

4.6 Option F – Tahunanui to Washington Valley Tunnel

(Cost \$\$\$\$\$)

This option proposes to construct a tunnel between Tahunanui and Washington Valley as shown in Figure 4.6-1 below.

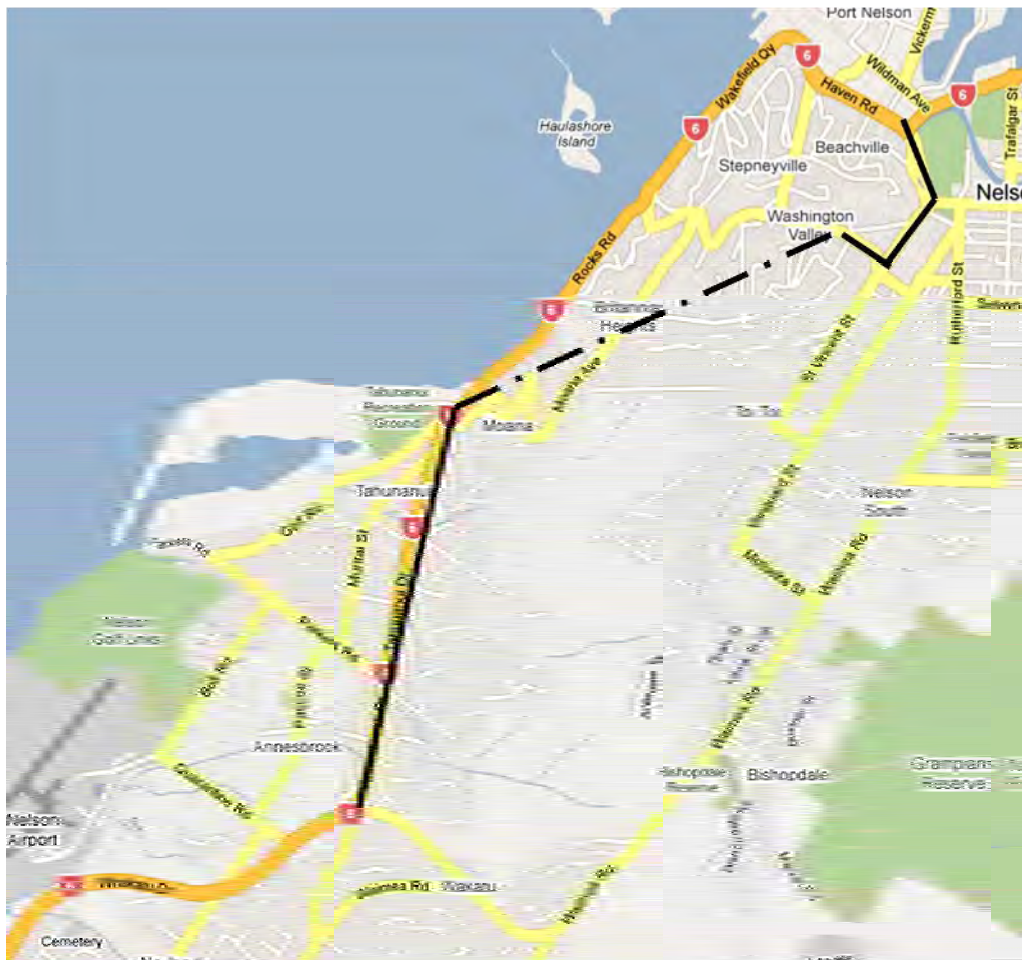


Figure 4.6-1 Option F - Tahunanui to Washington Valley Tunnel

Pro and Cons of the Tahunanui to Washington Valley tunnel	
Pros	Cons
<ul style="list-style-type: none"> • Decreased travel times • Direct access to the Port Hills suburbs 	<ul style="list-style-type: none"> • Very expensive • Increased traffic volumes for Washington Valley and surrounding suburbs, and in Tahunanui • Constructability issues • Funding issues

4.7 Option G – Princes Drive to Whakatu Drive Link

(Cost \$\$)

This option involves the construction of a link between Princes Drive and Whakatu Drive link as shown in Figure 4.7-1 below. The Council already plans via a private developer to link Princes Drive to Waimea Road although this is going to be a local route



Figure 4.7-1 Option G - Princes Drive to Whakatu Drive Link

Pro and Cons of the Princes Drive to Whakatu Drive link	
Pros	Cons
<ul style="list-style-type: none"> • Provides link for local Port Hills traffic • Removes some local traffic from Rocks Road • Relatively inexpensive 	<ul style="list-style-type: none"> • The route to the city centre from Princes Drive is through winding (non-arterial standard) residential streets • Significant terrain issues • Does not provide benefits for arterial traffic

4.8 Option H – Rocks Road Four Laning

(Cost \$\$\$-\$\$\$\$)

This option involves constructing a new seawall to the northwest of the existing frontage on Rocks Road and providing a dual carriageway with cycle lanes on both sides of the road.

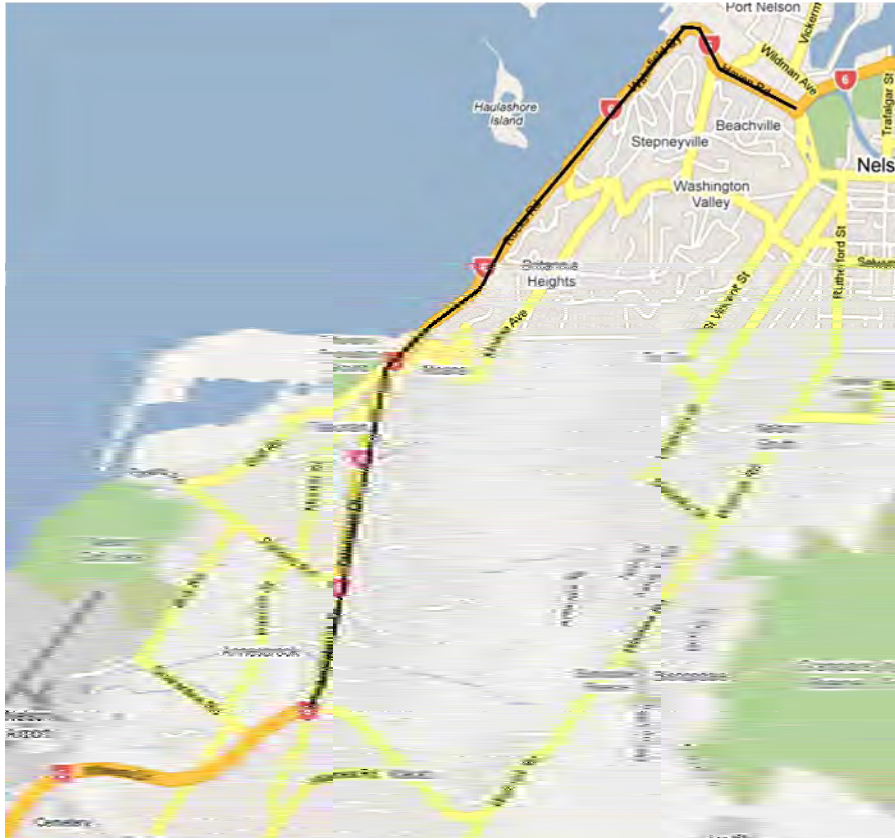


Figure 4.8-1 Option H - Rocks Road Four Laning

This option could be varied by providing three lanes with tidal flow, or by building an expressway and retaining the existing route as a local access road only.

Pro and Cons of four laning Rocks Road	
Pros	Cons
<ul style="list-style-type: none"> Decreased travel times due to greater capacity on Rocks Road Pedestrian / cycle boulevard facility Reduced traffic on Waimea Road 	<ul style="list-style-type: none"> Very expensive, including the land requirements Increased traffic volumes on Rocks Road Constructability issues Impacts on seaward side facilities (e.g. Boat Shed, Boathouse) and access to foreshore areas Impacts on the historic nature of Rocks Road including the seawall, the stabilisation of cliffs and the historic fence. Difficulty at intersections on Rocks Road Local driveway access and parking issues Extreme weather events and sea level rise could affect option

4.9 Option I – Waimea / Rutherford Four Laning

(Cost \$\$-\$\$\$)

This option involves four laning Waimea Road and Rutherford Street as shown in Figure 4.9-1 below.

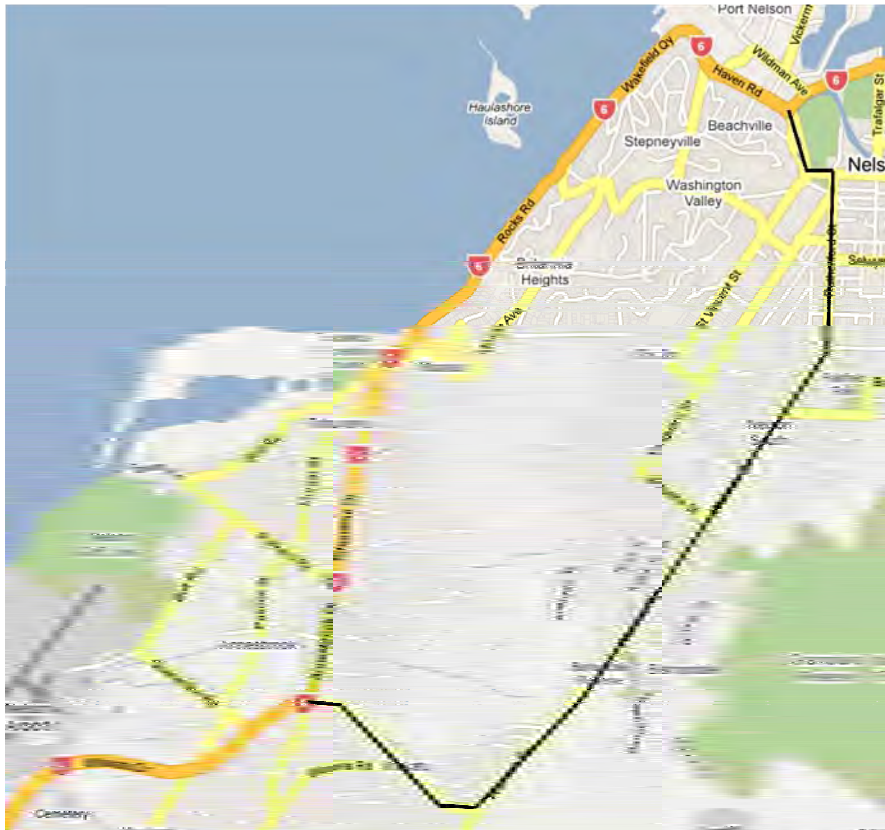


Figure 4.9-1 Option I - Waimea / Rutherford Four Laning.

This option could be varied by widening to only three laning the roads and providing tidal flow facilities along this route.

Pro and Cons of the four laning of Waimea / Rutherford	
Pros	Cons
<ul style="list-style-type: none"> • Decreased travel times • Less traffic on Rocks Road, Vanguard Street and St Vincent Street 	<ul style="list-style-type: none"> • Expensive • Increased traffic on Waimea Road • Accessibility/Severance issues • Local driveway access and parking issues • Land requirements • Air quality issues • Decrease pedestrian / cycle connectivity • (Road Safety design challenges for three lane option)

5 Rail Infrastructure Options

5.1 Option J – Freight Rail on old Railway Reserve

(Cost \$\$\$\$\$)

This option looks to establish a freight rail service from Richmond to the Port via the old railway reserve as shown in Figure 5.1-1 below. This option could be extended to include a passenger service to Richmond.

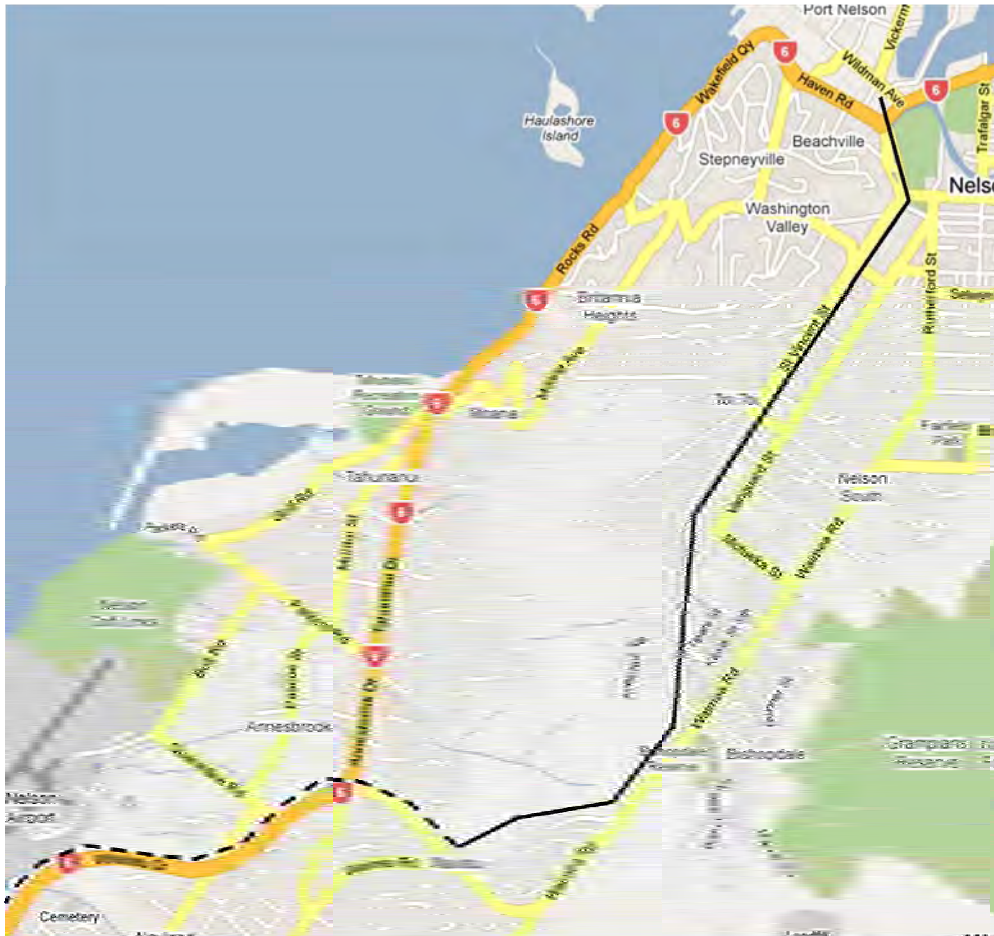


Figure 5.1-1 Option J - Freight Rail in the old Railway Reserve

Pro and Cons of freight rail in the old railway reserve	
Pros	Cons
<ul style="list-style-type: none"> • Reduces volumes of trucks using Rocks Road • Passenger rail could provide some relief to arterial routes 	<ul style="list-style-type: none"> • Very expensive • Impacts on adjoining properties • Requires double handling of freight • Increase freight cost • Land costs at each termini • Minimal impact on private vehicle travel times • People still need to drive to rail station and are therefore likely to drive the whole way • Potential loss of rail reserve cycleway

5.2 Option J1 – Rail in Port Hills Tunnel

(Additional cost \$\$\$\$\$)

This option looks to reinstate trains and tunnel through the Port Hills to the CBD for trains as shown in Figure 5.2-1 below.

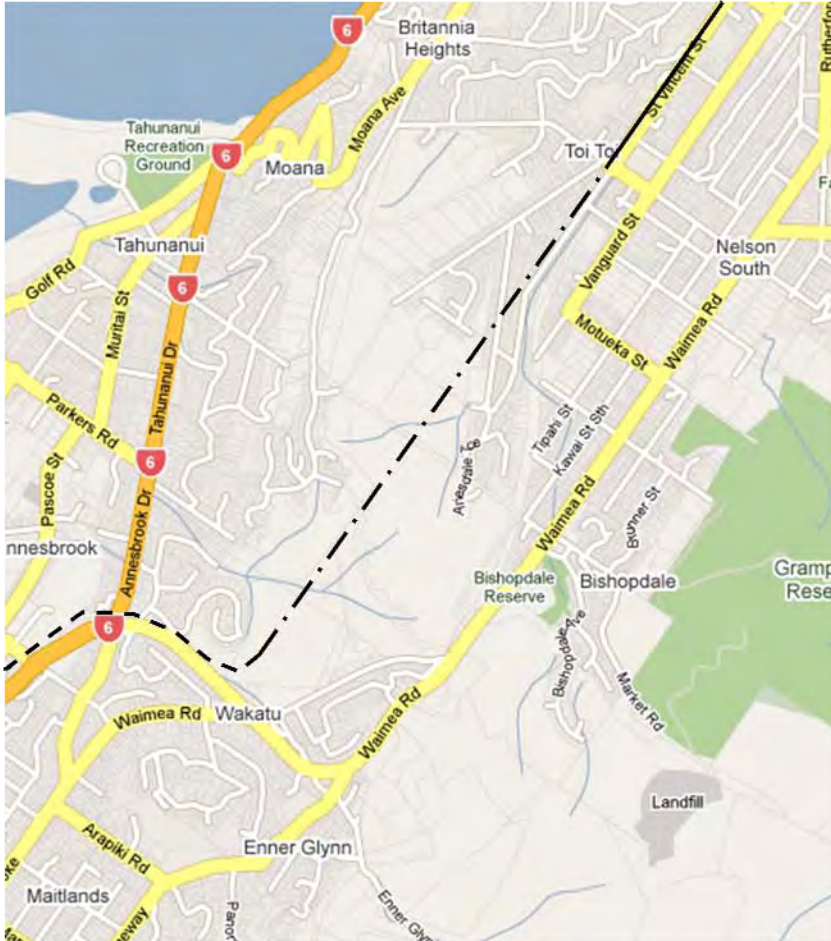


Figure 5.2-1 Option J1 - Rail in Port Hills Tunnel

Pro and Cons of rail in Port Hills tunnel	
Pros	Cons
<ul style="list-style-type: none"> Cycle facilities retained on old rail reserve 	<ul style="list-style-type: none"> Very expensive addition \$\$\$\$\$ No additional benefits for arterial traffic or freight movement

5.3 Option K – Light Rail

(Cost \$\$\$\$)

This option would involve the construction of either a light rail service or a “SkyTrain” route for passengers to travel between Richmond and the Nelson CBD as shown in Figure 5.3-1 below. The service would be a passenger only service and would not be used by freight.

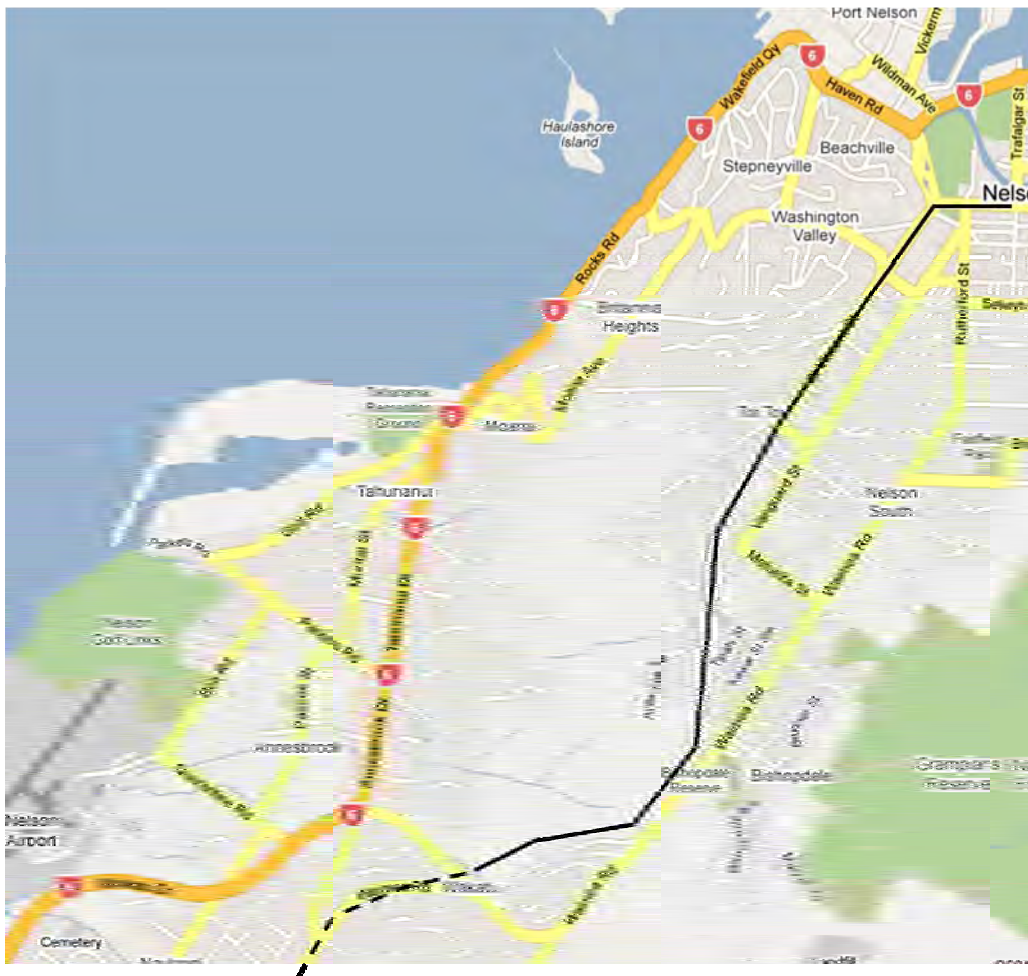


Figure 5.3-1 Option K - Light rail

Pro and Cons of Light Rail	
Pros	Cons
<ul style="list-style-type: none"> • Less traffic on Rocks Road and St Vincent Street • Good express public transport service 	<ul style="list-style-type: none"> • Very expensive • Limited patronage demand • Likely lower frequency service compared to buses as light rail has much higher capacity per service • Land requirements • Services limited to as far as Richmond and Stoke only • Does not remove freight from Rocks Road • Reduces road capacity on Main Road Stoke, probably creating areas of congestion.

6 Public Transport Options

The public transport options outlined below are taken directly from the Passenger Transport Network Plan appendix of the current Regional Land Transport Strategy (RLTS).

A diagram showing the proposed routes referred to in this section is presented in Figure 6.3-1 below.

It is estimated that there are approximately 220,000 passenger trips per annum on the current public transport network.

Four Public Transport options are presented in the RLTS, entitled Phases A, B, C and D. The options propose increasing levels of service provision, which could be introduced through a staged approach. Whilst the RLTS proposes Phase A, the NZTA have stated that it is unlikely to receive funding under current evaluation criteria as the proposal does not align with national investment priorities.

The estimated costs included below are taken from the RLTS and are annual costs. The local share is also given assuming a 50% contribution from NZTA for the net costs (after revenue from fares is deducted). This cost would need to be covered by Nelson City Council and Tasman District Council.

As well as the increase in bus frequency and services as outlined in the option descriptions below, bus infrastructure would also be improved. The RLTS suggested that the infrastructure improvements include bus stop upgrades, on-street bus interchanges at Nelson, Stoke and Richmond and bus priority measures within Richmond, Nelson CBD and on Waimea Road. Park and Ride facilities will also be considered to improve the bus service, and although unlikely to be viable in the short-medium term may be in the longer term. The estimated cost of these infrastructure improvements was estimated to be approximately \$1.5M in addition to the cost of the service improvements outlined below; however the cost could be substantially higher than this, depending on the exact facilities proposed.

6.1 Phase A

The option includes the provision of one express bus service and two secondary bus services between Nelson and Richmond operating at least every 30 minutes in the peak, with a lesser frequency outside these times, Monday to Saturday 6.30am to 6.30pm. One secondary service will operate to the west and one will operate to the east of the corridor. The existing local access service (branded "The Bus") to retain its existing level of service, subject to regular review of routes and timing.

The RLTS does not specify how many additional passenger trips per annum are targeted by this option, however preliminary modelling is showing that total system patronage could be in the order of 300,000 in the first year the services are introduced, rising to 380,000 by 2016.

The annual cost of the option is expected to be a minimum of \$2.1M (of which \$0.8M would be funded by the Councils) and a maximum of \$3.1M (of which \$1.32M would be funded by the Councils).

6.2 Phase B

This option includes the provision of one express bus service and two secondary bus services between Nelson and Richmond operating at least every 30 minutes from 6.30am to 6.30pm Monday to Saturday (with a combined frequency of every 10 minutes) as in Phase A.

There will also be an hourly evening service until 11.30pm and hourly daytime services on Sundays.

The existing local access service (branded "The Bus") will be revised and upgraded to at least 60 minutes in the daytime from Monday to Saturday.

This option is expected to generate 380,000 passenger trips per annum in the first year rising to 625,000 passenger trips per annum after three years.

The annual cost of the option is expected to be a minimum of \$3.52M (of which \$1.49M would be funded by the Councils) and a maximum of \$5.27M (of which the Councils would fund \$2.24M)

6.3 Phase C

This option is the same as Phase A but with an additional express service operating at least every 20 minutes from 7.00am to 6.00pm from Monday to Saturday and earlier morning Express and Secondary services from Monday to Saturday.

This is expected to generate up to 730,000 passenger trips per annum after three years.

The annual cost of this option is expected to be a minimum of \$4.18M (of which \$1.77M would be funded by the Councils) and a maximum of \$6.29M (of which \$2.67M would be funded by the Councils)

6.4 Phase D

This option is the same as Phase B but with an additional Secondary service operating at least every 20 minutes between 7.00am and 6.00pm from Monday to Saturday.

The existing "The Bus" services will be substantially revised and upgraded to operate every 30 or 60 minutes in the daytime between Monday and Saturday with some additional evening and Sunday provisions.

This is expected to generate up to 855,000 passenger trips per annum after three years.

The annual cost of this option is expected to be a minimum of \$5.70M (of which the Councils would fund \$2.42M) and a maximum of \$8.80M (of which the Councils would fund \$3.73M).

Pro and Cons of Public Transport	
Pros	Cons
<ul style="list-style-type: none"> • Environmentally sustainable • More resilient to peak oil pressures • Provides accessibility and mobility options for whole community • Safe for users • Efficient use of road space if well patronised 	<ul style="list-style-type: none"> • Limited patronage compared to private vehicle travel – impacts on road congestion limited • Not high on current central government funding priorities • Poor service levels (frequency, routes and hours of operation) for funding committed/available

6.5 Proposed Passenger Transport Network

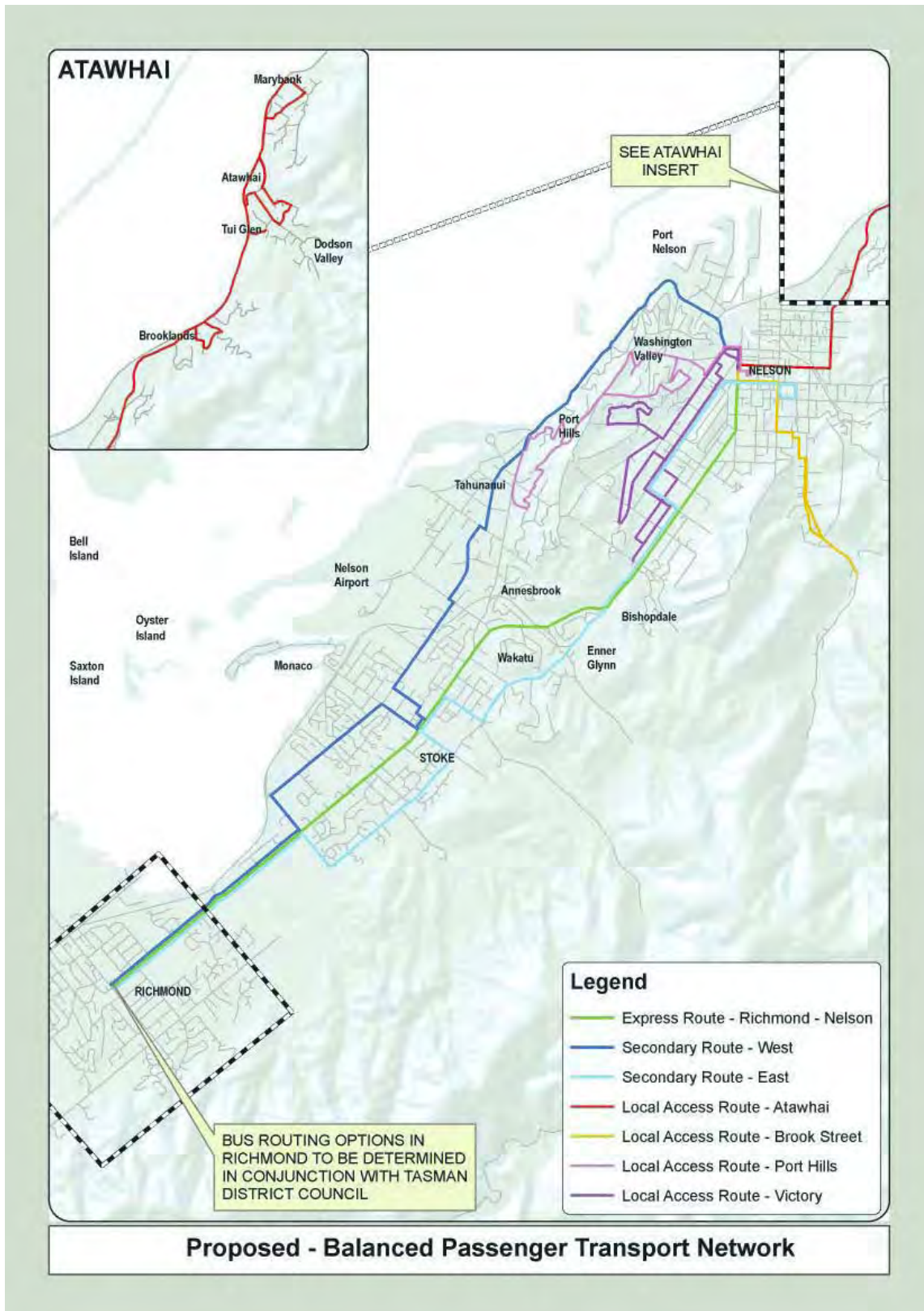


Figure 6.3-1 Proposed Passenger Transport Network

7 Travel Demand Management

Travel demand management could also be implemented as an exclusive option or combined with any of the options above. Travel demand management options are a range of measures which influence the demand for travel – that is when, where, how, and how often we travel. They are different to those measures which focus on providing “supply” to the transport system, such as roads, infrastructure and public transport services. Such examples of travel demand management include:

- School travel plans
- ‘TravelSmart’ targeted travel choices programme
- Workplace travel plans
- Car-pooling
- Tele-working infrastructure
- Promotion of alternative forms of travel/Marketing/Education programmes
- Road pricing
- Increase parking pricing/public parking restrictions and controls
- Review resource management plan rules (e.g. to reduce on-site parking requirements)

Many of these measures promote “active travel” (walking and cycling mainly) as alternative modes to the private motor vehicle for travel. These are already well established modes in Nelson (more popular than public transport) with potential for further use, given more promotion, education and integrated infrastructure. Further discussion on each of these options can be found in the Nelson City Council Regional Travel Demand Management Strategy which is an attachment to the RLTS.

It is noted, however, that for Travel Demand Management to be most effective a good level of walking and cycling infrastructure and an attractive public transport system needs to be in place. Accordingly Travel Demand Management measures would need to be implemented along with improvements in these other areas.

8 Fatal Flaw Analysis

All of the 'long list' options were presented to the Decision Making Team who undertook an initial 'fatal flaw' analysis. The purpose of the fatal flaw analysis is to remove any options from consideration at an early stage if there is no chance of them being implemented in the future.

Two fatal flaw criteria were considered by the Decision Making Team as part of this process, namely:

- Whether the option would provide significant benefit to arterial traffic
- Whether the option is prohibitively expensive, i.e. neither NZTA nor Nelson City (via their ratepayers) would consider funding the project.

The answers to these questions were obtained through the knowledge of the project team and the decision making team members, rather than undertaking detailed analysis at this stage of the project.

8.1 Arterial Traffic Benefits

This fatal flaw analysis primarily revolved around the question "will this option provide benefits for arterial corridor travel". As discussed earlier in the report, arterial traffic was taken not to mean motor vehicles in particular, but the transport of people and freight via an arterial network, be this on road or other transport corridor.

The following table outlines the results of the fatal flaw analysis in regard to whether the options provide significant benefit for arterial traffic. Each option is discussed in more detail after the table.

Table 8-1 : Arterial Traffic Benefits

Option	Significant Benefit to Arterial Traffic?
Option A: Part time clearways	Yes
Option B: Southern Arterial	Yes
Option B1: Southern Arterial with exclusive links	Yes. No significant benefit over Option B
Option B2: BORN Bypass	Yes. No significant benefit over Option B
Option B3: Southern Arterial with Flyover	Yes
Option B4: Southern Arterial with Viaduct	Yes. No significant benefit over Option B3
Option C: Southern Route via Marsden Valley	No. Route unlikely to be attractive to arterial traffic
Option D: Tahunanui to Haven Drive Tunnel	Yes
Option E: Annesbrook to Emano Street Tunnel	Yes
Option F: Tahunanui to Washington Valley Tunnel	Yes
Option G: Princes Drive to Whakatu Drive link	No. Adds traffic to local streets
Option H: Rocks Road four laning	Yes
Option I: Waimea Rd / Rutherford St four laning	Yes
Option J: Freight Rail in Railway Reserve	No. Freight would not transfer to rail
Option J1: Rail in Port Hills Tunnel	No. No significant benefit over Option J
Option K: Light Rail	Yes. Although likely to be minor
Option L: Public Transport	No, not by itself and needs major TDM measures co-ordinated. Effects likely to be minor
Option M: Travel Demand Management	No. But would complement other options, especially Option L.

The peak hour clearway option was shown to provide benefits to arterial traffic when analysed in the North Nelson to Brightwater Strategic Study. Whilst the forecasts of population and employment have

changed significantly since this study and the traffic volumes are not expected to increase to the same extent, the provision of an additional lane during peak hours will provide benefit for arterial traffic.

Likewise, routes along the railway reserve have also been shown to have significant benefits in previous studies. However, options B1 and B2 that involve variations to the southern end of the Southern Arterial route (Option B) have both been set to one side as variations for assessing at a later stage should the basic option B be favoured in some form, although options B1 and B2 would not provide any additional benefits to arterial traffic over option B, and both would also reduce accessibility for local traffic. Accordingly, these options are not being considered further for the time being.

The 'southern route' from Hill Street, Richmond to The Brook past Grampians Reserve would need to traverse through very hilly terrain. This terrain would mean that any route would be either very winding which would not really be suitable for arterial traffic and may result in the link being significantly longer than the current arterial routes or very expensive to provide a higher standard alignment. Furthermore the route through The Brook area is not suitable for arterial traffic. Overall the additional length, the likely curvy nature of the route and the fact that it would only benefit those drivers travelling between Richmond and the CBD rather than anywhere in between, meant that it would attract very little arterial traffic and resulted in this option being discarded.

Tunnels can provide significant travel time savings, due to complete separation of traffic from what is termed 'side friction' (i.e. side roads, driveways, parking, pedestrians and cyclists etc). All traffic options would provide benefits in this respect, however the options that terminate in Emano Street would require significant widening and upgrading of this road so that it would be suitable for (and therefore create benefits for) arterial traffic. It must be noted, however, that the exact alignment of any tunnel option would be subject to further investigation.

The Princes Drive to Whakatu Drive Link has been discounted as Princes Drive is not deemed suitable for arterial traffic. Furthermore, a link from Princes Drive to Waimea Road is already proposed to provide an additional connection for local traffic as part of future subdivision works.

The options which propose to four lane the existing arterial routes would clearly provide benefits for arterial traffic and are therefore brought forward for further consideration.

The options which involve provision of heavy rail services for freight and/or passenger transport have been discounted as freight would not be attracted onto rail and therefore there would not be benefits to arterial traffic from this modal shift. Freight would not be attracted to rail primarily due to the very short length of rail that would be able to be progressed; it could not tie into any other rail networks as there are none in close proximity to Nelson. One of the key strengths of rail is in its ability to transport large heavy loads through long distances. This would not be able to be undertaken in Nelson as the closest rail networks are in Picton on the east coast and Ngakawau (north of Westport) on the West Coast. Transferring freight to rail would be both more expensive and more time consuming than utilising the road network. It would be more time consuming as freight would need to be transferred from trucks to rail at a rail interchange/yard around the Richmond area for transport to the Port. It would be more expensive as the cost of installing and operating the rail network and termini, and the rail infrastructure such as the rolling stock would need to be borne by the freight operators who would already be paying for road freight infrastructure and services.

Some benefits are possible in moving people from cars to rail based public transport, however light rail systems would be at least as attractive as standard rail. Light rail could provide some benefits to arterial traffic in creating a modal shift away from the private car. This could be both for passengers on the light rail network who could obtain a faster journey to work and also to freight and remaining passenger vehicles on the existing arterial network which would have less traffic creating delays.

Expanding and improving the current public transport (bus) network could similarly create some benefits for arterial traffic albeit not significant by itself but more so in conjunction with TDM measures. Faster journey times could be obtained by bus commuters by both providing better buses on routes with increased frequencies and also with improvements such as bus lanes and bus interchanges. Thus Public

Transport can add to the benefits and scoring of other options under the MCA framework if implemented in an integrated fashion with those options. To this end, a public transport package will be included in all options investigated in Stage 3 but not taken on by itself.

Travel Demand Management by itself is unlikely to have a significant impact on arterial traffic unless it is combined in a package with viable and attractive alternatives to the private car. Accordingly, TDM would need to be implemented with significant improvements to the public transport system and further walking and cycling improvements. To this end, some level of TDM will be included in all options investigated in Stage 3.

8.2 Cost

Some of the options identified in this report would never be constructed due to the constraints on funding availability both locally, through the Council, and nationally, through NZTA.

Currently, the first priority for nationally distributed funding through NZTA is for the Roads of National Significance, of which there are none in Nelson. The current National Land Transport Programme (NLTP) states that, while additional funding is being placed into activities designed to stimulate economic development and growth, the NZTA cannot even afford, within the National Land Transport Fund (NLTF) funding constraints, to complete all the elements of the Roads of National Significance within 10 years. The NLTP goes on to state that this means that trade-offs will be required across the range of State highway activities, so that funding is used most effectively to deliver best value for money from a national perspective.

Accordingly, even a modestly priced solution for this study would have to vigorously compete for funding over at least the next 10 years, and the demand on funding past this point is unlikely to subside as traffic levels are predicted to continue to increase in the larger cities, creating additional economic constraints.

On the local level, if Nelson City Council was to proceed with a local project option, it would typically pay 50% of the cost, with the remaining 50% being sought from the NLTF. The 50% 'local share' would need to be prioritised and programmed in the 10 year Long Term Council Community Plan (LTCCP) and to progress would either need to displace other projects or require an increase in rates.

This fatal flaw analysis has used a figure of approximately \$100-200M as the price point which is expected to be too expensive for Council and the NZTA to consider funding within at least the next 20 years, and possibly further. For example, an impact of a \$100-200M local project would be to require about \$50-100M of Council "Local share" funding, which analysis has shown, in today's market conditions, would currently require a 8.3%-16.5% increase on annual property rates for many decades. This increase could be higher if interest rates go up again in a stronger economy.

However, this is not to say that any option under \$100M would be able to attract funding; this is still a very large cost and any project, regardless of cost, would need to be proven to create significant economic benefits and would be prioritised alongside other projects prior to being included in the National Land Transport Programme and/or the Nelson LTCCP.

Some of the submissions presented during the consultation phase of the North Nelson to Brightwater Strategic Study raised the possibility of using tolls to help pay for some of the costs of the more expensive options such as the tunnels. Current legislation allows for tolling; however only on a new route where there is an alternative route without tolls. Investigations for other projects around New Zealand recently have determined that tolling typically only finances around 10% of the entire project cost. This would be no different in Nelson, especially as none of the options would provide very large travel time benefits (e.g. such as those yielded by a new bridge that bypasses a long route around an inlet). Accordingly, tolling would not deliver enough of a cost saving to alter the fatal flaw analysis.

The following table outlines the results of the fatal flaw analysis in regard to whether the cost of the option is likely to be prohibitive. This is applied to each of the options remaining after the initial analysis above. Each option is discussed in more detail after the table.

Table 8-2 : Cost of Options

Option	Cost less than \$100-200M?
Option A: Part time clearways	Yes
Option B: Southern Arterial	Yes
Option B3: Southern Arterial with Flyover	Yes
Option B4: Southern Arterial with Viaduct	No. Would considerably exceed \$100M
Option D: Tahunanui to Haven Drive Tunnel	No. Would exceed \$200M.
Option E: Annesbrook to Emano Street Tunnel	No. Would exceed \$200M.
Option F: Tahunanui to Washington Valley Tunnel	No. Would exceed \$200M.
Option H: Rocks Road four laning	Yes
Option I: Waimea Rd / Rutherford St four laning	Yes
Option K: Light Rail	No. Would exceed \$200M.
Option L: Public Transport	Yes

The North Nelson to Brightwater Strategic Study considered that the part time clearways option was likely to cost less than \$20M and a route along the railway reserve less than \$40M. These costs will be revisited in this study, although they do appear to be comparatively affordable projects.

Adding a short underpass to the Southern Arterial option bypassing Toi Toi Street will considerably increase its cost to the point where it may not be fundable; however the cost is such that both this and a flyover should be retained for further consideration as a possible addition to the Southern Arterial.

Whilst there is some benefit to arterial traffic in providing a flyover or a tunnel at Toi Toi Street, the viaduct option for a raised carriageway down St Vincent Street has been rejected as in addition to its high cost and incremental cost over Option B, it also does not provide any significant additional benefit to traffic over and above that already provided by the Southern Arterial with a flyover. Furthermore, it could actually result in additional travel for many people wanting to access the southern areas of the CBD as they would need to travel back via Haven Road, having passed the CBD.

All major tunnel options would easily exceed the \$200M figure, with the longest option likely to cost multiples of this number. In addition to the construction cost of such an option, significant operating and maintenance costs are also required throughout the life of the structure.

In terms of public transport infrastructure, light rail is significantly more expensive than buses in terms of both construction and operational cost. The population of Nelson and Tasman is much too small to be able to adequately support such infrastructure costs. The most appropriate way to provide many of the benefits of rail transport without the high costs is to have dedicated bus ways, or a guided bus system. This provides the flexibility of being able to use buses which can traverse local streets to pick up passengers and then the convenience of having dedicated facilities to bypass congested areas. These bus ways could be upgraded to light rail at some stage in the future. The most appropriate place for a bus way within the study area is along the railway alignment and the option of providing a route purely for public transport could be considered as part of Option B.

As noted in the previous section, the Public Transport option should be combined to complement other options, and the cost options are all well within the fatal flaw threshold.

9 Stage 3 Options

From the above fatal flaw analysis four options warrant further consideration. These are:

- **Option A: Part time clearways (plus PT and TDM)**
- **Option B: Southern Arterial (plus PT and TDM) including consideration of a flyover or an underpass at Toi Toi Street**
- **Option H: Rocks Road Four Laning (plus PT and TDM)**
- **Option I: Waimea Rd / Rutherford St Four Laning (plus PT and TDM)**

As most of Option B is the same as Option B3, these options will initially be considered together. The first part of Stage 3 will look at the likely costs and benefits of an underpass or a flyover and a decision will be made as to whether to retain one of those additions throughout the Stage 3 process.

Whilst the Public Transport option was considered to not warrant progressing as a stand-alone option due to no significantly affecting arterial traffic, it is considered that Public Transport would provide the valuable benefits if it is developed alongside other options. To this end, it is proposed to include Phase A public transport as well as the bus infrastructure improvements proposed in the RLTS within all four options. This will enable comparisons to be made with the modelling which has already been undertaken for the existing situation with and without Phase A. Higher levels of public transport have not been proposed as part of options primarily as the most logical implementation strategy would be to implement Phase A initially with further phases of public transport progressed in the future in response to increased demand.

A range of Travel Demand Management measures will also be included in each of the four options.

The full extent of these options will be developed during the first part of Stage 3; however a preliminary description of each option is presented below.

9.1 Option A: Part time clearways

Option A would provide for arterial traffic by providing an additional peak-hour clearway lane on the existing road corridors between the Haven Road roundabout and the Annesbrook Drive roundabout. A clearway lane would be provided northbound on SH6 (Annesbrook Drive, Tahunanui Drive, Rocks Road and Wakefield Quay) and southbound on Rutherford Street and Waimea Road (these clearway locations simplify traffic management at the key intersections at each end of the corridors).

The clearway lanes would become available for parking during off-peak hours. Along the waterfront, the footpath on the seaward side would be widened (with piles or by cantilevered construction) to incorporate a 4m-wide footway and cycleway. This would enable the current on-road cycleway to be removed and three lanes to be provided on the existing carriageway.

This option would not include the restrictions included in the option that went out for consultation under the North Nelson to Brightwater Strategic Study. For the current study, it will be assumed that the part time clearways would operate in both peaks, as the current model is showing an increase in travel in what is currently considered to be the 'off-peak direction'. Furthermore the lanes will be available for all vehicles, rather than just high occupancy vehicles (cars with two or more occupants), buses and freight.

Further development work is required into the appropriate form of intersection treatments along the length of the routes. This will be undertaken early in Stage 3 of the study.

9.2 Option B: Southern Arterial

Option B would involve the construction of a new Southern Arterial along Beatson Road, the Railway Reserve and up St Vincent Street.. This would be a two-lane two-way local road with at-grade intersections. A separate 3m wide footpath/cycleway will also be provided along the Railway Reserve.

In the base option, traffic signals would be installed at the St Vincent Street/Toi Toi Street intersection. However, alternatives of a short underpass and an overbridge will also be considered early in Stage 3 to determine the benefits and costs of such a treatment.

A new roundabout would be constructed at the southern end of the route adjacent to the existing Waimea Road/Beatson Road roundabout. Other intersection treatments will be determined early in Stage 3.

During the investigation of this option, and further to the light rail discussion earlier in this report, consideration will also be given to the impacts of running the route as a public transport only corridor.

9.3 Option H: Rocks Road Four Laning

Option H would involve widening the existing SH6 between Annesbrook roundabout and the Haven Road roundabout to provide four lanes; two in each direction.

Along the Rocks Road section of the route, the requirement for additional width would require a new seawall to be constructed to the northwest of the existing one. This would be constructed to allow dedicated pedestrian and cycle facilities to be separated from the through traffic.

Consideration will be given to property requirements, intersection treatments, property access and pedestrian and cycle connectivity early in the Stage 3 development of this option.

9.4 Option I: Waimea / Rutherford Four Laning

This option involves providing four lanes on the existing Waimea Road and Rutherford Street from the Annesbrook Drive roundabout to the Haven Road roundabout. Whilst four lanes will be required at the southern end of the route, the need for the additional lanes decreases towards the northern end of the route as traffic diverts to schools, the hospital, the CBD and other destinations.

Accordingly, the extent of four laning required will be determined early in Stage 3 of the study along with issues such as property requirements, intersection treatments, property access and pedestrian and cycle connectivity.

The possibility of providing an efficient connection from four lanes over Bishopdale Hill to St Vincent Street north of Victory Square will also be considered under this option as an alternative to four laning the entire length of Waimea Road.