Department of Infrastructure,
Energy and Resources

Review of Passenger Travel Demand Measures
Greater Hobart

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FINAL STAGE 3 REPORT
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PARSONS BRINCKERHOFF

Future Land Use and Transport Scenarios Discussion Paper

June, 2009

Department of Infrastructure, Energy and Resources

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Executive summary

PB was commissioned by the Department of Infrastructure, Energy and Resources (DIER) to undertake a review of passenger travel demand management (TDM) measures in Greater Hobart. The purpose of this study is to review passenger travel demand measures for Greater Hobart's passenger transport system and outline potential measures to improve passenger transport outcomes and reduce greenhouse gas emissions associated with the passenger transport task. Each stage of the review will produce a stand alone report, with this report focussing on Stage 3.

Methodology

The project methodology includes the following three broad stages:

- Stage 1 - Understanding the factors in Hobart's passenger travel
- Stage 2 - Identifying potential measures to reach passenger transport aims
- Stage 3 - Identifying Travel Demand Measures best suited to Hobart.

Stage 3, the final stage of the project, involves a review of the full range of potential travel measures that could be applied and consideration of their applicability to Greater Hobart. A suite of recommendations and an implementation plan is also presented.

Background

The Greater Hobart region is Tasmania's largest urban area. The total population for the study area is 197,639, based on the 2006 Census. Future population forecasts estimate the population for Greater Hobart to be 242,020 in the year 2032. Most of the population are located within older areas of Hobart, Glenorchy and Clarence municipalities that contain the highest density living. Additionally closer settlement areas are concentrated in Kingborough, Brighton and Sorell.

For each LGA, the age distribution to 2032 shows an ageing population with the proportion of residents aged over 54 projected to increase. Population forecasts show the movement of the urban population to adjacent local government areas that combine a mix of urban and rural land. The average household size for the study area is 2.5, with most areas showing a decreasing trend in household size.

Land use in Greater Hobart

Several key issues have emerged in Greater Hobart pertaining to land development. The current pattern of development in Greater Hobart does not support the efficient and effective provision of public transport. It also limits opportunities to walk or bike to access land uses. In Greater Hobart, three major development trends affect travel demand, including:

- a dispersed settlement pattern
- segregation of land use types
- emphasis on car-based development approvals; and
- the location of affordable housing in urban fringe areas.

Land use planning framework and institutional arrangements

Key constraints of the existing land use planning framework and institutional arrangements are:

- lack of a strategic focus at the State level
- a reliance on local government to implement policy
- the limited integration of both adjacent local government areas and the transport authority.

Transport issues

The region's passenger transport system is predominantly about moving cars. The cumulative impact of state and local decisions has placed car travel as the dominant mode of transport. This has led to declining use of other modes. As importantly, it has lead to a dramatic decline in the range of choices of how and where we travel in Hobart. Today's regional transport system largely reflects original transport linkages and alignments and there have been limited changes to major intrastate transport corridors. Broad trends in the development of the region's transport system are:

- topographical constraints affecting road and rail alignments and corridor options
- initial importance of rail (including trams and trolley buses) for passenger and freight transport (intra and inter-regional) but now freight-based only.

Increasing vehicle kilometres travelled

Greater Hobart has an increasing trend in private vehicle passenger transport kilometres travelled each year. In 2006, it was estimated that there were 1.47 billion vehicle kilometres travelled by car. By comparison, passenger kilometres travelled by bus have remained relatively stable, and in 2006 were estimated at 0.025 billion vehicle kilometres. Future projections for Greater Hobart's passenger transport task show that this trend will continue, with the majority of vehicle kilometres being travelled by car, rising to 1.54 billion vehicle kilometres by the year 2020. All roads increase in traffic density with proximity to central Hobart.

Metro Tasmania timetabling

Experience from other jurisdictions indicates that public transport needs to be convenient, reliable and easy to use. A brief review of the Metro bus timetables indicates that the Hobart bus network is complex with numerous route variations and complicated timetables. Other issues are:

- inadequate operating hours with over 60% of routes spanning less than 8 hours, requiring full-time workers to travel on different services to and from work. Additionally 85% of routes finish before 7pm
- low service frequencies with over 60% of routes running less than six times per day; and
- poor weekend services with 70% of routes not operating on Saturday and 85% not operating Sundays.

The service standards recently developed by DIER and Metro will go some way to addressing operating hours and frequencies across greater Hobart. However, this is being undertaken within existing budget allocations which means changes will be made by achieving service efficiencies and reducing services in some areas. The current focus is on improving consistency of service delivery across Hobart and improving evening and weekend services.

Need for a "one seat ride"

Another issue is the lack of a "one seat ride" if travelling from one suburb to another – meaning that passengers seeking destinations beyond the CBD are required to transfer between buses in the CBD. The public transit system is oriented in a radial pattern to and from the Hobart CBD and this can have a significant penalty on transit ridership.

Ageing population

The population in Greater Hobart is getting older and this is expected to continue as baby boomers age. An ageing population means there are more people who may choose not to drive or cannot drive and are therefore dependent on transit. A parallel issue with an aging population is the increase in driving during non-peak hours.

Traffic priority

The vast majority of spending on transport infrastructure is car-based. Priority in timing of traffic signals is given to moving cars. Traffic patterns are geared towards getting cars through our CBD as fast as possible at the expense of the pedestrian environment, for example the Macquarie/Davey couplet. Too often, the pedestrian realm is considered to be the foot path. Examples of other pedestrian issues identified through consultation with DIER include:

- Poor pedestrian linkages around Eastland in Clarence.
- Kingston is not pedestrian friendly, and the north-west area in particular has poor linkages.
- Contemporary subdivision designs around Hobart do not promote pedestrian activity, due to circuitous routes and poor linkages.

Transport disadvantage

Very high scores for transport disadvantage are recorded in New Norfolk and surrounding areas and in developed parts of Bridgewater and Gagebrook. There appears to be a correlation between transport disadvantage and broad acre public housing estates in areas such as Bridgewater/Gagebrook, Clarendon Vale, Rokeby and Risdon Vale. A reliable public transport service is essential in these communities, providing access to employment and services, and promoting participation in the community. Rural areas such as New Norfolk, Richmond, Pontville and the outer areas of Sorell are highly disadvantaged in relation to transport. This is due to physical distance and lack of alternatives to cars (e.g. buses).

Parking

Hobart is the only municipality across Greater Hobart to charge for parking. Parking spaces are in short supply in the Hobart municipality commuter car parks have waiting lists and short term car parks often have queues of vehicles trying to access the limited number of spaces. One third of spaces in Hobart are dedicated to employee parking. Of these 60% are for use of Government employees. There is a large supply of free parking in the Glenorchy, Moonah and Claremont areas.

Cycling

Although bicycle usage levels remain low in Tasmania in comparison to other States, Hobart in particular has a growing cycling culture and cycling is increasing in popularity as a method of commuting to work. The proportion of trips using cycling as a mode is greatest in the Hobart area, compared to the other

local government areas. For short trips, especially people living nearby to their workplaces, there is great potential for cycling to increase as the mode of choice. Provision of bicycle infrastructure is generally better on the western shore of the Derwent River. The Intercity Cycleway is the main commuting cycle route from Glenorchy to Hobart CBD, with grade separated crossings at major roads along the way. The Tasman Bridge has shared (but very narrow) paths on either side, connecting to the Intercity Cycleway; however one side includes stairs as part of the connection. The Tasman Bridge is perceived by many as unsafe and is a barrier to cycling.

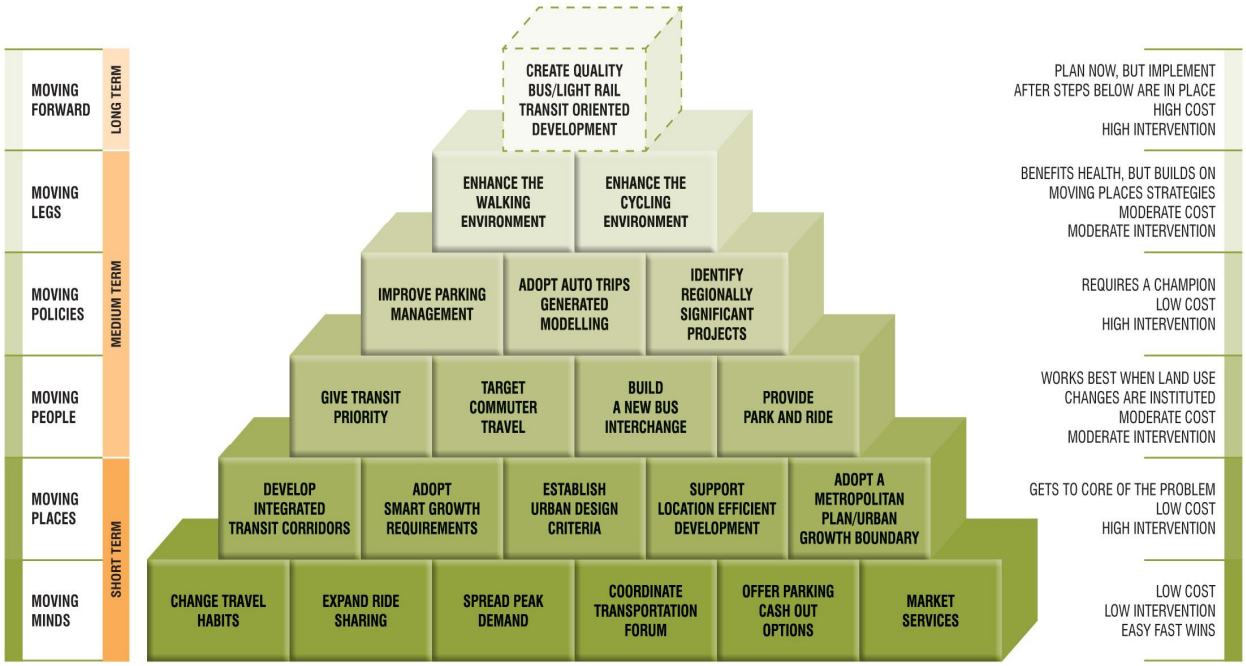
Review of travel demand measures

Stage 2 of the project involved a review of potential travel measures that could be applied and consideration of their applicability to Greater Hobart. Measures were identified through case studies to address the key transport issues identified during Stage 1. Findings from Stage 2 of the project are summarised in Appendix B of this document.

Six case studies were identified in consultation with DIER with comparable population, land use patterns and natural landscape characteristics to Hobart. A very high level review of the case studies has been undertaken to highlight the travel demand measures implemented in these coastal cities with dispersed settlement patterns. Additional research is encouraged as there has been limited opportunity to fully investigate the relationship between the measures and their applicability in Hobart due to the time constraints of the project.

TDM measures best suited to Greater Hobart

The figure below presents a 'pyramid' of TDM measures best suited to Greater Hobart. The recommended travel demand measures are separated into six streams: Moving Minds, Moving Places, Moving People, Moving Policies, Moving Legs and Moving Forward. The pyramid approach builds on actions that have relatively low costs and low amount of intervention to implement. As the TDM program proceeds, more expensive and difficult to implement measures can build on the success of these first steps.



These measures are discussed in further detail under their relevant stream heading in Section 3 of this report, followed by a suite of implementation plan tables in Table 3-1 to Table 3-6. The tables identify the following:

- Issue or need addressed through implementation of the measure
- Likely outcomes and successes that could be achieved
- Timing – short, medium or long term
- Relationship with other measures
- Cost
- Responsibility – DIER and partners.

Measures are classified in terms of anticipated timing, with short-term actions being under five years, medium-term between five and ten years and long-term more than ten years.

The possible responsibility for delivery column of the tables recognises the roles played by major stakeholders in shaping the future transport policy and direction of Greater Hobart. DIER is responsible for the arterial road system, including freeways, and for catering for the needs of on-road public transport, major infrastructure initiatives, public transport and area wide policy. In addition public transport operators also play a clear role in the future development and direction of public transport systems. Whilst it is clear that councils have a significant role to play in lobbying for improved transport systems, the councils also have responsibility for local roads, safety, traffic management, community transport and cycling and pedestrian issues.

Next steps

The implementation of the proposed TDM measures outlined in this report will involve co-ordination between DIER and other stakeholders including Local Councils, public transport operators and the Department of Justice. DIER's role ranges from facilitation, funding, liaison to active implementation of measures.

More complex TDM measures require further development through detailed investigation and planning work before advancing to implementation phase. Once the integrated transit corridors and land use frameworks have been established, transit priority measures should start to incorporate along the main transit spines. Further investigations into possible treatments and measures would be required to determine the feasibility, design, costs and travel time savings of such schemes. It is also important to note that investments in priority for transit should be focused on the transit corridors, not highways. This will help to attain the desired integration of land use and public transport to reduce greenhouse gases.

A range of projects to support and inform the recommended measures have been identified and these include:

- Passenger transport network review
- Regional Passenger Strategy
- Metropolitan Plan

- Development of Urban Design Criteria
- Regional Parking Strategy

The TDM measures recommended for Greater Hobart should be reviewed every three years to ensure that it keeps pace with changing circumstances, travel needs and policy.

The Greater Hobart TDM implementation plan will need to be reviewed each year and an implementation team should be established to monitor and facilitate the implementation of the TDM measures. The Implementation Team will need to comprise of senior staff from a wide range of organisations to ensure that policies are installed across the region and that implementation and further development are informed by all stakeholders. Annual updates should be prepared to report on the progress of the implementation of the TDM measures on a yearly basis.

1. Introduction

1.1 Purpose

PB was commissioned by the Department of Infrastructure, Energy and Resources (DIER) to undertake a review of passenger travel demand management (TDM) measures in Greater Hobart. The purpose of this study is to review passenger travel demand measures for Greater Hobart's passenger transport system and outline potential measures to improve passenger transport outcomes and reduce greenhouse gas emissions associated with the passenger transport task. Each stage of the review will produce a stand alone report, with this report focussing on Stage 3.

1.2 Objectives

The principal objectives of the review are to:

- define current travel demands and measures
- scope issues pertinent to Greater Hobart
- identify a range of potential measures
- screen potential measures in consideration of issues and conditions in the region
- identify most likely measures for modelling
- recommend a set of measures for future implementation.

1.3 Background

The Tasmanian Government seeks to reduce greenhouse gas emissions associated with the delivery of passenger transport. As such, the Government is delivering the Tasmanian Passenger Transport Strategy through DIER and the Tasmanian Climate Change Office (TCCO). An integrated transport review or development of a passenger transport strategy has not previously been undertaken in any of Tasmania's metropolitan areas. The Government will develop the Tasmanian Passenger Transport Strategy using the responses from the review of passenger travel demand measures and outputs from other associated projects.

1.4 Related projects

Four projects related to the review of travel demand measures currently being undertaken by DIER include:

- Local Area Transport, exploring opportunities for substituting private vehicle travel with walking and cycling.
- Alternate uses for Hobart's freight rail corridor, considering potential public transport uses for the existing rail corridor; options include light rail and guided busway systems, similar to Adelaide's O-Bahn.

- Water-based transport in Greater Hobart, investigating the viability of passenger ferry services.
- Travel Demand Forecasts for the major corridors in Hobart, being undertaken concurrently by PB.

1.5 Methodology

The project methodology includes the following three broad stages:

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2. Background

2.1 Overview

In 2005, the transport sector accounted for approximately 14 per cent of Australia's net greenhouse gas emissions. Between 1990 and 2005, the carbon dioxide equivalent emissions from the transport sector grew by 30% or 18.5 million tonnes. Tasmania's transport contribution to greenhouse gas emissions was 1,567.40 Giga-grams (1000 tonnes).

The intent of managing passenger travel demand is, in part, to reduce our contribution of greenhouse gases. Simply put, this means we need to shift the proportion and amount of travel that is done by car to other modes such as walking, biking and public transport. This requires a focus on land use and the overall transportation system. Issues, existing conditions and emerging tools pertaining to each in Greater Hobart are presented below.

2.1.1 Land Use in Greater Hobart

Issues

The starting point for thinking about passenger travel demand is the way we develop land and manage land uses. Decisions about land use directly affect the demand for different modes of travel. Obviously, as the amount or area of development increases, the demand for transportation facilities grows accordingly.

Several key issues have emerged in Greater Hobart pertaining to the way we develop land. The current pattern of development in Greater Hobart does not support the efficient and effective provision of public transport. It also limits opportunities to walk or bike to access land uses. Hobart is not alone in dealing with this issue. The majority of Tasmania's urban areas have been designed around private cars and road-based transport.

In Greater Hobart, three major development trends affect travel demand, including:

- a dispersed settlement pattern
- segregation of land use types
- emphasis on car-based development approvals; and
- the location of affordable housing in urban fringe areas.

Tasmania has a comparatively lower rate of growth and significantly more dispersed population compared to other Australian States. In Tasmania the population level has been static in rural areas and in inner city areas. The population growth that has occurred in Greater Hobart has been in outer urban areas such as Sorell, Kingston and Brighton.

The general land use pattern and resulting travel behaviour is also based on a preference for low-density, single family housing that is segregated from where we shop, work or conduct many of our other daily activities. Historically, land uses were segregated to minimize conflicts between uses, improve public health and to respond to lifestyle desires by the public. Current local zoning regulations in Greater Hobart generally reinforce this

segregation. Consequently, it is common to "need" a car to access the majority of our travel destinations from our homes (or vice versa).

The trends above have substantial costs to governments and each of us. As such, they should not be dismissed as "givens". Recent research completed by Curtin University of Technology and Parsons Brinckerhoff has highlighted the cost of fringe residential development versus urban consolidation. The research assessed the cost of market externalities such as transport, environmental and health costs with more traditional economic costs associated with infrastructure. The analysis found that:

- Each new peripheral lot cost government in Australia approximately $80,000 – this includes utilities, community services and road services.
- For every 1000 fringe lots, the cost to people was over $250 million over 50 years, including transport cost associated with heavy reliance on car usage and approximately $4 million in health costs associated with higher risks of obesity and lower level of physical exercise.
- Carbon offsets achieved per 1000 urban dwellings totals a reduction of 4,400 tons of greenhouse gas; this is the equivalent emissions generated from 200 single detached dwellings.

Anecdotally, there is evidence that councils have been in a "race for rateables" which further disperses land uses in the region. This simply means that some councils tend to compete with one another encourage economic development within their municipal borders. While this may help to reduce the property tax burden in a municipality, it places greater strain on the regional transport network.

The current political system dictates that local governments tend to compete for development and infrastructure. The State Government is left confronting multiple residential and commercial growth corridors and ad-hoc industrial precincts, which all demand finite infrastructure and services to be spread more thinly and at significantly greater cost.

Councils also tend to focus on impacts of individual projects. The review of projects tends to consider access by cars, congestion at nearby intersections and the adequacy of parking supply as the key issues of concern. Very little attention is given to ensuring development contributes to the development of a better regional public transport system or a better environment for walking, biking or transit use. These car-based solutions make it even more difficult to shift auto-users to other modes of travel.

Recent increases in house and rental prices have led to a growing spread of affordability among suburbs. Inner areas tend to be higher-priced markets while many outer suburbs representing lower-priced segments. Prices and rents are higher in inner areas, in part, because jobs, services and amenities are readily available within a short travel distance. People can also afford to pay more since travel uses a lower proportion of their disposable income.

Conversely, people earning lower incomes and living in outer areas are distanced from public transport, employment, education and other services and amenities. Particular areas of concern based on the SEIFA index include Gagebrook, Clarendon Vale, Bridgewater, Warrane, Goodwood, Chigwell, Rokeby, Risdon Vale, Derwent Park, Primrose Sands, Sorell, Glenorchy and Mornington. These outer areas typically are developed at relatively

low densities with few mixed use areas. The result is that it is not financially viable to offer adequate public transport and the lowest income residents are the most dependent on cars and have the longest distances to drive. In addition, these residents often face higher transport costs due to longer distances being travelled and a lack of suitable alternatives to car use. This situation can be further compounded by fuel price increases, so people who live in these areas often have to make a choice between housing affordability and transport costs.

In addition, four other major issues have been identified including:

- Lack of Strategic Focus
- Reliance on local planning schemes to deliver strategic outcomes
- Limited role of the Transport Authority
- Lack of Regional Strategic Planning.

Lack of Strategic Focus

Since the initiation of the Better Planning Outcomes project in 2004, there has been a focus on review of the existing Land Use Planning system in Tasmania. The concentration of work appears to be associated with achieving a consistent Planning Scheme approach to facilitate more efficient Planning Approvals. Strong strategic direction is required at both the State and Local levels to provide a framework that articulates key assets and directions and constraints at a broad macro level. Despite the strength of the *State Policies and Projects Act 1994,* however, there have been only three State Policies prepared under the RMPS since its implementation.

The *Better Planning Outcomes* report identified a range of issues affecting the development and implementation of State Policies, including uncertainty regarding format and content, problems in preparation and implementation, and the level of resources and expertise needed for development. The means for making, reviewing and giving greater weight to State Policies is included in the current review of Tasmania's Planning System Review that began in 2008.

There is a 'gap' in the structure of the planning system, it is recognised that State Policies take a long time to prepare and that there were relevant matters that did not lend themselves to being addressed through State Policies. While there are other mechanisms to implement State policies such as planning directives or through standard planning scheme schedules, these strategic planning 'tools' remain untested.

As a result there is no State Policy on transport. The Tasmanian Planning Commission have prepared a Planning Advisory Note 1 which does provide guidance on better integrating transport infrastructure with land use planning considerations within Planning Schemes. Traffic Impact Assessment (TIA) guidelines have been developed in Tasmania. The TIA guidelines provide proponents and developers with a methodology to ensure that traffic impact from new development is assessed and mitigated through appropriate design response. The TIA's provide a mechanism at the site level to address objectives of sustainable development; however they are limited in their ability to promote sustainable transport as they only provide guidance for motor vehicles and road freight.

Reliance on local planning schemes to deliver strategic outcomes

Much of the planning system is delivered on a day-to-day basis by local government through planning schemes. Each of these planning schemes outlines the strategic objectives for the region they cover, and provide for specific zones for different land uses.

Planning schemes detail relevant performance criteria and the type of use and development permitted in particular locations of situations. A planning scheme is the basis under which councils issue planning permits for use and development. It comprises a text document (ordinance) and a set of planning scheme maps showing the different land use zones. The two must be read in conjunction with one another.

Strategic planning policies can be driven from the Local Government level. However, the ability of various local governments to do this work varies greatly. For example, generally larger councils can afford to undertake strategic planning, whereas smaller councils lack the resources to do this work.

The funding and financing of major infrastructure investment is an acute problem for many local Councils. Many Councils have a very small rate base and very dispersed settlement patterns, which makes gaining economies of scale in infrastructure provision difficult. Anecdotally, evidence suggests that the focus on economic development within the last decade has seen a focus on approvals and an ad hoc response to planning application. This planning approach has resulted in a site focus rather than an integrated approach to regional transport planning aligned with land use development.

The reliance on strategic direction through the individual Planning Schemes limits the broader strategic transport objectives across the Greater Hobart Region. This is compounded by a lack of a strategic policy framework at both the State and Local policy level. A number of planning schemes articulate 'objectives' for land use, settlement, transport and the environment, however, the lack of strategic planning work to justify or articulate the real goals for these elements of land use is absent and often reliant on the interpretation by the responsible planning authority. The history of planning scheme objectives is linked to high level objectives, such as:

- ensure the area is easily accessible by both public and private transport (Glenorchy)
- to ensure an adequate network of principal roads to provide access within and between the main urban areas and village localities (Sorell)
- development will only be permitted provided it will facilitate the mutual compatibility of public and private transport and it can demonstrate that it will not create traffic flows and movements that are detrimental to safety or amenity, and can make adequate provision for the direction, access, turning and parking of all vehicular traffic, as well as provision for pedestrian movement, in accordance with Council requirements (Hobart).

These objectives afford the planning authority the benefit of interpretation and can be applied as required to a development proposal in accordance with its scale. They highlight the opportunistic focus of integrating land use planning with transport through the planning approval process. More recent planning schemes within the Greater Hobart region (Kingborough and Clarence) do at least provide a geographic reference for a strategy to protect a transport asset integrate multi-modal opportunities. Additionally, when these

Schemes refer to additional studies there are limitations. For example the Kingston Environs Transport Study had a limited scope, and was developed to provide a solution to a vehicle transport problem rather than a transport solution in the broader sense.

Fundamentally, there is a disconnect between a clear preference for the preferred growth, infrastructure and transport networks across the region and implementation at the local level based on broad objectives at the Planning Scheme level.

Limited role of the Transport Authority

There are no formal requirements for referral of applications for development or amendments to Planning Schemes made through the *Land Use Planning and Approvals Act 1993* to be referred to DIER or to other transport service providers such as Metro for comment unless there access from or impact on the State Road network. As the peak transport authority for the State, the implication of inconsistent referral requirements to DIER results in some approvals receiving approval without consideration of the site specific and wider implications on the transport system.

When referral requirements are made by the Planning Authority, there is no legislative basis either under LUPAA or the Road and Jetties Act for DIER as the asset owner of the State Road network to require the planning authority to impose conditions on a development. Subsequently, DIER has no regulatory ability to impose conditions through the planning process aside from through the formal appeals process.

Lack of regional strategic planning

One potential tool for addressing the land use issues described above is the creation and adoption of a regional strategic plan. There is currently no strategic plan for Greater Hobart. The plan can also be used to improve coordination within and between State Government Agencies and local government as it pertains to land use and transportation infrastructure. State agencies tend to plan for infrastructure in isolation from other State agencies and levels of government. Similarly, Councils tend not to include State agencies and other Councils in their planning for land use and infrastructure.

The plan can provide a forum for a more integrated approach. By including all relevant state agencies and local councils in its preparation, a regional strategic plan could be a way to better coordinate state and local decisions. At the state level, such a plan could be used to bring infrastructure agencies together to understand and collectively respond to the location and amount of future growth (which is managed by local governments). Conversely, local governments are unclear of where and when services will be provided by state government.

Regional strategic planning is gaining hold in Tasmania with the three regions now all committed to a collaborative planning approach at the local level. This is under the sponsorship of the Department of Justice. However, strategic planning at the Local Government level in Tasmania is currently based primarily on the Planning Schemes. Planning schemes have been the key (and sometimes only) planning tool for providing a vision for future development at the local level. While Planning Schemes provide the tools for assessing specific development, they often do not provide the strategic direction for the long term management of transport infrastructure. A regional strategic plan can help to draw together the array of relevant information, policies and strategies at both the State and local government level.

Existing Conditions

Growth Patterns

The Greater Hobart region is Tasmania's largest urban area. The total population for the study area is 197,639, based on the 2006 Census. Future population forecasts estimate the population for Greater Hobart to be 242,020 in the year 2032. Most of the population are located within older areas of Hobart, Glenorchy and Clarence municipalities that contain the highest density living. Additionally closer settlement areas are concentrated in Kingborough, Brighton and Sorell.

For each LGA, the age distribution to 2032 shows an ageing population with the proportion of residents aged over 54 projected to increase. Population forecasts show the movement of the urban population to adjacent local government areas that combine a mix of urban and rural land. Anecdotal evidence suggests that households are generally becoming smaller, reflecting people's choices to wait longer before having children, having smaller families, increases in some specific household structures (i.e. single person households and single parent families. The average household size for the study area is 2.5, with most areas showing a decreasing trend in household size.

Much of greater Hobart's recent residential growth has been through establishment of low-cost affordable housing on the urban fringe (such as Brighton, Rokeby, and around Sorell). Additionally, some outer residential areas have also attracted attract new residents based through lifestyle choices. Lifestyle attractors are associated with coastal and/or rural residential settings (predominantly Clarence and Kingborough LGA's.

The Hobart municipality has the highest density of commercial development in the Greater Hobart region. Major public infrastructure such as hospitals, university campuses and schools are concentrated within Hobart, including the CBD, North Hobart and Sandy Bay. This concentration of public sector and private service business provides significant employment opportunities, and also generates much demand for travel to and from the CBD on a daily basis. Housing and land prices in the municipality are generally higher than in outer urban areas. The constraints associated with the topography of the area and limited opportunities for expansion adjacent to both the Derwent River and flanks of Mount Wellington effectively contain peripheral land use development within the municipality.

Brighton Council was once principally a rural municipality the development of public housing estates in Bridgewater and Gagebrook after 1970 as well as development activity in the Old Beach and Brighton Township have resulted in population growth. Due to the socio-economic profile of public housing tenants and the relative affordability of housing and land on the urban fringe, much of the residential settlements around Brighton also have been linked with clear indicators of low socio-economic standing. The focus of employment and subsequent land development within the municipality is around the manufacturing, warehousing, transport light industrial activity, principally within the Brighton Industrial Estate, and a number of small, retail –based activity centres; this is principally within the Brighton Industrial Estate and including the Bridgewater, Brighton and the Cove Hill Shopping Complex.

The residential development of Glenorchy City Council parallels the constraints of Hobart with the presence of the Derwent River and the north-eastern ridges of Mount Wellington.

There are two major road connectors in the region – Main Road, which accesses a major a subregional retail and light industrial strip, and the Brooker Highway – Hobart's primary connection to Brighton and northern Tasmania via the Midlands Highway. Traditionally Glenorchy has provided affordable housing alternatives from Hobart and some of the southern suburbs, within reasonable travel distance of major activity centres and employment opportunities. Glenorchy also has an established industrial and retail base that services Greater Hobart and the region. Retailing has developed along the north-south spine of Elizabeth Street, New Town Road and Main Road, with centres in North Hobart Moonah and Glenorchy providing a focal point for this activity. In addition, health care features in the locality including Calvary Hospital in Lenah Valley and the 'precinct' of Nursing Homes in New Town.

Residential development in Kingborough is concentrated to land between Kingston, Kingston Beach and towards Blackman's Bay. Further residential development has now occurred in a westerly direction toward Summerleas Road. The business and civic activities Commercial activity within the municipality are focussed in the Kingston and Margate areas and include central Kingston, the Kingston Town Shopping Centre and the Antarctic Division area on the Channel Highway. Some relatively small areas of light industrial activity occur around Huntingfield and near Margate.

Rosny Park provides the central business activity for the Clarence municipality including service retail and the municipal offices. The hierarchy of activity centres that serve the regional extent include Howrah, Lindisfarne and Bellerive. Residential development is contracted to areas adjacent the Derwent River and along the coastal extent of the South Arm including inland areas such as Clarendon Vale. The Local Government area has undergone significant pressure for residential growth with numerous planning scheme amendments to accommodate residential subdivision occurring between Rosny and Rokeby. Movement of people in Clarence is more reliant on private vehicles than Glenorchy or Hobart. This issue is compounded by the dispersed nature of pattern of development single detached dwellings throughout the municipality and limited public transport opportunities in outer areas.

Residential development within Sorell is concentrated to Midway Point and the southern beaches south of Sorell. Sorell is the key administrative and local service related settlement node. The remainder of the municipality is fundamentally a rural local government area.

Sorell, Glenorchy and Brighton all had an average income below that of Greater Hobart. The latest available SEIFA data for the study area has illustrated small areas of disadvantage. SEIFA has been designed to have an average value of 1000, with lower values indicating areas of disadvantage and higher values reflecting a minimal disadvantage. These areas include Gagebrook, Clarendon Vale, Bridgewater, Warrane, Goodwood, Chigwell, Rokeby, Risdon Vale, Derwent Park, Primrose Sands, Sorell, Glenorchy and Mornington.

Tasmania's Resource Management and Planning System

Tasmania's Resource Management and Planning System (RMPS) was established in 1994 to achieve sustainable outcomes from the use and development of the State's natural and physical resources. The RMPS covers a variety of areas including: land use and

development, State policies and projects, environmental management and pollution control, historic cultural heritage and major infrastructure development approvals.

Decisions by local planning authorities and State Agencies under the RMPS on the use and development of resources take into account wider economic, social and environmental implications. In doing so, the objective is to focus on how use and development occurs rather than what it is or even where it is located.

The RMPS is a framework of legislation. The *Land Use Planning and Approvals Act 1993* (LUPAA) is the principal planning Act, and provides for the preparation and amendment of planning schemes and the development assessment process, including development applications, appeals and enforcements.

LUPAA is supported by the *State Policies and Projects Act 1993*, the Resource Management and Planning Appeal Tribunal Act 1993 and the Resource Planning and Development Commission Act 1997.

Much of the planning system is delivered on a day-to-day basis by local government through planning schemes. A planning scheme outlines the strategic objectives for a local government area and for specific zones. It details relevant performance criteria and the type of use and development permitted in particular locations of situations. A planning scheme is the basis under which councils issue planning permits for use and development. It comprises a text document (ordinance) and a set of planning scheme maps showing the different land use zones. The two must be read in conjunction with one another. A planning scheme is binding on all members of the public, State Government agencies, public authorities and local councils.

Land use and transport planning – institutional arrangements

Three separate Tasmanian Government agencies have responsibility for land use and transport planning: the Resource Planning and Development Commission, Department of Justice and the Department of Infrastructure, Energy and Resources.

The Tasmanian Planning Commission is an independent statutory body established by the Resource Planning and Development Commission Act 1997. It oversees the State's planning system, and is responsible for the following land use planning functions:

- Assessment and approval of local government planning schemes and planning scheme amendments.
- Assessment of Projects of State Significance.
- Assessment of Draft State Policies.

Major approvals and strategic planning processes are approved via the Tasmanian Planning Commission.

The Department of Justice provides policy direction related to the State's statutory land use planning processes, including issues related to planning legislation, associated statutory functions and the general provision of advice to the Planning Minister.

2.1.2 Transport in Greater Hobart

Issues

The region's passenger transport system is predominantly about moving cars. The cumulative impact of state and local decisions has placed car travel as the dominant mode of transport. This has led to our declining use of other modes. As importantly, it has lead to a dramatic decline in our range of choices of how and where we travel in Hobart.

In recent decades, transportation planning and investment in Greater Hobart has focused on congestion relief. The Bureau of Transport and Regional Economics estimate the preventable cost of congestion in Greater Hobart in 2005 as approximately $50 million. Base case projections have the preventable cost of congestion in Greater Hobart rising to $70 million dollars by the year 2020. Congestion relief is an important, if not critical, issue for the region.

However, the majority of investment and policy intervention at the state and local has been given to wider roadways, one way streets and more capacity for cars at intersections. This has been at the expense of other measures of success such as housing choice, overall disposable household income, climate change, social justice and public health which may merit equal consideration to congregation. At issues is whether a broader range of measures could be integrated into our transport investment decisions.

The emphasis on additional road capacity has failed to recognize the impact of induced demand. For example, as a road is widened or improved to provide additional capacity, a new "path of least resistance" is created. Additional drivers, who previously did not travel by the road, will quickly, be attracted to use the road due to the time or cost improvement. In recent years, we have learned that this additional capacity also induces unanticipated growth in the population "upstream" of the road. In turn, this growing population re-congests the roadway. This then creates a demand for additional widening or capacity enhancements to that road. This fundamental cycle of land use and transportation demand is commonly ignored in the assessment of impacts of transportation decisions.

The focus on road infrastructure investment by all levels of government relies on an operational Level of Service for determining impacts and mitigation for new development proposals. The required improvements to accommodate more cars generally impair the ability of the land uses and streets to encourage walking, biking and transit use.

This focus on car-based personal mobility has contributed to the region's highly dispersed settlement pattern. Today's regional transport system largely reflects original transport linkages and alignments and there have been limited changes to major intrastate transport corridors. Broad trends in the development of the region's transport system are:

- topographical constraints affecting road and rail alignments and corridor options
- initial importance of rail for passenger and freight transport (intra and inter-regional) but now freight-based only.

Public transport needs to be convenient, reliable and easy to use. A brief review of the Metro bus timetables indicates that the Hobart bus network is complex with numerous route variations and complicated timetables. Other issues are:

- inadequate operating hours with over 60% of routes spanning less than 8 hours, requiring full-time workers to travel on different services to and from work. Additionally 85% of routes finish before 7pm
- low service frequencies with over 60% of routes running less than six times per day; and
- poor weekend services with 70% of routes not operating on Saturday and 85% not operating Sundays.

The service standards recently developed by DIER and Metro will go some way to addressing operating hours and frequencies across greater Hobart. However, this is being undertaken within existing budget allocations which means changes will be made by achieving service efficiencies and reducing services in some areas. The current focus is on improving consistency of service delivery across Hobart and improving evening and weekend services.

Another issue is the lack of a "one seat ride" if travelling from one suburb to another. The public transit system is oriented in a radial pattern to and from the Hobart CBD. Passengers that are seeking destinations beyond the CBD are required to transfer buses in the CBD. This can have a significant penalty on transit ridership.

Ideally, transit is responsive to emerging socio-economic trends. The population in Greater Hobart is getting older and this is expected to continue as baby boomers age. An aging population means there are more people who may choose not to drive or cannot drive and are therefore dependent on transit. A parallel issue with an aging population is the increase in driving during non-peak hours.

At some point in every trip, we walk. Yet, planning and design often ignores the significance of this. The vast majority of our spending is car-based. Priority in timing of traffic signals is given to moving cars. Traffic patterns are geared towards getting cars through our CBD as fast as possible at the expense of the pedestrian environment.

Too often, the pedestrian realm is considered to be the foot path.

Examples of other pedestrian issues identified through consultation with DIER include:

- poor pedestrian linkages around Eastland in Clarence
- Kingston is not pedestrian friendly, and the north-west area in particular has poor linkages; and
- contemporary subdivision designs around Hobart do not promote pedestrian activity, due to circuitous routes and poor linkages.

As noted in the land use section, the economic benefits of walking and biking are often overlooked. These include avoided costs, such as health care costs that result from inactivity, fuel and maintenance costs and infrastructure maintenance, when we choose to walk or bike instead of driving.

Distance, availability of services and public transport, and access to a private motor vehicle are all variables used to determine levels of transport disadvantage. Very high scores are recorded in developed parts of Bridgewater and Gagebrook. There appears to be a correlation between transport disadvantage and broad acre public housing estates in areas such as Bridgewater/Gagebrook, Clarendon Vale, Rokeby and Risdon Vale. A reliable public transport service is essential in these communities, providing access to employment and

services, and promoting participation in the community. Rural areas such as, Richmond, Pontville and the outer areas of Sorell are highly disadvantaged in relation to transport. This is due to physical distance and lack of alternatives to cars (e.g. buses).

The region's physical geography is a transportation issue in Greater Hobart. For example, Hobart's steep terrain and weather are likely to act as barriers to cycling. Access across the Derwent River is also an issue for cyclists.

Existing Conditions

The following is a summary of the existing conditions for the road network, public transport, cycling and walking.

Road network

An extensive road network exists in Greater Hobart connecting inner urban areas, urban fringe and the major activity centres. Three major arterial outlet roads provide transport links through and between the CBD area and major outer urban population centres: the Southern Outlet, the Tasman Highway and the Brooker Highway. The Tasman Highway or eastern outlet has varied freight movements due to commercial vehicles serving the light industrial areas at Cambridge and Mornington and general freight movements between Sorell and Hobart. The Brooker Highway is the main north-south linkage and also the region's major freight route, linking key freight distribution and warehousing areas. It provides an important urban arterial and local commuter road; it is the major passenger route by volume and carries higher daily volumes than the Southern Outlet.

Many intra-regional and intra-state movements occur east-west through central Hobart area making use of the one-way pair of Davey and Macquarie Streets. Other significant arterial roads in metropolitan Hobart include the East Derwent Highway (Lindisfarne to Bridgewater), South Arm Highway (Mornington to South Arm). A network of locally significant roads providing inter- and intra-suburb access for residential, commercial and industrial uses, include Main Road and Derwent Park Roads (Glenorchy), Argyle Street (Hobart), Clarence Street (Clarence) and Lewisham and Old Forcett Roads (Sorell). Road crossings of the Derwent River include the Bridgewater Bridge, Bowen Bridge, and Tasman Bridge. The Bridgewater and Tasman Bridges carry a high freight task. The Sorell Causeway and McGees Bridge link Sorell with Hobart.

Greater Hobart has an increasing trend in private vehicle passenger transport kilometres travelled each year. In 2006, it was estimated that there were 1.47 billion vehicle kilometres travelled by car. By comparison, passenger kilometres travelled by bus have remained relatively stable, and in 2006 were estimated at 0.025 billion vehicle kilometres. Future projections for Greater Hobart's passenger transport task show that this trend will continue, with the majority of vehicle kilometres being travelled by car, rising to 1.54 billion vehicle kilometres by the year 2020.

Traffic forecasting was undertaken during development of the Southern Region Overview Report. The Brooker and Tasman Highways are the most significant roads in terms of current and future forecast traffic. The Tasman Bridge, Brooker Highway south of Risdon Road (New Town) and the Tasman Highway west of the Mornington interchange are the highest volume sections. Traffic volumes increase with proximity to central Hobart. All roads increase in traffic density with proximity to central Hobart.

The majority of trips from home to work are made to destinations in the Hobart, Glenorchy and Clarence municipalities. Car ownership is increasing in Greater Hobart as vehicles become more affordable and there is an increased propensity and mobility for personal travel. Car as driver remains the dominant mode of transport for commuters across Greater Hobart, at over 71% of trips.

Public transport

Buses are the principal mode of public transport in Hobart. Public transport in Greater Hobart generally consists of:

- scheduled bus services which are wholly or partly funded by the State Government and include school and urban services
- commercial transport providers, including: taxis, charter coach services and luxury car hire
- community transport providers, including: unscheduled services for transport-disadvantaged groups, funded and delivered by community welfare groups.

The major provider of bus services in Greater Hobart is Metro Tasmania, a State owned company which primarily operates services in metropolitan areas along with a small number of regional services. Metro's Submission to the GPOC (2008) states that Metro had experienced more than a quarter of a century of declining patronage, not experiencing growth until 2005-06 following the acquisition of the Kingston/Blackmans Bay contract. This growth then stopped in 2007-08 with the early signs of an improvement in 2008-09.

Although in BTRE's projections a smaller number of vehicle kilometres travelled will be travelled by bus (0.027 billion vehicle kilometres in the year 2020), over the period 2005-2020 the growth rate for buses (10.6%) is double that for cars (5.2%).

Parking

Hobart is the only municipality across Greater Hobart to charge for parking. Parking spaces are in short supply in the Hobart municipality commuter car parks have waiting lists and short term car parks often have queues of vehicles trying to access the limited number of spaces. One third of spaces in Hobart are dedicated to employee parking. Of these 60% are for use of Government employees. There is a large supply of free parking in the Glenorchy, Moonah and Claremont areas. The large private parking providers, Northgate Shopping Centre and Claremont Village, restrict parking to three or four hours in order to discourage commuter parking and encourage short-term parking for shoppers.

All parking within the area supported by Clarence City Council (CCC) is free. The majority has three to four hour time restrictions, to discourage commuter parking and encourage short-term parking for shoppers. In Kingborough all parking is free of charge.

Cycling network

Provision of bicycle infrastructure is generally better on the western shore of the Derwent River. Hobart's main off road shared path facility is the Intercity Cycleway from Sullivans Cove in Hobart to Box Hill Road at Claremont, approximately 15 kilometres in length. The Intercity Cycleway is the main commuting cycle route from Glenorchy to Hobart CBD, with

grade separated crossings at major roads along the way. The Tasman Bridge has shared (but very narrow) paths on either side, connecting to the Intercity Cycleway; however one side includes stairs as part of the connection. The Tasman Bridge is perceived by many as unsafe and is a barrier to cycling. Other major cycle routes include Taroona and Sandy Bay to Hobart CBD, and Hobart Airport to the CBD.

Although bicycle usage levels remain low in Tasmania in comparison to other States, Hobart in particular has a growing cycling culture and cycling is increasing in popularity as a method of commuting to work. The proportion of trips using cycling as a mode is greatest in the Hobart area, compared to the other local government areas. For short trips, especially people living nearby to their workplaces, there is great potential for cycling to increase as the mode of choice.

Pedestrian network

Most pedestrian facilities are provided by local Councils; however the State Government has responsibility for pedestrian movements along arterial roads. In Hobart, pedestrians generally access the CBD by using the Hobart Rivulet, Sandy Bay Road and St David Park. In terms of initiatives that may make walking more inviting, Kingborough Council has a Master Plan and the Kingston Central Area Master Plan outlining urban design and placemaking concepts. In Clarence, a street scope project is underway and there are plans to develop a Master Plan for Lindisfarne Village (though little mention of pedestrians). Brighton aims to develop a foreshore walking-cycling track to connect municipalities in its Strategic Plan. Glenorchy Council has developed a Master Plan for the Main Road area, and Sorell Council currently has no urban design initiatives.

Additional considerations

Growing recognition that congestion is the inevitable result of successful cities. Cities exist because they promote social interactions and economic transactions. Congestion occurs where lots of people pursue these actions within limited space. Ironically, empty streets are a sign of failure. While congestion is an unfortunate consequence of prosperity, it is not a cause of economic decline and urban decay. A larger number and wider variety of activities can be accommodated in cities than suburbs or rural areas. Congestion may be worth the wait.

When we speak of congestion in Greater Hobart, the congested portion of the trip constitutes only a small portion of our overall commute. As a result, it may be misguided to spend money to relive congestion instead of shifting demand to other modes.

Travel behaviour research has shown that transfer and waiting times, such as walking from the car to the office or waiting for a bus, comprise a large share of trip times. These interludes are viewed by travellers as far more onerous than in-vehicle travel time. Most travellers would rather reduce transfer and waiting times by five minutes than in-vehicle travel on roadways by five minutes.

There are two compelling reasons why walking, biking and transit is vibrant in cities and not in suburban or rural areas. First, the utility of driving in cities is limited. Parking is generally scarce and expensive. Driving speeds are slow on congested streets. When driving in cities gets easier or less expensive, other modes suffer. For example, parking supply has a tremendous impact on transit use. Generally, each 1 per cent rise in parking supply decreases transit ridership by 0.77 per cent. Second, the convenience and attractiveness of

walking, biking and transit can be enhanced through urban design. Through a variety of techniques, cities provide visual interest and more compelling reasons to walk more often and walk further.

We invest in transportation improvements to relieve congestion based on extrapolations of current trends. We often assume the trends and behaviours will remain when making decisions for 20 years into the future. We will only have to look back at the planning assumptions of the 1950s and 1960s which relied on male breadwinners as the only commuters to realize that we cannot predict the future. It would be questionable to assume that current trends, such as increasing car ownership, will continue. While we will have no better luck forecasting the future than others, it is useful to consider ways to make our investments and policies create a more flexible in responding to future conditions.

3. Travel demand measures best suited for Greater Hobart

Successfully managing travel demand in Greater Hobart to reduce greenhouse gas emissions requires a major paradigm shift. The focus of State and local land use and transportation policies and investment needs to shift away from 'moving cars' and sprawling out from the region's core. Without such, there is very limited potential to achieve the desired reductions. The shift can achieved over time following a series of short, medium and long term actions.

Some of the recommendations will be controversial or require a new way of thinking. For example, the community will need to accept that congestion is not a problem that can be solved. Providing more roadway capacity to move cars simply induces more travel by cars. As a result, new capacity is rapidly eroded by people who change travel routes to take advantage of the initially faster travel. The benefits are also degraded by those who relocate further away from the region's core to take advantage of lower real estate costs. As a result, the problems of congestion represent themselves soon after the improvement has been completed.

Initially, the emphasis should be on 'moving minds.' The public may not embrace the recommended actions unless Government clearly identifies and promotes the need to act and the benefits of doing so. Moving minds also requires a focus on why the traditional ways of managing a problem will not attain the desired benefits. The creation of a regional transportation forum accompanied by a marketing campaign about the problem of greenhouse gases would be useful in educating the public and accomplishing a shift in attitude towards more alternative modes. There are also some simple measures, such as implementing travel planning, ride sharing, peak spreading and parking cash out programs, than can be completed as early successes. These strategies are relatively low cost and require only limited intervention, but can go far in creating an appreciation for the other required actions.

At the same time, it is clear that existing land use practices need change as they do not support walking, cycling and transit as an alternative mode of travel. For example, the continued emphasis on low density sprawl, segregation of land uses by type and leap frogging of commercial development makes it very costly and operationally difficult to provide public transport. These changes, termed 'moving places', will require a substantial shift in both the management and application of land use. There is very little sense in making substantial investments in physical infrastructure to supportive alternative modes of travel if land use practices. A suite of land use practices, such as a metropolitan plan, urban growth boundary, smart growth requirements, location efficient development and integrated transit corridors, are recommended to create the foundation for transportation investments to reduce greenhouse gases.

Once the groundwork has been provided in building up the public's understanding of the problem and redirecting growth back to the core, 'moving people' will be more cost effective for the public transport system. Physical improvements, such as priority transit along key streets, high quality bus interchanges and park and ride lots at rural gateways, would then merit investment. The current service pattern would also be shifted to focus on "choice" riders who have the option of driving but can be lured out of their cars.

Another mid-term set of measures would be focus on 'moving policies' that innovatively encourage walking, cycling and bus travel. These include changes to parking requirements, such as pricing for all parking in the region and creation of maximum instead of minimum parking requirements. New ways to measure the impacts of new developments, such as Auto Trips Generated modelling, could replace the conventional Level of Service modelling. Together the parking and modelling measures can create revenues to help finance the infrastructure and operational costs of the recommendations herein. Developer interest in providing the desired types and locations of growth could be fostered by listing and fast tracking such projects as "regionally significant projects".

The study also recommends investment and policies for 'moving legs' through walking and cycling as a mid-term action. Without the necessary land use policy changes, walking and cycling infrastructure would largely remain underutilized as a transport mode (as opposed to recreation). For example, people walk more and further if the environment is visually compelling, encourages interaction with others or shopping, or is memorable, special place By doubling the amount of time a person that a person is wiling to walk through better urban design and smart growth, the area that a person does not need a car is increased by four-fold. Yet, current land use and roadway design and management practices nearly prohibit these types of places to be created.

Over the long term ('moving forward') the actions above may create the framework for the implementation of two important high quality transit (either bus or light rail) and transit oriented development corridors. Once corridor would extend north south between Taroona and Bridgewater. The corridor would pass through Claremont, Glenorchy, Hobart CBD and Sandy Bay. The second would extend roughly east west between South Hobart and Howrah on the eastern shore of the Derwent Estuary. It would pass through the Hobart CBD, Rosny and Bellerive Each are conceived as a combination of street running and dedicated transit facilities abutted by higher density, mixed uses for most of the corridor. Ridership would come from "walk and ride" primarily as opposed to "park and ride". These two spines would be the focus of infrastructure investment and policy support to reduce greenhouse gases.

Figure 3-1 summarizes the phasing of the recommended measures in 'pyramid' mad up of the six streams: Moving Minds, Moving Places, Moving People, Moving Policies, Moving Legs and Moving Forward. The pyramid is categorized by short, medium and long term streams. It illustrates that the mid and long term phases build on the short and medium term phases respectively. As the TDM program proceeds, more expensive and difficult to implement measures can build on the success of these first steps.

In addition to the streams building on one another, individual recommendations build upon one another. For example, making people more interested in using transit through Travel Smart Programs and providing more services along Integrated Transit Corridors will increase ridership. Subsequently, the streets identified as transit corridors can be upgraded to give signal pre-emption to buses, provide peak hour clearways and to upgrade the waiting facilities (e.g. bus interchanges) and provide real time information at higher volume stops. Ultimately, two of these corridors may be upgraded to provide dedicated travel lanes or provide light rail/tram transit.

Similarly, the land use changes made in the short term will make the parking management, transit, walking and biking improvements easier to implement and more successful. The implementation of high quality urban design and the mix of uses will create the amenity that creates the market demand for urban living. Over time, the integrated corridors will be fully

developed based on transit oriented development principles justifying the investment for high quality transit corridors (i.e. dedicated bus or light rail/tram facilities).

Each of the recommended measures is discussed in further detail below. The discussion is supported by tables that identify the following:

- Issue or need addressed through implementation of the measure
- Likely outcomes and successes that could be achieved
- Timing – short, medium or long term
- Relationship with other measures
- Cost
- Responsibility – DIER and partners.

Measures are classified in terms of anticipated timing, with short-term actions being under five years, medium-term between five and ten years and long-term more than ten years.

The possible responsibility for delivery column of the tables recognises the roles played by major stakeholders in shaping the future transport policy and direction of Greater Hobart. DIER is responsible for the arterial road system, including freeways, and for catering for the needs of on-road public transport, major infrastructure initiatives, public transport and area wide policy. In addition public transport operators also play a clear role in the future development and direction of public transport systems. Whilst it is clear that councils have a significant role to play in lobbying for improved transport systems, the councils also have responsibility for local roads, safety, traffic management, community transport and cycling and pedestrian issues.

The recommended measures were identified based on a high level review of the potential measures listed in Section 3.1 herein. The potential measures were screened for suitability and potential benefits in a mid-size city such as Greater Hobart. The following factors were also considered to screen the measures:

- Effect on greenhouse gas emissions relative to reference case
- Cost
- Accessibility
- Safety
- Health
- Affordability to user
- Risk (easy/difficult)
- Impact on current passenger transport mix
- Service efficiency, capacity for implementation, infrastructure requirements
- Community acceptance
- Strategies and actions required by the Tasmanian Government
- Critical success factors.

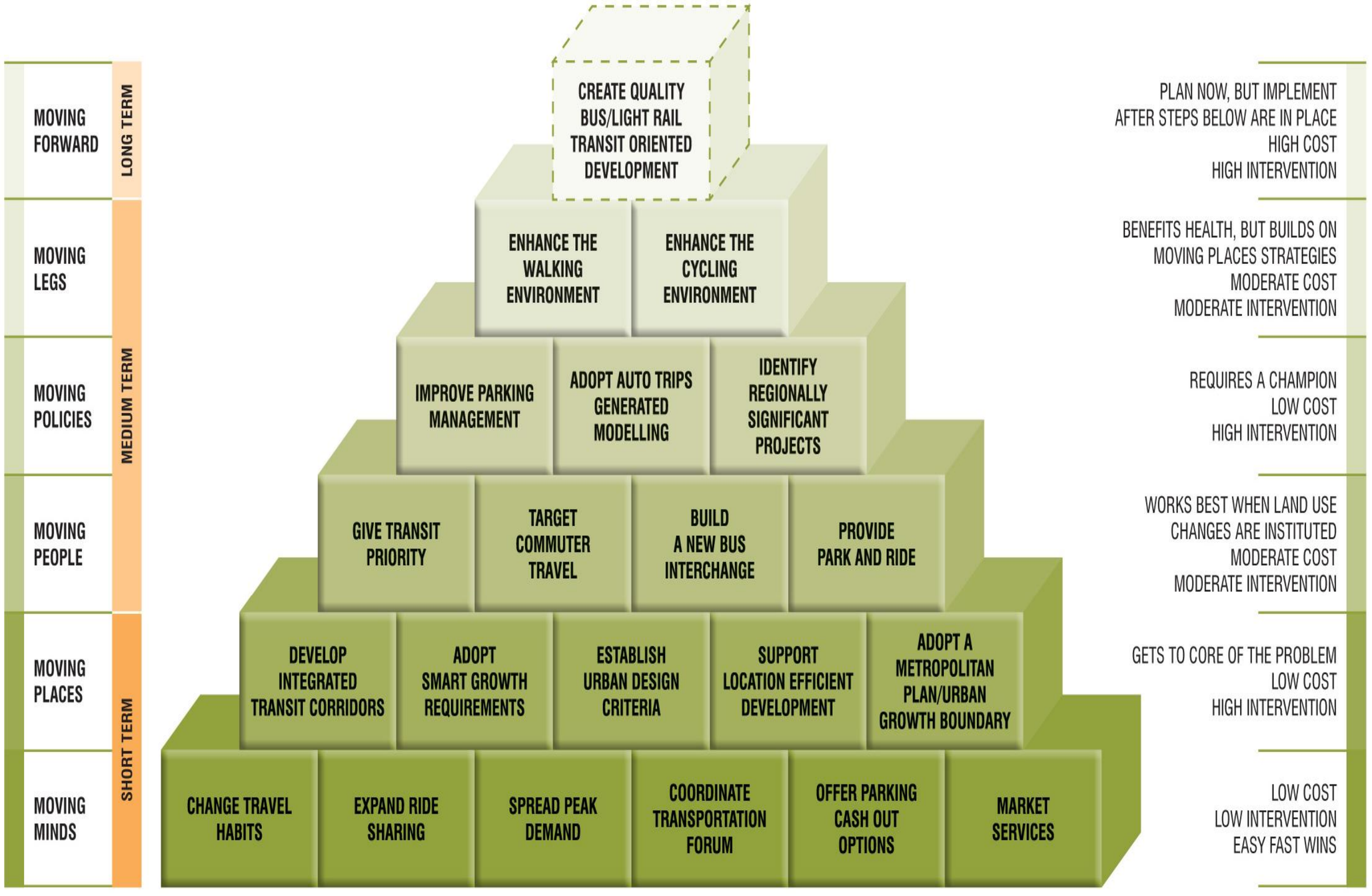


Figure 3-1: Recommended Travel Demand Measures for Greater Hobart

3.1.1 Moving Minds

This section identifies possible TDM improvements for marketing and education measures which could be applied to the regional or sub-regional transport network. These work primarily on providing incentives or making it easier for people to shift modes of travel away from the automobile. They are relatively easy to implement and should be implemented in the short term. These measures will have a limited impact on mode shift, but the aim of these measures is to improve the public's understanding of the relationship between travel behaviours and greenhouse gas emissions. In turn, this will build public support for the more difficult and costly measures. Moving Minds measures are described below and further identified in Table 3-1.

Change travel habits

The following includes a summary of TravelSmart, Workplace Travel Plans, School Travel Plans and Walking School Bus programs.

TravelSmart

Individual marketing programmes, of which "TravelSmart" is the best known, seek to change individuals' travel choices by providing them with information that is directly relevant to their needs. These include information on walking and cycling paths as well as public transport timetable and fares information. These programmes can be funded by state or local government.

The greatest benefits from these programmes have been found where quality transport alternatives are available. Generally speaking, they have performed best in inner city areas with plentiful public transport and commute distances short enough to support cycling. They have performed worst in outer suburban areas with long distances and poor public transport.

Workplace Travel Plans

Workplace travel plans are employer-based packages that promote sustainable travel options to their staff. Workplace travel plans can encourage alternatives to the private car such as walking, cycling, public transport and car sharing. In Wellington, the council has developed and implemented a travel plan program to encourage the uptake of business, school, community and individual travel plans, and associated travel behaviour change initiatives such as ridesharing, telecommuting, flexible work hours, walking school buses, etc. O*rganisations with travel plans in place include Victoria University of Wellington, Capital and Coast District Health Board, Shell, Hutt City, Ministry for the Environment, Inland Revenue. Initiatives that have been trialled through the travel plan programme include:*

- *A van between offices for the Inland Revenue Department, which had patronage of 13,000 in 2005/2006 and a 140% rise in patronage in its third year of operation.*
- *A free bus pass, giving employees access to free bus travel for one month. At the end of the trial 81% involved said that they were likely to use the bus more in the future, with 83% if these affirmative respondents saying they would do it more than twice a week.*

Green travel plans and other related initiatives such as ride sharing schemes could be introduced through work place travel plans.

School Travel Plans and Walking School Bus initiatives

School related travel is a key contributor to travel demand in Greater Hobart. While no actual data is available, it appears a significant portion of automobile trips relate to the drop-off and pick-up of school children. In addition, because of school choice policies, the Metro transit service is required to invest substantially in the school related service. In turn, this has limited the ability of Metro to provide commuter related transit service which could help reduce greenhouse gas emissions.

Thus, it is recommended that the State government and school districts implement school travel plans. School travel plans promote healthy and sustainable methods of travelling to school, such walking and cycling and less use of the private car. A potential School Travel Plan initiative could be the implementation of a Walking School Bus. In addition, school choice and siting policies should be reviewed and modified to reduce dependence on cars and transit in order to promote walking and biking for school children.

Expand ride sharing

Ride sharing programs to identify potential travel partners are useful for private car users where passenger transport services are currently not available or provide limit services. The services may become even more important as fuel costs rise over time in real costs. Rewards for users could include priority parking spaces at places of work and at satellite park and ride facilities along with subsidized transit tickets. An example, of a Tasmanian ride share program is Cool Pool Tas (http://www.coolpooltas.com.au). This scheme could be promoted and supported by a number of government agencies including DIER at a sub-regional level.

Spread peak demand

The greatest demands on the transport network occur in the morning peak, where work and school peaks coincide in a relatively narrow band. Peak spreading attempts to tackle this problem by encouraging trips at slightly different times. In particular, employers are encouraged to introduce policies that allow employees to commence work earlier or later and travel before and after the peak. This may be particularly easy to achieve in the Hobart CBD where approximately 60 percent of the commuters are employed by either the State Government or the hospital.

One management technique to achieve this is to ‘time release’ parking in the morning. Under this approach, parking operators are required to limit the availability of a portion of parking lots until certain designated times. This would create a behaviour whereby a certain portion of drivers would defer driving until later in or after the peak period.

Both car and public transport users can benefit from this approach, and there are potential savings on road and public transport capital expenditure that would otherwise be required to meet the peak demand. For public transport users, the improved flow of travel means the transit can operate more reliably. However, it is important that public transport services are of adequate quality either side of the peaks to encourage drivers to travel off-peak.

Coordinate a Transport Forum

The establishment of a Transport Forum with representation from DIER, TCCO, bus operators, local councils, key employers and Tasmania Police could focus on the recommendations herein. The group’s purpose is to foster discussion and support for the actions needed to reduce greenhouse gas emissions. In particular it could focus on regional

issues relating to the establishment of the integrated transit corridors as well as supporting land use and parking policies. A similar passenger transport forum exists in the Auckland Region (i.e. the Auckland Bus Priorities Initiatives Steering Group).

Provide Parking Cash Out options

Many workplaces provide free parking for employees, particularly outside the CBD. However, no specific benefits are available for public transport users. To redress this balance, employers could be encouraged to provide alternatives – cash payments for not using car parks or subsidies for public transport use. This should lead to reduced car use and increased public transport use. This approach is likely to be very popular for employees. However, it faces significant challenges: the Australian taxation system supports the use of private vehicles and the decision to provide car parking is generally taken by a property developer and not an end user, so savings from reduced parking are difficult to realise.

In Victoria, British Columbia, a non-profit group has a program named TRAX which assists with public transport initiatives. This program was responsible for negotiating discounted public transport passes for large employers causing a shift of employees out of single occupancy vehicles and into buses. This discount can be combined with a federal tax deduction for public transport passes to lower the cost even further and thereby making public transport even more attractive.

Currently, one third of spaces in Hobart are dedicated to employee parking. Of these 60% are for the use of Government employees. This presents a real opportunity for Government to lead by example. Green travel plans and other related initiatives such as ride sharing schemes could be introduced in conjunction with any parking cash-out schemes.

Market Services

Marketing is a powerful tool in communicating and influencing how, when and what one does. It is important that DIER plays a leading role in the provision of information to raise awareness/educate travelling public on transport issues and DIER's wider objectives. Key TDM measures DIER should be involved with are:

- Developing branded communication and education programs – i.e. bus way priority lanes to promote their use.
- Developing clear route choice awareness information with key stakeholders – regional / national basis e.g. long distance cycle route.
- Information provision to raise awareness/educate travellers on advisory information - *can VMS be installed/used to provide general transport messages to assist in reducing congestion and encouraging more sustainable travel e.g. market rideshare scheme operating in area, advertising traveller information websites.*
- Communication/marketing associated with special large events.
- Support marketing and communication programs that encourage private vehicle drivers from cars to other alternative modes i.e. buses, walking and cycling.

3.1.2 Implementation plan – Moving Minds

Key:

✓✓	Higher impact	$	Low cost
✓	Lower impact	$$	Low to medium cost
Commuter trips – commuter		$$$	Medium cost
Educational trips – educational		$$$$	High cost
Non-peak trips	Non-peak trips		

Table 3-1: Implementation plan - Moving Minds (Short Term)

Measures – **Moving Minds**	Travel need/issue addressed	Relation to other measures	Likely outcome	Environment		Cost	Responsibility
				Urban	Outer Urban		
Market services	Commuter Educational non-peak trips Reduce GHG emissions.	All measures, especially related to public transport services, e.g. branding of specific Metro services.	Reduced share of trips by car.	✓	✓	Varies	DIER, Local Councils
TravelSmart – Workplace Travel Plans, School Travel Plans	Commuter Educational, non-peak trips Reduce GHG emissions.	All measures, especially related to public transport services, e.g. branding of specific Metro services and Active Transport.	Reduced share of trips by car.	✓	✓	Varies	DIER, Local Councils
Expand the rideshare program	Commuter Educational, non-peak trips Reduce GHG emissions. Increase accessibility	All measures	Reduced share of trips by car. Increase accessibility	✓	✓	$	DIER, Local Councils/Community organisations

Spread peak demand	Commuter, non-peak trips Reduce GHG emissions.	All measures	Congestion management	✓	✓	$	State Government agencies, Local Councils and major employers
Coordinate Transportation Forum	Commuter Educational, non-peak trips Reduce GHG emissions.	All measures	Reduced share of trips by car.	✓	✓	$	DIER, Local Councils
Offer parking cash-out options	Commuter, non-peak trips Reduce GHG emissions.	All measures	Reduced share of trips by car.	✓	✓	$$	State Government agencies, Local Councils and major employers

3.1.3 Moving Places

There is little benefit to invest in transportation infrastructure to support walking, biking and transit if underlying land use practices do not support these modes. Five key measures are recommended to allow for the integration of land use and transportation decisions, including:

- Integrated transit corridors
- Smart growth requirements
- Urban design criteria
- Location efficient development and
- Metropolitan plan and urban growth boundary.

These measures will require a high degree of intervention by the State Government to overcome conventional perceptions about the independence of local governments and their purview over this issue. The emphasis should be on incentives, such as improved transit service and infrastructure, for local government to collaborate. However, it will also require discipline by the State Government to not provide services, especially additional road capacity, to local governments that choose not to undertake the necessary reforms.

The measures are relatively low cost over the long term. In fact, these measures can actually be revenue positive since, as shown below, they substantially reduce the cost of providing infrastructure and services to residents compared to low density sprawl.

Benefits

The majority of new development in Greater Hobart occurs as low density, suburban style development outside the urban core costs. Much of this is the result of the perceived benefits associated, the supporting highway investments and the lack of appreciation of the benefits of compact development. The following is a brief summary of the messages that could be used to develop support for the land use policies needed to reduce greenhouse gas emissions.

The cost of infrastructure provision, transportation costs and the economic costs of transport greenhouse gas emissions for low density, suburban development outside core areas is approximately $630 million for every 1000 lots. When considering infrastructure costs (power, water, sewerage, schools, hospitals and local government services) in isolation, an inner city development costs $50.5 million compared to $136.0 million for a development on the urban fringe. This translates to a saving of $86,000 per block in capital costs for infill development within the urban core (CUSP PB 2008). People living in core area developments drive less frequently and own fewer cars. This equals savings of $5000 per year for each household. (CUSP PB 2008). Thus, a change in land use practices can save both government and households substantially thereby improving the affordability of housing.

Compact, mixed use centres, such as those along the proposed integrated transit corridors, with a diversity of tenancy options, attract and incubate new businesses and create more local employment options (TCRP 2004 and Grady 2006). A major local destination encourages money to be spent locally and provide local jobs (Grady 2006). In addition,

agricultural land that would otherwise have been developed for housing will be kept available for production.

Compact development helps to create active, vibrant places. In this can reduce crime and increase perceptions of safety (TCRP 2004). Pedestrian activity increases chance encounters between neighbours and helps build a sense of community (Barton 2002). Easy and reliable access to services and employment by foot or via public transport can significantly reduce the impact of rising fuel prices. Living in a pedestrian environment encourages incidental exercise improving health and well being (Mees 2006).

Develop a metropolitan plan and urban growth boundary

Metropolitan Plan

One potential tool for addressing land use issues is the creation and adoption of a metropolitan plan for the six Councils in Greater Hobart. There is currently no strategic plan for Greater Hobart at either the 12 Council regional levels or the 6 Council study areas. It would also provide the framework for designation of the integrated transit corridors, adoption of uniform smart growth and urban design criteria, encouragement of location efficient development through a headwork fee and the creation of an urban growth boundary.

Coordination within and between State Government Agencies and local government as it pertains to land use and transportation infrastructure can be improved by undertaking such an exercise. State agencies tend to plan for infrastructure in isolation from other State agencies and levels of government. Similarly, Councils tend not to include State agencies and other Councils in their planning for land use and infrastructure.

The metropolitan plan can provide a forum for a more integrated approach. By including all relevant state agencies and local councils in its preparation, a regional strategic plan could be a way to better coordinate state and local decisions. At the state level, such a plan could be used to bring infrastructure agencies together to understand and collectively respond to the location and amount of future growth (which is managed by local governments). Conversely, local governments are unclear of where and when services will be provided by state government.

Strategic planning at the Local Government level in Tasmania is currently based primarily on Planning Schemes. Planning schemes have been the key (and sometimes only) planning tool for providing a vision for future development at the local level. While Planning Schemes provide the tools for assessing specific development, they often do not provide the strategic direction for the long term management of transport infrastructure. A metropolitan plan can help to draw together the array of relevant information, policies and strategies at both the State and local government level.

A key component of the metropolitan plan would be the identification of satellite activity centres served by high frequency bus service along highways to the integrated transit corridors. These outlying centres would have a broader mix of uses than local convenience or shopping opportunities. Activity Centres. They should be well serviced by public transport, provide a range of opportunities for employment, social interaction and other related services. Typically they could include local neighbourhood strip development through to regional towns and other areas of principal activity. Within the Greater Hobart region, examples would include, but not be limited to, the townships of Bridgewater, Sorel, Kingston and the airport.

Urban growth boundary

An urban growth boundary, or UGB, is an officially adopted regional boundary, set in an attempt to control urban sprawl and better provide public infrastructure and services. Beyond the UGB growth is discouraged through allowing higher density development in the area inside the boundary and lower density development outside the boundary. Urban growth boundary programs should be able to be revised over time, but should have limitations on how often the boundary can be modified. Despite some Councils proposing residential growth boundaries in their own municipalities, such as the recently completed Clarence Residential Strategy, this approach has not been adopted by all Councils in Greater Hobart.

Adoption of an UGB will support the more orderly development of land, discourage the unnecessary extension of community infrastructure and help preserve the important qualities of rural areas. It is recommended that an UGB be adopted in metropolitan Hobart, and a regional agency may be needed to manage the boundary across the various Council jurisdictions.

A conceptual UGB is outlined in Figure 4-2. The UGB includes a core area as well as several satellite villages (e.g., Kingston and Sorel). The UGB for Greater Hobart should closely align with the catchment of the integrated transit corridors discussed below. The pace of development is relatively slow in the region; therefore it is important that boundary strictly limits the area available for Greenfield development. Otherwise, there will be no encouragement for the desired form of growth along the transit corridors. In addition, without a tightly constrained UGB, there would be very little change in the product that the development community offers to residents.

Designate integrated transit corridors

Integrated transit corridors are designated corridors where land use and transit be integrated to reduce the need to travel by automobile. The corridors will serve as transit spines and growth corridors for the region within the UGB. The corridors are characterized by higher than traditional density and a greater mix of uses. They are also the focal point for investments in improving the reliability, speed and comfort of transit.

Once established, route variations would not made to support low density or sprawl type development. The aim is to provide high frequency corridors with a high potential of ‘walk and ride’ passengers. This measure is to be complimented by the elimination of low volume, circuitous transit routes over time. The design of new development in the integrated transit corridors would be subject to state and Metro review to ensure transit can properly serve users.

The recommended integrated transit corridors, as shown in Figure 4-2, would focus the linkage of higher density, mixed uses and the more frequent and reliable passenger services. The two major spines include:

- Main Road/Sandy Bay Road in Hobart, Moony, Glenorchy and Claremont;
- Macquarie Street, Tasman Highway, Rosny Hill Road, Cambridge Street, Clarence Street and Howrah Road in South Hobart, Hobart, Rosny and Howrah.

Initially, the corridors would simply be the location where future development and transit improvements are targeted (See Moving People below). More frequent bus services might also be provided along these corridors to raise consumer interest and confidence in transit.

The corridors would focus on providing and growing 'walk and ride' travel over time. They would use existing 'main streets' instead of highways. However, parallel highways should be considered as a critical component of that corridor since any capacity enhancement to the arterial would defeat the purpose of upgrading the transit spine. Ideally transit users would be offered a more convenient, faster and reliable trip than auto users on parallel highways. Otherwise, there is little incentive for people to travel by transit. Regional highways are not appropriate locations for such corridors since they do not allow for the integration of adjacent land uses and the transit line.

The benefit of identifying and developing integrated corridors is the ability to reduce congestion on key strategic routes, improved travel time reliability for passengers over an entire corridor, by providing an alternative mode of transport which reduces reliance on private car travel.

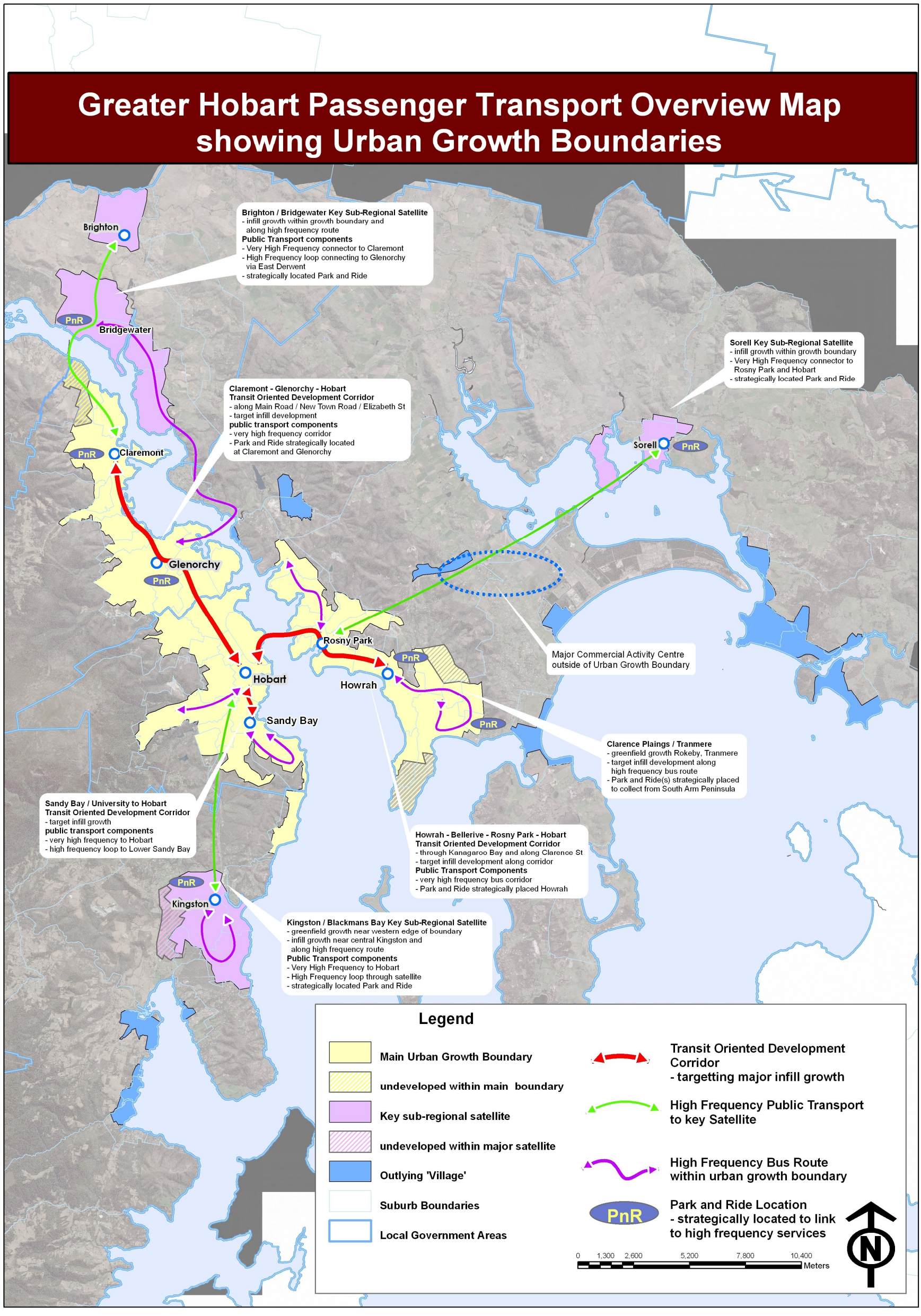


Figure 3-2: Greater Hobart Passenger Transport Overview Map, showing Urban Growth Boundaries

Adopt smart growth requirements

A typical pattern of suburban development has arisen in the decades following the Second World War. These include a strict hierarchy of land uses and transport networks, low density suburban development and an overall assumption that the movement network is to be designed for the most efficient use of the private car.

In recent years, this pattern of development has been challenged. New ways of planning seek to recreate a pedestrian-oriented form of development that was present in the past, focussed around permeable, compact, mixed-use developments with a lower priority given to car mobility. A comprehensive example of this can be seen in the Western Australia *Liveable Neighbourhoods* document.

The impact of alternative development patterns depend greatly on the implementation. For example a medium density housing development with a grid street network is likely to have a small increase in walking compared to a similar cul-de-sac development patterns, while a fully integrated mixed-use development is likely to have significant increases in walking, cycling and public transport and decreases in car use.

Smart growth also encourages development within the urban core and precludes 'leap frog' development such as the commercial outlets at the Hobart Airport. Leap frog development stains State and local infrastructure systems and services, especially transit. While it may provide revenue to local governments, it passes the associated costs of the development on to State Government.

Subdivision design is an important part of contemporary neighbourhood design, as good subdivision design will increase connectivity and linkages both within and between suburbs. For example, many smart growth requirements preclude the use of cul-del-sacs and the segregation of land uses by type.

Implementing alternative patterns of development is particularly challenging as it challenges accepted wisdom and practices in land use planning, transport engineering and real estate development. The Department of Justice and DIER should be empowered to jointly review and require the revision of local land use schemes to ensure that smart growth measures are fully incorporated as a mandatory requirement for all new development. This recommendation applies to the entire study area.

Establish urban design criteria

Local land use schemes in Greater Hobart focus predominantly on design to accommodate travel by car. There is little evidence of the consideration given to the perspective of the pedestrian, cyclist or transit user. In particular, urban design criteria to support these modes are uniformly absent.

Walking, cycling and transit use is not a function of installing a foot path, cycle lane or bus stop. Instead, the level of activity for each of these modes depends on the overall experience of the traveler. For example, people will walk if the route is visually inviting, promote social interaction and feel safe and secure. In addition, at some point in every trip, no matter what the mode, the traveler becomes a pedestrian. Thus, it is important project designs support walking by adhering to fundamental urban design criteria.

The list of features (e.g., buildings built out to the foot path) which foster these activities is quite extensive. However, good urban design criteria ensure that the critical pieces are

incorporated in all new projects. Good urban design can offer significant benefits to the community; however poor design can have adverse effects on the urban environment, society and economy. Urban design is most effective when a number of elements are brought together (e.g. promoting mixed use neighbourhoods, higher densities and enhanced connectivity). Adoption of urban design criteria across Greater Hobart's Councils would not only enhance safety and alternative travel modes but also offer health benefits. This recommendation applies to the entire study area, but has a particular focus within the recommended urban growth boundary.

Support location efficient development

Location efficient development (LED), such as urban infill, seeks to reduce the number of motorised trips by locating new development close to existing services and facilities (e.g. public transport routes and infrastructure). This will encourage the use of walking, public transport and cycling, while at the same time reducing the cost to government for providing new services.

In order to support LED, the State Government should consider the adoption of a headworks charge for development outside the urban growth boundary. Hypothetically, the charge could equate to the difference in cost to Government to provide infrastructure and services compared to within the compact core. The adoption of such a one-time, up-front charge would provide a strong incentive to develop and locate within the core.

When proposing this type of development, care should be taken to ensure that the design supports reduced car use (e.g. through contemporary neighbourhood design and reduction of parking requirements). Analysis should be undertaken to ensure the existing infrastructure (including public transport system) is capable of supporting the expected growth.

3.1.4 Implementation plan – Moving Places

Key:

✓✓	Higher impact	$	Low cost
✓	Lower impact	$$	Low to medium cost
Commuter trips – commuter		$$$	Medium cost
Educational trips – educational		$$$$	High cost
Non-peak trips	Non-peak trips		

Table 3-2: Implementation plan: Moving Places (Short Term)

Measures – **Moving Places**	Travel need/issue addressed	Relation to other measures	Likely outcome	Environment		Cost	Responsibility
				Urban	Outer Urban		
Develop a Regional Plan and urban growth boundary	Commuter Educational, non-peak trips Reduce GHG emissions.	Regional Plan, Smart Growth, Location efficient development, Develop Integrated Transit Corridors.	Decreased settlement dispersion, more infill developments. Reduce the cost of providing infrastructure and services to residents compared to low density sprawl.	✓	✓	$	Department of Justice and Local Councils
Location efficient development	Commuter Educational, non-peak trips Reduce GHG emissions.	Regional Plan, Smart Growth and Develop Integrated Transit Corridors.	Reduce the cost of providing infrastructure and services to residents compared to low density sprawl. Fewer car trips.	✓	✓	$	Department of Justice and Local Councils

Urban design criteria	Commuter Educational, non-peak trips Reduce GHG emissions.	Location efficient development, Transit Oriented Development, Walking and Cycling improvements.	Enhanced walkability and promotion of cycling. Higher density neighbourhoods – minimised sprawl. Fewer car trips.	✓	✓	$	Local Councils
Smart Growth requirements	Commuter Educational, non-peak trips Reduce GHG emissions.	Regional Plan, Location efficient development, Develop Integrated Transit Corridors.	Reduce the cost of providing infrastructure and services to residents compared to low density sprawl	✓	✓	$	Department of Justice and Local Councils
Provide Integrated Transit Corridors	Commuter Educational, non-peak trips Reduce GHG emissions.	TOD land use and decision making	Profile of public transport raised, increased convenience and attractiveness of public transport in comparison to car. Encourages use of public transport through fast, frequent, direct services. Reduced share of trips by car. Social inclusion through improved mobility.	✓	✓	$$	DIER and Local Councils

3.1.5 Moving People

This section identifies possible TDM improvements for passenger transport. The following measures identified, take into consideration existing measures recommended and identified during the earlier stages of the project, background review work and from discussions with DIER. The total benefits of these measures are often cumulative, with higher cost benefits often achieved over the total length of a passenger transport corridor. Thus, an annual monitoring program should be established to capture patronage usage and service levels. Passenger transport improvements need to be supported by a comprehensive passenger transport scheme and plan and have the support of all key stakeholders, including DIER.

Give transit priority

Once the integrated transit corridors and land use frameworks have been established, transit priority measures should start to be incorporated along the main transit spines. The type of measures available to assist buses are for example peak period bus or transit lanes, traffic signal pre-emption and high quality bus waiting facilities. Further investigations into possible treatments and measures would be required to determine the feasibility, design, costs and travel time savings of such schemes. It is also important to note that investments in priority for transit should be focused on the transit corridors, not highways. This will help to attain the desired integration of land use and public transport to reduce greenhouse gases.

The corridors should also incorporate real time information which informs passengers when passenger transport services are expected to arrive. Successful transit systems are reliable and convenient in the minds of the users, so the ability to receive information on advice of services arriving provides an attractive and competitive service. Further investigations into the feasibility of providing advance travel information via mobile and web-based technologies, should be considered as it may be a more viable and cost effective option in coverage and asset management. Improvements would be included into the comprehensive Tasmanian Passenger Transport Strategy Project.

Target commuter travel

The existing transit network in Hobart is oriented towards disadvantaged communities rather than commuters. It is circuitous and often requires lengthy travel times to reach the most common destinations. A rethink of approach is needed, which will compliment other recommended Integrated Transit Corridor and Moving Policies measures. The completion of a passenger transport network review would consideration to existing and future passenger transport needs such as buses, light rail and ferry networks. However, it should focus on two key service patterns.

The first pattern is the creation of a high frequency, on-street transit trunk lines along the designated integrated transit corridors. Bus service patterns should also be modified so that outlying services are used as feeder buses to travel to and then along the transit spine. The net effect is very frequent bus service where the highest concentrations of people live, work or conduct their day to day activities. The net effect of the trunk and feeder system will be the perception that “there is always a bus within a few minutes” and “it is always within a short walk”. Each of these corridors can be upgraded in the long term to high quality transit systems, such as bus rapid transit or light rail, once land uses adequately support ridership and the high cost of investment (see Moving Forward below for additional discussion).

The second pattern is the provision of high frequency bus service between the satellites and the integrated transit corridors along highways. These services will then become part of the trunk line and reinforce the transit corridor. However, this service will have limited stops, if any, between the satellite centres and the transit corridor. Its importance will likely grow as fuel prices increases over time.

Build a Bus Interchange

Similar to car and air travel, transit riders desire a high quality service and supporting facilities. The key to increasing travel by bus is to attract choice riders who have the option of driving. There is no high quality indoor bus waiting areas, in Greater Hobart. Comfort, dignity and convenience will be critical incentives for attracting choice riders to travel by bus. In addition, Greater Hobart's public transport interchanges are traditionally poorly integrated with suburban centres, and Hobart's bus mall is reaching capacity.

Thus, it is recommended that DIER and Metro undertake a comprehensive study to determine the needs of future passenger transport centres and hubs and possible infrastructure improvements required. In particular, it is recommended that steps be initiated to identify a suitable location for such a facility in the Hobart CBD. This location benefits travellers from the entire region. A successful model of a high quality bus interchange is provided in the Christchurch, NZ central business district.

There are significant opportunities for redevelopment of public transport exchanges in Hobart. The provision of passenger transport interchanges with accessibility to a range of services and frequencies could enable seamless travel and transfers to occur. A passenger transport interchange may provide the following:

- High quality, lounge style indoor waiting areas.
- Bike/public transport integration – this could be suitable where the distance to a service or interchange is too far to comfortably walk. In urban environments it would enable a cyclist to commute part of their journey. Bike lockers and repair shops might also be provided at the interchange.
- Retail and other amenity services.
- Restrooms.
- Pre-boarding ticketing and real time information.
- Inter and intra regional passenger services (i.e. bus and coach services).

Additional possible locations for intra-regional passenger transport hubs and centres could be established along the transit corridors connecting with Hobart (e.g. Glenorchy, Kingston, Sorel and Rosny).

Provide park and ride facilities

The primary purpose of park and ride facilities is to intercept car journeys before they reach congested links, reduce vehicle kilometres travelled on the road system and encourage a transfer to space and energy efficient transit. Park and ride can effectively expand the catchment area of an interchange allowing people living in low-density areas or distant from line-haul services to catch public transport. Park and ride (and kiss and ride) are particularly important for persons with impaired mobility (such as parents with children, people with physical disabilities, the elderly and persons with large shopping or personal baggage), or

users with perceptions of personal danger at interchanges and surrounding areas (particularly children and women at night).

There are some important concerns that limit the benefits of park and ride in settings such as Greater Hobart. For example, in a study undertaken by PB during the RailCorp Park and Ride Strategy (October 2006) in Sydney, it was found that park and ride plays an important role in low density outlying areas where land is plentiful but is less sustainable in inner areas with higher land use densities (allowing greater walk-in catchment), greater public accessibility and higher land values.

Potential general locations that are suitable for park and ride are shown on Figure 4-2. The following recommendations for the future investigation into park and ride facilities include:

- Undertaking a comprehensive parking study to identify size of and suitable locations (on the urban fringe and in satellites) for temporary and permanent facilities.
- Integration of park and ride facilities at ends of integrated transit and high frequency transit corridors.
- Monitoring – annual monitoring programmes which capture patronage and passenger movements.
- Planning, funding and responsibilities of key stakeholders in the delivery of the strategy.

The following Implementation plan in Table 3-3 provides an overview of passenger transport improvements for the region.

3.1.6 Implementation plan – Moving People

Key:

✓✓	Higher impact	$	Low cost
✓	Lower impact	$$	Low to medium cost
Commuter trips - commuter		$$$	Medium cost
Educational trips - educational		$$$$	High cost
Non-peak trips	Non-peak trips		

Table 3-3: Implementation plan - Moving People (Medium Term)

Measures – **Moving People**	Travel need/issue addressed	Relation to other measures	Likely outcome	Environment		Cost	Responsibility
				Urban	Outer Urban		
Public transport service improvements: - Frequency of services - Bus stop rationalisation - Route rationalisation	Commuter Educational, non-peak trips, accessibility in urban fringe. Reduce GHG emissions.	Public transport priority at signals HOV / Bus lanes Park and Ride schemes	Decreased journey times, improved reliability increasing convenience and attractiveness of bus in comparison to car. Encourages use of public transport through fast, frequent, direct services. Reduced share of trips by car. Social inclusion through improved mobility.	✓	✓	$$	DIER, Local Councils, Metro Tasmania and other operators.

Give transit priority through other transit priority measures, targeted at key locations: - Priority at signals for buses	Commuter Educational Peak period congestion, Reduce GHG emissions.	Public transport service improvements, HOV / Bus lanes.	Shorter journey times for more efficient modes (buses and HOVs). Encourages switch to more efficient modes (bus or HOV) from private car.	✓		$$$	DIER and Local Councils
Give Transit Priority through High Occupancy Vehicle (HOV) Lanes or Bus Lanes, targeted at key locations in the public transport network.	Commuter Educational Peak period congestion, Reduce GHG emissions.	Public transport service improvements, public transport priority at signals.	Separation of buses / HOVs from other traffic. Shorter journey times for more efficient modes (buses and HOVs). Creates additional space for emergency services at peak congestion times. Encourages switch to more efficient modes (bus or HOV) from private car.	✓		$$$	DIER and Local Councils

Provide Park and Ride options and investigate feasibility.	Commuter Educational, non-peak trips, accessibility in urban fringe. Reduce GHG emissions.	Public transport priority at signals HOV / Bus lanes Public transport service improvements Parking Management Strategies Parking pricing in Central Hobart	Increased mobility options Encourage more people to use public transport for most of their journey Reduced parking demand on local streets and shopping centre car parks near bus stops Reduced commute time and cost by offering convenient car parking Provision of safe, high quality passenger waiting facilities.	✓	✓	$$$	DIER; Local Councils, Metro Tasmania and other operators.
Build a Bus Interchange - New Central Hobart bus interchange	Commuter Educational, non-peak trips Reduce GHG emissions.	Service improvements Park and Ride schemes	Profile of public transport raised, increased convenience and attractiveness of public transport in comparison to private car. Encourages use of public transport through fast, frequent, direct services. Reduced share of trips by car. Social inclusion through improved mobility.	✓		$$$	DIER; Local Councils and Transport Operators.

3.1.7 Moving Policies

Improve parking management

The review identified that there were no Parking Strategies in the Greater Hobart Region. The purpose of any parking management strategy is to provide guidance to the local Council and the community on how best to promote, manage, plan and provide for parking. Any strategy would need to involve Councils, DIER and other key stakeholders, agencies and others identified. It would be anticipated that any Parking Strategy developed for Councils could address the following:

- Aims and Objectives.
- On-street parking supply and demand.
- Public Off-Street parking supply and demand.
- Private Off-Street parking supply and demand.
- Parking Standards for new development.
- Parking restrictions e.g. charges, hours of operation, clearways.
- Other road users.
- Parking enforcement.
- Key groups – commuter, utility and visitor.
- Action plan and recommendations.
- Monitoring – annual monitoring programs which capture demand and occupancy.
- Planning, funding and responsibilities of key stakeholders in the delivery of the strategy.

The applicability of policies and strategies contained within a parking management strategy may vary across the region and network.

A Greater Hobart Regional Parking Strategy could include such policy actions as:

- Encouraging councils to incorporate parking maximums instead of minimums (further discussed below).
- Linking district plan parking standards to public transport accessibility.
- Giving priority to short stay parking over long stay parking.
- Reducing parking provision in high density residential development.
- Controlling public long stay/commuter parking provision in parking buildings and lots
- Regional parking pricing (further discussed below).
- Shared parking (further discussed below).

Maximum Parking Standards

Subdivision codes and parking requirements are often in conflict with good urban design and smart growth development. Car parking in new developments across the Hobart region is focussed on approving development in accordance with requirements of Standards, rather than encouraging development with linkages to other forms of transport or providing

incentives to avoid the provision of car parking. It is recommended that minimum parking standards for new developments are eliminated and replaced with maximum standards. The standards should reflect the proximity to the integrated transit corridors (e.g., closer the transit spines the lower the maximum parking).

Parking Pricing

The Hobart CBD is the only area of Hobart to charge for parking, with all other areas providing free parking, which does not promote the use of other transport modes. In many parts of Australia parking is free to the end user. The cost of providing parking is borne either by the provider (e.g. employer) or by the community at large (public parking). This effectively reduces the cost of driving to the end user and encourages car use.

By charging directly for parking, there is the incentive to change travel behaviour. Where the destination is attractive enough, and suitable alternatives exist, this may result in mode changes. Otherwise, it can result in change of destination to one where free parking is available. This can reduce commercial activity if the destination is not very well established. One solution is to provide free (or very low cost) parking for short term visits, with larger costs for all day parking.

Parking pricing should be uniform across the entire study area to discourage the migration of commercial uses to Councils that do not charge for parking. This may require the State to administer a uniform parking fee for all commercial and employment uses in the region.

Shared Parking

Conventional planning practice is to provide a certain number of car parking areas for each development. This effectively institutionalises driving. Where a larger development takes place, an alternative is to supply one central shared parking area. This encourages visitors to park once on arrival, and then move around the centre on foot. This reduces the number of car trips within an area. Shared parking can reduce the required number of spaces by up to 25 per cent (Urban Land Institute).

Adopt auto trips generated modelling

The assessment of transport impacts of new developments relies on an operational Level of Service for determining impacts and mitigation for new development proposals. The required improvements to accommodate more cars generally impair the ability of the land uses and streets to encourage walking, biking and transit use. The net effect is to continuously expand intersection sizes and roadway widths.

LOS measures quality of service through average delays experienced by drivers at a particular intersection. LOS does not capture environmental impacts, which are related to the automobile trips generated by a scheme. Mitigating the impacts of LOS, for example through a road widening scheme, can worsen conditions for pedestrians, cyclists and public transport as well as induce more driving.

The emphasis on additional road capacity has failed to recognize the impact of induced demand. For example, as a road is widened or improved to provide additional capacity, a new “path of least resistance” is created. Additional drivers, who previously did not travel by the road, will quickly be attracted to use the road due to the time or cost improvement. In recent years, we have learned that this additional capacity also induces unanticipated growth in the population “upstream” of the road. In turn, this growing population re-congests the roadway. This then creates a demand for additional widening or capacity enhancements

to that road. This fundamental cycle of land use and transportation demand is commonly ignored in the assessment of impacts of transportation decisions.

It is recommended that auto trips generated (ATG) modelling replace the Level of Service (LOS) method of analysis. ATG focuses on the total new car trips induced by a proposed scheme and recognises that adding additional car trips is environmentally undesirable. Trips by auto are then assessed a fee which is used to fund pedestrian, cycling and public transport improvements in the vicinity of development. It motivates schemes that will increase the use of walking, cycling and public transport rather than those that will generate car trips. Appendix A provides further information about ATG in the form of a San Francisco County Transportation Authority presentation.

Identify regionally significant projects

Development proposals that meet smart growth and sound pedestrian oriented urban design criteria should be encouraged. This can be done by designating such projects as regionally significant projects to remove them from the Council review process. Councils are generally responsive to the short term concerns of constituents in close proximity to proposed developments. This often precludes sound projects which provide a regional benefit from advancing.

In particular, the designation as a regionally significant project can offer the development sponsor the certainty that a fair assessment of the proposal can be obtained. In addition, by removing qualifying projects from the local process, the development sponsor is provided a predictable time frame for project review. For developers, time is both money and risk. Given that smart growth is a relative new product in the Greater Hobart area, measures are needed to reduce costs and risks for developers. Otherwise, they will not have the incentive to bring these projects to market.

A range of TDM measures for policy have been identified for implementation, subject to further investigations into the feasibility of each measure proposed. These are identified in the Implementation plan in Table 3-4. Critical to the success of implementing TDM measures, is the need to understand parking management requirements through the Hobart region.

3.1.8 Implementation plan – Moving Policies

Key:

✓✓	Higher impact	$	Low cost
✓	Lower impact	$$	Low to medium cost
Commuter trips - commuter		$$$	Medium cost
Educational trips - educational		$$$$	High cost
Non-peak trips	Non-peak trips		

Table 3-4: Implementation plan - Moving Policies (Medium Term)

Measures – **Moving Policies**	Travel need/issue addressed	Relation to other measures	Likely outcome	Environment		Cost	Responsibility
				Urban	Outer Urban		
Improve parking management by developing Regional Parking Management Strategies	Commuter, non-peak trips Reduce GHG emissions.	Public transport service and infrastructure improvements	Reduced share of trips by car.	✓	✓	$	DIER, Local Councils, Landowners, Business owners
Improve parking management - establish maximum in lieu of minimum parking standards/requirements for new developments	Commuter, non-peak trips Reduce GHG emissions.	Public transport service and infrastructure improvements Regional Parking Management Strategies	Reduced share of trips by car.	✓	✓	$	DIER, Local Councils
Auto trips generated modelling	Commuter Educational, non-peak trips Reduce GHG emissions.	Pedestrian and cycling improvements Passenger transport improvements	Reduced share of trips by car Incentives public transport, bicycle and pedestrian improvements	✓	✓	$$	DIER, Local Councils

Identify regionally significant projects	Commuter Educational, non-peak trips Reduce GHG emissions.	Land Use and Integrated Transit Corridors	Predictability and incentive for developers of desired alternative housing products.	✓	✓	$	Department of Justice

3.1.9 Moving Legs

Enhance the cycling environment

Developing an Active Transport Strategy

The review has identified the absence of an Active Transport Strategy n the Greater Hobart Region. An Active Transport Strategy provide guidance to the local Council and the community on how best to promote, manage, plan and provide for cycling and walking in the region. Any strategy would need to involve Councils, DIER and other key stakeholders, agencies and others identified.

It would be anticipated that any Active Transport Strategy developed for Councils could address the following:

- Aims and Objectives.
- Existing Conditions.
- Identification of Walking and Cycling Routes (Strategic and local networks).
- Design Principles.
- Key groups – Commuter, School, Recreational, Sport and Visitor.
- Implementation/Action plan and recommendations.
- Monitoring – annual monitoring programs which capture cycle movements.
- Planning, Funding and responsibilities of key stakeholders in the delivery of the strategy.

The applicability of policies and strategies contained within a walking and cycling strategy may vary across the region and network. The following sections provide an overview of possible TDM measures and treatments that could be considered subject to further detailed investigation. The nature of benefits may not be purely economic but instead generate a number of social benefits which may vary across the region.

Monitoring of cyclist numbers

In order to ensure provision for cyclists in the right location, monitoring is essential of all road user groups to identify potential conflicts and daily / seasonal movements. This is an area of work currently being investigated by DIER. It would be recommended that DIER work with Councils to identify how monitoring could provide benefits to ongoing work for cycling infrastructure provision.

Develop GIS database and maps of cycle network

The development of a GIS database the cycle network will allow for more efficient management and planning of the entire network.

Improve signage and intersection treatments

Improve signage and intersection treatments (e.g. Advanced Stop Lines for cyclists), bike boxes, signal attenuation triggered by bikes. These treatments would be identified by undertaking a cycling conditions survey.

Develop and improve cycle dedicated cycle routes

Cycle lanes provide a dedicated lane to cyclists. It is important to understand the needs of recreational/touring and commuter cyclists differ as does the level of ride skill. The provision of on-road or segregated cycle lanes or shared lanes with the road network will depend on the function of the road corridor and environment it passes through. It will be important for DIER to work with local authorities and key stakeholders to identify cyclists' needs and routes.

Access and crossing facilities for cyclists / pedestrians

DIER will strive to provide safer travel for pedestrians and cyclists to increase the number of people walking / cycling through improved management of the road space and the provision of more off-road paths and access.

An active program of initiatives designed to increase safety for pedestrians and cyclists while improving access could include:

- Introduce more appropriate speed limits in shopping areas, high intensification areas i.e. residential and industrial estates.
- Encourage through-traffic to avoid shopping strips and to use alternative routes where feasible.
- Establish a program to provide greater priority for pedestrian / cycle access across busy arterial roads that sever community activities.
- Identify suitable locations for advance stop lines at junctions.

Enhance the walking environment

Environment enhancements and streetscape

Improving the pedestrian environment within the urban and suburban settlements is an important component in reducing the number of short vehicle trips. The provision of footpaths should also take into consideration elements of urban design to ensure that the width and location of footpaths is appropriate to the function and environment. The focus of these investments should be along the transit spines and for streets within 10 minutes walking distance of the transit spines.

Personal security

There is also a need to allow provision for personal security for pedestrians in the form of lighting and good visibility / sight lines to key services and public transport. Environmental streetscape, particularly in urban areas can also enhance the pedestrian's journey. The urban design criteria should set forth measures to improve the perception of safety and security for pedestrians.

Walking and cycling facilities in the vicinity of schools

It is recommended that walking and cycling facilities be improved and extended in vicinity of schools to encourage students to use active transport modes during their journey to school. This could be done in conjunction with the roll out of Walking School Bus Program.

A range of TDM measures for walking and cycling have been identified for implementation subject to further investigations into the feasibility of each measure proposed. These are identified in the Implementation Plan Table 3-5.

3.1.10 Implementation plan – Moving Legs

Key:

✓✓	Higher impact	$	Low cost
✓	Lower impact	$$	Low to medium cost
Commuter trips - commuter		$$$	Medium cost
Educational trips - educational		$$$$	High cost
Non-peak trips	Non-peak trips		

Table 3-5: Implementation plan - Moving Legs (Medium Term)

Measures – **Moving Legs**	Need / issue addressed	Relation to other measures	Likely outcome	Environment		Cost	Responsibility
				Urban	Outer Urban		
Walking & cycling environment opportunities – develop an Active Transport Strategy	Commuter Educational, Non-peak trips Reduce GHG emissions	Walking and cycling infrastructure improvements, locations for end of trip facilities, integration of PT and walking/cycling.	Identification of walking and cycling priority areas leading to increased number of cycling and walking trips, reduced share of trips by car.	✓✓	✓	$$	DIER, State Government agencies, Local Councils and other key stakeholders
Monitoring of cyclist numbers	Commuter Educational, Non-peak trips Reduce GHG emissions	Use to further develop Strategic Bicycle Plan	Identification of frequently used cycling routes	✓	✓	$	DIER, Local Councils

Develop GIS database of cycle network, including cycling maps	Commuter Educational, Non-peak trips Reduce GHG emissions	Use to further develop Strategic Bicycle Plan	Mapping of entire cross-council cycle network	✓	✓	$	DIER
Improve signage and intersection treatments (e.g. Advanced Stop Lines for cyclists), bike boxes, signal attenuation triggered by bikes. Undertake cycling conditions survey.	Commuter Educational, Non-peak trips Reduce GHG emissions	Strategic Bicycle Plan would identify locations	Increased number of cycling trips, reduced share of trips by car. Social inclusion through increased accessibility. Health benefits.	✓	✓	$ / year	DIER, Local Councils
Develop / improve dedicated cycle routes	Commuter Educational, Non-peak trips Reduce GHG emissions	Strategic Bicycle Plan would identify locations	Increased number of cycling trips, reduced share of trips by car. Social inclusion through increased accessibility. Health benefits.	✓	✓	$$	DIER, Local Councils,
Improved crossing facilities – e.g. Macquarie / Davey Streets	Commuter Educational, Non-peak trips Reduce GHG emissions	Identify in Walking & Cycling Strategies	Increased number of walking trips, reduced share of trips by car. Social inclusion through increased accessibility. Health benefits.	✓		$ / year	DIER, Local Councils

Walking improvements - personal security	Commuter Educational, Non-peak trips Reduce GHG emissions	Personal security	Increased number of walking trips, reduced share of trips by car. Social inclusion through increased accessibility. Health benefits.	✓		$ / year	DIER, Local Councils
Walking improvements – environment enhancements / streetscape. Undertake walking conditions audit.	Commuter Educational, Non-peak trips Reduce GHG emissions	Walking environment enhancements / streetscape improvements	Improved aesthetics – physical and visual. Increased number of walking trips, reduced share of trips by car. Social inclusion through increased accessibility. Health benefits.	✓		$ / year	DIER, Local Councils
Extend urban footpath network	Commuter Educational, Non-peak trips, non-peak trips Reduce GHG emissions	Local walking and cycling opportunities	Increased number of walking trips, reduced share of trips by car. Social inclusion through increased accessibility. Health benefits.	✓		$ / year	Local Councils

Local walking / cycling opportunities	Commuter Educational, Non-peak trips Reduce GHG emissions	Identify in Walking & Cycling Strategies	Increased number of walking and cycling trips, reduced share of trips by car. Social inclusion through increased accessibility. Health benefits.	✓	✓	$	DIER, Local Councils
Extend walking & cycling facilities in vicinity of schools. Roll out of Walking School Bus Program.	Educational Reduce GHG emissions	Identify in Walking & Cycling Strategies	Increased number of walking trips and cycling trips for students. Reduced share of trips by car. Social inclusion through increased accessibility. Health benefits.	✓	✓	$$	DIER, Local Councils, Schools

3.1.11 Moving Forward

There is an opportunity to initiate a large scale integration of land use and transport in the region by strengthening the role of the two integrated transit corridors over the long term. The focus of the long term vision for the region is to promote and implement Transit Oriented Development (TOD) at key bus or light rail station locations while serving the corridor with high quality, dedicated transit. The concept is further explained below and builds on the smart growth and urban design measures to support even higher transit ridership

The creation of TODs along the two corridors is needed to create the passenger demand to make dedicated transit viable. These modes generally rely on walk and ride passengers. A bus or tram that operates with few passengers actually contributes more greenhouse gases than individual automobiles. Consequently significant intervention and public investment would be required to support the change in land use, especially within Hobart and Glenorchy.

The high costs and intervention needed to develop the corridor can accrue substantial benefits such as those listed in the table below. However, the corridor would serve only a portion of the region. Thus, it is recommended that while planning for the corridor should be initiated now, the majority of other region-wide measures be put in place initially.

Transit Oriented Development

A TOD is a compact community that seeks to maximise synergies between built environment form and public transport availability. It consists of mixed use centres, containing medium to high density residential, retail and commercial uses built around a central public transport mode. However, TODs are primarily about creating urban environments that offer significant amenities that attract people. In addition, planning for public transport, pedestrians and cyclists takes priority of planning for the car. There are a number of benefits that can be obtained from TOD including:

- Recent US research (TCRP Report 128) shows up to 44% reduction in private car use and 50% reduction in car parking demands for TOD compared to similar high-density development without a public transport component.
- TOD residents are 5-6 times more likely to travel to work by public transport as suburban residents (TCRP 2004).
- Office workers located in TODs are 3.5 times more likely to commute by public transport than the average office worker (TCRP 2004). Housing living in compact housing styles (flats and townhouses) use 40 per cent less water and 20 per cent less energy than households of a similar size and income living in a detached house (Rickwood 2007).
- 'Other' residential dwellings (as labelled by the Australian Bureau of Statistics (ABS) are 25-40 per cent smaller than detached houses resulting in a proportional reduction in embedded energy. Living within or near a TOD can reduce household CO2 emissions from transport alone by over 3 tonnes per annum (TCRP 2004).

A reasonable quality public transport service is essential for successful TOD, and most successful examples to date have been built around fixed rail (LRT or heavy rail) systems. Suitable locations are limited and this leads to a demand premium on TOD. As a result,

housing in TODs may be more expensive than surrounding areas. This may lead to social equity issues, unless appropriate government intervention takes place.

Quality Bus / Light Rail

The following is a brief introduction to the alternative rapid transit modes that may be viable in the corridor. It is assumed that heavy or commuter rail is not viable during the planning period for this study (i.e. 2031) given the lack of an existing dedicated right of way. The two modes discussed below include Bus Rapid Transit (BRT) and Light Rail Transit (LRT).

The north south corridor includes the existing freight line which extends from Sullivans Cove to slightly north of Bridgewater. Alternative concepts have been proposed to use all or the portion north of Newtown Creek for a dedicated, quality bus or light rail transit (LRT) corridor. The latter option would incorporate a street running quality bus or LRT through the southern portion of the corridor. While the former option might have operational benefits of being removed from street traffic, it would be segregated from development and potential passengers since the freight line travels through Derwent Park.

Regardless of the route, significant investment would be required as shown in the Hobart Light Rail Cost Estimate: Desktop System Design and Service Model which is currently underway by DIER. **Given the costs for a 22 kilometre north south LRT would exceed $600 million in capital costs, it is imperative that the recommended comprehensive suite of supporting measures are in place to ensure ridership.** The costs for a BRT along this corridor should also be investigated. A similar investigation into the east west corridor connecting South Hobart and Howrah would also be needed to determine the appropriate mode.

Bus rapid transit

This section presents an introduction to the bus rapid transit (BRT) concept as a potential mode for the northeast corridor. It provides details of typical operating systems and their key characteristics in providing high levels of priority using bus-based transit systems.

BRT is a mass transit system that mimics the rapidity and performance of light rail systems (or is some cases heavy rail systems), but uses buses rather than rail vehicles. BRT combines the reliability of rail and the versatility of conventional bus systems.

BRT systems have gained international attention as cost effective transit systems. They can operate in an exclusive right-of-way (ROW) or can utilize dedicated bus lanes in a mixed traffic environment. In some instances sections of the system can operate in mixed traffic conditions.

In the last decade BRT systems have commenced operations in Brisbane and Sydney, while the other significant system, the Adelaide O-Bahn, has now been operating for some 20 years. These systems illustrate the diversity of character which can define BRT.

- Brisbane is fully segregated from the general traffic system with on-line stations offering fully accessible, grade separated pedestrian circulation. The busiest line (South East Busway) carries in excess of 18,000 people in the peak hour (Source: TransLink). Services are a mix of feeder express (which start in residential areas before joining the busway) and dedicated trunk operations.
- Sydney provides exclusive bus lanes operating in their own right of way over two thirds of the corridor with the remainder providing Tway lanes on existing roads. Stations provide a high level of amenity and an iconic design, while pedestrians generally cross at grade. Only dedicated trunk services run on the Tway, with some feeders connecting at two major stations.

- Adelaide O-Bahn provides fully segregated operation for all but the final three kilometres of its run when bus mix in general traffic through the CBD. It is a guideway using simple kerb guidance and services enter and leave the line mainly at two stations. Services predominantly operate through residential areas before joining the guideway to run express to the city.

Fundamentally, BRT includes the following key components:

- a priority corridor where the speed and reliability of the buses on the system deliver a travel experience which is competitive with the private vehicle. In this respect, aspects of comfort, speed and reliability are of key concern

- a system of sufficient operating efficiency and capacity that is able to cater for high passenger volumes with comparative ease
- purpose designed and themed stations, signage and branding to delineate the BRT product within the broader travel market. In this respect, branding can include the bus livery

- a modern bus fleet which is designed for and supports the station infrastructure. Buses may be either high or low floor but fundamentally they should be designed for the purpose intended. That is, they must be capable of rapid boarding and alighting, be able to cater for the demands intended and deliver an image which projects an efficient and modern system
- supporting systems including integrated ticketing and relevant passenger information systems to complement the image and branding philosophy.

Light rail transit

Light rail transit (LRT) is a fixed-rail public transport system that is designed to a lighter standard of rail and vehicle than a traditional suburban rail system. LRT systems cover a wide spectrum from the traditional street-based tramway systems, through to fully segregated systems that can share infrastructure with main line railways. The majority of systems are electrically powered via overhead wires.

Benefits of LRT systems include a lower engineering footprint than heavy rail systems, including being able to negotiate tighter curves and steeper gradients. At the same time, the presence of fixed rail infrastructure generates a sense of permanence that attracts greater patronage than equivalent bus routes.

Light rail systems have frequently been incorporated into urban regeneration projects and they have been a catalyst for significant development in places such as Portland and San Diego in the US and London in the UK. They have been built in a range of cities, from dense European areas to low density US cities.

In Australia, LRT is found in Melbourne, Sydney and Adelaide.

Melbourne has one of the world's largest tramway systems, which includes many features of a modern LRT. The system covers the inner and middle suburbs and reaches up to 24 km from the CBD. Most of the older routes operate on unreserved tracks in the centre of urban streets. Newer extensions are on dedicated right of way in central medians. Two routes (to Port Melbourne and St Kilda) are primarily on converted heavy rail routes with segregated right-of-way. An on-going programme is underway to provide improved traffic priority for trams and improved passenger stop amenity. In 2007, 156.4 million passengers were carried on Melbourne trams.

The Sydney light rail route was opened in 1997 and runs for approximately 7 km from Central station to the inner suburb of Lilyfield. 70% of the route is on dedicated right-of-way on a former goods line; the remainder is on street. The line is operated by a private company and fares are not integrated with either Sydney bus or Cityrail. Considerable interest exists in extending the line through the CBD to Circular Quay, but a number of obstacles (such as narrow streets and opposition of traders) have so far prevented this.

Adelaide's 11km 'Glenelg Tram' route connects the CBD with the seaside suburb of Glenelg. Most of the route is on a dedicated right-of-way that was converted from steam to 'light electric railway' in the 1920s. There are short sections of on-street running at each end of the line. The city end was extended along King William Street and North Terrace through the city centre in 2007, and design is now underway to extend to the Entertainment Centre and Bowden redevelopment area in the inner western suburbs.

Typical features

A key feature that distinguishes modern LRT from traditional street tramways is a high level of segregated running. This avoids conflict with other traffic, decreases journey time and improves reliability. Segregated running can be achieved by dedicated right-of-way or through use of a wide median in road reserve.

Many LRT systems have been designed to permit on-street running if required. This is particularly attractive in city centre areas where close integration with the built environment is required, or where retrofitting segregated right-of-way would be prohibitively expensive.

Some larger LRT systems include large station facilities, but the majority of systems feature relatively low scale stops. These include low platforms (dependent on height of vehicle) which may be either centre 'island' platforms or side platforms.

Desirable features

A range of features can be included in an LRT system to improve its quality and passenger amenity. These include:

- step-less entry vehicles
- multiple-unit or multiple-articulated (high capacity) operation
- quality information systems, integrated fares and ticketing.

Light rail systems have the ability to be tailored to meet individual cities' circumstances. The main varying factors include vehicle size and type and route type (segregated or on road). An important factor in successful systems is integration with other modes of public transport and integration with the land use planning system.

3.1.12 Implementation plan – Moving Forward

Key

✓✓	Higher impact	$	Low cost
✓	Lower impact	$$	Low to medium cost
Commuter trips - commuter		$$$	Medium cost
Educational trips - educational		$$$$	High cost
Non-peak trips	Non-peak trips		

Table 3-6: Implementation plan - Moving Forward (Long Term)

Measures – **Moving Forward**	Travel need/issue addressed	Relation to other measures	Likely outcome	Environment		Cost	Responsibility
				Urban	Outer Urban		
Quality Bus / Light Rail	Commuter Educational Reduce GHG emissions	All measures	Greater patronage	✓		$$$$	DIER
Transit Oriented Development	Commuter Educational Reduce GHG emissions	All measures	Reduction in private car use and Reduction in car parking demands	✓		$$$	DIER, Department of Justice, Local Councils

4. Next steps

The implementation of the proposed TDM measures outlined in this report and presented in will involve co-ordination between DIER and other stakeholders including Local Councils, public transport operators and the Department of Justice. DIER's role ranges from facilitation, funding, liaison to active implementation of measures.

Potential measures have been identified under six streams in the Greater Hobart region: Moving Minds, Moving Places, Moving People, Moving Policies, Moving Legs and Moving Forward. These measure are outlined in Table 3-1 to Table 3-6 The potential timeframes for implementation have also been indicated for the short (5 years), medium (5-10 years) and long term (greater than 10 years). These measures take into account and give consideration to a number of polices and legislation objectives that support TDM.

4.1 Monitoring and Review

The TDM measures recommended for Greater Hobart should be reviewed every three years to ensure that it keeps pace with changing circumstances, travel needs and policy. The Greater Hobart TDM Implementation Plan will need to be reviewed each year and an Implementation Team should be established to monitor and facilitate the implementation of the Greater Hobart TDM measures. The Implementation Team will need to comprise of senior staff from a wide range of organisations to ensure that policies are installed across the region and that implementation and further development are informed by all stakeholders. Annual updates should be prepared to report on the progress of the implementation of the TDM measures on a yearly basis.

5. Bibliography

1. Australian Bureau of Statistics (2007), Census 2006.
2. Trubka, R. Newman, P. & Bilsborough, D. (2008) Assessing the Costs of Alternative Development Paths in Australian Cities. Curtin University Sustainability Policy Institute.
3. RPDC (2008) Planning Advisory Note 11 – Subject: Integration of Land Use & Transport in Planning Schemes
4. WAPC/DPI *Liveable Neighbourhoods.* 3 ed. Perth: Western Australian Planning Commission, 2007
5.
6. Barton, Hugh (2002) 'Do Neighbourhoods Matter?' in Hugh Barton (ed) *Sustainable Communities: The Potential for Eco-Neighbourhoods*, Earthscan Publications, London, pp 63-64.
7. Grady, S. and Leroy, G. (2006) 'Making the Connection: *Transit Oriented Development and Jobs*, Good Jobs First, USA.
8. Mees, Paul (2000) 'Transport and Healthy Cities' in *Health Promotion Journal of Australia,* Volume 10, Number 3, pp 197-201.
9. Rickwood, P. (2007) 'Integrating Population, Land-use, Transport, Water and Energy-use Models to Improve the Sustainability of Urban Systems.' Presentation given at State of Australian Cities conference, Adelaide.
10. Transit Cooperative Research Program (2004) *Transit Oriented Development in the United States: Experiences, Challenges and Prospects.* Transportation Research Board, Washington, DC pp 122-135.
11. Cevero. R. et atl. TCRP Report 128 *Effects of TOD on Housing, Parking and Travel* Washington DC: Transportation Research Board, 2008.

APPENDICES

Appendix A

Auto Trips Generated Presentation

SAN FRANCISCO COUNTY TRANSPORTATION AUTHORITY

Auto Trips Generated (ATG)

CEQA Impact Measure and Mitigation Program

Governor's Office of Planning and Research

December 19, 2008

Part I

Background / Problem

Background

- Analysis of Alternative LOS Methodologies requested by Authority Board
  - What is the best way for the City to measure transportation impacts under California Environmental Quality Act (CEQA)?
- Technical Working Group (TWG) assembled
  - Planning Department, SFMTA, DPH, professional transportation planners, SFBC, SPUR, Walk SF, CEQA attorney
- TWG recommends alternative to LOS
  - Replace automobile LOS with Automobile Trips Generated (ATG)
  - Provide more effective impact mitigation

Why ATG?

- LOS measures the delay experienced by drivers at an intersection
  - LOS does not capture environmental impacts
  - LOS does not reflect the City's policies and priorities
  - LOS results in an inefficient CEQA review process
- Environmental impacts **ARE** related to the automobile trips generated (ATG) by a project

LOS does not capture environmental impacts

Environmental Impact	Automobile Delays (LOS)	Automobile Trips Generated (ATG)
Air Quality	+ CO hotspots rare in Bay Area	++ ROG, NO_x, PM_{10}
Greenhouse Gases	−−	++ From cold starts
System Efficiency	+	+
Traffic Intrusion	−	++ Traffic volumes affect neighborhoods
Noise	+ At congested intersections only	+ Captures noise conditions
Safety	−− Delay unrelated to safety	++ SF DPH Vehicle-Pedestrian Injury Collision model

LOS does not reflect City policies

- LOS impacts are a predictable and unavoidable consequence of implementing the Transit First Policy
  - Improvements to transit, bicycle, and pedestrian networks require re-allocating auto and shared infrastructure to other modes
  - Mode shift will occur gradually as transit, bicycle, and pedestrian networks are improved
- Climate Action Plan calls for reduction in driving
  - Auto tripmaking is 50% of SF's greenhouse gas emission
- Mitigations to LOS are environmentally harmful
  - worsen conditions for pedestrians, transit, and bicycling
  - …while inducing more driving

LOS does not reflect City Policies

Widening this roadway will improve LOS, mitigating any LOS impacts…

While worsening pedestrian conditions and inducing more driving.

LOS does not reflect City Policies

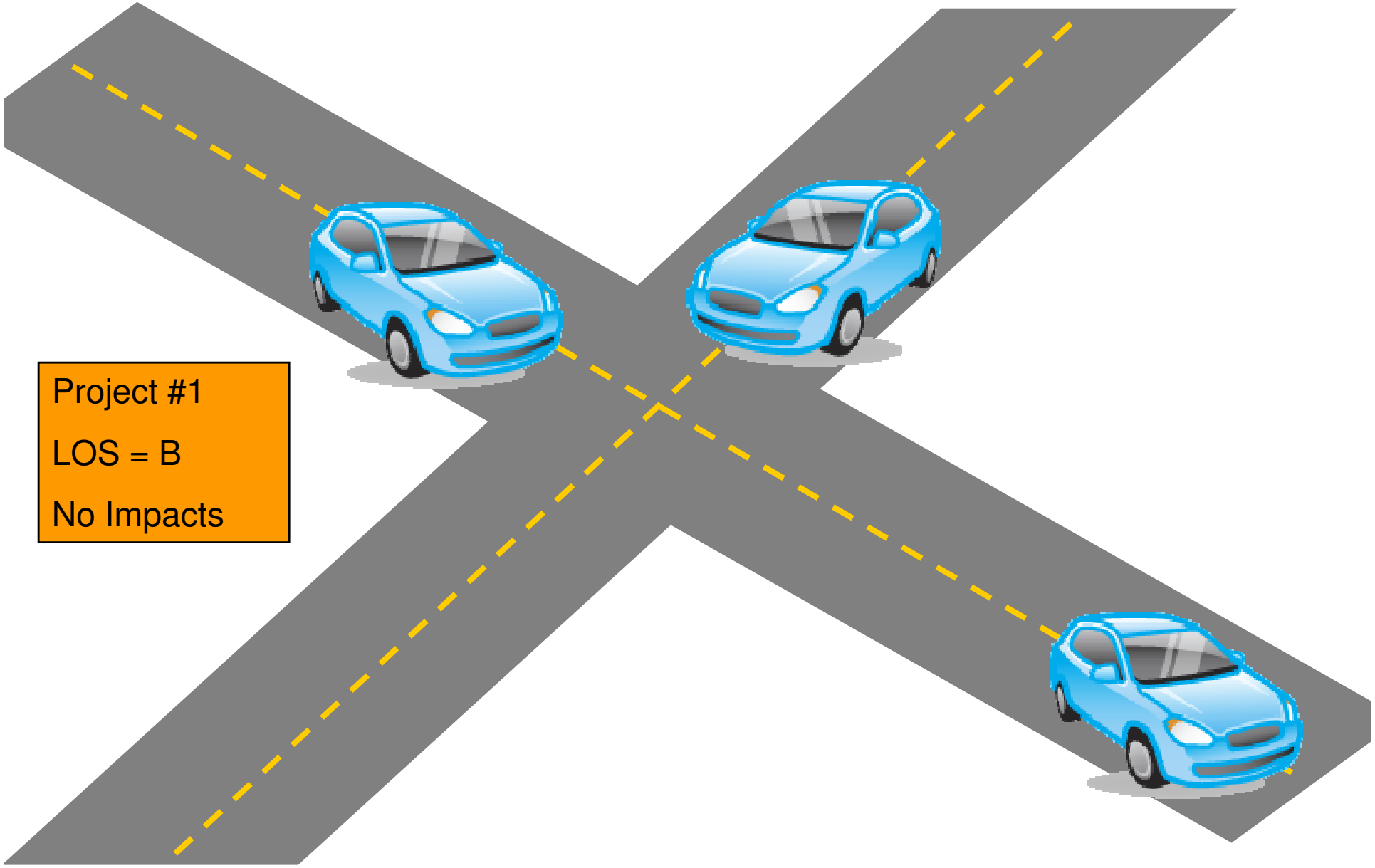
Providing a pedestrian crossing here would increase delays for right-turning drivers, potentially triggering significant LOS impacts...

Minimizing automobile delays takes precedence over minimizing pedestrian delays.

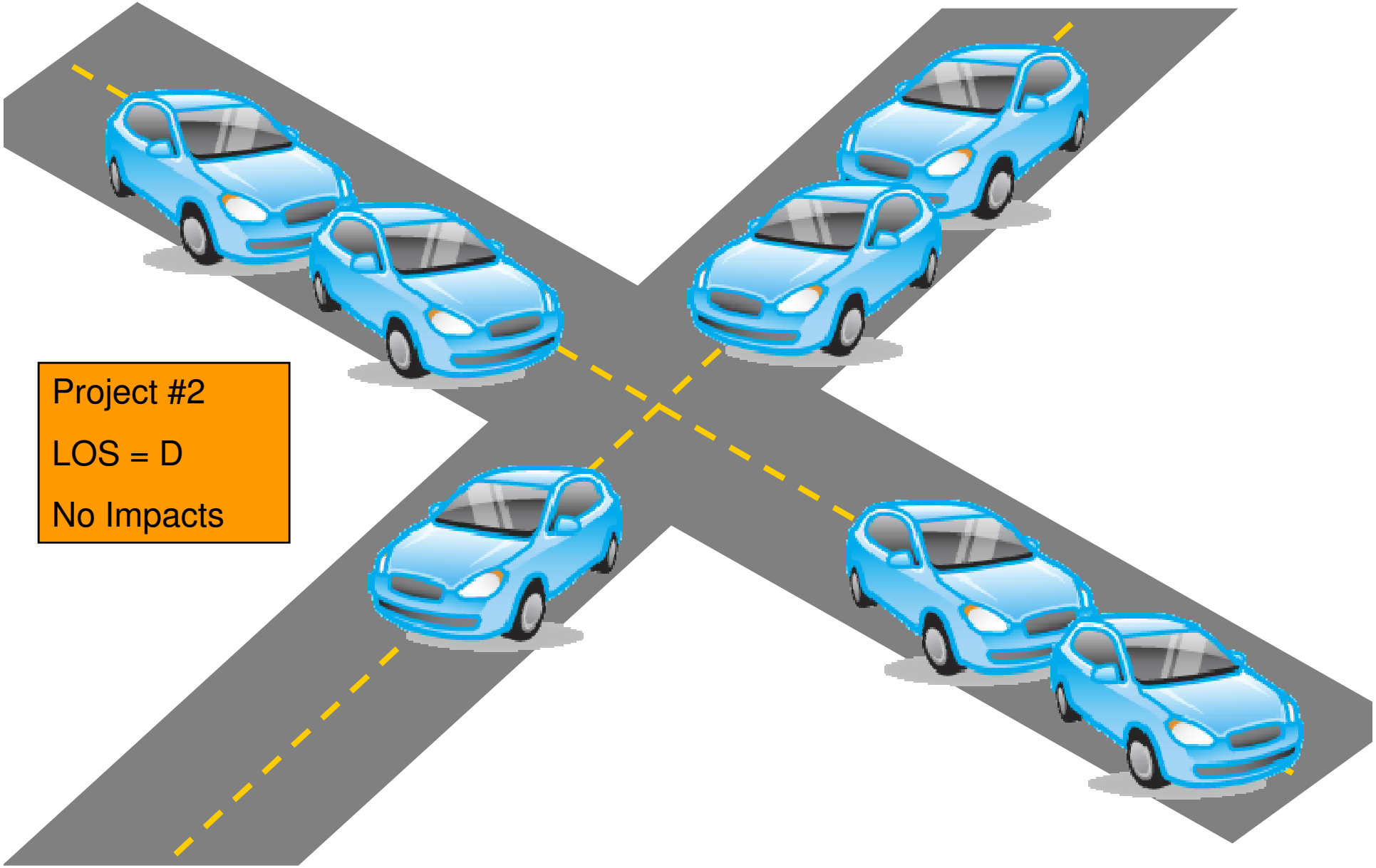
LOS results in inefficient CEQA review

- LOS analysis and impacts are:
  - Difficult for project sponsors to predict
  - Not transparent for project sponsors or the public
  - A burden to the “last project in” (last-in problem)

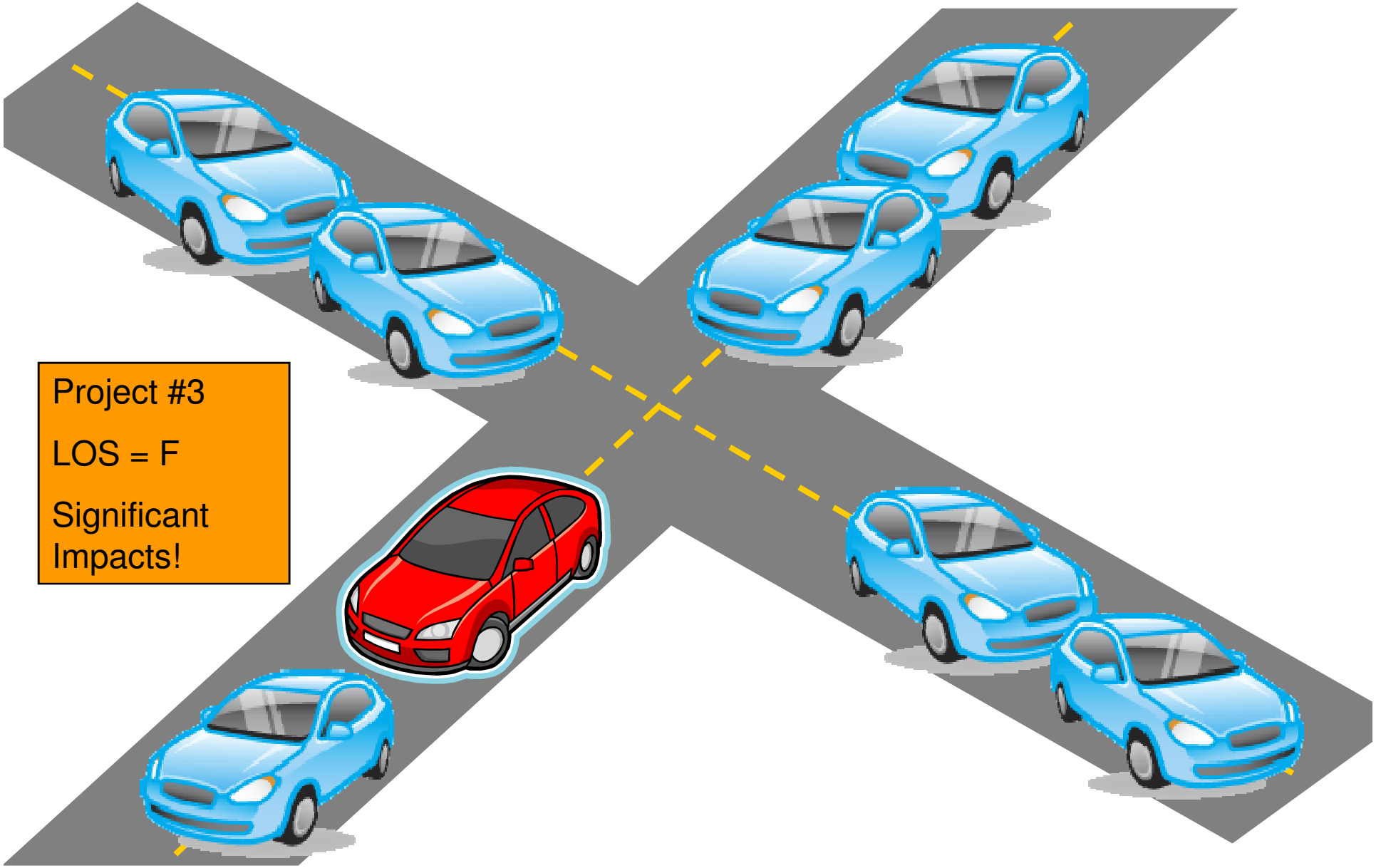
The “last-in” problem



The “last-in” problem



The “last-in” problem



The Problem

- Fortunately, CEQA grants local jurisdictions the authority to define impact measures and thresholds consistent with local policy…
- …Constrained by State CEQA Guidelines and past practice

Part II

The Solution

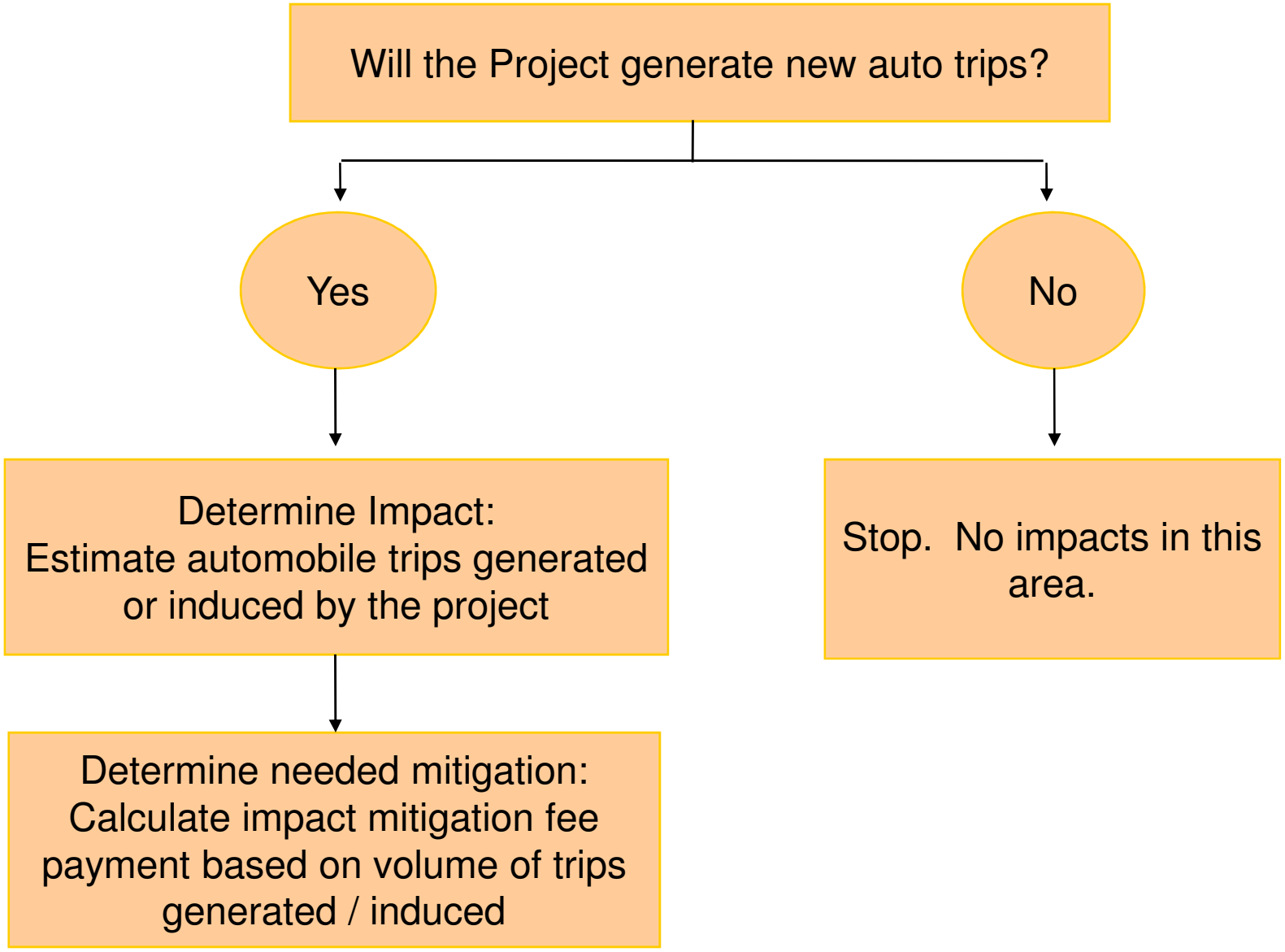
2-Part Recommendation

- Per-Auto Trip Generated (ATG) Impact Measure
  - Each automobile trip added by a project contributes to impact
  - Projects that do not generate net new automobile trips have no impact
- Transportation impact mitigation fee (TIMF) program
  - Project sponsors pay per-trip impact mitigation fee
  - Fee revenues fund actions that help reduce new automobile tripmaking (by improving transit, waling, and bicycling as choices)

TIMF Improves Mitigation

- Mitigate local and citywide impacts
  - Revenues contribute to citywide program of projects
  - Portion dedicated to local area improvements
  - Neighborhood involvement in determining local mitigation measures
- More equitable and accountable (for project sponsors and the public)
  - Eliminates last-in problem; each project contributes in proportion to impact levels
  - More transparent process for identifying and mitigating impacts
  - Clear nexus between fee collected and projects funded

Process for Applying ATG Measure



Part III

The Benefits

The Solution

- Environmentally protective
  - Consistent with CEQA
  - Captures incremental impacts
  - More closely related to actual environmental effects
  - More neighborhood involvement in determining mitigation measures
- Consistency with City policies and vision
  - Reduces time and cost to implement Transit First projects
  - More effective at discouraging auto-oriented projects
- Improved efficiency
  - More predictable for project sponsors
  - More transparent for the public
  - More accountability: mitigations linked directly to local and citywide improvements

Implementation Roadmap

- Authority Board approved final report in October 2008
- Conduct Nexus Study
- Authority to incorporate ATG into Congestion Management Agency (CMA) monitoring measures
- Planning Commission adoption of an ordinance approving the ATG measure and TIMF package
- Revisions to CEQA Guidelines?

Thank you!

Appendix B

Review of potential travel demand measures

Review of potential travel demand measures

Overview

Stage 2 of the project involved a review of the full range of potential travel measures that could be applied and consideration of their applicability to Greater Hobart, as well as a comprehensive review of case study cities. The potential measures were screened for applicability to the Greater Hobart region based on the issues and context developed in Stage 1 of the project. Among the factors used to screen the measures where the following:

- Reduction in greenhouse emissions
- Cost of implementation
- Ongoing cost of operation
- Access and social equity
- Public safety (particularly reduction in road accident frequency and severity)
- Improves public health (both through reduced air pollution and increased activity)
- Cost to end user
- Difficulty of implementation.

In addition, the degree to which a measure would impact the fundamental causes of automobile uses, such as land use and congestion, where also given strong consideration. Other factors such as the potential interrelationship among measures and the ability to phase or build upon other measures were also considered.

Travel demand management potential measures

The various travel demand management measures considered are listed below.

- Public transport improvements:
  - Increase service levels
  - Improved coordination
  - Comfort improvements
  - Improvements at stops and stations
  - Lower fares and more convenient fare payments
  - Improved security
  - Improved information - marketing and real-time information for passengers
  - Shuttle services – e.g. UTAS to CBD
  - Public transport priority
  - High quality vehicles / rolling stock
  - Integrated ticketing
  - Intelligent Transport Systems
  - Bus Rapid Transit / Light Rail Transit.

- Bicycle and public transport integration:
  - Bicycle parking at stations and stops
  - Improving bicycle access to public transport stations
  - Accommodation of bicycles on public transport modes
  - Public bicycle systems.
- Non-motorised improvements:
  - Initiatives that can improve walking and cycling conditions and encourage use of non-motorised modes
  - Improvement of walking and cycling infrastructure, e.g. bicycle lanes and end of trip facilities
  - Improving safety and conflict points
  - Pedestrian oriented design
  - Connectivity improvements
  - Street furniture rationalisation (utility poles, benches, garbage bins etc.)
  - Signage and way finding
  - Traffic management (e.g. shared zones)
  - Landscaping, footpaths
  - Street furniture (utility poles, benches, garbage cans, etc.)
  - Building fronts.
- Commute reduction strategies:
  - Carpooling / vanpooling initiatives
  - Financial incentives e.g. reduced employee parking payments, parking cash out and travel allowances
  - Flextime - alternative work schedules to spread the peak travel period
  - Workplace Travel Plans
  - Telework / telecommuting
  - Guaranteed ride home
  - Premium quality service options (workstations, complementary newspapers and drinks for vanpoolers
  - Car sharing.
- Taxi improvements:
  - Methods for improving taxi services
  - Increasing the number of taxis in an area
  - Increasing the quality of taxi vehicles
  - Improving support services

  - Driver skill and courtesy (customer service)
  - Reducing fares through regulation, competition, increased efficiency, incentives or subsidies
  - Allowing shared taxi trips (more than one passenger)
  - Providing taxi stands, curb access.
- Campus travel management
- Area traffic management / traffic calming
- Smart Growth
- New urbanism
- Location efficient development
- Transit oriented development
- Car free planning
- Least cost planning
- Shared parking
- TDM marketing programs
- Road pricing
- Distance based charging
- Commuter financial incentives
- Distance based vehicle insurance
- Fuel taxes
- Shared parking
- Regulation and pricing of parking facilities
- Flexible parking standards
- Parking maximums – establish maximum parking standards
- Remote parking
- Increased parking capacity of existing facilities
- Mobility management
- Improve user information and marketing
- Transportation Management Associations
- Overflow parking plans.

Case studies

Six case studies were identified in consultation with DIER with comparable population, land use patterns and natural landscape characteristics to Hobart. A very high level review of the case studies has been undertaken to highlight the travel demand measures implemented in these coastal cities with dispersed settlement patterns. Additional research is encouraged as

there has been limited opportunity to fully investigate the relationship between the measures and their applicability in Hobart due to the time constraints of the project.

In order to screen potential measures, case studies were reviewed with consideration given to the issues and conditions in other jurisdictions that match those of the Greater Hobart region.

The following table presents a summary comparison of the case study city characteristics, including population, geographical / topographical constraints, journey to work travel mode split data (where available), public transport patronage trends and relevant levels of government intervention.

Summary of issues and conditions in case study cities and Greater Hobart

City	Population	Journey to work	Public transport patronage trends	Government initiatives
Greater Hobart	197,639 (2006)	Car 81% PT 5.8% Walk 8.1% Other (Cycle) 5.2%	6.4 million public transport trips during 2007/2008. 1.8% increase since 2004/2005 0.3% decrease on previous year.	Development of Tasmanian Passenger Transport Strategy in progress.
Greater Auckland	1.3 million (2006)	Car 86% PT 7% M/C 1% Bike 1% Walk 4% Other 1%	54.4 million public transport trips during 2007/2008. Grew by 4.4% over all modes in the year to June 2008, with rail passenger numbers up 18.4%	Heavy investment in public transport infrastructure. Auckland Regional Growth Strategy. Regional Land Transport Strategy. Auckland Transport Plan. Auckland Passenger Transport Network Plan (2006-2016).
Greater Christchurch	414,000 (2006)	Car 83% PT 4% M/C 1% Bicycle 5% Walk 5% Other 2%	16.8 million public transport trips during 2007/2008. Increase of 5.6% from the 2006/2007 period. 90% increase between 1998 and 2006	Substantial investment in public transport services and infrastructure. Regional Land Transport Strategy. Canterbury Regional Travel Demand Management Strategy. Urban Development Strategy.
Greater Wellington	385,600 (2008)	Car 68% PT 17% M/C 1% Bicycle 2% Walk 11% Other 1%	34,693,534 passenger trips made during 2007/2008. An increase of 1.7% from the previous year.	Regional Land Transport Strategy Regional Passenger Transport Plan Regional Travel Demand Management Plan Bus only lanes Bus service improvements

Halifax Regional Municipality	372,679 (2006)	Car 78% PT 10% Walk 11% Bicycle 11%	18.5 million passengers during 2007/2008. Approximately 40 percent increase over the last six years. Rate of increase outpaces most comparably sized operations in Canada.	Transit priority and increased standards for commuter buses. Alternative fuels. Behaviour change programs: Employee financial incentives – public transport tickets. Pedestrian oriented design.
Greater Victoria	330,088, (2006)	Car 72% PT 10.2% Walk 10.4% Bicycle 5.7%	22.7 million trips during 2007/2008, including: Transit trips increased by 3% from the previous year. Handy DART patronage increased by 6% from the previous year. Since 1998, the annual patronage has increased by over 2.5 million trips	Land use planning: Greenways Plan to increase the number of active transport trips. Bus service improvements. Bus priority. Alternative fuels. Victoria Regional Rapid Transit Project
Saskatoon	245,910 (2008)	Car 86 % PT 3.7% Walk / Cycle 8.6%	Public transport patronage decline from 12.4 million passengers in 1987 to 7.2 million in 2005, despite population growth. In 2007, Saskatoon Transit experienced a 17.15% increase on the previous year. Access Transit provided 108,088 trips an increase of 7.2% on the previous year.	A re-orientation of the current regular service network to better serve the University of Saskatchewan and other key destinations. The introduction of higher-order [DART] service on four corridors interlined into two routes. A new bus terminal at Market Mall, and major improvements to the terminals downtown and at the University. Alternative fuels.

Travel demand measures identified from case studies

From the review of case studies a variety of potential TDM options were identified with the potential to be applied with success in Hobart. These are discussed further below.

Public transport improvements

All of the case study cities have experienced success in increasing public transport patronage through implementing improvements to bus services, networks and infrastructure.

Bus network redesigns

Christchurch, similar to Hobart, was lacking cross-city connections. Higher frequency bus services and new cross-suburban routes were introduced across Christchurch as Christchurch's radial bus routes were not meeting the changing travel needs that were resulting from the growth of new suburban centres. A substantial proportion of users have been diverted from cars. Auckland's bus network also underwent a redesign, into a simple core network with feeds as well as new cross-town services. This network redesign, in conjunction with frequency and length of service improvements contributed to a 3 percent patronage increase.

Reallocation of bus services

In Victoria, BC reallocated services from areas of low demand to those with higher demand. This has been identified as an issue in Hobart, with existing bus services needs focussed rather than targeting areas of high demand. These changes could be offset by community bus provision to areas of lower demand in a similar fashion to the community bus services implemented in areas of Victoria, BC.

Bus service improvements through improved frequency and temporal coverage

Temporal coverage in the evenings and weekends has been identified as a deficiency in Hobart's bus timetables. Bus services in Victoria were also enhanced on major routes in the evening, Sunday and public holiday services were also enhanced. Metro Transit in Halifax, Nova Scotia has undertaken a similar program of service improvements over the last four years, and have grown their service by more than 60 per cent with more upgrades planned for the future. Metro Transit increased Sunday services to meet the needs of Sunday shoppers and have also included completely new routes to service growing areas.

Saskatoon's Strategic Transport Study in 2005 identified many deficiencies. Public transport patronage had declined from 12.4 million passengers in 1987 to 7.2 million passengers in 2005, in contrast to the city's population growth. One of the major recommendations of the study was re-orientation of the current service network to better service the University of Saskatchewan and other key destinations. Prior to the review, there were areas of Saskatoon with limited or non-existent bus services. There are strong links between this program and the enhancements that Hobart's bus network is likely to require boosting public patronage.

Bus Rapid Transit

A theme found common to all the Canadian cities was the introduction of Bus Rapid Transit (BRT) projects along key transport. After the introduction of BRT along two corridors in Halifax, passenger counts showed that 1,795 passengers were using the service daily (this increased by a further 49% to 2,683 in 2006). BRT services were a fundamental contributing

factor to the increased patronage across Halifax, with patronage across the region increasing by 9% overall in comparison to the Canadian average of only 3.5%. BRT has also been successful in Victoria and Saskatoon.

Bicycle / Bus integration

Bicycle racks on buses have been well received during trials in Christchurch and have been installed on BRT services in Halifax, Victoria and Saskatoon. The program is being considered for expansion in Christchurch.

Bus interchanges

Hobart's public transport interchanges are traditionally poorly integrated with suburban centres, and Hobart's bus mall is reaching capacity. There are significant opportunities for redevelopment of public transport exchanges in Hobart in a similar fashion to the highly successful Christchurch Bus Xchange. A city centre retail redevelopment in the Christchurch CBD provided an opportunity for development of an off-street bus interchange integrated with a shopping centre.

Travel plans

Greater Wellington has developed and implemented a travel plan programme to encourage the uptake of business, school, community and individual travel plans, and associated travel behaviour change initiatives such as ridesharing, telecommuting, flexible work hours, walking school buses, etc. Organisations with travel plans in place include Victoria University of Wellington, Capital and Coast District Health Board, Shell, Hutt City, Ministry for the Environment, Inland Revenue. Successful initiatives that have been trialled through the travel plan programme include:

- A van between offices for the Inland Revenue Department, which had patronage of 13,000 in 2005/2006 and a 140% rise in patronage in its third year of operation.
- A free bus pass, giving employees access to free bus travel for one month. At the end of the trial 81% involved said that they were likely to use the bus more in the future, with 83% if these affirmative respondents saying they would do it more than twice a week.

One third of car parking spaces in Hobart are dedicated to employee parking. Of these 60% are for use of Government employees. This presents a real opportunity for Government to lead by example. Green travel plans and other related initiatives such as ride sharing schemes could be introduced through work place travel plans.

Commuter financial incentives – discounted public transport passes

A successful commuter financial incentive program similar to the TRAX program in Halifax could be applied in Hobart. This program was responsible for negotiating discounted public transport passes for large employers causing a shift of employees out of single occupancy vehicles and into buses. The number of employers who expressed interest in this initiative in Halifax exceeds the program's capacity.

Walking and cycling improvements

Halifax Regional Municipality has developed an Active Transportation Plan with objectives to:

- Better integrate on and off road network facilities.
- Connect to pedestrian, trail and cycling facilities in other municipalities.

- Serve a broad range of users and interests.
- Link residents and visitors to desirable or important destinations and attractions.
- Provide connections to public transport.

The Halifax Regional Municipality also implemented a liveability policy for the downtown area. Part of this plan was to increase the number of sidewalk cafes that had outdoor seating on the sidewalk. This led to fewer parking spaces with the benefit of encouraging more pedestrian traffic that was able to walk through the area easily and parking revenue was off-set by a charge to the business for each space removed.

Likewise, Victoria City Council is currently developing the initial draft copy of the Downtown Plan, which is scheduled for completion in early 2009. The Downtown Plan also aims to increase the walkability of the downtown area through the extension of car free pedestrian zones and a mid-block crossing network that makes walking easier and more convenient. A short-term parking only parking strategy will continue to be supported to further encourage more walking. Similar programs could be implemented in Hobart to encourage walking and cycling as there is currently an ad-hoc approach to walking and cycling policy, facilities and standards across Greater Hobart.

Parking Management

Free and ample parking encourages car dependence and fosters dispersed land use patterns. Parking management strategies can assist in making existing parking facilities more efficient and improving the service quality offered to users of parking facilities. When parking is free, there is little inducement for people to reduce their car use or to switch to more sustainable modes of transport. Increasing the cost of parking can reduce the attractiveness of driving and parking in a particular location. Parking is free in every council area cross Greater Hobart, with the exception of the Hobart CBD.

Hobart could benefit from a Regional Parking Strategy, such as the draft strategy in development in Auckland, which would give consideration to:

- Linking district plan parking standards to public transport accessibility
- Giving priority to short stay parking
- Supporting land use intensification
- Reducing parking provision in high density residential development
- Controlling public long stay/commuter parking provision in parking buildings and lots
- Providing regional guidance on parking on arterials
- Preparing comprehensive parking management plans for centres
- Preparing a regional plan for implementation of park and ride facilities
- Subdivision codes and traffic engineering codes and parking requirements are often in conflict with good urban design and TOD-type development.