Main Road Transit Corridor

Stage Two - Identification of Corridor Improvement Options

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Department of Infrastructure,
Energy and Resources

Tasmania
Explore the possibilities

CONTENTS

1 EXECUTIVE SUMMARY

Stage One of the Main Road Transit Corridor Plan focused on identifying existing problems on the Transit Corridor from a public transport perspective. The identification of these problems helped to inform the identification of options in Stage Two of the project.

Stage Two of the Transit Corridor project encompasses three key stages:

- Option Generation Workshop: identification of a broad range of options to improve public transport along the Corridor.
- Strategic option assessment: identification of options which should be investigated further through the detailed option assessment (based on strategic merit).
- Detailed option assessment: assessment of options based on social and economic benefits and identification of recommended options.

The following options have been recommended for inclusion in the draft Transit Corridor Plan (Stage Three) which will be the subject of public consultation. These options will enable public transport to be improved on the Main Road Transit Corridor through targeting the Corridor problems and objectives.

Figure 1 Recommended options for improving public transport on the Main Road Transit Corridor

Improved frequency and temporal span of bus services
1. Immediate improvements to bus frequency in response to demand: • Weekday (7:00 AM-7:00 PM): frequency every ten minutes or less. • Saturday (7:00 AM-7:00 PM): frequency every 20 minutes. • Sunday (7:00 AM-7:00 PM): frequency every 30 minutes. • All days (before 7:00 AM and after 7:00 PM): frequency every 30 minutes.
2. Immediate improvements to temporal span to ensure consistency across the week: • Monday to Saturday: services commence at 5:30 AM and finish by 1:00 AM. • Sunday: services commence at 7:00 AM and finish by 10.00 PM.
3. Ensure any changes provide services with predictable and consistent frequencies (harmonised timetables).
4. In the medium-term, monitor demand and make the necessary improvements to frequency and temporal span.
Simplify Northern Suburb bus services
1. Metro Tasmania to undertake a Northern Suburbs Bus Service Review to ensure routes are as simple and direct as possible and maximise use of the Transit Corridor.
Better managing our road network
1. Develop a road network approach within Hobart and Glenorchy local Government areas to establish the priority use of roads by transport mode, time, and place of activity.
Bus priority measures
1. Implementation of short-term bus priority treatments to improve travel time reliability for buses, including: • Bus priority approaching major intersections (reallocation of road space and providing signal priority). • Removal of Springfield Depot inward diversion.
2. Investigation of medium-term bus priority treatments to reduce the diversion caused by the one-way street network within the Hobart CBD.
3. Investigation of medium-term bus priority treatments at key intersections, such as queue-jump bus lanes and bus-early start signal priority. For the longer-term, consider set-back bus lanes depending on the effect of short and medium term bus priority measures.
Improved bus stop infrastructure
1. Upgrade bus stop infrastructure, including shelters, seating and passenger information displays and ensure stops are accessible (DDA compliant).
2. Review bus stop lengths to ensure the space is adequate for efficient bus manoeuvrability.
Bus stop optimisation
1. Optimise the number of bus stops along the Corridor to improve travel time reliability.
Increased density and mixed use through infill development
1. State and local Government to jointly investigate mechanisms to facilitate development, in the form of higher residential densities and mixed use, focusing on the Main Road Transit Corridor and its activity centres.
A better urban environment to support and encourage the use of public transport, walking and cycling.
1. DIER and Glenorchy and Hobart City Councils to ensure urban design frameworks for activity centres

within the Transit Corridor support and encourage public transport, walking and cycling.
2. Improved pedestrian connections to major bus stops within activity centres through targeted infrastructure upgrades and/or signage. Major bus stops to target include: • Hobart Bus Mall (subject to the outcomes of the Hobart Central Bus Interchange project). • Glenorchy Bus Mall. • Elizabeth Street bus stops (between Liverpool and Bathurst Streets, bus stop id 3385/341 and 958). • North Hobart activity centre (bus stop id 346 and proposed new stop near Lefroy Street). • Moonah activity centre (bus stop id 358 and 937). • New Town activity centre (bus stop id 354 and 944).
Improved cycling connections to the Transit Corridor and Principal Urban Cycling Network
1. Improved connectivity ,through targeted infrastructure upgrades and/or signage for the following Transit Corridor cycling connections: • Bathurst Street, Molle Street to Campbell Street. • Burnett Street, Murray Street to Campbell Street. • Newdegate Street, Mellifont Street to Elizabeth Street, with link via Strahan Street to Argyle Street. • Archer Street, Argyle Street to New Town Road. • Bay Road, Inter-city cycleway to New Town Road via Cross Street. • Bromby Street, Inter-city cycleway to New Town Road. • Derwent Park Road or alternative route (eg. Bayswater Road, Lutana rail spur). • Tolosa Street or alternative route (Humphreys Rivulet).
Provision of secure bicycle parking at select locations on the Transit Corridor
1. Provision of additional short-term bicycle parking facilities within Moonah activity centre.
2. Investigate the provision of long-term secure bicycle parking at Glenorchy activity centre.
Corridor branding and marketing of services
1. Better understand the target markets for public transport users and their expectations, in order to create an informed direct marketing campaign.
2. Investigate and implement options to brand Metro Tasmania's Transit Corridor services.
3. Develop a uniform 'brand' for bus priority infrastructure through the use of a distinctive colour.
Improved passenger service information
1. Provision of simplified, easy to understand and accessible pre-trip information including: • Internet journey planners. • Integrated website for all Greater Hobart bus services.
2. Provision of real time passenger information: • Fixed roadside passenger information at interchanges and major bus stops. • Smart phone applications, SMS and recorded messaging. • Web-based information.

2 PURPOSE OF STAGE TWO REPORT

The Stage One report (released in July 2012) identified existing problems on the Transit Corridor to help inform the identification of options for improving public transport in Stage Two of the project.

Stage Two of the project encompasses:

- Option Generation Workshop: identification of a broad range of options to improve public transport along the Corridor
- Strategic option assessment: identification of options which should be investigated in more detail through the detailed option assessment based on strategic merit.
- Detailed option assessment: assessment of options based on social and economic benefits and identification of recommended options.

2.1 Problem identification

The Stage One Report identifies problems at both the metropolitan and Transit Corridor level, as follows:

Metropolitan level

- Population growth occurring in outer urban areas.
- Low levels of population density.
- An ageing population.
- People experiencing social exclusion.
- Low levels of physical activity.
- High reliance on cars.
- Vulnerability to increases in oil prices.
- Transport's contribution to greenhouse gas emissions.
- Increasing cost of transport infrastructure.

Corridor level

- Low levels of population growth in Glenorchy City Council in comparison to surrounding areas.
- Low levels of public transport use.
- The complexity of the Northern Suburbs bus network.
- Demand for improved bus frequency and temporal span.
- Poor travel time reliability for buses.
- Poor quality bus stop infrastructure and pedestrian links.
- Cycling infrastructure gaps.

Actions developed in the Transit Corridor Plan will need to properly target the problems identified above. Problem identification is increasingly being used at a national level by Infrastructure Australia in assessing whether infrastructure proposals are actually addressing a demonstrable and significant deficiency.

3 TRANSIT CORRIDOR VISION

The vision for the Corridor is based on the project objectives, together with consultation with stakeholders through a public transport reliability workshop held in Stage One of the project.

3.1 Corridor Vision

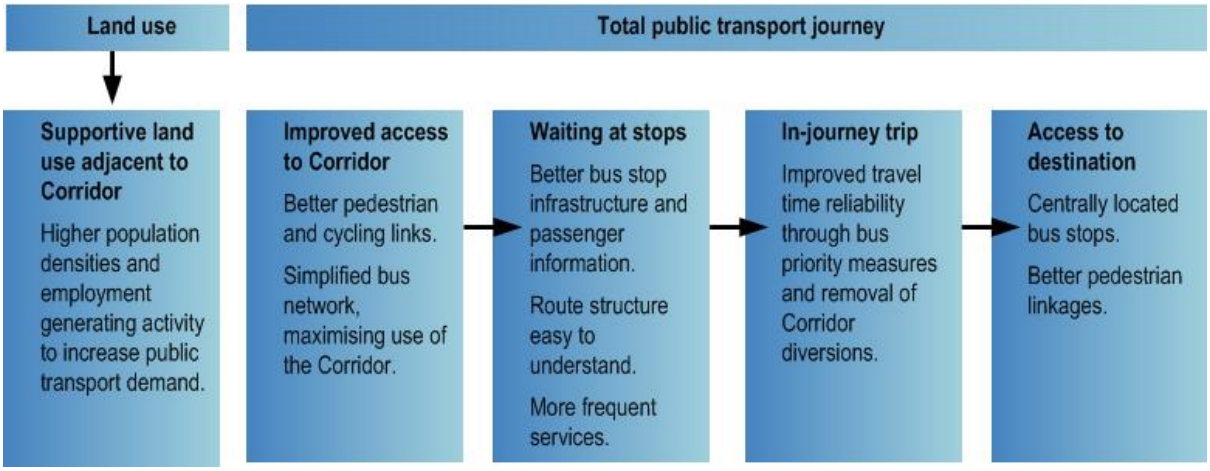
Main Road is a core public transport route through the Northern Suburbs, with a public transport system that is frequent, reliable and supported by high quality infrastructure. The

focus will be on improving the reliability and effectiveness of the existing bus system to build public transport demand.

To achieve this:

- Public transport will have greater priority on Main Road.
- Public transport routes will be easy to understand and supported by high quality bus stop infrastructure and passenger information.
- Services will have a high frequency all day, every day.
- Pedestrian and cyclist access to the Corridor and Principal Urban Cycling Network will be improved.
- The Corridor will be a focal point for land use change through higher densities and greater employment activity.

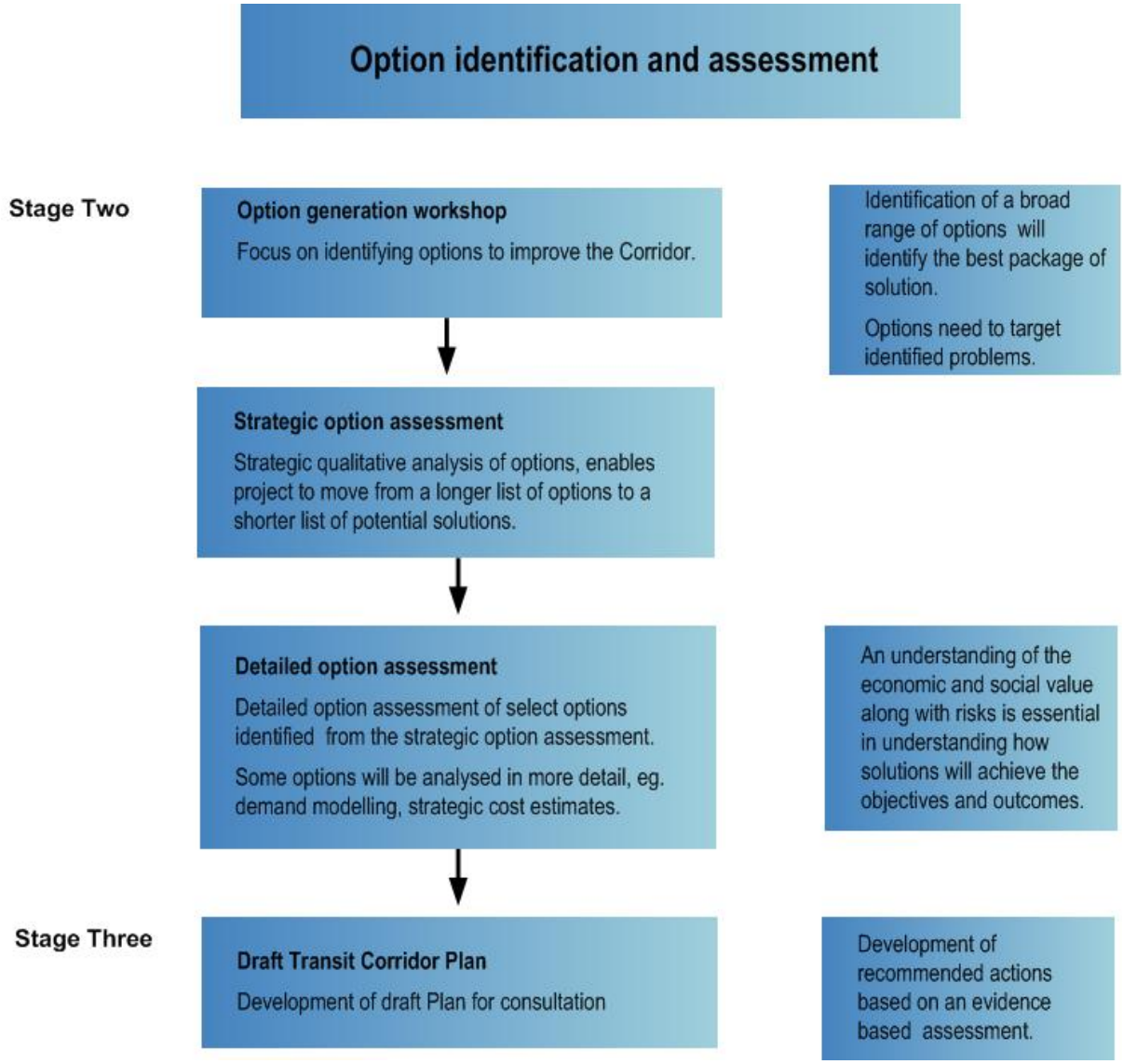
Figure 2 Transit Corridor vision



4 PROCESS FOR OPTION IDENTIFICATION

Figure 3 outlines the process for the identification and assessment of options to improve the Transit Corridor.

Figure 3 Process for option identification and assessment



4.1 Options generation workshop

A workshop was held on 21 June 2012 with key stakeholders to assist in identifying options for improving the Transit Corridor. The purpose of the workshop was to ensure that a comprehensive list of upgrade options was captured, and to commence consideration of priorities and weighting of different options. The outcomes of the workshop are contained in **Attachment A.**

4.2 Strategic option assessment

A strategic option assessment was undertaken of the options identified in the Options Generation workshop that were high and medium scoring. These options were consolidated into a shorter list of higher level options, as some of the options identified were similar.

The strategic option assessment enabled the project to move from a longer list of options to a shorter list of potential solutions, through a qualitative assessment of the strategic fit of each of the options proposed. Options were assessed in terms of:

- Strategic policy (alignment with strategic plans and the Transit Corridor project objectives).
- Ability to address identified Corridor problems.
- Whether the option required a change to the Corridor or the whole transport and land use planning system.
- Community acceptability.
- Ease of implementation.
- Planning and development costs.

The strategic option assessment is located at **Attachment B.**

4.3 Detailed option assessment

The detailed option assessment provides analysis of the options identified as part of the strategic assessment and identifies recommended options. The detailed assessment is essential in understanding how effective the recommended option is likely to be in addressing the identified problems and achieving the project objectives and its economic and social benefits.

Some options are analysed in more detail in terms of measuring the impact on travel demand and the cost of implementation, these include bus priority measures and bus stop optimisation and upgrades. These measures are analysed in more detail as they have been submitted to the Australian Government as part of the Nation Building 2 Program, which required development of a Benefit Cost Ratio (BCR). Development of BCR's is a complex process as it requires the benefits to be monetised, this is difficult for public transport, walking and cycling projects as many of the social and environmental benefits are hard to quantify and place an economic value on.

Smaller less complex options such as improving frequency and temporal span do not generally require a BCR, as they are generally low cost initiatives and a merits based assessment which identifies the costs and benefits is usually considered sufficient.

4.4 Nation Building 2 Program

The following options have been submitted to the Nation Building Two Program:

- Planning and delivery of short-term bus priority measures, which can be effectively implemented in the near future.
- Planning and delivery of improved bus stop infrastructure, including bus stop optimisation and upgrading of bus stops.
- Planning for medium-term bus priority measures, focusing on the Hobart CBD to reduce the diversion for buses caused by the one-way street network.

The total funding sought to plan and deliver these projects is $3 million.

These options are considered to be significantly progressed in terms of identification of Corridor improvement options and analysis to submit as infrastructure projects for funding. The measures are presented at a 'concept' level only. More detailed planning is required to optimise the effect of the recommended treatments and resolve any outstanding issues (eg. stakeholder consultation and detailed design).

5 OPTION ASSESSMENT

5.1 Improved frequency and temporal span of bus services

Recommended options:

1. Immediate improvements to bus frequency in response to demand:
    - Weekday (7:00 AM-7:00 PM): frequency every ten minutes or less.
    - Saturday (7:00 AM-7:00 PM): frequency at least every 20 minutes.
    - Sunday (7:00 AM-7:00 PM): frequency at least every 30 minutes.
    - All days (before 7:00 AM and after 7:00 PM): frequency at least every 30 minutes.
2. Immediate improvements to temporal span to ensure consistency across the week:
    - Monday to Saturday: services commence at 5:30 AM and finish by 1:00 AM.
    - Sunday: services commence at 7:00 AM and finish by 10:00 PM
3. Ensure any changes provide services with predictable and consistent frequencies (harmonised timetables).
4. In the medium-term, monitor demand and make the necessary improvements to frequency and temporal span.

5.1.1 Service frequency and temporal span

Service frequency has to be carefully matched to the demand on the Transit Corridor if services are to operate as efficiently and productively as possible. A frequency which is too high can result in an over-supply of services with low passenger utilisation per bus and therefore reduced fare cost recovery. A frequency which is too low can result in overcrowding and reduced overall passenger volumes over time.

The Stage One report highlighted that the Transit Corridor performs well in terms of desired frequency levels, but that improvements need to be made to the level and consistency of frequency during the weekday inter-peak and at weekends. These are periods coinciding with core shopping hours where demand is strong for services on the Corridor due to a very large number of trip attractors on-route. The Transit Corridor has a lower frequency than other comparative services operating in other cities for weekends and evening periods (after 6 PM). The frequency during this period needs to be improved, if Main Road is to operate as a genuine Transit Corridor.

It is proposed that passengers will wait no more than ten minutes for a bus service between 7:00 AM to 7:00 PM during weekdays and in the evening (after 7:00 PM) no more than 30 minutes. During the AM and PM peaks, services will operate at a higher frequency than ten minutes, eg. on average five to seven minutes, however most services during the day will operate within a ten minute frequency. The maximum waiting times on Saturday and Sunday (7:00 AM to 7:00 PM) would be 20 and 30 minutes respectively.

The temporal span of services on the Transit Corridor is applied inconsistently with variations in starting and finishing times across most days of the week. Transit Corridor weekday services start later than other systems, commencing at 6:00 AM with other systems generally commencing between 5:00 or 5:30 AM. Services on a weekday (Monday to Thursday) finish earlier than other systems. The temporal spread on Sundays is also limited. There is a need to operate services as consistently as possible particularly from

Monday to Saturday, only diminishing temporal spread if demand is lower, for example on Sunday evenings.

Currently services on the Transit Corridor operate on an inconsistent (deharmonised) basis, with services departing on irregular timetables which make it hard for passengers to predict departure times. This uncertainty for passengers increases waiting times at bus stops, which leads to passenger annoyance and reduced patronage. Where Metro has made timetables irregular, patronage has fallen on impacted services.

Timetabled services need to be at consistent evenly spaced frequencies. This ensures that people do not have to rely on accessing a timetable, as they know that a bus will be arriving at regular intervals.

5.1.2 Frequency and temporal span benefits

Research shows that increasing bus service frequency is one of the key measures likely to increase patronage (Walker and Donovan see Stage One Report). Research on passenger responsiveness to frequency indicates that an increase in frequency of 10 percent will increase demand by around 3.5 percent. This is known as the service change elasticity which is often quantified at +0.35, doubling in the long-term (Currie, Wallis 2008).

Improving frequency reduces waiting time at bus stops, which contributes to an overall reduction in people's total transit time. A high frequency from 7:00 AM to 7:00 PM weekdays means that people will have confidence that a bus will arrive within a few minutes and that they do not have to rely on accessing a timetable to use a service. Enhanced services during this period will encourage more public transport trips outside the AM and PM peak periods, in periods know as shoulder peaks. Improving the frequency of evening services will improve the perception of safety while waiting for services at night.

Metro are currently investigating improving the frequency and temporal span on the Corridor in line with the above options.

Improvements in frequency are more likely to have bigger impacts if they occur in conjunction with changes to the temporal span and operate as harmonised timetables.

The temporal span of services for a high frequency corridor is essential in attracting public transport users and making the service more attractive. A wide temporal coverage means that people can use public transport if they start work early in the morning and finish late at night; this is particularly the case for people who work in hospitality and tourism, or undertake shift work. This has particular benefits for those that are transport disadvantaged (such as students, people on low incomes) that rely on public transport to access employment.

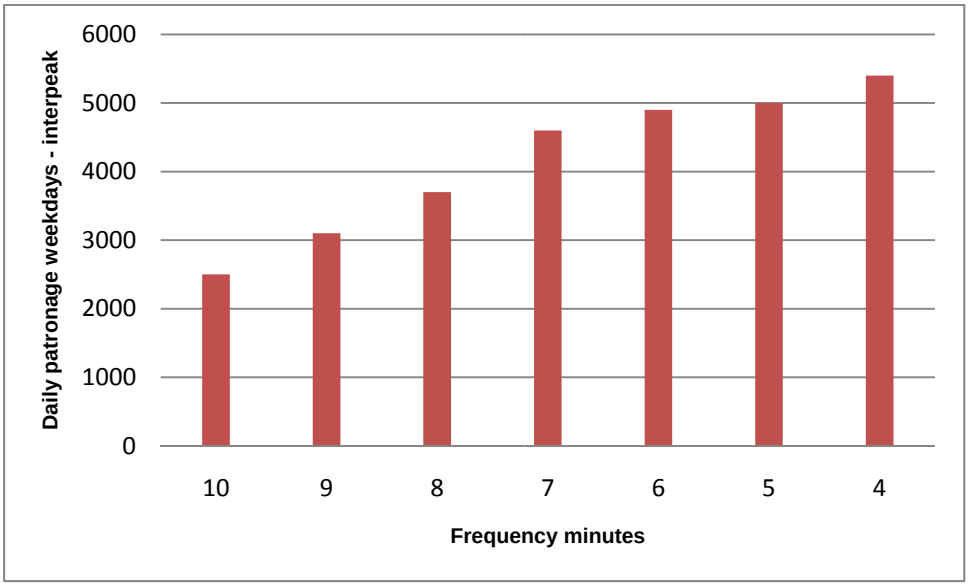
A wide temporal span across the whole week also encourages the use of public transport for other trip purposes such as recreation, shopping and entertainment, particularly at night.

It is anticipated that the cost of increasing frequency in response to demand can be cost effectively implemented, given expected improvements in fare revenue and the relatively low costs of providing additional services between peak periods. The cost of providing services between peak periods during weekdays is relatively low due to driver shift structures which results in more drivers being available at the beginning and at the end of the inter-peak period.

Both frequency and temporal span should be monitored and improvements made in response to demand. There is likely to be demand for additional frequency improvements in the medium term. Demand modelling (using DIER Public Transport Economic Analysis Model) shows that improvements in service frequency from an average ten minutes to an average of six minutes during the inter-peak (typically during 9 AM to 3 PM) may increase patronage by up to 100 percent. This would represent an additional 2400 trips along the

Corridor per weekday. The figure below shows the relationship between frequency increases and patronage increase.

Figure 4 Frequency improvements and relationship between passenger volumes



Source: DIER Public Transport Economic Analysis Model

5.2 Simplify Northern Suburb bus services

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Changes to frequency and temporal span also need to occur in conjunction with making the route structure more direct and legible. Experience in Melbourne shows that improvements to frequency and temporal span are more effective in terms of maximising passenger volumes if routes are made more direct and simple (Parker 2011).

The Northern Suburbs is serviced by multiple Metro bus routes, with a number of different route variations operating throughout the day. The multitude of routes and variations makes the system overly complex and difficult to quickly comprehend for both current and potential passengers.

The Northern Suburbs has a high penetration bus service, with services operating outside the Transit Corridor being generally low frequency. This means that routes have been planned to provide a wide spatial coverage (penetration), but such services are provided at the expense of services operating more frequently. These services cater for only a small section of the market, and therefore are poorly patronised and arguably represent an inefficient use of resources.

Based on principles of bus service planning, routes should be as simple and direct as possible producing an efficient and reliable service. An effective bus service should either follow a reasonably direct path along defined public transport corridors or provide a service which feeds into a corridor. Overall this makes the service more 'legible' to passengers in that they can understand where the service operates and it makes it easy to remember. Direct routes can also result in travel time savings through reducing deviations, which results in benefits to passengers and also bus operators through lower travel and operating costs.

A review of bus routes can also result in a reduction of duplicated routes. Routes which are too close together will reduce passenger volumes on both corridors and have a lower frequency. For example, the Northern Suburbs currently has parallel bus routes operating along Main Road and Argyle Street in New Town. In the suburb of New Town itself there are effectively six different bus routes competing for virtually the same passenger market. The principle is to create fewer routes, but improve frequency in order to achieve patronage gains.

Route simplification is likely to be cost effective, especially if poorly utilised or duplicated routes are rationalised. Improved route structure in other locations such as Melbourne, has been shown to be the single most cost-effective measure to grow patronage, with benefits exceeding costs (Currie and Wallis 2008).

There is likely to be a mixture of benefits and losses involved with changing route structures, with most passengers likely to experience benefits, while other passengers may be concerned about withdrawn or altered routes especially if they have to walk further to access a bus route. These losses can be off-set through upgrading the existing high frequency route through frequency, bus stop upgrades and reliability improvements improving total travel times associated with using public transport.

Metro Tasmania is currently in the early stages of conducting a review of Northern Suburb bus services. This review is expected to take up to 12 months to complete.

The Northern Suburbs review will also include an assessment of whether the number of direct services to the Hobart CBD should be reduced from outer areas (suburbs beyond Glenorchy). Passengers wishing to travel beyond Glenorchy may need to transfer at the Glenorchy bus mall if they wish to travel further south. Currently there are relatively few passengers having to transfer, therefore it is unclear how passengers will respond to the need to transfer. However this can be off-set by creating more frequent and direct services, which are harmonised so that transferring services evenly connect with minimal waiting times.

5.3 Better managing our road network

1. Develop a road network approach within Hobart and Glenorchy local Government areas to establish the priority use of roads by transport mode, time, and place of activity.

As road space along Main Road is very limited, improving the reliability of public transport requires a ‘network priority approach’, where particular transport modes are given priority over other modes. Within the Hobart CBD, there are also bus routes operating on the majority of CBD streets, which makes the service less legible (in terms of people being able to find the right bus route) and also harder to manage from a priority perspective.

Improving the reliability of travel times is considered to be a critical means to improve public transport patronage.

The road network approach recognises that there are competing modes using the transport system and allocates traffic priority to different modes on certain networks to maximise movement. This approach could include priority on:

- Certain road networks.
- Sections of road eg activity centres.
- At particular times of the day.

All modes will continue to have access to all roads, however certain routes will be managed to function more efficiently for cars, while other routes will give greater priority to public transport, cyclists and pedestrians.

There has been no formalised network priority approach developed in Greater Hobart. Planning has been undertaken for specific modes such as bicycles through the creation of the Principal Urban Cycling Network which identifies the highest priority transport oriented cycling routes. The State Government has also developed the *Tasmanian State Road Hierarchy* which identifies the function and planning requirements for State roads predominately from a freight perspective. In terms of public transport, while key corridors have been identified in the *Tasmanian Urban Passenger Transport Framework* and Metro's *Draft Hobart Passenger Network Plan*, no formal network planning has identified that public transport should be given priority on these routes. Similarly within activity centres, pedestrian activity is encouraged through slower speed limits and safety treatments for pedestrians.

DIER, Glenorchy and Hobart City Councils will need to jointly develop a network approach to manage limited road space in Glenorchy and Hobart local Government areas focusing particularly on the Main Road Corridor and connecting networks. This approach can utilise existing frameworks such as the Victorian 'SmartRoads' and the 'Link and Place' classification, as used by Adelaide City Council.

A possible allocation of priority by mode across the road network is shown below.

Figure 5 Proposed road network function and priorities

Mode	Proposed Priority
Freight	Brooker Highway (Tasmanian State Road Hierarchy, Southern Integrated Transport Plan). Local freight roads eg Derwent Park Road.
Cars	Brooker Highway (Tasmanian State Road Hierarchy, Southern Integrated Transport Plan). Argyle Street.
Public transport	Main Road Corridor (identified as a key public transport corridor in the *Tasmanian Urban Passenger Transport Framework* and *draft Hobart Passenger Transport Network Plan*).
Cyclists	Inter-City Cycle Way, Argyle Street and Campbell Streets (Principal Urban Cycling Network).
Pedestrians	Main Road Corridor within the Activity Centres of Hobart CBD, North Hobart, Moonah and Glenorchy.

A network approach will enable the road network to be better managed for certain modes. It enables the road owner to plan for the future, in terms of ensuing public transport is given priority on identified routes and considered upfront when changes are made to the road environment.

This approach will lead to improved travel time reliability for public transport and improved connectivity and amenity in activity centres for pedestrians. Cycling infrastructure improvements can be targeted at Principal Urban Cycling Network.

5.4 Bus priority measures

1. Implementation of **short-term** bus priority treatments to improve travel time reliability for buses, including:
    - Bus priority approaching major intersections (reallocation of road space and providing signal priority).
    - Removal of Springfield Depot inward diversion.
2. Investigation of **medium-term** bus priority treatments to reduce the diversion caused by the one-way street network within the Hobart CBD.
3. Investigation of **medium-term** bus priority treatments at key intersections, such as queue-jump bus lanes and bus-early start signal priority. For the **longer-term** consider set-back bus lanes depending on the effect of short and medium term bus priority measures.

5.4.1 Poor travel time reliability

The Stage One Report highlighted that transport planning has traditionally focused on increasing the capacity of roads to improve traffic flow for cars, rather than improving public transport reliability. This has resulted in poor travel time reliability for buses, both in terms of longer travel times for buses than cars and a high variability in bus travel time.

Reliability on the Main Road Corridor is affected by:

- General traffic delays: localised congestion especially during peak travel times.
- Traffic conditions within activity centres: affects the reliability of through traffic movements including buses.
- The number and spacing of bus stops: there is an average of a bus stop every 250 metres.
- Inadequate bus stop lengths: creates difficulties for buses merging back into traffic.
- Deviations from the Corridor: the bus has to deviate from the Corridor through the Springfield Depot on the inward trip and via the Hobart CBD one-way street network on both the inward and outward trips.

In terms of adherence to published timetables, buses on the Main Road Corridor are unreliable which affects a potential passenger's decision whether to use buses or not. If the travel time reliability for public transport can be improved, the generalised cost of travel also decreases. Consequently, the demand for services increases and results in a modal shift, as travel patterns change to travel at the lowest possible overall generalised cost.

Poor travel time reliability for buses results in an economic cost to both individuals and the bus operator:

- For individuals, the economic costs are an increase in total travel time, unexpected waiting times at bus stops and late arrival. This results in a loss of productivity, especially for commuters.
- For bus operators, poor travel time reliability results in an increase in operational costs including higher bus kilometres (caused by Corridor diversions) and capital labour costs.

Research indicates that passengers place high importance on having a minimal waiting time. It also suggests that waiting for a bus with uncertain arrival times is often seen as an anxious and stressful experience (Mazloumi, Currie, Rose 2008). Consequently, minimising passenger waiting time is critical to encouraging greater use of public transport.

As road space is limited on the Main Road Corridor (operates as a single lane in each direction) there is little opportunity for expansion. Widening the Corridor is not a desirable option as the Corridor contains strip shopping precincts and major activity centres, where pedestrian movement and amenity is a priority. Therefore, bus reliability is likely to decrease in the future, in the absence of bus priority intervention.

A range of bus priority measures have been considered on the Corridor, including:

- Bus lanes: continuous, set-back, queue jump, transit lanes.
- Traffic signal priority: bus early start, bus phase, extended green time, phase actuation, GPS based signal priority, bus bays and left-turn slip lanes (assist buses to safely exist a bus bay on the departure side of an intersection).
- Alternative routes: re-routing via Argyle Street and the rail corridor.
- Bus stop improvements: improving bus stops in terms of improving draw-in and draw-out length and extension of bus zones.

5.4.2 Bus priority measures – short-term

The following short-term bus priority treatments have been identified and assessed for implementation in the near future. These measures have been submitted as part of a funding application for planning and delivery under the Australian Government's Nation Building 2 Program.

The short-term bus priority measures are presented at a 'concept' level only. More detailed planning is required to optimise the effect of the recommended treatments and resolve any outstanding issues (eg. additional traffic modelling, stakeholder consultation and detailed design).

These measures can be implemented relatively easily in the short-term (next one to three years) without any significant infrastructure works (predominately line-marking changes and some removal of on-street car parking). The measures include treatments at 12 separate locations and focus on giving buses priority at key intersections and removing the Springfield Depot inward diversion.

Figure 6 Summary of short-term bus priority measures

Location	Recommended Treatment	Objective	Further Investigations Required
Springfield Avenue / Derwent Park Road	Install new inbound bus stop on Main Road	Reduce travel time for inbound services	Detailed design (including Metro forecourt area) Pedestrian safety audit
	Inbound bus queue jump lane B phase (bus early start)	Improve egress from proposed new bus stop	Intersection modelling Detailed design
Hopkins Street	Remove two to three parking spaces on departure side of intersection (outbound)	Allow buses to remain in left lane through signals	Consultation Intersection modelling

Location	Recommended Treatment	Objective	Further Investigations Required
Albert Road	Remove three parking spaces on departure side of intersection (inbound)	Allow buses to remain in left lane through signals	Consultation Intersection modelling
	Inbound approach lane allocation, allowing buses to use left-turn only lane	Bus priority approaching signals	Consultation Intersection modelling
	Ban southbound right turns into Albert Road	Reduce congestion	Consultation Intersection modelling
Creek Road	Outbound approach lane allocation, allowing buses to use left-turn only lane	Bus priority approaching signals	Consultation Intersection modelling
	Part-time parking restrictions opposite Bromby Street	Improve traffic flow Improve access to bus priority lane	Consultation
Risdon Road	Car parking restrictions and outbound approach lane allocation	Bus priority approaching signals	Intersection modelling Detailed design Consultation
	Inbound bus lane	Bus priority approaching signals	Intersection modelling Detailed design Consultation
Cross Street	Remove three car parking spaces opposite intersection	Reduce congestion caused by right turning traffic	Consultation
Roope Street	Remove or relocate pedestrian refuge away from bus stop	Allow traffic to pass stopped bus	Detailed design
Augusta Road	Outbound bus lane (queue jump)	Bus priority approaching signals	Intersection modelling Detailed design
Federal Street	Right turn signal phases at Federal / Argyle and Federal / Elizabeth	Improved access around North Hobart	Intersection modelling Detailed Design
North Hobart	Extend outbound bus stop	Improve bus stop capacity	Detailed Design Consultation
	Install new inbound bus stop	Reduce bus dwell times	Detailed Design Consultation
Burnett Street	Outbound approach lane allocation, allowing buses to use left-turn only lane	Bus priority approaching signals	Consultation Intersection modelling

Location	Recommended Treatment	Objective	Further Investigations Required
	Remove two car parking spaces and relocate loading zone on departure side of intersection (outbound). Other changes in North Hobart will result in a net gain of one additional on-street car park.	Allow buses to remain in left lane through signals	Consultation Intersection modelling
Collins Street	Remove two car parking spaces	Reduce congestion from overflowing right turn bay	Consultation

The design of the treatments includes the proposed removal of on-street car parking spaces at certain locations which is essential for the bus priority treatments to be effective. As removal of on-street car parking is a sensitive issue for adjacent residents and businesses, public consultation will occur with affected parties in mid 2013.

The following locations are likely to be affected:

- Moonah activity centre: removal of five to six on-street car parking spaces.
- New Town:
    - On-street car parking restrictions along New Town Road on the inward and outward approach to Risdon Road.
    - On-street part-time car parking restrictions on the inward approach to Creek Road outside Aurora Netball Stadium/Bowls Club.
    - Removal of three on-street car parking spaces on the inward approach to Cross Street.
- North Hobart activity centre: net gain of one on-street car park.
- Collins Street: removal of two on-street car parking spaces between Argyle and Campbell Streets.

The capital costs of delivering the short-term bus priority measures is estimated at $230 000.

The location of the bus priority measures is shown at **Attachment C.**

5.4.3 Short-term bus priority benefits

The short-term measures do not reduce the capacity of the Corridor for car based traffic. A microsimulation traffic model was developed for Main Road from Burnett Street to the Springfield Depot. The model assessed the current traffic conditions against the proposed bus priority measures, allowing a comparison to be made between the two scenarios.

The results from the analysis are shown below for the current year (2012) and for estimated future traffic conditions (2022).

Figure 7 Travel times from Burnett Street to Springfield Depot (mm:ss)

	2012				2022			
	AM		PM		AM		PM	
Direction	Current	Proposed	Current	Proposed	Current	Proposed	Current	Proposed
Outbound								
Bus	18:39	14:43	17:44	16:14	21:27	16:31	15:02	14:58
Other Vehicle	10:51	09:42	11:47	11:18	12:26	10:59	10:08	10:02
Inbound								
Bus	18:23	15:12	16:24	14:27	20:15	17:04	15:56	13:46
Other Vehicle	10:17	09:35	09:12	09:06	11:25	10:47	09:00	08:50

The model indicates that the proposed bus priority changes may result in decreases in travel time for buses and other vehicles in both AM and PM peak periods in 2012 and 2022.

The decrease in travel time for other vehicles travelling inbound is primarily due to the right turn ban proposed at Albert Road, Moonah. The decrease for other vehicles travelling outbound is due to a minor increase in 'green time' for through movements on New Town Road, at the intersections of Risdon Road and Creek Road.

The modelling also indicates that bus reliability improves substantially from the proposed bus priority measures. Variations in bus travel times between the Springfield Depot and Burnett Street reduced by an average of 37 seconds. This is due to the reduced number of bus stops, which can cause delays in terms of passenger boarding and alighting and merging in and out of traffic. The bus priority measures also result in less travel time variability, due to buses not been delayed by traffic at key intersections.

Travel time data for the whole length of the Transit Corridor (Hobart CBD to Glenorchy) was calculated by including the time savings from the microsimulation model study area (Burnett Street to Springfield Depot), plus a 10 second saving for each bus stop proposed for removal outside of the model's study area. These travel times are shown below.

Figure 8 Bus Travel Times for the whole Transit Corridor (mm:ss)

	Existing Travel Time	Estimated Travel Time	Savings
AM Peak – Inbound	31:19	27:28	3:51
AM Peak – Outbound	20:29	15:43	4:46
PM Peak – Inbound	31:43	29:06	2:37
PM Peak – Outbound	28:32	26:12	2:20

Over the whole eight kilometre journey, buses can obtain travel time savings of between 12 percent (inbound) and 23 percent (outbound) in the AM peak and eight percent in the PM peak.

5.4.4 Bus priority measures – medium-term

Depending on the success of the short-term bus priority measures, the following bus priority measures could be considered in the medium to long-term:

- **Queue jump lanes at key intersections** (medium-term):

    - Queue jump lanes start before the approach to an intersection to allow buses to bypass queues.
    - The lane typically needs to be longer than the peak hour queue.
    - This priority measure works where there is an underutilised lane such as a left-turn lane or slip lane.
- **Set-back bus lanes for parts of (or the entire) Corridor** (longer-term):
    - Set-back bus lanes end a certain length on the approach to an intersection and are used instead of continuous bus lanes.
    - Set-back bus lanes enable the intersection capacity to be maintained for all traffic, by not dedicating road space for buses.
    - The purpose of the set-back is to position the bus close enough to an intersection to allow it to cross the intersection in one cycle. It can also include a set-back departure bus lane after the intersection to enable the bus to merge back into traffic.
    - Set-back bus lanes can be used in conjunction with signal priority.
    - Continuous bus lanes are unlikely to be achievable without significant road widening and property acquisition. Continuous bus lanes operate the entire length of the road section between intersections.
- **Traffic signal priority** (medium to long-term):
    - Including extended green time (reduces delays to buses through an intersection).
    - GPS-based signal priority treatments (enables the bus to be tracked and provides them with signal priority when required eg. late running services).

As part of the assessment, alternative routes have also been considered:

- **Re-routing the Corridor via the entire length of Argyle Street (from New Town Road)**:
    - This option is not considered viable at this time due to the commencement of Argyle Street as one-way south of Burnett Street. It could only be considered with conversion to a two-way network.
    - Re-routing would also need to consider more supportive land use change (more trip attractors) along Argyle Street between New Town Road and Brisbane Street.
- **Re-routing the Corridor via the rail corridor**:
    - The potential re-use of the rail corridor remains a future option for the Northern Suburbs public transport network.
    - The options of light rail and bus rapid transit have been previously examined on the rail corridor.

More in-depth planning is required to assess options to reduce the diversion from the Corridor caused by the one-way street network in the Hobart CBD. This is considered a medium-term option because of the complexity of making changes to the CBD network and the flow on affects to key arterial roads (Macquarie/Davey Streets). In addition changes to the CBD network cannot be considered in isolation from other projects. These include the Hobart CBD Bus Interchange project and the Hobart City Council's implementation of the Inner City Action Plan, which includes investigation of reversing the one-way street network within the CBD. Both these projects are in the early planning phase.

Preliminary modelling indicates that conversion of Argyle Street to two-way, in isolation from other streets, will increase congestion on parallel routes. Delays are reduced if other CBD streets are converted to two-way operation, but the delays are generally greater than if the existing one-way street network were to be maintained.

Therefore other options will need to be developed, and modelled, to determine how travel time reliability in the CBD can be improved for buses. These could include:

- Bus lanes.
- Introduction of contra-flow lanes.

5.5 Improved bus stop infrastructure

1. Upgrade bus stop infrastructure, including shelters, seating and passenger information displays and ensure stops are accessible (DDA compliant).
2. Review bus stop lengths to ensure the space is adequate for efficient bus manoeuvrability.

There is a substantial inconsistency in the quality of bus stop infrastructure along the Corridor, including a lack of passenger information for public transport users, poor pedestrian connections and way-finding to bus stops. Not all major bus stops have shelter or seating, and where shelters are present; most are aged and have a poor appearance and aesthetic. The majority of bus stops on the Corridor are also not fully accessible, which affects people with limited mobility.

Bus stop infrastructure is an important component of the operation of the bus system and the community's perceptions of it, as it is the first interaction that passengers have with the system. Improving the design of bus stops, and their location, is a crucial element in improving the quality of bus services.

Buses also require sufficient space in which to approach a bus stop, so that they can stop parallel and immediately adjacent to the kerb. Insufficient length can result in the rear of buses obstructing traffic in an adjacent lane, causing congestion, and difficulties in some passengers boarding or alighting. When departing a bus stop, sufficient draw-out length is required. If the draw-out length is too short, this may reduce the capacity for another bus to also stop.

Providing sufficient bus stop lengths may require removal of parallel parking adjacent to bus stops or changes to the physical kerb. Particular attention should be given to bus stops in activity centres such as North Hobart and Moonah, where the potential for buses to obstruct traffic is greater.

Perceptions of comfort, safety and access to passenger information all contribute to improving the 'generalised cost of travel' (includes total cost of travel including monetising travelling time, comfort and convenience). If bus stop infrastructure can be improved, this will reduce the generalised cost of travel for each person resulting in an increase in patronage, (Currie, Wallis 2008). This will have economic and social benefits, as passengers will:

- Be more comfortable: through the provision of adequate shelter and/or seating.
- Feel safer: because of the provision of lighting and bus stops being located close to safe crossing points (eg. pedestrian lights and refuges).
- Have access to better information: simple and easy to understand timetable and route information and/or real-time travel information.

The quality of the bus stop infrastructure affects the overall perception and brand of the bus system. Therefore, investment in bus stop infrastructure is an important marketing and branding component of creating a high quality public transport system.

Upgraded bus stops must meet the requirements of the Commonwealth's Transport Standards for *Accessible Public Transport 2002*. Upgrades will also provide social and economic benefits for passengers with impaired mobility, the aged or people travelling with young children. This will enable sectors of the community who are transport disadvantaged to participate more fully in the community and reduce social exclusion.

Investment in bus stops will also contribute to an improvement in the pedestrian environment and streetscape, particularly within activity centres. An improvement in amenity will create a sense of place, where people want to spend time and undertake activity.

The upgrade of bus stop infrastructure has been submitted for funding under Nation Building 2. The capital cost of upgrading bus stops is estimated at around $470 000.

5.6 Bus stop optimisation

1. Optimise the number of bus stops along the Corridor to improve travel time reliability.

The Stage One Report identified that there is a high number of bus stops on the Corridor with an average spacing of stops every 250 metres. This is well above the recommended spacing of 400 metres. Optimising the number of bus stops along the Corridor will lead to improvements in travel time reliability, through reducing the number of times a bus has to stop between its origin and destination.

A bus stop optimisation review has been undertaken, which involved evaluating the pattern of bus stop placement and patronage to determine which stops should be retained, removed or relocated. The focus was on removing stops which are located close together or poorly utilised. Some bus stops are poorly located which can cause bus travel time delays, as buses have difficulty merging back into traffic.

The review recommended the following changes:

- Net reduction of nine inbound stops and eight outbound stops.
- Relocation of two inbound stops.
- Consolidation of four outbound and four inbound stops to provide two outbound and two inbound stops.

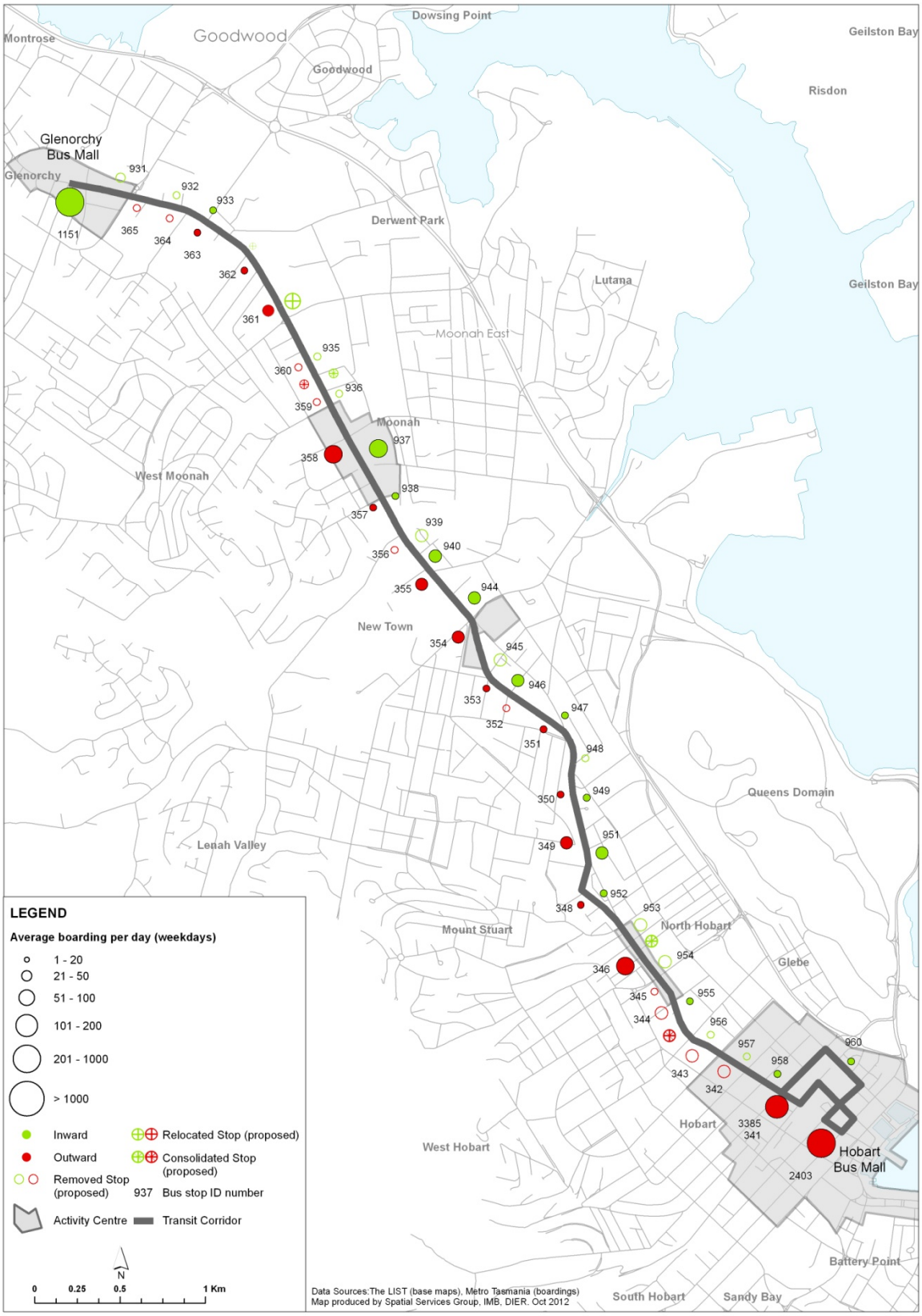
If services are more frequent, stops can be more widely spaced as research shows that people are prepared to walk further in return for a more frequent and reliable service. However, there is a need to balance bus stop optimisation against accessibility requirements, especially for the aged or those that have a physical disability. Infrequently spaced bus stops may also increase walk times beyond acceptable threshold levels.

As part of the bus stop optimisation process, consultation will need to occur with the local community and adjacent residents and businesses.

The potential travel time savings from the reduction of bus stops along the whole length of the Corridor is around 1:30 minutes.

Optimising the number of bus stops along the Corridor has been submitted as part of the bus stop upgrade program for Nation Building 2.

Figure 9 Bus stop optimisation map



5.7 Increased density and mixed use through infill development

1. State and local Government to jointly investigate mechanisms to facilitate development, in the form of higher residential densities and mixed use, focusing on the Main Road Transit Corridor and its activity centres.

Land use planning directly affects both the demand for travel and mode of travel. Past land use policy has resulted in low density development patterns and separation of land uses, which has created high levels of car dependency and makes effective provision of public transport problematic.

Research shows that compact and mixed use development creates more sustainable travel behaviour, with higher levels of public transport use, walking and cycling. Increasing density and mixed use development along high frequency public transport corridors and close to activity centres will enable more people to use sustainable transport options and therefore be more likely to achieve modal change.

The *Southern Tasmania Regional Land Use Strategy* aims to increase residential densities in inner urban areas. The strategy sets a 25 year infill development target, with the intent of achieving a 50/50 ratio of Greenfield to infill development.

The first step in increasing density along major public transport corridors and adjacent to activity centres is to determine if suitable sites are available within close proximity to the Main Road Transit Corridor.

DIER, in conjunction with Councils, has identified sites within 800 metres of the Main Road Transit Corridor which could be suitable for infill development. Between Glenorchy and Moonah, Main Road is in close proximity to the rail corridor, therefore the identification of sites will also benefit potential re-use of this corridor for passenger transport in the future.

The site identification analysis included identification of two scenarios:

- Residential scenario: land considered suitable for residential development or mixed use excluding land zoned Recreation and Open Space.
- Industrial scenario: including all industrial land which could be redeveloped for residential or mixed use excluding land around Derwent Park which is zoned Major Impact Industry.

The results are as follows:

Figure 10 Sites considered suitable for infill development within 800 metres of the Transit Corridor

Planning Scenarios	Net density Ha*	Dwelling yield (25 per ha)	Dwelling yield (40 per ha)	Dwelling yield (60 per ha)
Residential scenario (including land identified as being suitable for partial development).	56	1405	2248	3372
Residential and industrial scenario (includes only industrial land considered suitable for development ie not part of a cluster).	105	2626	4202	6303
Residential and industrial scenarios (including industrial land that requires development as a cluster).	117	2925	4681	7021

*Based on net density.

The supply of land in the residential scenario, only meets 16 percent of the dwelling yield required in Glenorchy and Hobart for infill areas (based on 25 dwellings per hectare).

Not all of this infill development will be along the Main Road Transit Corridor, however it would be expected that the Corridor would yield a significant supply of infill development, given that it is one of the core public transport routes in Glenorchy and Hobart.

In order to achieve a modal shift towards sustainable transport options, development in the form of new housing and key trip attractors need to be located close to the Main Road Transit Corridor and activity centres. These areas should be priority areas for infill residential and commercial development.

In order to yield a higher supply of land for infill development adjacent to the Transit Corridor, particularly around Glenorchy and Moonah activity centres, it is highly likely that either density will need to be significantly increased eg a dwelling yield of 60 dwellings per hectare or a proportion of industrial land within Glenorchy will need to be converted to residential or mixed use development.

The approach should be to begin the redevelopment of non-industrial land in the first instance and only convert industrial land with the following characteristics:

- Land within close proximity to the Transit Corridor and activity centres eg. within 400 metres;
- Fragmented and isolated industrial sites; and
- Sites which are poorly utilised with buildings of low capital value.

The focus of large scale urban renewal projects in major Australian cities has predominately been on underutilised industrial land known as 'brownfield' development. The supply of industrial land will need to be carefully managed as there is a forecast shortage of industrial land in Hobart and Glenorchy for local service industries. There is also a need to better manage urban industrial land; preliminary research shows that industrial land in Glenorchy is under-utilised (*Draft Southern Tasmania Industrial Land Study* 2012). If this land is better utilised it could assist in meeting the demand for more industrial land.

The provision of infill development is a challenge. The development market in Tasmania is highly geared towards Greenfield development, at present 85 percent of new dwellings in Greater Hobart are built in Greenfield areas (STCA 2011). The development process for infill can be complex, lengthy and more costly to the developer than Greenfield development. In order to achieve a significantly higher level of infill development, it is likely that there will need to be deliberate policy changes and some form of Government intervention. There is no single entity within State or local Government that is responsible for facilitating infill development.

More work is required by both State and local Government to investigate the best means of progressing infill development and assessing the most appropriate intervention mechanisms within the Tasmanian context.

For more information on the identification of land for infill development see **Attachment D,** Developable Sites Analysis Report.

5.8 A better urban environment to support and encourage the use of public transport, walking and cycling.

1. DIER and Glenorchy and Hobart City Councils to ensure urban design frameworks for activity centres within the Transit Corridor support and encourage public transport, walking and cycling.
2. Improved pedestrian connections to major bus stops within activity centres through targeted infrastructure upgrades and/or signage. Major bus stops to target include:
    - Hobart Bus Mall (subject to the Hobart Central Bus Interchange project).
    - Glenorchy Bus Mall.
    - Elizabeth Street bus stops (between Liverpool and Bathurst Streets, bus stop id 3385/341 and 958).
    - North Hobart activity centre (bus stop id 346 and proposed new stop near Lefroy Street).
    - Moonah activity centre (bus stop id 358 and 937).
    - New Town activity centre (bus stop id 354 and 944).
    -

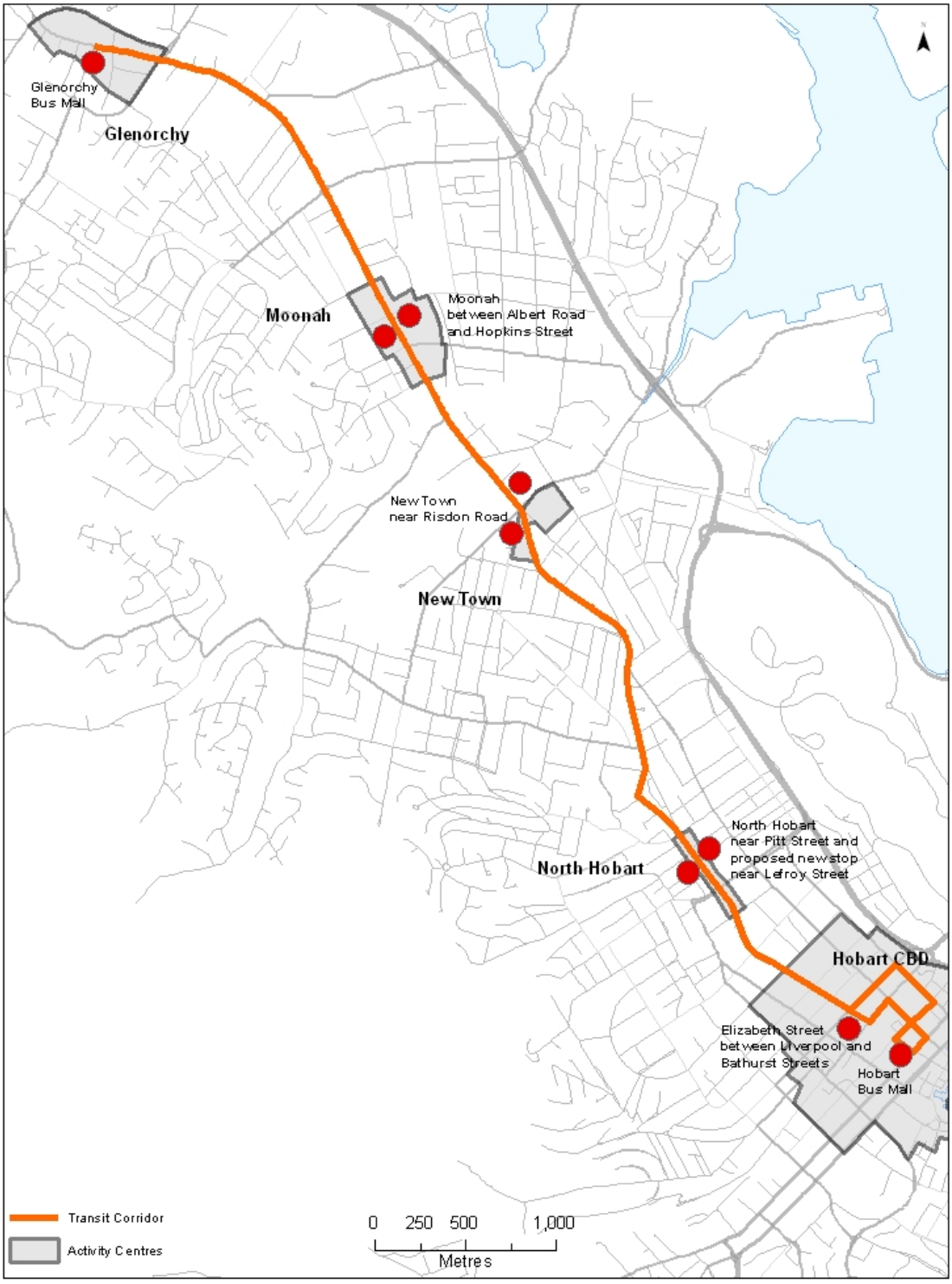
The urban environment needs to be more people-focused and support use of public transport, walking and cycling especially within activity centres. All public transport trips have a walking component; therefore it is critical that walking connections to the Corridor are improved. The Gehl report highlighted that the quality of public spaces and connections to major bus stops, such as the Hobart CBD bus mall are poor (Gehl 2010).

Improving the public realm can be achieved by developing urban design frameworks which encourage people movement and activity and enhance the walkability of an area. This can be achieved by:

- Enabling public transport to penetrate the core of activity centres, so it is highly visible and accessible to key trip generators.
- Providing high quality supporting infrastructure such as:
    - Safe and direct pedestrian connections to bus stops and key trip attractors, adequate footpath widths and quality surfaces and mechanisms to assist pedestrians to safely cross roads such as traffic lights or pedestrian refuges.
    - Bus stop infrastructure, including shelter, seating and passenger information.
    - Way finding mechanisms such as signage or well-delineated routes that link trip attractors in a logical way.
- Improving the amenity of public spaces, especially those close to highly patronised bus stops or bus malls, eg provision of seating, street landscaping, passive surveillance and adequate lighting.
- Reducing the amount of through-traffic and reducing vehicle speeds.
- Creating a bicycle-friendly environment through shared road space and cycling infrastructure, such as on and off-road cycling routes and bicycle parking.

The focus of improving pedestrian linkages should occur at a manageable spatial scale where there are high volumes of people movement such as activity centres. For this reason major bus stops within activity centres are targeted for pedestrian improvements. Walking infrastructure needs to be in place, with barriers removed and connectivity improved as a starting point.

Figure 11 Location of major bus stops to target for pedestrian improvements



A people-focused environment will encourage a place where more people want to travel repeatedly to and spend time in. Research undertaken by the Heart Foundation (2011) indicated that measures aimed at attracting more public transport users, pedestrians and cyclists to activity centres have the following economic and social benefits:

- Generates more business and stimulates the local economy, leading to increased public transport demand and patronage.
- Greater levels of activity which will make the centre more vibrant and safer.
- Revitalises 'drive-through' centres into lively places that people want to visit.
- Rise in property values leading to increased refurbishment and redevelopment opportunities.
- Encourages people to spend time outside of their homes, leading to greater levels of social inclusion.
- Increases health outcomes through increased incidental exercise.

Both Hobart and Glenorchy City Councils have developed urban design strategies which cover parts of the Transit Corridor such as the *Main Road Master Plan* and the *Inner City Action Plan*. DIER will need to work with both Councils to ensure these strategies support increased use of public transport, walking and cycling.

5.9 Improved cycling connections to the Transit Corridor

1. Improved connectivity, through targeted infrastructure upgrades and/or signage for the following Transit Corridor cycling connections:
   - Bathurst Street, Molle Street to Campbell Street.
   - Burnett Street, Murray Street to Campbell Street.
   - Newdegate Street, Mellifont Street to Elizabeth Street, with link via Strahan Street to Argyle Street.
   - Archer Street, Argyle Street to New Town Road.
   - Bay Road, Inter-city cycleway to New Town Road via Cross Street.
   - Bromby Street, Inter-city cycleway to New Town Road.
   - Derwent Park Road or alternative route (eg. Bayswater Road, Lutana rail spur).
   - Tolosa Street or alternative route (Humphreys Rivulet).

Research indicates that the mode share of cycling can be increased if cycle routes are safe and connected. The needs of cyclists are diverse, and vary according to age, levels of mobility, experience and confidence. It is not possible to cater for all users in all situations; however, infrastructure and the built environment must be designed so that it is attractive to a wide range of users. Providing safe, well-connected cycling infrastructure, whether on or off-road, encourages more people to cycle.

Although the existing on-road and off-road cycle infrastructure provides access to the Transit Corridor at some locations, there are several key points where connectivity between the Corridor and the cycle network are poor. The focus of the investigation is to identify routes which facilitate ‘transport orientated’ cycling to key attractors on the Transit Corridor such as activity centres.

A workshop with cycling stakeholders held in February 2012 helped to identify these cycling infrastructure gaps. Routes which directly connected to the Transit Corridor were investigated further through site visits.

These routes were then prioritised through a framework, taking into account land use and spatial characteristics and ease of implementation. Additional routes were also identified that linked to key residential areas such as New Town, Moonah/Lutana/Derwent Park and Glenorchy. Details of this assessment are in **Attachment E,** Cycling Infrastructure Assessment Report.

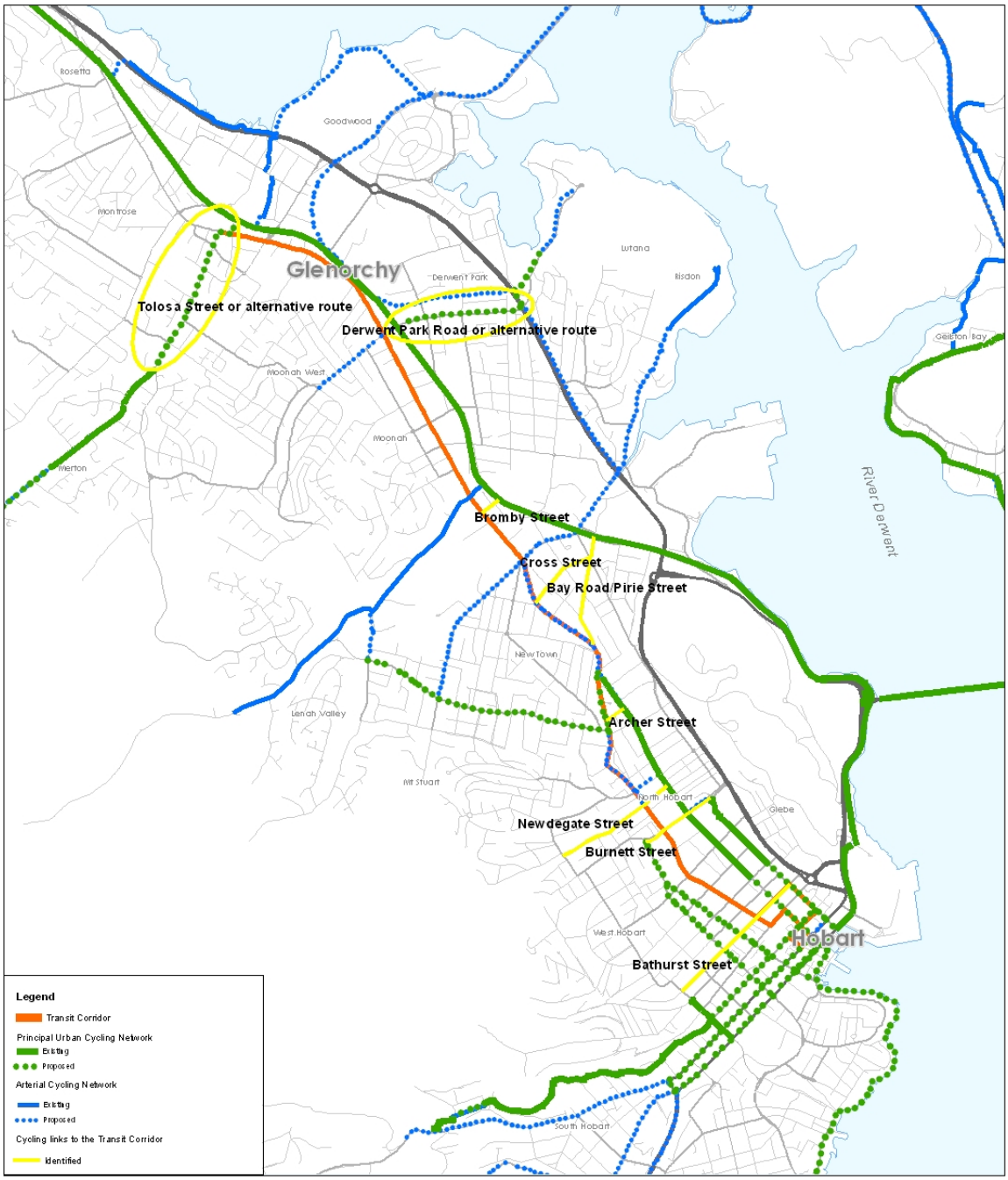
The high priority routes and type of infrastructure treatment required include:

Figure 12 Transit Corridor cycling infrastructure gaps - high priority cycling routes

Catchment and links	Cycling route	Type of treatment required
West Hobart to Hobart CBD.	**Bathurst Street:** Molle Street to Campbell Street.	Treatment to be determined. May require some form of separation due to traffic environment. Alternative route may also require consideration due to one-way street network eg Melville Street.
North Hobart to Hobart CBD.	**Burnett Street:** Murray Street to Campbell Street.	Treatment to be determined. May require some form of separation due to traffic environment. Further investigation is required around Elizabeth Street and Burnett Street intersection treatment or alternative route eg Little Arthur Street.
West Hobart to North Hobart.	**Newdegate Street:** Mellifont Street to Elizabeth Street, with link via Strahan Street to Argyle Street.	Marked route with shared wide lane or mixed traffic. Could also consider alternative route Arthur Street and Little Arthur Street.
New Town to Hobart CBD.	**Archer Street:** Argyle Street to New Town Road.	Marked route with shared wide lane.
New Town Activity Centre to Inter-city cycleway.	**Bay Road/Pirie Street and/or Cross Street:** Inter-city cycleway to New Town Road.	Marked route with mixed traffic.
New Town (High Schools and Aurora Netball Stadium) to Inter-city cycleway.	**Bromby Street:** Inter-city cycleway to New Town Road.	Marked route with mixed traffic.
Moonah, Derwent Park, Lutana to Principal Urban Cycling Network (Inter-city cycleway) and Main Road.	**Derwent Park Road or alternative route (eg. Bayswater Road, Lutana rail spur):** linking to Main Road, Intercity cycle way.	Initial study on Derwent Park Road and Bayswater Road was inconclusive. Requires further investigation in determining the best route.
West Glenorchy to Glenorchy Activity Centre and Intercity cycleway	**Tolosa Street or alternative route (Humphreys Rivulet):** linking to Main Road and Inter-city cycleway	Feasibility study currently underway for Humphreys Rivulet to determine if this is a feasible alternative route.

The map depicts the above routes, showing the current gaps in cycle infrastructure provision. Also shown is the Principal Urban Cycling Network and the Arterial Cycling Network which are also important links to the Transit Corridor including Augusta Road, Federal Street: Elizabeth Street and Argyle Street and Hobart Showgrounds: Inter-city cycleway to Bowen Bridge (via Goodwood Road).

Figure 13 Location of Transit Corridor cycling infrastructure gaps - high priority cycling routes



Map Users Note:
Data Sources:
Principal Cycling Network (Draft), 2011, DIER
Hobart Arterial Bicycle Network, 2009, Cycling South Tasmania.

Map produced by Spatial Services Group, DIER
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BikeStrategyMapPublished.mxd
27 Nov 2012

The type of treatment required will vary depending on factors such as traffic volume, traffic speed and the nature of the road environment. Some routes will require traffic engineering interventions to ensure cycle movements are safe and convenient, whereas other routes such as Bromby Street require signage to indicate that this is a cycle-friendly route.

Further investigation is required on some corridors such as Derwent Park Road as alternative routes may be more suitable for cyclists. These alternative routes also need to be considered in terms of surrounding land uses such as connecting key attractors and residential areas.

5.10 Provision of secure bicycle parking at select locations on the Transit Corridor

1. Provision of additional short-term bicycle parking facilities within Moonah activity centre.
2. Investigate the provision of long-term secure bicycle parking at Glenorchy activity centre.

Short term bicycle parking currently exists along the Transit Corridor in the form of hoops and/or poles in activity centres. Only Hobart CBD (Argyle Street car park) offers publicly available secure long-term parking.

There are currently limited short-term bicycle parking facilities at convenient locations in the Moonah activity centre. Moonah would benefit from the provision of additional short-term parking, especially given its proximity to the Inter-City Cycleway and its role in providing local shopping needs. Bicycle parking should be provided centrally within the Moonah activity centre between Hopkins Street and Albert Road.

Long-term bicycle parking is most appropriately located close to where people are spending extended periods of time, in particular activity centres. The major activity centres of Hobart, Moonah and Glenorchy are likely to be where there would be a concentration of demand for long-term bicycle parking. People are also likely to combine cycling as part of a public transport trip if secure bicycle parking facilities are provided.

There is little evidence of people currently combining cycling as part of a public transport trip, perhaps because:

- There is a lack of secure bicycle parking on the Transit Corridor.
- Bicycles are currently unable to be transported on buses.
- The majority of suburbs adjacent to the Corridor are within acceptable cycling distance to the Hobart CBD (within 10 kilometres).
- The steeper topography in parts of Lenah Valley, West Moonah and Glenorchy may discourage some people cycling to the Hobart CBD, Glenorchy or Moonah to connect to public transport.

Notwithstanding the above, long-term bicycle parking at Glenorchy should be considered for the following reasons:

- Glenorchy is just within the outer limits of acceptable cycling distance to the Hobart CBD (where the majority of people work), therefore people living in parts of West Glenorchy, Montrose and Rosetta are more likely to combine cycling with public transport to cover the greater distance involved.

- Research undertaken in Victoria shows that most people 'bike and ride' from their homes to access public transport, rather than 'bike and ride and bike' or 'ride and bike' (Martin and den Hollander 2010). Therefore people who 'ride and bike' should be the primary target for provision of secure parking.
- Glenorchy is a principal activity centre, therefore secure bicycle parking serves a dual purpose by providing a facility for those that want to use public transport and also encouraging people to cycle, who work, shop and use services within the centre.
- Glenorchy Bus Mall has one of the highest number of boardings on the Corridor, with just under 2400 boardings per day (weekdays).
- The Northern Suburbs Bus Services Review may lead to more people transferring at Glenorchy, which could provide people with the motivation to combine cycling with a public transport trip. The time-competitive nature of cycling with cars over short distances means that cycling can be an effective mode of transport to access a high frequency public transport route, without the need to transfer.

The provision of secure parking could be in the form of either bicycle lockers/kennel or cages (known as 'Parkiteers'). Lockers/kennels usually store a single bicycle, with cyclists either using their own locks or access systems provided by the facility manager. Victoria is in the process of installing bicycle cages at suburban railway stations to better integrate cycling with public transport use, these systems use a card access system. The bicycle cages in Victoria typically cover over an area of five metres by seven metres (equivalent to three car parks) and can accommodate 26 bicycles. The cost of construction is around $100 000 (Martin and den Hollander, 2010).

The management and maintenance of the secure bicycle parking facility will need to be carefully investigated. A system is required to support and assist users and protect the asset, particularly after hours.

If the provision of secure long-term bicycle parking at Glenorchy is successful in terms of utilisation, consideration could be given to identifying other locations for secure parking along the Corridor.

5.11 Corridor branding and marketing of services

1. Better understand the target markets for public transport users and their expectations, in order to create an informed direct marketing campaign.
2. Investigate and implement options to brand Metro Tasmania's Transit Corridor services.
3. Develop a uniform 'brand' for bus priority infrastructure, through the use of a distinctive colour.

Branded Corridor services have been implemented in other Australian cities and overseas in order to distinguish Corridor services from standard bus routes. Branded Corridor services need to provide a higher level of public transport service than other routes by having features such as simple and direct routes, high frequency services, bus priority measures and easily understandable passenger information in order to provide a point of differentiation from other services. Branding and marketing is more powerful when it promotes features that actually exist.

The intent of branding Corridor services is to improve the image of the bus services and increase passenger awareness, thereby increasing patronage by attracting new users. The 'SmartBus' branding in Melbourne was highly effective in making the community aware of

changes to services, through branded buses and bus stop infrastructure. In Adelaide patronage improved through the branding of bus stops along the specific high frequency routes known as 'Go Zones'.

Branding should be simple in order for the community to easily recognise and understand the service. Branding of services can include the following:

- Colour scheme: use of distinctive colours to identify Corridor services that do not conflict with colours used elsewhere in the bus system.
- Unique logo and name.
- Vehicle livery: branded vehicle fleet, either through colour, logo and name.
- Bus stop infrastructure: shelter, seating and signage which are linked to the brand eg colour, name and logo.
- Bus priority infrastructure: branding of bus lanes through use of a distinctive colour.

Bus livery is the most commonly used form of branding a service (Devney 2011), while bus stop infrastructure branding is the least likely because of the cost of developing new bus stop infrastructure (such as shelters). However for the Main Road Transit Corridor, bus stop infrastructure is proposed to be upgraded, which provides an opportunity for bus stops to either have a distinct Corridor brand or a consistent brand across the network.

Due to the role and function of the Transit Corridor (with some services using the Corridor for its entire length, and others feeding into the Corridor at different points), it may be difficult to brand the Corridor through vehicle livery, as buses will be travelling on routes which are not defined as Corridor services. This could weaken or confuse the brand. Using only branded vehicles on the Corridor may also create scheduling difficulties for Metro particularly if services change in the future.

Bus priority infrastructure in the form of bus lanes should be branded through the use of a distinctive colour. This enables users of the road network to clearly identify which lanes they can use, reducing unauthorised use and providing a clear message to bus passengers that they are important and are being given priority. In other Australian States, red is used to distinguish a bus lane. This can either take the form of a lane with continuous colour or partial marking which is more cost effective. There is a need to develop a uniform standard for bus priority treatments to ensure consistency and road user compliance.

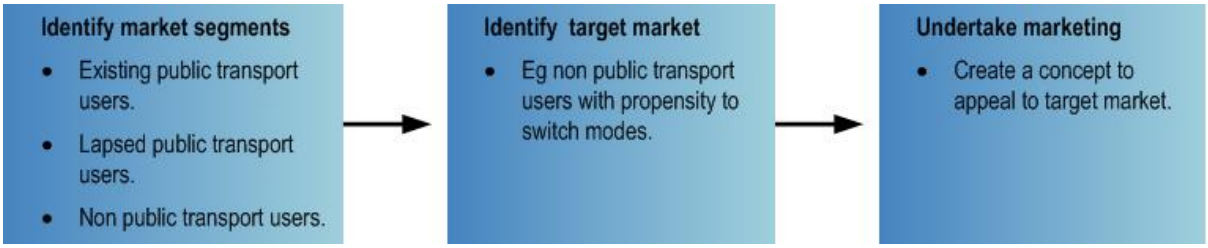
Metro already has a well recognised brand in place. As part of the *Metro Corporate Plan 2012-2014*, Metro is proposing to measure and benchmark its brand equity. This will provide an indication of the strength of Metro's brand and how the public perceives it. There needs to be research undertaken to determine whether it is more effective to closely connect the brand of the Corridor with Metro's existing brand or to differentiate the Corridor services entirely. If the public perceives the current system poorly, it might be more effective to differentiate the Corridor brand. However, as an important part of branding is to have consistent branding across all user information systems, differentiating the Corridor brand could result in passenger confusion.

Existing public transport users and potential passengers need to be kept informed of any improvements to Corridor services through marketing and information campaigns, especially if the intent of service changes is to attract new users.

An important component of a marketing campaign is to identify the different market segments of customers and determine which markets should be targeted. Market research can be a valuable tool in understanding the target market and how they perceive and value public transport. Once the potential target market has been determined, specific marketing and communication messages can be developed to appeal to their needs. It is also important to focus on retaining existing customers, as this can be achieved more effectively

and cost efficiently than attracting new potential customers and helps build customer loyalty and repeat patronage.

Figure 14 Identification of public transport target markets



Branding and marketing of public transport are considered to be cost-effective 'soft' measures to increase public transport patronage. Information and marketing campaigns for Met Bus and Melbourne Tram in Victoria led to a corridor patronage growth of six and seven percent, respectively (Currie, Wallis, 2008).

5.12 Improved passenger service information

1. Provision of simplified, easy to understand and accessible pre-trip information including:
   - Internet journey planners.
   - Integrated website for all Greater Hobart bus services.
2. Provision of real time passenger information:
   - Fixed roadside passenger information at interchanges and major bus stops.
   - Smart phone applications, SMS and recorded messaging.
   - Web-based information.

Metro's current ticketing system infrastructure can be readily upgraded to enable real-time data transfer from buses to passengers. Activating this capacity would allow the implementation of a range of customer-focused real time passenger information functions, which show the arrival time of the next service including:

- Fixed roadside passenger information displays at highest volume bus stops.
- SMS and recorded messaging.
- Smart phone applications.
- Web-based information on computers and mobile devices.

The provision of real time travel information also provides Metro with enhanced real-time network performance data. This will deliver increased capacity to better monitor and manage the operation, in real-time, of Metro's bus network.

Successful public transport systems should be reliable and convenient, so the ability to receive real travel time information will provide a perception to passengers that services are reliable and an attractive transport option. Provision of real time passenger information has the capacity to better respond to and shape the expectations and behaviour of consumers,

particularly with prevailing digital technology where passengers have high expectations for instant access to information.

Passengers place a high value on waiting time for public transport. The potential waiting time for public transport is therefore likely to remain a significant component of the perceived travel time for a journey, particularly over short distances between points along the Main Road. For potential passengers who have a choice in mode, uncertainty over arrival time serves only to exacerbate their perceptions of the inconvenience of the public transport system.

The benefits of real time passenger information are listed below:

- Removes the uncertainty involved in predicting the arrival time of the next service at any given bus stop.
- Passengers perceive that the waiting time at a bus stop is reduced, and therefore waiting is more acceptable. The service is also seen as being more reliable, as passenger have access to real time information.
- Passengers have a stronger satisfaction with the service and are therefore more likely to use the service more frequently, increasing patronage.
- A greater feeling of safety, particularly at night as passengers can spend less time waiting for a bus to arrive.

Fixed roadside real time passenger information displays are expensive to provide. Therefore displays should be provided only on well patronised routes (such as Main Road) and at major bus stops. Real time passenger information can also be used to differentiate Transit Corridor services from standard services, by offering a higher level of information.

The provision of smart phone applications can reach a wider audience and can be more cost effective than providing fixed real time displays at a large number of bus stops. These systems can also support additional personalised functionality, such as customised alerts in addition to features such as journey planners. Victoria's tramTRACKER is an example of a smart phone application.

The Stage One Report highlighted the complexity of the bus network in the Northern Suburbs. There are multiple timetables covering numerous routes, which makes it difficult for passengers to understand and plan trips. Although Metro is the predominant service provider in Greater Hobart, there are other operators in the urban fringe eg. New Norfolk that provide services along Main Road. There is currently no integrated website for all bus operators in Greater Hobart, showing timetable and route information. This makes it difficult for passengers planning trips who want to travel to and from the urban fringe to other destinations in Greater Hobart where they have to transfer to another service provider.

Perceptions of network complexity can be alleviated by providing tools to assist passengers to link trips. Metro Tasmania has developed an internet-based journey planner for Burnie and Launceston, with Hobart expected to be available in 2013. The journey planner enables the planning of more complex trips on public transport, using multiple buses, without requiring a prior knowledge of timetables and routes.

Pre-trip information (such as journey planners with simple and accessible maps) increases the potential for passengers that use public transport infrequently to become loyal customers. Other potential features that are web or application-based include:

- Using GPS technologies to locate bus stops eg. the nearest bus stop or stops near a desired destination; and
- Filtering of services based on route number and accessibility (eg people with mobility issues can locate the next accessible bus service).

The estimated cost of providing a real time passenger information system is $2.5 million. This includes upgrades to the ticketing system, purchase of mobile communication technologies for the bus fleet, Metro information technology system upgrades, fixed signage and development of smart phone applications.

As part of the Nation Building 2 Program the State Government has submitted an application for funding to develop Real Time Travel Information across the Greater Hobart Metro Tasmania network.

6 OPTION COSTS AND BENEFITS

The following assessment provides a summary of the costs and benefits of the recommended options. As stated earlier in this report, some options have been analysed in more detail in terms of quantifying the costs and benefits, as they require a capital investment and substantial planning. The assessment also provides an indication of the timeframe for when options should be actioned. Some options will commence in the short-term, but their delivery will be ongoing. For example infill development will evolve over the next ten years, as the development of infill sites typically has long lead times.

Figure 15 Recommended options – summary of costs and benefits

OPTION	TARGETS IDENTIFIED PROBLEMS AND PROJECT OUTCOMES	IMPACTS (COSTS AND BENEFITS)	TIMEFRAME TO IMPLEMENT	RESPONSIBILITY
Improved frequency and temporal span of bus services				
1. Immediate improvements to bus frequency in response to demand: • Weekday (7:00 AM-7:00 PM): frequency every ten minutes or less. • Saturday (7:00 AM-7:00 PM): frequency every 20 minutes. • Sunday (7:00 AM-7:00 PM): frequency every 30 minutes. • All days (before 7:00 AM and after 7:00 PM): frequency every 30 minutes.	• Improves frequency.	Costs: • No capital costs. • Ongoing net operational costs estimated at $425 000 per annum (short-term net cost). Benefits: • Improved patronage/revenue, through increase in existing users and ability to attract new users (modal increase). • Reduced total travel time: passenger waiting times at bus stops reduced. • Eliminate need for passengers to rely on accessing timetables to use a service at most times. • Some reduction in overcrowding.	Short-term Metro have commenced work on improving frequency.	Metro
2. Immediate improvements to temporal span to ensure consistency across the week: • Monday to Saturday: services commence at 5:30 AM and finish by 1:00 AM. • Sunday: services commence at 7:00 AM and finish by 10.00 PM.	• Improves temporal span.	Costs: • No capital costs. • Ongoing operational costs estimated at $50 000 per annum. Benefits: • Improved patronage, through increase in existing users and ability to attract new users. Attracts new passengers to services responding to longer spread of hours.	Short-term Metro have commenced work on improving temporal span.	Metro

OPTION	TARGETS IDENTIFIED PROBLEMS AND PROJECT OUTCOMES	IMPACTS (COSTS AND BENEFITS)	TIMEFRAME TO IMPLEMENT	RESPONSIBILITY
		• Improved service consistency (starting and finishing times) throughout the week.		
3. Ensure any changes provide services with predictable and consistent frequencies (harmonised timetables).	• Ensures services have harmonised timetables.	Costs: • No capital costs. • No ongoing operational costs (included in ongoing frequency improvements). Benefits: • Improve patronage through increase in existing users and ability to attract new users. • Improved service consistency throughout the day. • Reduced total travel time: passenger waiting times at bus stops reduced. • Reduced need for passengers to rely on accessing timetables to use a service.	Short-term Metro have commenced work on improving frequency.	Metro
4. In the medium-term, monitor demand and make the necessary improvements to frequency and temporal span.	• Improves frequency and temporal span in response to demand.	Costs: • Utilisation of existing Metro resources to monitor demand. Benefits: • Enables frequency and temporal changes to be made in response to demand. • Ensures public transport is efficient and productive rather than creating an oversupply of services or	Medium-term	Metro

OPTION	TARGETS IDENTIFIED PROBLEMS AND PROJECT OUTCOMES	IMPACTS (COSTS AND BENEFITS)	TIMEFRAME TO IMPLEMENT	RESPONSIBILITY
		overcrowding.		
Simplify Northern Suburb bus services				
1. Metro Tasmania to undertake a Northern Suburbs Bus Service Review to ensure routes are as simple and direct as possible and maximise use of the Transit Corridor.	• Targets complexity of the bus network through creating simple and more direct routes.	Costs: • Utilisation of existing Metro resources to undertake review. • Initial costs of implementing the review eg timetable and rostering changes are unknown, estimated to be less than reduce expenditure above due to efficiency gains. • Ongoing operational costs are dependent on review outcomes and whether changes are cost neutral. Expected benefits: • Creation of more direct and legible routes which are easy to understand by passengers. • Improved patronage, through increase in existing users and ability to attract new users. • Reduced in-vehicle travel times, resulting in operational savings for Metro and reduced travel time for passengers. • Reduction of inefficient routes and ability to use these savings to increase frequency on well patronised direct routes with supporting infrastructure (upgraded bus stops and	Short-term Metro have commenced work on the review.	Metro

OPTION	TARGETS IDENTIFIED PROBLEMS AND PROJECT OUTCOMES	IMPACTS (COSTS AND BENEFITS)	TIMEFRAME TO IMPLEMENT	RESPONSIBILITY
		bus priority measures). Expected disbenefits: • Changes to routes may mean some passengers are required to walk further to access a bus stop or may need to transfer to get to their final destination.		
Better managing our road network				
1. Develop a road network approach within Hobart and Glenorchy local Government areas to establish the priority use of roads by transport mode, time, and place of activity.	• Improves public transport reliability by giving priority to public transport on certain networks.	Costs: • Utilisation of existing DIER, Glenorchy and Hobart City Council resources to undertake review. • May require ongoing capital costs in the form of infrastructure provision to give priority to certain modes. Benefits: • Guides decision making and investment on the road network. • Ensures public transport is given priority on core public transport corridors. • Enables priority to be given to certain modes to increase travel time reliability.	Short-term	DIER, Glenorchy and Hobart City Councils
Bus priority measures				
1. Implementation of short-term bus priority treatments to improve travel time reliability for buses, including: • Bus priority approaching major intersections	• Improves public transport reliability through giving priority to buses, better use of road space and removal of Corridor diversions.	Costs: • Capital costs estimated at $230 000. Benefits: • Improved travel time reliability for passengers.	Short-term Funding application submitted under Nation Building 2.	DIER, Glenorchy and Hobart City Councils

OPTION	TARGETS IDENTIFIED PROBLEMS AND PROJECT OUTCOMES	IMPACTS (COSTS AND BENEFITS)	TIMEFRAME TO IMPLEMENT	RESPONSIBILITY
(reallocation of road space and providing signal priority). • Removal of Springfield Depot inward diversion.		Savings are estimated at 3:51 minutes during AM peak inward trip 2012 (also includes bus stop optimisation savings). • Operational savings for Metro (bus kilometres, fuel, labour costs) as a result of reduced travel time, estimated to be $36 000 per annum (2011 dollars). • Increased patronage, by 2030 patronage will increase from 5310 to 6060 by 2030 (daily weekday trips), which is a 14 percent increase. • Increased fare revenue through increased patronage, estimated to be to $378 000 by 2030 which is a 13 percent increase. • Decreased travel time variability. From the Springfield Depot to Burnett Street ,variability is estimated to be reduced by an average of 37 seconds. • Other vehicles will also experience decreases in travel times in the AM and PM peaks. Disbenefits: • Requires some removal of on-street car parking to give priority to buses.		
2. Investigation of medium-term bus priority treatments to reduce the diversion	• Improves public transport reliability through giving priority to buses, better use	Costs: • Capital costs are unknown at this stage. Requires	Medium term Funding application submitted	DIER and Hobart City Council

OPTION	TARGETS IDENTIFIED PROBLEMS AND PROJECT OUTCOMES	IMPACTS (COSTS AND BENEFITS)	TIMEFRAME TO IMPLEMENT	RESPONSIBILITY
caused by the one-way street network within the Hobart CBD.	of road space and removal of Corridor diversions.	planning funding to investigate estimated at $320 000. Expected benefits: • Improved travel time reliability for passengers. • Operational savings for Metro (bus kilometres, fuel, labour costs). • Decreased travel time variability.	under Nation Building 2 for planning.	
3. Investigation of medium-term bus priority treatments at key intersections, such as queue-jump bus lanes and bus-early start signal priority. For the longer-term, consider set-back bus lanes depending on the effect of short and medium term bus priority measures.	• Improves public transport reliability through giving priority to buses and better use of road space.	Costs: • Capital costs are unknown at this stage. Requires scoping funding to investigate. Expected benefits: • Improved travel time reliability for passengers. • Operational savings for Metro (bus kilometres, fuel, labour costs). • Increased patronage. • Decreased travel time variability.	Medium to long-term	DIER, Glenorchy and Hobart City Councils
Bus stop optimisation				
1. Optimise the number of bus stops along the Corridor to improve travel time reliability.	• Improves reliability by reducing the number of bus stops along the Corridor.	Costs: • Capital costs included as part of bus stop upgrade costings. Requires removal of stops (minimal capital cost) and construction of new bus stops. Benefits: • Improved travel time reliability for passengers.	Short-term Funding application submitted under Nation Building 2.	Metro

OPTION	TARGETS IDENTIFIED PROBLEMS AND PROJECT OUTCOMES	IMPACTS (COSTS AND BENEFITS)	TIMEFRAME TO IMPLEMENT	RESPONSIBILITY
		Estimated reduction of 1:30 minutes travel time along the Corridor. • Operational savings for Metro (bus kilometres, fuel, labour costs). • Decreased travel time variability. Disbenefits: • Optimisation of bus stops may require some passengers to walk further to access a bus stop.		
Improved bus stop infrastructure				
1. Upgrade bus stop infrastructure, including shelters, seating and passenger information displays and ensure stops are accessible (DDA compliant).	• Improves bus stop infrastructure.	Costs: • Capital costs to upgrade bus stops estimated at $470 000. Benefits: • Improves the overall quality of the bus system. • Passengers will be more comfortable through provision of shelter and seating. • Passenger safety will be enhanced through provision of lighting. • Passengers will have better access to passenger information which is simple and easy to understand. • Provision of accessible bus stops will enhance access for those individuals who have limited mobility, the aged or people travelling	Short-term Funding application submitted under Nation Building 2.	Metro

OPTION	TARGETS IDENTIFIED PROBLEMS AND PROJECT OUTCOMES	IMPACTS (COSTS AND BENEFITS)	TIMEFRAME TO IMPLEMENT	RESPONSIBILITY
		with young children.		
2. Review bus stop lengths to ensure the space is adequate for efficient bus manoeuvrability.	• Improves public transport reliability by improving bus manoeuvrability.	Costs: • Requires capital costs to increase bus stop lengths. Costs are likely to be minimal, as infrastructure is low cost in the form of line-marking and signage. Benefits: • Improves travel time reliability for passengers, by improving bus draw-in and draw-out manoeuvrability. • Reduces congestion and travel time delays for other road users, as buses will not obstruct passing traffic. • Improves safety for passengers as the bus can park parallel to the kerb. Disbenefits: • May require some removal of on-street car parking to ensure bus stop lengths are adequate.	Short-term	Metro
Increased density and mixed use through infill development				
1. State and local Government to jointly investigate mechanisms to facilitate development, in the form of higher residential densities and mixed use focusing on the Main Road Transit Corridor and its activity centres.	• Targets low levels of population growth by encouraging higher residential densities through infill development along the Main Road Transit Corridor.	Costs: • Funding required to undertake initial investigation on how State and local Government can facilitate infill development along Transit Corridors. • The direct costs to State and local Government in facilitating infill development	Short to long-term. Planning for infill development needs to occur in the short-term due to long planning lead times.	State Government (DIER, DED, TPC), STCA, Glenorchy and Hobart City Councils.

OPTION	TARGETS IDENTIFIED PROBLEMS AND PROJECT OUTCOMES	IMPACTS (COSTS AND BENEFITS)	TIMEFRAME TO IMPLEMENT	RESPONSIBILITY
		through policy and planning changes and direct intervention are unknown and will be informed by the initial investigation taken above. • Substantial investment will be required by the private sector to redevelop sites for infill. Benefits: • Initial investigation provides State and local Government with an informed response of the best means of facilitating infill development within the Tasmanian context. • Infill development will lead to urban renewal and subsequent population growth and economic activity along high frequency public transport corridors. • Increased growth will lead to greater demand for public transport and patronage increases. • Infill development adjacent to Transit Corridors will maximise the use of existing public transport systems and walking and cycling networks. • Infill development adjacent to Transit Corridors provides people with a greater modal choice and has the potential to reduce people's travel		

OPTION	TARGETS IDENTIFIED PROBLEMS AND PROJECT OUTCOMES	IMPACTS (COSTS AND BENEFITS)	TIMEFRAME TO IMPLEMENT	RESPONSIBILITY
		costs.		
A better urban environment to support and encourage the use of public transport, walking and cycling.				
1. DIER and Glenorchy and Hobart City Councils to ensure urban design frameworks for activity centres within the Transit Corridor support and encourage public transport, walking and cycling.	• Encourages greater use of public transport, walking and cycling through an improved urban environment.	Costs: • Utilisation of existing DIER, Glenorchy and Hobart City Council resources to ensure urban design frameworks support public transport, walking and cycling use. Benefits • Urban design frameworks that support and encourage public transport, walking and cycling. • Urban design that increases the attractiveness of a place and encourages more people generating activities leading to increased public transport demand.	Short to long-term Ongoing action	DIER, Glenorchy and Hobart City Councils
2. Improved pedestrian connections to major bus stops within activity centres through targeted infrastructure upgrades and/or signage. Major bus stops to target include: • Hobart Bus Mall (subject to the Planning for the Hobart Central Bus Interchange project). • Glenorchy Bus Mall. • Elizabeth Street bus stops (between Liverpool and Bathurst Streets, bus stop id	• Targets poor quality bus stop infrastructure by improving pedestrian connections to bus stops.	Costs: • Requires capital costs to remove pedestrian barriers and improve connectivity. Costs are unknown at this stage. Benefits: • Improved safety and connectivity for pedestrians. • Improved access to public transport.	Short-term	DIER, Glenorchy and Hobart City Councils

OPTION	TARGETS IDENTIFIED PROBLEMS AND PROJECT OUTCOMES	IMPACTS (COSTS AND BENEFITS)	TIMEFRAME TO IMPLEMENT	RESPONSIBILITY
3385/341 and 958). • North Hobart activity centre (bus stop id 346 and proposed new stop near Lefroy Street). • Moonah activity centre (bus stop id 358 and 937). • New Town activity centre (bus stop id 354 and 944).				
Improved cycling connections to the Transit Corridor and Principal Urban Cycling Network				
1. Improved connectivity, through targeted infrastructure upgrades and/or signage for the following Transit Corridor cycling connections: • Bathurst Street, Molle Street to Campbell Street. • Burnett Street, Murray Street to Campbell Street. • Newdegate Street, Mellifont Street to Elizabeth Street, with link via Strahan Street to Argyle Street. • Archer Street, Argyle Street to New Town Road. • Bay Road, Inter-city cycleway to New Town Road via Cross Street. • Bromby Street, Inter-city cycleway to New	• Targets cycling gaps through identification of infrastructure needs.	Costs: • Requires capital costs to improve cycling connectivity. Costs are unknown at this stage. Benefits: • Improved safety and connectivity for cyclists. • Improved access to the Transit Corridor, activity centres and Principal Urban Cycling Network.	Short to long-term. Infrastructure and signage upgrades will be progressively implemented over the next 10 years.	DIER, Glenorchy and Hobart City Councils

OPTION	TARGETS IDENTIFIED PROBLEMS AND PROJECT OUTCOMES	IMPACTS (COSTS AND BENEFITS)	TIMEFRAME TO IMPLEMENT	RESPONSIBILITY
Town Road. • Derwent Park Road or alternative route (eg. Bayswater Road, Lutana rail spur). • Tolosa Street or alternative route (Humphreys Rivulet).				
Provision of secure bicycle parking at select locations on the Transit Corridor				
1. Provision of additional short-term bicycle parking facilities within Moonah activity centre.	• Targets cycling gaps by provision of additional short-term bicycle parking facilities.	Costs: • Capital costs are estimated at $780 per hoop. Benefits: • Encourages more people to cycle. • Provides supportive end of trip facilities for cyclists.	Short-term	Glenorchy City Council
2. Investigate the provision of long-term secure bicycle parking at Glenorchy activity centre.	• Targets cycling gaps by provision of long-term bicycle parking facilities.	Costs: • Capital costs for provision of secure bicycle parking are unknown. The costs will vary depending on the type of facility. The cost of a bicycle cage (to accommodate 26 bicycles) in Victoria is $100 000. The cage consists of steel support structures with mesh and covered roof. • May require some operational ongoing costs in terms of managing the facility. Benefits: • Encourages more people to cycle. • Provides supportive end of	Short-term	DIER, Glenorchy City Council

OPTION	TARGETS IDENTIFIED PROBLEMS AND PROJECT OUTCOMES	IMPACTS (COSTS AND BENEFITS)	TIMEFRAME TO IMPLEMENT	RESPONSIBILITY
		trip facilities for cyclists, which are secure and visible. • Enables people to combine cycling with a public transport trip.		
Corridor branding and marketing of services				
1. Investigate and implement options to brand Metro Tasmania's Transit Corridor services.	• Targets low levels of public transport use by marketing and differentiating Corridor services.	Costs: • Estimate $100 000 to investigate and start implementing Corridor branding. • Capital cost of branding the Corridor (depending on options) is unknown. Branding of bus stop and passenger information displays would be included as part of bus stop upgrade costs. Benefits: • Raising passenger awareness of services and improvements to services, particularly potential new users. • Improves the image and overall quality of bus services.	Short-term	Metro
2. Better understand the target markets for public transport users and their expectations, in order to create an informed direct marketing campaign.	• Targets low levels of public transport use by marketing Corridor services.	Costs: • Estimated $30 000-40 000 to undertake initial market research to determine target market. This research would also apply to other future Transit Corridors. • Cost of information campaign is unknown.	Short-term	Metro

OPTION	TARGETS IDENTIFIED PROBLEMS AND PROJECT OUTCOMES	IMPACTS (COSTS AND BENEFITS)	TIMEFRAME TO IMPLEMENT	RESPONSIBILITY
		Benefits: • Enables target groups to be identified, which will deliver a higher patronage response rate. • Ability to deliver targeted information which is relevant and useful to target groups. • Informs existing and new potential passengers of existing services and changes to services.		
3. Develop a uniform 'brand' for bus priority infrastructure through the use of a distinctive colour.	• Targets low levels of public transport use by marketing public transport.	Costs: • The capital cost of resealing bus lanes (colour cold applied plastic or similar) will vary based on treatment area. Cost is currently $70 per m2. Benefits: • Enables users of the road network to clearly identify which lanes they can use and reduces unauthorised use. • Highly visible which provides a clear message to bus passengers that they being given priority. • Easy to install.	Short-term	DIER
Improved passenger service information				
1. Provision of simplified, easy to understand and accessible pre-trip information including: • Internet journey planners.	• Reduces the complexity of the bus network through provision of better information.	Costs: • Use of existing Metro resources to develop an internet journey planner for Hobart Metro services. • Development of an	Short-term Metro have commenced work on developing a Hobart Metro journey planner.	Journey Planner – Metro Integrated website – Metro and other private bus operators

OPTION	TARGETS IDENTIFIED PROBLEMS AND PROJECT OUTCOMES	IMPACTS (COSTS AND BENEFITS)	TIMEFRAME TO IMPLEMENT	RESPONSIBILITY
• Integrated website for all Greater Hobart bus bus services.		integrated website for metropolitan services has not been costed. Benefits: • Reduces the complexity of the network by providing tools to assist passengers to plan their journey especially where there are multiple operators.		
2. Provision of real time passenger information: • Fixed roadside passenger information at interchanges and major bus stops. • Smart phone applications, SMS and recorded messaging. • Web-based information.	• Reduces the complexity of the bus network through provision of better information. • Improves travel time reliability for passengers by reducing waiting times at bus stops.	Costs: • Estimated $2.5 million to upgrade ticketing system, purchase mobile communication technologies for the bus fleet, Metro information technology system upgrades, fixed signage and development of smart phone applications (applies to whole of Greater Hobart). Benefits: • Removes the uncertainty involved in predicting the arrival time of the next service. • Removes reliance on paper based timetables. • Passengers perceive that the waiting time at a bus stop is reduced, and therefore waiting is more acceptable. • Increases passenger satisfaction with the service. • A greater feeling of safety,	Short-term Funding application submitted under Nation Building 2.	Metro

OPTION	TARGETS IDENTIFIED PROBLEMS AND PROJECT OUTCOMES	IMPACTS (COSTS AND BENEFITS)	TIMEFRAME TO IMPLEMENT	RESPONSIBILITY
		particularly at night as passengers can spend less time waiting for a bus to arrive.		

7 SUMMARY OF NORTHERN SUBURB TRANSIT CORRIDOR OPTIONS

The high level review of public transport corridor options in the Northern Suburbs was completed in late 2011. The review highlighted that:

- The Brooker Highway was not a suitable Transit Corridor, as it is Hobart's key urban highway with a high freight and car based passenger function, as opposed to a core public transport route.
- Previous work on the rail corridor suggests that the capital costs of refurbishing the rail corridor for public transport use (either light rail or bus rapid transit) may outweigh the potential benefits of using the corridor. A peer review of the Light Rail Business Case was finalised in December 2012 and determined that the findings of the business case "was in essence a fair and sound appraisal of the economic benefits and costs".

The Main Road Corridor is an existing high frequency public transport route linking the key activity centres of Glenorchy, Moonah, New Town, North Hobart and Hobart CBD. It carries 20 percent of Greater Hobart's public passenger boardings. Main Road has historically been (since the introduction of trams in 1893), and will continue to be a core public transport route in Greater Hobart. Regardless of the ultimate decision to re-use the rail corridor for transit, there will be demand for public transport on the Main Road Corridor to service the large number of attractors and people living adjacent to the Corridor between Glenorchy to Hobart.

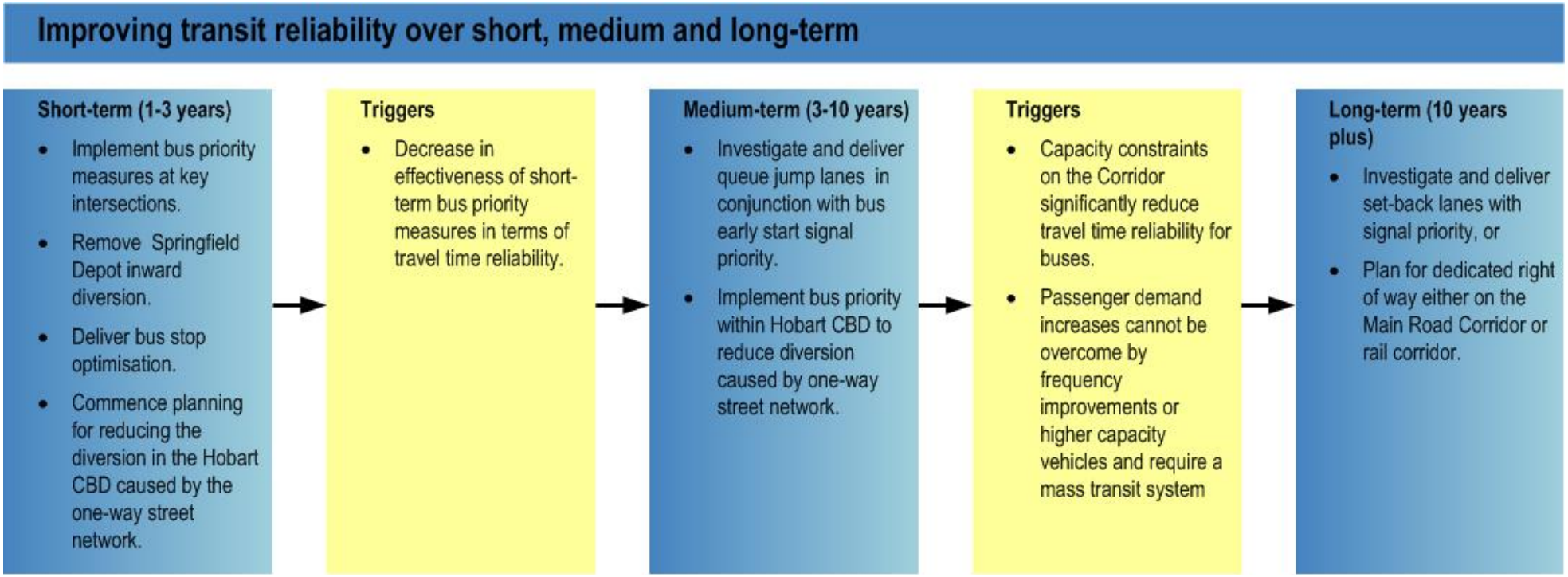
Improving the reliability and effectiveness of public transport on the Main Road Corridor is not contrary to future development of public transport options on the rail corridor. Investment on the Main Road Corridor will build the overall market for public transport in the Northern Suburbs, some of which may be ultimately transferred to the rail corridor.

In the first instance, the State Government's priority is to ensure that the best return is being secured from existing investment in the public transport system. The *Tasmanian Urban Passenger Transport Framework* identifies measures to maximise passenger transport patronage through targeted investment in existing services and road based infrastructure.

Improving public transport on the Main Road Corridor is seen as an essential step in improving demand for public transport. As patronage increases to a level that exceeds the capacity of the bus system (as indicated by significantly reduced reliability and frequency) other higher capacity mass transit options will need to be considered.

The diagram below outlines the steps for improving transit reliability on the Main Road Corridor over the short to long-term.

Figure 16 Improving transit reliability



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