Mix of new arterial route + supporting options) | PACKAGES 5/5ab (Includes Package 2 with/without Toi Toi intersection and priority traffic) |                                                                                                                                                                                                                                                                   | Long-term network and resilience impacts, combined with Package 2                                                                                                           |
|                                                                            | PACKAGES 5B/5Ba/5Bab (as above but excludes Package 2)                                     | <br>Performs poorly compared to packages that include Package 2 as noted above                                                                                                                                                                                    |                                                                                                                                                                             |

### 6.5 Short-list Packages Traffic Modelling

Traffic modelling of the main Packages was undertaken to provide outputs to help differentiate the transport performance between Packages and provide inputs into the MCA process.

## 6.6 Short-list Packages Consultation

A detailed record of feedback from Iwi, PRG Members and the public is provided in Appendix E. Two consultation phases were undertaken through the project: consultation on the short-list packages, and a later engagement phase regarding the preferred package. In summary for the short-list packages consultation, the main inputs, insights, themes and outputs provided to the project team were:

### A. Iwi and PRG Members

Iwi and PRG members helped the project team identify a long list of options for addressing the identified problems, determine Iwi and Community criteria (to be used in the MCA process along with the weighting of all the MCA criteria and provide feedback on the material to be used for public engagement.

Following public engagement, PRG members were then asked to review the public engagement report and score the community criteria. Iwi undertook a similar process in a separate meeting for the Māori Values MCA criteria.

### B. Views of the Public

Public engagement was undertaken to help the Project Team to understand which long-term option or combination of options should be progressed so that they could refine short term interventions that would support the outcomes. It also allowed the team to understand how acceptable the packages were to the community, and to capture any other issues as part of the assessment.

Public consultation was undertaken in July 2020, and the public were asked to provide feedback on three long-term packages (refer to Appendix E for the engagement brochure), that helped the Project Team's Specialists (including the PRG members and Iwi) inform their MCA scoring and provide insights, concerns and opportunities related to the packages.

Appendix E provides the public engagement report. In summary, the NFAP community engagement captured:

Figure 62: July 2020 public engagement received



The Priority Lanes Package was considered preferable in terms of enabling the vision for Nelson; changing future travel behaviours; responding to climate change and getting more people to use active modes.

The community values Rocks Road and the waterfront. People want to see less heavy traffic on this route, with priority given to people, especially in terms of retaining good access and connectivity to the waterfront.

Many members of the community highlighted how valuable and well used the current Railway Reserve is and how a new Inland Route would negatively impact the community around Victory. The respondents that supported the Inland Route cited better traffic flow and reduced congestion, removal of heavy vehicles away from Rocks Road and having a more resilient route.

A comparison with the public engagement undertaken during the PBC, showed a similar level of engagement. The PBC asked questions around preference of three approaches being:

- Approach A – making the most of the existing network. This is similar to the Short-Term Package.
- Approach B – widening of the existing two main arterials. This is a similar amount of widening as for the Priority Lanes Package but in the PBC the widening was for general traffic.
- Approach C – Creating a new arterial route. This is similar to the Inland Route Package
- Approach D – Creating your own approach

Respondents showed a higher preference for Approach C as below.

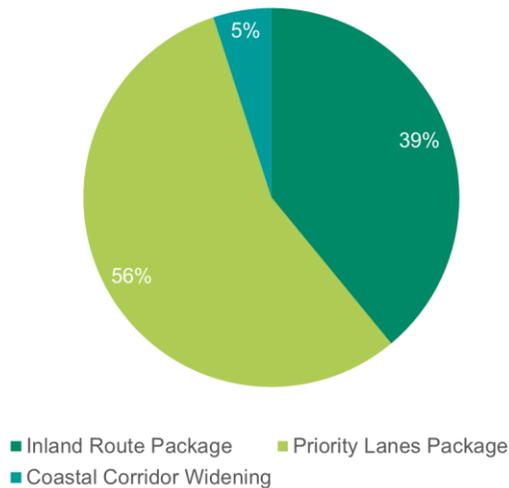
**Table 20: Approach Preferences from the PBC Public Engagement**

| Question 3 Which of the proposed approaches do you prefer and why? |       |       |      |       |
|--------------------------------------------------------------------|-------|-------|------|-------|
| A                                                                  | B     | C     | D    | Total |
| 483                                                                | 211   | 1,234 | 82   | 2010  |
| 24%                                                                | 10.5% | 61.4% | 4.1% |       |

The engagement of 2020 produced the following engagement response

**Figure 63: Respondent's preferences for the Packages**

Which long-term transport package is likely to be the most successful and enabling the vision for Nelson?



Although the Packages are not exactly comparable, this comparison shows that support for a new arterial along the Inland Route has reduced attributed to changing perspectives within the community.

### 6.7 Short-list Packages Multi-Criteria Assessment

Packages were analysed using a multi-criteria analysis process as a framework. Four main areas were identified, along with criteria aligned to the Resource Management Act, were developed and agreed with the project partners.

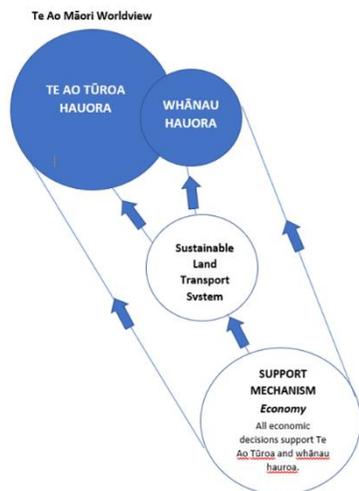
Community and Iwi Cultural criteria were determined by the PRG and Iwi representatives respectively, with the remaining criteria set by the project partners. Weightings of the individual criteria to be used for sensitivity testing were also set in the same manner.

**Figure 64: MCA Weightings**



Te Ao Māori (Māori Worldview) of Te Tau Ihu and Te Ao Tūroa (the natural world) is highlighted to enlighten Waka Kotahi and the broader community of the Crown's Treaty Partners Values. The diagram shown in Figure 65 reflects a healthy balanced natural world (including the human species) and people with a quality sustainable lifestyle which is underpinned by socio-cultural equity and justice. Te Ao Māori has informed the development of criterion that reflects Māori values.

Figure 65: Te Ao Maori Worldview



Scoring of each criteria was undertaken by discipline specialists and then tested with iwi representatives and PRG members. Through this process a consensus score was achieved, supported by the technical disciplines reporting. Appendix G contains a summary report of the Specialists who undertook the MCA scoring and the reasons for those scores.

### 6.8 Investment Objectives and Additional Criteria

Agreed investment objectives and additional criteria for assessing the short-list packages via the multi criteria analysis are described below in Table 21.

Table 21: Investment objectives and additional criteria descriptions

| Investment Objectives                 |                                                                                              |
|---------------------------------------|----------------------------------------------------------------------------------------------|
| Investment Objective 1: Reliable      | Nelson’s transport system is more effective at moving people and freight                     |
| Investment Objective 2: Accessible    | Nelson’s transport system provides better access to employment, amenities and core services. |
| Investment Objective 3: Urban Amenity | Nelson’s transport system contributes to quality urban environments.                         |

| Investment Objective 4: Safety                   | Nelson’s transport system feels safer and is safer.                                                            |
|--------------------------------------------------|----------------------------------------------------------------------------------------------------------------|
| Investment Objective 5: Resilience               | Nelson’s transport system is more resilient.                                                                   |
| Additional Criteria                              |                                                                                                                |
| Te Ao Turoa                                      | Mana of the wider world around us, of nature, or the earth                                                     |
| Whanau and hapu                                  | The integrity / sustainable management of cultural sites / areas / locations                                   |
| Ki Uta ki Tai                                    | A sustainable NCC Land Transport System managed in accordance with Kaitiakitanga and Tino Rangatiranga         |
| Community connectivity and cohesion              | Connections to jobs, schools, shops, key community services and recreational facilities from residential areas |
| Active and equitable transport modes             | Facilitation of healthy and diverse transport modes across ages, ethnicity and abilities                       |
| Sustainability and environment                   | Potential to implement sustainable outcomes in construction and whole of life                                  |
| Natural environment                              | Impacts on natural features and biodiversity                                                                   |
| Greenhouse gas emissions                         | Reduction or increase                                                                                          |
| Economic opportunities                           | Positive or negative                                                                                           |
| Human health – Air quality                       | Reduction or increase in particulates                                                                          |
| Human health – Noise and Vibration               | Reduction or increase in dBA                                                                                   |
| Non-Maori related archaeology and heritage sites | Impacts on these sites. Requirements for heritage orders.                                                      |

|                       |                                                                                                                                 |
|-----------------------|---------------------------------------------------------------------------------------------------------------------------------|
| <b>Property</b>       | Affected properties                                                                                                             |
| <b>Consentability</b> | Potential to consent through the RMA                                                                                            |
| <b>Technical</b>      | Technical difficulty and risks to implement                                                                                     |
| <b>Adaptability</b>   | Opportunity to adapt to the foreseeable and unforeseeable risks including changing demands, land use, climate change, policies. |

## 6.9 Investment Objective Assessment

A summary of the different package assessments against the project's investment objectives is provided below. These then informed the moderated scoring of the multi-criteria assessment with stakeholders shown in Table 32.

### 6.9.1 Investment objective 1 - reliability assessment

Compared to the do minimum the short-term package provides a reasonable percentage mode shift to PT and active modes. In the long-term this has little to no impact on improving the 2048 travel times for key arterials, and reliability for traffic flow.

The priority lanes package provides a significant reduction in the travel times on key arterials compared to the do minimum. This improvement is significant for NB traffic. PT travel will become significantly more reliable due to the provision of dedicated lanes in the peak period. This increases the mode shift to PT.

The Inland Route open to general traffic splits traffic three ways with SH6 Rocks and Waimea Road. The significant improvements to travel time are experienced in the PM peak period for southbound traffic on both existing arterial routes. Smaller changes in travel time and reliability are shown in the AM peak period but the improvements in reliability are also expected to be high.

**Table 22: Investment objective 1 - reliability assessment**

| # | Description | Investment Objective 1 (Diff 2048 and 2018)<br>Nelson's transport system is more effective at moving people and freight |
|---|-------------|-------------------------------------------------------------------------------------------------------------------------|
| 1 | Do Minimum  | This is the reference case by which all packages are assessed against                                                   |

| #             | Description                | Investment Objective 1 (Diff 2048 and 2018)<br>Nelson's transport system is more effective at moving people and freight                                                                                                                                                                                                                                                                                        |
|---------------|----------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 2             | Short Term                 | People trips by: Car = -5% / Bus = +22% / Active mode = +52%<br><br>Rocks Rd AM peak TT difference (min)<br>AM NB = -0.7 min / SB = 0 min<br><br>Waimea Rd AM peak TT difference (min)<br>AM NB = -0.9 min / SB = 0.1 min                                                                                                                                                                                      |
| 3<br>3b       | Priority Lanes / Clearways | People trips by: Car = -7% / Bus = +65% / Active mode = +52%<br><br><b>2048 Rocks Rd AM peak TT difference (min)</b><br>NB = -2.0 min / SB = -0.7 min<br><br><b>2048 Waimea Rd AM peak TT difference (min)</b><br>NB = -2.7 min / SB = -0.7 min                                                                                                                                                                |
| 4             | Coastal Widening           | Similar outcomes to Package 2                                                                                                                                                                                                                                                                                                                                                                                  |
| 5<br>5a<br>5b | Inland Route               | People trips by: Car = -5% / Bus = +22% / Active mode = +52%<br><br><b>2048 Rocks Rd AM/IP/PM peak periods TT difference (min)</b><br>AM NB = 1.8 min / SB = -0.3 min<br>IP NB = -0.7 min / SB = 0.6 min<br>PM NB = -2.0 min / SB = -9.5 min<br><br><b>2048 Waimea Rd AM peak TT difference (min)</b><br>AM NB = 1.6 min / SB = -1.2 min<br>IP NB = -0.6 min / SB = -0.3 min<br>PM NB = 2.2 min / SB = -14 min |

## 6.9.2 Investment objective 2 - accessibility assessment

The short-term package increases accessibility for active modes to key destinations within the project area. This is primarily due to the completion of the primary and secondary walking and cycling network within the project area. The benefits are enduring across the other packages. The impact on accessibility for PT and drivers is decreasing, due to increasing travel times across the network.

The priority lanes package increases accessibility through an increased LoS, increasing the catchment of people that are within 30 minutes of the key destinations.

Coastal widening does not provide significant changes to LoS along Rocks Road due to the increased ADT consuming the additional capacity created.

The Inland Route for general traffic provides improved access for drivers to key destinations in the medium-term. This improvement declines out to 2048 after the medium-term. If the Inland Route was dedicated to PT the improvement will be significant for increasing the catchment of people that are within 30 minutes of the key destinations. There would be no additional improvement for access for drivers using the key arterial routes.

**Table 23: Investment objective 2 - accessibility assessment**

| # | Description                | Investment Objective 2 (Diff 2048 and 2018)<br>Nelson's transport system provides better access to employment, amenities and core services.                                                                                                                                                                                                             |
|---|----------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1 | Do Minimum                 | This is the reference case by which all packages are assessed against.                                                                                                                                                                                                                                                                                  |
| 2 | Short Term                 | Active mode: Network coverage increased to access key destinations<br>PT: Decreasing accessibility though increased travel times >30 minutes to the city centre, hospital, Tāhunanui and Airport<br>General traffic: Decreasing accessibility though increased travel times and decreased LoS to the city centre, hospital, Port, Tāhunanui and Airport |
| 3 | Priority Lanes / Clearways | <b>Package 3 - Priority Lanes</b>                                                                                                                                                                                                                                                                                                                       |

| #             | Description      | Investment Objective 2 (Diff 2048 and 2018)<br>Nelson's transport system provides better access to employment, amenities and core services.                                                                                                                                                                                                                                                                                                                                  |
|---------------|------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 3b            |                  | Active mode: Network coverage increased<br>PT: Increased accessibility from growing populations to a PT service with travel times <30 minutes to the city centre, hospital, Tāhunanui and Airport.<br>Driver: Increased accessibility for car and freight drivers to key areas through increased LoS from mode shift to PT and active modes to 2048 due to the priority lanes.<br><b>Package 3b - Clearways</b><br>This effect is neutral for clearways for general traffic. |
| 4             | Coastal Widening | Active mode: Network coverage increased to access key destinations and Rocks Road enhanced.<br>PT: No significant improvement to LoS along Rocks Road with general traffic increase<br>Driver: No significant improvement to LoS along Rocks Road with general traffic increase                                                                                                                                                                                              |
| 5<br>5a<br>5b | Inland Route     | <b>Package 5 / 5a</b><br>Active mode: Network coverage increased through Package 2.<br>PT: LoS maintained at 2018 level with general traffic<br>Driver: Medium term LoS improved; declining long-term to 2048<br><b>Package 5b</b><br>PT: Increased accessibility from growing populations to a PT service with travel times <30                                                                                                                                             |

| # | Description | Investment Objective 2 (Diff 2048 and 2018)<br>Nelson's transport system provides better access to employment, amenities and core services.       |
|---|-------------|---------------------------------------------------------------------------------------------------------------------------------------------------|
|   |             | minutes to the city centre, hospital, Tāhunanui and Airport.<br><br>Drivers: Decreased accessibility along Rocks Road to the waterfront and Port. |

### 6.9.3 Investment objective 3 - quality urban outcomes assessment

The short-term package provides the largest changes for residential areas within the study area through reducing some of the rat-running occurring through local area traffic management interventions and reducing traffic operating speeds. Urban quality is improved for residents using active modes in the area.

The priority lanes and inland route package provides a good opportunity for improving the proportion of city streets that meet the volume of traffic expected for their classification. For the inland route option providing for general traffic, there is a reduced effect when compared to having dedicated PT.

The inland route for general traffic will provide a significant reduction in forecast traffic on SH6 Rocks Road, and Waimea Road. The coastal widening package will significantly increase forecast traffic volume on SH6 Rocks Road, and significantly decrease forecast traffic volumes on Waimea Road.

**Table 24: Investment objective 3 - quality urban outcomes assessment**

| # | Description                | Investment Objective 3 (Diff 2048 and 2018)<br>Nelson's transport system contributes to quality urban environments.                                            |
|---|----------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1 | Do Minimum                 | This is the reference case by which all packages are assessed against. No significant change to do nothing scenario to traffic volumes through the study area. |
| 2 | Short Term                 | Primary and Secondary walking and cycling routes condition rating improved to Good or Excellent.                                                               |
| 3 | Priority Lanes / Clearways | Primary and Secondary walking and cycling routes FLoS rating improved to Good or Excellent                                                                     |

| #             | Description      | Investment Objective 3 (Diff 2048 and 2018)<br>Nelson's transport system contributes to quality urban environments.                                                                                                                                                                                                                                                                                    |
|---------------|------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 3b            |                  | By 2048 the proportion of city streets that meet the volume of traffic expected for their classification will meet current 2018 levels                                                                                                                                                                                                                                                                 |
| 4             | Coastal Widening | Primary and Secondary walking and cycling routes condition rating improved to Good or Excellent with a focus on Rocks Road<br><br>2048 Average Daily Traffic Changes:<br>Rocks Rd NB = +43% Rocks Rd SB = +29%<br>Waimea Rd NB = -82% Waimea Rd SB = -19%                                                                                                                                              |
| 5<br>5a<br>5b | Inland Route     | Primary and Secondary walking and cycling routes condition rating improved to Good or Excellent with a focus on Rocks Road<br><br>By 2048 the proportion of city streets that meet the volume of traffic expected for their classification will meet current 2018 levels<br><br>2048 Average Daily Traffic Changes:<br>Rocks Rd NB = -2% Rocks Rd SB = -26%<br>Waimea Rd NB = -82% Waimea Rd SB = -19% |

### 6.9.4 Investment objective 4 - safety assessment

The qualitative assessment for safety has been quantified. This allows the conservative reduction in crashes resulting in deaths and serious injuries (DSI) to be applied to the anticipated infrastructure changes to demonstrate the impacts that could be achieved. The reduction in crashes is based on the 2015-2019 crash history within the study area, and estimated DSI's out to 40 years.

Table 25: Investment objective 4 - safety assessment

| #       | Description                | Investment Objective 4 (Diff 2048 and 2018)<br>Nelson's transport system feels safer and is safer                                                                                                                                                                                                                                                                                                                                                                                                                  |
|---------|----------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1       | Do Minimum                 | This is the reference case by which all packages are assessed against. No significant change to do nothing scenario for safety.                                                                                                                                                                                                                                                                                                                                                                                    |
| 2       | Short Term                 | <p>Forecast reduction in the proportion of DSI's for vulnerable users by 20% resulting in 60 to 70 DSI's saved within the study area. Provided through extensive use of two-cycle facilities, and improved footpaths and crossings.</p> <p>Forecast reduction in the proportion of vehicle crashes resulting in DSI's by 10% resulting in 30 to 40 DSI's saved within the study area. Achieved through rationalising widths and speed management.</p> <p>Perception risk rating for vulnerable users improved.</p> |
| 3<br>3b | Priority Lanes / Clearways | <p><b>Package 3 - Priority Lanes</b></p> <p>Enduring benefits carried over from the Short-term Package.</p> <p><b>Package 3b - Clearways</b></p> <p>Enduring benefits carried over from the Short-term Package.</p> <p>Potential for increased crash risk for road traffic due to weaving and merging. Increased cycle crash risk through sharing clearways with general traffic.</p>                                                                                                                              |
| 4       | Coastal Widening           | <p>Enduring benefits carried over from the Short-term Package for vulnerable users.</p> <p>However due to deficiencies in the provision for safety along Rocks Road the net safety benefit for vulnerable users is zero. The addition of the extra</p>                                                                                                                                                                                                                                                             |

| #             | Description  | Investment Objective 4 (Diff 2048 and 2018)<br>Nelson's transport system feels safer and is safer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|---------------|--------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|               |              | <p>general traffic lanes means that existing on-road cycle lanes have to be forfeited. The increased width of roads and risk of pedestrian jaywalking across multi-lane roads offsets the safety improvements provided in the short term.</p> <p>Road traffic safety is reduced as the significant widening of SH 6 will be associated with higher speeds (even within the posted speed limit) and greater difficulty and risk of injury in turning across or crossing multiple lanes mid-block where signalised crossings cannot be provided.</p>                                                                                                                                                                                                                                                                                                                                                                                       |
| 5<br>5a<br>5b | Inland Route | <p><b>Package 5</b></p> <p>Enduring benefits carried over from the Short-term Package for vulnerable users for existing facilities.</p> <p>Safety accommodated in the design for the Inland Road. Heavy vehicle traffic reductions and improvements on SH 6 and Waimea Road, combined with safety in-built to the inland road improves safety for vehicle users. Forecast reduction in the proportion of vehicle crashes resulting in DSI's by 10% resulting in 30 to 40 DSI's saved within the study area</p> <p><b>Package 5a</b></p> <p>Forecast reduction in the proportion of DSI's for vulnerable users by 20% resulting in 60 to 70 DSI's saved within the study area</p> <p>Heavy vehicle traffic reductions and improvements on SH 6 and Waimea Road, combined with safety in-built to the inland road improves safety for vehicle users. Forecast reduction in the proportion of vehicle crashes resulting in DSI's by 10%</p> |

| # | Description | Investment Objective 4 (Diff 2048 and 2018)<br>Nelson's transport system feels safer and is safer                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|---|-------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|   |             | <p>resulting in 30 to 40 DSI's saved within the study area.</p> <p>This package also mitigates the safety concerns adjacent to residential areas at the southern end of St Vincent Street and around the Victory Community Centre.</p> <p><b>Package 5b</b></p> <p>Enduring benefits carried over from the Short-term Package for vulnerable users for existing facilities.</p> <p>The exclusion of heavy vehicles and general traffic from the new inland route further cements no net gain over the improvements implemented in the short term.</p> |

### 6.9.5 Investment objective 5 - resilience assessment

Compared to the other packages the Inland Route for general traffic provides the significant resilience benefits for the network. As the alternative route for SH6 it reduces the impact for full or partial closures and increases redundancy in the system.

Table 26: Investment objective 5 - resilience assessment

| # | Description | Investment Objective 5 (Diff 2048 and 2018)<br>Nelson's transport system is more resilient                                                                                                                                                                         |
|---|-------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1 | Do Minimum  | This is the reference case by which all packages are assessed against. Renewal of the sea wall will improve resilience to coastal hazards. It will be higher to protect against 2048 sea level rise and more robust than the existing wall which is deteriorating. |
| 2 | Short Term  | Neutral impact on network resilience. No change in elevation of Rocks Road which is narrowed slightly to allow construction of new cycle paths                                                                                                                     |

| #             | Description                | Investment Objective 5 (Diff 2048 and 2018)<br>Nelson's transport system is more resilient                                                                                                                                                                                                                                                                                                                                                                                                                 |
|---------------|----------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|               |                            | located behind the kerb-line on the seaward side. No change in exposure of either route to natural hazard risks compared to Do Minimum.                                                                                                                                                                                                                                                                                                                                                                    |
| 3<br>3b       | Priority Lanes / Clearways | Includes road widening and changes to road cross sections to allow additional temporary lanes to be created on both SH6 and Waimea Road, although this does eliminate the parking lane in some places. This provides some resilience benefits as Rocks Road is wider with more space away from the hillside and the associated hazards. By providing widening on both routes, Waimea Road has more capacity and this warrants a positive resilience score for both packages for slips and coastal hazards. |
| 4             | Coastal Widening           | Additional road corridor width (away from the hillside) on Rocks Road and the potential to strengthen existing pavements should increase resilience to slips and rockfall hazards more so than Packages 2 and 3. However, there is no additional mitigation for tsunami or storm surge other than the sea wall.                                                                                                                                                                                            |
| 5<br>5a<br>5b | Inland Route               | <p><b>Package 5 / 5a</b></p> <p>Inland route provides the alternative route to SH 6 and Waimea Road reducing the impact of partial or full closures of SH 6. Overall network resilience is significantly increased against coastal hazards, earthquakes, and liquefaction hazard, wind and flooding.</p> <p><b>Package 5b</b></p> <p>Package 5b is reduced slightly in significance based on the assumption that freight would be prevented from using this route in an emergency.</p>                     |

### 6.9.6 Summary

The moderated MCA Analysis shows that the inland package 5B provides very high benefits when compared against the investment objectives. The key reason for this is the dedication of the inland route for public transport, and vehicles carrying multiple occupants. By dedicating the inland route to these types of vehicles more people are able to be moved along the corridor and is not encumbered by movement along SH 6 Rocks Rd. The next best performing options are Package 5A Inland Route, and Package 3 Peak Period Priority Lanes.

Package 3 and Package 5A both had the same score against the five investment objectives. Package 3 provided significantly more benefit to Investment Objective 2 by increasing the populations that would be within 30 minutes of key destinations. It also provided more benefit for Investment Objective 3 by decreasing car mode share and increasing PT mode share and increasing people throughput on the existing arterial roads. The provision of the Inland Route with no restrictions on use would provide much less benefit for quality urban environments through the severance effects that the road creates for the residential communities that it passes through.

Package 5A does provide for greater benefits when scored against Investment Objective 4 – Safety, and Investment Objective 5 – Resilience. Package 3 improves the safety risk for all users compared to Package 3 which carries much of the same benefit as the Short-term package which is included in both. The inland route is more resilient than SH 6 to rock falls and coastal inundation and scores better than Package 3 which retains Waimea Rd as the alternative route when SH 6 is closed.

### 6.9.7 Additional Assessment Criteria

The following summaries are provided for the additional criteria where they have a significant impact on the overall total score for the packages. A complete summary is included in Appendix G.

**Table 27: Maori values summary assessment**

| Package        | Maori Values Summary Assessment                                                                                        |
|----------------|------------------------------------------------------------------------------------------------------------------------|
| Short-term     | Significantly positive in a sustainable transport system to achieve net enduring restorative outcomes                  |
| Priority lanes | Widening on Rocks Road for the priority lanes and the shared path impacts the sustainable management of cultural sites |

| Package          | Maori Values Summary Assessment                                                                                                                                                                                                                      |
|------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Coastal widening | Significant impact to the values in the coastal environment, and coastal sites of importance for local iwi                                                                                                                                           |
| Inland route     | The impact from severance on Victory community due to new road, interaction between Victory Community centre, schools, square and village. Negative impacts from amenity and health degradation/compounded by the package enabling growth in traffic |

**Table 28: Greenhouse gas emissions summary assessment**

| Package          | GHG Summary Assessment                                                                                                                                                                                                                                                                                                             |
|------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Short-term       | GHG: ~12% daily reduction in greenhouse gas emissions                                                                                                                                                                                                                                                                              |
| Priority lanes   | GHG: ~12% - 16% daily reduction in greenhouse gas emissions for the priority lanes. Consistent with the short-term package and increased efficiencies through PT uplift.                                                                                                                                                           |
| Coastal widening | GHG: ~7% daily reduction in greenhouse gas emissions due to package 2 and additional efficiencies. Short-term package benefits offset by increasing VKT.                                                                                                                                                                           |
| Inland route     | GHG: ~5% daily reduction in greenhouse gas emissions due to Package 2 and some additional efficiencies. Short-term package benefits offset by increasing VKT.<br><br>Package 5b: GHG: ~12% - 16% daily reduction in greenhouse gas emissions. Consistent with the short-term package and increased efficiencies through PT uplift. |

**Table 29: Economic impact summary assessment**

| Package        | Economic Impact Summary Assessment                                                                           |
|----------------|--------------------------------------------------------------------------------------------------------------|
| Short-term     | Some benefit in improving access to the port, tourism and the city centre                                    |
| Priority lanes | Enhanced benefits for access to the port, tourism and the city centre in addition to the short-term package. |

| Package          | Economic Impact Summary Assessment                                                                                                                                                                                  |
|------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Coastal widening | Enhanced access to the port along Rocks Road. Minor positive impact for tourism and the city centre.                                                                                                                |
| Inland route     | Significant increase and resilience for freight access to the port. Significant increase in the opportunity to expand Rocks Rd for community use. Creates additional capacity for people to access the city centre. |

Table 30: Human health - Air quality summary assessment

| Package          | Air Quality Summary Assessment                                                                                                                                                                                                                                                                                    |
|------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Short-term       | Positive outcome for active transport modes, and cyclists in particular.                                                                                                                                                                                                                                          |
| Priority lanes   | Positive outcome for active transport modes, and cyclists in particular, will be removed in some areas from traffic emissions.<br><br>The removal of traffic to public transport on the airshed counteracted by the widening of the road to accommodate the priority lanes, moving vehicles closer to residences. |
| Coastal widening | Neutral                                                                                                                                                                                                                                                                                                           |
| Inland route     | Negative impact on the residential areas by increasing traffic volumes within the Victory community due to new inland road.                                                                                                                                                                                       |

Table 31: Human health - Noise and vibration summary assessment

| Package        | Noise and Vibration Summary Assessment                                           |
|----------------|----------------------------------------------------------------------------------|
| Short-term     | Neutral                                                                          |
| Priority lanes | Minor negative impact through the increase in bus public transport on key routes |

| Package          | Noise and Vibration Summary Assessment                                                                                                                                                                                                                                         |
|------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Coastal widening | Minor negative impact through the increase in traffic on Rocks Road                                                                                                                                                                                                            |
| Inland route     | The inland route introduces an elevated noise and vibration source and exposes a number of new receivers to road traffic noise. The associated reduction in traffic volumes on Rocks Road and Waimea Road would not result in a perceptible reduction in traffic noise levels. |

Table 32: Moderated MCA scoring for the short-list packages

| PACKAGE MULTI-CRITERIA ANALYSIS<br>Package objective contribution analysis is based on subjective and qualitative information, which was summarised into a rank to compare the packages against each other |                                                                                              | PACKAGE 1  | PACKAGE 2          | PACKAGE 3                  | PACKAGE 3b                                | PACKAGE 4        | PACKAGE 5    | PACKAGE 5a                                    | PACKAGE 5b                                                                      |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------|------------|--------------------|----------------------------|-------------------------------------------|------------------|--------------|-----------------------------------------------|---------------------------------------------------------------------------------|
|                                                                                                                                                                                                            |                                                                                              | Do minimum | Short-term package | Peak period priority lanes | Peak period clearways for general traffic | Coastal widening | Inland route | Inland route with cut and cover at Toi Toi IS | Inland route (no freight) with cut and cover at Toi Toi IS for priority traffic |
| Objective 1                                                                                                                                                                                                | Nelson's transport system is more effective at moving people and freight                     | 0          | 1                  | 3                          | 2                                         | 2                | 3            | 3                                             | 3                                                                               |
| Objective 2                                                                                                                                                                                                | Nelson's transport system provides better access to employment, amenities and core services. | 0          | 2                  | 3                          | 2                                         | 2                | 1            | 1                                             | 3                                                                               |
| Objective 3                                                                                                                                                                                                | Nelson's transport system contributes to quality urban environments.                         | 0          | 1                  | 2                          | 1                                         | 0                | 0            | 1                                             | 2                                                                               |
| Objective 4                                                                                                                                                                                                | Nelson's transport system feels safer and is safer.                                          | 0          | 1                  | 1                          | 0                                         | 0                | 1            | 2                                             | 1                                                                               |
| Objective 5                                                                                                                                                                                                | Nelson's transport system is more resilient.                                                 | 0          | 0                  | 1                          | 1                                         | 1                | 3            | 3                                             | 2                                                                               |
| <b>Sub-total</b>                                                                                                                                                                                           |                                                                                              | <b>0</b>   | <b>5</b>           | <b>10</b>                  | <b>5</b>                                  | <b>5</b>         | <b>8</b>     | <b>10</b>                                     | <b>11</b>                                                                       |
| <b>ADDITIONAL ASSESSMENT CRITERIA</b>                                                                                                                                                                      |                                                                                              |            |                    |                            |                                           |                  |              |                                               |                                                                                 |
| Te Ao Turoa                                                                                                                                                                                                |                                                                                              | 0          | 1                  | 0                          | -2                                        | -3               | -2           | -3                                            | -2                                                                              |
| Whanau and hapu                                                                                                                                                                                            |                                                                                              | 0          | -1                 | -2                         | -3                                        | -3               | -3           | -3                                            | -3                                                                              |
| Ki Uta ki Tai                                                                                                                                                                                              |                                                                                              | 0          | 2                  | 0                          | -1                                        | -3               | -3           | -3                                            | -3                                                                              |
| Community connectivity and cohesion                                                                                                                                                                        |                                                                                              | 0          | 1                  | 0                          | -1                                        | -2               | -1           | 0                                             | -1                                                                              |
| Active and equitable transport modes                                                                                                                                                                       |                                                                                              | 0          | 1                  | 0                          | -1                                        | -1               | -1           | -1                                            | -1                                                                              |
| Sustainability and environment                                                                                                                                                                             |                                                                                              | 0          | 1                  | 1                          | -1                                        | -2               | -1           | 0                                             | -1                                                                              |
| Natural environment                                                                                                                                                                                        |                                                                                              | 0          | -1                 | -2                         | -2                                        | -2               | -1           | -1                                            | -1                                                                              |
| Greenhouse gas emissions                                                                                                                                                                                   |                                                                                              | 0          | 2                  | 3                          | 1                                         | 1                | 1            | 1                                             | 3                                                                               |
| Economic opportunities                                                                                                                                                                                     |                                                                                              | 0          | 1                  | 2                          | 1                                         | 2                | 3            | 3                                             | 1                                                                               |

|                                                  |          |          |           |            |            |            |            |            |
|--------------------------------------------------|----------|----------|-----------|------------|------------|------------|------------|------------|
| Human health – Air quality                       | 0        | 1        | 1         | 1          | 0          | -1         | -1         | -1         |
| Human health – Noise and Vibration               | 0        | 0        | -1        | -1         | -1         | -3         | -3         | -3         |
| Non-Maori related archaeology and heritage sites | 0        | -1       | -3        | -3         | -3         | -2         | -2         | -2         |
| Property                                         | 0        | -1       | -2        | -2         | -2         | -1         | -2         | -2         |
| Consentability                                   | 0        | 3        | 1         | 1          | -1         | -2         | -2         | -1         |
| Technical                                        | 0        | -1       | -2        | -2         | -3         | -2         | -3         | -3         |
| Adaptability                                     | 0        | 1        | 2         | 2          | 3          | 2          | 1          | 1          |
| <b>Sub-total</b>                                 | <b>0</b> | <b>9</b> | <b>-2</b> | <b>-13</b> | <b>-20</b> | <b>-17</b> | <b>-19</b> | <b>-19</b> |

## 6.10 Multi-criteria Assessment Sensitivity Testing

Sensitivity tests were then undertaken to understand whether the relative ranking of programmes would change in response to changes to the weighting of key criteria. These sensitivity tests were:

- Double the weighting of the Investment Objective Criteria
- Double the weighting of the Iwi Partner / Stakeholder Values
- Double the weighting of the Assessment of Effects Criteria
- Double the weighting of the Implementability Criteria
- The Te Ao Maori (the Maori world view) test
- A Project Reference Group test which was developed by the group

Conclusion - The relative rankings of the programmes remained relatively consistent, regardless of the sensitivity test that was used.

## 6.11 MCA Summary

In reviewing the raw scores of the criteria across the four main areas, and considering Investment Objectives 1 to 4 inclusive, those packages that focus on priority traffic utilising additional road capacity score higher than those packages that provide for all traffic. Packages that provide for an additional route score higher than those that don't. All packages score positively when considering all of the criteria that make up the Investment Objectives.

Packages that provide for growth using car-based travel would likely show neutral or dis-benefits across the Investment Objectives 2, 3 and 4 if the short-term package was not included.

The Specialists acknowledged that on its own the Short Term Package would not achieve the desired outcomes of the Investment Objectives over the life of the programme (out to 2048) but would provide the desired outcomes across the Investment Objectives (except for resilience) for a minimum of 10 years when compared to the do-minimum and the assumed growth in population as stated in the FDS.

When considering Iwi, Partner and Stakeholder values as an area for consideration, on average the Short Term Package on its own scores positively, whilst all the other packages score negatively with the Priority lanes package being slightly negative and the Coastal Widening and Inland Route Packages being moderately negative.

When considering the effects of the packages, on average, the Short-term is slightly positive, the Priority Lanes Packages is slightly negative, with all the other packages on average being moderately negative.

When considering the implementability of the packages (excluding adaptability), on average, the Short-term package is slightly positive, the Priority lanes and Peak Period Clearways Packages is slightly negative with the remaining packages being moderately negative.

At an area wide level, only the Short-term Package scores positively across all four areas, with the Priority Lanes Package scoring positively across two areas. All other packages score neutral or negatively across three areas.

Applying sensitivity weightings demonstrates that the Short-term Package is the highest ranked package followed by the Priority Lanes Package.

Acknowledging that the Short-term Package is contained in all the other Packages (except the do minimum), the Priority Lanes Package is the highest-ranking longer-term Package followed by the Peak Period Clearways Package.

The MCA provided a good tool for understanding which programmes would best address each of the identified problems, and the risks associated with each. This information ultimately helped in the process of refining the Preferred Programme.

## 6.12 Economic Evaluation of the Alternative Packages

Indicative benefit cost ratios for the Package options have been assessed using simplified procedures appropriate for the short-list package assessment, and to differentiate the packages. A separate Rocks Road assessment was included to show the potential monetised benefits as a standalone project. This is because of the large cost associated with the Rocks Road project and is the single biggest project in the short-term package.

The following indicative BCRs were assessed, noting that the results have been rounded to the nearest decimal:

**Table 33: Short-list package economic assessment summary**

| Package   | Description | Total Benefits (\$M) | NPV Costs (\$M) | BCR |
|-----------|-------------|----------------------|-----------------|-----|
| Package 1 | Do Minimum  | -                    | -               | -   |

| Package                                                                  | Description         | Total Benefits (\$M) | NPV Costs (\$M) | BCR        |
|--------------------------------------------------------------------------|---------------------|----------------------|-----------------|------------|
| <b>Package 2 (excl Rocks Road enhanced walking and cycling facility)</b> | Walking and cycling | 124.1                | 127.2           | <b>1.0</b> |
| <b>Package 2 (incl Rocks Road enhanced walking and cycling facility)</b> | Walking and cycling | 179.5                | 164.9           | <b>1.1</b> |
| <b>Package 3</b>                                                         | Priority Lanes      | 309.2                | 236.0           | <b>1.3</b> |
| <b>Package 4</b>                                                         | Coastal Widening    | 210.1                | 436.5           | <b>0.5</b> |
| <b>Package 5</b>                                                         | Inland Route        | 210.1                | 237.5           | <b>0.9</b> |
| <b>Rocks Road Shared Path</b>                                            | Standalone          | 55.3                 | 37.7            | <b>1.5</b> |

The BCR assessment indicates that the Package 2, Package 3 and Rocks Road standalone BCRs are economically viable with a “Low” economics profile factor (Range 1.0 to 2.9). For Package 2 over 50% of the monetised benefits are attributed to walking and cycling benefits through new users. Package 3 includes these benefits, with an increase walking and cycling facility benefits for Rocks Road, and additional travel time benefit for vehicles on the key arterials.

A shared path facility has been assessed for Rocks Road as a standalone project. The project has a positive BCR based on the monetised walking and cycling new user benefits alone.

The BCRs for Package 5 at 0.9 is less than 1.0 meaning the indicative package BCR may not be economically viable as a whole due to the higher cost and lower benefits. Including an underpass at Toi Toi intersection will result in an indicative BCR of 0.80.

## 7.0 Preferred Programme

### 7.1 Identification

The 30-year Preferred Programme was identified through combining the best performing packages overall, being the combined Package 2 providing short-term options for implementation, and Package 3 providing for peak period priority lanes as the key activity. Combined together these two packages provide significant benefit against the investment objectives and have reduced negative external impacts.

Packages 4 and 5 have been excluded from the 30-year preferred programme as described below. It is important to note that reconsideration of these options may be needed beyond the 30-years.

**Package 5 Inland Route** has not been carried through to the preferred programme. The Inland Route scored well for positive impacts against the Investment Objectives but scored poorly overall for external impacts on the community and environment.

**Package 4 Coastal Widening** has not been included in the Preferred Programme. The package provided additional capacity for SH6 in order to allow an improved level of service for people driving and freight. The provision of additional lane space widening the corridor would have provided no additional benefits for the other investment objectives.

It also has a significantly higher cost and would pose some significant cultural and technical challenges for delivery. Widening into the coastal marine area and extending the carriageway width would add significantly more to the cost of the project compared to the alternative packages. This cost estimate is also reflective of the significant technical and cultural challenges from this package. Because of these challenges Package 4 scored poorly against the additional criteria and had the lowest BCR.

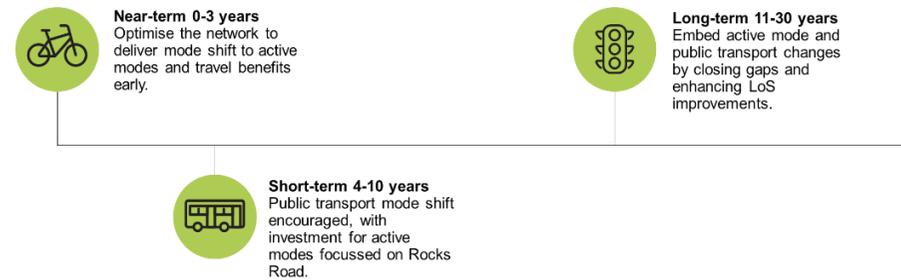
### 7.2 Scope

The Preferred Programme of improvements provides strategic alignment with national and regional strategies, outcomes for moving people through

and within the study area and has much better social and environmental outcomes than the alternative packages.

The preferred package of activities provides a Near, Short, Medium and Long-Term approach to transport infrastructure investment. Monitoring over time will help to further refine investment priorities within each period to adapt to changing circumstances. A summary of the activities to be delivered within each period is described below:

**Figure 66: Recommended package timeline**



#### 7.2.1 Near-term (Years 0-3)

Investment in network optimisation to improve the user experience and access to active modes. Focussed on the area ~5km around the CBD where the majority of the mode shift will occur, and for which the majority of the local trips (~60%) originate.

Key infrastructure activities for the near-term are shown in Table 34. A full description of the near-term activities is included in Appendix J.

**Table 34: Key near-term activities**

| Type                       | Description                                                                         |
|----------------------------|-------------------------------------------------------------------------------------|
| Rat-running interventions  | Focus on Washington Road, and Tipahi Street interventions to discourage rat-running |
| Cycling connection         | Cycling Connection from Waimea/Hampden to Railway Reserve via Broads Fields         |
| Walking and cycling routes | Washington Road                                                                     |

| Type                     | Description                                                                                                                   |
|--------------------------|-------------------------------------------------------------------------------------------------------------------------------|
| Intersection upgrades    | Waimea Road and Franklyn Street ; Motueka Street & Tipahi Street Tāhunanui/Parkers/Maire IS; SH6 Bisley Ave southbound merge  |
| Arterial crossing points | Tāhunanui/Muritai St; Maori Road / Haven Road; SH6 between Muritai and Rui; SH6/Gracefield                                    |
| Parking                  | Development, implementation and monitoring of a parking strategy                                                              |
| Speed management         | Development, implementation and monitoring of a speed management plan                                                         |
| Land Use                 | Monitoring of actual growth vs FDS forecasts and management of programme (interventions and activities) sequencing over time. |

### 7.2.2 Short-term (Years 4-10)

Investment in transferring more people to Public Transport, complementing the investment and changes in the Regional Public Transport Plan. Changes include:

- Priority lanes on Rocks Road associated with the implementation of the Rocks Road walk and cycle component of the programme.
- Active Mode improvements including upgraded facilities along SH6 Rocks Road to increase LoS.
- Extends the scope of investment beyond ~5km of the CBD where the transfer of people from car to Public Transport will most likely occur.
- Reinforces the road hierarchy to remove rat-running from suburban streets.

Key activities for the short-term are shown in Table 35. A full description of the short-term activities is included in Appendix J.

**Table 35: Key short-term activities**

| Type                               | Description                                                                                                          |
|------------------------------------|----------------------------------------------------------------------------------------------------------------------|
| Public transport -New bus shelters | Ten new bus shelters including improved signs and markings; new superstops; increased frequencies and ongoing review |

| Type                                  | Description                                                                                                                                                                                        |
|---------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| SH6 Rocks Road                        | Enhanced walking and cycling route and Priority Lane between Days Track and Bisley signals southbound                                                                                              |
| Rat-running interventions             | Princess Dr; Moana Ave; Stansell Ave; Tosswill Rd; Chamberlain St; Maire St; Kawai St                                                                                                              |
| Walking and cycling routes            | Motueka St; Vanguard St; Gloucester St; Toi Toi St Cycling Route; Franklyn St; Kawai St; Boundary Road, Hardy St, Tukaka St                                                                        |
| Walking and cycling area improvements | Project area improvements; access to Railway Reserve improvements                                                                                                                                  |
| Intersections                         | Washington Road and St Vincent Street intersection; Toi Toi Street with Vanguard and St Vincent St signalised Intersections aligned with Road to zero programme                                    |
| Arterial crossing points              | Between Hay St and Vickerman St Crossing on southbound side of state highway; Rutherford/Vanguard Crossing; Rutherford/Examiner St intersection crossing; Waimea Rd at Admirals Motor Inn Crossing |
| Parking                               | Ongoing monitoring, refinement and implementation of parking strategy developed in near term,                                                                                                      |
| Speed management                      | Ongoing, implementation and monitoring of a speed management plan developed in near term                                                                                                           |
| Land Use                              | Monitoring of actual growth vs FDS forecasts and management of programme (interventions and activities) sequencing over time.                                                                      |

### 7.2.3 Medium and Long-term (Years 11-30)

Investment to accommodate the increased demand for active modes through new and upgraded crossing points, corridor and project area upgrades. Provides an enhanced streetscape and level of service for active modes, and closes gaps identified in the network hierarchy. Public transport improved further through the provision of priority lanes on SH6 and Waimea Road corridors.

Corridor widening and road space reallocation to accommodate active mode improvements, and to further close gaps in the network hierarchy.

Key activities for the medium and long-term are shown in Table 36. A full description of the medium and long-term activities is included in Appendix J.

**Table 36: Key medium to long-term activities**

| Type                                                   | Description                                                                                                             |
|--------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------|
| Priority lanes SH6                                     | Improvements for public transport priority including intersection upgrades                                              |
| Priority lanes Waimea Road/Rutherford Street           | Improvements for public transport priority including intersection upgrades                                              |
| Detuning roads or increasing width to conform with NOH | Targeted roads within the project area                                                                                  |
| Railway reserve widening                               | Widen/upgrade railway reserve south of Totara to Beatson Intersection                                                   |
| Walking and Cycling                                    | Provide 2m wide footpaths on primary and secondary walking routes, increasing LoS to existing facility on St Vincent St |
| Parking                                                | Re-Development, implementation and monitoring of a parking strategy                                                     |
| Speed management                                       | Re-Development, implementation and monitoring of a speed management plan                                                |
| Land Use                                               | Monitoring of actual growth vs FDS and management of programme (interventions and activities) sequencing over time.     |

The Inland Route packages were not discarded. In refining the proposal significant risks posed by consenting in the coastal marine area, the degree of uncertainty in relation to sea level rise and the seismic AF8 event in the long term – beyond the project scope (2050) on the current State Highway 6 corridor between Tāhunanui and QEII Drive were considered. Three risks support the retention of the Inland Route as a 'Transport Corridor' in the long

term. Accordingly included in the Preferred Programme is protection of the Inland Route. The Inland Route is the future long-term resilience option. It would be considered only after the modified priority lane work is completed and network optimised, and associated land use, parking and transport price tension has been applied.

### 7.3 Outcomes

The primary outcomes sought through the development of this Business Case were to address the issues identified for the Nelson City study area. The combination of stakeholder and public consultation coupled with evidence base data collected demonstrated the lack of suitable alternatives available to move a growing number of people and increased volume of goods through the network, increasing delays for reaching key destinations, an increasing safety risk for both the arterial and local road network, and the need for adoption measures due to increasing resilience concerns

*1. The inability of Nelson's transport network to support the increasing movement of people and freight between Stoke and Nelson city centre is constraining the economic growth and social wellbeing of the region.*

Stoke suburb is located between Richmond and Tāhunanui. It has a resident population of >18,000 people and is projected to have the most growth (80%) within the Nelson City area. Transport modelling has shown that there will be a significant increase in traffic related congestion between Stoke and key destinations within the study area including the central business district, and for freight the seaport. Modelling shows that if we do nothing, by 2048 journey times will significantly increase, and the reliability of travel will significantly decrease to key destinations within the study area for vehicle trips and the movement of freight. This is due to a growing population in the suburbs and a growing number of trips to these key destinations along constrained arterial roads prioritised for traffic.

The Preferred Programme looks to move more people through the network by providing alternative modes of travel. By using alternative modes, including public transport and active modes, a key outcome for reducing this problem is the ability to move more people to key destinations and to prioritise the movements through the network. Traffic and traffic related

congestion is anticipated close to 2018 levels but is forecast to increase beyond 20 years. The programme also looks to offset this increase by encouraging more trips by private vehicle by two or more passengers per trip.

### *2. Conflicting uses, and inappropriate use of the network severs neighbourhoods reducing their safety and amenity*

A key issue resulting from increasing congestion on the arterial road network is the vehicle rat running that occurs through suburban neighbourhoods. This problem was forecast to increase due to the increasing number of vehicle trips occurring and the lack of restrictions in place to discourage vehicles from travelling through these suburbs to access key destinations.

The Preferred Programme looks to embed the right traffic for the right road. This means actively discouraging through movements on residential roads that should be undertaken on the arterial roads, ensuring that local trips are undertaken on local roads, and providing suitable alternatives over time for people to transfer from vehicles by providing people appropriate priority, and space allocation on arterial roads for public transport.

For Nelson City the programme will deliver tangible interventions for reducing GHG emissions. The calculation of GHG emissions is anticipated to realise a ~12% daily reduction compared to the do minimum in the ten years at the completion of the near and short-term programmes. Beyond the ten years the delivery of the programme in the medium and long-term will increase the reduction to ~16%.

The reduction in GHG emissions has been calculated against the reduction in vehicle emissions based on mode shift to PT and active modes. For this reason, the overall reduction in GHG emissions calculated is conservative. Further reductions can be expected through the adoption of new technologies such as EV's, and social changes such as technology that promotes remote working reducing travel demand.

### *3. The susceptibility of the arterial network to natural events of increasing severity and a greater number increases the risk of significant economic shock to Nelson and the wider region*

A review of the evidence found that coastal resilience issues along state highway 6 were small. Any closures on an annual basis occurred on average one to two times, and those closures were relatively short. The focus for this particular business case was ensuring that alternative routes along Waimea Rd were maintained and fit for purpose. The recommended package of options includes measures for Waimea Rd that would maintain its access for freight and private vehicle travel in the event of state highway 6 being unavailable for a short period.

## **7.4 Engagement Feedback on Preferred Programme**

Public consultation was held to gather feedback on the near-term and short-term options plus the Rocks Road proposal.

Further details on this second round of engagement can be found in the Engagement Report located in E. In summary the overall themes from feedback on the near and short-term and other improvements package were:

- Broad support for enhanced walking and cycling safety and connectivity;
- Support for improved bus services;
- Support for proposed cycleway safety improvements on Washington Road;
- Support for Parkers Road intersection upgrade;
- More support for separated pedestrian and cycling facilities as opposed to shared paths;
- Divided opinion about a cul-de-sac for Chamberlain Street;
- Divided opinion on other traffic calming measures for those streets identified as potentially benefitting from such measures;
- Southbound lane reinstatement is not wanted by the Tāhunanui community;
- Concern about safe access to medical facilities in Tāhunanui;
- Support for lower speeds;
- Support to review the supply, demand, cost and time restrictions of CBD parking as an essential part of encouraging walking, cycling, ride sharing and use of public transport.

### Overall themes arising from feedback on the Rocks Road walking and cycling proposal:

- Support for Rocks Road shared path, but concern about loss of natural environment and beach access for all abilities;
- Support for bringing forward the Rocks Road proposal;
- Support for lower speeds on Rocks Road;
- Concern about the removal of parking spaces.

### Overall themes arising from the decision to nominate Priority Lanes as the long-term solution for Nelson:

- Priority Lanes are not wanted by the Tāhunanui community;
- Concern about loss of parking in Tāhunanui;
- Concern about the closure to general traffic of Tukuka St;
- Concern over number of traffic lights being introduced;
- Concern about access to Tāhunanui and Waimea businesses and community services (e.g., medical facilities school, church, bakery);
- Roundabouts desired to allow traffic to flow.

## 7.5 Refined Outcomes

### 7.5.1 Detailed Traffic Modelling

To understand the combined impact of the preferred package, additional transport modelling was undertaken. The purpose was to understand the impact of the preferred package on changes to the current network. This would be influenced by the sequencing of the changes, influences on transport demand, and the impact of mode shift away from private vehicles.

The results of the modelling assessment forecast that:

- Providing active mode travel facilities will increase the walking and cycling mode shares by between 1% and 4% depending on the peak hour and model year. The largest mode shift is forecast for the 2048 AM peak hour where the combined walking and cycling mode share is forecast to shift from 33% to 37%;

- Bus travel times for the Do Minimum are forecast to increase significantly from 2018 to 2048 with PM peak southbound (outbound from the city centre) forecast to more than double in travel time;
- Providing safety and bus priority improvements measures along SH6 Tāhunanui Drive and Waimea Road is forecast to improve bus travel times and therefore bus travel mode shares;
- Providing safety and bus priority improvements along SH6 Tāhunanui Drive and Waimea Road will increase the travel time for general traffic along these routes;
- The treatment of local roads within Nelson to minimise rat-run behaviour is forecast to reduce the travel along these local roads and increase demand on the SH6 and Waimea Road arterials;
- Increased parking costs, are forecast to:
  - Reduce the demand on private vehicle travel into the Nelson City Centre; and
  - Increase the attractiveness of the bus and therefore bus mode shares could be expected to increase.

At the wider network level, the modelling summary statistics forecast that:

- For the 2028 model year, the Preferred Option is forecast to reduce the total network travel distances as some trips are forecast to be shifted to public transport and active modes, but increase travel times due to the proposed safety and bus priority measures along the two main arterials into the Nelson City Centre; and
- The 2048 model year shows that the Preferred Option is forecast to reduce both the network travel distances and travel times compared to the Do Minimum as the forecast congestion in the Do Minimum scenario is relieved by a combination of the forecast shift

from private vehicle trips to other modes, and the improved level of service.

Given the high level of uncertainty, and as travel time and parking cost elasticities were central assumptions in the assessment, sensitivity tests around these assumptions were undertaken to determine how sensitive the outcomes are against these assumptions, and to present an indicative range of potential outcomes.

In general, apart from bus mode shares, the modelling forecasts that car travel times, mode shares and average daily traffic volumes are relatively insensitive to these parameters.

### 7.5.2 Key Assumptions

1. The forecast modelling considers the growth forecast as part of the Nelson Tasman Future Development Strategy (FDS) adopted by Nelson City Council (NCC) and Tasman District Council (TDC) in July 2019. From a modelling and travel demand perspective, the demand matrices based on these land use forecasts are 5% and 24% larger than the previous demand matrices (from the original NTTTTM) for the 2028 and 2048 model years respectively. The modelled peak hours are: the morning peak hour (8-9:00); the afternoon peak hour (17-18:00); and an inter-peak which represents the average of the two busiest hours in the middle of the day (11-13:00).
2. The model years are 2018 (base model), 2028 and 2048. The choice of these future years was to be consistent with the land-use forecasts carried out by the Nelson Infrastructure Strategy 2018 – 2048. This land use was subsequently updated with the FDS.
3. Bus public transport analysis utilised a SATURN + Spreadsheet modelling approach that builds on the existing NTSM using an elasticity of demand. It was agreed that the uncertainty around forecasting mode shift behaviour should be sensitivity tested using a range of elasticity values.
4. The origins and destinations of the inter and PM peak active mode and PT matrices were calculated based on the AM peak matrices
5. It was noted that roughly 90% of the existing bus public transport patronage is on route 1 and 2 via Rocks Road and Waimea Road respectively. For the purposes of this study, therefore, the assumption was made that all patronage changes applied to these two routes only. For this purpose of the NFAP option assessment modelling, it was assumed that the increase in bus patronage would be trips transferred from private vehicle travel based on the RPTP service improvements as these routes represent longer distance trips with much of the patronage between Richmond and Nelson.
6. The light vehicle demand matrices used for the option model were therefore adjusted accordingly – i.e. the light vehicle matrix for the 2048 AM peak hour was reduced by 411 vehicle trips. The matrix adjustments were made to model zones within a 400m buffer of the two main bus routes only to account for acceptable walking distances to stops along the two main routes. This was considered a conservative approach as it largely ignores the effect of the additional route from Atawhai to the airport servicing the City Centre and Port Hills.
7. To address existing rat-run behaviour to avoid the delays at intersections along the arterials, and to minimise additional rat-run

trips due to further intersection restrictions along the arterials, several routes were reduced in terms of capacity and speed in the model to reflect proposed treatments.

8. The assumed increase in parking costs was from \$8/day to \$17/day which is an increase of 124%. The elasticity determined to be appropriate to estimate the response in demand for travel due to parking cost increases was -0.3 which implies a 1% increase in costs would result in a -0.3% decrease in travel.

### 7.5.3 Right Traffic Right Road

Table 37 shows the forecast percentage difference in average annual daily traffic (AADT) along roads of interest for the preferred package excluding and including parking charges compared to the do minimum.

**Table 37: AADT difference preferred option excluding and including parking charges v do minimum**

| Road              | 2028  | 2048  | Road              | 2028  | 2048  |
|-------------------|-------|-------|-------------------|-------|-------|
| Rocks Road        | 2500  | 2700  | Rocks Road        | 1900  | 2000  |
| Waimea Road       | -2200 | -2800 | Waimea Road       | -2800 | -3400 |
| Motueka Street    | -300  | -1600 | Motueka Street    | -500  | -1900 |
| Tipahi Street     | 100   | 300   | Tipahi Street     | 100   | 200   |
| Kawai Street      | 200   | 400   | Kawai Street      | 100   | 400   |
| Brougham Street   | 1200  | 900   | Brougham Street   | 1000  | 700   |
| Van Diemen Street | -2300 | -2000 | Van Diemen Street | -2500 | -2200 |
| Vanguard Street   | 2600  | 2200  | Vanguard Street   | 2200  | 1700  |
| Washington Road   | -4200 | -5900 | Washington Road   | -4700 | -6100 |
| Bisley Avenue     | 0     | -600  | Bisley Avenue     | -200  | -800  |
| Tosswill Road     | -2300 | -3100 | Tosswill Road     | -2400 | -3100 |
| Maire Street      | 1500  | 1300  | Maire Street      | 1100  | 1200  |

These results forecast that there will be a reduction in the AADT along the Waimea Road route and an increase along Rocks Road in the Preferred Package model compared with the Do Minimum model. This appears reasonable as several intersections along Waimea Road are proposed to be signalled and traffic will likely avoid Waimea Road and reroute via Rocks Road to avoid the additional signal delays.

Comparing the Preferred Option model with the Do Minimum model, In 2048, the AADT:

- Along Rocks Road is forecast to increase by 2,700, from 25,900 to 28,600; and
- Along Waimea Road is forecast to decrease by 2,800, from 36,900 to 34,100.

The proposed bus priority infrastructure along the two main arterial roads, including the introduction of bus priority signals, is expected to reduce the capacity for light vehicles and therefore, light vehicles are forecast to continue to use the rat run routes despite the proposed capacity and speed reduction treatments on these routes.

For example, in 2048 the AADT:

- Along Maire Street is forecast to increase by 1,300, from 1,100 to 2,400;
- Along Tipahi Street is forecast to increase by 300, from 800 to 1,100;
- Along Kawai Street is forecast to increase by 400, from 1,000 to 1,400; and
- Along Vanguard Street is forecast to increase by 2,200, from 9,400 to 11,600.

The modelling suggests that by applying a parking restriction in combination with the Preferred Package models will result in a further decrease in traffic.

For example, the forecast decrease in AADT of the Preferred Option with parking restriction in 2048:

- Along Rocks Road is forecast to decrease by 700, from 28,600 to 27,900;

- Along Waimea Road is forecast to decrease by 600, from 34,100 to 33,500;
- Along Maire Street is forecast to decrease by 100, from 2,400 to 2,300;
- Along Tipahi Street is forecast to decrease by 100, from 1,100 to 1,000; and
- Along Vanguard Street is forecast to decrease by 500, from 11,600 to 11,100

#### 7.5.4 Mode Share

Table 38 shows the changes in forecast mode share compared to the do minimum. These figures are reporting the travel statistics for the project study area.

**Table 38: Mode share difference preferred option excluding parking charges v do minimum**

|               | AM   |      | IP   |      | PM   |      |
|---------------|------|------|------|------|------|------|
|               | 2028 | 2048 | 2028 | 2048 | 2028 | 2048 |
| Years         | 2028 | 2048 | 2028 | 2048 | 2028 | 2048 |
| Light Vehicle | -3%  | -6%  | -2%  | -4%  | -3%  | -5%  |
| Heavy Vehicle | 0%   | 0%   | 0%   | 0%   | 0%   | 0%   |
| Bus           | 2%   | 2%   | 2%   | 2%   | 2%   | 2%   |
| Active Mode   | 1%   | 4%   | 1%   | 2%   | 2%   | 3%   |

**Table 39: Mode share difference preferred option including parking charges v do minimum**

|               | AM   |      | IP   |      | PM   |      |
|---------------|------|------|------|------|------|------|
|               | 2028 | 2048 | 2028 | 2048 | 2028 | 2048 |
| Years         | 2028 | 2048 | 2028 | 2048 | 2028 | 2048 |
| Light Vehicle | -6%  | -8%  | -6%  | -7%  | -6%  | -7%  |
| Heavy Vehicle | 0%   | 0%   | 0%   | 0%   | 0%   | 0%   |
| Bus           | 4%   | 3%   | 5%   | 4%   | 4%   | 3%   |
| Active Mode   | 1%   | 4%   | 1%   | 2%   | 2%   | 3%   |

The most significant growth in bus patronage for the Preferred Option is forecast to occur before 2028 and plateaus off over time to 2048 as forecast land use patterns change and the total number of trips generated increases<sup>12</sup>.

For the purposes of the modelling, it has been assumed that the bus priority infrastructure has been introduced by 2028 with no further changes beyond 2028. The highest shift to PT therefore reflects in the 2028 model outputs. The absolute number of bus trips is forecast to increase from 2028 to 2048 in all peaks, but the mode shares of bus trips is forecast to decrease in all peaks. This difference is due to the relative difference in light vehicle travel times in 2048 between the Do Minimum and Option models not being as pronounced as in the inter peak and PM peak models.

A similar trend can be found in the modelling of the Preferred Option with parking price increases. However, the mode share of buses is forecast to increase, and the mode share of light vehicles is forecast to decrease compared with the preferred option without parking price increases.

#### 7.5.5 Parking Cost Elasticity

Sensitivity tests were also conducted around the central parking cost elasticity assumptions. Two parameters were changed and tested; the elasticity parameter and the daily parking cost (based on weighted average hourly parking costs for city centre and fringe).

The central assumption for the parking cost elasticity used was -0.3, implying that car travel into the city centre will reduce by 0.3% for every 1% increase in parking costs. Table 40 shows tested scenarios and the respective forecast impacts on private vehicle trip reduction and bus patronage.

<sup>12</sup> The elasticity calculations for the 2028 and 2048 forecast years are independent and based only on the relative travel times in the respective model years. i.e. there are different travel

time baselines in each forecast year so the relative change in car and bus travel times for each year determine the shift to/from PT/active modes to/from car trips and vice versa.

**Table 40: Parking cost elasticity sensitivity test**

| Assumption                       | Parking elasticity / parking cost | Private vehicle trip demand reduction | Bus patronage increase |
|----------------------------------|-----------------------------------|---------------------------------------|------------------------|
| Base                             | -0.30                             | 772 (39%)                             | 535                    |
| Lower bound (-50%)               | -0.15                             | 386 (20%)                             | 268                    |
| Upper bound (+50%)               | -0.45                             | 1,158 (59%)                           | 803                    |
| Base parking costs               | \$17/day                          | 772 (39%)                             | 535                    |
| Lower bound parking cost (-50%)  | \$13/day                          | 432 (22%)                             | 300                    |
| Upper bound parking costs (+50%) | \$27/day                          | 1,451 (74%)                           | 1,006                  |

### 7.5.6 Travel time – general traffic

Table 41 shows the change in travel time along Rocks Road and Waimea Road between the Preferred Option and the Do Minimum scenario.

**Table 41: Travel times of Preferred Package minus Do Minimum (min)**

| Route                                                     | 2028 |     |     | 2048 |     |     |
|-----------------------------------------------------------|------|-----|-----|------|-----|-----|
|                                                           | AM   | IP  | PM  | AM   | IP  | PM  |
| Annesbrook roundabout to Haven roundabout via Rocks Road  | 4.2  | 1.8 | 2.1 | 4.7  | 2.3 | 2.5 |
| Haven roundabout to Annesbrook roundabout via Rocks Road  | 2.4  | 2.0 | 5.6 | 2.3  | 3.8 | 5.4 |
| Annesbrook roundabout to Haven roundabout via Waimea Road | 4.0  | 1.8 | 1.6 | 3.7  | 2.2 | 2.2 |
| Haven R/A to Annesbrook roundabout via Waimea Road        | 2.1  | 1.8 | 5.4 | 2.1  | 3.6 | 4.9 |

The travel time differences shown in Table 41 shows that the proposed changes along the two corridors will increase average travel times along these sections by between 2 and 5 minutes. These increases can largely

be attributed to the additional delay incurred by having to stop at several traffic signals.

Table 42 shows the change in travel time along Rocks Road and Waimea Road between the Preferred Option with parking charges and the Do Minimum scenario.

**Table 42: Travel times of Preferred Option with parking charges minus Do Minimum (min)**

| Route                                                     | 2028 |     |     | 2048 |     |     |
|-----------------------------------------------------------|------|-----|-----|------|-----|-----|
|                                                           | AM   | IP  | PM  | AM   | IP  | PM  |
| Annesbrook roundabout to Haven roundabout via Rocks Road  | 2.1  | 1.6 | 2.2 | 2.2  | 2.1 | 2.8 |
| Haven roundabout to Annesbrook roundabout via Rocks Road  | 2.5  | 1.8 | 3.8 | 3.0  | 3.0 | 3.2 |
| Annesbrook roundabout to Haven roundabout via Waimea Road | 1.3  | 1.6 | 1.6 | 0.4  | 1.9 | 2.3 |
| Haven R/A to Annesbrook roundabout via Waimea Road        | 2.0  | 1.6 | 3.3 | 2.0  | 3.1 | 2.7 |

Table 42 shows that with increased parking charges in the Nelson City Centre, travel times into and out of the city centre are forecast to decrease, when compared to no change to parking charges, as private vehicle travel demand into city centre are forecast to be reduced in response to higher parking costs. This effect is forecast to be more marked for Rocks Road than for Waimea Road.

### 7.5.7 Intersection Delays

Table 43 shows the results of the modelling analysis undertaken for the key intersections within the study area out to 2048. The intersections that would experience large delays are highlighted in red. In particular, the intersection delays have been assessed along SH6 and Waimea Road, the two key freight routes through area.

Overall, seven of the intersections assessed would meet an unacceptable level of delay by 2048 in the PM peak, and two intersections in the AM

peak. Monitoring of the queues and delays over time will allow optimisation improvements for these intersections to be specified as part of an active management strategy for the network.

**Table 43: Preferred option 2048 intersection delay**

| Intersection                                      | AM | IP | PM |
|---------------------------------------------------|----|----|----|
| Van Diemen Street / Waimea Road                   | ✓  | ✓  | ✓  |
| Hampden Street / Waimea Road                      | X  | ✓  | ✓  |
| Franklyn Street / Waimea Road                     | ✓  | ✓  | ✓  |
| Motueka Street / Waimea Road                      | ✓  | ✓  | ✓  |
| Tukuka Street / Waimea Road                       | ✓  | ✓  | ✓  |
| Boundary Road / Waimea Road                       | ✓  | ✓  | ✓  |
| Market Road / Waimea Road                         | ✓  | ✓  | ✓  |
| Princes Drive / Waimea Road                       | ✓  | ✓  | ✓  |
| Beatson Road / Waimea Road                        | ✓  | ✓  | X  |
| Waimea Road / The Ridgeway                        | ✓  | ✓  | ✓  |
| Waimea Road / Whakatu Drive                       | ✓  | ✓  | ✓  |
| Whakatu Drive / Tāhunanui Drive (SH6)             | ✓  | ✓  | X  |
| Maire Street / Tāhunanui Drive (SH6)              | ✓  | ✓  | ✓  |
| Parkers Road / Tāhunanui Drive (SH6)              | ✓  | ✓  | ✓  |
| Tosswill Road / Tāhunanui Drove (SH6)             | ✓  | ✓  | ✓  |
| Bisley Avenue / Rocks Road (SH6)                  | ✓  | ✓  | X  |
| Richardson Street / Rocks Road (SH6)              | ✓  | ✓  | ✓  |
| Russell Street / Haven Road (SH6) towards city    | ✓  | ✓  | ✓  |
| Russell Street / Haven Road (SH6) away from city  | ✓  | ✓  | X  |
| Hay Street / Haven Road (SH6) towards city        | X  | ✓  | X  |
| Hay Street / Haven Road (SH6) away from city      | ✓  | ✓  | X  |
| Vickerman Street / Haven Road (SH6)               | ✓  | ✓  | X  |
| Queen Elizabeth II Drive (SH6) / Haven Road (SH6) | ✓  | ✓  | ✓  |
| Halifax Street / Haven Road                       | ✓  | ✓  | ✓  |

| Intersection                        | AM | IP | PM |
|-------------------------------------|----|----|----|
| Rutherford Street / Halifax Street  | ✓  | ✓  | ✓  |
| Vanguard Street / Rutherford Street | ✓  | ✓  | ✓  |
| Bridge Street / Rutherford Street   | ✓  | ✓  | ✓  |
| Hardy Street / Rutherford Street    | ✓  | ✓  | ✓  |
| Selwyn Place / Rutherford Street    | ✓  | ✓  | ✓  |
| Nile Street / Rutherford Street     | ✓  | ✓  | ✓  |
| Examiner Street / Rutherford Street | ✓  | ✓  | ✓  |
| Waimea Road / Rutherford Street     | ✓  | ✓  | ✓  |

### 7.5.8 Travel time – bus routes

Table 44 shows the change in travel time forecast along the bus routes between the Preferred Option and the Do Minimum scenario (note: these travel times are between Richmond and Nelson).

**Table 44: Preferred Option - Do Minimum (min and %)**

| Route   | 2028 |      |      | 2048 |     |       | 2028 |    |     | 2048 |     |      |
|---------|------|------|------|------|-----|-------|------|----|-----|------|-----|------|
|         | AM   | IP   | PM   | AM   | IP  | PM    | AM   | IP | PM  | AM   | IP  | PM   |
| 1 north | -2.8 | 0.1  | -1.6 | -8   | -2  | 0.1   | -8%  | 0% | -6% | -17% | -6% | 0%   |
| 1 south | -0.6 | 0.9  | -2.9 | -1.9 | 1.3 | -11.6 | -2%  | 4% | -9% | -5%  | 4%  | -22% |
| 2 north | -2.2 | -0.1 | 0.1  | -4.8 | -1  | -1.8  | -6%  | 0% | 0%  | -11% | -3% | -5%  |
| 2 south | 0.3  | 0.5  | 0.7  | -1.1 | 0.3 | -4.6  | 1%   | 1% | 2%  | -4%  | 1%  | -7%  |

Table 45 shows the change in travel time along the bus routes between the Preferred Option with parking charges and the Do Minimum scenario.

**Table 45: Preferred Option with parking charges - Do Minimum (min and %)**

| Route   | 2028 |      |      | 2048 |      |       | 2028 |     |      | 2048 |     |      |
|---------|------|------|------|------|------|-------|------|-----|------|------|-----|------|
|         | AM   | IP   | PM   | AM   | IP   | PM    | AM   | IP  | PM   | AM   | IP  | PM   |
| 1 north | -2.7 | -0.1 | -1.7 | -8.3 | -2.2 | 0.4   | -8%  | 0%  | -6%  | -18% | -7% | 1%   |
| 1 south | -0.6 | 0.8  | -3.1 | -1.6 | 0.9  | -12.3 | -2%  | 3%  | -10% | -4%  | 3%  | -24% |
| 2 north | -2.4 | -0.2 | 0.1  | -5.4 | -1.3 | -1.5  | -7%  | -1% | 0%   | -12% | -4% | -4%  |
| 2 south | 0.4  | 0.3  | -1   | -1   | -0.2 | -7.8  | 1%   | 1%  | -3%  | -3%  | -1% | -12% |

Table 44 and Table 45 show that with the proposed priority treatments, bus travel times along these routes are forecast to improve by up to 11.6 minutes (22%), and 12.3 minutes (24%) out to 2048 if parking charges are introduced.

### 7.5.9 Network summary statistics

Table 46 shows that with the Do Minimum scenario, total travel on the network is forecast to increase from 2018 through to 2048. Travel times are forecast to increase more rapidly than travel distances as the network is forecast to become more congested. This is especially true for the 2048 PM peak for which the light vehicle demand matrix is 20% larger than the 2048 AM peak.

**Table 46: Do minimum summary statistics**

| Year/Peak                      | 2018 AM | 2028 AM | 2048 AM | 2018 IP | 2028 IP | 2048 IP | 2018 PM | 2028 PM | 2048 PM |
|--------------------------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| Total Travel Distance (veh-km) | 121,710 | 146,547 | 205,953 | 97,324  | 122,096 | 169,282 | 123,747 | 154,370 | 212,901 |
| Total Travel Time (veh-hr)     | 2,906   | 3,760   | 8,562   | 2,109   | 2,790   | 5,643   | 2,835   | 4,003   | 11,064  |
| Average Speed (kph)            | 42      | 39      | 24      | 46      | 44      | 30      | 44      | 39      | 19      |

Table 47 also shows that for 2028 model year, the Preferred package is forecast to reduce the total network travel distances as some trips are

forecast to be shifted to public transport and active modes but increase travel times due to the proposed safety and bus priority measures along the two main arterials into the Nelson City Centre.

For the 2048 model year it shows that the Preferred Option is forecast to reduce both the network travel distances and travel times compared to the Do Minimum as the forecast congestion in the Do Minimum scenario is relieved by a combination of the forecast shift from private vehicle trips to other modes, and the improved level of service to traffic from the side roads along the two arterials, even with the increase in travel times along these arterials routes.

**Table 47: Difference preferred option excluding and including parking charges v do minimum**

| Year    | Total Travel Distance (veh-km) |                          | Total Travel Time (veh-hr) |                          | Average Speed (kph) |                          |
|---------|--------------------------------|--------------------------|----------------------------|--------------------------|---------------------|--------------------------|
|         | Option                         | Option + parking charges | Option                     | Option + parking charges | Option              | Option + parking charges |
| 2028 AM | -2.0%                          | -3.8%                    | 6.8%                       | -0.2%                    | -8.5%               | -3.6%                    |
| 2028 IP | -1.3%                          | -2.9%                    | 4.2%                       | 1.4%                     | -5.5%               | -4.3%                    |
| 2028 PM | -2.1%                          | -3.8%                    | 4.4%                       | -0.8%                    | -5.7%               | -3.1%                    |
| 2048 AM | -3.0%                          | -4.4%                    | -2.1%                      | -6.5%                    | -1.2%               | 2.1%                     |
| 2048 IP | -2.9%                          | -4.1%                    | -11.2%                     | -13.8%                   | 9.3%                | 11.0%                    |
| 2048 PM | -3.5%                          | -4.9%                    | -1.1%                      | -5.9%                    | -2.1%               | 1.0%                     |

### 7.5.10 Changes as a result of engagement feedback

Key changes considered to the Preferred Programme as a result of the second round of Community Engagement were:

#### Short Term programme:

- A slower speed on Rocks Road to be included in the assessment;
- Consider permanent southbound lane at Bisley Signals, including safe access to businesses;

- Additional pedestrian crossings at Māori Rd and Tāhunanui Dr near St Stephens Church;
- Remove Whakatu Drive, near the Bisely Ave roundabout, pedestrian crossing
- Confirmed separated cycle facilities to link Railway Reserve to Waimea Road;
- Align programme over time with development pressures as they are consented;
- Bring forward Ridgeway Waimea signals to short term provided potential for developer funding and future proof layout.

**Rocks Road:**

- Include a linkage to recently constructed Tāhunanui cycle network.

**Priority Lanes:**

- Co-ordinate future project development alongside Parking Strategy work.

## 8.0 Recommended Programme

The results alignment has been assessed against the criteria for state highway and local road improvements in the Investment Assessment Framework for 2018-21, and the Investment Prioritisation Method for 2021-24 to inform the National Land Transport Programme.

### 8.1 2021-24 Investment Priority Method

The Investment Assessment Framework used for the 2018-21 NLTP has been replaced by the Investment Priority Method for the 2021-24 NLTP.

The programme being put forward for inclusion is new to the 2021–24 NLTP, and thus all phases of the programme for the 2021- 24 NLTP may be assigned the GPS Alignment of the programme. The GPS alignment rating assigned to the programme is based on the highest rating and is a key focus area. For the programme the highest rating, and of most relevance is the contribution of the NFA programme to the Better Travel

Options strategic priority, and in turn this is closely linked to the Climate Change strategic priority.

**Table 48: IPM strategic priority rating - better travel options and climate change**

| GPS Strategic Priority                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Better Travel Options                    |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------|
| <b>Benefit</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | <b>Impact on access to opportunities</b> |
| <b>Rating</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | <b>Very High</b>                         |
| <ul style="list-style-type: none"> <li>• For public transport, the improvements include bus priority measures on the key Routes 1 and 2 through the project area will support the additional measures planned in the RPTP. In particular, bus travel times between Richmond and Nelson are forecast to increase to &gt;45 minutes by 2048 in the AM peak, and the preferred package will maintain travel times to below &gt;40 minutes.</li> <li>• &gt;8% change in number of jobs accessed within 45 minutes by a given mode or modes (public transport, walking, cycling, driving) in the morning peak</li> <li>• &gt;8% change in proportion of population within 15 minutes access of social opportunity (namely primary or secondary, education, GP surgery or supermarkets) by a given mode or modes (public transport, walking, cycling, driving) in the morning peak</li> <li>• The Recommended Programme aligns with the Regional Public Transport Plan &gt;10% increase in percentage of the population living within 500m of a bus stop where service frequency is ≤30 minutes per hour</li> <li>• The Recommended Programme completes within the study area the primary and secondary walking and cycling routes. This will increase overall accessibility connecting residential areas with the CBD, hospital campus, and schools for those suburbs within the project area.</li> </ul> |                                          |

| GPS Strategic Priority                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Climate Change       |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|
| <b>Benefit</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | <b>Impact on GHG</b> |
| <b>Rating</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | <b>Very High</b>     |
| <ul style="list-style-type: none"> <li>Based on the do minimum AADT on key roads the Recommended Programme without parking charges will reduce forecast AADT by 3% by 2028 and 7% by 2048. For the preferred option with parking charges the reduced forecast AADT is 7% by 2028 and 9% by 2048.</li> <li>Overall forecast network vehicle kilometres travelled for the preferred option without parking charges is reduced by 1.8% in 2028, and 3.5% by 2048. With parking charges, the reduction is 3.1% by 2028, and 4.9% by 2048.</li> <li>The seawall renewal beside Rocks Road needs to occur by 2048 due to end of life, but opportunity exists to replace earlier which will improve resilience to climate change /sea level rise.</li> </ul> |                      |

The recommended programme also performs well against the other GPS strategic priorities showing the overall transport impact that it will deliver.

Table 49: IPM strategic priority rating (safety & others)

| GPS Strategic Priority                                                                                                                                                                                                       | Safety                                                 |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------|
| <b>Benefit</b>                                                                                                                                                                                                               | <b>Impact on social cost and incidences of crashes</b> |
| <b>Rating</b>                                                                                                                                                                                                                | <b>High</b>                                            |
| <ul style="list-style-type: none"> <li>Targets SH6 and Waimea Road, medium-high collective risk corridors and key intersections to achieve a death and serious injuries reduction of 25-39% over a 5- year period</li> </ul> |                                                        |

| GPS Strategic Priority                                                                                                                                                                                                                                                                                                                                                                 | Better Travel options and Climate Change (GHG emissions reduction and air quality improvements) |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------|
| <b>Benefit</b>                                                                                                                                                                                                                                                                                                                                                                         | <b>Impact on mode choice</b>                                                                    |
| <b>Rating</b>                                                                                                                                                                                                                                                                                                                                                                          | <b>Very High</b>                                                                                |
| <ul style="list-style-type: none"> <li>The network change in mode shift away from private vehicles ranges from 6% to 8%.</li> </ul>                                                                                                                                                                                                                                                    |                                                                                                 |
| GPS Strategic Priority                                                                                                                                                                                                                                                                                                                                                                 | Improving Freight Connections                                                                   |
| <b>Benefit</b>                                                                                                                                                                                                                                                                                                                                                                         | <b>Impact on network productivity and utilisation</b>                                           |
| <b>Rating</b>                                                                                                                                                                                                                                                                                                                                                                          | <b>Very High</b>                                                                                |
| <ul style="list-style-type: none"> <li>•SH6 is the key freight route between the primary produce producing region and Port Nelson. Based on the intersection delays along SH6 through the project area, the reduction in variability between the 2048 do minimum and the 2048 Recommended Programme there is a reduction in variability along the route between 40% and 64%</li> </ul> |                                                                                                 |

8.1.1 Scheduling

The Investment Prioritisation Method assesses the investment scheduling against the next three-year NLTP periods.

Table 50: IPM scheduling rating

| Scheduling                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Interdependency |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|
| Rating                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | High            |
| <ul style="list-style-type: none"> <li>The delivery of the programme is aligned with the growth and densification of residential areas directed by the Future Development Strategy. These developments are dependent upon improved multi-modal connections in advance of the developments being completed.</li> <li>The delivery of the near-term activities as part of the Recommended Programme will deliver early active mode shift, and travel time benefits. These activities will then expand further into the delivery of the short-term, and medium to long-term package activities. Non-delivery of the near-term package will result in those early benefits of the recommended programme not being realised.</li> </ul> |                 |
| Scheduling                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Criticality     |
| Rating                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Medium          |
| <ul style="list-style-type: none"> <li>The delivery of the near-term activities will prepare for the delivery of the short-term package in the next 2024 NLTP.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                 |

### 8.1.2 Priority Order

A Very-High GPS alignment, and High for Scheduling across either interdependency or criticality, and a Low BCR of 1-2.9 would provide a priority order of 2 for the preferred programme.

## 8.2 Risks, Uncertainties, Constraints, Dependencies and Assumptions

### 8.2.1 Assumptions

The key assumptions in the implementation of the Recommended Programme are summarised in Table 51.

Table 51: Recommended Programme key assumptions

| Key Assumptions |                                                                                                                    |
|-----------------|--------------------------------------------------------------------------------------------------------------------|
| 1               | The programme would be implemented progressively over 30 years                                                     |
| 2               | Designed to current sea level rise forecast for 100 years guided by Representative Concentration Pathway (RCP) 8.5 |
| 3               | Follows a traditional consenting path through the Resource Management Act                                          |
| 4               | Infrastructure designed to current standards and codes                                                             |
| 5               | Assumes that Richmond will implement complimentary and integrated infrastructure to the recommended programme      |
| 6               | Seawall replacement timelines have been estimated                                                                  |

### 8.2.2 Risks

The delivery of the recommended programme has a number of key risks that have been summarised in Table 52.

**Table 52: Recommended Programme key risks**

| Risk                                                                                                                                                 | Impact | Mitigation                                                                                                                                                                                                                                                                                                            |
|------------------------------------------------------------------------------------------------------------------------------------------------------|--------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Covid19 recovery takes longer, or is faster, than originally expected                                                                                | Medium | Over the long-term the effects of the current pandemic will likely influence transport trends, such as working from home. The near and short-term programmes will deliver against the increased demands for local trips, with longer term monitoring of transport trends informing the timing for future investments. |
| Technology and private company 'disrupters' significantly alter the demand, supply and consumption of transport services over the short to long-term | Low    | Nelson City Council has the legal capacity to regulate commercial operators including those utilising technology changes to disrupt existing markets. Disrupters have in the past influence demand away from additional vehicle trips.                                                                                |
| Interdependent investments being delivered through the Richmond PBC delayed                                                                          | Medium | Due to the interdependencies between the adjoining urban areas, the DBC has engaged closely with the team developing the Richmond PBC. Engagement between the Council's will ensure an informed delivery of investment.                                                                                               |
| Land use changes beyond the Nelson City Council boundaries significantly influence traffic demands into the city                                     | Low    | This DBC has use high growth forecasts based on forecast land use changes within Nelson City, and adjoining areas                                                                                                                                                                                                     |
| Parts of the community are resistant to growth and the consequences of growth.                                                                       | Medium | A staged approach of increasing investment over different timeframes will help to demonstrate the benefits achieved, which will help to engage with those parts of the community unsure about a growing population                                                                                                    |

| Risk                                                                                                | Impact | Mitigation                                                                                                                                                        |
|-----------------------------------------------------------------------------------------------------|--------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Sequencing of activities leads to inconsistent levels of service and safety outcomes for key routes | High   | The sequencing of activities has been considered carefully in this DBC, to ensure investment is coordinated to maximise the benefits achieved in each time period |
| Funding through local share and national funding through the National Land Transport Programme      | High   | Adopt and adapt the delivery programme overtime to match the greatest benefit                                                                                     |

### 8.2.3 Key Interdependencies / Prerequisites

Fully realising the benefits and objectives of the Nelson Future Access business case will be dependent on the alignment with a number of interrelated projects and activities occurring in wider Nelson City, and the adjoining Richmond area in the Tasman District. Their development highlights the need to ensure continued collaboration and knowledge-sharing to ensure the success of the Recommended Programme. A discussion of the key interdependencies and their relationship to the development of NFA is outlined in Table 53.

**Table 53: NFA key interdependencies / Prerequisite**

| # | Interdependency                                                                   | Description                                                                                                                                                                                                                                                                                        |
|---|-----------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1 | Supporting legislation and technology in place at the point of funding commitment | Priority Lanes on the State Highway network are currently having enforcement challenges impacting on their effectiveness. Likely to be solved within 10-15yrs via NZ Upgrade Programme. If not, then legislation and education needs to be a key deliverable in the design / implementation phase. |

| # | Interdependency                                                                                                                                                                                                                                                                                                                                | Description                                                                                                                                                                                                                                                                                                                                                                      |
|---|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 2 | Public Transport fare reductions, service, route and frequency improvements as proposed in Regional Public Transport Plan progressed ahead of Priority Lanes Implementation.                                                                                                                                                                   | Lack of co-investment by Waka Kotahi to Regional Public Transport Plan proposal would lead to a lower mode shift to PT. To give effect to the Intervention Hierarchy and align with best practice it is recommended progressing the non-infrastructure works such as fare reductions, service, route and frequency improvements as first step prior to Priority Lane commitment. |
| 3 | Interdependent investments being delivered through the Richmond PBC.<br><br>The two transport planning projects underway are essentially in one urban metro area. If the solutions/interventions are inconsistent the interventions in one area may impacting negatively on the benefit realisation of the interventions in the adjacent area. | Engagement between the Council's will ensure an informed delivery of investment. Due to the interdependencies between the adjoining urban areas the DBC has engaged closely with the team developing the Richmond PBC.                                                                                                                                                           |

### 8.2.4 Key Uncertainties

The key uncertainties in the delivery of the Recommended Programme are summarised in Table 54.

**Table 54: Recommended programme key uncertainties**

| Type          | Factor                         | Time               | Uncertainty    | Impact | Reason                                                                                                                                                                                                  |
|---------------|--------------------------------|--------------------|----------------|--------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Environmental | Outstanding natural landscapes | Near to short-term | Almost certain | Medium | Outstanding landscapes are identified and there is potential to enhance the appeal of these ONL from areas identified for investment. The key uncertainty is the ability to consent the physical works. |

| Type     | Factor                            | Time         | Uncertainty            | Impact | Reason                                                                                                                                                                                                                                                                                   |
|----------|-----------------------------------|--------------|------------------------|--------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|          | Rising sea level                  | Coming years | Reasonably foreseeable | High   | Investigation has been guided by RCP8.5. Rising sea levels will impact coastal areas of the city, and corridors identified for investment. The key uncertainty is that sea level rise may occur faster and or be greater than the RCP8.5 forecast.                                       |
|          | Erosion                           | N/A          | Reasonably foreseeable | Medium | Erosion prone areas are known, and this has informed the scope of interventions such as along SH6 Rocks Road<br><br>Lack of detailed coastal process investigation to date creates a wider range of consenting and cost uncertainty.                                                     |
|          | Ecological                        | N/A          | Reasonably foreseeable | Medium | Lack of detailed surveys to date creates a wider range of consenting and cost uncertainty.                                                                                                                                                                                               |
| Societal | Heritage and archaeological sites | N/A          | Almost certain         | Medium | Land-owners, authorities and appropriate hapū must be consulted during planning and before development. Initial discussions have highlighted many important features and values but the treatment and mitigation which hasn't been determined may create consenting or cost uncertainty. |

| Type              | Factor                          | Time               | Uncertainty            | Impact | Reason                                                                                                                                                                                                                                                                                                                        |
|-------------------|---------------------------------|--------------------|------------------------|--------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                   | Community needs and aspirations | N/A                | Almost certain         | Medium | <p>Changing community aspirations over time will be influenced by external and internal factors.</p> <p>Community insights will be gained through consultation and influenced by the benefits of investment over time. An adaptive approach is encouraged for the programme delivery to respond to the feedback provided.</p> |
|                   | Tourism growth                  | Near to short-term | Reasonably foreseeable | Medium | The broad summer plus shoulder season tourist demand experienced pre-Covid19 is currently only experienced during summer school holidays. The speed of return to Pre-Covid tourist levels is uncertain.                                                                                                                       |
| <b>Structural</b> | Urban parking                   | N/A                | Almost certain         | Medium | Parking changes will need to balance commercial interests, encourage mode shift and enable high urban amenity / vibrancy whilst meeting demand                                                                                                                                                                                |

## 9.0 Economic Case

This section outlines the results of the economic analysis and benefit-cost analysis of the recommended programme. Summary of the economic analysis undertaken is located in Appendix H.

### 9.1 Recommended Programme summary

The project has been evaluated in accordance with the Waka Kotahi Monetised Benefits and Costs Manual. The assumed timeframe for implementation adopted for the analysis includes:

1. Time zero 1 July 2020.
2. Base date 1 July 2019.
3. Staged Design and implementation

**Table 55: Total net present value costs**

| Total NPV Cost        |                   |                              |                |                  |                    |
|-----------------------|-------------------|------------------------------|----------------|------------------|--------------------|
| Item                  | Travel Time (\$M) | Vehicle Operation Cost (\$M) | CO2 Cost (\$M) | Crash Cost (\$M) | Project Cost (\$M) |
| Do Minimum            | 9,261.6           | 3,850.7                      | 216.6          | 427              | -                  |
| Recommended Programme | 8,868.5           | 3,775.5                      | 212.4          | 413.2            | 384.2              |

**Table 56: Total net present value benefits**

| Total NPV Benefits    |                   |                         |           |             |                       |     |
|-----------------------|-------------------|-------------------------|-----------|-------------|-----------------------|-----|
| Item                  | Travel Time (\$M) | Vehicle Operation (\$M) | CO2 (\$M) | Crash (\$M) | Health Benefits (\$M) | BCR |
| Recommended Programme | 393.1             | 75.2                    | 4.2       | 13.8        | 129.5                 | 1.6 |

Table 56 shows that the overall BCR for the recommended programme is positive and reflects good value for money. This can be attributed to the value of benefits derived from travel time and vehicle operating cost

savings through improved network reliability compared to the do minimum, and health benefits from the increase in new users to active modes.

#### 9.1.1 Sensitivity tests

Table 57 shows the results of sensitivity testing against a number of different parameters.

**Table 57: Economic analysis sensitivity test results**

| Sensitivity Tests                  | BCR |
|------------------------------------|-----|
| 3% Discount Rate                   | 1.9 |
| 6% Discount Rate                   | 1.1 |
| 40 Years Analysis Period           | 1.2 |
| Project Benefit Delay by 3 Year    | 1.6 |
| Project Benefit Delay by 5 Year    | 1.6 |
| Car + Bus Travel Time Benefit +20% | 1.8 |
| Car + Bus Travel Time Benefit -20% | 1.4 |
| Vehicle Operation Benefit +20%     | 1.6 |
| Vehicle Operation Benefit -20%     | 1.6 |
| CO2 Benefit +20%                   | 1.6 |
| CO2 Benefit -20%                   | 1.6 |
| Crash Benefit +20%                 | 1.6 |
| Crash Benefit -20%                 | 1.6 |
| Health Benefit +20%                | 1.7 |
| Health Benefit -20%                | 1.5 |
| Project Cost +20%                  | 1.3 |

| Sensitivity Tests | BCR |
|-------------------|-----|
| Project Cost -20% | 2.0 |

The impact on the BCR overall shows that the range remains positive being between 1.1 and 2.0. The largest increase to the BCR is the decrease in the discount rate to 3%, or the reduction of the estimated programme cost by 20%.

## 9.2 Key Assumptions

### 9.2.1 Economic Period and growth

- Costs and benefits have been calculated over 60 years with a present worth discount rate of 4%
- The forecast modelling considers the growth forecast as part of the Nelson Tasman Future Development Strategy (FDS) adopted by NCC and TDC in July 2019.
- From a modelling and travel demand perspective, the demand matrices based on these land use forecasts are 5% and 24% larger than the previous demand matrices (from the original NTTTTM) for the 2028 and 2048 model years respectively.

### 9.2.2 Construction and Maintenance costs

Construction costs to inform the economic analysis have been developed using SM014.

- Economic analysis has been undertaken against base estimates.
- Property costs have been calculated for relevant projects.
- Design costs are incorporated into the overall Pre-Implementation cost estimates for the projects referenced in the near-term and short-term periods.
- Construction costs are delineated over the following time periods:

**Table 58: Near to short-term programme construction periods**

| Near to Short-term Projects                                                      | Construction Period |
|----------------------------------------------------------------------------------|---------------------|
| Bisley Av / Tāhunanui Drive Southbound Merge                                     | 2022 - end of 2024  |
| Franklyn Road / Motueka St Signalised Intersection                               | 2022 - end of 2024  |
| Muratai St Crossing                                                              | 2022 - end of 2024  |
| Railway Reserve to Waimea Road Walking and Cycling Facility and Speed Management | 2022 - end of 2024  |
| Tāhunanui / Parkers / Maire signalised intersection                              | 2022 - end of 2024  |
| Washington Road                                                                  | 2022 - end of 2024  |
| Remaining projects preferred years 4-10 Waka Kotahi                              | 2025 - end of 2030  |
| Remaining Package 2 preferred years 4-10 NCC                                     | 2025 - end of 2030  |
| Rocks Road                                                                       | 2025 - end of 2030  |

**Table 59: Medium to long-term programme construction period**

| Priority Lane Projects                     | Construction Period |
|--------------------------------------------|---------------------|
| Remaining projects years 11-30 Waka Kotahi | 2032 - end of 2033  |
| Remaining projects years 11-30 NCC         | 2032 - end of 2033  |
| Priority Lanes Waka Kotahi                 | 2032 - end of 2033  |
| Priority Lanes NCC                         | 2032 - end of 2033  |

## 10.0 Financial Case

This Financial Case concentrates on the affordability of the recommended programme, funding arrangements and technical accounting issues. It presents the financial profile of the recommended programme and the impact of the proposed option on the programme budgets for Nelson City Council and Waka Kotahi as partners.

As defined by Waka Kotahi SM014 Cost Estimation Manual, the project cost can be separated into different time periods, base estimate, contingency and funding risk contingency.

Delivery of the Nelson Future Access Programme is significant in scale and cost. Timeframes extend out to 30 years, with more detailed costs specified for the first ten years of the programme. The financial case presents the cost estimates for a near-term three-year programme that aligns with the 2021-24 NLTP funding periods within this timeframe. The short-term programme provides cost estimates that align with the ten-year forecasts required by the 2021-24 NLTP for significant activities, and the Council's long-term plan.

The medium to long-term programme extends beyond year ten to year 30 of the programme. The purpose of providing these costs is to show the affordability and sequencing of the programme in responding to changing travel volumes and patterns across the Nelson City network.

Delivery of the near-term activities is considered to be affordable with a total cost estimate of ~\$31.55m.

### 10.1 Programme Delivery Costs

Cost estimates were developed through:

- Costing exercise by each activity identified in the preferred package;
- On-site observations
- Pricing schedules from previous projects of a similar type; and
- Parallel estimates

The cost estimates exclude the maintenance and operation costs.

Table 60 shows the source and scale of capital, operation and maintenance costs over the life of the project:

**Table 60: Elemental costs**

| Cost Source             | Activity Description                                                                                                                                                                                                                                                                                                                                                                                                     |
|-------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Project Development     | <ul style="list-style-type: none"> <li>• Consultancy fee's</li> <li>• Managed costs</li> </ul>                                                                                                                                                                                                                                                                                                                           |
| Pre-Implementation      | <ul style="list-style-type: none"> <li>• Consultancy fee's – DBC/Detailed Design</li> <li>• Managed costs</li> </ul>                                                                                                                                                                                                                                                                                                     |
| Preliminary and General | <ul style="list-style-type: none"> <li>• Materials/ formation testing allowance</li> <li>• Temporary Works</li> <li>• Services Risk</li> <li>• Access During Works (Public &amp; Contractor)</li> <li>• Environmental Compliance</li> <li>• Contractors Preliminary and General (P&amp;G)</li> <li>• Temp Traffic Management</li> </ul>                                                                                  |
| Physical Works          | <ul style="list-style-type: none"> <li>• Site Clearance</li> <li>• Pavements</li> <li>• Fencing</li> <li>• Traffic Signs and Road Markings</li> <li>• Road Restraint Systems (Vehicle and Pedestrian)</li> <li>• Piling and Embedded Retaining Walls</li> <li>• Drainage and Service Ducts</li> <li>• Special Structures - Bridges</li> <li>• Lighting</li> <li>• Landscape and Ecology</li> <li>• Earthworks</li> </ul> |
| Implementation fees     | <ul style="list-style-type: none"> <li>• Consultant fees – procurement / MSQA</li> <li>• Consenting</li> </ul>                                                                                                                                                                                                                                                                                                           |
| Property                | <ul style="list-style-type: none"> <li>• Property acquisition agent's fee's</li> <li>• Land purchase</li> </ul>                                                                                                                                                                                                                                                                                                          |

### 10.2 Assumptions

The financial case makes the following assumptions when determining the financial viability of the preferred package:

- Cost estimates quoted are 50<sup>th</sup> percentile estimates
- Estimates are based in NZD
- No allowance for future inflation. Activity costs inputted into Waka Kota’s Transport Investment Online will escalate costs 3% per year
- Estimates have an assessed +40% contingency
- A +30% property/land acquisition contingency has been applied to property estimates
- Nelson City Council led activity costs include the Waka Kotahi FAR of 51%
- Waka Kotahi led activity costs are 100% funded

### 10.3 Recommended Programme Cost

The total recommended programme base contract estimate is \$309M, as and the expected estimate is outlined in Table 61 and attached in Appendix L. As per SM014 the contingency included in the expected estimate is \$426M. The contingency costs refers to the amount included in the budget to represent uncertainty and funding risk that experience shows will likely result in added costs. The 95%ile cost estimate is \$509M.

Table 61: Package cost estimates (\$M)

| Package Activities         | Expected Base Estimate (\$M) | Contingency (\$M) | Funding Risk (\$M) |
|----------------------------|------------------------------|-------------------|--------------------|
| Nett Project Property Cost | \$ 12.692                    | \$ 3.917          | \$ 3.407           |
| Project Development        | \$ 11.521                    | \$ 3.456          | \$ 2.304           |
| Pre-Implementation         | \$ 26.424                    | \$ 7.927          | \$ 5.574           |

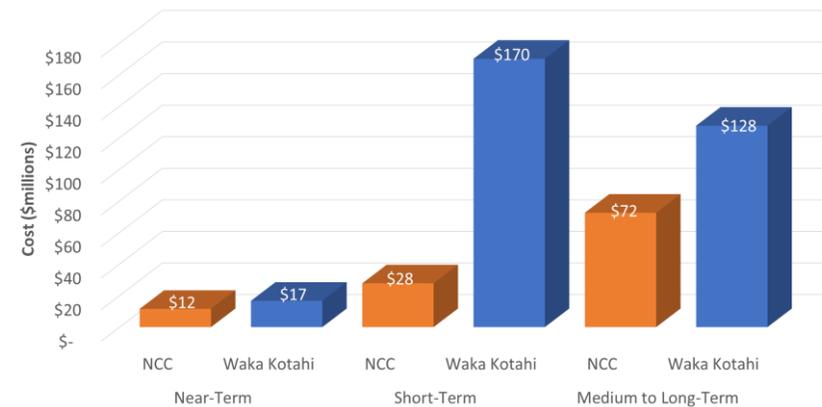
| Package Activities             | Expected Base Estimate (\$M) | Contingency (\$M) | Funding Risk (\$M) |
|--------------------------------|------------------------------|-------------------|--------------------|
| Implementation                 | \$ 258.545                   | \$ 101.209        | \$ 72.866          |
| <b>Total</b>                   | <b>\$ 309.182</b>            | <b>\$ 116.510</b> | <b>\$ 84.151</b>   |
| <b>Total Expected Estimate</b> |                              | <b>\$ 425.692</b> |                    |
| <b>\$95%ile estimate</b>       |                              |                   | <b>\$ 509.843</b>  |

The recommended programme cost estimate is further defined by the sequenced funding periods; the total capital cost between 2021-2024 (near-term), 2025-2030 (short-term), 2031-2050 (long-term).

The estimate **excludes** Waka Kotahi indirect and admin costs of 8%. All cost estimates quoted exclude GST.

Figure 67 shows the project costs across the near-term, short-term and medium to long-term periods for NCC and Waka Kotahi.

Figure 67: Project estimates by organisation and period



### Near-term programme cost estimate

The near-term package (2021-2024) has an expected total cost estimate of \$28.2m. This estimate reflects rounded element components for each route. Refer to the DBE Project Estimate forms within Appendix L for a detailed breakdown of the estimate by activity.

### Short-term programme cost estimate

The short-term programme (2025-2030) has an expected total cost estimate of \$197m. This estimate reflects rounded element components for each activity. Refer to the DBE Project Estimate forms within Appendix L for a detailed breakdown of the estimate by activity.

A significant proportion of the short-term programme cost is the delivery of the SH6 Rocks Road project.

### Medium to Long-term programme cost estimate

The medium to long-term programme (2031-2050) has an expected total cost estimate of \$201m. This estimate reflects rounded element components for each activity. Refer to the DBE Project Estimate forms within Appendix L for a detailed breakdown of the estimate by activity.

A significant proportion of the medium to long-term programme cost is the delivery of the public transport priority lanes project in the medium-term.

#### 10.3.1 Funding Arrangements

This business case seeks to secure funding for the active travel network through the National Land Transport Fund (NLTF) and local contributions from the Nelson Long Term Plan (LTP) with a 51% Funding Assistance Rate (FAR) for activities identified in the recommended programme. The Waka Kotahi funding assistance rate for Nelson City Council is set at 51% for the next 2021/24 NLTP.

Table 62 outlines the proposed 10-year funding profile along with proposed investment allocations between NCC and Waka Kotahi being the two investment funding partners. Individual activities also correspond to the concept designs presented in Appendix J.

**Table 62: Proposed 10-year investment allocations (including project development costs)**

| NLTP Period       | Activity                                                                         | Lead Org    | Total Cost (\$M) | Funding Commitment |             |
|-------------------|----------------------------------------------------------------------------------|-------------|------------------|--------------------|-------------|
|                   |                                                                                  |             |                  | NCC                | Waka Kotahi |
| <b>Near-Term</b>  |                                                                                  |             |                  |                    |             |
| 2021/22 – 2023/24 | Railway Reserve to Waimea Road Walking and Cycling Facility and Speed Management | NCC         | \$10.90          | \$5.34             | \$5.56      |
|                   | Washington Road Walking and Cycling Facility and Speed Management                | NCC         | \$9.40           | \$4.61             | \$4.79      |
|                   | Tāhunanui / Parkers/Maire Signalised Intersection                                | Waka Kotahi | \$3.40           | \$-                | \$3.40      |
|                   | Muratai Street Crossing Facility                                                 | NCC         | \$0.34           | \$0.17             | \$0.17      |
|                   | Franklyn Road and Motueka Street Signalised Intersection                         | NCC         | 1.58             | \$0.77             | \$0.81      |
|                   | Bisley Ave / Tāhunanui Drive Southbound Merge                                    | Waka Kotahi | \$0.3*           | \$-                | \$0.3       |
|                   | Maori Road / Haven Road intersection                                             | NCC         | \$0.2            | \$0.1              | \$0.1       |
|                   | SH6 between Muritai and Rui                                                      | Waka Kotahi | \$0.4            | \$-                | \$0.4       |
|                   | SH6 / Gracefield Intersection                                                    | Waka Kotahi | \$0.4            | \$-                | \$0.4       |
|                   | SH6 Tahunanui Drive Bisley Ave signals                                           | Waka Kotahi | \$0.3            | \$-                | \$0.3       |

|                   |                                                            |             |               |               |               |
|-------------------|------------------------------------------------------------|-------------|---------------|---------------|---------------|
|                   | Tipahi Street LATM                                         | NCC         | \$1.3         | \$0.6         | \$0.7         |
| <b>Sub-total</b>  |                                                            |             | <b>\$28.2</b> | <b>\$11.6</b> | <b>\$16.6</b> |
| <b>Short-Term</b> |                                                            |             |               |               |               |
| 2024/25 – 2030/31 | SH6 Rocks Road                                             | Waka Kotahi | \$138         | \$-           | \$138         |
|                   | Local road improvements and walking and cycling activities | NCC         | \$56.80       | \$27.83       | \$28.97       |
|                   | State highway walking and cycling activities               | Waka Kotahi | \$2.20        | \$-           | \$2.20        |
| <b>Sub-total</b>  |                                                            |             | <b>\$197</b>  | <b>\$28</b>   | <b>\$169</b>  |

(\* denotes that the cost does not include amenity parking – refer to Section 11.4 and Appendix J).

The total costs by year over 2021-2030 are summarised in Figure 68. The costs are heavily skewed to the construction of the Rocks Road project in years 8 and 9.

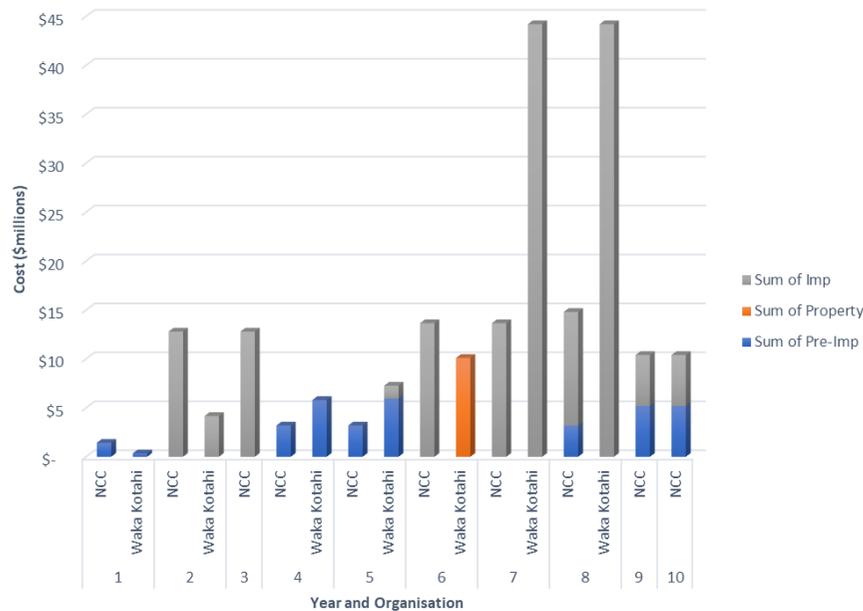
The recently released NLTP 2021-24 has noted significant funding pressures for new activities in the three-years, and into the next NLTP 2025-28. This is a key risk for the delivery of the near-term and short-term activities. In particular this is a risk for the SH6 Rocks Road project. The Pre-implementation funding should progress in the next six years in order allow for consenting and property to be managed, and provide for construction procurement planning to align with the NLTP 2029-32.

Additional cost risks are described in the table below. These apply across the preferred programme, and are linked to the Risk and Opportunity register.

**Table 63: Cost risks**

| Cost Risk           | Description                                                                                                                                                                                                                                                                                                             |
|---------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Materials           | The fluctuation in the cost of local and offshore sourced materials is a key concern and contributor to increasing costs.                                                                                                                                                                                               |
| Consent mitigation  | This a cost risk for SH6 Rocks Road as it involves work in the coastal marine area in particular.                                                                                                                                                                                                                       |
| Construction period | Delays during project construction, especially for SH6 Rocks Road, and the bus priority lanes, will increase costs overall for from extra traffic management, and site works.                                                                                                                                           |
| Resources           | It is noted that suppliers have recently had problems attracting sufficiently trained and experienced personnel. This will form a cost risk based on wage and salary pressure, and limiting competition. This will be accentuated by the timing with other development projects further putting pressure on resourcing. |

**Figure 68: Summary of estimated costs 2021-2030 by organisation**



### 10.4 Project Revenues and Third-party Contributions

No revenue streams have been identified from the operation of the preferred network. Therefore, no detailed analysis for project revenues has been undertaken.

Nelson City Council has in place a development contributions policy in place to assist with funding the infrastructure impact of growth. The latest development contributions policy became operative in July 2021. In this policy infrastructure includes transportation activity as an integrated activity that includes all modes of transport.

Total development contributions have been forecasted over the next ten years. The forecast is based on the number of new residential, and non-residential land titles to be developed over the next ten years. A charge per Household Unit of Demand (HUD) is then calculated using a conversion factor depending upon the type of household unit, or non-residential activity (e.g. one bedroom, two-bedroom, impervious surface area etc).

The projected revenue from development contributions is forecast to be ~\$48m over the next ten years. This total is then allocated against capital improvements for stormwater, wastewater, water supply, transportation, community infrastructure and reserves. The total projected revenue from development contributions for each infrastructure class is highlighted in Table 64:

**Table 64: 2021/22-203/2031 LTP - projected development contribution revenue<sup>13</sup>**

| Activity                 | Projected Revenue from development contributions (\$M) |
|--------------------------|--------------------------------------------------------|
| Stormwater               | \$ 13.275                                              |
| Wastewater               | \$ 14.826                                              |
| Water Supply             | \$ 8.025                                               |
| <b>Transportation</b>    | <b>\$ 4.161</b>                                        |
| Community Infrastructure | \$ 5.370                                               |
| Reserves                 | \$ 2.326                                               |
| <b>Total</b>             | <b>\$ 47.983</b>                                       |

The policy does caveat that “projected revenue is based on the forecast number of new HUDs over the next 10 years. The revenue is subject to a number of factors such as the speed of development, the quantum of

<sup>13</sup> Nelson City Council – Policy on Development Contributions 2021

remissions and exemptions, the lag time between consent and certification (payment) and is therefore difficult to forecast.”

Growth costs for transportation have been estimated for related activities identified in this study. Growth costs projected for the Nelson Future Access Study in the next ten years were estimated at ~\$2.9m which represents nearly a third of the forecast transportation related growth costs of \$10.1m.

Community feedback from the public engagement for the preferred option showed support for bringing the timing of projects to facilitate growth forward. This is due to the visibility and popularity of development areas within Nelson City. The timing and sequence of development within the city will likely provide opportunities to move projects forward in time as different developers push their developments forward, and public support is high.

Nelson City Council is intending to develop a framework for aligning with business and residential growth. The framework will help the council to engage with the larger residential development companies, and business community. Better engagement will help to plan and sequence activities in this business case, and across other infrastructure categories, to invest in growth. Private development companies and other businesses have different market forces working as triggers for investment in expansion and it's important to understand these.

## 10.5 Crown investment beyond the NLTP

Funding in transport infrastructure is increasingly being provided outside of the NLTF by the government. This funding is typically targeted at key government priorities that are either a low priority in the NLTF, or to support the economy during a nationally significant event (e.g. Covid19 pandemic response). Recent examples of separate crown funding in transport improvement project include the NZ Upgrade Programme and the Infrastructure Accelerated Fund.

The Infrastructure Accelerated Fund is a component of the Government's Housing Acceleration Fund. Nelson City Council have considered expressions of interest to the fund from developers to endorse prior to their applications being submitted. As noted above if approved for funding then

these developments will be accelerated in time, with a corresponding impact of the timing of network improvements to accommodate growth.

## 11.0 Commercial Case

The commercial case outlines the proposal in relation to the activities to be delivered in the Near-term and Short-term periods. The commercial case for the recommended programme involves consideration of network delivery, including its attractiveness to the market, affordability of delivery, and associated implications. The commercial case is underpinned by property and consenting strategies for the project. Procurement of professional design services and construction contractors will be undertaken by NCC and Waka Kotahi for the relevant work packages funded by each partner outlined in Section 10.3.

### 11.1 Procurement Approach

This section sets out a high-level approach to procurement. More detailed procurement plans are envisaged to be developed as part of future project stages when funding and cashflows have more certainty. To enable the activities to move forward promptly this section does however include more detail on the suggested next stages of procurement for professional services and Near and Short-term activity physical works.

The Waka Kotahi's Procurement Manual identifies the obtainment of the greatest economic, social and environmental benefits for the lowest overall cost as key criteria for an effective procurement delivery model. Delivery of the entire recommended programme is significant in terms of scale, with Rocks Road forming a significant proportion of the expenditure over the first 10-year period. Implementation of the overall project will require careful planning and execution to ensure its commercial success.

The NCC procurement strategy (in redevelopment) has an overall emphasis on "value for money". The commercial case is based on specific strategic outcomes and benefits, against which procurement options are assessed. The key considerations for procurement are as follows:

- The need for suitably skilled and experienced professional service suppliers given the varying levels of scale, complexity and timeframes

of the recommended programme activities across different time horizons;

- Ensuring sufficient market competition to deliver value for money;
- Achieving clarity around scheme costs so that the project can be delivered with the available funding;
- Minimising further costs with respect to scheme design by ensuring whole of life value and appropriate quality;
- Obtaining contractor experience and input into the construction programme and design details to ensure project delivery is robust, achievable, incorporates innovation and sustainability;
- Obtaining contractor input into risk management and appraisals to capitalise at an early stage on opportunities to reduce risk associated with delivery and implementation; and
- Consideration for the procurement strategies of similar recent procurements such as the Ngauranga to Petone shared cycle path (Te Ara Tupua);
- Based on the funding allocations identified in the Financial Case, procurement approaches for pre-implementation and implementation phases have been identified for the two delivery partners (NCC and Waka Kotahi);
- Alignment of the procurement with Tasman District Council. This will help to remove any duplication and realise any efficiencies.

#### 11.1.1 Approach to Delivery – Implications for Procurement

The recommended programme provides a pipeline of infrastructure improvements that will provide a level of certainty for the infrastructure construction sector in the region. The activities provide an uplift in the investment in transport that will help to support the local sector. It signals broadly the funding intentions through to a programme of investment over the next 30 years.

Key for the procurement of activities as part of this business case includes the continued collaboration in the procurement of joint projects with Waka

Kotahi. For infrastructure projects within the study area where there is joint management between Waka Kotahi and NCC the two organisations may proceed as either a lead principal or jointly, with joint funding arrangements and use of their own procurement strategy and processes.

NCC has a close relationship with TDC in the procurement of joint activities. For this business case the area of joint influence will be the provision of public transport services. The joint procurement of these services is explained in the RPTP.

### 11.1.2 Pre-Implementation Procurement Options

NCC procured in 2018 an infrastructure professional services panel. There are three suppliers that were engaged to be part of the panel. The panel at the time included demonstration of experience in project management, technical services, design services, asset management and business analysis. This panel had a minimum contracted period of three years ending in June 2021, and a maximum period of eight years.

This panel would form the ideal basis for progressing activities in the programme defined as Low Cost Low Risk due to:

- Local presence in Nelson
- Project scope and services articulated to the panel through a simplified project services brief
- Experience and knowledge of the NCC's Infrastructure Project Tools to ensure that all Council quality assurance, reporting and approval processes are followed
- Existing panel rates
- Allow NCC's involvement in the project to be the selection of the consultant from the panel, and overseeing performance against NCC's requirements

The current thresholds for purchasing services in outline in the NCC Procurement Policy February 2021 to December 2025. The policy provides the general requirements for procurement and the delegation limits for direct appointment, closed and open tenders based on cost. Variations to

the procurement approach can be made with General Manager approval. Based on the pre-implementation phase costs the majority of those projects in the Near-Term programme could be procured through the panel through a closed tender process.

The use of the Nelson City professional services panel for the delivery of the pre-implementation phase for Low Cost Low Risk projects on the state highway would need to be agreed with Waka Kotahi. It can be assumed however that the open or closed tender to secure professional services would involve the same three panel consultants, so there is likely to be efficiency in a joint approach.

Any procurement for activities would need to conform with the Waka Kotahi Procurement manual. The Procurement manual is to be used for activities funded through the National Land Transport Programme and contains procurement procedures approved by Waka Kotahi for use by approved organisations when purchasing infrastructure, planning and advice, and public transport services.

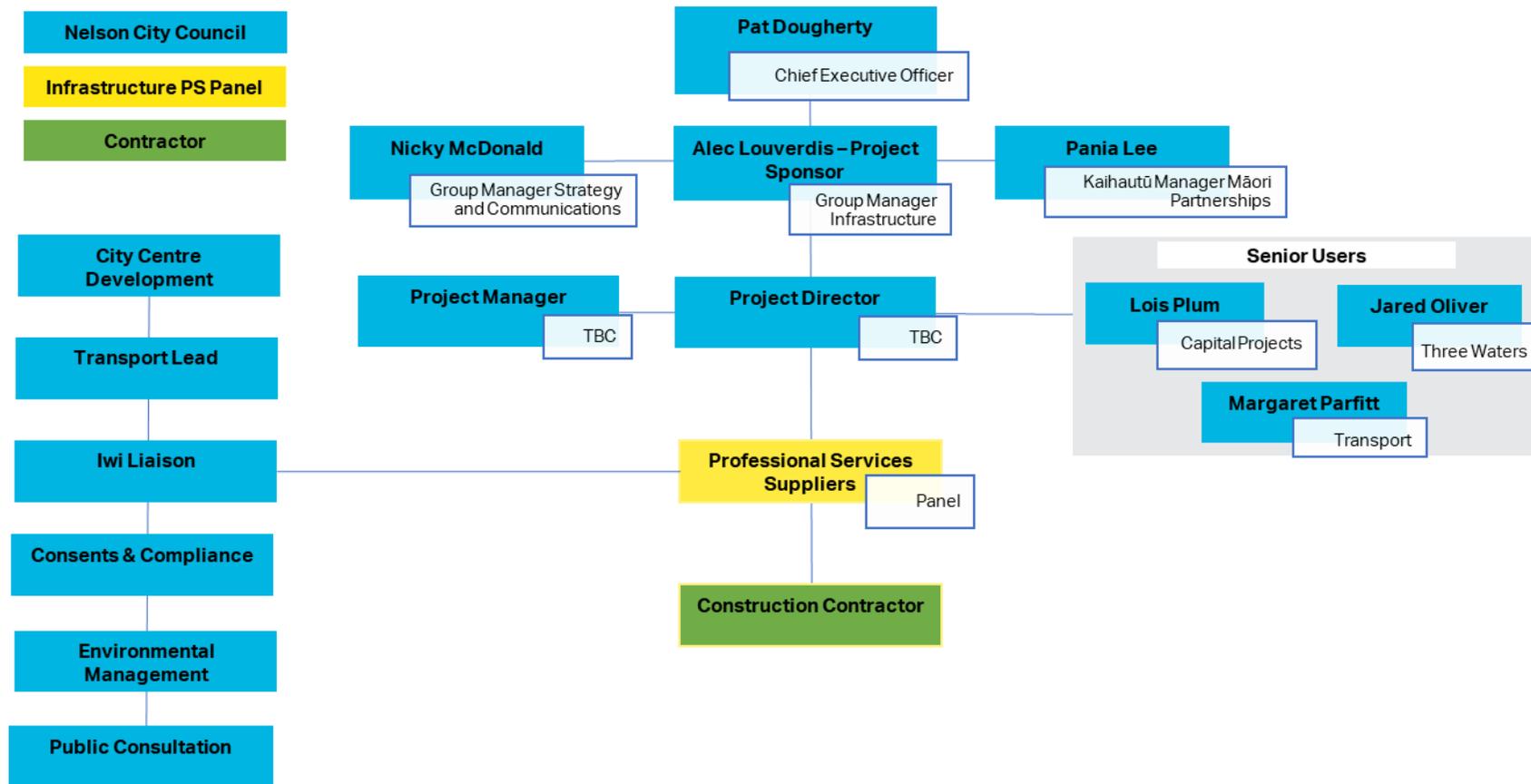
### 11.1.3 Pre-Implementation Procurement Risks

Capacity across the panel will be key to the delivery of the NFA programme over the next ten years. The Council has a heavy infrastructure programme to deliver across all asset classes particularly for the three waters. It is recommended that Council undertake a detailed programme assessment across all the asset classes to either match the programme to the capacity of panel or consider the expansion of the panel to more than three suppliers.

Nationally there is pressure on capacity for professional services consultants due to the large infrastructure programme being progressed in the next 10-years. The work programme across all infrastructure is large in the coming years. An aging workforce and closed borders over 2020 and 2021 due to Covid19 will stretch these companies to deliver a growing pool of work while recruiting and training new people. Because of these factors it reinforces the case for engaging closely with the panel and expanding it to encourage one or two more consultancies to focus in on Nelson City in order to expand the resource pool.

Figure 69. shows the recommended organisation chart for the delivery of Nelson City pre-implementation phases.

Figure 69: Nelson City Council Pre-Implementation phase organisation chart



#### 11.1.4 Pre-implementation Procurement Opportunities

Efficiencies could further be realised in the pre-implementation phase by aligning three waters and other utility upgrades with the transport upgrades. By undertaking design work either jointly, or in parallel the timing of the overall infrastructure upgrade will inevitably lead to efficiency in construction, construction cost saving, and reduce the risk of requiring new works to be redone due to the timing of other activities.

A recent example of this alignment is the replacement of the watermain down Rocks Road and the Waka Kotahi resealing programme. The water main that run-down Rocks Road (from the intersection of Bisley Avenue and Tāhunanui Drive to Magazine Point) is due to begin in August 2021. Its renewal will provide a more reliable water supply to the users in the area. The watermain is located in the road carriageway and is being undertaken over a ten-week period to align with when Waka Kotahi reseals the road in November 2021.

Further opportunities exist to align with offsite developments such as the Hospital redevelopment. An enhanced bus stop and walking and cycling infrastructure have been identified to support the hospital. Aligning the infrastructure development with the Hospital redevelopment presents a good opportunity to develop a procurement strategy together with the District Health Board, to identify cost and programme efficiencies between the two organisations.

#### 11.1.5 SH6 Rocks Road Procurement Options

Waka Kotahi and Nelson City Council have separate delivery teams to oversee the delivery of major projects. Within the short-term programme the significant major project is the SH6 Rocks Road project. This project triggers the Waka Kotahi significance policy by carrying a high cost, and a high-risk profile.

In particular the project would trigger a high rating for:

- Reputation / public interest: Public interest in the project will be very high. The reputation risk to the partner organisations is correspondingly very high.

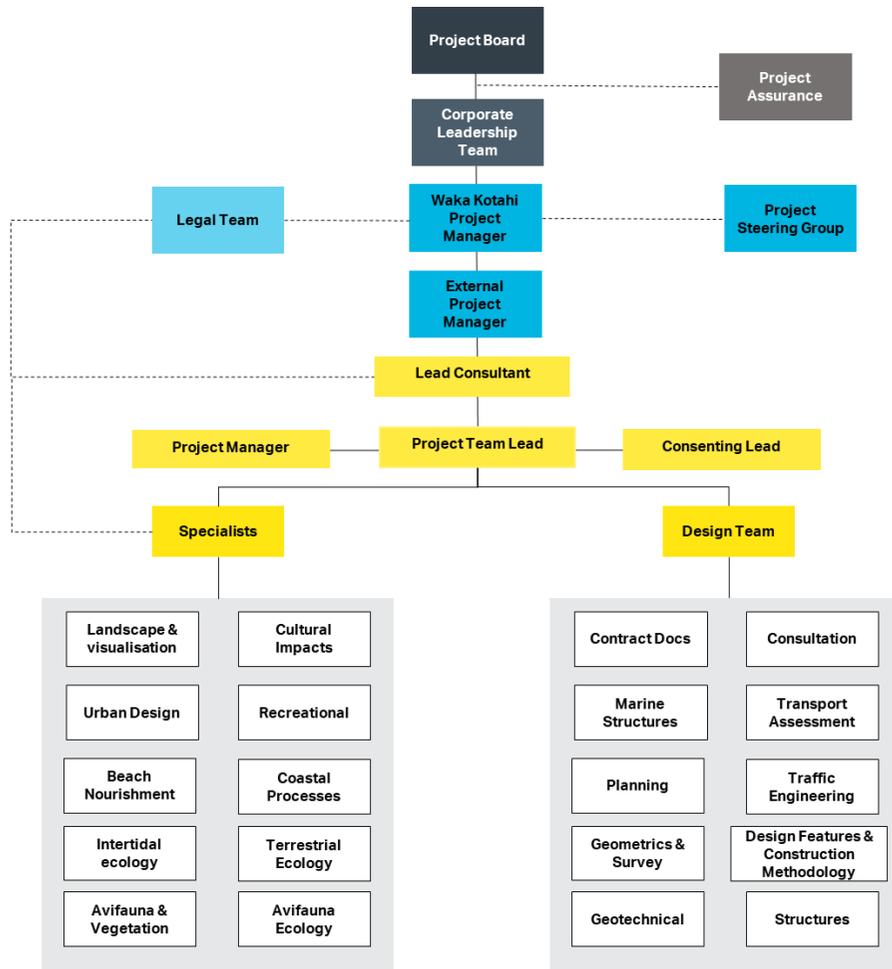
- Environmental and other impacts: the project will have environmental, cultural or social impacts that need to be considered

In order to fully understand and plan for the project it is recommended that the project follow the procurement path of procuring the services for the pre-implementation and consenting phases, and separately procuring the implementation of the project.

The pre-implementation phase would procure suppliers to progress the project to the lodgement of resource consents. The key services to be procured include consenting design, quantities and cost estimates, and specialist environmental impact assessments. Procuring these services as a pre-implementation phase is due to the time period to undertake the design, engagement and assessments, plus the time to go through the resource consent process. Conservatively this period could extend from 2-5 years.

An example organisation chart for the delivery of the pre-implementation phase is shown in Figure 70.

Figure 70: Example SH6 Rocks Road Pre-Implementation Organisation Chart

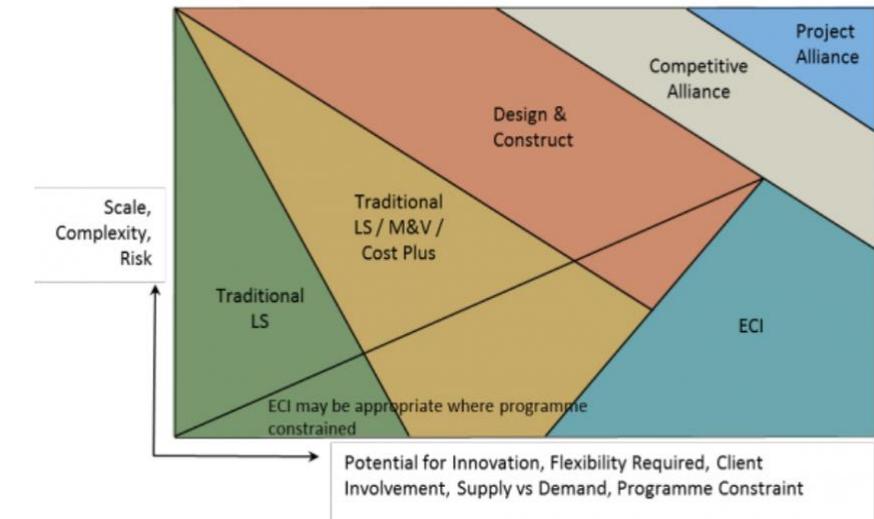


Procuring an Alliance to deliver the project is potential consideration for the Implementation phase of Rocks Road. Waka Kotahi provides guidance for

the procurement method for a range of different projects based on cost and complexity.

Table 65: Delivery model selection diagram

Delivery model selection diagram



The final procurement method for delivering the project would be made fin the pre-implementation phase It can be expected that the project would be considering a Design & Construct or ECI model, extending into potential Alliancing models. As an example, there are key reasons why an Alliance model may benefit this project:

- Improved efficiency and innovation: The project involves working in a complex marine environment and is a high-volume highway that requires careful traffic management in partnership with Nelson City Council. Further innovation can be achieved in the construction design.
- Participants can develop a detailed understanding of pricing and cost due to the transparent, collective contract-pricing process.

- Supports a high level of knowledge transfer between all participants.
- Parties are incentivised to work together to achieve time and cost targets
- A fully integrated project team deals with planning, design and construction, encouraging participants to look for best-for-project solutions

A project with similar attributes that has recently been procured using an Alliance model is the Ngā Ūranga to Pito-one (Ngauranga to Petone) section of Te Ara Tupua. The delivery of this project should be observed using an Alliance model and form part of the considerations for deciding a final procurement method in the pre-implementation phase.

### 11.1.6 Implementation/Construction Procurement

Planning for the Implementation phase for each project in the programme should occur in the Pre-Implementation phase for each project. This would include producing a procurement strategy to provide a recommendation based on knowledge of the market. The procurement approach will be informed by good intelligence about the current state of the local contracting sector

Key opportunities and risks need to be understood to inform the procurement approach. As an example, it is recognised that there has been an increase in the number of contractors in the market across transportation and three waters services<sup>14</sup>. This in turn provides a wide range of capabilities across potential suppliers.

However, there is a significant issue for all suppliers in a shortage of skilled employees within the Nelson-Tasman region. This shortage will also be exacerbated by the border closures due to Covid19 affecting recruitment. A resource shortage of skilled people places upward pressure on costs and their ability to deliver on programme, and to quality.

## 11.2 Risk Allocation and Transfer

An assessment of risks associated with the procurement and implementation of the near to short term programme has been undertaken in the main risk register. The key risks are highlighted Table 66.

**Table 66: Highlighted Risks**

| Risks                                                | Mitigation                                                                                                                                                                                                                                                                                                                                                                   |
|------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Community license to proceed with different projects | Consultation lead by NCC's Project Management Office.                                                                                                                                                                                                                                                                                                                        |
| Covid19 shutdown requirements                        | Offsite areas assigned to store material and equipment during shutdowns during construction.                                                                                                                                                                                                                                                                                 |
| Covid19 supply chain disruption                      | Certainty of design will allow materials to be ordered upfront, particularly for bespoke assets.                                                                                                                                                                                                                                                                             |
| Rocks Road consenting                                | Understanding the requirements and consequences of consenting conditions for the cost of the project. For example, the use of natural rock would add significant cost due to transport from mines in other parts of the country. A 'natural looking' rock can also be moulded nearer to the site that could provide a significant cost saving, and achieve a similar result. |
| Rocks Road consenting                                | A consenting design should not be so prescriptive as to remove the opportunity for innovation during the construction phase.                                                                                                                                                                                                                                                 |

NCC and Waka Kotahi have the ability to influence the commercial outcomes for the projects to be delivered through contractual terms, providing the opportunity to optimise the balance between managing the

<sup>14</sup> Tasman District Council Procurement Strategy

risks and delivering the best project outcomes. The risks would ideally be borne by the entity best able and willing to manage it.

An initial assessment of how the associated risks might be apportioned between the organisation and potential suppliers is outlined in the risk allocation table below.

**Table 67: Risk allocation by organisation**

| Risks                        | Organisation |             |                       |                              |
|------------------------------|--------------|-------------|-----------------------|------------------------------|
|                              | NCC          | Waka Kotahi | Related Govt entities | Third parties, inc suppliers |
| Design                       |              |             |                       |                              |
| Stakeholder                  |              |             |                       |                              |
| Construction and development |              |             |                       |                              |
| Operation                    |              |             |                       |                              |
| Variability of revenue       |              |             |                       |                              |
| Technology and obsolescence  |              |             |                       |                              |
| Legislative                  |              |             |                       |                              |
| Programme                    |              |             |                       |                              |

### 11.3 Schedule

The programme sequencing for the preferred package is contained in Appendix J.

### 11.4 Property Strategy

Property impacts are more specifically attributable to the SH6 Rocks Road, and Priority Lanes projects. The detailed impacts on property requirements are to be considered in the next business case phases for the project development. For Priority Lanes in particular this will be beyond the ten-year horizon of the near-term and short-term packages.

For the Tāhunanui southbound merge project, NCC will explore purchase or lease options for carparking in this vicinity in recognition that the services, particularly the medical services in this location, are important to the community. This could have a significant cost range between \$200 and \$1.2M.

### 11.5 Consenting Strategy

A consenting strategy is included in Appendix I. The strategy has considered the projects to be delivered over the near to short-term periods and provided recommendations. A summary extracted from the strategy is provided for reference below:

#### 11.5.1 South Nelson

The South Nelson works will require authorisation, likely by way of a resource consent. Section 88 and Schedule 4 CI 6 RMA require an assessment of alternative locations or methods for any resource consent activities which might have significant adverse effects. The magnitude of any effects resulting from the South Nelson works are considered likely to be less than minor, and thus an assessment of alternatives is not required. Notwithstanding this, good practice suggests the inclusion of a discussion of alternatives in this circumstance, and it is considered that the work completed to date is sufficient to enable such a discussion.

### **11.5.2 Washington Valley**

Like the South Nelson works, the Washington Valley works are expected to require resource consent. Due to the lack of definition of these projects at this stage, it is not possible to fully scope the resource consents required, particularly with respect to impacts on listed trees. It is recommended that during detailed design some consideration is given to alternatives in respect of this aspect of the works. In this instance, it is foreseeable that the provisions of Section 88 and Schedule 4 Cl 6 RMA will need to be satisfied.

### **11.5.3 Tāhunanui Intersection Improvements**

The intersection improvements at Tāhunanui are partially located within existing designations, however it is considered necessary that the minor alteration of the boundary of the designation is sought in two locations. While a broad-brush assessment of alternatives has been undertaken in respect of the wider proposal, a fine grain assessment has not been completed with respect to the impact of the proposed works on the intersections impacted. Accordingly, additional assessment of alternatives will be required in respect of this aspect of the works to satisfy the provisions of Form 9 of the Resource Management (Forms, Fees, and Procedure) Regulations 2003.

### **11.5.4 SH6 Rocks Road**

Most of the works proposed on Rocks Road will occur within the existing designation for SH6, and thus no assessment of alternatives will be required for those aspects of the project.

The reclamation proposed for corridor widening is the exception, and this resource consent application may be considered to have adverse effects that are greater than minor. As such, an assessment of alternatives will be necessary to satisfy the requirements of Section 88 and Schedule 4 Cl 6 RMA.

The impacts include the revetment versus seawall options along Rocks Road. Heritage NZ has provided feedback that will need to consider in the next phase, with continued consultation with them as a stakeholder.

## 12.0 Management Case

The management case addresses what needs to be done and by whom, setting out the planning required to ensure successful delivery, effectively coordinate change and manage project risks. This section considers the arrangements necessary to realise benefits and allocates project governance, roles and responsibilities. Implementation of the Nelson Future Access recommended programme will be developed and delivered by the key partners and stakeholders.

### 12.1 Near-term Programme Activities

In delivering the Near-Term activities in the next 3-years the following sequencing of actions are recommended to successfully deliver the projects over the next three years.

1. NFA business case endorsement – Endorsement sought by Waka Kotahi of the business case is required to co-fund activities identified in the business case. This should be completed before the end of 2021 ideally.
2. Inclusion of activities in the NCC and Waka Kotahi Low Cost Low Risk programmes – prior to endorsement the inclusion of projects under \$2 million in both the NCC and Waka Kotahi Low Cost Low Risk programmes. This would allow for accelerated delivery of these projects within the programme.
3. Amendments to the RLTP and NLTP – Once endorsement is achieved amendments to the NLTP can be sought to include individual projects that are over \$2 million total cost.
4. Sector briefing – it is recommended that NCC and Waka Kotahi undertake a sector briefing with professional services suppliers and contractors. This will allow the partners to present the outcomes of the business case, and the plan for delivering the near-term projects in particular over the next three-years.
5. Procurement strategies – The procurement strategies for the near-term activities should be developed by the end of the March 2022.
6. Professional services supplier procurement – it is recommended that the procurement of the professional services for the Near-Term activities be progressed in the period from April 2022 – June 2022. It is

anticipated that the design phases across all activities will range between three to twelve months.

7. Contractor procurement – at the completion of each design phase, subject to funding approval, the procurement of the contracting supplier will be undertaken progressively. This will allow these projects to be committed for construction in 2023.

There is a risk of programme delay if professional services procurement is not undertaken by April 2022.

### 12.2 Governance and Management

In general, the governance approach to the delivery of the recommended programme of activities should look to:

- Establish a shared vision, and a clear understanding of each partners roles and responsibilities
- Coordinated management between the partners
- A governance body that has a clear strategy, leadership and direction
- Having a dedicated resource within NCC to ensure coordinated development of the NFA over time
- Involvement of Tasman District Council r in the management structures
- Clear roles and responsibilities of the project partners, and clarity about partners' commitment to long-term funding.
- On-going marketing and promotion of the NFA through implementation stages to promote the programme of activities to the wider community and regionally.

#### 12.2.1 Near-term to Short-term Management

In order to facilitate delivery and successful outcomes for activities in the near-term to short-term, it is envisaged that these activities will be delivered and managed under the normal mechanisms within each partner organisation. This approach allows for separate delivery and management of those activities between the activities that each funding partner is delivering. The exception to this is the delivery of the Rocks Road project, given its high profile, and community impacts.

There is likely to be benefits for delivery through the close collaboration of each partner organisation in the project development and pre-implementation phases as noted in the Commercial Case. This will identify areas of cost efficiency and provide consistency of delivery. Key considerations include:

- NCC and Waka Kotahi may choose to have Memorandum of Understanding (MoUs) or other agreements to coordinate ongoing management and delivery against the programme. A template for the MoU can be made from the existing MoU guiding this business case which outlines use of internal resource and technical specialists, and a process for problem resolution.
- An MoU would be efficient for managing activities that interface between the state highway and local road network. For example, intersection improvements on SH6 will interface with local roads.
- A system wide view of speed management is encouraged across the Nelson and Richmond local road networks, and the state highway. Social pinpoint is being used through Shape Nelson to gauge peoples view of future of speed management in the city.<sup>15</sup>
- A parking management strategy for Nelson is currently going through a Social Pinpoint engagement using Shape Nelson.<sup>16</sup>
- Trials for ‘rat running intervention’ are planned for the 0-3 year period to enable engagement with the community (Port Hills, Kawai Street) to enable full implementation of these activities in years 4-10.

**12.2.2 Medium to Long-term Management**

Over the medium to long-term, the relationships between NCC and Waka Kotahi to deliver the NFA will have matured and changed to effectively deliver the recommended programme of activities based on the experience of delivering to completion the near to short-term activities, and the Rocks Road project. It is envisaged that the relationship structure will have matured to provide more effective collaboration in the delivery of activities.

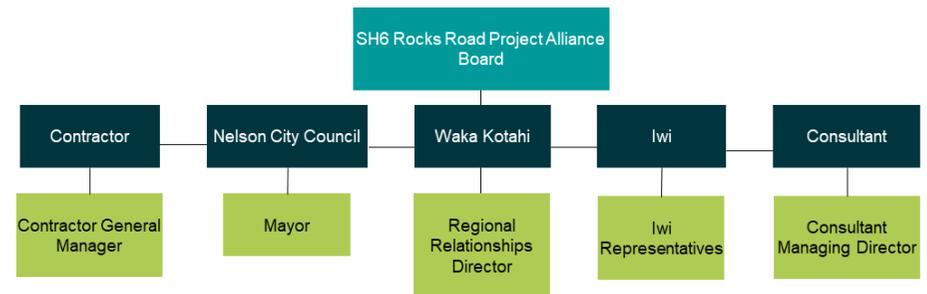
**12.3 Proposed Governance Approach**

Based on the assessment of various governance approaches, Figure 71 outlines a proposed governance structure for the delivery of the SH6 Rocks Road project. This draws upon evaluation of the governance and management of active mode and public transport infrastructure packages, and the Ngauranga to Petone shared path that has similar issues to the Rocks Road shared path project. The proposed governance approach is based on close collaboration between the project partners at a steering group level over the next 10-years for the delivery of the SH6 Rocks Road project, particularly during pre-implementation phases where stakeholder, Iwi, and landowner engagement is critical.

A modified governance structure utilising the Regional Transport Committee is recommended for the overarching management and reporting of the NFA programme. The committee includes elected members, and the Waka Kotahi Regional Relationship Director.

Additional coordination with the Tasman District Council could be considered. This will be based on the outcomes of the Richmond PBC that has an emerging programme with similar activities. Benefits will be realised through PT coordination as well as cross boundary coordination.

**Figure 71: SH6 Rocks Road project board structure**



**12.4 Project Delivery**

Project delivery for Waka Kotahi led activities are managed under the SM011 Project Management Manual. This manual prescribes their internal administrative procedures for the planning and management of projects. It

<sup>15</sup> [https://shape.nelson.govt.nz/Reviewing\\_Speeds](https://shape.nelson.govt.nz/Reviewing_Speeds)

<sup>16</sup> <https://shape.nelson.govt.nz/developing-parking-strategy-nelson>

provides the processes and forms for undertaking managing a compliant project at each stage.

NCC's Major Projects team have their own internal project management systems in place to manage project delivery.

## 12.5 Key Programme Risks

The key programme risks are highlighted in Table 68. These pose a threat to the delivery of the programme as a whole. Refer to the risk register in Appendix M for a more complete view of key project and programme risks.

Table 68 details the impacts and consequences if each risk is not mitigated. Due to the timescale of the preferred programme these risks will need to be managed actively.

**Table 68: Key risks for the preferred programme**

| Risk                                                      | Impact                                                                                                                                                                                              | Consequence                                                                                                                                                        |
|-----------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>NLTP Funding is Unavailable to progress activities</b> | The existing commitments for funding under the current NLTP and forecast out to 10-years means that there could be delays in starting each activity, resulting in delays for delivery.              | Poor transport outcomes with new infill and growth developments being completed.                                                                                   |
| <b>New developments are completed faster</b>              | Accelerated delivery and occupation of new developments results in additional transport demands earlier than forecast.                                                                              | Poor transport outcomes with new infill and growth developments being completed earlier than forecast.                                                             |
| <b>Project scope</b>                                      | The project scopes extend beyond planned increasing complexity and cost for delivery. This in turn impacts the affordability of the programme and risks the activities being deferred or abandoned. | Poor transport outcomes if activities are not undertaken.<br><br>If progressed the cost pressure on Council and Waka Kotahi could compromise the delivery of other |

|                                                                |                                                                                                                                                                                                      |                                                                                                                                                  |
|----------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                |                                                                                                                                                                                                      | projects outside of the NFA.                                                                                                                     |
| <b>Non-delivery of early activities</b>                        | Lack of delivery by the partners would show a non-commitment to the recommended programme resulting in the programme being abandoned later.                                                          | Poor transport outcomes.<br><br>Mitigation measures become reactive, and more costly.                                                            |
| <b>Complimentary activities outside the NFA not progressed</b> | Complimentary activities outside of the NFA programme would impact the extent of the wider transport network improvements that could be achieved.                                                    | Poor transport outcomes.                                                                                                                         |
| <b>SH6 Rocks Road</b>                                          | Heritage, cultural, visual and ecological values associated with the Rocks Road walking and cycling component of the programme requires considerably more time and cost to resolve than allowed for. | SH6 Rocks Road is a significant component of the short-term programme. Delays will have a consequence for poorer transport and amenity outcomes. |

## 12.6 Stakeholder Engagement

Stakeholder engagement to date has been undertaken primarily through the Project Reference Group (PRG). The PRG and consultation through the development of the NFA is described in Section 5 of this report. It is anticipated that the stakeholder engagement plan for each project will identify those stakeholders and affected parties to be engaged at the beginning of each pre-implementation phase. For the SH6 Rocks Road project it is expected that the same stakeholders engaged during the development of the NFA business case will continue when the next phase is approved for funding.

Due to the scale and public interest in the SH6 Rocks Road project public information should be made available prior from the outset. A common project website would be developed to keep the public informed about progress and for project information to be discovered. As the project develops overtime more detailed engagement would be undertaken in accordance with a project specific engagement plan.

The stakeholder and public engagement register from this business case and the previous PBC will need to be maintained. It could be held by either Waka Kotahi or NCC provided each is able to access it. This will be important for the development of each project to ensure any feedback is considered and reiterated in any future project engagement.

### 12.7 Benefits Alignment and Measurement

This project proposes to manage benefits in accordance with the Waka Kotahi Non-Monetised Benefits and Costs Manual which provides guidance in respect to defining and measuring the land transport benefits. These measures can be both quantitative and qualitative in nature. Assessing the delivery of benefits against the programme is important for the evidence-based decision making to monitor the delivery of the forecasted benefits. It will also provide insights into the trigger points required for informing project implementation over the medium to long-term.

The key vehicle for reporting the delivery against each of the measures should be through the Activity Management Plan reporting to the Nelson Regional Transport Committee annually. The measures align with the Nelson City Activity Management Plan 2021-2031, and monitoring that is undertaken. It is recommended that for the NFA a dashboard reporting tool be developed that tracks the progress of delivering against the programme, and the impacts on the network as described by the measures. NCC should lead the development of the dashboard, in coordination with Waka Kotahi.

Table 69: Benefits monitoring framework

| Investment objectives | Benefit            | Measure                           | Monitoring                                                                                                      |
|-----------------------|--------------------|-----------------------------------|-----------------------------------------------------------------------------------------------------------------|
| Reliability           | Effective movement | Intersection delay traffic and PT | Queues and delays monitored and report every three years along the SH6 through the study area, and Waimea Road. |

| Investment objectives | Benefit                         | Measure                                             | Monitoring                                                                                                                                                                                                                                                                                                    |
|-----------------------|---------------------------------|-----------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                       |                                 |                                                     | Post-implementation review one year after each intersection upgrade to review impacts.                                                                                                                                                                                                                        |
|                       |                                 | Pedestrian delay at intersections                   | Post-implementation review one year after each intersection upgrade to review impacts.                                                                                                                                                                                                                        |
|                       | Reliability & People Throughput | Growth in AADT and peak period traffic demands      | Continued AADT monitoring for SH6.<br>Regular traffic monitoring using tube counts on the local roads within the study area.<br>Post-implementation review one to three years after the implementation of Rocks Road, and Priority Lanes projects is recommended to understand the change in traffic demands. |
|                       |                                 | Public Transport travel times and people boarding's | Post-implementation reviews undertaken one to three years after the completion of priority lane projects.<br>Census reporting and reporting through the Transport AMP for journey to work for ongoing monitoring of throughput.                                                                               |
|                       |                                 | Active mode users                                   | Permanent pedestrian and cycle counters deployed to provide ongoing monitoring on key routes.<br>Active mode surveys on select routes undertaken at regular intervals to understand demand changes.<br>Post-implementation review at the completion of larger active mode projects.                           |

| Investment objectives     | Benefit                                                     | Measure                                                                                 | Monitoring                                                                                                                                                                                                                                                                                                    |
|---------------------------|-------------------------------------------------------------|-----------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Accessibility             | Improved access to key destinations                         | % popn change within 30min travel by PT and vehicle of key destinations                 | Post-implementation review after the delivery of the packages, and significant projects such as SH6 Rocks Road, and the priority lanes.<br>Census review for journey to work.                                                                                                                                 |
|                           |                                                             | % popn change within Cycling - 5km or 15min; Walking - 1km or 15min of key destinations |                                                                                                                                                                                                                                                                                                               |
| Quality Urban Environment | Quality and connectivity of the walking and cycling network | AADT expected for different road classifications                                        | Continued AADT monitoring for SH6.<br>Regular traffic monitoring using tube counts on the local roads within the study area.<br>Post-implementation review one to three years after the implementation of Rocks Road, and Priority Lanes projects is recommended to understand the change in traffic demands. |
|                           |                                                             | CLoS for footpaths and cycle facilities                                                 | CLoS changes reported as part of the three-year update of the Transport AMP within the study area.                                                                                                                                                                                                            |
|                           | Carbon neutral                                              | GHG emissions from transport                                                            | Regular GHG emissions reporting included as part of the Transport AMP measuring the impact of delivery against the NFA.                                                                                                                                                                                       |

| Investment objectives                       | Benefit                     | Measure                                             | Monitoring                                                                                                                                                               |
|---------------------------------------------|-----------------------------|-----------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Nelson's transport is safer and feels safer | Is safer                    | Number of crashes by severity<br>Number of DSIs     | CAS analysis no less than 3-years after project or package completion. This is important for having a sufficient number of years data to evaluate the changes to safety. |
|                                             | Feels safer                 | Safety - Perception                                 | Survey one-year post implementation and on-going survey feedback through the development of the Transport AMP.                                                           |
| Nelson's transport is resilient             | Number and hours of closure | Number and hours of closure for SH6 and Waimea Road | TREIS assessment and reporting ongoing.<br>Monitoring and reporting of closures on Waimea Road.                                                                          |
|                                             | System redundancy           | Capacity for key arterials                          | Traffic management plans in place and maintained to provide system redundancy in during a closure of the key arterials.                                                  |

## 12.8 Programme Assurance

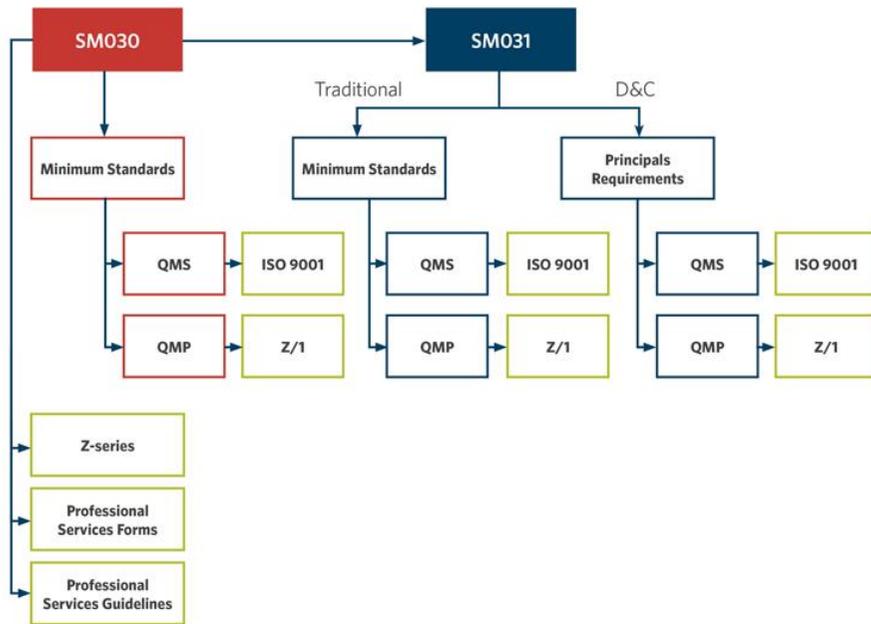
Figure 72 presents the quality assurance documents referenced and presented as a hierarchy.<sup>17</sup> It shows the relationship between the contact documents, minimum standards and technical requirements for Waka Kotahi capital projects. The following is referenced in the diagram:

- State highway professional services contract proforma manual (SM030)
- State highway construction contract proforma manual (SM031)
- Quality management plan (NZTA Z/1:2021)

<sup>17</sup> <https://www.nzta.govt.nz/roads-and-rail/highways-information-portal/technical-disciplines/quality-assurance/quality-assurance-documents/>

- Z Series - minimum standards
- Professional services forms (PSF)
- Professional services guidelines (PSG)

Figure 72: Waka Kotahi quality assurance documents hierarchy



Project assurance for NCC led projects will be undertaken in alignment with the Procurement Policy 2021-26.

The Waka Kotahi Investment Quality Assurance process is applicable for each activity phase in the programme requesting funding through the NLTP

### 13.0 Next Steps

In order to progress funding opportunities, it is important to have an approved and endorsed business case. Most activities will require funding to be made available to progress with subsequent stages of investigation, design and implementation via an amendment to the Regional Land Transport Plan.

Funding of the recommended programme is still to be determined but will likely include the National Land Transport Fund, Nelson City Council local share, and potential funding opportunities through alternative crown funding sources as they arise over time.

Monitoring of the transport network in order to understand the actual effectiveness of the activities delivered and inform and refine the interventions. Modifications to the sequencing of the activities to match growth demands could become very relevant if large residential developments to meet the housing affordability crisis that are brought forward in time.

With reference to Section 12.1 the following should be undertaken to progress the near-term programme and reduce the likelihood of any delays upon endorsement of the NFA business by Waka Kotahi:

1. Inclusion of qualifying activities in the NCC and Waka Kotahi Low Cost Low Risk programmes.
2. Amendments to the RLTP and NLTP – Once endorsement is achieved amendments to the NLTP can be sought to include individual projects.
3. Sector briefing with professional services suppliers and contractors.
4. Procurement strategies developed for the Near-term activities.
5. A dashboard report develop for reporting the progress of the NFA preferred programme for annual reporting to the RTC.

## Appendix A Strategic Alignment Summary

A summary of the strategic cases alignment with the National and Regional policy context is shown in Table 70.

**Table 70: Strategic alignment**

| Benefit                                                                         | GPS 2018 & 21                                                                                                                                                                                                                                                                                                                                                                                                                                 | NZTA SOI 2018-2022                                                                                                                                                                                                                                                                                                                | LTP 2018-2028                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|---------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Nelson's transport system is more effective in moving people and freight</b> | <p>GPS 2021 provides a stronger guidance for the investment for freight. For this business case the benefit is more efficient freight movements to the port and to key business centres.</p> <p>The growing demands on the transport system for moving people is a key focus for both GPS periods. The keep benefit for Nelson is the ability to move more people during peak periods through the system efficiently to key destinations.</p> | <p>Focus is on improving access to the transport system for people, freight and tourism, particularly in high-growth areas, by providing more accessible, frequent and affordable transport choices. This includes promoting a shift from the use of private cars to greater use of public transport, walking and cycling.</p>    | <p>Infrastructure outcomes look to increase public transport use, and efficiency to maximise the movement of people using this mode over the ten years.</p>                                                                                                                                                                                                                                                                                                         |
| <b>Nelson is more accessible</b>                                                | <p>The benefit aligns with the strategic priority to provide better travel options to help them access social and economic opportunities.</p>                                                                                                                                                                                                                                                                                                 | <p>Focus is on improving access to the transport system for people, freight and tourism, particularly in high-growth areas, by providing more accessible, frequent and affordable transport choices. This includes promoting a shift from the use of private cars to greater use of public transport, walking and cycling</p>     | <p>Infrastructure outcomes look to increase public transport use, and efficiency to maximise the movement of people using this mode over the ten years.</p> <p>It also looks to increase the combined journeys to work of people using active modes over ten years.</p> <p>Roads and footpaths do not currently meet the needs of our ageing population, walkers and cyclists thereby creating barriers to those wishing to use alternative modes of transport.</p> |
| <b>Nelson's transport system contributes to quality urban environments</b>      | <p>The strategic priority to provide better travel options aligns with the infrastructure required for shorter journeys by different modes, and moving more people in fewer vehicles.</p>                                                                                                                                                                                                                                                     | <p>As the principal investment manager and planner for the land transport system, Waka Kotahi is looking to strongly integrate land use and transport planning to create healthy, thriving and well-connected communities. Alongside a people-centric approach, they are targeting partnerships to create transport links and</p> | <p>Our urban and rural environments are people-friendly, well planned and sustainability managed.</p> <p>Our unique natural environment is healthy and protected.</p>                                                                                                                                                                                                                                                                                               |

| Benefit                                                          | GPS 2018 & 21                                                                                                                                                                                                                 | NZTA SOI 2018-2022                                                                                                                                                                                                                                                                   | LTP 2018-2028                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                  |                                                                                                                                                                                                                               | <p>services that can improve social, economic and environmental outcomes for communities and businesses.</p> <p>In addition, they are looking to encourage transition to a more sustainable transport system that protects and enhances the environment and public health.</p>       | <p>Our communities have access to a range of social, educational and recreational facilities and activities</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <p><b>Nelson's transport system feels safer and is safer</b></p> | <p>Improvements in real and perceived safety risk in the transport system is a key strategic priority for both GPS periods. Improved safety for active travel is a key outcome so that this mode is an attractive option.</p> | <p>Applying the Safe System approach to road safety in everything we do to protect people from death and serious injury. They are also targeting our resources and interventions to the areas with the greatest potential to save the most lives.</p>                                | <p>Achieves a safe road network. Decreasing fatal and serious crashed on the network each year of the ten-year period.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <p><b>Nelson's transport system is more resilient</b></p>        | <p>Supporting alternatives to key routes and modes will improve the resilience of the network. Better and more diverse travel options can reduce localised resilience risks for communities.</p>                              | <p>prepare for and recover from disruptions such as earthquakes and severe weather events that can compromise vital transport links</p> <p>we must factor in the effects of climate change and increasing traffic volumes and incidents, such as crashes, in our decision-making</p> | <p>The transport network is essential for all other utilities to get up and running rapidly after a disaster, so needs to be resilient to natural hazards such as earthquakes and flooding and the consequences of climate change such as storm surge and coastal inundation. Council. responds to this challenge by focusing resources on maintaining and developing alternatives routes to arterial roads, emergency response and repair and integrating the Civil Defence Emergency Management Lifelines Plan into the Transport Asset Management Plan.</p> <p>improvements to the safety and resilience of the SH6 Blenheim to Nelson route.</p> |

## Appendix B Investment Logic Map

## Appendix C Long-list options

## Appendix D Traffic modelling summaries

## Appendix E Public consultation reports

## Appendix F Network operating hierarchy gap analysis

## Appendix G Short-list package MCA scoring summary

## Appendix H Economic summary sheets

## Appendix I Technical summary reports

## Appendix J Preferred package design plans

## Appendix K Preferred package design philosophy statement

## Appendix L SM014 cost estimates

## Appendix M Risk and safety in design registers