# Nelson Public Transport Network Review

October, 2008

Nelson City Council

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# 1. Introduction and background

Parsons Brinckerhoff Australia (PB) was commissioned by Nelson City Council to assess residents' future transport needs and to recommend a new passenger transport network to 2016, consistent with objectives identified in relevant planning documents.

The draft Nelson RLTS highlighted a series of transport impacts expected from future urban growth (particularly an increase in commuter travel demand to Nelson, as well as deficiencies in the existing passenger transport network that should be addressed in a public transport strategy.

The North Nelson to Brightwater Corridor Study had recommended that future transport demands be accommodated through an additional arterial road to increase capacity to 6 lanes, as well as improvements to public transport services. However, as the Regional Land Transport Committee recommended that the roading option not be proceeded with for at least 5 years, passenger transport must take a greater role in managing future transport demands, particularly along the Richmond-Nelson corridor.

The existing passenger transport network has two main functions – a limited commercial bus service between Richmond and Nelson, and a series of contracted services providing links to Nelson, aimed mainly at the transport-disadvantaged.

This study, rather than reviewing existing services (which was done thoroughly in the Baxter report in 2004), develops two options for future passenger transport services in Nelson, based on:

- the location and scale of population and employment growth to 2016
- projected journey to work travel patterns
- transport needs of PT users and non-users.

The study also considers a range of related issues including recommended vehicle characteristics, fares and ticketing, implications of recommendations on existing commercial and school services, likely costs, revenue and funding considerations from the proposals and provisions for bus priority, bus stops and a bus terminal in Nelson CBD.

The scope of the study is limited to the Nelson council area, however it does consider the Tasman District (particularly as future travel demands are heavily influenced by development around Richmond).

## 1.1 Study scope

PB gained a thorough understanding of the issues and challenges that face the Nelson region via a review of relevant reports, strategies and policies, as well as discussions (including an internal workshop) with Council staff. PB also visited and travelled in the region.

PB also conducted an analysis of expected future travel patterns, from modelling produced by Council's consultants Gabites Porter. The development of the suggested passenger transport network was carried out in a highly consultative manner – a gap analysis workshop was carried out with representatives of the Nelson and Tasman Councils, and other stakeholders, who were closely involved in the network's development.

# 2. Legislative and Policy Context

Relevant policies and strategies highlight a firm government commitment, by central and regional governments, to make substantial improvements to passenger transport. There are a range of objectives for these policies:

- provide an alternative to car
- provide for the transport disadvantaged
- increase accessibility
- provide environmental and social benefits
- mitigating traffic congestion.

### 2.1.1 National government direction

The New Zealand Government has foreshadowed some substantial changes to transport policy that are likely to have major implications for regional transport and land use planning.

The first is the Land Transport Management Amendment Bill 2007 ('LTMA Bill'), which was introduced into the house on 25 October 2007 and is currently going through the Select Committee process. The bill is intended to enhance New Zealand's transport planning and funding system established under the LTMA 2003, through:

- reserving fuel excise duty for land transport purposes and changing the way fuel excise is set
- augmenting central government transport funding by regional fuel taxes
- providing for a government policy statement to set out the government's planned investment and funding priorities for the next 3 – 6 years
- changing to a 3-year planning cycle
- introducing 3-yearly regional land transport programmes to rationalise land transport planning documents, reduce consultation, and encourage integrated land transport planning
- increasing the term of regional land transport strategies and national land transport strategy to 30 years
- merging Land Transport New Zealand, the office of the Director of Land Transport, and Transit New Zealand into a single statutory Crown Entity.

The Bill introduces longer term transport planning requirements and a much stronger focus on land use and transport integration. The use of fuel excise duty for land transport purposes; and the ability for regional councils to levy fuel taxes to augment transport funding will, if passed, provide a powerful mechanism for funding passenger transport improvements. Regional Land Transport Strategies will have a much longer-term focus.

The updated New Zealand Transport Strategy (NZTS) was released in August 2008. The NZTS's vision is for New Zealand to have, by 2040, 'an affordable, integrated, safe, responsive, and sustainable transport system' for people and freight.

The strategy has 4 key principles:

1. sustainability – the transport system needs to contribute to achieving NZ's economic, social, environmental and cultural goals for the benefit of current and future generations

2. affordability – the transport system needs to be affordable for individuals, households, businesses, regions, local government and central government. A key component of affordability is the need for all investments in transport to be cost-effective and represent value for money

3. safety – the transport system needs to be based on design, operating and maintenance standards that protect people and property

4. responsiveness – the transport system needs to be responsive to users by recognising that people wish to travel and move freight at different times and by different modes. It must also be prepared for, and able to recover well from, unforeseen events.

The NZTS sets new targets for substantial increases in sustainable transport. The Government has previously announced targets to halve per capita domestic greenhouse gas transport emissions by 2041 and to be one of the first countries in the world to widely use electric vehicles. The NZTS includes targets to more than double the public transport mode share for all trips to 7%, to increase walking and cycling and other 'active modes' to 30% of total trips in urban areas and to reduce the kilometres travelled by single occupant vehicles in major urban areas on weekdays by 10% per capita by 2015 compared to 2007.

The NZTS did not adopt the draft target in the 2007 Sustainable Transport Discussion Paper, of 'increasing the public transport mode share of peak hour travel (journeys to work) in Auckland, Wellington and Christchurch from an average of 9% to 20% and work with each region to optimise peak hour travel targets', so it has not peak-period focused PT or active mode targets.

The Government also released the Government Policy Statement (GPS) on Land Transport Funding 2009/10 – 2018/19, which sets a series if interim targets as stages in the implementation of the NZTS targets.

There is recognition at the national level that meeting sustainable transport targets will require substantial changes to transport and land use planning, as well as additional funding.

In addition, the Public Transport Management Bill aims to provide more control over commercial bus services to regional councils. Controls include but are not limited to enforcing minimum service levels, integration with other services, participation in integrated ticketing and fare schemes, real time information, bus priority and fare systems. The Bill also outlines the requirements for Regional Public Transport Plans (formerly Regional Passenger Transport Plans).

### 2.1.2 Nelson City Council's Regional Land Transport Strategy 2001

Nelsons' RLTS's vision is:

'*To meet the region's land transport needs in ways that are safe, efficient and environmentally, socially and financially sustainable.'*

It considers the benefits of spending funding on public transport rather than road upgrades to cope with increases in demand. It has taken regional influences into consideration:

- increases in light vehicle traffic due to residential growth in Tasman
- increases in freight traffic predominately from growth in forest log availability
- increases in visitor traffic.

It is estimated that the existing relative significance in terms of vehicle movements is:

- commuter - 50%
- freight and commercial traffic - 30%
- visitor and recreation traffic – 20%.

The latter is expected to increase in significance while commuter traffic is expected to decline in proportion due to constrained residential development. However, the gross number of commuter trips is still expected to increase significantly.

The strategy stated that residential development will increase in the Saxton and Ngawhatu areas and along the southern portion of The Ridgeway. It also highlights the opportunity to use infill development as a means to limit the increase in commuter trips noting that the anticipated lifestyle blocks to the north of Nelson, (along the SH 6 north between Hira and Todds Valley), will have the reverse effect. The residential growth in the Tasman district and increased car ownership is expected to create an increase in commuter trips to Nelson.

It is also expected that the demand for public transport will rise from growing numbers of transport disadvantaged. Cycling and walking will increase as favoured transport modes as journey trips are reduced in length.

The increase in traffic demand raised the following concerns:

- safety (especially pedestrians and cyclists)
- delays in port movements
- delays in public transport services
- increased congestion along existing routes
- impacts upon the environment and the community.

The Strategy states that Collingwood Street and Selwyn Place are predicted to exceed their design capacity in 2011 and 2021 respectively and that Vanguard Street is already exceeding design capacity.

The three main identified congestion points are:

- the Tahunanui roundabouts/Rocks Road
- Beatson Road / Whakatu Drive roundabout
- Waimea Road.

This is a result of ‘high traffic volumes, especially from the south, and the absence of a free-flowing (express) arterial route into Nelson CBD and the port.’

In terms of public transport, the main deficiencies/issues identified were:

- insufficient use of services
- limited routes and hours
- inadequate or poorly designed facilities and routes (lack of passenger convenience, e.g. low-entry buses, lack of shelters, uncertainty over which are scheduled stops and which are courtesy stops)
- road infrastructure which is not bus friendly (physical obstacles to negotiate e.g., lamp posts and lack of bus pull-over areas)
- insufficient funding of public bus services (i.e. subsidies)
- insufficient publicity and promotion
- aging population likely to increase demand.

In general, the RLTS concludes that the existing passenger transport network is an 'unattractive alternative' to use of the private car, but recommends that passenger transport be seen and developed as an alternative to cars in order to reduce reliance on cars in the future.

### 2.1.3 Tasman District Council's Regional Land Transport Strategy 2003

The Tasman RLTS was first developed in conjunction with Nelson City Council. Its aim is to:

'*provide a planning framework for future investment decisions and research related to land transport in the region'. Its vision is 'to maintain and enhance a safe efficient land transport system while avoiding, remedying and mitigating the adverse effects on the environment.*'

The RLTS identified five main needs:

- a land transport system that provides for the safe movement of people and goods in a cost-effective manner
- an efficient land transport system that promotes the economic vitality of the region
- a land transport system that is accessible for all people within the region
- a land transport system that has regard to environmental effects
- a seamless land transport system between regions.

### 2.1.4 Nelson and Tasman Public Transport Study – Baxter Report (2004)

The Baxter Report looked at the current bus services and their deficiencies. It also made recommendations for improvements. However, most of the recommendations are unlikely to make real change to commuter demands. This is partly as a result of the commercial operations of *The Bus* and the limitations that this presented. However, subsequent legislative changes for procurement will provide new opportunities for better integrating commercial services with regional and local transport objectives.

The study identified The Bus services as performing poorly with very high subsidy costs per passenger. The Hospital/Toi Toi route was the only one of four to perform 'satisfactorily'.

### 2.1.5 North Nelson to Brightwater Corridor Study (2007)

Developed by Transit New Zealand, Nelson City Council and, Tasman District Council (the latter withdrawing in August 2007), the Corridor Study proposed a preferred package and two road options as part of a long term transportation strategy for the Nelson and Richmond urban areas.

The preferred package included small and large scale road upgrades, improvements for connectivity and safety, travel demand management measures, enhanced bus services and improvements to cycling facilities. The travel demand measures included TravelSmart programmes, school and work travel plans, parking pricing changes, carpooling and intensification of residential development. The enhancement of bus services included express bus services, an airport bus service, additional 'feeder' and 'shopper' services/frequencies, upgrade of fleet and, bus priority at key intersections.

The two road options aimed to address capacity issues between Nelson and Stoke. Option 1 included the introduction of peak hour clearways for use by high occupancy vehicles (HOVs) northbound on SH6 and southbound on Rutherford Street/Waimea Road. Option 2 proposed the Southern Corridor Local Arterial Road.

# 3. Future travel demands

PB, in association with Council's transport modelling consultants, Gabites Porter, identified future changes to population and employment in the Nelson and Tasman areas, and using the Nelson transport model, determined the resulting journey to work travel patterns for the district in 2016.

The study area was broken into 16 travel regions (made up of aggregates of transport model zones) to assist in identifying future travel patterns. The regions were defined to represent known population and employment regions. Figure 3-1 illustrates the travel regions used in the analysis.

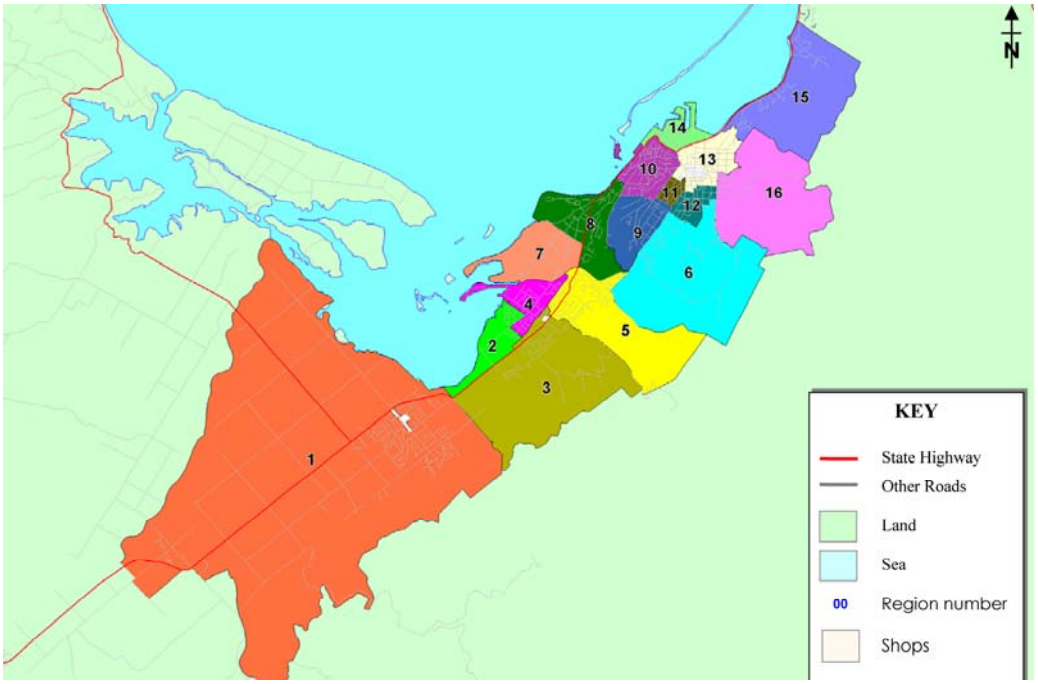



**Figure 3-1 Aggregated Travel Zones**

The regions include:

1. Richmond and surrounds
2. Stoke
3. Saxton (east)
4. Nayland/North Stoke
5. Maitlands/Enner Glynn
6. Grampians/The Brook
7. Airport/Annesbrook
8. Tahunanui/Moana
9. Toi Toi
10. Britannia Heights/Washington Valley
11. Nelson South (west)
12. Nelson South (east)
13. Nelson CBD
14. Port Nelson
15. Atawhai
16. Maitai/Atmore

Richmond is expected to receive considerable residential growth over the next 10 years and beyond. This coupled with an increase in 'lifestyle blocks' in the surrounding areas is expected to increase travel demand significantly between Richmond and Nelson. Residential growth is also expected in between the two centres – Saxton (east), Maitlands/Enner Glynn and The Grampians/The Brook. There will also be significant growth in employment at Richmond and the surrounding area, Stoke and the Nelson CBD. Figure 3-2 illustrates the expected growth patterns between 2006 and 2016.

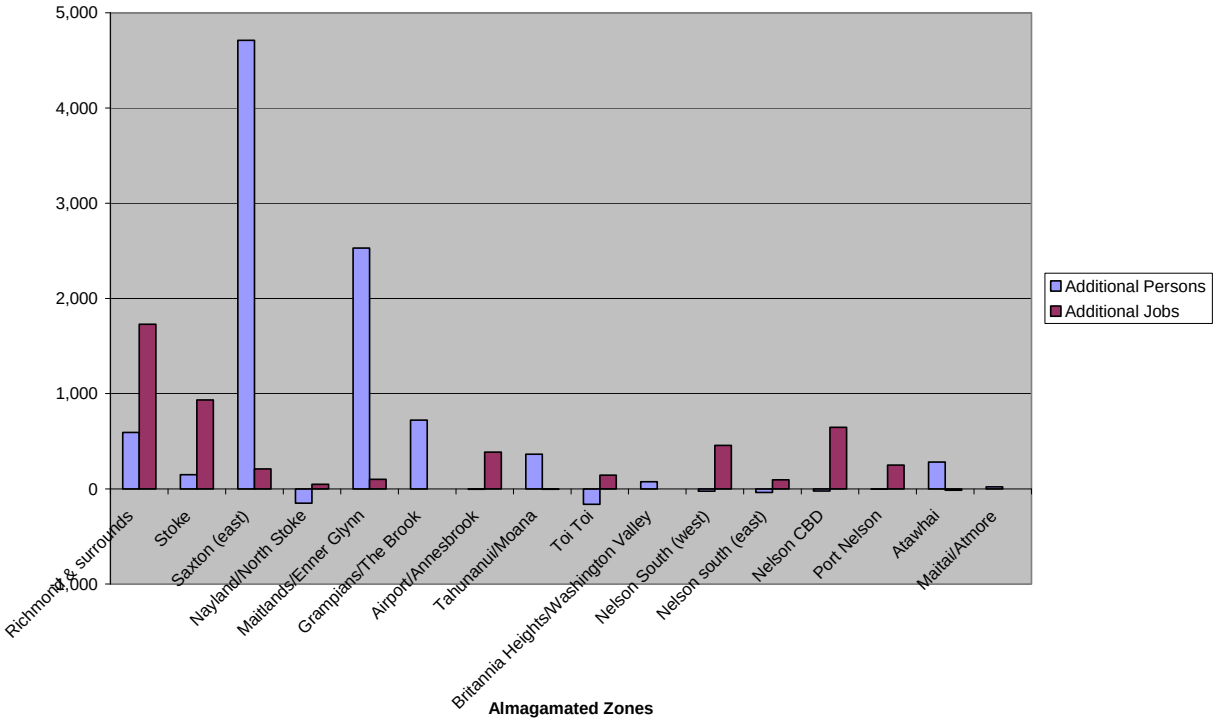



**Figure 3-2 2006-2016 growth in population and employment**

## 3.1 Population and employment changes to 2016

Analysis of existing population and employment data, Figure 3-3, shows the largest share of residential is located in the large area of Richmond and surrounds. Other areas with large populations include Maitlands / Enner Glynn, Saxton (east) and, Britannia Heights / Washington Valley. In contrast, the largest employment area is in the Nelson CBD followed by Richmond and surrounds. The only other notable employment zone is Nelson Airport / Annesbrook.

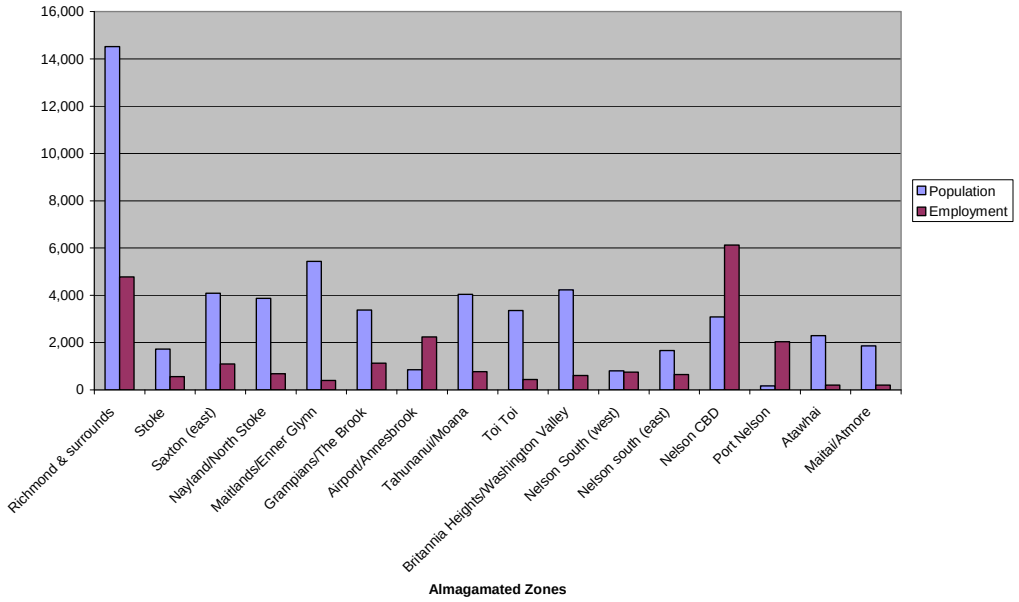



**Figure 3-3 2006 Population and Employment**

For 2016, Figure 3-4, shows there will be strong population growth south of Nelson; and Richmond and surrounds will experience significant employment growth.

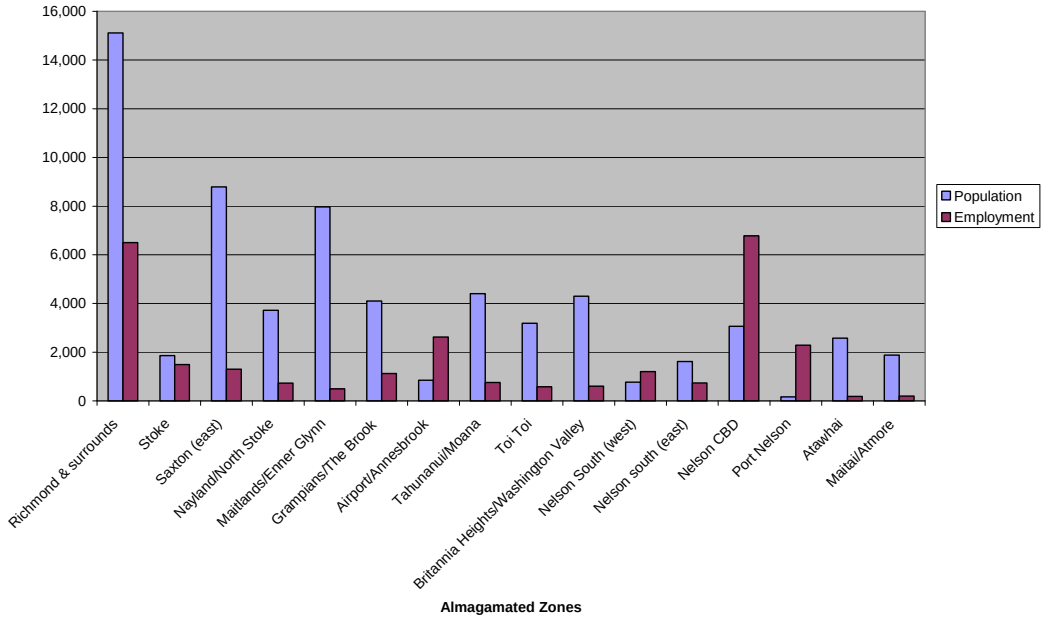



**Figure 3-4 2016 population and employment**

### 3.1.1 Population growth summary

A summary of the population growth is:

- overall expected growth in population between 2006 and 2016 - 16% (an additional 9,000 people)
- Richmond will experience considerable population growth while Nelson will not
- growth will be predominantly in the southern half of the study area in comparison to the north
- the majority of growth will occur predominately on the eastern side of the corridor between Nelson and Richmond (to the east of Main Road Stoke north of Stoke and around Waimea Road up to Nelson Hospital)
- however, there are pockets on the western side that are also expected to receive some growth - Tahunanui and Stoke
- areas with no growth or population decline include:
  - around central Nelson
  - Nelson South (east and west) in the industrial areas
  - Toi Toi
  - western side of the central area between Nelson and Richmond
    - north Stoke
    - Nayland
    - Annesbrook
    - near Nelson Airport
- the only area to the north to receive significant growth is to the north of Nelson CBD in Atawhai.

Figure 3-5 and Figure 3-6 give the gross population growth and growth per square kilometre for each region respectively.

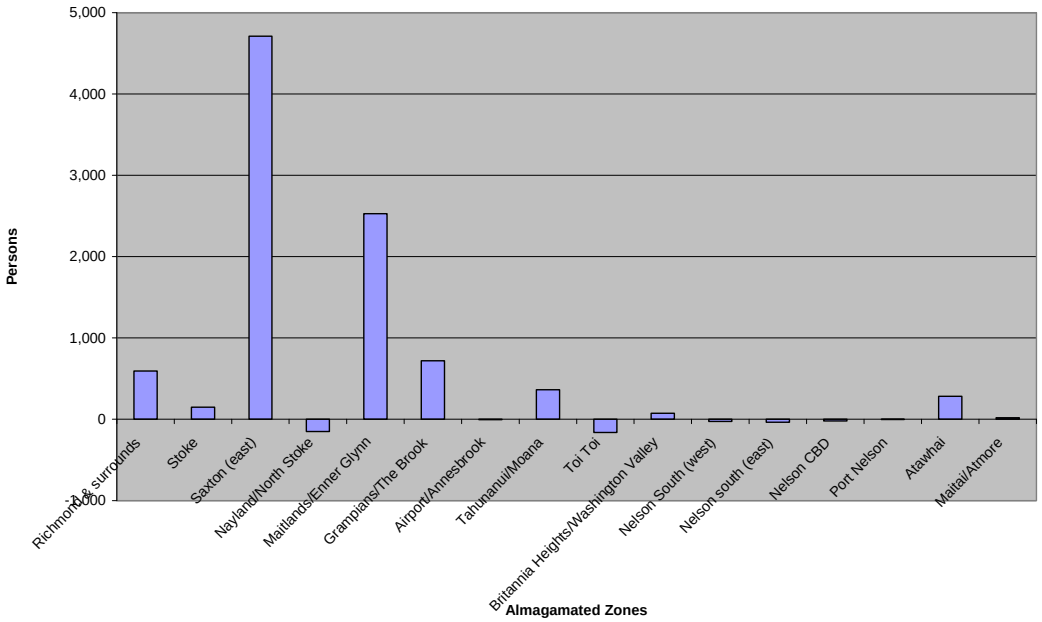



**Figure 3-5 Population growth 2006 - 2016**

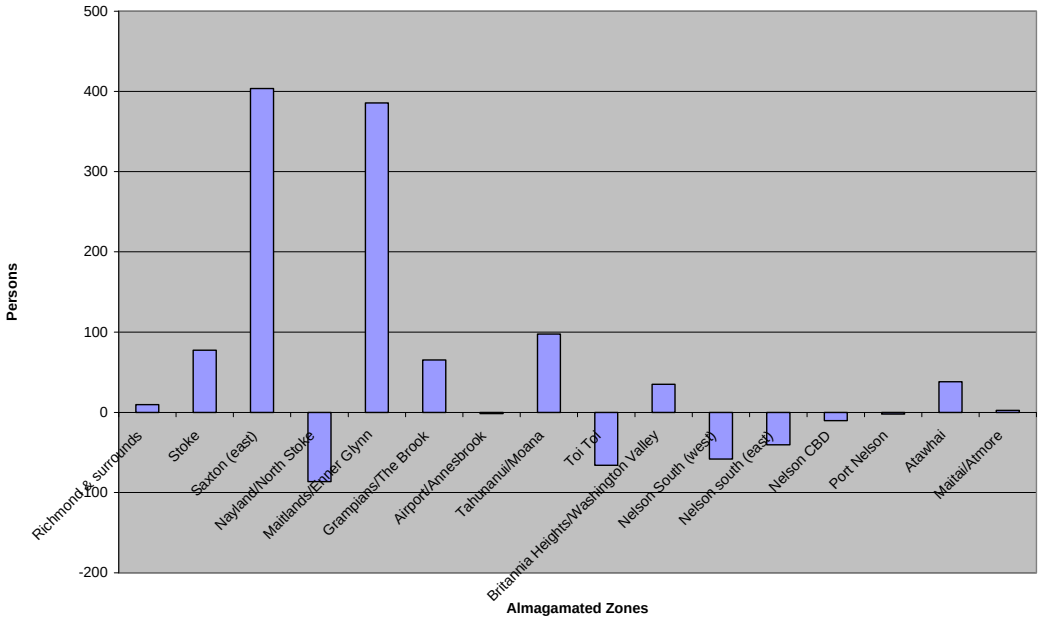



**Figure 3-6 Population growth / sqkm 2006 – 2016**

Saxton, (east of Main Road) will experience the greatest growth in population. This is over 50% of the entire growth in population up until 2016 and almost double the growth of the region with the next largest growth – Maitlands / Enner Glynn. However, the level of intensification is almost equal. Grampians / The Brook will be the region with the third greatest population growth (8% of the total growth) although Tahunanui/Moana's and Stoke's growth will be more intensified. Richmond and surrounds will also experience significant growth (7% of growth).

### 3.1.2 Employment summary

A summary of employment change is:

- growth is expected to be slightly more dispersed than the growth in population
- an overall expected growth in jobs is expected between 2006 and 2016 - 22% (an extra 5,000 jobs)
- Nelson and Richmond will both experience considerable growth and will remain the largest and second largest employment regions respectively
- Nelson's share of overall employment will fall from 27% to 25%
- Richmond and surrounds share of overall employment will rise from 21% to 24%
- Nelson Airport / Annesbrook and Port Nelson will remain high employment regions with approximately 9% and 8% of jobs respectively
- the majority of growth is expected to occur in the southern end of the study area
- growth also expected in industrial areas towards the north:
    - Nelson South (west - the industrial area to the west of the CBD bounded by St Vincent Street and Vanguard Street)
    - Nelson Airport / Annesbrook
    - Port Nelson.

Figure 3-7 and Figure 3-8 give the gross employment growth and employment growth per hectare respectively. Richmond and the surrounding area, Stoke and the Nelson CBD are the three most significant growth regions.

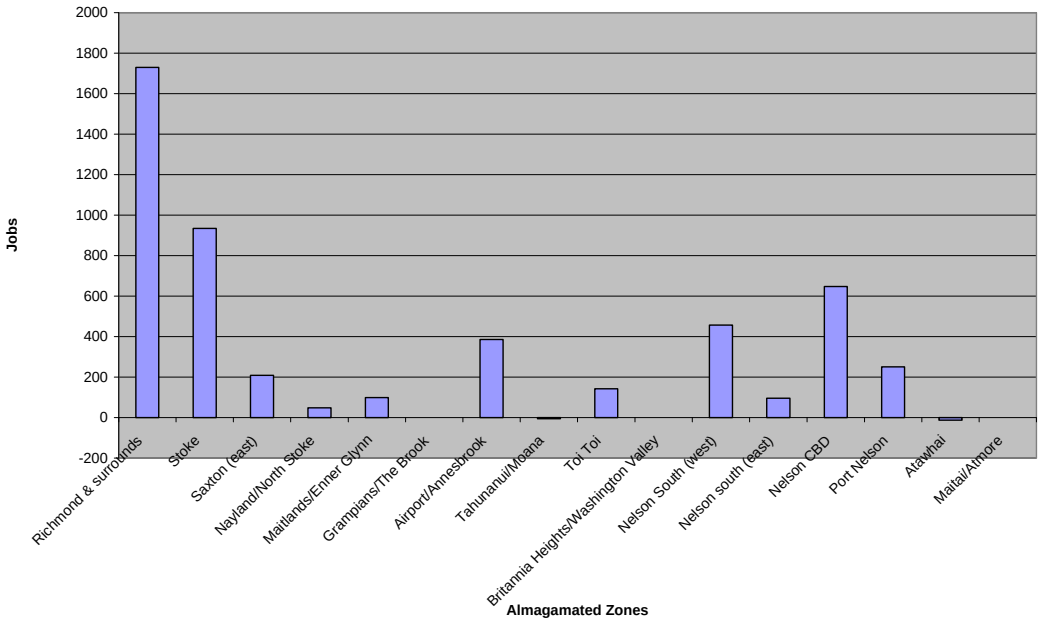



**Figure 3-7 Employment growth 2006 – 2016**

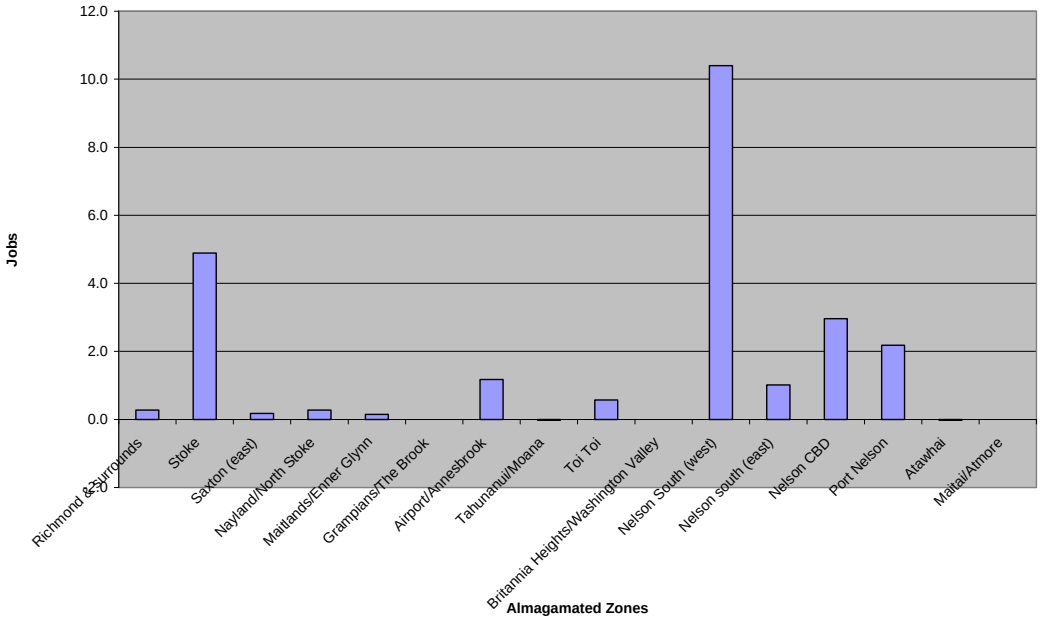



**Figure 3-8 Employment growth / hectare 2006 – 2016**

The three most southern regions will total 58% of additional jobs, while 29% will occur around Nelson CBD, Nelson South (east and west) and, Port Nelson and a further 8% will occur at Nelson Airport/Annesbrook.

Richmond and surrounds is expected to have the largest growth in jobs with 35% of the growth. The next largest growth is in Stoke (19% or just over half the growth experienced in Richmond and surrounds), Nelson CBD (13%) and, Nelson South (west) (9%). The latter will experience, by far, the most intensive growth within the study area with an additional 10.4 jobs/ square kilometre.

## 3.2 Journey to work patterns

Future journey to work patterns were identified using the Nelson Transport Model outputs. Travel patterns by all modes were used to identify demands unconstrained by existing modes. This allows travel patterns that could potentially be serviced by passenger transport to be uncovered.

The Nelson Transport Model is an AM peak model, which simulates travel during the 2-hour weekday morning peak. Results discussed below relate to the morning peak and in general, the travel patterns would be reversed in the evening.

In 2016, the largest journey to work travel movements will be from the south travelling north. These are shown in summary, in Figure 3-9. Nelson CBD will be the major destination with 29% of all daily JTW trips (excluding internal) ending there, but Nelson will not be a major trip origin, with only 3% of all daily JTW trips (excluding internal) starting in Nelson CBD (reflecting the low residential population). Richmond will is a less significant but still major destination (11%) as well as a major origin (15%). The Richmond zone includes the CBD as well as a broad area of other settlements.

However, there will also be significant east - west movements across the traditional Nelson – Richmond corridor, driven by urban development east of The Ridgeway, creating increased demand on cross-regional roads. Note that the large bold numbers in the figures below represent the internal trips.

In addition, the analysis shows that there will be a substantial proportion of trips that will travel along only part of the corridor, such as trips starting in Richmond, or suburbs around Nelson, and ending in the industrial areas around Stoke.

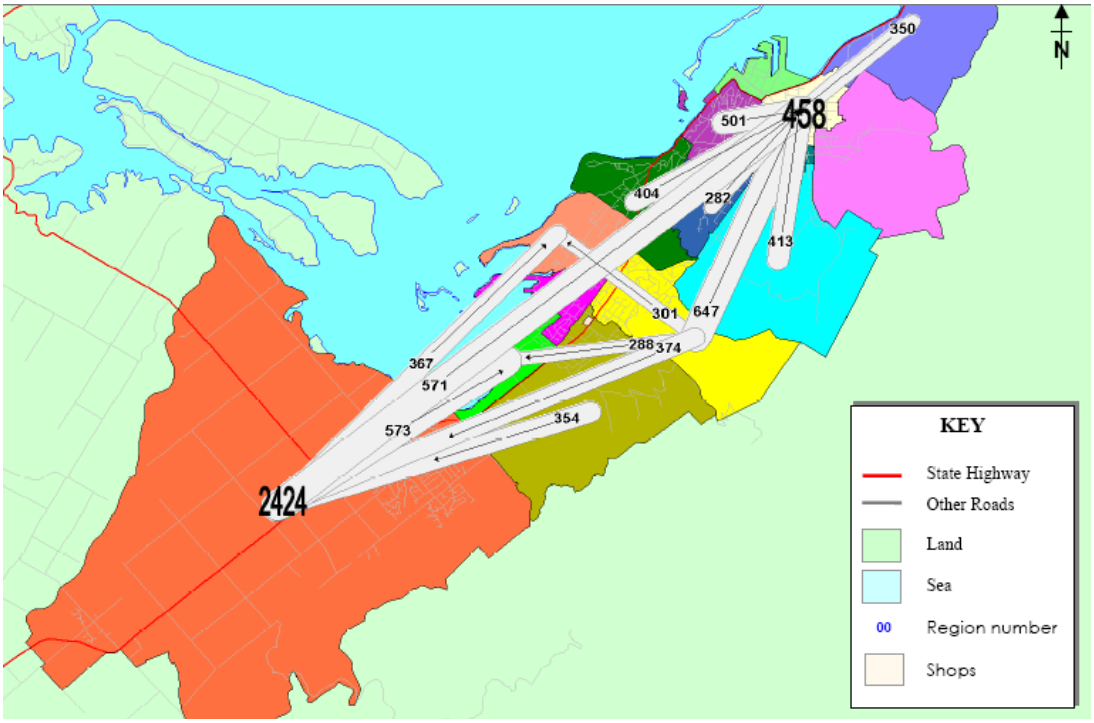



**Figure 3-9 Top 15 JTW Movements**

## 3.3 Transport challenges

In 2016, a large share of the population will be in the southern half of the Richmond – Nelson corridor, while the employment is more divided between Nelson and Richmond with a large proportion also in the Nelson Airport/Nayland region.

The expected growth patterns in residential development and employment will result in some expected Journey to Work patterns which constitute predominately south to north patterns in the AM Peak. However, there will also be east to west movements as well as some partial north to south movements. Nelson CBD, Stoke, Nelson Airport/Nayland and Richmond will be the major Journey to Work destinations. Maitlands/Enner Glynn, Richmond and surrounds, Saxton (east) and, Tahunanui/Moana will be the major origins.

## 3.4 Detailed discussion of travel patterns

### South to North

The three major JTW travel movements are south to north:

- Maitland/Enner Glynn to Nelson CBD – 647
- Richmond and surrounds to Stoke - 573
- Richmond and surrounds to Nelson CBD – 571.

### East – West Travel

The importance of east – west movements will increase significantly. Maitland/Enner Glynn to Stoke (288 trips) and Saxton to Stoke (242 trips) movements will each grow by over 190 trips. Maitland/Enner Glynn to Nelson Airport/Annesbrook (301 trips) will experience over 60 additional trips.

### Destination

Nelson CBD is the major destination with 29% of all daily JTW trips (excluding internal):

- Maitland/Enner Glynn to Nelson CBD – 647 (an increase of 188 trips)
- Richmond and surrounds to Nelson CBD – 571 (a fall of 98 trips)
- Washington/Britania to Nelson CBD – 501
- Grampians/The Brook to Nelson CBD – 413
- Tahunanui/Moana to Nelson CBD – 404
- Atawhai to Nelson CBD – 350
- total trips to Nelson CBD – 4,424 (4,882 including internal).

Stoke is also a major destination with over 12% (up from 6% in 2006) of all daily JTW trips (excluding internal):

- Richmond and surrounds to Stoke – 573 (an increase of 288 trips)
- Maitland/Enner Glynn to Stoke – 288 (an increase of 192 trips)
- Saxton (south east of Main Road) to Stoke – 242 (an increase of 191 trips)
- total trips to Stoke – 1,185 (1,931 including internal).

Nelson Airport/Annesbrook and Richmond and surrounds will each attract 11% of JTW trips.

### Origins

Nelson CBD is not a major origin as is evident in Figure 3-10, with only 3% of all daily JTW trips (excluding internal):

- total trips from Nelson CBD– 418 (876 including internal).

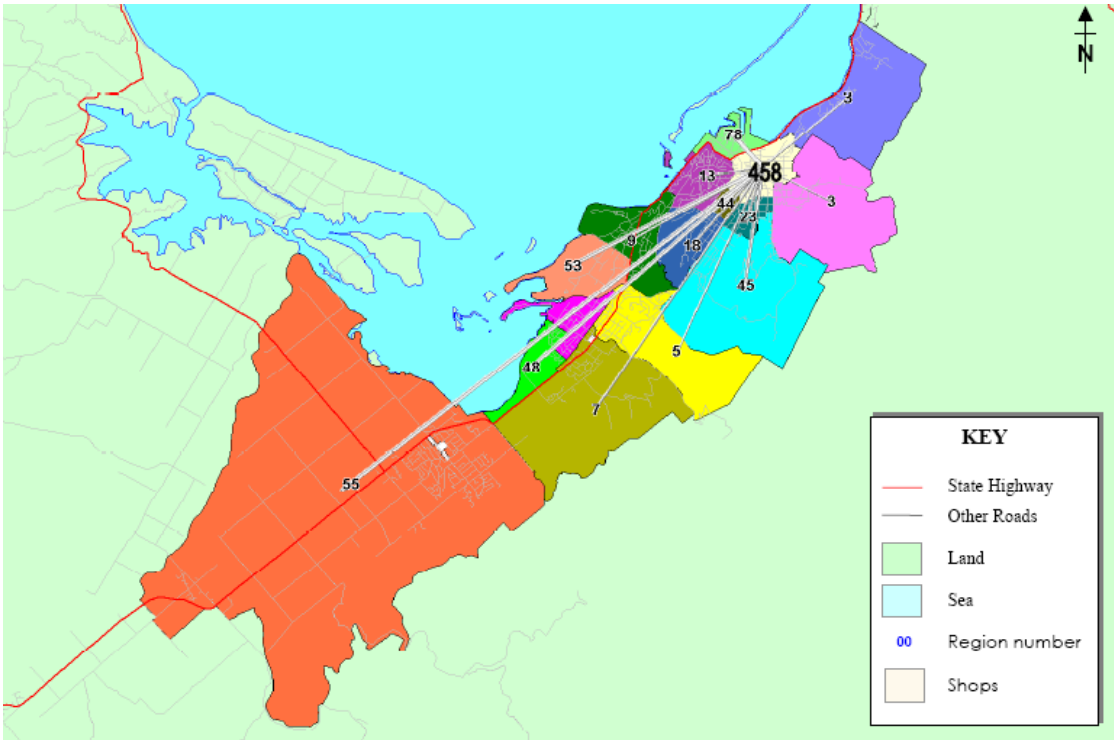



**Figure 3-10 JTW Trips from Nelson CBD (2016)**

Maitlands/Enner Glynn will be a major origin (see Figure 3-11), with 17% (up from 13% in 2006) of all JTW trips (excluding internal):

- Maitland/Enner Glynn to Nelson CBD – 647 (an increase of 188 trips)
- Maitland/Enner Glynn to Richmond and surrounds – 374 (an increase of 146 trips)
- Maitland/Enner Glynn to Airport/Annesbrook – 301 (an increase of 64 trips)
- Maitland/Enner Glynn to Saxton (south east of Main Road) – 288 (an increase of 165 trips)
- total trips from Maitlands/Enner Glynn – 2,552 (2,733 including internal).

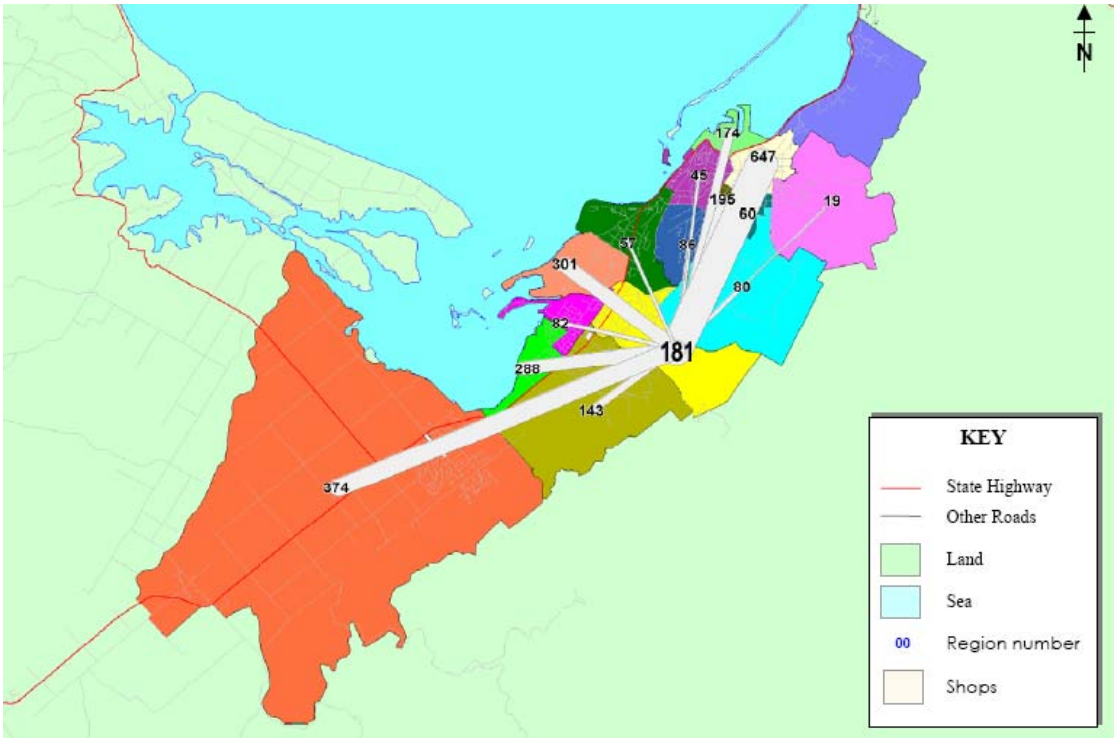



**Figure 3-11 JTW Trips from Maitlands/Enner Glynn (2016)**

Richmond and surrounds (see Figure 3-12), will still be a major origin with 15% (down from 18% in 2006) of all JTW trips (excluding internal):

- Richmond to Stoke – 573 (an increase of 288 trips)
- Richmond to Nelson CBD – 571 (an increase of 98 trips)
- Richmond to Nelson Airport/Annesbrook – 367
- Richmond to Port Nelson – 202
- Richmond to Kirks – 107
- Richmond to Saxton (south east of Main Road) – 105
- total trips from Richmond – 2,371 (4,795 including internal) (note, the large internal trips is attributable to the very large geographical area of this region).

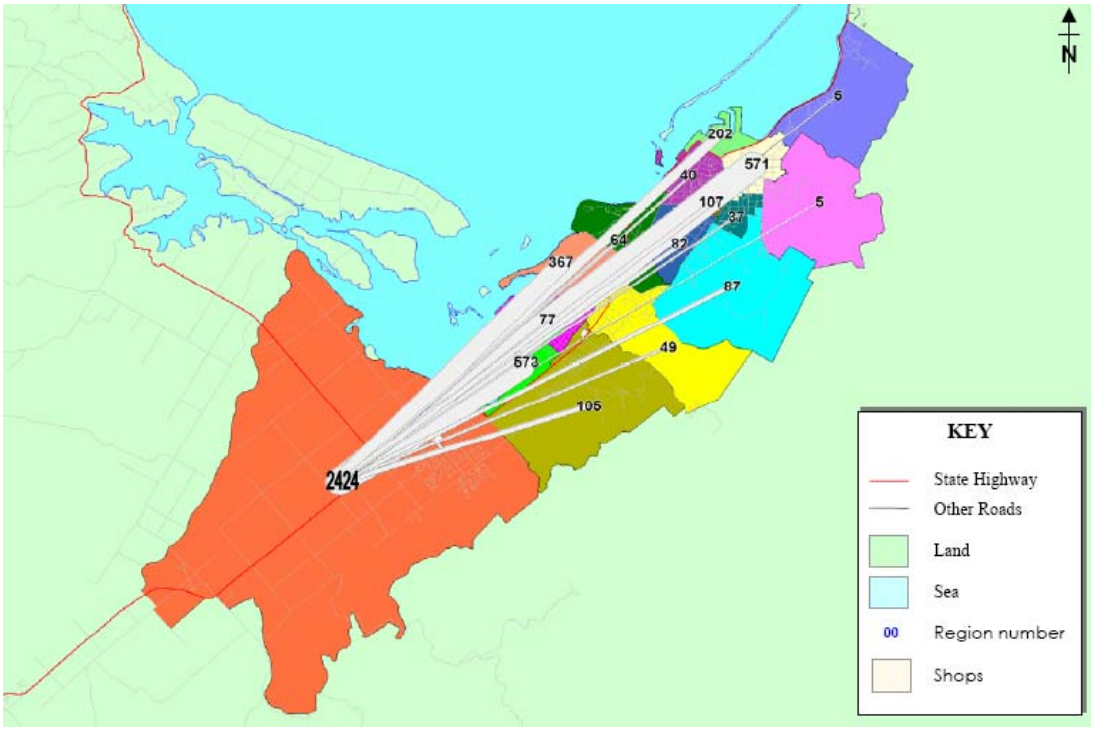



**Figure 3-12 TW Trips from Richmond and surrounds (2016)**

Saxton (south east of Main Road), (see Figure 3-13), will be a major origin with 10% (up from 5% in 2006) of all JTW trips (excluding internal):

- Saxton to Richmond and surrounds – 354 (an increase of 240 trips)
- Saxton to Nelson CBD – 271 (an increase of 127 trips)
- Saxton to Stoke – 242 (an increase of 191 trips)
- total trips from Saxton – 1,475 (1,682 including internal).

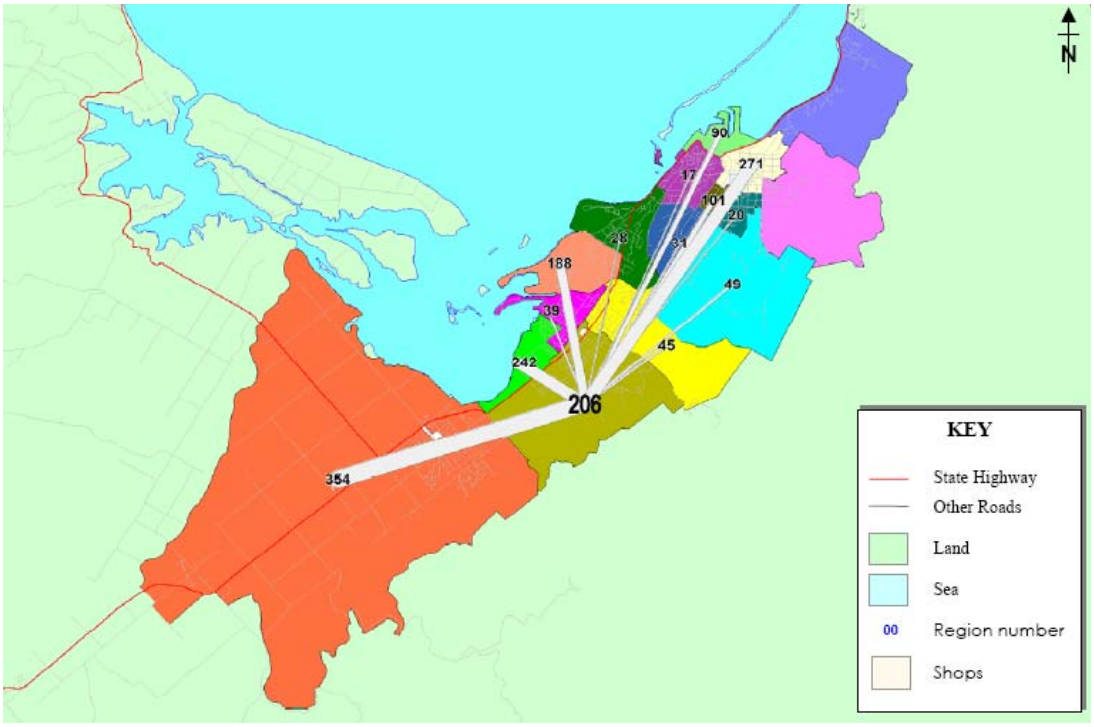



**Figure 3-13 TW trips from Saxton (south east of Main Road) (2016)**

Tahunanui/Moana (see Figure 3-14), will be a major origin with 9% of all JTW trips (excluding internal):

- Tahunanui/Moana to Nelson CBD – 404
- Tahunanui/Moana to Nelson Airport/Annesbrook – 193
- Tahunanui/Moana to Richmond and surrounds – 189
- Tahunanui/Moana to Port Nelson – 117
- Tahunanui/Moana to Stoke - 114
- total trips from Tahunanui/Moana – 1,366 (1,522 including internal).

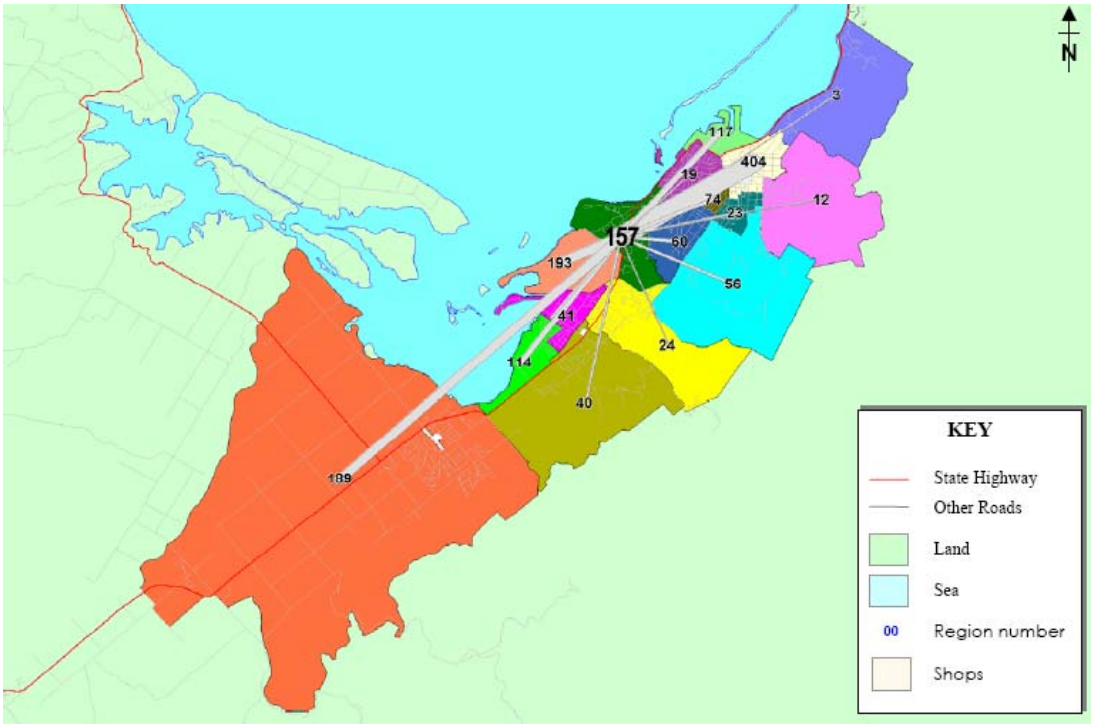



**Figure 3-14 TW Trips from Tahunanui/Moana (2016)**

## 3.5 Employer operating hours

PB surveyed a number of major employers within Nelson and Richmond in order to gain an understanding of staff numbers and shift start and finish times. The assessment was intended to identify the core operating hours a passenger transport network would need in order to be an effective alternative to the private car; and to meet the travel needs of transport-disadvantaged residents.

The summary is broken down into regions within the study area.

### 3.5.1 Richmond

Key employers include PAKnSAVE, Fresh Choice Richmond and Richmond Mall, which in total employ approximately 1,750 people (over 40% of jobs in the region). These employers have staff starting work at 6.00 am, with large numbers finishing around 5.30pm (though some 30 staff start at PAKnSAVE at 4.00 am, finishing work at 8.00 am or 1.00 pm.

Compass Fruit has staff starting at 8.00 am and working until 5.00 pm as well as an evening shift that starts at 6.00 pm and finishes at 11.00 pm.

### 3.5.2 Nelson CBD/Nelson South (west)

A number of businesses, including New World Nelson, Woolworths Nelson and The Warehouse, which together employ approximately 350 people, have staff shifts starting ranges between 6.00 am and 9. am. There are other major employers not included here such as Countdown Supermarket, Fresh Choice Nelson City, Nelson Marlborough Institute of Technology and, Coverstaff Nelson which to date have been uncontactable. Little information was able to be gathered about core finishing times, but many of the late shifts finished around 10.00 pm to 10.30 pm. However, it is known that Countdown opening hours are from 7.00 am to 11.00 pm from Monday to Sunday, so accordingly, it is likely staff are required to travel to and from work before and after those times .

### 3.5.3 Port Nelson

The core starting time for staff at Port Nelson Ltd. and Sealord Group Ltd., which combined employ approximately 720 staff (35% of jobs in the region), is from 6.00 am and 7.00 am respectively. However, staff generally start arriving about half an hour before their start time. A large number (140) from Port Nelson Ltd. finish at 11.00 pm.

### 3.5.4 Stoke

The core starting time for staff at Nelson Fruit Services Stoke, is 7.30 am (finishing at 5.00 pm) and at 6.00 pm (finishing at 11.00 pm). There are 100 staff on each shift (accounting for approximately 15% of jobs in the region). However, it is seasonal work and operates from mid-February to the end of June. Staff generally arrive 15 minutes before starting.

### 3.5.5 Annesbrook/Airport

The core working time for staff at Sealord Group Ltd. in Annesbrook is between 6.00 am (with approximately 230 workers starting at this time) and 11.30 pm (with approximately 110 finishing at this time). It employs approximately 370 staff (15% of jobs within the region).

### 3.5.6 Nelson South/Braemar (hospitals)

There are over 1,100 staff who work at Nelson Public Hospital. However, the hospital operates 24-hours and staff work a variety of shifts due to the nature of hospital work. General visiting hours are to 8.30 pm for both weekdays and weekends/public holidays.

### 3.5.7 Conclusion

Key employers in Nelson/Richmond have staff starting and finishing times that are well outside the present operating hours for buses in Nelson. A future passenger transport network that wishes to be an effective alternative to the private car (and to cater for transport-disadvantaged residents) will need to operate seven days per week, generally between 5.00 am and midnight.

# 4. Development of the passenger transport network

## 4.1 Strategic approach

The analysis of future travel demands shows that there would be a stronger demand for trips between Richmond and Nelson in the morning peak period (and in the reverse direction in the afternoon), because the future increase in population will be largely occurring in the south/west of the study area (particularly around Richmond) where the topography is more favourable, while the majority of jobs will remain in the north/east of the study area, in Nelson CBD and surrounds. There will still be substantial demands for travel from Nelson to Richmond during the morning peak, but of a lower order – the peak demand direction will be from Richmond towards Nelson.

Other key future travel patterns include:

- a strong demand for trips in both directions along the Richmond-Nelson corridor, but only travelling part of the way between the cities. These trips either originate in both the north/eastern and south/western parts of the study area and end in the employment areas of Stoke/Nayland Road/Tahunanui, or will originate from intermediate population areas (such as Enner Glynn/Saxton) and end in either Richmond or Nelson CBDs
- a future east-west demand across the corridor, from residential areas east/south of Waimea Road/Main Stoke Road, to employment areas on the north/east side of Tahunanui Drive/Main Stoke Road.

The primary future role of the passenger transport network, as indicated by NCC, is to help address traffic congestion in the Richmond-Nelson corridor by making passenger transport a viable alternative to the private car.

Current traffic congestion is focused on Waimea Road between Wakatu and Nelson CBD, and on Tahunanui Drive/Rocks Road, the two main road corridors to Nelson CBD from the south. Traffic congestion is worst closer to the Nelson CBD. Commuter demands between Richmond and Nelson account for around half of the expected future travel demands on the corridor.

In the light of this, there are two general strategic approaches to future passenger transport for Nelson:

1. Commuter traffic congestion approach - a network that focuses on reducing traffic congestion in the Richmond-Nelson corridor by concentrating investment into providing direct, frequent and fast services between Richmond and Nelson during peak worker travel periods, supported by bus priority measures where possible. Using this approach the network would not necessarily serve travel demands that do not contribute towards traffic congestion in the subject corridor, (for example east-west movements between say Enner Glynn/Saxton to Stoke/Nayland Road employment areas) or transport-disadvantaged residents;

2. Balanced passenger transport approach – in this approach, the passenger transport network would be aimed at providing an alternative to use of the private car for any trips in Nelson (either directly, or by transferring), as well as providing travel for the transport-disadvantaged. With this approach, the passenger transport network would provide services along the key Richmond-Nelson corridor, but also provide a network that would connect residential areas with activity areas, to allow most Nelson travellers to use passenger transport for their journeys. In addition, with this approach, operating hours of passenger transport services would be more extensive (ie operating beyond hours where traffic congestion is high).

## 4.2 Commuter traffic congestion approach

As discussed above, this service response would concentrate on serving the Richmond-Nelson corridor to attempt to relieve traffic congestion. To do this, services must be direct, frequent and have a good, reliable travel time. Reliability is found to be potentially more important to prospective passenger transport users than travel time itself. Reasonable travel time should be provided in comparison with private cars, though it is recognised that due to the relatively limited nature of traffic congestion in Nelson and the current reasonably high average travel speeds for cars on the two main corridors at peak times, it is unlikely that buses can provide a more attractive travel time than private cars at most times. However, with transit priority support, buses should be able to provide a reliable travel time.

In this option a core express route would be introduced between Richmond and Nelson CBD, to provide a fast, frequent and reliable commuter service. The service would operate every 15 minutes during the peak period (7.00 am to 9.00 am and 4.30 pm to 6.30 pm) and every 30 minutes off-peak. The service would operate from 7.00 am until 6.30 pm on weekdays only and would operate via Waimea Road (using Beatson Road to avoid traffic congestion near Wakatu), stopping only at Richmond, Stoke, Nelson Hospital and Nelson CBD.

The core route would be supported by two secondary routes operating between Richmond and Nelson.

Both secondary routes would commence in suburban areas beyond Richmond CBD (actual locations have not been identified, but the routes should penetrate residential areas around Richmond) and extend beyond Nelson CBD to serve important destinations – the Polytech and the Port employment areas. These routes would be less direct than the core express route and would help to serve intermediate employment destinations between Nelson and Richmond, as well as residential areas on either side of the main Richmond-Nelson corridor.

The first of the secondary routes (the western route) would travel through the industrial area of Stoke, diverting back to Main Road Stoke before continuing through Nayland, Annesbrook and to Tahunanui, then via Rocks Road and the Port of Nelson, to Nelson CBD.

The second of the secondary routes (the eastern route) would depart Richmond from the south east via Hill Street to travel through a wider catchment, then to Main Road Stoke via Champion Road (until a connecting road to The Ridgeway is built). After travelling through Stoke, it would then join The Ridgeway, joining Waimea Road to Nelson hospital , then to Nelson CBD via Vanguard Street, extending to the Polytech in Nelson.

These routes would operate less frequently than the core express route – every 20 minutes during the peak hours and every 40 minutes off-peak. Operating hours would be identical to the express route - 7.00 am until 6.30 pm weekdays only.

The routes are shown in the following figure (green, blue and light blue routes). One of the secondary routes would operate along the Rocks Road corridor, while the other would operate via Waimea Road and Vanguard Street to Nelson CBD.

Taken together, the commuter traffic congestion service approach would provide 10 buses per hour between Richmond and Nelson (a bus every 6 minutes) in the peak period 5 buses per hour (a bus every 12 minutes in the off-peak) and would allow commuters to choose between a fast direct service to key destinations, and secondary services serving intermediate destinations. This level of frequency would be highly attractive to potential travellers and represent a substantial improvement over existing services between Richmond and Nelson.

As the map shows, the routes would come together at Stoke, allowing passengers to transfer between the core and secondary services to access a range of destinations along the corridors.

Supporting infrastructure for this option would include:

- bus priority measures at identified congestion points to maintain reliable bus travel times
- high quality bus stops at Richmond CBD, Nelson CBD and Stoke (interchange point)
- standard quality bus stops at regular intervals on the secondary routes (every 400 metres).

Table 4-1 below summarises the service level guidelines applied to this approach.

**Table 4-1 Service level guidelines – commuter traffic congestion service approach**

| Aspect | Guidelines | |
|---|---|---|
| 1. Service Period | Monday to Friday service approximately 7.00am to 6.30pm (based on first trip arrivals in the CBD and last trip departures from the CBD). | |
| | Sundays and Public Holidays - no service | |
| 3. Service Frequency | | |
| 3.1 Core express service | 7.00am - 9.00am (am peak) | Target 15 mins |
| | 9.00am – 4.30pm (interpeak) | Target 30 mins |
| | 4.30pm – 6.30pm (pm peak) | Target 15 mins |
| | 6.30pm -12.00am | No service |
| | Saturday | No service |
| | Sunday | No service |
| 3.2 Secondary services | 7.00am - 9.00am (am peak) | Target 20 mins |
| | 9.00am – 4.30pm (interpeak) | Target 40 mins |
| | 4.30pm – 6.30pm (pm peak) | Target 20 mins |
| | 6.30pm -12.00am | No service |
| | Saturday | No service |
| | Sunday | No service |
| 4. Service Directness | Routes are direct, logical and consistent | |
| 5. Bus Stop Spacing | Maximum desirable bus stop spacing of 400 m | |
| 6. Bus Shelters | Bus shelters to be provided at those bus stops with the greatest usage. High quality stops with passenger waiting lounges at Richmond and Nelson CBDs. High quality interchange stop at Stoke. | |
| | Standard suite of bus service information to be provided at bus stops. | |

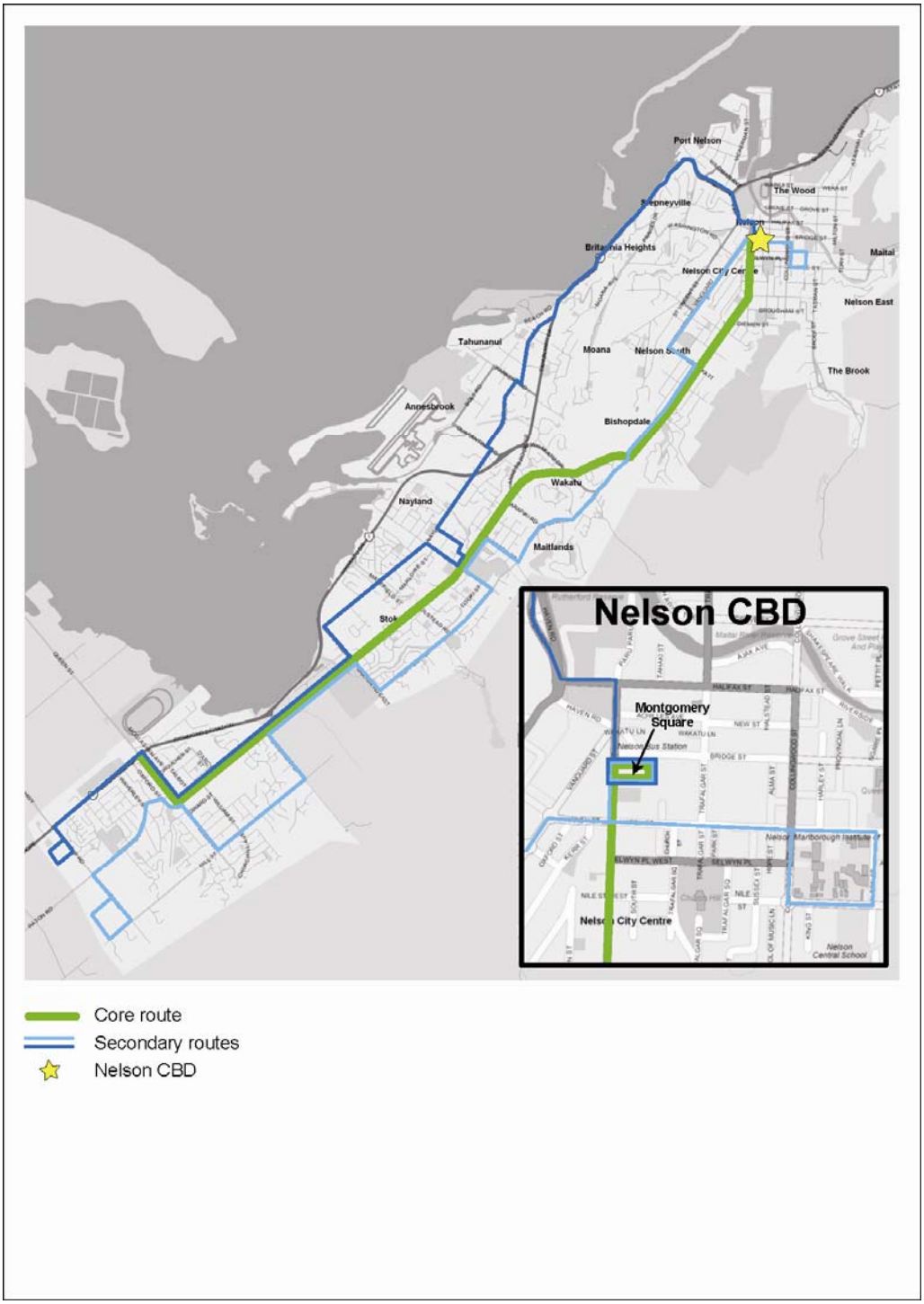



**Figure 4-1 Commuter traffic congestion network**

### 4.2.1 Strengths and weaknesses

While this approach would address traffic congestion in the Richmond-Nelson corridor by providing a frequent, reliable passenger transport service that could be an effective alternative to the use of the private car, it would not provide for other trip types (such as those catered for by the existing The Bus services), or for travel on weekends, or outside the weekday core service hours. As is shown in section 3.7, employers in Nelson have a wide range of operating hours. However, as traffic congestion is only significant during weekday peak hours, there would be little justification for extending operating hours with this approach.

## 4.3 Balanced network approach

A balanced passenger transport network for Nelson would aim to ensure that passenger transport can be used as an alternative to the private car for most journeys in Nelson (either directly, or by transferring); and in particular, that people who don't own a car, or are otherwise transport-disadvantaged, can travel for work, education and other purposes.

The balanced approach would feature the core and secondary routes in the commuter traffic congestion service approach, providing high frequency services along the key Richmond-Nelson corridor, and supplemented by local Nelson services aimed at connecting surrounding residential areas with Nelson CBD.

In the balanced network approach, the operating hours of all services would be extended to reflect operating hours of key employers, as well as allowing the passenger transport network to be used for entertainment trips (such as late night trips currently served by the Late, Late Bus).

As indicated, the core express and secondary routes between Richmond and Nelson would be identical to the commuter traffic congestion service approach, but their operating hours would be extended to operate from 5.00 am until midnight (Monday to Thursday and Sunday), and until 3.00 am on Friday and Saturday nights.

In addition, two local access routes would be introduced (operating 2 buses per hour) as follows:

- Atawhai to Nelson via The Wood. This route would be largely identical to the existing The Bus route 2. However, we recommend reversing the direction that the route diverts off Atawhai Road into the residential areas on the hills. Rather than the inbound routes diverting up the hill and the outbound routes continuing on Atawhai Road, this would mean that residents would only be required to walk down the hill to catch the bus rather than up the hill after alighting the bus for those that did not want to remain on the bus until the return trip
- the Brook to Nelson CBD to Washington Valley/Britannia Heights. After travelling inbound from The Brook, the route would continue via Collingwood Street into the CBD, onto St. Vincent Street, Washington Road, Princes Drive, Quebec Road, Abraham Heights, Toi Toi Street and back onto St. Vincents Road into the CBD. This will serve the Toi Toi area that Route 1 currently serves. Every second service would operate the circuit west of the CBD, to reduce the effects of a large loop.

The local access routes would operate 'hail and ride'.

This approach would provide a high quality, frequent commuter service between Richmond and Nelson as well as local access services that would operate at times that would particularly suit lower-paid workers.

The service frequency of the local access services (a bus every 30 minutes) is considered to be the minimum acceptable service level.

Supporting infrastructure for this option would include:

- bus priority measures at identified congestion points to maintain reliable bus travel times
- high quality bus stops at Richmond CBD, Nelson CBD and Stoke (interchange point)
- standard quality bus stops at regular intervals on the secondary routes (every 400 metres).

Table 4-2 below summarises the service level guidelines applied to this approach.

**Table 4-2 Service level guidelines – balanced network approach**

| Aspect | Guidelines | |
|---|---|---|
| 1. Service Period | Monday to Thursday service approximately 5.00am to 12 midnight (based on first trip arrivals in the CBD and last trip departures from the CBD).<br>Friday, Saturday service 5.00am to 3.00am | |
| | Sundays and Public Holidays – 5.00am to 12 midnight | |
| 3. Service Frequency | | |
| 3.1 Core express service | 5.00am – 7.00am | Target 30 mins |
| | 7.00am - 9.00am (am peak) | Target 15 mins |
| | 9.00am – 4.30pm (interpeak) | Target 30 mins |
| | 4.30pm – 6.30pm (pm peak) | Target 15 mins |
| | 6.30pm -12.00am | Target 30 mins |
| | Saturday | Target 30 mins |
| | Sunday | Target 30 mins |
| 3.2 Secondary services | 7.00am - 9.00am (am peak) | Target 20 mins |
| | 9.00am – 4.30 pm (interpeak) | Target 40 mins |
| | 4.30pm – 6.30pm (pm peak) | Target 20 mins |
| | 6.30pm -12.00am | Target 40 mins |
| | Saturday | Target 40 mins |
| | Sunday | Target 40 mins |
| 4. Service Directness | Routes are direct, logical and consistent | |
| 5. Bus Stop Spacing | Maximum desirable bus stop spacing of 400 m | |
| 6.Bus Shelters | Bus shelters to be provided at those bus stops with the greatest usage. High quality stops with passenger waiting lounges at Richmond and Nelson CBDs. High quality interchange stop at Stoke. | |
| | Standard suite of bus service information to be provided at bus stops. | |

The figure below shows the complete network.

### 4.3.1 Strengths and weaknesses

The balanced passenger transport network approach would best meet the broader objectives of national policies and strategies (in terms of achieving a sustainable transport network), as well as making the passenger transport network a more attractive alternative to the private car.

However, the greatest benefit of this approach when compared with the commuter congestion approach, is that it makes passenger transport an effective option for people who suffer from transport disadvantage. Nelson has an aging population and a relatively high number of people from lower socio-economic strata – a balanced passenger transport network would help to improve the lives of all Nelson residents, especially those required to work early and late shifts at local employers.

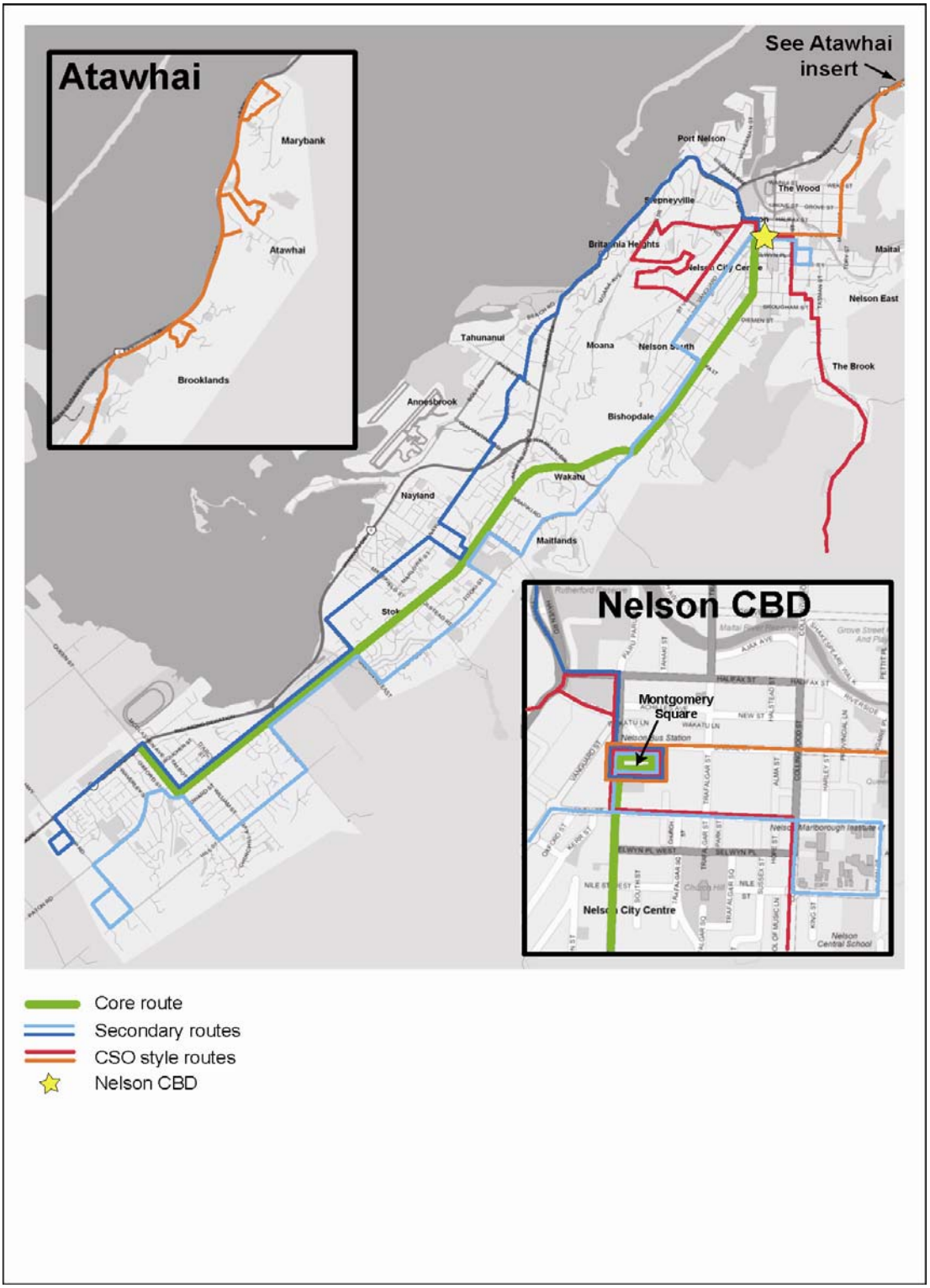



**Figure 4-2 Balanced network**

# 5. Supporting the network investment

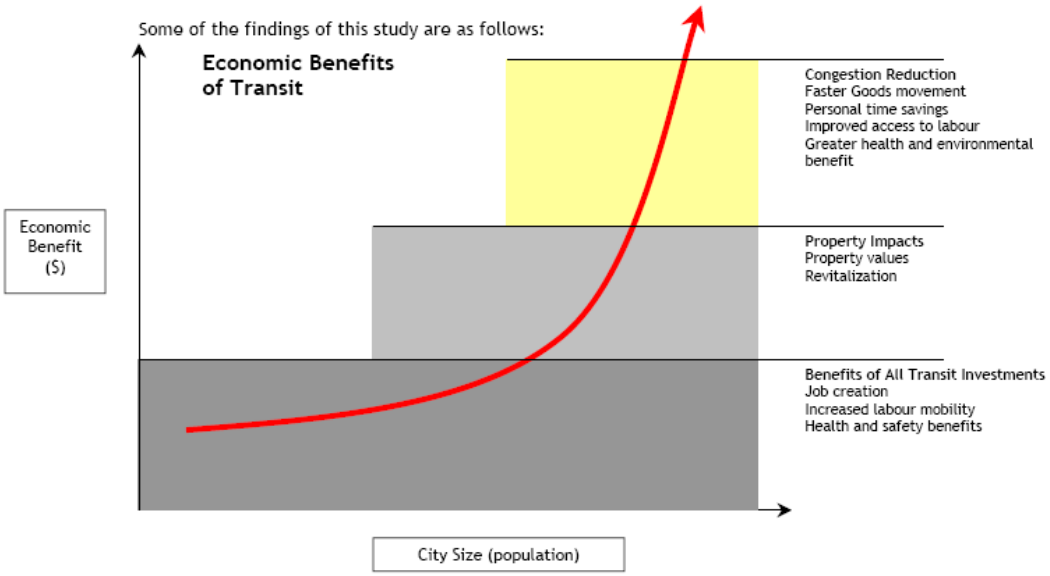
It is a generally accepted truth in transport planning, that investment in improved passenger transport services alone is not enough to generate a mode shift of any reasonable scale and permanence. Professor Vukan Vuchic, in Transportation for Liveable Cities (1999), demonstrates how incentives for passenger transport use must be matched with disincentives to private car use, to create a mode shift (by modifying disutility of each mode), and to make the passenger transport investment worthwhile. Indeed, Vuchic states that investment in passenger transport inceptives (such as service improvements and infrastructure) is wasted, if it is also accompanied by investment in incentives to private transport (such as roading improvements, or increased parking supplies).

There is therefore a real risk that investment in passenger transport improvements by Nelson City will not be effective in generating a mode shift and reducing traffic congestion in the key Richmond-Nelson corridor, unless there are also active disincentives to private car use. However, having an effective passenger transport network in place can allow those disincentives to be applied without having a dramatic impact on the city's activities, because an alternate transport mode exists.

Even in small cities like Nelson, there are economic benefits from encouraging passenger transport use. The range of benefits that passenger transport can provide to economies ranges from obvious benefits such as reduced traffic congestion, air quality improvements, traffic noise and safety, to less obvious impacts on land use and land values.

The benefits increase with city size, particularly with respect to the impact on the efficiency of cities (worker mobility etc) of traffic congestion, and are exponential. In addition, higher-order passenger transport investments may be required to realise property value benefits.

The figure below from Canada conceptually illustrates this relationship.




Source: Transit Means Business: The Economic Case for Public Transit in Canada

**Figure 5-1 Economic Benefits of Transit**

International studies have found that passenger transport is more efficient than the private car as city size increase; and in many larger cities passenger transport is the only mode allowing ongoing growth to occur.

Passenger transport is also a more efficient user of scarce resources than the private car, consuming 3 times less energy per passenger than private cars. The cost of travel per kilometre is also much smaller for passenger transport than for private car – again, the Canadian study found that the cost of travel per kilometre for the private car was $CA0.46, compared with $CA0.12 for passenger transport, and calculated an annual saving to the economy of $CA4,278 per resident in Calgary, solely on the basis of total kilometres travelled.

In Sydney, a study estimated that the CityRail rail network provided an average return on subsidy (based on traffic congestion, air quality, noise, crashes and road damage) in the order of $AU3.10 for every dollar of subsidy over a 10 year period 1997-2007.

There are also substantial worker productivity benefits from using a travel mode that allows users to work while travelling, rather than having to operate a vehicle. Transport Canada estimated that if 5% of passenger transport travellers were able to work in the vehicle, this would provide an annual productivity benefit of $CA33 million.

## 5.1 Incentives for passenger transport

In addition to the passenger transport service increases that would be provided in the passenger transport network options, a number of other measures will decrease the disutility of passenger transport in mode choice.

These include:

- travel time and reliability
- travel cost
- accessibility and comfort.

### 5.1.1 Travel time and reliability

Given traffic conditions in Nelson generally, it is unlikely that buses could offer a more attractive travel time than the private car door to door (particularly as bus users would need to walk to a stop and wait for a service). However, providing express services would reduce current bus travel times, and bus services can potentially offer more reliable ytravel times than private cars, on some congested corridors, through bus priority measures.

The scope of our work did not allow us to assess potential bus priority measures throughout the study area, but we did examine the Waimea Road corridor in some detail, developing a bus priority concept for that corridor (focused on the inbound direction where traffic congestion is considered worst in the morning peak period).

#### Waimea Road Bus Priority Concept

It should be noted that while the likely bus flows in Nelson would fall well short of the usual numerical warrants for bus lanes, Nelson City is keen to make a strong statement about bus priority to promote passenger transport use on the corridor.

The table below illustrates the numerical warrants for different forms of bus priority. The warrants are important (particularly for bus lanes) because public perceptions of the value of the investment relate to frequency of use. ‘Empty lane syndrome’ – where the bus lane is seen to be largely empty is to be avoided. As well, in general it is important to match the level of priority (and the selected solution) with the problem to be solved – bus priority is most important to overcome the effects of traffic congestion on reliability.

**Table 5-1 Selected General Planning Guidelines for Bus Priority Treatments – Arterials**

| Treatment | Minimum One-Way Peak Hour Bus Volumes | Minimum One-way peak hour Passenger Volumes | Related Land Use and Transport Factors |
|---|---|---|---|
| CBD kerb bus lanes, main street | 50-80 | 2,000-3,000 | Commercially oriented frontage |
| Kerb bus lanes, normal flow | 30-40 | 1,200-1,600 | At least 2 lanes available for other traffic |
| Median bus lanes | 60-90 | 2,400-3,600 | At least 2 lanes for other traffic; ability to separate vehicular turn conflicts from buses |
| Bus pre-emption of traffic signals | 10-15 | 400-600 | Wherever not constrained by pedestrian clearance or signal network constraints. |
| Special bus signals and signal-phase, bus-activated | 5-10 | 200-400 | At access points to bus lanes, busways or terminals; or where special bus turning movements must be accommodated. |

Source: Transit Capacity and Quality of Service Manual, 1999

Nelson City Council supplied travel time data for the strategic routes between Richmond and Nelson. The following tables shown AM and PM peak travel times on the corridors.

Private car travel time variability increases significantly once north of Annesbrook Drive roundabout on Waimea Rd (see Figure 5-2). There is also a large variation in travel time between the roundabout and Nelson CBD via Rocks Road (see Figure 5-3) though this is not as pronounced.

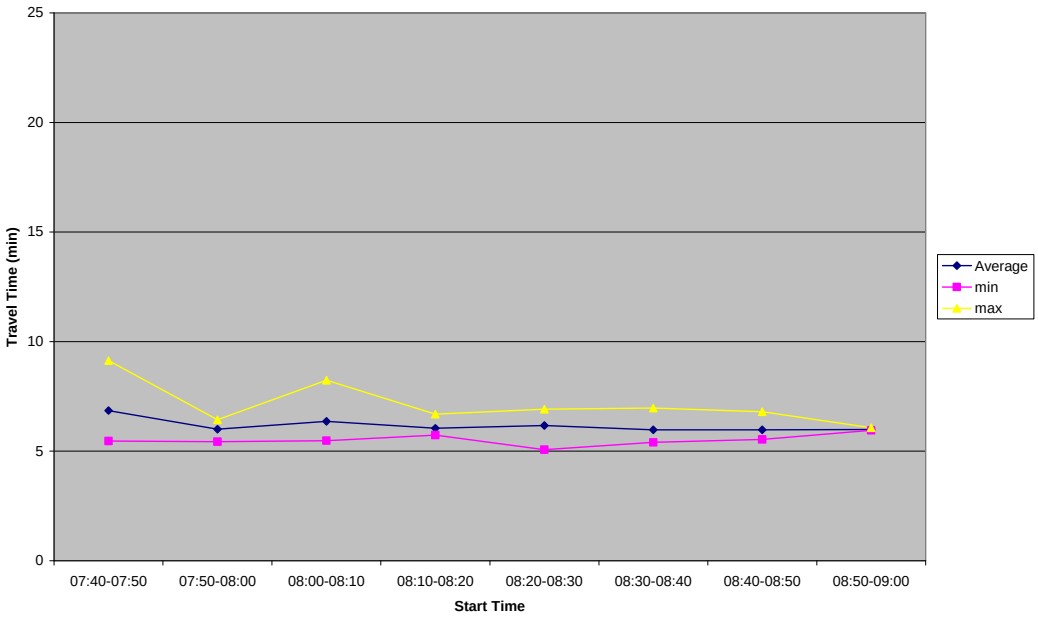



**Figure 5-2 Private vehicle travel time Richmond to Annesbrook Drive roundabout via Whakatu Drive AM Peak**

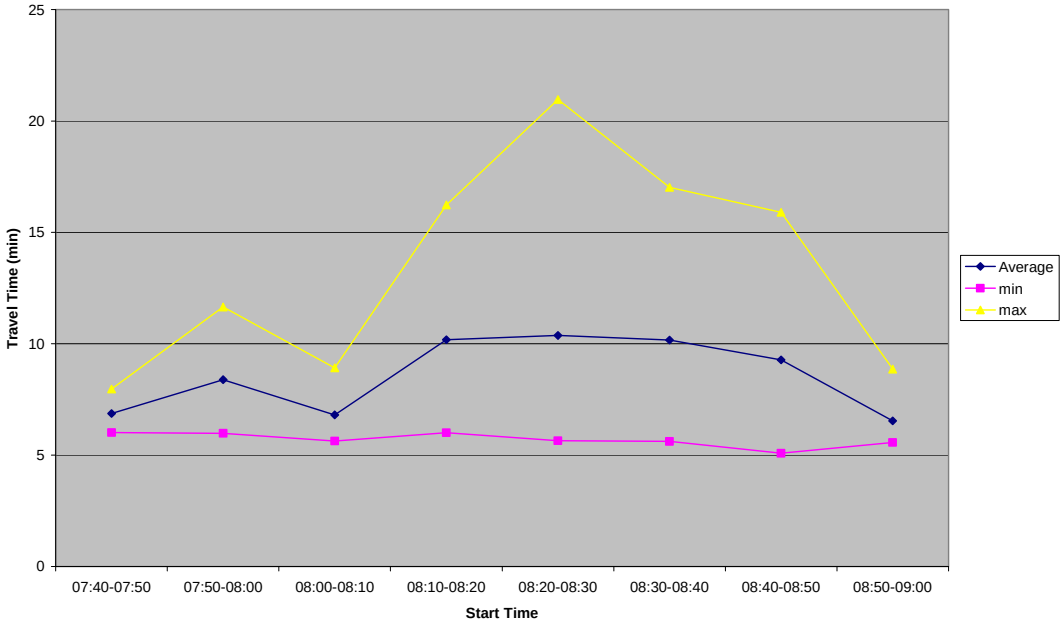



**Figure 5-3 Private vehicle travel time Annesbrook Drive roundabout to Selwyn Place via Waimea Road AM Peak**

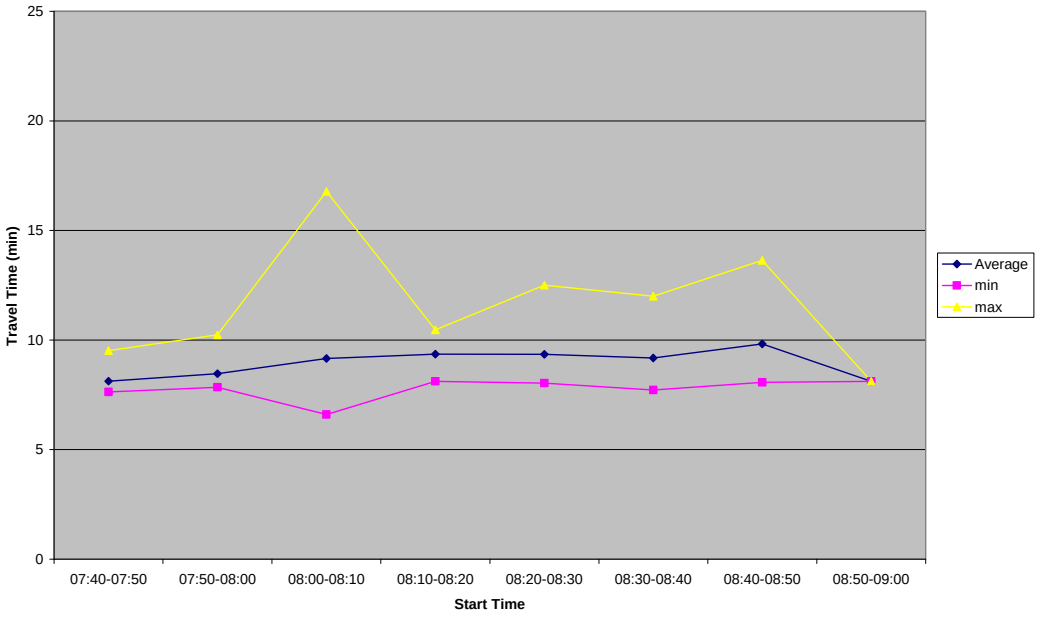



**Figure 5-4 Private vehicle travel time Annesbrook Drive roundabout to Halifax Street via Rocks Road AM Peak**

In the reverse direction, during the PM Peak, the variability is not as great.

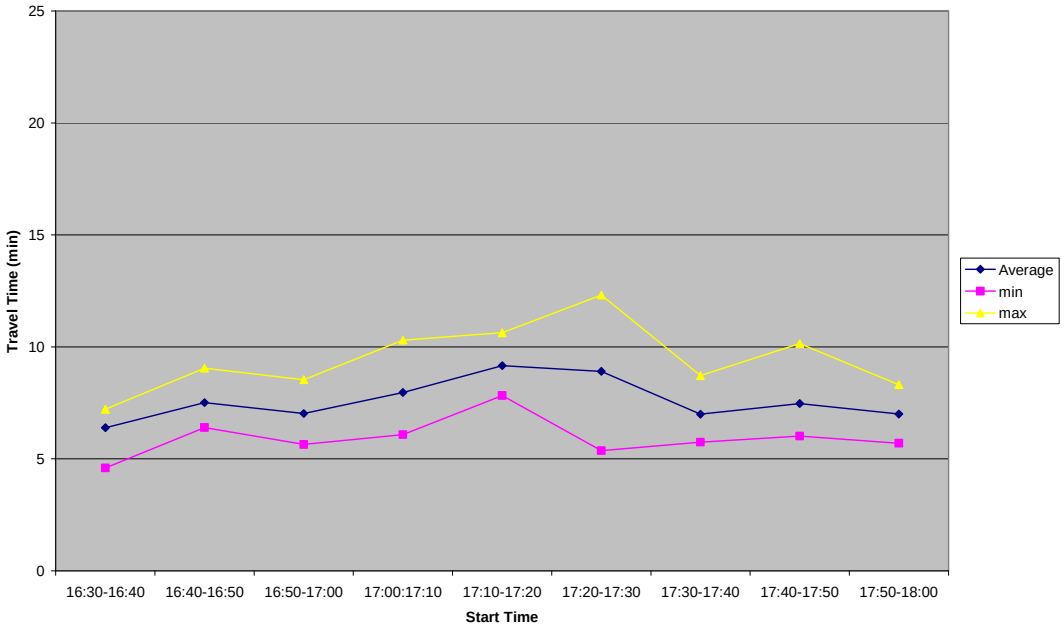



**Figure 5-5 Private vehicle travel time Selwyn Place to Annesbrook Drive roundabout via Waimea Road PM Peak**

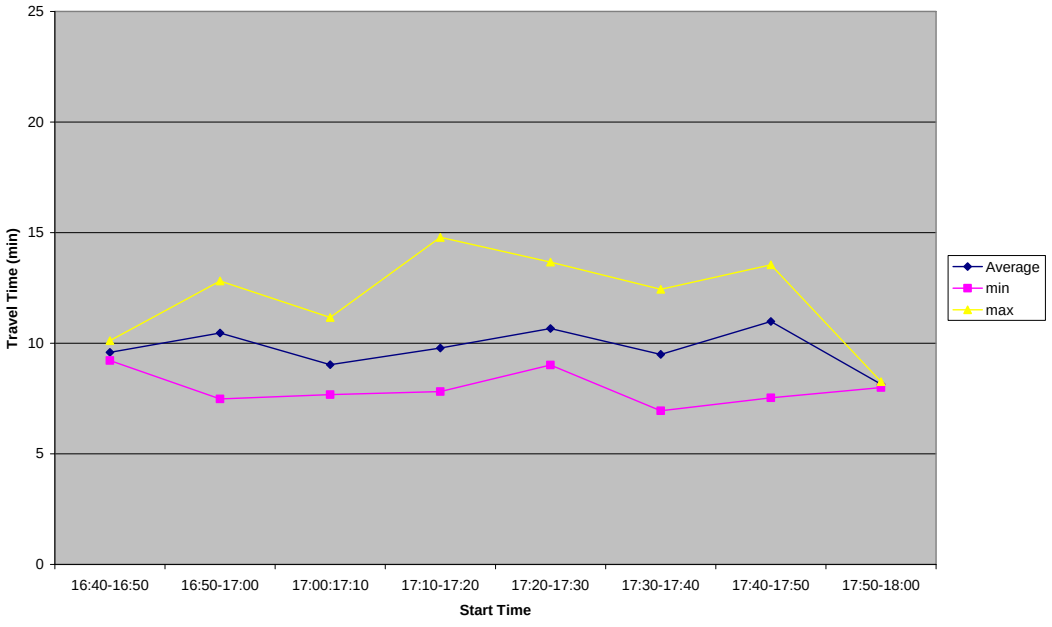



**Figure 5-6 Private vehicle travel time Halifax Street to Annesbrook Drive roundabout via Rocks Road PM Peak**

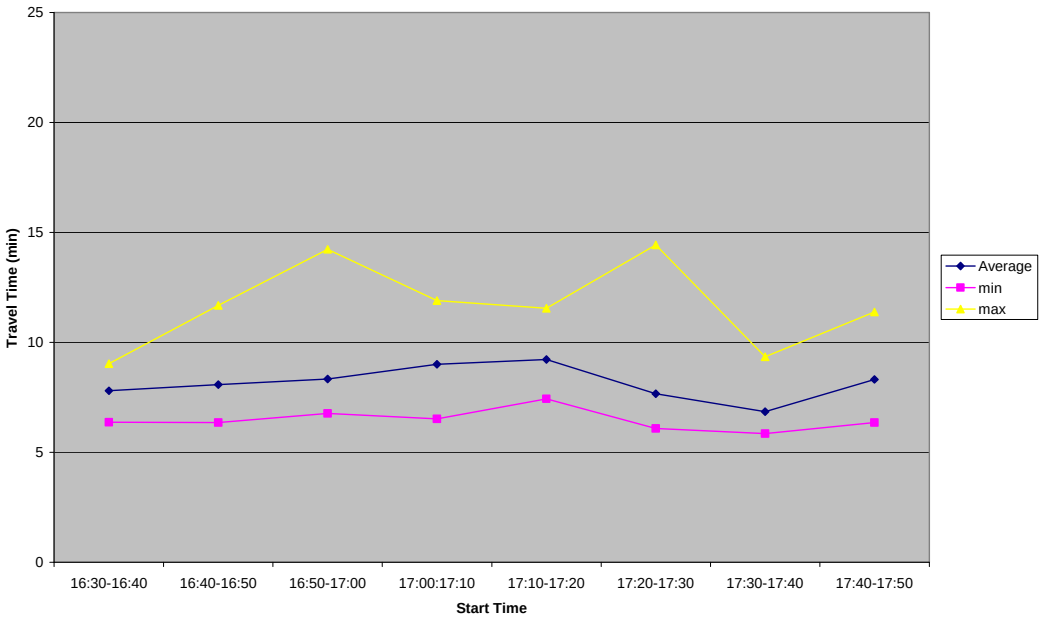



**Figure 5-7 Private vehicle travel time Annesbrook Drive roundabout to Richmond via Whakatu Drive PM Peak**

Of the two main access routes to Nelson CBD, Waimea Road offers the most opportunity to apply bus priority measures. Rocks Road is highly constrained, having the ocean on one side and steep hillsides on the other. Improving capacity for buses on Rocks Road would be extremely costly. On the other hand Waimea Road offers significant opportunities for low-cost provision of a northbound bus lane from Beatson Road to Motueka Street. This would be achieved by a combination of linemarking, peak period parking restrictions and limited road widening, as shown in the figures in Appendix A.

Waimea Road presently provides one traffic lane in each direction over much of its length, with localised widenings to three lanes in places. A flush median is also provided to assist in driveway access, and marked kerbside parking lanes are provided where width allows.

The bus priority concept for Waimea Road would be as follows:

- northbound buses would be diverted around the Waimea Road/Enner Glynn Road intersection via Beatson Road. A gate or retracting bollard would limit access to Beatson Road to buses and residents (reducing the potential for rat-running) which would also allow speed humps in Beatson Road to be removed
- at the Beatson Road/Scotia Street/Waimea Road intersection, Waimea Road would be linemarked to create a northbound bus lane in the present lane one, while the second northbound lane (short passing lane) would be used by general traffic
- the northbound bus lane would be retained through peak period parking restrictions (to create a clearway), relinemarking to create one lane southbound (and two northbound, including a bus lane) south of Boundary Road, realignment of the Waimea/Bishopdale/Boundary Road intersection (understood to be planned by NCC) and limited road widening between Boundary and Tukuka Street; and south of Motueka Street.

This would provide a continuous northbound bus lane in lane one of Waimea Road on weekday peak periods, allowing improved bus travel time and better reiability.

Since Waimea Road northbound has a practical capacity of one lane, there would be little impact on capacity for general traffic. In fact, removal of short two-lane passing lane sections may improve reliability and safety for general traffic, as in congested conditions, shockwaves created by merging vehicles (which can contribute to crashes and traffic queues) would be reduced.

While some kerbside parking would be removed from the western side of Waimea Road during the morning peak period (say 6.30 am to 10.00 am), this is unlikely to have a major impact, as properties generally have access to off-street parking.

The present southbound climbing lane south of Bishopdale Road would be removed, but the inconvenience to general traffic should be low, as the use of this section of road by heavy vehicles is understood to be low and infrequent.

Opportunities for southbound bus priority have not been considered in detail (and the requirement for bus priority is not as great in this direction) but opportunities do exist for limited priority, such as queue jumps at intersections, or short bus lanes with PM peak period parking restrictions.

### 5.1.2 Travel cost

The idea of subsidies for passenger transport services is often used to suggest that public transport is less efficient than private transport. However, roading and parking construction and maintenance effectively subsidise private transport.

Because Nelson passenger transport is intended to perform a critical economic function (reducing traffic congestion on key corridors) it is reasonable that it should be seen as an important component of the city's life, success and efficiency, rather than as a stand-alone business. Accordingly PB recommends a cheap but reasonable fare is recommended based on accepting a low proportion of farebox return, say 20%, with the balance funded from a variety of different ways (such as parking charges and the like).

Free fares have been found internationally to not encourage passenger transport patronage to the extent expected and can lead people to not value the service, increasing graffiti and antisocial behaviour as well as all-day riders (such as homeless people).

A small fare will both encourage use and help people to place some value on the service provided

We recommend a flat fare of $2.00 for single trips. This would be attractive to potential users and would minimise change-making by drivers, reducing boarding times.

A simple paper-based ticket would be appropriate for Nelson. While electronic smart card tickets are in use in a number of New Zealand cities (Christchurch, Dunedin, Hamilton etc) and are proving popular, they are costly to produce and the usual requirement for stored value ($10 or $20 value held on the card) can make them unattractive for low income travellers.

### 5.1.3 Accessibility and comfort

#### Bus terminals

To be an effective alternative to the private car, passenger transport needs to take people where they actually want to go. In city centres, this means buses should penetrate into the heart of the city centre and be prominent.

While both Richmond and Nelson CBDs are compact, the existing bus stop facilities (particularly in Nelson CBD) are far from prominent. While SBL's terminal has good passenger comfort it is not prominent or easily found by those unfamiliar with the city (it is also privately-owned and so may not be available , while the stops for The Bus services, located in a car parking area, are practically invisible.

PB recommends an on-street bus terminal for Nelson CBD, located in Bridge Street, near Work & Income. This location would be reasonably central and an on-street facility will be more prominent.

The figure below shows the suggested arrangement for the Nelson CBD bus terminal. Passenger pick up and drop off would occur in Bridge Street, while buses would take layover (if required) in the Montgomery Square car park. Minor adjustments to the car park entrances and some new kerbing within the car park would create an anti-clockwise bus-only circulation around the terminal.

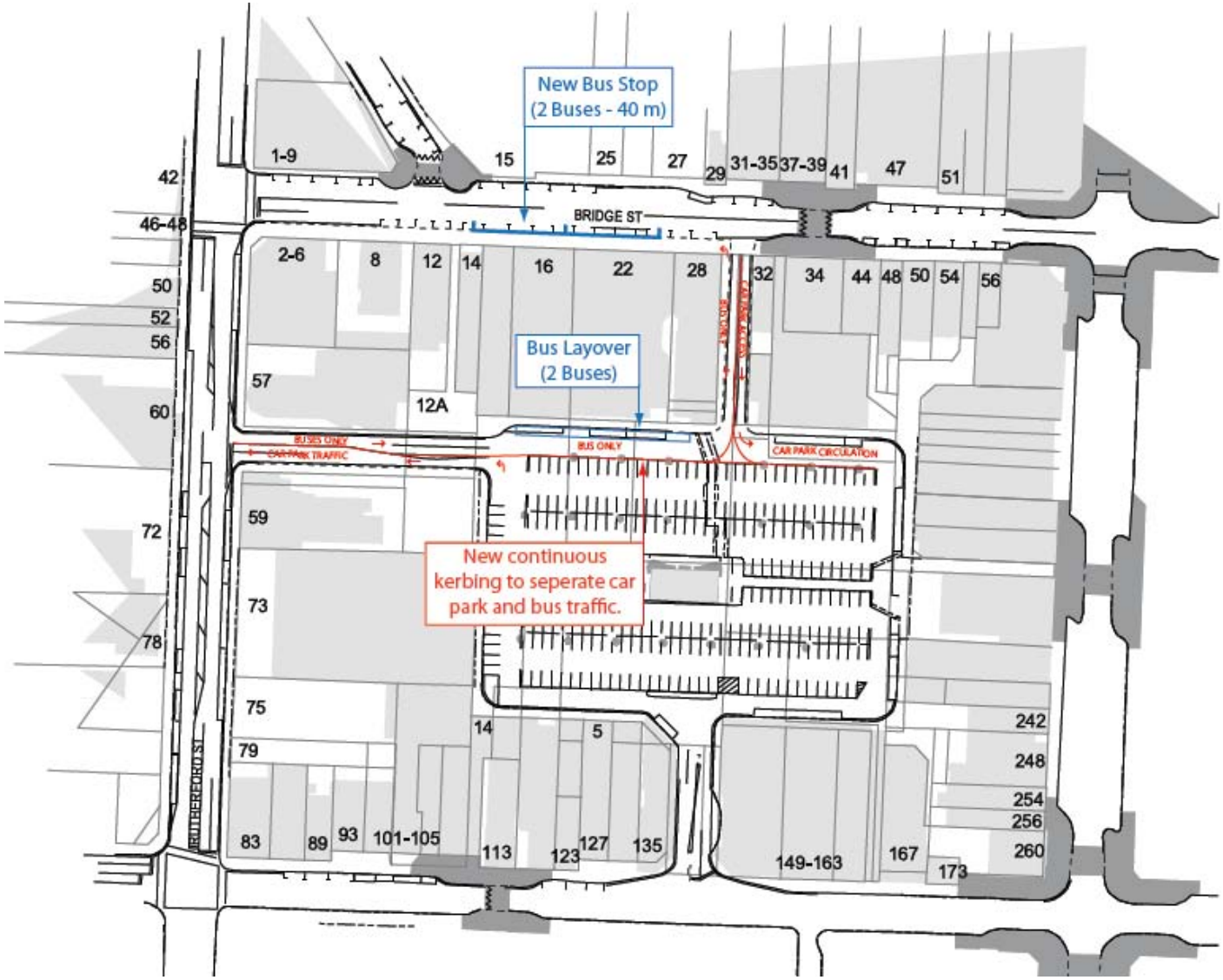



**Figure 5-8 Nelson CBD bus terminal concept**

For Richmond, PB recommends an on-street bus stop in Queen Street (as the scope of our work did not include Tasman District we have not considered a Richmond bus stop in any detail. However, in both Nelson and Richmond, overseas experience supports prominent main street locations for bus terminals – bus operations and facilities are not constraints to main street shopping activities.

Bus services commencing in Richmond town centre should also act as feeders, by originating in surrounding residential areas, to improve accessibility.

### Passenger amenity

Best practice in city centre bus facilities is for high quality passenger waiting spaces, including off-street waiting lounges. The best example is the Christchurch bus exchange, which features airconditioned and carpeted off-street airport-quality lounges, but lower-key solutions are also being developed. In Colombo Street Christchurch, a vacant main street shopfront is being converted to a high quality 'departure lounge' that provides a combination on-street and off-street environment for waiting passengers. The advantage of this approach is that it can fit within the main street vernacular, can reduce numbers of passengers waiting on-street, can minimise street furniture that can impact on footpath capacity, and can easily be converted back into a retail purpose. The concept is illustrated below and is considered compatible with both Nelson and Richmond bus terminals. An off-street lounge of this type could be incorporated into the Work & Income building for example.

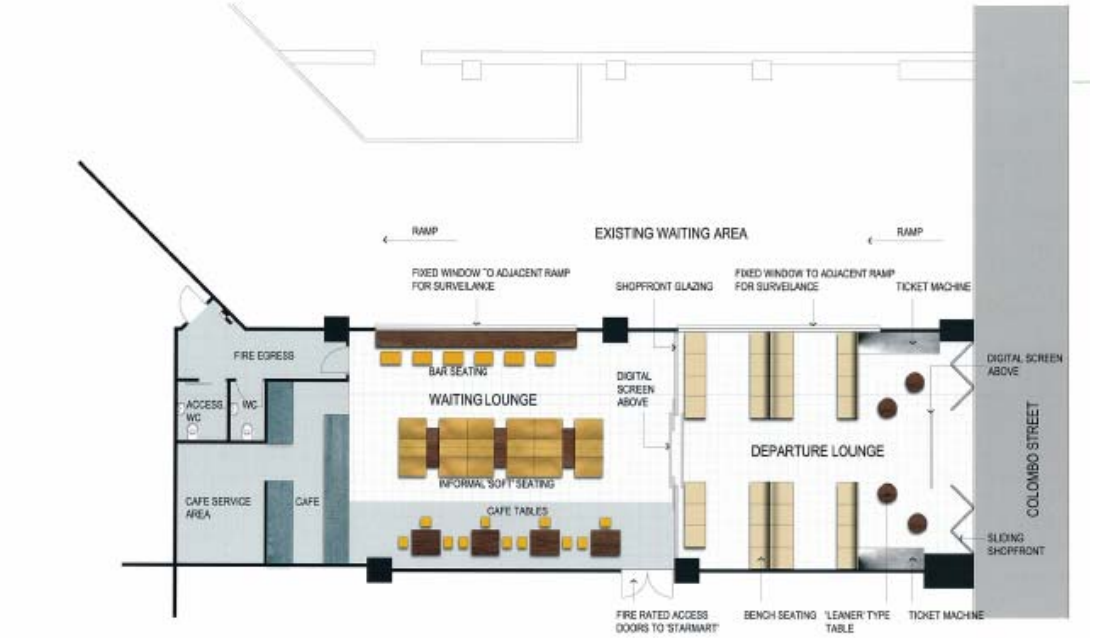



**Figure 5-9 Indicative off-street passenger lounge concept**

Stoke will be an important interchange point, where passengers will be able to transfer between the core express and secondary routes to access a range of destinations. Transfer times will be short and no more than a quality, prominent on-street stop with shelter is required.

The photo below illustrates a typical quality bus stop (from Sydney's Liverpool-Parramatta Tway) of the standard required.

**Photo 5-1 High quality on-street interchange stops**

## Park and ride

PB considers that there are limited opportunities for park and ride in the passenger transport strategy. Park and ride works best when it is used to extend the catchment of passenger transport services and where there is an advantage to potential users in using park and ride. To most reduce vehicle kilometres travelled (VKT), park and ride should be located to intercept car trips as far as possible from their destinations. However, some activity is also recommended to provide surveillance and security for parked cars.

The study area is relatively compact and the area with the best potential for a park and ride facility would be in the Tasman District, north of the Richmond Deviation. A park and ride could be integrated with Richmond Park parking (for multiple use) and a bus route extended to serve it. This could intercept car trips from Mapua, Motueka and the like bound for Nelson (though the availability of parking at the destination, and the traffic conditions on the Richmond Deviation would be influences on drivers' use of a park and ride. As PB's scope was limited to the Nelson City, we have not investigated this park and ride opportunity further.

## Fleet

The quality and comfort of the vehicles operating passenger transport services can have a great influence on system attractiveness. Best practice in New Zealand is for diesel powered low-floor buses, and the Christchurch and Hamilton Orbiter buses are good examples of the type of buses that would be appropriate for the core and secondary services (see photo below). These would provide 30 seats and capacity for another 10-15 standing passengers (providing a potential capacity between Richmond and Nelson of some 300-450 passengers per hour, or equivalent to almost half the car capacity of a lane on a city arterial road).

With Neslon's aging population, a low-floor configuration is considered essential. Low floor vehicles are the current standard among locally-made buses. Capital costs of around $300,000.

A potential risk is the limited capacity of local manufacturers to supply new buses. PB understands that orders placed by Environment Waikato may not be able to be filled by local bus makers.


**Photo 5-2 Suggested bus type for core and secondary services**

Local access routes may require a smaller bus because of the steeper, winding streets around Atawhai and the Washington Valley. A 20 seat, 9 metre rigid bus design would be appropriate.

## 5.2 Disincentives for private car use

As discussed above, disincentives for private car use must be applied at the same time as passenger transport incentives, if Nelson City's transport objectives for the PT system are to be met. The same general components that reduce disutility for passenger transport services can guide disutility for private vehicle use:

- travel time and reliability
- travel cost
- accessibility and comfort.

### 5.2.1 Travel time and reliability

Travel time data for the main corridors to Nelson CBD from the south show that traffic congestion is having an impact on travel time reliability, particularly on the Waimea Road corridor. Levels of congestion for general traffic can be important in encouraging more sustainable transport modes, particularly when passenger transport is given benefits (real or perceived), such as transit priority. Provision of additional capacity for private vehicles between Richmond and Nelson would work against passenger transport success and attractiveness. The focus of traffic management and roading improvements should be on improving conditions for passenger transport, walking and cycling.

The bus lane on Waimea Road, if implemented, should be strongly enforced, particularly as bus flows on it will be low, contributing to perceptions of underutilisation.

### 5.2.2 Travel cost

A number of strategies are available to increase travel costs for private vehicles. Increasing travel costs can have a substantial impact on demand. Measures available include road user charges (tolls and congestion charges) and parking charges.

Road pricing is more effective in a CBD area where traffic demand nears the available road capacity during the AM peak. They are less effective, or justifiable, in areas where traffic congestion is lower (such as at regional centres). One of the potential impacts of a CBD congestion charge in Nelson would be the increased attractiveness of other centres (such as Richmond) for business and retail activities, which could see the CBD's future viability affected. A road pricing approach is not considered necessary in the Nelson context (not least because of the potential costs of implementation and management).

However, work done recently in Christchurch by PB has suggested that increasing long-stay parking charges (and reducing supply of long stay parking) would be effective in encouraging greater passenger transport use.

In many cities there is a tension between the use of car parking as a transport planning tool; and as a profit centre. Many cities have moved to use car parking revenue (from parking charges, levies or parking fines) to supplement public transport services, while others continue to use parking revenue as a source of funding for expanding car parking supplies.

Several approaches are relevant:

- while parking in CBDs is often cited as a critical to allow CBD businesses (primarily retail shops) to compete with suburban or regional centres where there is less parking restraint, substantial supplies are offered to CBD workers through early-bird parking discounts or poor enforcement, weakening that argument
- in NSW Australia, the State Government imposed a car parking space levy in 1992, initially in the Sydney CBD, of $200 per long-stay space per annum, with the money being used to fund capital public transport improvements, such as transport interchanges. The levy was doubled in 1995, doubled again in 2000 and extended to regional centres. The approach has been followed by other Australian states and raises a substantial amount for public transport in NSW – some $47 million per annum
- hypothecation of car parking revenue (on-street and off-street) to public transport services and infrastructure. This is being examined in the UK, where legislation allows local authorities to dedicate revenue streams from sources such as parking charges to develop and improve public transport services. There would need to be a mechanism in Christchurch to allow parking revenue to be made available to the passenger transport funding body (Ecan). This may not need to be direct – an option used in London is for parking revenues to be used to fund a free public transport pass system for elderly and mobility-impaired travellers (Freedom Pass).

In general though, car parking supply, management and revenues (user charges and fines) should be seen as transport planning tools rather than general revenue sources for the City. Parking charges can be effective in moderating traffic and can be easily changed in influence travel behaviour (different charges in different areas, times of day etc). However, to be effective, there needs to be a district-wide policy for parking provision and charging to ensure an integrated approach and minimise unintended consequences.

Otherwise, if parking charges were increased in Nelson CBD, without a concurrent increase in parking charges in Richmond, retail and other activity could be shifted away from Nelson. Long-stay parking supplies and parking costs in Richmond and Nelson should be managed to discourage private car use by commuters and increase attractiveness of the passenger transport system.

### 5.2.3 Accessibility and comfort

As discussed above, passenger transport should be prominent in traveller destinations. It also follows that to support this, long-stay car parking should be less prominent and available to provide disincentives. PB recommends a strategy in both Nelson and Richmond of locating long stay car parking to reduce convenience for car drivers.

# 6. Assessment of the network options

## 6.1 Bus requirements and operating costs

Indicative bus schedules were developed for the two network options:

- commuter traffic congestion approach
- balanced passenger transport approach.

To identify the number of buses required to operate the services.

Revised bus travel times were determined based on provision of bus priority on Waimea Road, and the proposed routes.

The commuter traffic congestion approach would require 11 buses to operate, while the balanced passenger transport approach would require 13 buses.

The tables below show the estimated operating costs (including bus cost) for the two options, based on annual route kilometres and applying a recent New Zealand rate.

**Table 6-1 Commuter traffic congestion approach**

| Service | Round trip distance (km) | Trips/day (one direction) | Annual route km | Operating cost |
|---|---|---|---|---|
| Core express | 26.2 | 31 | 213,792 | |
| Secondary (w) | 43.4 | 22 | 243,474 | |
| Secondary (e) | 37.6 | 22 | 210,936 | |
| Total | | | | $3,436,242 |

**Table 6-2 Balanced passenger transport approach**

| Service | Round trip distance (km) | Trips/day (Mon-Thur) | Trips/day (Friday) | Trips/day (Saturday) | Trips/day (Sunday) | Annual route km | Operating cost |
|---|---|---|---|---|---|---|---|
| Core express | 26.2 | 47 | 53 | 38 | 20 | 404,187 | |
| Secondary (w) | 43.4 | 29 | 34 | 29 | 16 | 437,732 | |
| Secondary (e) | 37.6 | 29 | 34 | 29 | 16 | 379,234 | |
| Local (Atawhai) | 35.6 | 37 | 37 | 37 | 25 | 456,000 | |
| Local (Brook/Toi) | 27.4 | 37 | 37 | 37 | 25 | 350,967 | |
| Total | | | | | | | $7,922,360 |

## 6.2 Patronage and revenue estimation

Estimates of potential patronage (and potential reduction in traffic) have not been able to be made in this study because potential demand will be strongly related to the suite of supporting measures implemented, and their effectiveness. However, the Nelson transport model will provide the opportunity to test the effectiveness of the passenger transport options in generating potential patronage, and their sensitivity to supporting measures such as parking charges and the like.

PB recommends that the passenger transport network options be coded in the model and the model run (with scenarios reflecting various packages of supporting measures) to generate potential patronage, revenue, cost recovery and traffic flow changes. This would allow refinement of the options and identification of a preferred approach, as well as generating data likely to be required by LTNZ in any funding application.

## 6.3 Funding options

In addition to the conventional funding approaches embodied in national transport policies and acts (including rating), this report looks at some alternative funding approaches that may be applicable.

### 6.3.1 Best practice for sustainable development

Early introduction of passenger transport services to new development areas can have a valuable role in reducing private car use in the longer term.

This provides the opportunity to 'lock in' sustainable travel behaviour from the outset and also enables the developer or planning authority to consider some reduction in road and parking provision without adversely affecting accessibility.

In practice there can be obstacles to achieving this best practice. There are three principal types of obstacle.

- funding availability - bus services, particularly 'start up' services at new developments, frequently require subsidy funding in an environment of competing demands for those resources
- design - layout at new developments is often focused on private car use to the detriment of effective passenger transport operations
- planning - in some jurisdictions planning requirements include minimum car parking standards which can result in over-supply and consequently encourage high levels of car ownership and dependence.

Considerable progress has been made in addressing the design and planning obstacles. Planning authorities are gradually switching to 'maximum parking standards' in response to new integrated land use and transport policies. Principles of design and layout are more frequently based around sustainability objectives to provide more liveable urban environments.

Provision of passenger transport services from an early stage of urban development has proven more difficult. For most new developments it is unlikely that public transport services could be operated commercially without subsidy. Public transport subsidy is generally provided through taxation and rates and is therefore subject to policies relating to equity and distribution. Under these policies it is unlikely that public transport authorities would be prepared to fully fund services to new developments. An exception to this might be where policies on social exclusion take priority.

### 6.3.2 Current funding mechanisms

In most jurisdictions developers are required to provide non-voluntary contributions to fund the capital infrastructure improvements and expansions which are necessary to accommodate growth from new developments across the area. These contributions are almost always restricted to capital budgets for community infrastructure such as wastewater treatment, water supply, roading and leisure facilities.

In Auckland, ARTA (the Auckland Regional Transport Authority) is beginning to receive requests from developers to accept voluntary contributions towards passenger transport operating budgets, where the proposed development is being marketed or developed with a sustainable transport theme. There are also substantial potential benefits to developers from encouraging public transport use, including greater intensity of development on sites because of lower requirements for parking and roading.

Currently there are few examples of developers being required to provide non-voluntary contributions for public transport operating. To some degree this may reflect public sector accounting practices which are concerned with the transparent separation of capital and operating budgets. Where developer contributions for services have been provided these have generally been focused on a 'voluntary' basis through one-off partnership arrangements.

However, PB considers that there is scope to develop a policy to encourage more transport-sustainable developments in the Nelson/Tasman districts, by promoting developer contributions towards the operating costs of passenger transport service improvements, (as well as required infrastructure) and allowing developers incentives for transport-sustainable developments (such as reduced parking provisions and capital infrastructure contributions).

The use of a property developer funding contribution to help pay for needed transit service is becoming a common practice world-wide. The following section outlines international practice in voluntary and non-voluntary developer contributions for public transport services.

### 6.3.3 Developer Contributions

Internationally, the use of developer contributions to help pay for transit service is becoming standard. It is generally understood that new developments increase the travel demand of an area; thus, some sort of travel plan is needed to mitigate for the increased strain on the existing travel network.

In the State of Florida, U.S.A, any development that is deemed to have a significant impact on its surrounding region is deemed a Development of Regional Impact (DRI). These developments are then forced go through a DRI process where the host municipality will issue a Development Order (DO) in response to the Application for Development Approval submitted by the DRI. The DO will often outline certain transport objectives that the developer must meet before construction is permitted.

Similarly, England's Department for Transport has outlined within their planning policies that a Transport Assessment (TA) is required for any new development that is likely to have significant transport implications. As the English case studies show, most of these TAs result in the developer contributing to the area's transit service.

### Non-Voluntary

The majority of international case studies are examples of non-voluntary developer contributions. In these scenarios, the local government agency forced the developers to subsidise local transit service and infrastructure. Most often, these types of agreements were part of the planning and permitting process for the development. The scope of the contribution was largely based on the scale of the development and its proximity to a larger urban centre.

For example, Queen Elizabeth Park in Guildford, Surry, England is a relatively small development that has fairly convenient access to local facilities. Thus, the public transit provision in the developer's travel plan was fairly basic: the developer subsidised an upgraded bus service for 5 years and offered a £200 bus travel voucher to each household in order to encourage bus use.

On the other hand, larger developments such as the North Lakes community located 25 km north of Brisbane, Queensland, Australia required the developer to be more financially involved. An agreement was made between the developer and the State Government that the developer would take on full financial risk to provide bus services to the community until the area was deemed viable for services provided by the government. The agreement also stipulated that the developer would contribute approximately A$1 million towards public transport services, thus, any money that was not used during the initial development (3-4 years) was transferred to the government.

### Voluntary

There are also current examples of voluntary developer contributions; however, they are not as common as non-voluntary. One example is the Marquam Hill Transportation partnership in Portland, Oregon, USA. The group of health facilities located on Marquam Hill formed the partnership with the City of Portland and local transit agency Tri-Met in order to mitigate the potential travel impacts of the planned extension of Oregon Health Sciences University (OHSU). The partnership developed a plan that provided 5 express bus routes directly to the hill, with the medical institutions and Tri-Met paying 70% and 30%, respectively, of the operating costs. Additionally, the medical institutions developed a carpool matching program and a vanpool incentive program.

The developers of Warner Center in Los Angeles, California, USA also took a proactive approach to transport management. When they purchased the land to build the development, they contributed US$5 million to a trust fund that would help finance transport improvements for the community. One main provision was that a portion of the money would finance the creation and continued support of a Transit Management Organization. Additionally, the developer must contribute US$3,500 to the trust fund for every commuter that a new office development attracts.

### Incentives

In reality, the line between voluntary and non-voluntary contributions is somewhat blurred. As mentioned early, many governmental agencies are integrating travel plans and contributions into their planning process. Since developers will likely be forced to contribute anyway, the difference between voluntary and non-voluntary becomes when and how the transport arrangements are made. Thus, there are indirect benefits that make voluntary contributions increasingly attractive to developers.

1. easier development process - An increasing number of government agencies legally require developers to take some responsibility for transport planning as part of the planning process. Thus, developers that are proactive in their transport planning can accelerate the permitting process. For example, the Marquam Hill Partnership was created partly to avoid legal battles with the neighbouring community over congestion and was successful in avoiding conflict

2. increased control over type and size of contribution - when developers voluntarily contribute, they are able to propose a plan that works best for them and their community vision instead of being dictated by the local government agency. For example, in Cambridge, England, developers that created their own transport mitigation plans were able to avoid the lump sum fee that the City and County Council would have charged

3. sustainability branding - As the public becomes increasingly environmentally aware, developers can benefit from sustainability branding. Developments that are branded as ‘sustainable’ because of their design and transport strategies will often have less political opposition and also be preferred over traditional developments. For example, Stapleton, Colorado, USA has received world-wide acclaim for its progressive environmental ideas relating to community planning. Among its many achievements, it has won the Stockholm Partnerships for Sustainable Cites Award and the US Environmental Protection Agency’s Environmental Achievement Award. Another example is the Marquam Hill Partnership, which has been commended by numerous sustainability organizations and was given the 1998 BEST award for transportation alternatives by the City of Portland Office of Sustainable Development.

Inclusion of mechanisms to encourage more transport-sustainable development approaches within the Nelson/Tasman area may help to reduce future traffic, while also providing a more focused source of funding for passenger transport improvements.

### 6.3.4 Central government

The upcoming Government Policy Statement (GPS) is expected to provide more details on funding of the transport strategy over the next 6 years and some mechanisms are expected to include full hypothecation of fuel excise duties, road user charges and motor vehicle licence fees to transport, which could provide a funding source for passenger transport infrastructure improvements. In addition, the potential for a regional fuel tax could provide capital funds for infrastructure.

Government's proposed SuperGold free off-peak travel for seniors will also potentially generate a funding source for services.

### 6.3.5 Parking fees and fines

As discussed above, allocation of parking fees and fines could provide an additional funding source for passenger transport improvements in Nelson, that would link travel demand management directly with passenger transport provision.

## 6.4 Procurement options

One of the risks for Nelson in implementing a comprehensive and substantially enhanced passenger transport network in a reasonably small city, is that few or no potential operators may emerge.

It is far from clear whether the existing commercial operator could resource such a large increase in new fleet and staff, particularly if the long-term success of the network relies on the implementation of supporting measures, including disincentives for private car use (and the political will this would require).

Even if the services are contracted, it is not clear if competitive bids would be received for the same reasons. It is likely that only a single operator could bid and Council would not be certain that they could achieve the best value for money. The cost of the fleet required to provide the service and the relative isolation and small size of Nelson may act as a disincentive to bidders.

One option PB recommends to remedy this is to take a similar approach to Adelaide bus contracts, which is for the Council to retain ownership of the fleet and acquire a depot, and to lease these to potential operators.

Benefits of this approach are:

- the removal of the requirement to purchase fleet removes a substantial barrier to entry – more tenders would result and Council could act to avoid monopoly tendering
- contract costs are expected to be lower, as there will be more competition and existing operators would not necessarily have a local advantage (but would not necessarily be disadvantaged in comparison with larger operators
- council would have more control over the vehicle type and quality used.

In any case, PB recommends a gross cost contract approach. Given that the success of the service will depend on a range of factors influenced by Nelson and Tasman councils, it is appropriate that Council take the risk.

# 7. Conclusions and recommendations

Nelson City's objective for passenger transport to have a greater role in managing traffic congestion on the main Nelson corridors will require much more than just an enhanced passenger transport network.

In addition to a high frequency service operating modern vehicles and supported by bus priority measures and high quality passenger facilities, both Nelson city and Tasman District will need to adopt a policy of active disincentives to private car use, including increased parking charges.

However, Nelson cannot do this alone. Much of the future demand for travel to Nelson and along the currently congested corridors will come from new urban development around Richmond and elsewhere in Tasman District. Tasman District must be an active partner in a coordinated transport strategy to encourage a more sustainable transport future for the two cities.

Of the two potential approaches for the passenger transport network, a solution that focuses solely on addressing traffic congestion in the Richmond-Nelson corridor during peak times would be the wrong approach for Nelson, because it would disadvantage transport-disadvantaged residents and would not be consistent with national policies for a sustainable transport future in New Zealand. PB recommends taking a balanced approach, including local access routes and longer operating hours to maximise the community benefit.

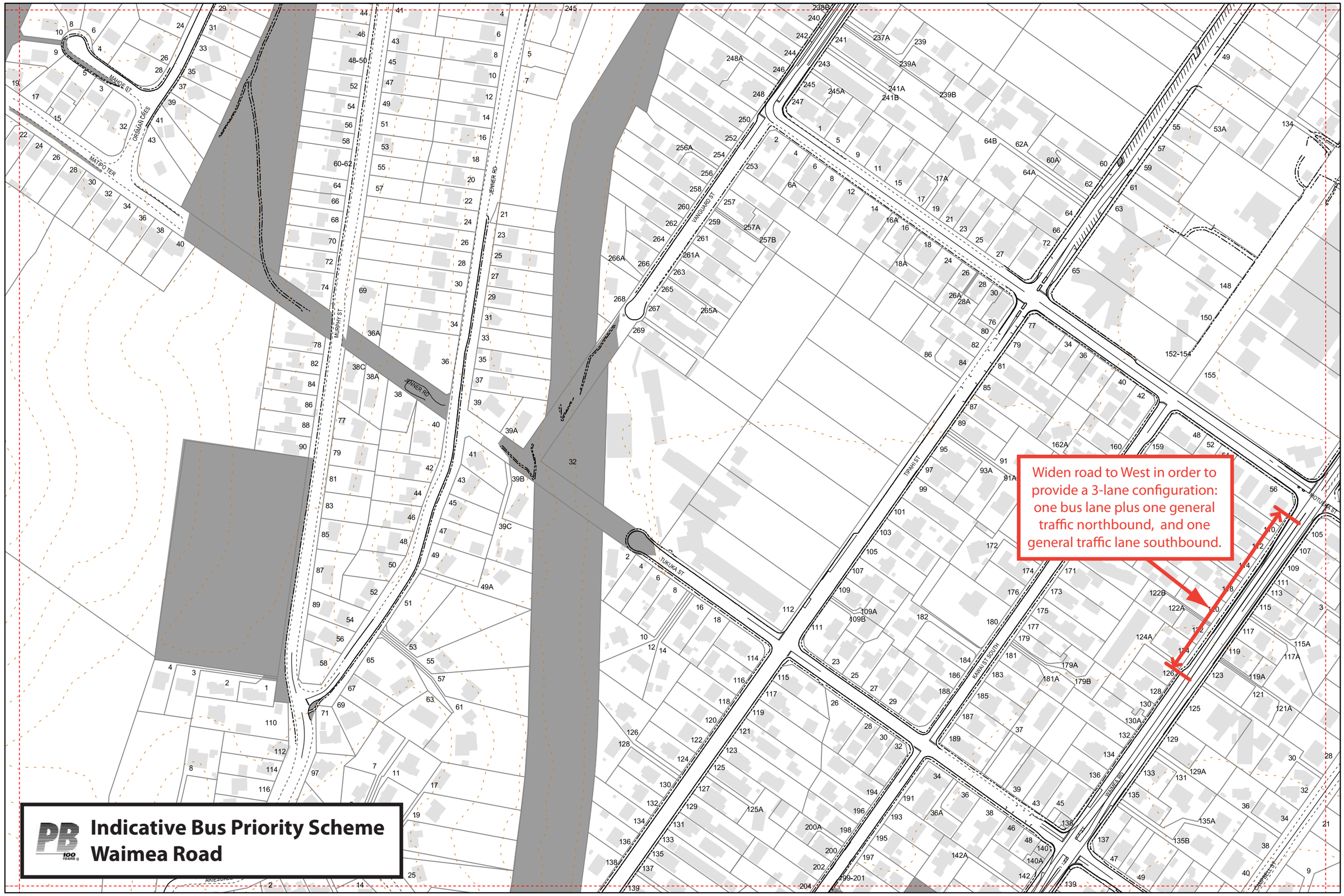
Innovative approaches are recommended for funding of the passenger transport services and for procurement to maximise potential funding (including having development itself fund improved services) and to minimise risks that Council may not be able to secure an operator for the expanded services.

PB recommends proceeding with low-cost bus priority measures on Waimea Road, to promote the passenger transport alternative.

As well, PB strongly recommends that Tasman District's transport needs be studied in more detail, to ensure they are an integrated part of the overall solution.

# Appendix A

Indicative Bus Priority Scheme




# Indicative Bus Priority Scheme
# Waimea Road

## NELSON CITY COUNCIL ROADEDGE & ROAD MARKING LOCATIONS



**Legend**

- NCC Kerbs
- NCC Road Edges
- Other Road Edges
- Other Kerbs
- Contours at 10m Intervals
- Nelson City Markings
- Footpaths
- Buildings
- NCC Managed Parks

1:2,500

**MAP 41**

**Apr 08, 2008**

Remove flush median and widen road to west in order to provide 3-lane configuration: one bus lane plus one general traffic lane northbound, and one general lane southbound.

Southbound Waimea Rd - ban parking during peak periods to achieve partial southbound bus lane and supporting bus priority measures.

Adjust linemarking to provide one bus lane plus one general traffic lane northbound, and one general lane southbound.

Reconfigure Boundary/Waimea Rd intersection (close Bishopdale Ave intersection) to provide 4-way intersection with bus queue bypass lane southbound.

# Indicative Bus Priority Scheme Waimea Road

NELSON CITY COUNCIL

## NELSON CITY COUNCIL ROADEDGE & ROAD MARKING LOCATIONS



Legend

- NCC Kerbs
- NCC Road Edges
- Other Road Edges
- Other Kerbs
- Contours at 10m Intervals
- Nelson City Markings
- Footpaths
- Buildings
- NCC Managed Parks

1:2,500

**MAP 47**

Apr 08, 2008

Remove speed humps.

Install gate to limit access to bus and local traffic (e.g. retracting bollard).

PINNACLE PL

HIGHVIEW DR

BEATSON RD

SCOTIA ST

ULSTER ST

WAIMEA RD

ANGLIA ST

WEKA TUTOR

CRAGGS RD

# Indicative Bus Priority Scheme
# Waimea Road

NELSON CITY COUNCIL

## NELSON CITY COUNCIL ROADEDGE & ROAD MARKING LOCATIONS



**Legend**

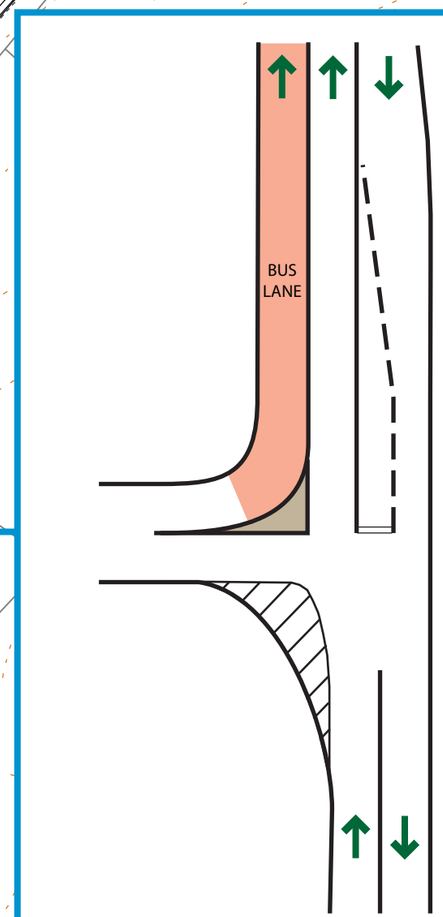
- NCC Kerbs
- NCC Road Edges
- Other Road Edges
- Other Kerbs
- Contours at 10m Intervals
- Nelson City Markings
- Footpaths
- Buildings
- NCC Managed Parks

1:2,500

**MAP 53**

**Apr 08, 2008**

Adjust line marking to provide northbound bus lane




Reconfigure intersection for free left turn for buses from Beatson to Waimea

# Indicative Bus Priority Scheme Waimea Road

NELSON CITY COUNCIL

## NELSON CITY COUNCIL ROADEDGE & ROAD MARKING LOCATIONS



**Legend**

- NCC Kerbs
- NCC Road Edges
- Other Road Edges
- Other Kerbs
- Contours at 10m Intervals
- Nelson City Markings
- Footpaths
- Buildings
- NCC Managed Parks

1:2,500

**MAP 54**

Apr 08, 2008