

NELSON FUTURE ACCESS - INFO PACK

SEPTEMBER 2019

V2

The Nelson Future Access Project will help us plan a transport system that works for everyone - no matter how they use it. It'll identify an investment programme that supports the aspirations of the community and Nelson City Council for a thriving CBD, a people-focussed waterfront and a healthy environment. And, it'll look at how to provide a safe, accessible and resilient transport system that supports continued economic growth and meets the diverse needs of our customers and communities.

BACKGROUND

Since the 1960s Nelson has been considering an additional road link between Nelson City Centre and Annesbrook to accommodate traffic growth. In 2004, a Southern Arterial Link proposal was rejected by the Environment Court for reasons including social severance, the proximity of the route to schools, air quality degradation and a lack of evidence that it would improve safety and efficiency.

Since then, there have been numerous investigations into the need for, feasibility and viability of infrastructure required to support Nelson's growth, including the North Nelson to Brightwater Strategic Study (2008), the Nelson Arterial Traffic Study (2011), and the SH6 Rocks Road Cycle and Walk Project Investigation (2014).

In 2017, the Nelson Southern Link Programme Business Case (PBC) built on the work done in these previous studies and concluded that:

A range of activities to optimise the transport system could be implemented in the short to medium term to improve traffic performance,

The need for a new road link be monitored, with an indicative implementation timeframe in the 2030's.

The Nelson Future Access Project (NFAP) is the next step.

CONTEXT FOR DECISION MAKING AND ACTIVITY ASSESSMENT

Since the adoption of the PBC by the NZ Transport Agency Board in 2017, there have been changes in both Government and Council policy directions. These changes provide an opportunity for the Agency and NCC to build on the findings of the PBC by taking a broader perspective of the potential for the transport system. It is an opportunity for the transport system to help deliver a vibrant central city, a people-focussed waterfront, a healthy environment and support smart and resilient infrastructure. A summary of the key changes is listed below:

Transport Policy – In 2018 the Ministry of Transport developed an outcomes framework making it clear what the Government is aiming to achieve through the transport system. Central to the purpose of the transport system is to improve people’s wellbeing, and the liveability of places. It does this by contributing to five key outcomes, represented in the diagram below:

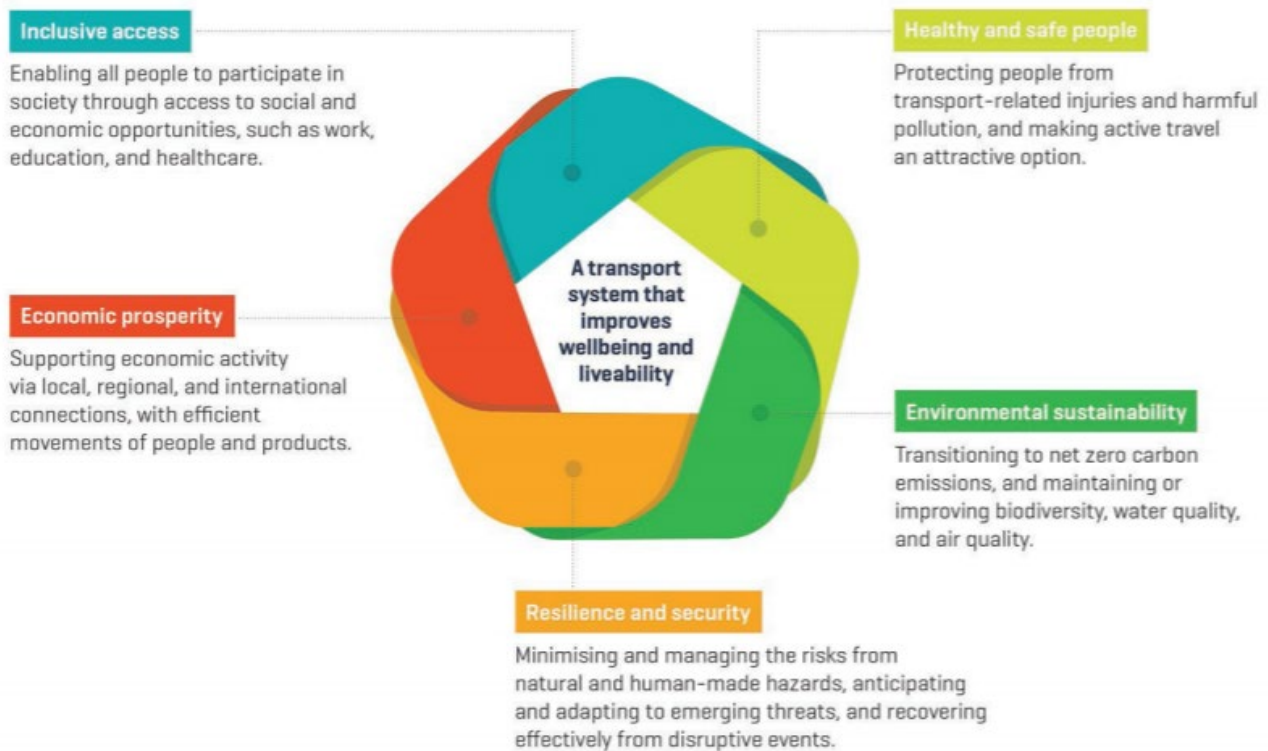


Fig 1 Ministry of Transport – Key Outcomes

The 2018 Government Policy Statement on Land Transport (2018 GPS)¹ provides a greater focus on safety, accessibility, resilient and liveable cities, the environment (including reducing GHG emissions), mode neutrality, reducing dependency on non-commercial private vehicles, and realising the role of the transport system in improving access to economic and social opportunities. As NFAP has a 30-year horizon, it is highly likely that these priorities will again change, hence the preferred option will need to be robust, and able to withstand changing Government priorities.

¹ <https://www.transport.govt.nz/assets/Uploads/Our-Work/Documents/c6b0fea45a/Government-Policy-Statement-on-land-transport-2018.pdf>

Community Outcomes – The Community Outcomes² being sought by Council to achieve the current and future needs of the community are listed below. These outcomes have been jointly developed with the Tasman District Council demonstrating a ‘one region’ understanding and need to collaborate to provide the best and most efficient service to the community.

- Our unique natural environment is healthy and protected
- Our urban and rural environments are people-friendly, well planned and sustainably managed
- Our infrastructure is efficient, cost effective and meets current and future needs
- Our communities are healthy, safe, inclusive and resilient
- Our communities have opportunities to celebrate and explore their heritage, identity and creativity
- Our communities have access to a range of social, educational and recreational facilities and activities
- Our council provides leadership and fosters partnerships, a regional perspective, and community engagement
- Our region is supported by an innovative and sustainable economy

Urban Development - Nelson and Tasman are growing regions, with population forecasts expected to increase between 20,000 to 40,000 people over the next 30 years, alongside the growth in economic activity from tourism and exports. In response, Nelson and Tasman have developed a joint approach to urban development over the next 30 years by adopting the Future Development Strategy³. This strategy moves from a scenario where the majority of development occurs on the fringes to one with a greater level of intensification.

Climate Change - In May 2019, Nelson City Council declared a State of Climate Emergency in recognition of the mounting advice that there is a small window for action to avoid the most damaging effects of climate change⁴.

The relevance for this Project is the shift towards a no-carbon-emissions transport system, the desire to improve air quality, and the need to improve Nelson’s resilience to sea level rise and more frequent natural events.

Technology - Personal (micro) mobility, Ridesharing (e.g. Uber), EV’s and hydrogen powered vehicles and the increasing efficiencies afforded by freight logistics highlights the changing face of transport and the need for the system to be agile to demand and mode changes.

² <http://www.nelson.govt.nz/council/council-structure/community-goals-for-nelson-whakatu/community-outcomes-3/>

³ <http://www.nelson.govt.nz/building-and-property/city-development/future-development-strategy>

⁴ <http://www.nelson.govt.nz/environment/climate-change/declaration-of-climate-emergency/>

Intervention Hierarchy – The NZ Transport Agency applies an intervention hierarchy approach to all steps in the planning and investment process. That means starting with the lowest cost alternatives and options, including making best use of existing transport capacity, before considering higher cost alternatives and options. Below is the intervention hierarchy typically applied to National Land Transport Fund investments.

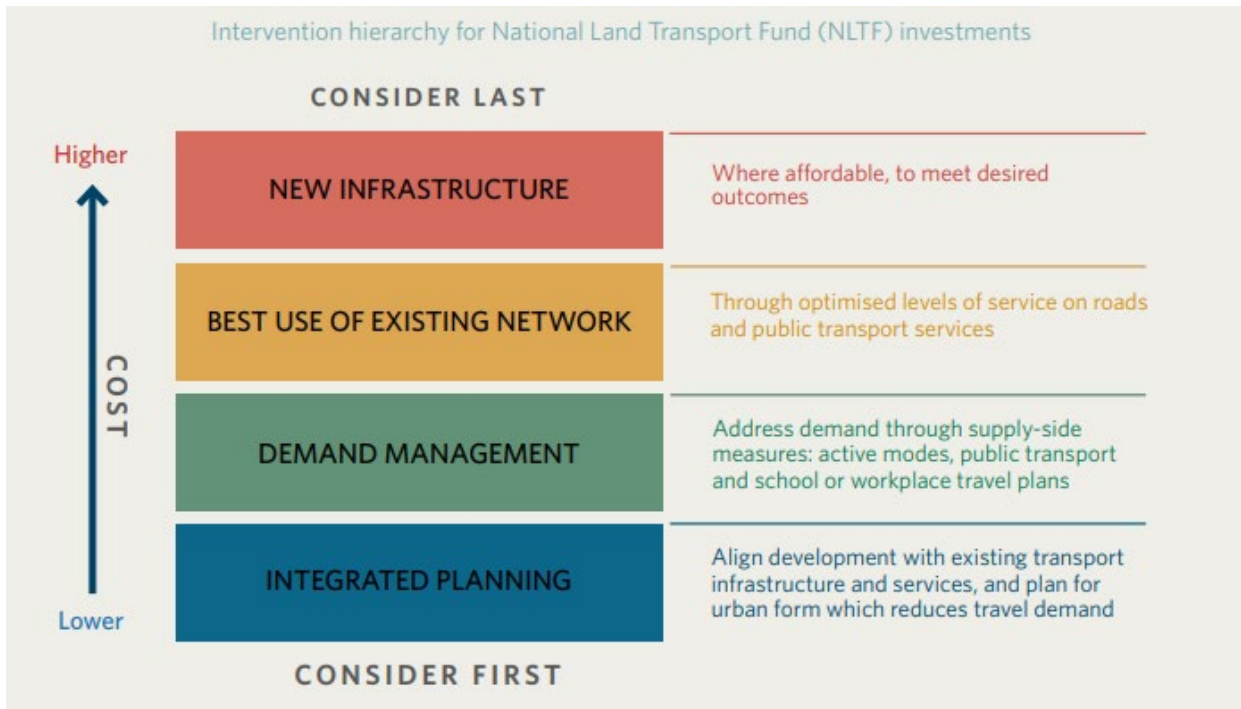


Fig 2 Transport System Intervention Hierarchy - National Land Transport Fund investments.

DISCUSSION

As this subject has been well-covered over the last 30 years, the NFAP will build on previous investigation work. It will take everything we have learned from the past, add context from today, and identify how to prepare Nelson for the future.

The specific project area, shown below, extends to SH6 at the north and west, Rutherford Road/Waimeimea Road to the east and south to the Annesbrook Drive roundabout. However, there is a far bigger area of influence, extending beyond Richmond to the south and west, and Atawhai to the north.



Fig 3 Location Plan

WHAT THE PROBLEMS AND EVIDENCE ARE TELLING US SO FAR

The first step for NFAP is building on the work done to date by updating the Strategic Case, and further developing the detailed evidence base. The Strategic Case will pull together the identified priorities for investment, evidence collection, the wider strategic environment (RLTP, climate, local policies, port, tourism etc) and any other factors required to make an evidence-based case for investment.

Each Strategic Case uses as its foundation a clear articulation of the most significant problems (and opportunities) which have driven a need for investment. These problems are then translated into a clear set of outcomes (described in benefits and measures) which are used to evaluate possible options later in the business case process.

The most significant problems for the Nelson Future Access project is shown below. It is important to note that the case for investment may alter emphasis, measures or other elements of the problems and benefits to reflect the confirmed evidence base as it evolves.

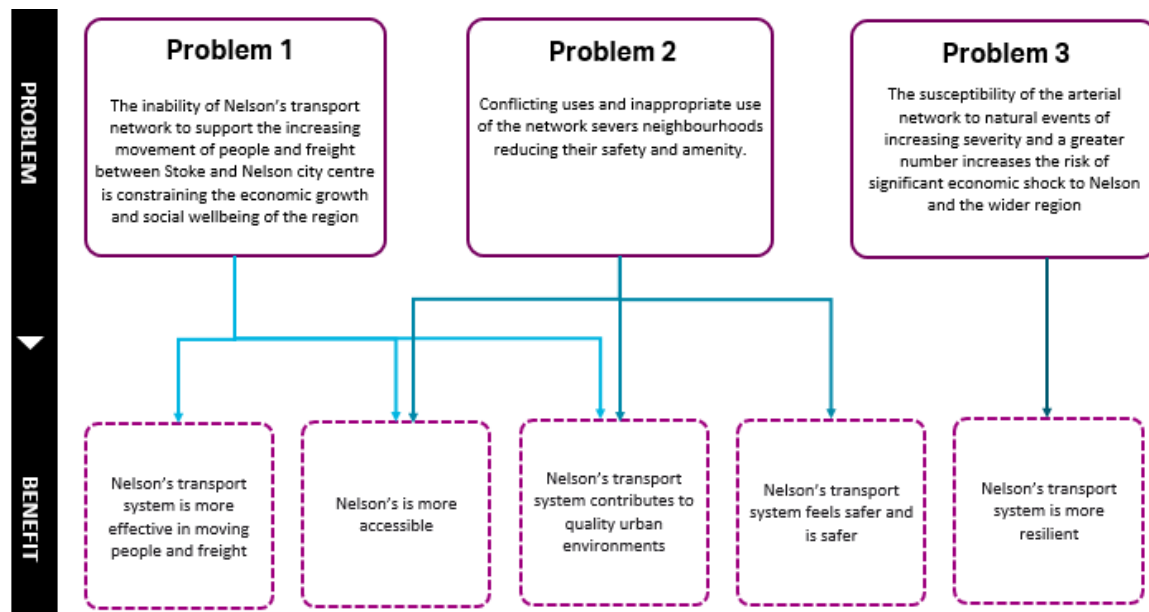


Fig 4 – NFAP Problems and Benefits

An investigation into the problems has identified the following causes, consequences and effects. The three tables below summarise those causes and consequences for each of the three problems. Details/evidence collection is continuing, so while we can demonstrate evidence for most of the causes and consequences, the scale of the problem is still being quantified.

Problem 1: - The inability for Nelson’s transport network to support the increasing movement of people and freight between Stoke and Nelson City Centre is constraining economic growth and the social wellbeing of the region

The initial evidence for problem 1 indicates that the arterials could provide more reliable travel throughout the day and better access to 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 per lane during the winter months.

PROBLEM 1: – THE INABILITY FOR NELSON’S TRANSPORT NETWORK TO SUPPORT THE INCREASING MOVEMENT OF PEOPLE AND FREIGHT BETWEEN STOKE AND NELSON CITY CENTRE IS CONSTRAINING ECONOMIC GROWTH AND THE SOCIAL WELLBEING OF THE REGION

CAUSES

- Demand side issues
 - Population and employment growth in Nelson and Tasman is increasing the demands for travel throughout the year.
 - Higher demands for travel between October and March is associated with an increase in economic activity that isn’t confined to holiday periods
 - Continued growth in activity in the medium to long term along with the projected growth in economic activity
- Supply side issues:
 - People moving capacity on routes to Nelson City Centre (Waimea Road and SH6 at Tahunanui) is inconsistent with the capacity of the roads and streets approaching these routes
 - Parking capacity within and on the fringes of Nelson City Centre is under strain although preferential parking is available for carpooling.
 - The road network heading south at Stoke and Richmond has limited spare capacity in the evening peak as people leave Nelson
 - Public transport alternatives for commuting are low-capacity, low frequency and comparatively slower.
 - Cycle network connectivity is incomplete and acts as a deterrent to increasing the potential of cycling for commuter travel.
 - No alternative “through” routes other than local streets for traffic movement
 - No priority infrastructure for high occupancy vehicles, buses or freight to encourage alternative modes of travel.

Consequences

- High car mode share in areas further away from Nelson City Centre
- Declining share in carpooling along Rocks Road and Waimea Road
- Low public transport patronage compared to what is needed to maximise the people carrying capacity of key corridors
- 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 time beyond the peak hour is leading to declining City Centre access by car and public transport, and to the Port for freight. The peak PM period is between 3pm and 6pm
- Impact on the reliability of freight movement is increasing costs of moving goods due to the time required to arrive on schedule.
- Increasing variability means fewer trips are made, limiting the economic growth of the region.
- The “off-peak” window through the day is reducing, impacting the productivity of business-related travel and services.

Table 1 - Problem 1 Summary of Causes and Consequences

Data and detailed evidence that supports Problem Statement One can be found in appendix A.

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

The initial evidence indicates that the network by-and-large 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 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.

PROBLEM 2: – CONFLICTING USES AND INAPPROPRIATE USE OF THE NETWORK SEVERS NEIGHBOURHOODS REDUCING THEIR SAFETY AND AMENITY

CAUSES

- **Supply side issues:**
 - Ease of access via the 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 and between many intersections across the network.
 - Narrow walking and cycling facilities on high volume roads, particularly Rocks Road and Waimea Road, that are not suitable for commuter or recreational users
 - Ease of long stay parking on the city fringes and along arterial corridors creates conflict with other uses for those corridors
 - Posted speeds on local streets are higher than the “safe and appropriate” speeds
 - Narrow road corridors roughly 20 – 22m wide make it difficult to provide for all travel needs
- **Demand side issues:**
 - High volume roads (Rocks Road, Waimea Road, St Vincent Street and Vanguard Street) create barriers for local activity at Tahunanui, Waterfront, City centre and City fringe.
 - High pedestrian and cyclist activity within the City Centre and City fringe are expected to grow with greater intensification of residential areas on the fringe.

Consequences

- 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 arterials
- Increasing use of City centre and local streets extending further out from centre for long stay parking
- Increasing conflict between 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 (Nelson City centre, schools and hospital) resulting in high personal risk and high probability that a serious injury will occur in an accident.
- Missed opportunities to increase the recreational, tourism and amenity potential of the Waterfront and City centre by improving the quality of facilities and removing barriers for travel on arterial corridors
- Missed opportunities to provide better connections for active modes between Tahunanui, Waterfront and City centre suitable for all ages and abilities. This would stimulate recreation, tourism and economic potential for the development of the Waterfront precinct.
- Missed opportunities to capitalise on the growth in cycle tourism and the attractiveness of Nelson as a potential cycle-tourism destination

Table 2- Problem 2 Summary of Causes and Consequences

Data and detailed evidence that supports Problem Statement Two can be found in appendix B.

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

The initial evidence indicates that Rocks Road has a significant risk of being closed during a high-impact low probability event, and currently experiences approximately 1 closure per year.

PROBLEM 3: – THE SUSCEPTIBILITY OF THE ARTERIAL NETWORK TO NATURAL EVENTS OF INCREASING SEVERITY AND IN GREATER NUMBER INCREASES THE RISK OF SIGNIFICANT ECONOMIC SHOCK TO NELSON AND THE WIDER REGION

CAUSES

- Demand side issues:
 - Storm surges overtopping the Rocks Road seawall and inundating parts of the City Centre and fringe⁵
 - Progressive impact of sea level rise on Rocks Road, Tahunanui, the Airport and parts of the City Centre and fringe⁶
- Supply side issues:
 - Lack of alternative capacity, routes and services in the transport system (including lack of an alternative for HPMV's)
 - Deteriorating condition of the Rocks Road seawall
 - Stability of the steep Rocks Road embankment
 - Height of vulnerable parts of the arterial network above the increasing mean high-water mark.

Consequences

- More frequent closures and events impact the moving of people and freight via Rocks Road to the Port and the City Centre
- During closures: All movements between Stoke and the City Centre (& Port) would be via Waimea Road, which doesn't have capacity to accommodate these demands
- During closures: HPMV's would not be able to reach the Port
- All events: Major system-wide delays throughout the day on all forms of motorised travel (except e-bikes). There would be major impacts on the cost of moving freight and for service-related businesses (e.g. trades), which are reliant on the transport system for their revenue.
- All events: People either do not travel to Nelson City Centre, or they travel elsewhere for what they need, with potential impacts to retail spend

Table 3 - Problem 3 Summary of Causes and Consequences

⁵ <https://www.mfe.govt.nz/sites/default/files/media/Climate%20Change/Climate-change-projections-2nd-edition-final.pdf>

⁶ <https://www.mfe.govt.nz/sites/default/files/media/Climate%20Change/coastal-hazards-guide-final.pdf>

NFAP BUSINESS CASE DEVELOPMENT

The business case for NFAP involves reviewing previous work in the context of the outcomes sought from the Ministry of Transport and the community outcomes of Council. It will understand the underlying dynamics of the local transport infrastructure and services before developing a range of transport packages with community input that can be tested against investment criteria, community and cultural values and technical criteria through a multi criteria analysis (MCA). From there the project can determine a recommended option or package of activities for consideration by Council and the NZ Transport Agency. Subject to their support, projects can then be incorporated into the region's key planning documents and considered for implementation. The process is shown in figure 5 below.

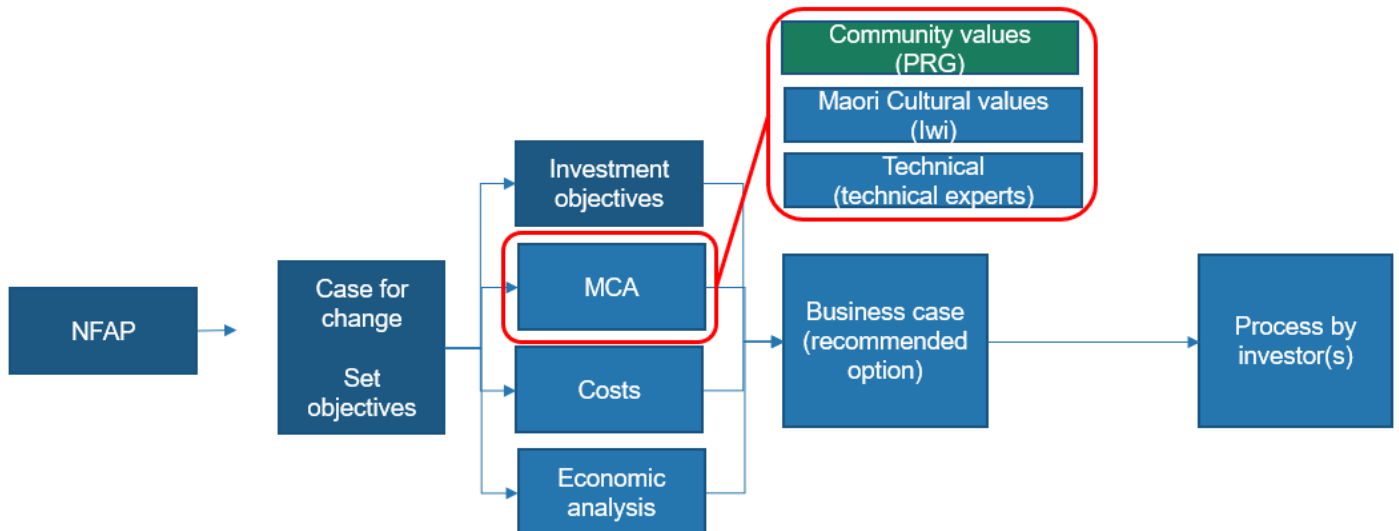


Fig 5 – Business Case Development Process

COMMUNITY INVOLVEMENT

Partners

The Nelson Future Access Project is being developed in collaboration between NZ Transport Agency and Nelson City Council with support from our Crown Treaty Partners in Te Tau Ihu and a diverse community group called the Project Reference Group. The roles and background for each is described below.

NZTA

Lead agency responsible for developing the business case

Co-investor in land transport systems

Provider and operator of the state highway network

Regulator of access to and use of the land transport system

Nelson City Council

Investigations study area is within the NCC unitary territory

Strategic transport planning for the region

Provision and operation of local road network

Co-investor in land transport systems within the NCC unitary territory

Unitary authority – plans for and manages the effects of the use and development of land

Manu Whenua

We will be working closely with the eight iwi in Te Tau Ihu as our Crown Treaty Partners. Our initial korerorero highlights that manu whenua will be represented at all levels across the project with representation at the Governance table reflecting their partner status, contribute at the Project Reference Group sessions alongside the community stakeholders and provide technical advice within the project team to ensure cultural input and Māori perspectives as well as understanding history and sensitive sites within the project area.

Project Reference Group

The PRG is made up of representatives from a wide range of organisations and groups including our partners Nelson City Council and Manu Whenua.

The key stakeholders include business groups, statutory organisations, community groups, primary industry, road and transport providers, emergency services, active and public transport interest groups.

This group will provide input into the decision-making process for the investigation phase of the Nelson Future Access Project.

At the first workshop in August the group heard from the project team about what is known from the previous projects and the most recent investigations. The current problems and possible solutions were then workshopped.

In the second session in September the multi criteria assessment (MCA) approach and how this fits in with NZTA investment criteria and RMA requirements will be presented and the community assessment criteria will be co-designed with the PRG.

At the third session in December the PRG will use the criteria they co-designed in PRG 2 to score the community criteria of the packages.

In PRG 4 a review of the public feedback and refinement of scoring and recommendations as necessary will be undertaken.

Public Consultation

Ongoing

A project website provides up to date material and acts as a one-stop-shop online resource for reports, newsletters, information on community engagement opportunities and general newsletters or facts.

Further information will be made available throughout the project via media releases, through the Transport Agency's website and other local news sources (i.e. Our Nelson and local newsletters, community updates).

Fortnightly library drop-in sessions are also available by appointment

There are two key phases proposed once we have something significant to share:

1. March 2020 – Engage on packages

It is likely that open days, one-on-one meetings and presentations (where appropriate), online/printed feedback forms, social pinpoint (a location-specific online platform enabling interactive feedback), and static displays will all be used by the project team to support wider engagement. These will provide an opportunity for people to learn more about the investigation, keep up to date with what is happening and provide feedback and opinion on packages.

Using a static display with continual information in a central location in Nelson could also be utilised.

2. June 2020 - Consult on preferred package

NEXT STEPS

The project timeline and key steps including the four PRG sessions are shown in figure 6 below.

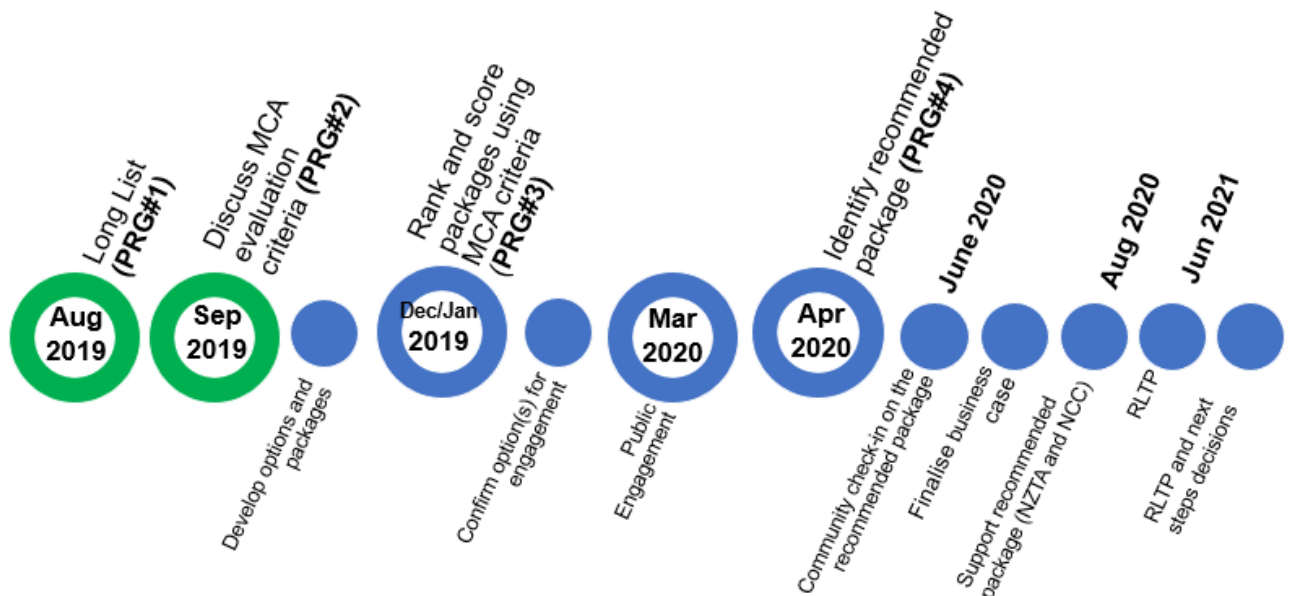


Fig 6 – Project time line with key PRG steps

The NFAP Detailed Business Case will be completed by September 2020, in time for consideration in the development of Nelson's 2021-24 Regional Land Transport Plan and the 2021-24 National Land Transport Programme.

KEEPING IN TOUCH

There will be opportunities for the public to have a say throughout the process, and we will keep our website up-to-date as the project progresses: nzta.govt.nz/projects/nelson-future-access-project

If you want to learn more about this work, Project Manager Rhys Palmer will be available, via appointment, every second Monday at the Elma Turner Library from 3pm to 5pm. Please email nelsonfutureaccess@nzta.govt.nz if you'd like to set up a time to talk with Rhys.

APPENDIX A – PROBLEM STATEMENT ONE – DATA AND EVIDENCE

Problem 1: - The inability for Nelson’s transport network to support the increasing movement of people and freight between Stoke and Nelson City Centre is constraining economic growth and the social wellbeing of the region

Population Growth Patterns

The figure below provides an indication of the scale of growth based on the patterns prior to the adoption of the Future Development Strategy.

The Future Development Strategy provides the opportunity to provide a more compact Nelson-Richmond corridor and greater opportunities for providing walking, cycling and public transport services that are effective and financially sustainable.

The orange bars show the forecast scale and location of population growth over the next 30 years under the scenario prior to the release of the Future Development Strategy and the blue bars show the forecast scale and location of employment growth over the next 30 years under that same scenario.

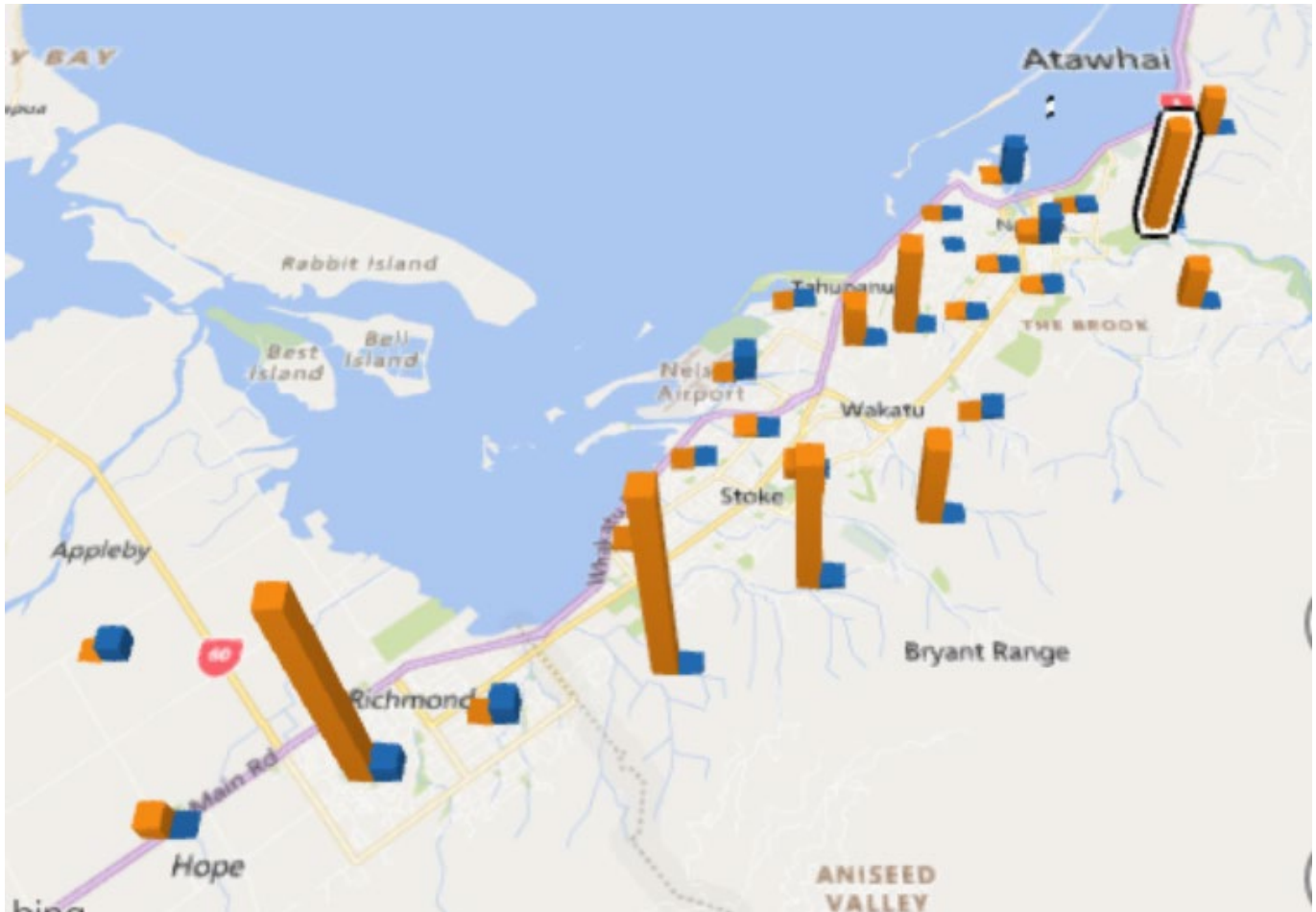


Figure A1 – Population Growth patterns Nelson Richmond

Travel Demand

Morning Peak Period (7am – 9am)

The demands for morning peak travel are expected to increase by ~10% through to 2048.

The figure below indicates that nearly two-thirds of travel to the Nelson sector (the Project area - which in this analysis extends from the Matai River to Annebrook and includes the Airport) has its origin within the Project Area but is expected to grow by ~13% through to 2048.

The proportion of trips travelling to the Nelson sector from areas further south stays relatively constant at just under 30%, but increases from ~3,200 vehicle trips per 2 hours up to ~3,700 vehicle trips per 2 hours (representing an increase of just under 15%).

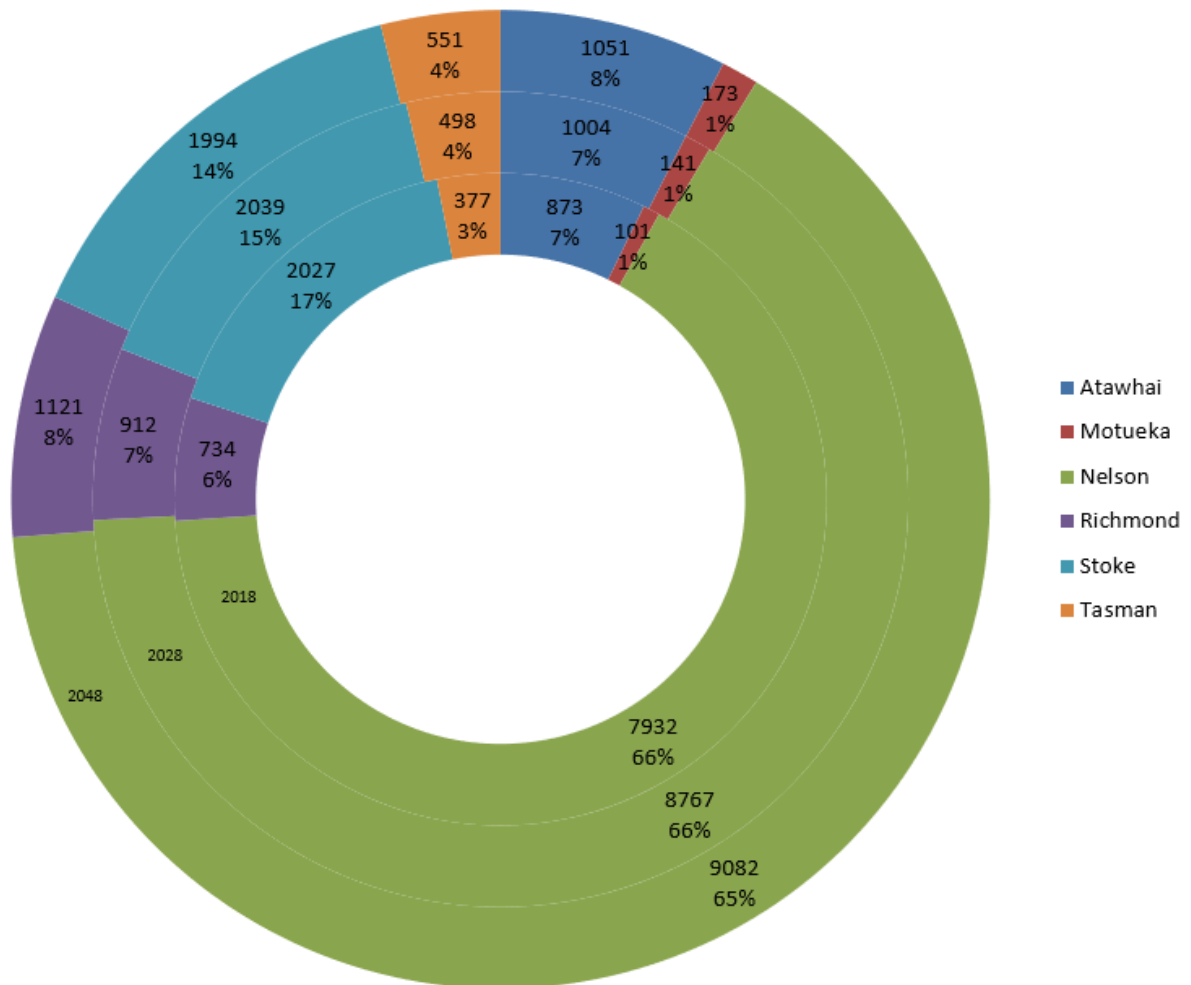


Figure A2 – Travel Demand Morning Peak Period (vehicle trips, 7am – 9am)

Daytime (Average 2hr over the 9am – 4pm period)

The demands for travel during the day are expected to increase by ~15% through to 2048.

The figure below indicates that nearly three-quarters of travel to the Nelson sector (the Project area - which in this analysis extends from the Matai River to Annesbrook and includes the Airport) but is expected to grow by ~24% through to 2048.

The proportion of trips travelling to the Nelson sector from areas further south stays relatively constant at ~23%, but increases from ~2,300 vehicle trips per 2 hours up to ~2,900 vehicle trips per 2 hours (representing an increase of just under 25%).

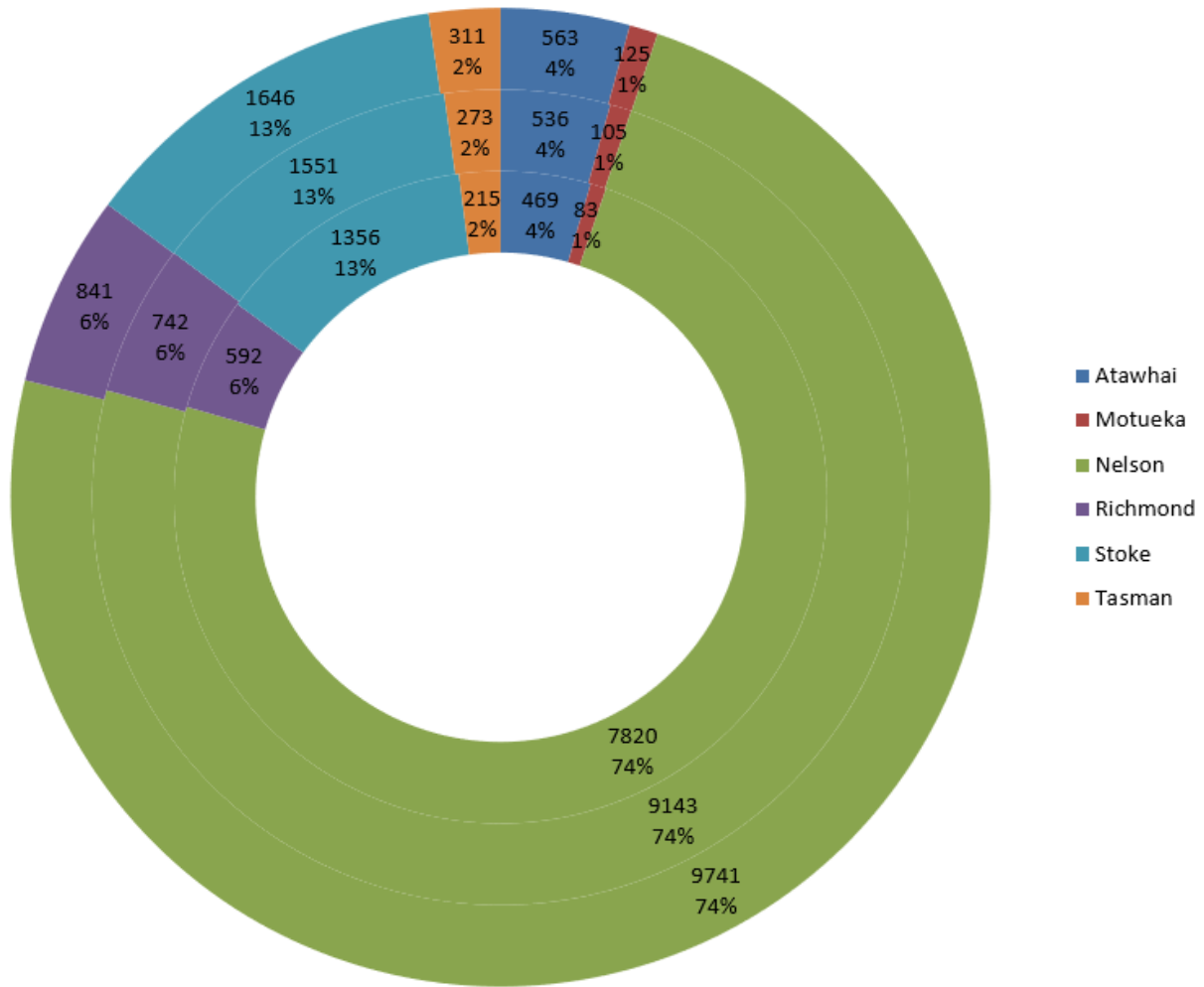


Figure A3 – Travel Demand Daytime (vehicle trips, Average 2hr over the 9am – 4pm period)

Trip Distances

The two figures below indicate the trip length distribution for all vehicle trips (top figure) and public transport trips (bottom figure) for the 2018 morning peak period (modelled).

The key points about these figures are that:

1. Approximately 40% of all vehicle trips in the morning peak period are less than 3km, and nearly 60% are less than 5km which indicates that there may be a latent demand for walking and cycling if there are facilities that met the communities needs
2. Nearly all of 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.
3. 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).

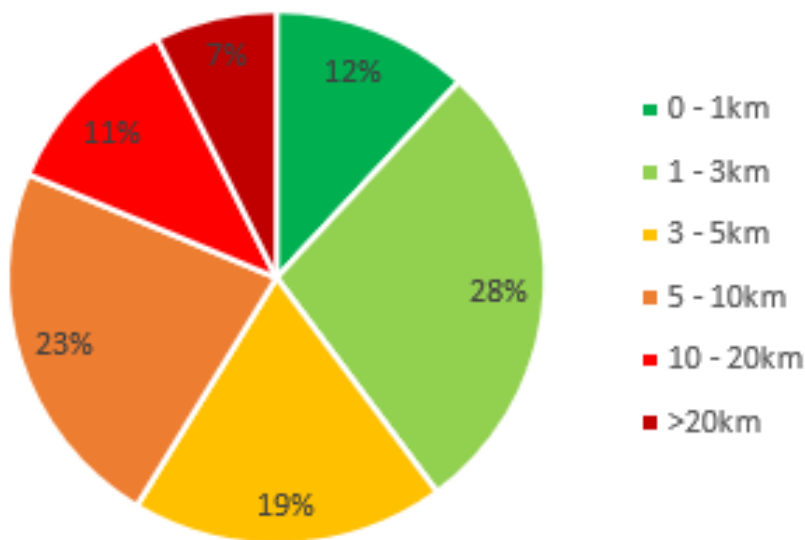


Figure A4 – Trip length distribution for all vehicle trips - 2018 Modelled

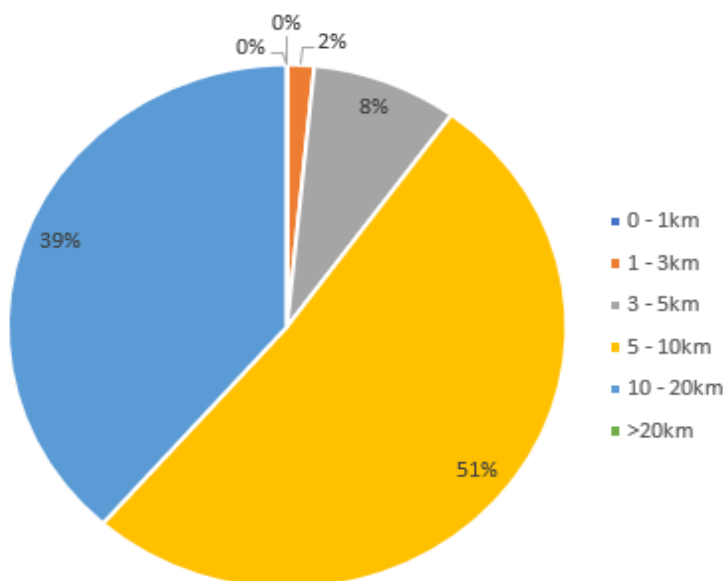


Figure A5 – Trip length distribution for public transport trips - 2018 Modelled

Travel Time

The two graphs below show the quarterly median travel times averaged over the last 5 years. The first graph being the northbound in the morning peak period (7:30 – 9:15) and the second graph being the southbound in the afternoon and evening peak period (14:30 – 18:00). The graphs show the increased delays on the arterial network during quarters 1 (Jan-Mar) and 4 (Oct-Dec).

Note also the Waimea Road exhibiting characteristics typical of an urban commuter route with distinct peaks associated with work travel and school travel.

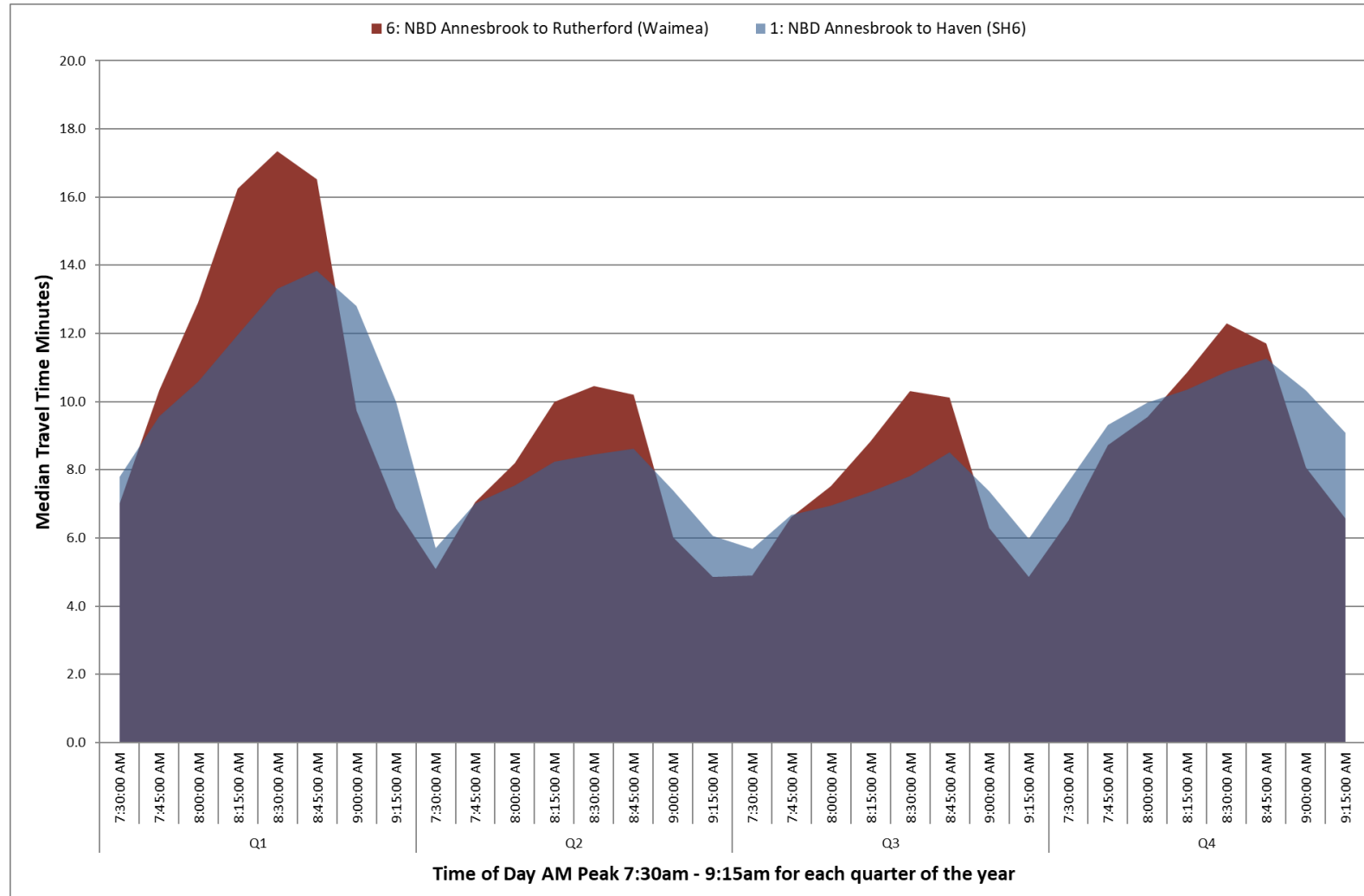


Figure A6: quarterly median travel times averaged over the last 5 years – morning peak

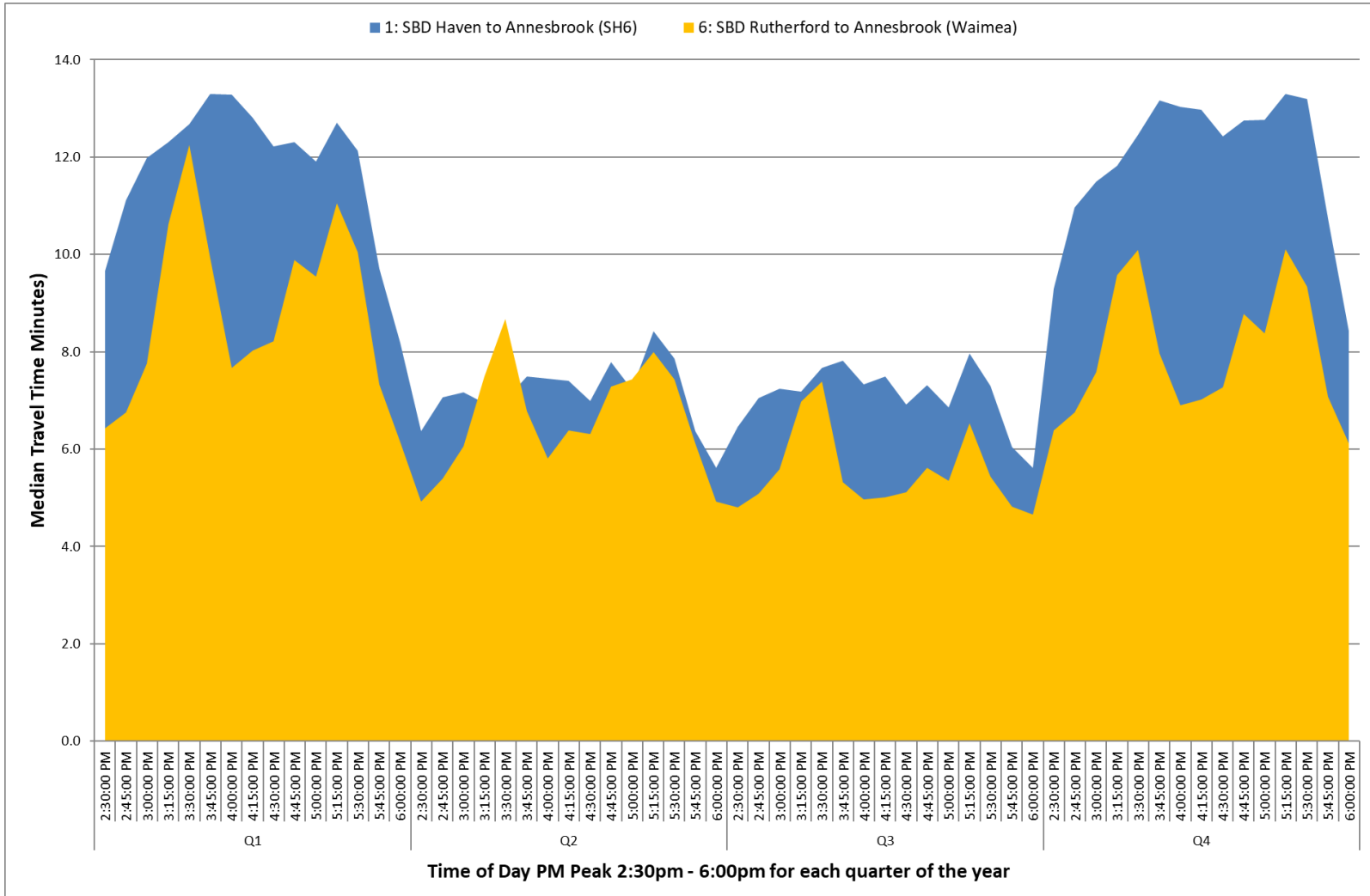


Figure A7: quarterly median travel times averaged over the last 5 years – afternoon peak

Arterial Traffic Volumes

The graph below presents average daily traffic (ADT) volumes collected on key routes in Nelson City.

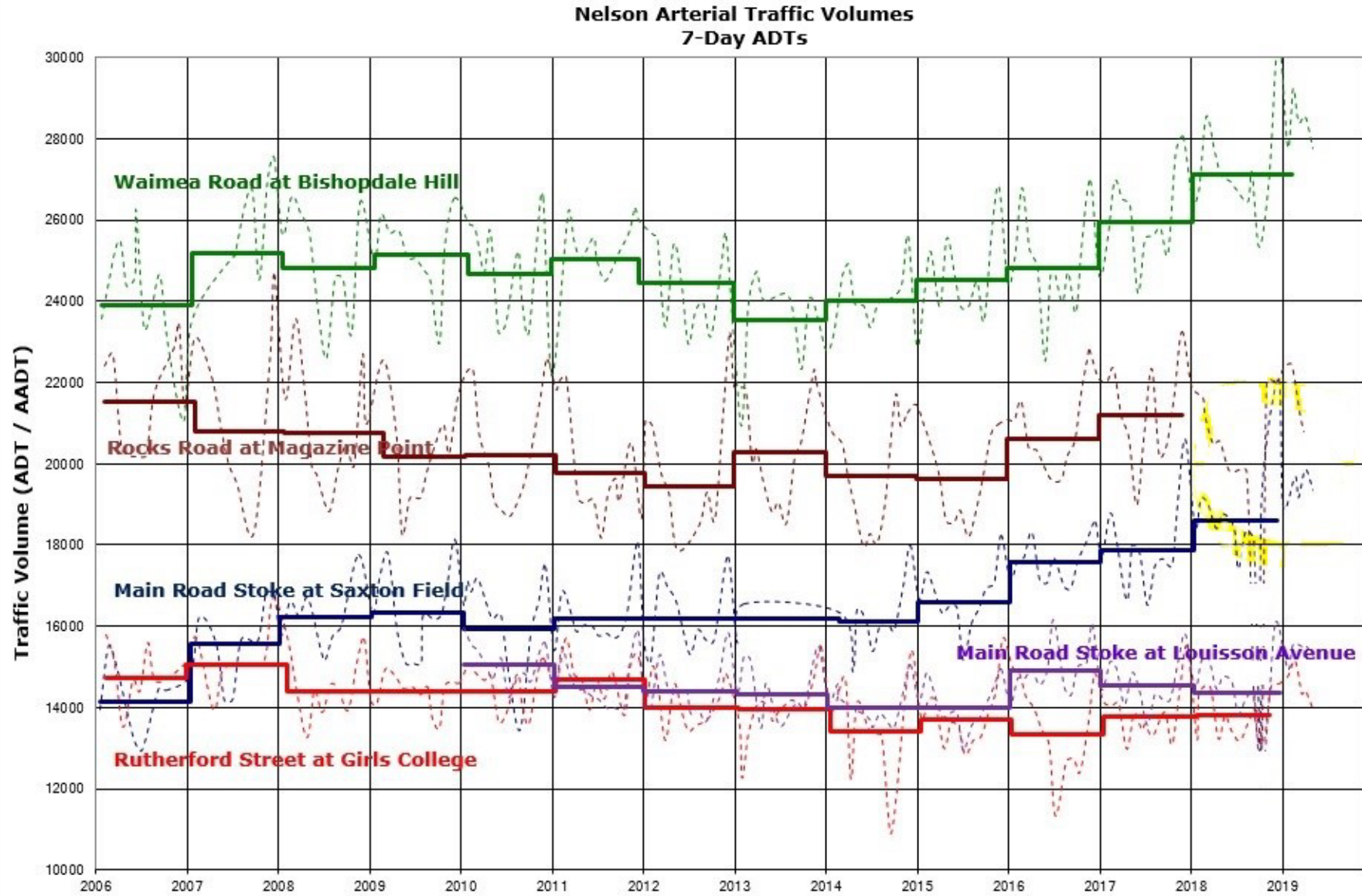


Figure A8: Nelson Arterial Traffic Volumes

Mode Share

The figure below highlights that for journeys to work, residents in Nelson are less car dependent compared to residents in the Tasman Region and New Zealand. Seventy eight per cent of Nelson residents drive or were driven to work, compared to 83% in the Tasman region and 82% in New Zealand. Nearly 20% of residents reported walking or cycling to work, which is one of the highest portions of active mode share in the country. By contrast, only 1% of residents use public transport to travel to work, which is substantially less than the New Zealand average of 5%.

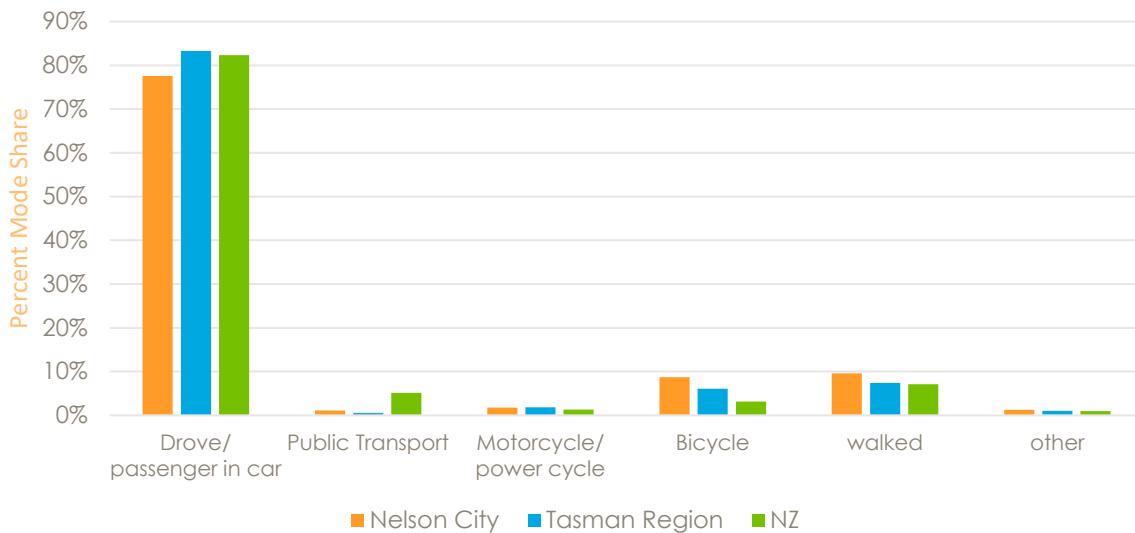


Figure A9: Journey to work mode share (2013 Census)

Cycling

Nelson has the highest percentage of people walking and cycling to work in New Zealand (18%, 2013 census). City undertakes bi-annual monitoring (winter and summer) at five locations on Nelson's cycle network to measure use and change over time. The figure below summarises the summer cycle counts between 2009 and 2018. On average, there has been 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.

Figure A10: Cycle Counts

APPENDIX B – PROBLEM STATEMENT TWO – DATA AND EVIDENCE

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

Crashes

Over the past 10 years the overall trend has been a general reduction in crashes, however over the last three years there has been a substantial increase. A review in the number of casualty crashes in Nelson City shows an overall increase over the past 10 years, with a substantial increase over the past two years, which is largely reflected by an increase in minor injury (M in orange in figure B1 below) and non injury crash numbers below (N in grey below).

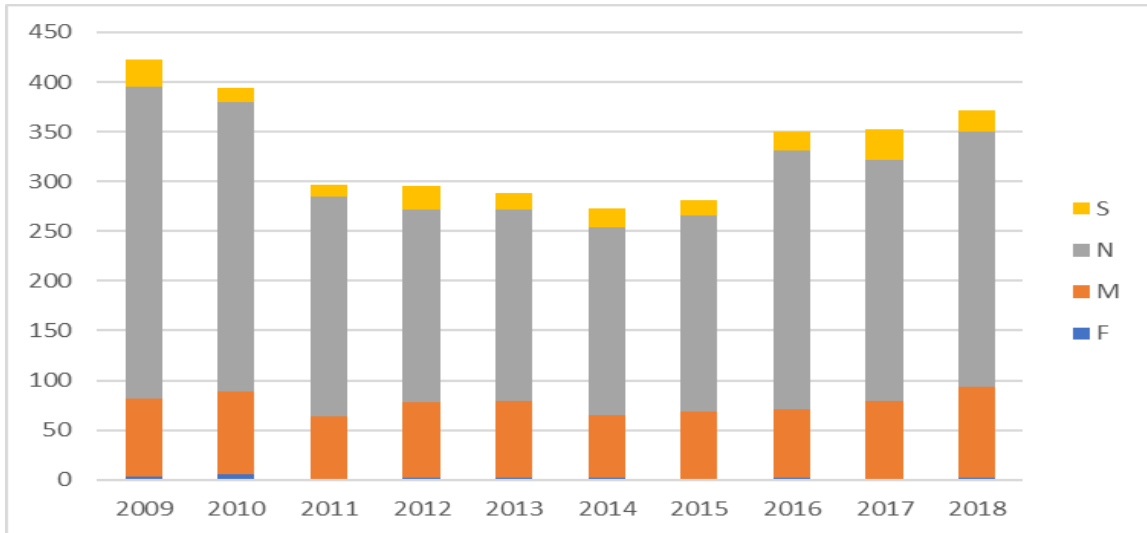


Figure B1: Crash analysis of all crashes in Nelson (by severity) between 2009 – 2018

Analysis of deaths and serious injuries by mode highlights that there has been an overall increase in cyclists and motorcyclist/moped DSIs, but little change in pedestrian casualties. An overall downward trend in the number of motor vehicle casualties was recorded between 2009 and 2015, however there has been a steep reversal in the past three years.

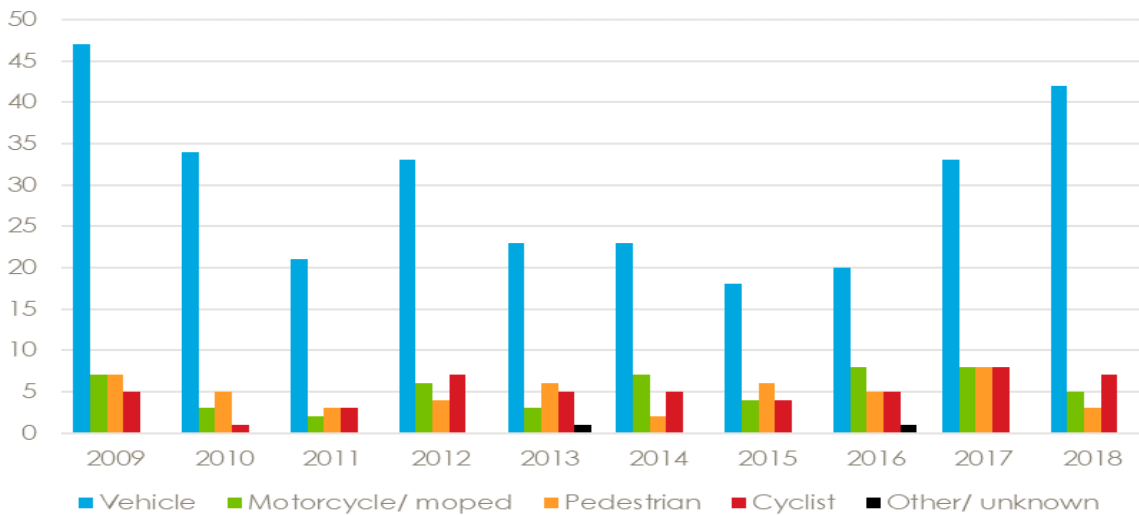


Figure B2: Death and Serious injuries by mode between 2009 and 2018

A review of the road safety risk in Nelson reveals a medium-high collective risk⁷(crash density) on Waimea Road, Rocks Road and Halifax Road and SH6 north of the City (refer to figure B3 below).

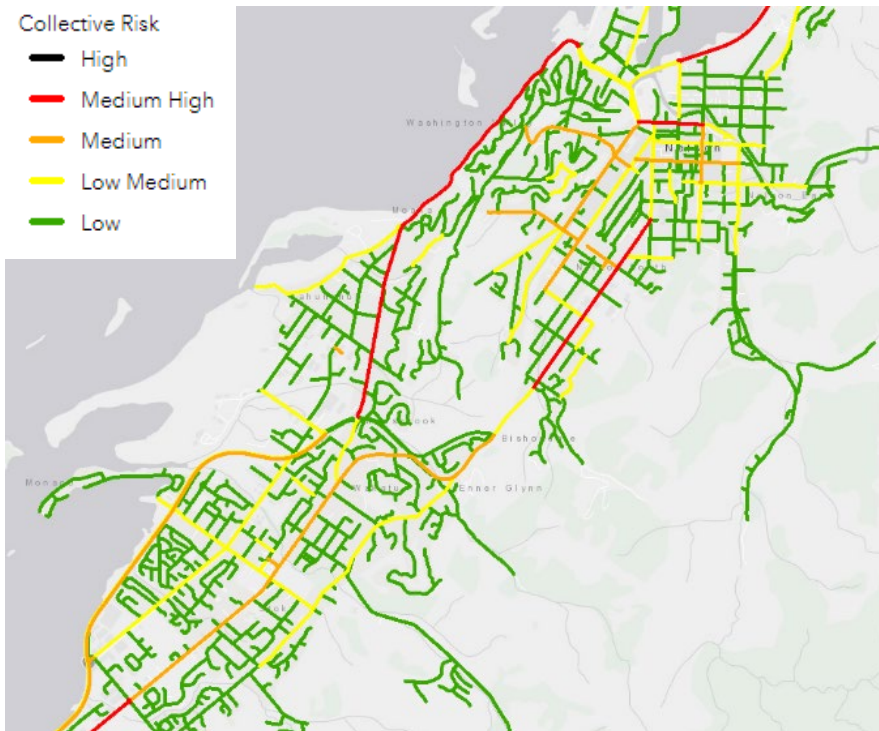


Figure B3: Collective risk

Corridors with identified high personal risk (Crash Rate) are also shown in B4 below and include Toi Street, Emano Street, St Vincent Street, Hamden Terrace, Halifax Street and Hardy Street.

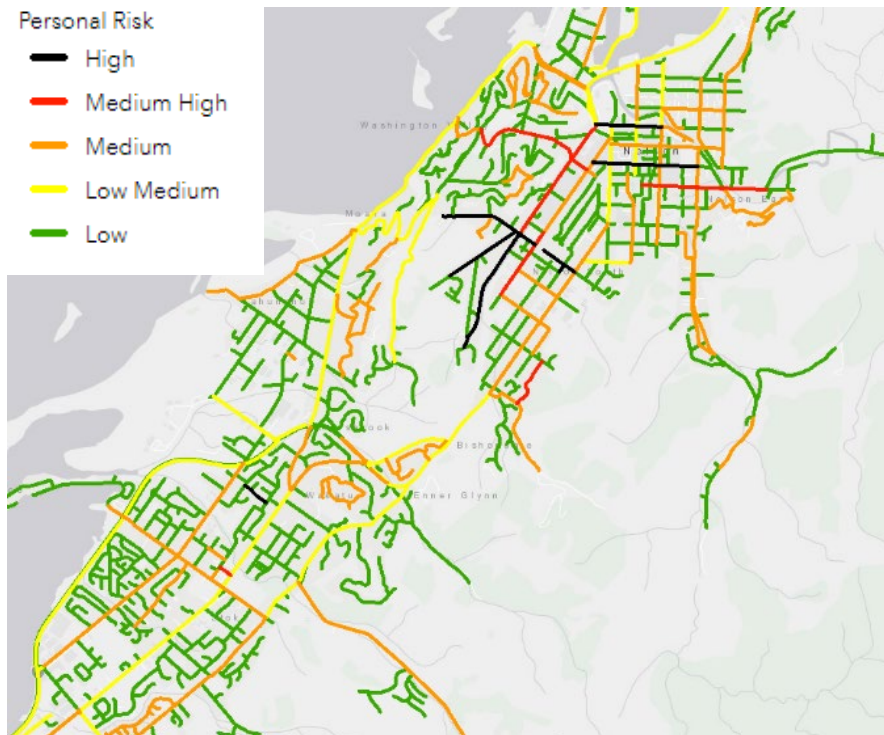


Figure B4: Personal Risk

⁷ http://www.kiwirap.org.nz/measures_risk.html

Speed

The severity of injuries is closely related to the speed of the crash on impact. The Safe and Appropriate Speed provides a guide of appropriate speed limits for each corridor based on adjacent land use, function (place or movement), key features and the risk rating. For Nelson, the Safe and Appropriate Speed for the key corridors in the City is shown in the map below. The map highlights that many of the corridors should have a 40km/h speed limit applied, however a comparison of the posted speed limit of these streets shown in the map at the bottom of the page reveals that most of these streets are operating at the general urban speed limit of 50km/h.

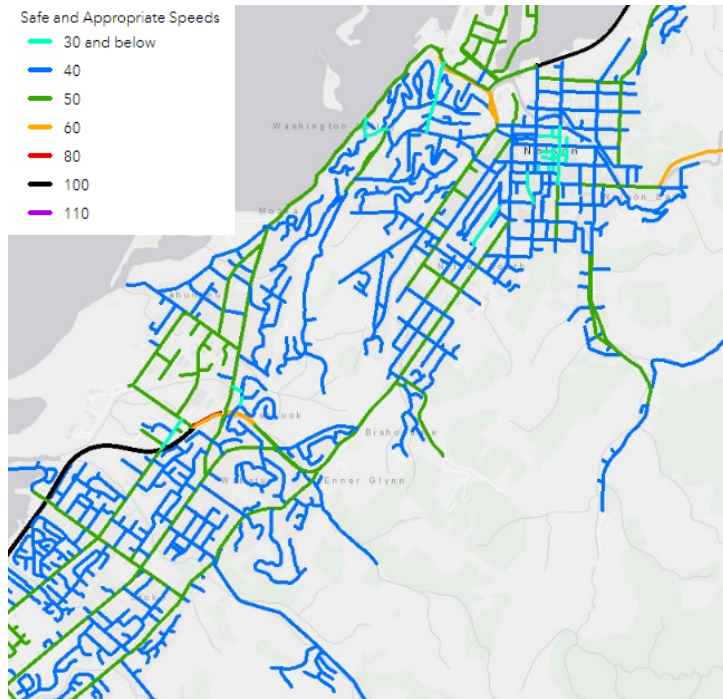


Figure B5: Safe and appropriate speed limit

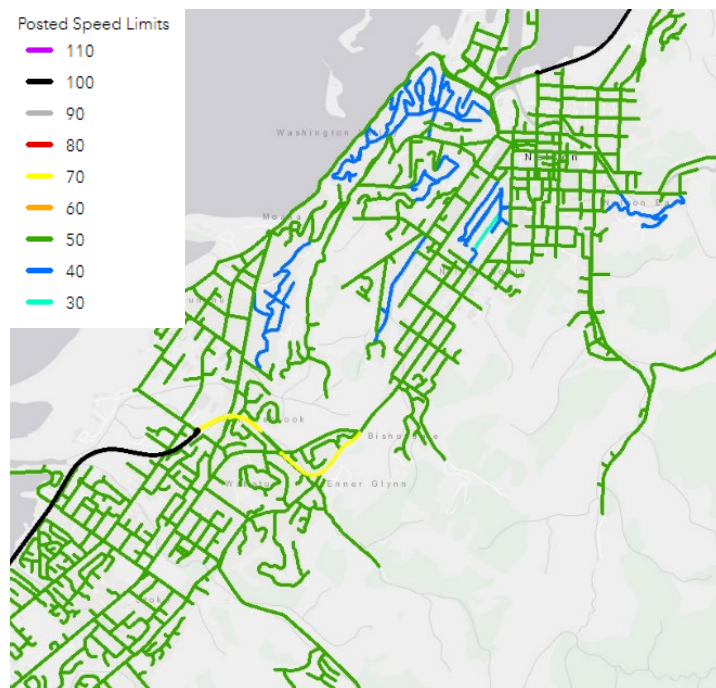


Figure B6: Posted speed limit

APPENDIX C – PROBLEM STATEMENT THREE – DATA AND EVIDENCE

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

Hazard risk is compounding in coastal areas, because hazard impacts are occurring more frequently as seas rise. The Ministry for the Environment⁸ provides guidance based on four scenarios to 2150 to cover a range of possible future sea levels:

1. a low emissions, effective mitigation scenario (RCP2.67)
2. an intermediate-low emissions scenario (RCP4.5)
3. a high emissions, no mitigation scenario (RCP8.5)
4. a higher, more extreme H+ scenario, based on the RCP8.5 (83rd percentile) projections from Kopp et al (2014) – included primarily for the purpose of stress-testing adaptation plans or pathways and major new development at the coast.

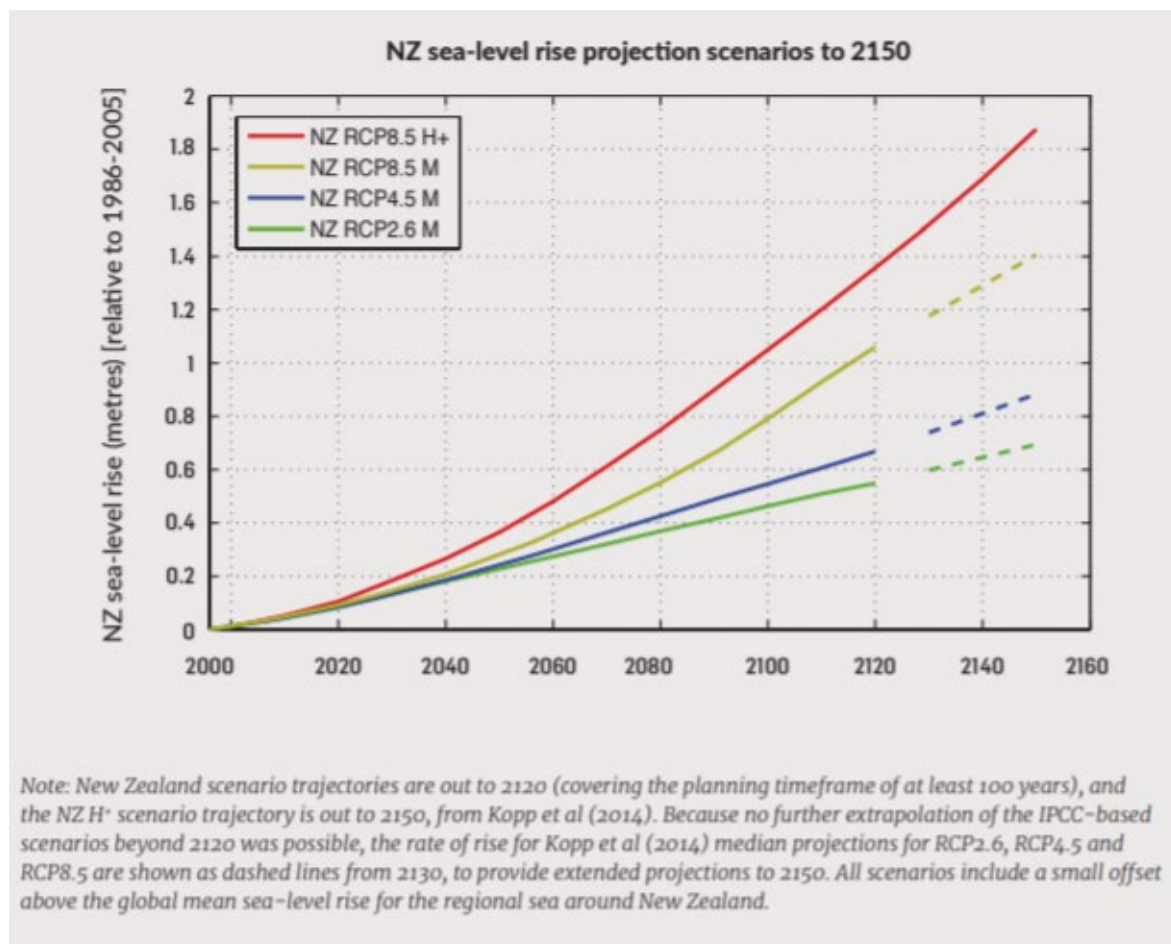


Figure C1: NZ sea Level Rise Predictions

⁸ <https://www.mfe.govt.nz/sites/default/files/media/Climate%20Change/coastal-hazards-summary.pdf>