

City of Bunbury

Local Planning Strategy- Integrated Transport Study

- Final Draft
24th July 2012



City of Bunbury

Local Planning Strategy- Integrated Transport Study

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- 24 July 2012

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Executive summary

The City of Bunbury has commissioned SKM to prepare an integrated transport study (ITS) as part of its local planning strategy (LPS). The LPS-ITS looks at how people in Bunbury travel at present, sets targets for the future and outlines intentions to improve accessibility for future, as well as present generations.

Principles and Strategic Directions

Bunbury's transport, like that of other cities, is complex. It impacts on its citizens, businesses and visitors to the city in a variety of different ways. Different groups in society have legitimately different views that need to be considered, discussed and understood as part of the development of an integrated transport strategy.

The principles /directions outlined here go some way to placing transport planning in the context of broader city planning. The principles also acknowledge that there are legitimately different transport needs and objectives, some of them conflicting, which need to be addressed.

Transport supports broader city planning

Plan the transport system in an integrated manner to support the broader regional and local planning strategies and schemes.

Sustainable transport system

Plan and develop a sustainable transport system that is robust enough, through adaptation, to meet the needs of present and future generations.

Balance regional and local needs

Study current travel patterns (within constraints of available data) and network deficiencies and plan to improve accessibility through network improvements that maximise travel options.

Understand complex travel needs

Study current travel patterns (within constraints of available data) and network deficiencies and plan to improve accessibility through network improvements that maximise travel options.

Constraints imposed by current infrastructure

Be aware of the constraints that the existing city and transport networks impose and be prepared to plan network improvements systematically in collaboration with the community.

Road / Street planning and design

Plan a network of well connected streets and roads in an integrated way taking account of function and demand for travel, but use quite different design philosophies and speed profiles for different street types.



Freight planning

Plan for a network of road and rail freight routes to meet the future needs of the Bunbury Port and to support the economic growth and development of the South West region in a way that will limit the impact on residents and other non-freight road users.

Public transport

- a) Design a simple public transport system with fewer rather than more routes to maximise frequency and improve legibility;*
- b) Provide priority for public transport vehicles where necessary, to maintain timely running and reliability;*
- c) Integrate quality public transport stops into the street network and provide safe, convenient access to transit stops by passengers;*
- d) Integrate public transport with other modes – bicycle parking and park and ride; and*
- e) Integrate public transport with appropriate residential density and mix of land uses.*

Cycling

- a) Develop a connected network of dedicated safe cycling routes, where cyclists are not required to share space with other vehicles or pedestrians;*
- b) Only use kerbside lanes adjacent to traffic on low speed, low volume streets – otherwise use segregated paths and bicycle lanes that are physically separated from traffic;*
- c) Use dual use or shared paths and kerbside lanes on low speed local streets as part of a secondary bicycle network to improve access;*
- d) Provide comprehensive bicycle direction signing for Bunbury and prepare easy to understand bicycle network maps.*

Walking

- a) Safe, comfortable, convenient walking routes should be a primary consideration in all transport planning and transport impact assessment on development;*
- b) A footpath is required on at least one side of all local streets and on both sides of all other streets;*
- c) A comprehensive system of safe, convenient road crossing areas is necessary to link and connect the footpath network;*
- d) A comprehensive education program and a rigorous enforcement program aimed at motorists who park on footpaths or illegally near pedestrian crossings will result in a safer system that is better used;*
- e) A range of TravelSmart, behaviour change programs for schools, business, shopping centres, sporting and other venues can encourage more walking;*



- f) Develop wayfinding (directional and information) signage along key routes in the Bunbury city centre;*
- g) Provide an appropriate range of land uses, including mixed use, along walking routes to enhance pedestrian interest and convenience; and*
- h) Provide urban design of residential, commercial, mixed use and civic buildings and open spaces that supports pedestrian movement by incorporating consideration of pedestrian comfort, safety and security.*

Parking and Traffic Management

- a) Undertake place based planning for centres with short and long term travel mode share targets;*
- b) Provide the level of parking at centres and developments that is required to meet the planned demand for car travel;*
- c) Provide the level of bicycle parking that is required to meet the planned bicycle mode share of travel;*
- d) Supplement city centre parking with park and ride at key points along the public transport system and manage city centre parking (supply and price) to encourage use of park and ride and reduce city centre traffic.*

Transport system role

Transport is a means to an end rather than an end in itself. As such it must be planned and designed to contribute positively to the desired transport vision for the city in a manner that is integrated with that of its region. The role of the Bunbury transport system is to provide a high level of accessibility for all to jobs, education, shops, entertainment and other activities as the city grows. It is intended the future transport system will:

- Provide a high level of connectivity in the network
- Offer travel choice for a variety of travel purposes
- Support sustainable growth opportunities through integration with land use planning
- Be an economic enabler
- Develop an efficient freight network to serve the port and the broader region
- Meet the lifestyle needs of the community by limiting segregation and integrating communities
- Be affordable and equitable for all social and age groups within the community
- Meet expectations for regional transport whilst minimising impacts on local communities
- Be environmentally responsible
- Be adaptable and sustainable



Mode share targets for the City of Bunbury

Mode of Travel (All trip purposes)	Estimated	Target	
	2011	2031	2051
Car Driver	70%	62%	54%
Car Passenger	16.5%	16%	15%
Public Transport	1.5%	4.5%	7.5%
Walk	8%	10%	12.5%
Cycle	2%	5.0%	8%
Other	2%	2.5%	3%

Transport for the city centre growth strategy

LPS-ITS intentions:

- Facilitate a potential doubling of jobs, retail and other activities within the city centre without excessive levels of traffic and congestion, which would detract from the enjoyment of the city centre by residents, visitors and business people.

Key strategies:

- Development of a number of quality public transport routes with priority for transit vehicles and high frequency services;
- Development of a network of dedicated cycle paths, cycle lanes and safe cycling routes that provide continuous, efficient, safe cycle connections from the suburbs to the city centre;
- Making walking on all city centre streets safe, convenient and attractive through employment of structural and non-structural measures (eg. Lower speed limits, street modifications, landscaping etc);
- Monitor, revise and implement, as appropriate, the adopted city centre parking strategy to manage car access and encourage a progressive switch over time from car driving to other more sustainable modes.

Freight planning

LPS-ITS intentions:

- Support the development of strategic road and rail freight routes to serve the Port of Bunbury and to support the economic growth and development of Bunbury and the entire South West region.

Key strategies:

- Support the early construction of the Bunbury Outer Ring Road and work with Main Roads to minimise segregation to adjacent communities by maximising opportunities to create safe, convenient crossings for pedestrians, cyclists and, in some cases, local roads;



- Continue to work with the Bunbury Port, WAPC and other agencies on staging and development of road and rail infrastructure as proposed in the inner harbour structure plan with a view to maintaining connectivity for local movement by motorists, pedestrians and cyclists.

Public transport

LPS-ITS intentions:

- Increase the mode share of public transport in the City of Bunbury from about 1.5 per cent in 2011 to 4.5 per cent by 2031 and 7.5 per cent by 2051;
- Support long term planning for a high speed rail connection linking Perth with Bunbury.

Key strategies:

- Introduce a high frequency bus rapid transit (BRT) system linking Dalyellup and Australind through the city centre with Park and Ride stations in South Bunbury and near Eaton within the next 3 to 5 years;
- Introduce a high to medium frequency circle route bus system to supplement the BRT route described above before 2020;
- Assist State Government agencies to master plan and reserve land for a high speed rail connection from Perth to Bunbury with a station close to the Bunbury City Centre and a potential station / interchange at Millbridge.

Cycling

LPS-ITS intentions:

- Make cycling in Bunbury a safe and highly valued form of transport;
- Increase the mode share of cycling in the City of Bunbury from about 2 per cent at present to 5 per cent by 2031 and to 8 per cent in the longer term around 2050.

Key strategies:

- Plan, design and construct a connected comprehensive network of bicycle routes (ie the Bunbury Principal Bicycle Network) based on the five principles of coherence, directness, attractiveness, safety and comfort;
- Develop and implement a comprehensive city wide wayfinding and signage system;
- Use shared use paths and a “local” bicycle network system for access to schools, small centres and to connect as feeders to the principal bicycle network;
- Modify the local street environment, where possible, to cater for safe bicycle usage;
- Provide parking for bicycles and other end of trips facilities;
- Develop a bicycle access plan for the Bunbury city centre;
- Promote cycling as a safe and healthy means of transport.



Walking

LPS-ITS intentions:

- Increase the mode share of walking in Bunbury from 8 per cent in 2011 to more than 10 per cent by 2031 and more than 12.5 per cent by 2051.

Key strategies:

- Upgrade the path network and provide safe, convenient street crossings;
- Transform the Bunbury central area into a high quality, safe pedestrian precinct;
- Introduce safe walk to schools programs;
- Promote and facilitate community based and workplace walking groups in support of the Heart Foundation Walking programme; and
- Maintain and keep paths free of obstructions such as tree branches and parked cars.

City centre parking

LPS-ITS intentions:

- Provide an adequate level of parking to meet demand for car travel to the city centre that is consistent with improvements to other modes of transport – walking, cycling and public transport.

Key strategies:

- Review the price charged for public parking on an annual basis with a view to modifying demand and maintaining car park occupancies below 85 per cent;
- Implement a reduced minimum level of private parking for developments in the Bunbury central area in association with a cash-in-lieu payment to be used for improvement to public transport (including park and ride) walking and cycling improvements and provision of public car parking, when required.

Streets for living, business and movement

(a) Local Streets

LPS-ITS intentions:

- Newly constructed or re-constructed local streets be designed for low speed traffic, for the safe use of residents and visitors, including children, people with disabilities and the elderly.

Key strategies:

- Undertake modified local street design where appropriate, in accordance with a 30kph design speed, for implementation as part of a systematic program of street upgrades associated with the need for road pavement re-construction or re-surfacing.
- Develop a palette of options for local streets designed to keep traffic speeds low including:
 - narrow road pavements;



- creative use of landscaping to reduced forward vision;
- creative design for on-street parking;
- Consult with residents on design options for their street.

(b) Neighbourhood connectors and distributor roads

LPS-ITS intentions:

- Design neighbourhood connector and distributor streets to provide options for local and district travel at speeds between 30 kph and 50 kph according to function and adjacent land uses.

Key strategies:

- Ensure the connector and distributor system is well connected to avoid bottlenecks and an over concentration of too much traffic on too few routes;
- Use context sensitive planning and design to modify the design and speed environment to take account of adjacent land uses, schools, activity centres and the like.

Sustainable mobility management approach

LPS-ITS Intentions:

The intention of the sustainable mobility management approach is to provide a coordinated, integrated and sustainable high level strategic approach to the delivery of transport improvements for the City of Bunbury in both the short term and the long term. In particular it is the intention of the ITS to plan the transport system in a integrated manner to support the City's vision and objectives for city planning.

Key Strategies:

- Improve overall accessibility for travel to work, education, shops and other activities;
- Reduce car dependency by improving options for travel by other modes;
- Improve transport and land use planning integration through development of transport improvement plans for different precincts and regions (eg: city centre and activity centres);
- Integrate demand management and behaviour charge programmes with improvements to public transport cycling and walking;
- Design streets, according to function, to appropriate (low) design speeds to maximise safety and amenity and to encourage cycling and walking.



1. Introduction

The City of Bunbury is preparing a Local Planning Strategy (LPS), which will provide strategic guidance for development of a new city planning scheme. The city has identified transport as one of a number of key factors to be considered in the preparation of the LPS.

SKM has been commissioned by the City of Bunbury to prepare an integrated transport study (ITS). It is intended that this study provide the basis for development of an integrated transport strategy for the city.

The ITS looks at how people in Bunbury travel at present and sets targets and outlines intentions to improve accessibility for future, as well as present, generations.

There are many aspects to transport that affect the quality of life of the entire Bunbury community and visitors to the city. The integrated transport study is designed to support multiple environmental, economic and social objectives in a sustainable manner.

An integrated strategy is required to bring together the many different components of transport and land use planning. It is entirely relevant that transport planning be considered as a part of the broader planning for the city. In that respect, this study supports integration between transport and land use planning, as well as integration between different transport modes. A major integrating theme is to improve accessibility and the effectiveness of the transport system by creating more options for travel and to reduce the current high levels of car dependence.

This report is comprised of the following chapters:

- Integrated transport planning principles and strategic directions
- Transport Visioning role and mode share targets
- Transport for the city centre growth strategy
- Port and industry freight network planning
- Public Transport
- Cycling
- Walking
- Parking in the city centre
- Streets for living, business and movement
- Bringing it all together- a sustainable mobility management approach



2. Integrated transport planning principles and strategic directions

There are a number of important transport planning principles and strategic directions that have been developed to help guide the preparation of an integrated transport strategy for the City of Bunbury. These principles are based on inclusiveness, openness, the sharing of knowledge and collaboration.

Bunbury's transport, like that of other cities, is complex. It impacts on its citizens, businesses and visitors to the city in a variety of different ways. Different groups in society have legitimately different views that need to be considered, discussed and understood as part of the development of an integrated transport strategy.

The principles /directions outlined here go some way to placing transport planning in the context of broader city planning. The principles also acknowledge that there are legitimately different transport needs and objectives, some of them conflicting, which need to be addressed.

A workshop was convened in December 2011 involving City of Bunbury staff, Department of Planning staff and consultants assisting the Local Planning Strategy and Integrated Transport Planning for the city. One important focus of this workshop was to discuss and better understand high level transport planning directions and integrated transport planning principles in the context of the city's Local Planning Strategy.

The integrated transport planning principles and strategic directions listed below were developed following the workshop.

2.1. Support state and local planning policy framework

Transport is a means to an end rather than an end in itself. An important principle of transport planning is that the transport system supports the vision and objectives of city planning.

TPP1. (Transport Planning Principle 1)

Plan the transport system in an integrated manner to support the broader regional and local planning strategies and schemes.¹

¹ Western Australian Planning Commission's (WAPC) Greater Bunbury Strategy, Greater Bunbury Structure Plan and Greater Bunbury Region Scheme and the City of Bunbury's Local Planning Strategy and Local Planning Scheme.



2.2. A sustainable transport system

Sustainable urban transport planning must meet the needs of the future as well as the present across a broad range of social, economic and environmental needs that impact on the community.

The Western Australian Department of Planning in its recently published Integrated Transport Guidelines (2012) has introduced the following definition of a sustainable transport system.

“A sustainable transport system² is one which:

- *Firstly, allows the basic access and development needs of individuals, companies and societies to be met safely and in a manner consistent with human and ecosystem health, and promotes equality within and between successive generations;*
- *Secondly, is affordable, operates fairly and efficiently, offers a choice of transport mode, and supports a competitive economy, as well as balanced regional development;*
- *And finally, limits emissions and waste within the planet’s ability to absorb them, uses renewable resources at or below their rates of generation, and uses non-renewable resources at or below the rates of development of renewable substitutes, while minimizing the impact on the use of land and the generation of noise”*

TPP2.

Plan and develop a sustainable transport system that is robust enough, through adaptation, to meet the needs of present and future generations.

2.3. Balance regional and local needs

Transport planning needs to take account of the collective needs a city has for the movement of people and freight. However major transport infrastructure can impact on liveability and on the environment in a way that disadvantages certain communities. It is often difficult to rationalise these competing objectives but they cannot be ignored and must be addressed through a consultative and collaborative process.

TPP3.

Plan the city’s transport system to meet the people and freight movement needs of the future in a way that minimises impacts on communities, activity centres and the environment.

² This definition was first developed by the Centre for Sustainable Transport, Canada (now located at the University of Winnipeg). It has been adapted in slightly different forms by many authorities around the world.



2.4. Understand current transport patterns and the potential for change

Current transport patterns in most cities are poorly understood, partly because of inadequate data and partly because complex networks and different modes can provide many options for travel. Ironically, it is systems with too few options that create bottlenecks and congestion.

TPP4.

Study current travel patterns (within constraints of available data) and network deficiencies and plan to improve accessibility through network improvements that maximise travel options.

2.5. Constraints to the pace of change

Much of the transport infrastructure that will be used to transport people and goods in Bunbury in 2030 and 2050 already exists. The existing networks will not always conform to best practice transport planning, but communities have developed around these networks and major changes are likely to be costly, time consuming to implement and, in some cases, inappropriate.

TPP5.

Be aware of the constraints that the existing city and transport networks impose and be prepared to plan network improvements systematically in collaboration with the community.

2.6. Road / street planning and design

In the future, Bunbury will require many different types of roads and streets from heavy freight routes to local streets for living and there will be some streets such as activity centre streets that will need to perform multiple functions. These different street types require a quite different approach to design. All will require appropriate attention to the safety of users, but this will be achieved in different ways. As a general rule, each component of the network should be well connected but designed for different traffic speeds, road capacity and amenity.

TPP6.

Plan a network of well connected streets and roads in an integrated way taking account of function and demand for travel, but use quite different design philosophies and speed profiles for different street types.

2.7. Freight planning

Bunbury is a port city and the export and import of goods through the Port will continue to grow. To enable the Bunbury Port Authority (BPA) to meet the growing needs of the South West region, both rail and roads serving the Port will need to be improved and protected with connections to the external regional road and rail network.



In applying this principle, proper consideration must be given to also protecting the freight routes by taking a whole of ‘transport corridor’ planning approach. As this is critical to ensuring that the development of contiguous land uses (and the associated urban design of the built environment) is compatible with desired road function and performance. Application of this principle in conjunction with that of the “road / street planning design” principle above is critical to the genuine integration of transport and land use planning.

TPP7.

Plan for a network of road and rail freight routes to meet the future needs of the Bunbury Port and support the economic growth and development of the South West region in a way that will limit the impact on residents and other non-freight road users.

2.8. Public transport

There is currently a very low level of use of public transport in Bunbury. It is imperative that the use of public transport improves over time to reduce dependence on cars. The following principles of public transport system planning are proposed to achieve this.

Important to the creation of a viable and efficient public transport system is the influence of the interrelated factors of population size and urban density. To this end the City of Bunbury has sought to increase residential densities in and around activity centres and along activity corridors,³ which are the destinations and routes of a logical public transport system. This has been achieved by designating higher residential density codes in a concentric pattern of walkable ped sheds around activity centres and along mixed use corridors - with lower densities across the balance of neighbourhood areas. By setting out a structured pattern of residential densities that frame the hierarchy of activity centres, land use planning mutually reinforces the role of activity centres as the focus of more connected and accessible neighbourhoods with places of employment, recreation, etc. This complementary approach is an example of how the integration of land use planning with transport planning solutions can satisfy a number of the mutually supporting principles set out in the LPS-ITS.

TPP8 - Public transport

- e) Design a simple public transport system with fewer rather than more routes to maximise frequency and improve legibility;*
- f) Provide priority for public transport vehicles where necessary, to maintain timely running and reliability;*

3 Scheme amendment number 38 to the City of Bunbury Town Planning Scheme No. 7 (also referred to as the R-Code Omnibus Amendment) gazetted on 6 December 2011. This amendment implemented the relevant recommendations of the Local Planning Strategy for Activity Centres & Neighbourhoods adopted on 22 March 2011.



- g) *Integrate quality public transport stops into the street network and provide safe, convenient access to transit stops by passengers;*
- h) *Integrate public transport with other modes – bicycle parking and park and ride; and*
- i) *Integrate public transport with appropriate residential density and mix of land uses.*

2.9. Cycling

Bunbury is a relatively small city with a reasonably flat terrain and fairly short overall travel distances that should be well suited for cycling, yet cycling as a transport mode is low. As is the case with public transport, there is considerable potential to increase cycling in Bunbury. The following principles / directions are proposed for bicycle planning in Bunbury:

TPP9 - Cycling

- j) *Develop a connected network of dedicated safe cycling routes, where cyclists are not required to share space with other vehicles or pedestrians;*
- k) *Only use kerbside lanes adjacent to traffic on low speed, low volume streets – otherwise use segregated paths and bicycle lanes that are physically separated from traffic;*
- l) *Use dual use or shared paths and kerbside lanes on low speed local streets as part of a secondary bicycle network to improve access;*
- m) *Provide comprehensive bicycle direction signing for Bunbury and prepare easy to understand bicycle network maps.*

2.10. Walking

Walking is the most sustainable of all transport modes, but it has become significantly underutilised as a means of transport over the last 30 to 40 years, as use of cars has increased. There is potential to reverse this trend as part of an integrated approach to transport and land use planning. The following principles / directions should be applied to planning for walking.

This principle works in sympathy with that of the “public transport” principle above, in that the revised pattern of residential density codings across the city has created the potential for walkable medium to high density ‘urban villages’¹ around activity centres and pedestrian oriented ‘main streets’ along activity corridors.

TPP10 - Walking

- a) *Safe, comfortable, convenient walking routes should be a primary consideration in all transport planning and transport impact assessment on development;*
- b) *A footpath is required on at least one side of all local streets and on both sides of all other streets;*



- c) *A comprehensive system of safe, convenient road crossing areas is necessary to link and connect the footpath network;*
- d) *A comprehensive education program and a rigorous enforcement program aimed at motorists who park on footpaths or illegally near pedestrian crossings will result in a safer system that is better used;*
- e) *A range of TravelSmart, behaviour change programs for schools, business, shopping centres, sporting and other venues can encourage more walking;*
- f) *Develop wayfinding (directional and information) signage along key routes in the Bunbury city centre;*
- g) *Provide an appropriate range of land uses, including mixed use, along walking routes to enhance pedestrian interest and convenience; and*
- h) *Provide urban design of residential, commercial, mixed use and civic buildings and open spaces that supports pedestrian movement by incorporating consideration of pedestrian comfort, safety and security.*

2.11. Integrated parking and transport management

There is a significant body of research available that shows there is a nexus between the amount of parking provided and the amount of travel by car. If the intention is to limit the growth of car travel and to encourage walking, cycling and public transport in town centres and other activity centres, then it follows that an integrated parking and transport management scheme be introduced.

TPP11 - Parking and transport management

- a) *Undertake place based planning for centres with short and long term travel mode share targets;*
- b) *Provide the level of parking at centres and developments that is required to meet the planned demand for car travel;*
- c) *Provide the level of bicycle parking that is required to meet the planned bicycle mode share of travel;*
- d) *Supplement city centre parking with park and ride at key points along the public transport system and manage city centre parking (supply and price) to encourage use of park and ride and reduce city centre traffic.*



3. Transport visioning, role and mode share targets

3.1. Transport visioning context

The following visioning context and overview of the city vision strategy has been provided by the City of Bunbury to provide context for the Local Planning Strategy – Integrated Transport Study.

3.1.1. Bunbury transport vision 2030 transport strategy

The Bunbury Transport Vision 2030 Transport Strategy (June 2002)⁴ was intended as a 30 year strategy for guiding transport development across the City of Bunbury, with a particular focus on the Bunbury city centre. Since the Strategy's adoption a number of projects have been completed or are scheduled by either Main Roads Western Australia (MRWA), the Public Transport Authority of Western Australia (PTA), or by the City of Bunbury. The most significant projects completed to date have included:

- *planning for a railway station situated in the Marlston Waterfront precinct, located on the north side of Koombana Drive west of the Plug, to service the future Bunbury to Perth fast train;⁵*
- *planned realignment of Washington Avenue to Somerville Drive to create a four way light controlled intersection with Bussell Highway;*
- *planned realignment of the South West Highway through Picton;*
- *realignment of Britain Road to Roberson Drive and South Western Highway to create a four way light controlled intersection;*
- *upgrading of Old Coast Road to a dual carriageway;*
- *upgrading of Ocean Drive;*
- *signalisation of Stuart Street and Blair Street intersection, with cross-over to Home Maker Centre (Lot 107 DP: 47979), which connects through to Mervyn Street;*
- *duplication of Stuart Street to make it a single lane dual carriageway connecting Spencer Street through to Blair Street;*
- *duplication of Picton Road to make it a double lane dual carriageway connecting to South Western Highway;*
- *signalisation and carriageway duplication of Eelup Rotary;*

⁴ Prepared by Gutteridge Haskins & Davey Pty Ltd (GHD) on behalf of the City of Bunbury.
⁵ Bunbury Waterfront Project (Stage 1).



- *connection and upgrading of Parade Road through to the boundary with Dalyellup (Shire of Capel);*
- *expansion of pedestrian footpath network;*
- *in relation to the Bunbury city centre;*
 - *a roundabout at Stirling Street and Victoria Street,*
 - *signalisation of Haley Street and Blair Street T intersection,*
 - *upgrading of Cobble Stone Drive,*
 - *installation of on-street parking metres and associated long term car park development and upgrades,*
 - *taxi bay enhancements.*

Proposals that have not yet come about and/or may not be feasible at this time include:

- *reopening of Strickland Street at the Blair Street intersection;*
- *extending Wisbey Street through to Blair Street and Mangles Street, or alternatively, the connection of Frankel Street through to Goldsmith Street with a new roundabout also connecting up Blair Street and Spencer Street;*
- *in relation to the Bunbury city centre;*
 - *making Victoria Street one-way between Symmons Street and Stirling Street for greater pedestrianisation and parking,*
 - *making Stirling Street one-way between Blair Street and Spencer Street,*
 - *changing Blair Street to single lane dual carriageway with on-street parking from Koombana Drive down to Hayes Street,*
 - *additional local access road connecting Symmons Street down to Stirling Street bisecting the Stirling Centre and Centrepont Shopping Centre,*
 - *aligning Haley Street and Prinsep Street (although feasibility assessment in progress),*
 - *connecting Hays Street to Spencer Street with a four way light controlled intersection (of which only the T junction traffic lights have been constructed),*
 - *free transit zone within the Bunbury city centre on a bus service connecting public car parks located in and around the Bunbury city centre,⁶ and*
 - *multilevel car parking in the vicinity of the Bunbury Regional Entertainment Centre (BREC) and in vicinity of the Bunbury Regional Art Gallery.*

As such, the Strategy has been successful in instigating a number of street enhancement and upgrading projects since its adoption. Nevertheless, over time the Strategy is losing its relevance

⁶ For example, the Perth's Central Area Transit (CAT) bus service.



*as it comes to the end of its useful life and no longer adequately provides the necessary guidance for decision making at either the strategic or operational levels. With the relatively easy actions now implemented - the limitations of the Strategy are now consequently manifesting since the beginning of the millennium, with a lack of guidance due in part to a range of interrelated factors operating at national, regional and local levels such as:*⁷

- *Contemporary thinking around what constitutes best practice transport planning has evolved over the past decade, with a growing acceptance of the need to review the methodologies and processes used in addressing transport needs / demands from a 'build it' solution mindset to more of a 'manage it' solution approach.*⁸
- *Acknowledgment of trends in changing land use pattern to become increasingly more complex with both urban consolidation through greater population density within medium and high density infill residential development and an associated shift away from distinctly differentiated zoning separating residential and non-residential uses to a more mixed use urban environment. Whilst increasing population density underpins greater viability of public transport services through a proportional increase in patronage, this factor also contributes to the increased cost of capital works projects in that the retrofitting of transport infrastructure often occurs with confined spaces of exiting networks in established urban areas.*
- *Increasing societal expectations regarding the level of servicing (e.g. universal access principles), and in particular, the segmentation of the community into stakeholders with distinct interest group needs and desires (e.g. increasing number of bike users).*
- *peri-urbanisation through rapid population growth and associated expansion of the urban fringe for both residential and employment purposes over the last decade during economic boom periods placing additional excess stress upon existing transport systems due to the unsustainable nature of current models and processes for infrastructure funding and provision.*
- *Taking account of economic cycles and correlating fluctuations in rates of population and employment growth, there is a general acceptance of the fact that the growing cost of capital works means that the burden of infrastructure provision is becoming fiscally less viable.*
- *Limitations in the scope of what local governments can feasibly achieve due to duplication of state agency and private sector roles and a lack of funding and statutory authority to assume greater responsibility for public transport provision. This issue is a key factor in understanding why some of the remaining actions identified in the Bunbury Transport Vision 2030 Transport Strategy have not been achieved.*

⁷ List of factors informed by Gick, J, 2012, pers. comm., 12 June.

⁸ Infrastructure Australia is a statutory body, established under the Infrastructure Australia Act 2008 which came into effect on 9 April 2008.



Bunbury, like other fast growing regional capitals is continuing to experience all of the above trends locally since the preparation of the Bunbury Transport Vision 2030 Transport Strategy in 2001. With the subsequent development of Davenport and Picton industrial estates along with the College Grove, Glen Iris, Moorlands and Tuart Brook neighbourhoods within its own local government boundary since the adoption of the Strategy. Regionally this urban expansion has been further augmented by the much more significant urban growth corridors extending to the south in the Shire of Capel (e.g. Dalyellup and Gelorup), to the north and north-east in the Shire of Harvey (e.g. Australind) and Shire of Dardanup (e.g. Eaton).

3.1.2. City Vision Strategy

The City Vision Strategy: Shaping the Future of Bunbury (September 2007) and associated City Vision Action Plan (September 2007), prepared by the City of Bunbury, foreshadowed the need for a “Strategic Community Plan” as now mandatorily required under the State government’s new Integrated Planning and Reporting Framework (IPRF) for local government.⁹ Whilst the City Vision Strategy demonstrated recognition of the important relationship between land use and infrastructure planning and broader community and corporate planning, it should be noted that the City Vision Strategy, and the Strategic Community Plan that will soon replace it, are not a component of the Local Planning Policy Framework.¹⁰

Nevertheless, the City Vision Strategy remains relevant with respect to its recommendations regarding strategic land use and infrastructure planning, and in particular transportation, given that they were soundly formulated in the context of strategic community planning process. Therefore, it is anticipated that the preparation of the Local Planning Strategy will necessarily continue to draw upon the relevant elements of Council’s adopted strategies, such as the Bunbury Transport Vision 2030 Transport Strategy and City Vision Strategy, until such time that a revised Integrated Transport Strategy can be prepared that cascades the strategic level recommendations of the LPS-ITS into the more detailed operational level in support of the Local Planning Strategy.

As such, the significant and enduring contribution that the City Vision Strategy makes is in its methodology, which breaks down the conventionally accepted venn diagram of three interrelated spheres of sustainability into five nested elements functionally represented in the City’s ‘Local Sustainability Framework Model’.¹¹ Whilst the conventional three spheres of sustainability are interdependent, the principle aim of the City Vision Strategy was to advance the overall

⁹ Subject to amendments to the Local Government (Administration) Regulations 1996, to be promulgated in June 2012.

¹⁰ Strategic Community Plan is prepared in accordance with supporting regulations to the *Local Government Act 1995*.

¹¹ Adapted from Hart, M. 1999, *Guide to Sustainable Community Indicators*, 2nd Edn. West Hartford, CT, USA: Sustainable Measures.



ecologically sustainable development of the City and its region. To facilitate the practical application of the sustainability model - the Strategy states that subordinate planning tools will be structured according to the Local Sustainability Framework Model, which takes the next step in the evolution of planning practice in translating the State Sustainability Strategy's framework into a local government context.

Reference to pages 10 to 12 of the City Vision Strategy provides an outline of the methodology used, which was based on what is now termed the "Oregon Model of Community Visioning".¹² This approach meant that it took a long term triple bottom line view of Bunbury in context of regional, continental and global trends, as typified in the following extract regarding key issues and trends (page 3):

City Vision recognises the need to respond to global and national issues and trends that have regional impacts. Scarcity of resources, particularly fossil fuels, and global warming will demand improved efficiency in relation to resource use, use of renewable energy, and modified living patterns and transport methods. The massive growth in human populations worldwide will cause significant changes in global economic markets. Australia is vulnerable to these issues and trends with its population located on the coast, the fragility of our natural environment, reliance on primary production and associated export industries and the dominance of the motor vehicle.

Further, the City Vision Strategy acknowledged the need to revisit integrated transport planning under its discussion on approaches to planning (page 4), which it stated that:

Strategies already prepared by the City in respect of housing, commercial centres and transport need to be updated and consolidated, and crucially their scope extended to reflect the true extent and dynamic character of the City. As the urban area grows and the City becomes evermore interrelated with activity occurring within surrounding areas, strategies that fail to address cross boundary linkages risk becoming progressively less robust and meaningful. City Vision will seek to encourage the State, the port and neighbouring shires to consolidate strategies into coherent and coordinated plans that protect values, maximise efficiencies and achieve common goals.

The Oregon model provided a framework for the evolution of the visioning process to derive desired outcomes for the whole of the City and its local areas over a 20 year+ timeframe. The visioning process in this regard involved development of a community profile, trend analysis, use of economic and population studies for development of a scoping and positioning paper. Initial

¹² Oregon Visions Project, 1993, *Guide to Community Visioning: Hands-On Information for Local Communities*.



stages of the City Vision process also engaged the local community in visioning workshops and summits - stimulating discussion regarding the City’s strengths, weaknesses, opportunities and threats.

Following this work, ideas and values were synthesised and distilled into a vision statement and supporting attributes (see Table 3.1). The five attributes were identified as elements representative of the community’s vision of Bunbury’s past, present and future. The attributes underpin the holistic triple-bottom-line approach taken in structuring the goals and objectives of the Strategy, and together they act as a sound basis for guiding the City’s development in keeping with the principles of ecologically sustainable development (ESD).¹³ The attributes act as a basis to review the overall merits of new development in conjunction with the principles of sustainability. In this regard, transport is explicitly identified as the enabling mechanism that underpins the attributes of a “functional” city.

■ **Table 3.1 Vision and Attributes**

VISION				
A uniquely Western Australian international port city linked into the global economy, Bunbury will strive to become a sustainable community, offering a high quality of life, focused on balancing environmental, social and economic needs. As the capital of the South West, it will aspire to promote the region as one of the finest in Australia, recognised for its diversity in culture, lifestyle opportunity and economic strength.				
ATTRIBUTES				
Dynamic	Functional	Attractive	Living	Innovative
A flourishing and diverse local economy with a regional sphere of influence	Good transport services and communication linking people to jobs, schools, health, other services and enabling strong linkages with the broader region	A quality built and natural environment, providing places for people to live in an environmentally-friendly way	Vibrant, harmonious and inclusive communities, enjoying a full range of appropriate, accessible public, private, community and voluntary services	Progressive, effective governance, offering inclusive participation, representation and leadership, facilitating the delivery of a modern, sustainable living and working environment

13

Report of the Brundtland Commission, December 1992, Our Common Future, published by Oxford University Press in 1987. Ecologically Sustainable Development Steering Committee, National Strategy for Ecologically Sustainable Development.



In terms of the triple bottom line approach, the City Vision Strategy recommends that (page 11):

Socially, City Vision recognises the need to respond to and develop urban areas with a sense of community, to support the health and wellbeing of communities and to encourage interaction. In this regard measures to develop walkable and cyclist friendly communities that are serviced with a local and regional public transport system are recommended. A range of housing types should be available, community and recreation facilities and activities provided for all users and the needs of youth, seniors and people with disabilities addressed. Heritage, the arts, natural and cultural values should also be managed and promoted, and health and education infrastructure and services designed to meet current and future needs.

Reference to page three of the City Vision Action Plan provides guidance on how the achievement of the Strategy's goals were then intended to be driven through corporate business planning and annual budgeting processes. Whereas, page five of the City Vision Action Plan sets out how the strategies and actions of a land use and infrastructure planning nature are intended to direct the Strategic Planning Programme, which in turn has to date driven the Local Planning Strategy & Scheme Review Project.

Transport features under the following goals, which seeks:

Environmental Goal

To value and protect the environment. The region must balance the protection of ecological processes and natural systems with economic development and the maintenance of the cultural, social and physical wellbeing of communities.

Social Goal

To plan and develop cohesive, inclusive, educated and healthy communities with a strong sense of place, access to all essential services and facilities and housing to meet diverse needs.

Economic Goal

To promote Greater Bunbury's regional advantage and support the necessary conditions for sustained investment, growth and employment generation.

Transport is then expanded upon under the relevant Environment Objectives and Strategies accordingly:

Env6 Incorporate energy conservation measures in all planning and development control processes and procedures.

6.2 Reduce motor vehicle dependency through improved urban design that facilitates pedestrian, cycle and public transport use.



Soc4 Maintain and improve public transport services within the Greater Bunbury Region and to interregional locations, particularly Perth.

4.1 Review current bus and train services between the City and Perth to ensure that the transport needs of all users especially seniors, people with disabilities, young families, school children and business commuters are met.

Soc5 Develop, enhance and maintain a sense of community, place and local identity in existing and proposed urban areas throughout Greater Bunbury.

5.3 Develop, as part of an integrated land use and transport strategy, plans that encourage and facilitate pedestrian and cycle use, particularly in the Central Business District and adjoining residential neighbourhoods.

Eco1 Ensure that major key infrastructure that supports industrial and commercial development is maintained and developed to attract investment and new businesses, supports operational efficiency and facilitates economic diversity.

1.5 Prepare an integrated land use and transport strategy that supports efficient, convenient, safe and equitable movement of people and goods and services.

Each of the above objectives and strategies were then broken down into detailed recommendations for each of the identified vision focus areas, which were devised as logical geographical planning units (refer to Annex 1) within which further detailed planning would be conducted as part of the 10 year capital works programme and through processes such as an integrated Local Area Planning approach.

3.2. Transport system role

Given the context outlined above and the reasonable assumption that the circumstances and mechanisms governing the provision of transport are likely to evolve gradually, this study does not outline a specific transport vision; rather it is considered important that the transport vision for the city reflect the views of the community and be developed following appropriate levels of discussion and engagement through the preparation of the Community Strategic Plan, Local Planning Strategy and any future supporting Integrated Transport Strategy. However, the following canvasses a number of transport system features that will be relevant in developing a transport vision for the city in the future.

Transport is a means to an end rather than an end in itself. As such it must be planned and designed to contribute positively to the desired transport vision for the city in a manner that is integrated with that of its region. The role of the Bunbury transport system is to provide a high



level of accessibility for all to jobs, education, shops, entertainment and other activities as the city grows. It is intended the future transport system will:

- Provide a high level of connectivity in the network
- Offer travel choice for a variety of travel purposes
- Support sustainable growth opportunities through integration with land use planning
- Be an economic enabler
- Develop an efficient freight network to serve the port and the broader region
- Meet the lifestyle needs of the community by limiting segregation and integrating communities
- Be affordable and equitable for all social and age groups within the community
- Meet expectations for regional transport whilst minimising impacts on local communities
- Be environmentally responsible
- Be adaptable and sustainable

The integrated transport plan will need to be developed carefully to ensure there is balance between economic, environmental and social needs and between regional and local needs. There is no point in denying that there are sometimes tensions between different stakeholder perceptions and requirements. The transport planning intention underpinning this study is to be proactive in understanding different and complex needs and to develop a plan that acknowledges and seeks to mitigate impacts whilst meeting sustainable access needs of the broader community.

3.3. Transport mode share targets

Currently the people of Bunbury are very dependent on cars for their travel needs. Figures from the 2006 census for journey to work show that 94 per cent and 93 per cent of work journeys within the City of Bunbury and the Greater Bunbury sub-region respectively are by car. The mode share for journey to work within the City of Bunbury in 2001 and 2006 are shown in **Table 3.2**.

■ **Table 3.2 Journey to work in City of Bunbury (2001 and 2006)**

Mode of Travel	2001 Daily Trips	2001 Mode Share	2006 Daily Trips	2006 Mode Share
Public Transport	141	1.0%	183	1.1%
Car Driver	11836	84.1%	13798	85.3%
Car Passenger	1231	8.7%	1374	8.5%
Walk	372	2.6%	390	2.4%
Cycle	209	1.5%	160	1.0%
Other	280	2.0%	268	1.7%
Total	14,069		16,173	

■ **Source: Australian Bureau of Statistics**



The major reasons for the current high level of car use are relatively low levels of congestion, the convenience of the car, lower travel times than by other modes, access to low cost parking and a culture of driving that has built up over many years. Such a high level of car use results in a high dependence on cars for travel, because alternative modes are neglected and underutilised. The alternative modes (walking, cycling and public transport), partly because of their low utilisation, have underdeveloped infrastructure and service levels that make them unattractive to potential users.

The high level of dependency on cars for future travel has significant risks that could impact adversely on affordability of travel and overall accessibility in the future. “Peak oil” is the term used to describe the future production of oil. Some experts believe the peak in the future production of cheap oil from existing and known future reserves has already been reached, whilst others believe it is imminent. Whilst there is some debate on the supply side, there is agreement that the demand for oil around the world is increasing sharply, due largely to expansion and changing lifestyles in developing countries. In the longer term, alternative forms of propulsion of private vehicle will become more affordable and will be more widely used. However, in the next twenty years or so, the cost of driving will continue to increase and possible world shortages of oil could see prices increase substantially.

This integrated transport study (ITS) proposes that the risk inherent in a transport system that is so highly dependent on car travel with few alternative travel options should be avoided in the future. A range of options are proposed in this study to improve public transport, walking and cycling. These improvements will provide a viable alternative to car driving for some people that, in combination with higher costs of driving and increased congestion, will change travel patterns over time and lead to a less car dependent society.

The mode share targets outlined in **Table 3.3** for the different components of the transport system have been developed to help understand how much travel patterns can be expected to change in the future, in response to the pull and push pressures outlined above. These mode share targets provide a framework for development of the Bunbury integrated transport strategy.

■ **Table 3.3 Mode share targets for the City of Bunbury**

Mode of Travel (All trip purposes)	Estimated	Target	
	2011	2031	2051
Car Driver	70%	62%	54%
Car Passenger	16.5%	16%	15%
Public Transport	1.5%	4.5%	7.5%
Walk	8%	10%	12.5%
Cycle	2%	5.0%	8%
Other	2%	2.5%	3%



These mode share targets, if achieved would result in the daily travel patterns by mode as shown in **Table 3.4.**

■ **Table 3.4 Estimated daily travel by mode in City of Bunbury**

	2011	2031	2051
Population	32,503	40,000 (+23%)	50,000 (+54%)
Total Daily Trips	113,760	140,000 (+23%)	175,000 (+54%)
Car Driver	79,632	86,800 (+9%)	94,500 (+19%)
Car Passenger	18,770	22,400 (+20%)	26,250 (+40%)
Public Transport	1,706	5,600 (x 3.7)	13,125 (x 7.7)
Walking	9,100	14,000 (x1.51)	21,875 (x 2.4)
Cycling	2,275	7,000 (x3.1)	14,000 (x6.2)
Other	2,275	3,500 (+1.5%)	5,250 (x2.3)

These mode share targets anticipate high levels of growth of both public transport and cycling, albeit from a low base level. If achieved, these increased levels of public transport and cycling will be largely responsible for reducing the level of car dependence in Bunbury. Both the public transport and cycling principles outline in section 2 are intended to tap the potential for increased travel by these modes. Over the longer period of 40 years to 2050, there are significant uncertainties in estimating future travel by mode. However, it is considered that there is an equal likelihood that future travel by public transport and cycling will be too low as there is that it will be too high. This is due to uncertainties as to how people will view travel by car in the future.



4. Transport for the city centre growth strategy

4.1. Potential city centre growth

The draft Greater Bunbury Strategy (WAPC, 2011) “*estimates that the population of the Greater Bunbury sub-region may range from a conservative figure of around 100,000 to potentially over 150,000 people between 2031 and 2051 dependent on the rate of economic growth.*”

With a doubling of the population of Greater Bunbury, the Bunbury central area will need to grow if it is to maintain its status as the primary centre for the region. Indeed it is likely to be an intention of the Local Planning Strategy that the Bunbury central area (see **Figure 4.1**) parallels the growth of Greater Bunbury in order to maintain its status as the primary centre for the region. This section of the ITS examines the feasibility of doubling the size of the Bunbury central area over a period of 30 to 40 years from a transport and access perspective.

At present there is some spare capacity on the city centre streets and on approach roads to the Bunbury central area. Although not verified by modelling at this stage, it is estimated that daily traffic volumes to and within central Bunbury could increase by 30 per cent to 40 per cent before businesses and residents become severely disadvantaged by congestion and loss of amenity on city streets. The capacity of the central area street system could be improved marginally by minor traffic management and through the use of intelligent transport systems, but major road widening is unlikely to be feasible or advantageous. As in most cities, it is likely that there will be a greater spread of traffic across the day with a lower percentage of traffic in the peak hours. It can be expected that the length of the peak periods will extend to accommodate higher levels of traffic. Overall an increase in peak hour car travel of about 20 per cent would be possible allowing an increase of 40 per cent on a daily basis.

It is clear that a doubling of the number of people travelling daily into central Bunbury will require a more integrated transport strategy with significant increases in public transport and cycling and to a lesser extent walking for more local trips.

Since the original draft of this report was prepared, the City of Bunbury has obtained improved modelling capability that can be utilised for validating and monitoring the implementation of the LPS-ITS with respect to its recommendations, and any subsequently revised integrated transport strategy, that could include:

- a) predicting the traffic impacts of large traffic generating land use developments (e.g. shopping centre upgrades, mixed high rise living / retail, intensification of R-Codes, etc; and
- b) predicting the traffic impacts of changing the road network within the study area..



4.2. City centre travel patterns and trends

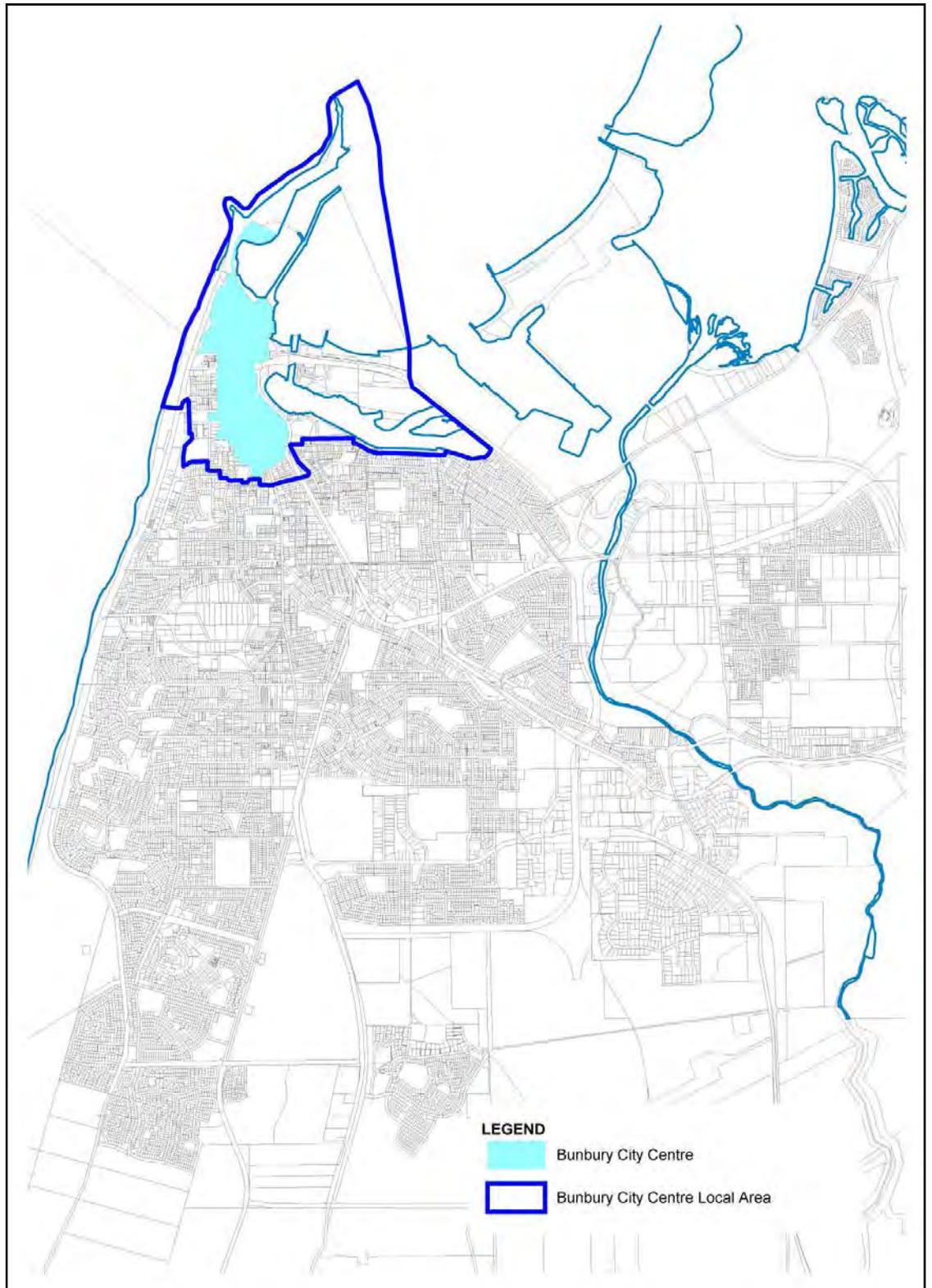
Travel trends have changed in cities around the world. This is being driven by a combination of factors, including increased cost of driving, increased congestion on city streets, limited and costly parking in and near centres and improvements in the capacity and frequency of public transport and, in some cases, safer, more convenient facilities for cyclists. **Figure 4.2** shows a clear change in trend of vehicle distance travelled in the USA, which translates to a reduction in driver mode share after many years of increase. In Perth 50 per cent of people accessing the city centre were car drivers in the mid-1990's and 35 per cent were public transport travellers. By about 2006 the figures had reversed with 50 per cent travelling by public transport and 35 per cent as car drivers. This demonstrates that travel patterns can change fairly quickly if the conditions are right.

The factors driving these changes are likely to continue. There is limited space on city streets and congestion will limit the ability of car travel to grow, particularly in inner cities. In addition “peak oil” is very likely to result in an increase in the cost of driving. The combination of higher costs of driving and increased congestion will continue to change travel patterns in cities provided the alternatives (public transport and cycling) are improved and provide a viable alternative.

Travel to central Bunbury at present is almost exclusively by private car. This is because the car currently provides a fairly convenient way to travel in Bunbury, with many people having access to a car and a reasonably high proportion of commuters and visitors having access to free or low cost parking close to destinations. By contrast, many people consider walking and cycling to be dangerous or too inconvenient and public transport to be too infrequent and too slow. 2006 census data for the City of Bunbury shows that more than 85 per cent of travel to work in Bunbury is as a car driver, with the majority of the remainder as car passengers. Less than 5 per cent of people travel to work by public transport, walking and cycling combined.

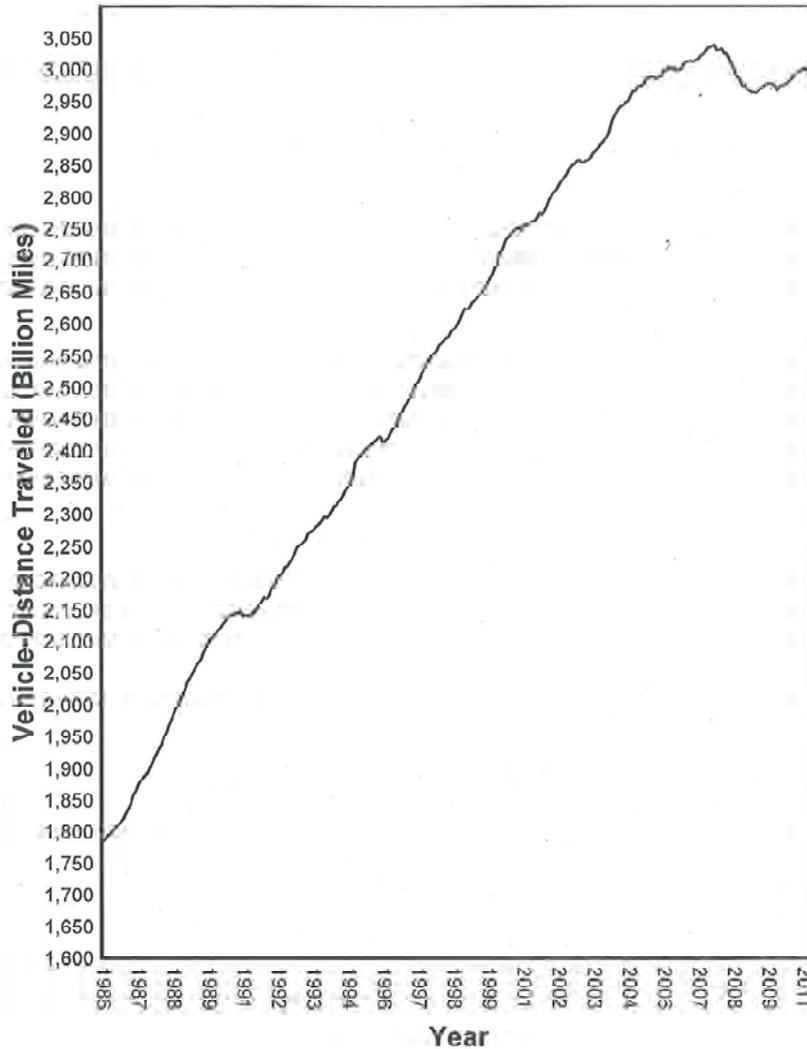


■ **Figure 4.1 Bunbury city centre area**





■ **Figure 4.2 Vehicle distance travelled per annum (USA)**



4.3. Mode share travel to Bunbury city centre

Travel to the Bunbury city centre for all purposes is likely to be slightly less dominated by car travel, although car driving mode share is still likely to be close to 80 per cent. The major reasons for this are relatively low levels of congestion, the convenience of the car, lower travel times than by other modes, access to low cost parking and a culture of driving that has built up over many years.

Although there is a lack of data to provide accurate figures, **Table 4.1** provides an estimate of the mode share of travel to the major land uses within the Bunbury city centre.



■ **Table 4.1 Estimated mode share to land uses in Bunbury city centre (2006)**

Mode of Travel	Retail (inc service industry)	Office / Business (inc health, welfare and community services)	Entertainment Recreation and Culture	Total ¹⁴
Car Driver	78%	87%	67%	79%
Car Passenger	14%	8%	20%	14%
Public Transport	2%	2%	4%	2%
Walking & Cycling	6%	3%	9%	6%

The mode share estimates for the different uses are based on the author's knowledge of:

- Mode share travel to work in Bunbury from ABS statistics;
- The level of overall travel by public transport in Bunbury;
- Travel patterns in other cities that show higher levels of car passengers for entertainment, recreation and shopping trips and lower levels of car driving, than for travel to work.

Table 4.2 provides an estimate for total travel and travel as a car driver for the predominant uses in the Bunbury city centre, based on 2006 yields.

■ **Table 4.2 Estimated travel to Bunbury city centre by major uses (2006)**

	Retail (inc service industry)	Office / Business (inc health, welfare and community services)	Entertainment Recreation and Culture	Total
Yield (m ² of NLA)	53,021	59,233	17,041	
Total Daily Travel Rate	0.9 x NLA	0.15 x NLA	0.15 x NLA	
Car Driver Daily Travel Rate	0.7 x NLA	0.13 x NLA	0.10 x NLA	
Total Travel (trips / day)	47,714	8,885	2,556	59,160
Car Driver Travel (trips / day)	37,115	7,700	1,704	46,579
Car Driver mode share	78%	87%	67%	79%

Source: *Land Use and Employment Surveys; Department of Planning, 2006.*

It can be seen from **Table 4.2** that retail, which includes employee travel to retail, is responsible for almost 80 per cent of travel to the Bunbury city centre with office use responsible for about 15 per cent of travel. In reality retail will account for less than 80 per cent of travel, as there are some

¹⁴ Figures may not add to 100 due to rounding.



more minor land uses that have not been included in this analysis. Also there will be some trips generated by people living within the Bunbury city centre. Some of these residential trips will have destinations within the city centre, so have already been included in the figures in **Table 4.2**.

It has been assumed that it will take about 30 to 40 years for the city centre to double in size. Over 30 years or so, it can be expected that mode share will change. Specifically public transport will increase as a result of service improvements and priority routes, increases in parking charges, provision of park and ride and other factors. Cycling has the potential to increase substantially if safer, convenient infrastructure with spacial separation from cars is introduced. Walking will increase if accessibility is increased through proximity by increasing the number of people living in and near the city centre. All of these factors have been assumed in the following analysis as well as the likely continuing increase in the cost of car driving due to “peak oil” and other factors.

To provide services, strategic employment opportunities and retail to meet the future needs of the Greater Bunbury Region, the Local Planning Strategy envisages a potential doubling of the retail, office, recreational and entertainment uses within central Bunbury over 30 to 40 years.

In informing the future Local Planning Strategy, this Integrated Transport Study examines how activity in the central area could double without doubling the level of traffic travelling to, from and within central Bunbury.

The doubling of traffic on Bunbury’s city centre street network and approach roads to the centre would result in unacceptable levels of congestion, even with improvements, that would damage the ability of the centre to grow and would result in a significant loss of amenity. Excessive levels of traffic on city centre streets would make central Bunbury less attractive for living, as a tourist and visitor destination and for business.

Table 4.3 provides an estimate of the mode share of travel to the Bunbury city centre by 2040/50 to coincide with a possible doubling of activity in the city centre. These estimates of travel by different transport modes take into account improvements to public transport and cycling networks recommended in this ITS by that time.

■ **Table 4.3 Estimated mode share to land uses in Bunbury city centre (2040/50)**

Mode of Travel	Retail (inc service industry)	Office / Business (inc health, welfare and community services)	Entertainment Recreation and Culture	Total
Car Driver	60%	62%	60%	60%
Car Passenger	13%	14%	18%	13%
Public Transport	15%	15%	10%	15%
Walking & Cycling	12%	9%	12%	12%



The mode share estimates in **Table 4.3** have been used to estimate the total travel and travel by the different modes in 2040/50, based on doubling of major city centre yields. (Refer **Table 4.4**)

■ **Table 4.4 Travel to Bunbury city centre by major uses (2040/50)**

Yield (m ² of NLA)	Retail (Inc service industry)	Office / Business (Inc health, welfare and community services)	Entertainment Recreation and Culture	Total
Total Daily Travel Rate	0.8 x NLA	0.15 x NLA	0.15 x NLA	
Car Driver Daily Travel (trips / day)	50,880	11,160	3,150	65,190
Car Passenger Daily Travel (trips / day)	11,034	2,520	683	14,237
Public Transport Daily Travel (trips / day)	12,720	2,700	787	16,207
Walking & Cycling Daily travel (trips / day)	10,176	1,620	630	12,426
Total Daily Travel (trips / day)	84,800	18,000	5,250	108,060

For office, business and entertainment the rate of total travel is proportional to the size of the centre. However the rate of travel for retail can be expected to drop as the size of the centre increases, because more shopping will be made in the one journey in larger centres than in small centres.

With these changes in mode share it is estimated that daily car driver trips within the Bunbury city centre would increase by about 40 per cent with a doubling of the size of the major land uses in the city centre. This pattern could be expected to be repeated in the remainder of the central area surrounding the city centre, although with perhaps a slightly higher car driver mode share. Based on what has occurred in other cities and recent trends, it is likely that car travel to and within the Bunbury central area will increase by less than 50 per cent assuming a doubling in size of the major land uses. It is possible that car driver growth will be much lower, perhaps closer to 30 per cent by the time activities in the centre doubles over 30 to 40 years.

Growth in car driving in this range (30 per cent to 50 per cent) can be achieved on the existing city centre street network with some modest upgrades without resulting in unacceptable levels of



congestion. **From this it can be calculated that traffic and transport considerations will not be an impediment to the doubling of activity in the city centre.**

The **vision** for the Bunbury city centre is one of bustling, vibrant streets and places with many pedestrians on the street during the day and in the evenings.

4.4. LPS-ITS intentions, strategies and actions (city centre)

LPS-ITS intentions:

- Facilitate a potential doubling of jobs, retail and other activities within the city centre without excessive levels of traffic and congestion, which would detract from the enjoyment of the city centre by residents, visitors and business people.

Key strategies:

- Development of a number of quality public transport routes with priority for transit vehicles and high frequency services;
- Development of a network of dedicated cycle paths, cycle lanes and safe cycling routes that provide continuous, efficient, safe cycle connections from the suburbs to the city centre;
- Making walking on all city centre streets safe, convenient and attractive through employment of structural and non-structural measures (eg. Lower speed limits, street modifications, landscaping etc);
- Monitor, revise and implement, as appropriate, the adopted city centre parking strategy to manage car access and encourage a progressive switch over time from car driving to other more sustainable modes.

More details on each of these strategies are contained in other sections of this report.

Three year actions:

- Establish and agree with the community mode share targets for travel to the Bunbury central area;
- Agree a public transport implementation plan with the PTA;
- Develop a ten year stage one implementation plan for transformative bicycle infrastructure improvements for consultation with the community and for inclusion in budgets and forward plans;
- Commence monitoring and concept planning for a city centre streetscape programme designed to make the city centre a safe, attractive and convenient environment for walking;
- Undertake consultation with the business community, the tourism industry and other key stakeholders on the staged implementation of a revised city centre parking strategy.



5. Port and industry freight network planning

Planning for the movement of freight in the Greater Bunbury sub region is largely the responsibility of State Government agencies. It is however of such significance that a strategic overview is required as part of the City of Bunbury's ITS in order to provide an adequate context for informing integrated transport planning at the local level, and in particular for in the preparation of the Local Planning Strategy and future Integrated Planning Strategy review.

5.1. Regional road and port access road network

There are four state Highways that link the City of Bunbury to the remainder of the State. These roads are managed by Main Roads WA. All four state highways currently connect to Robertson Drive, as shown in **Figure 5.1**. Robertson Drive provides an interim bypass and an interface to the more local street network with the City of Bunbury.

In the future this bypass function will be provided by the Bunbury Outer Ring Road (BORR) that will connect the Perth-Bunbury Highway near Eaton with the Bussell Highway south of Dallyellup (Refer **Figure 5.1**). The BORR will be access controlled and has been planned for upgrade to freeway standard in the longer term. In the medium term there will be a combination of grade separated and at grade intersections along the BORR.

The central stage of the BORR (shown **Figure 5.1**) is currently funded and is scheduled to be constructed by 2013. There is no implementation timetable for the following stages of the BORR.

The Bunbury Outer Ring Road is an essential piece of road infrastructure. It is necessary to provide a bypass function and to assist in removing freight and regional traffic from local streets. It also provides for the orderly movement of road freight traffic between the Port of Bunbury and the State Highways that connect Bunbury to Perth and other regions.

The central first stage of the BORR will also provide improved access to the Bunbury Port Authority (BPA). Tonnage of exports and imports through the Port has grown steadily by 22 per cent over the decade to 2011. 88 per cent of this trade is exports, of which 75 per cent is Alumina.

In 2007, the BPA¹⁵ released its Draft Bunbury Port Inner Harbour Structure Plan (BPIHSP), prepared by Thompson McRoberts Edgeloe (TME), which outlined the intended nature and scope of future expanded port operations. The BPIHSP was formally approved by the Board of Directors of the BPA in September 2009 as a policy document to guide development and decision making within the Inner Harbour and conforms to the strategic planning requirements under the Port Authorities Act 1999. The existing port development and transport (road and rail) access network

¹⁵ The BPA is an Authority established under the Port Authorities Act 1999. It is responsible to and reports to the Minister for Transport; Housing (State of Western Australia).



is shown in **Figure 5.2**). The proposed port development, as outlined in the structure plan and the proposed road and rail networks is shown in **Figure 5.3**.

The BPIHSP and associated road networks provide improved access to / from the Port from the major road network. However, the loss of Estuary Drive between Old Coast Road and Koombana Drive will result in a significant loss of connectivity for general traffic from the north wishing to enter the City of Bunbury. It is suggested that the proposal in the Bunbury Port Structure Plan to sever Estuary Drive be revisited to see if it can be retained as a through route on an alternative alignment, perhaps around the periphery of the proposed enlarged Port.

In the past, many regional roads have created a degree of segregation in communities through which they pass. Some of these disadvantages can be mitigated through careful planning and design, which provides for crossing opportunities of the highway at regular intervals for pedestrians, cyclists and, in some cases, local traffic.

5.2. Freight rail network upgrades

The Bunbury Port Inner Harbour Structure Plan proposes significantly improved rail freight access to the port (Refer **Figure 5.3**). The structure plan notes that rail access can be provided to all berths in the upgraded port facility, if required.

5.3. LPS-ITS intentions, strategies and actions (freight planning)

LPS-ITS intentions:

- Support the development of strategic road and rail freight routes to serve the Port of Bunbury and to support the economic growth and development of Bunbury and the entire South West region.

Key strategies:

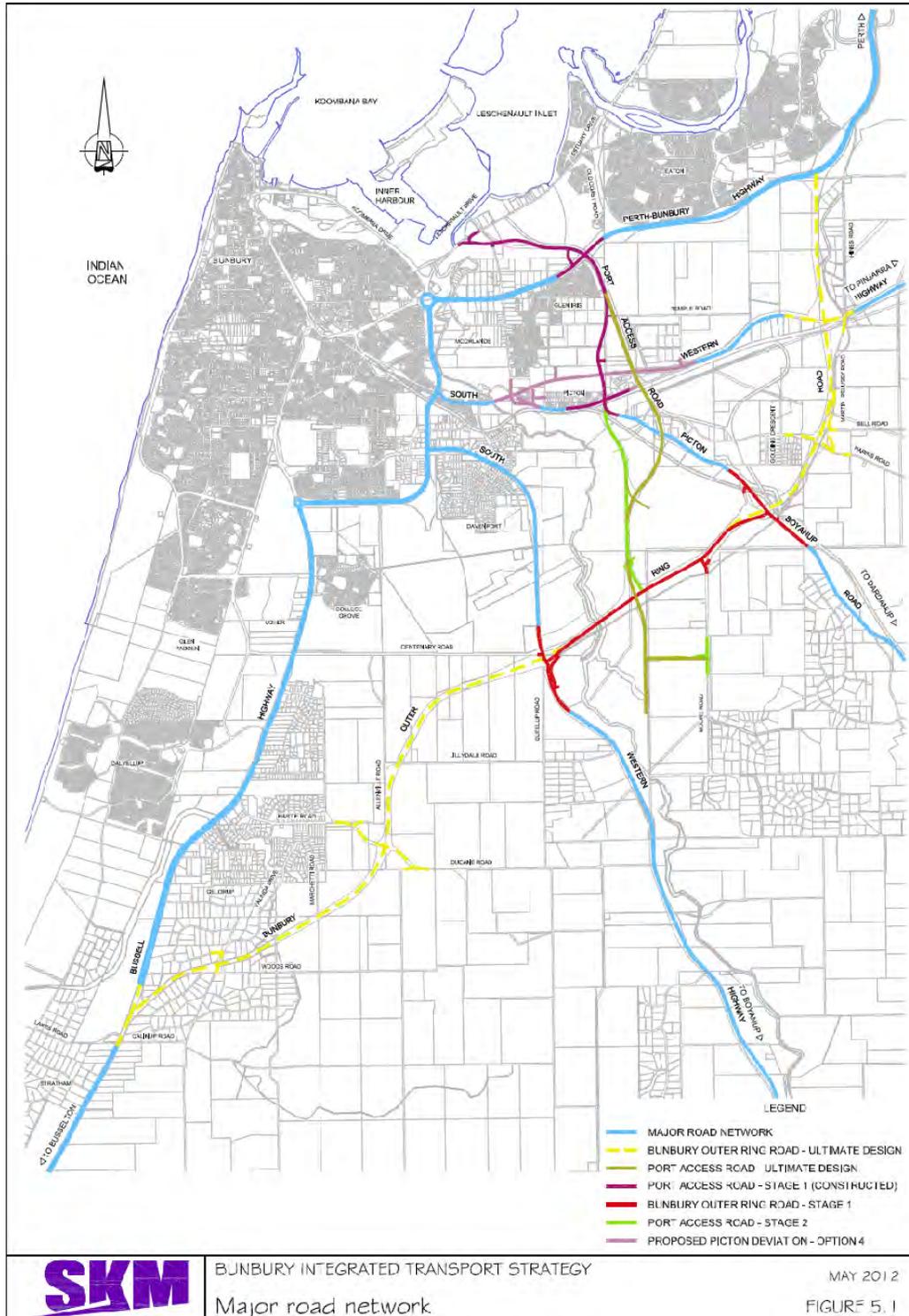
- Support the early construction of the Bunbury Outer Ring Road and work with Main Roads to minimise segregation to adjacent communities by maximising opportunities to create safe, convenient crossings for pedestrians, cyclists and, in some cases, local roads;
- Continue to work with the Bunbury Port, WAPC and other agencies on staging and development of road and rail infrastructure as proposed in the inner harbour structure plan with a view to maintaining connectivity for local movement by motorists, pedestrians and cyclists.

Three year actions:

- Establish a working group with Main Roads and other stakeholders to address design issues that can reduce segregation and maximise crossing opportunities for local traffic, pedestrians and cyclist;
- Establish a working group with the BPA, MRWA, DoP and other state agencies and stakeholders to address opportunities for maintaining a second road link for inter-district connectivity by the retention or realignment of Estuary Drive.



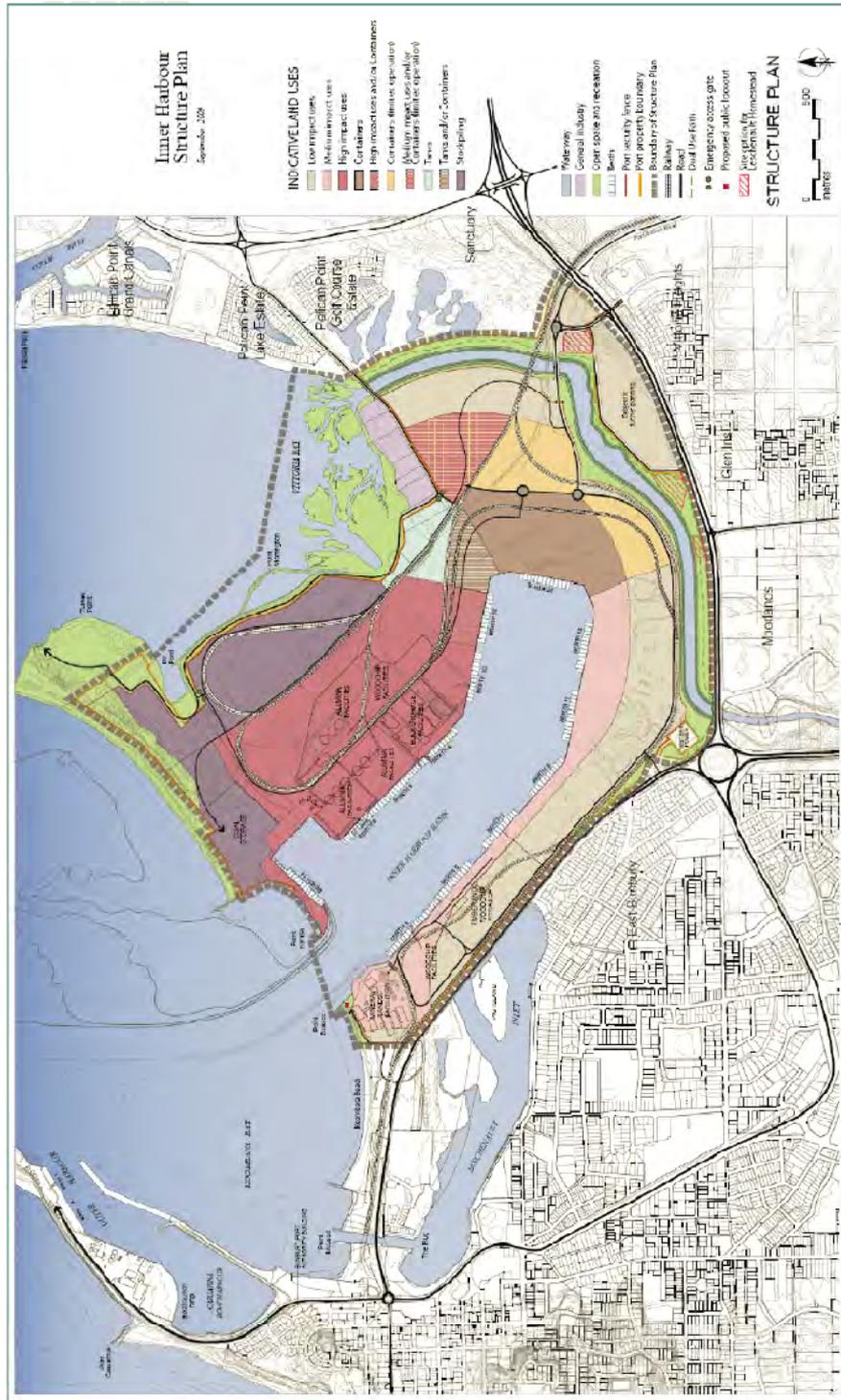
■ **Figure 5.1 Regional road and port access network**



■ **Source: Main Roads WA**



■ **Figure 5.3 Proposed port development structure plan**



■ **Source: Bunbury Port Structure Plan (2009)**



6. Public Transport

6.1. Public transport demand

Current travel by public transport in Bunbury is very low. In 2011, information received from the Public Transport Authority shows that the average daily public transport travel in Greater Bunbury was 2,874 trips per day, which represents only 1 per cent of all travel. Travel to work by public transport in Bunbury is also low at about 1 per cent of all travel. **Table 6.1** provides a number of comparisons between public transport mode share in Perth and Bunbury.

■ **Table 6.1 Public transport mode share comparisons – Perth and Bunbury**

Area	Estimated Public Transport Mode Share (2011)
Perth Metropolitan Area	6%
Greater Bunbury	1%
Perth Inner Suburbs	8%
City of Bunbury	1.5%
To Perth City Centre	50%
To Bunbury City Centre	2%

The difference for journey to work is even greater. In 2006, 10.4 per cent of all journeys to work trips in metropolitan Perth were by public transport. This compares to 1 per cent in Greater Bunbury and 1.1 per cent in the City of Bunbury. In Perth about 50 per cent of all public transport trips are work trips, whereas the comparative figure for Bunbury is only about 22 per cent. This suggests that a large proportion of public transport patronage in Bunbury is likely to be school children, students or the elderly, who are so-called captive users with no viable alternative.

If, as intended, Bunbury is to become less car dependant in the future, it is essential that the public transport system is improved significantly. Improvements to the level of service of public transport will of itself result in greater demand for public transport. However, there are other reasons why people drive in preference to using public transport. A major reason for this is that car travel is convenient on a road system, where spare capacity exists and the majority of car drivers have ready access to free or low cost parking in close proximity to their intended destination. Thus, it is likely that the demand for public transport will increase in response to improvements in public transport service and a decrease in the level of service of car driving due to increasing congestion and higher costs of parking, over time.

The targets shown in **Table 6.2** have been established for public transport mode share and travel in the City of Bunbury in 2031 and 2051 to assist with public transport network and service planning.



■ **Table 6.2 Public transport mode share targets for City of Bunbury**

	2011	2031	2051
City of Bunbury Estimated Transport Mode Share	1.5%	4.5%	7.5%
Estimated public transport daily trips ¹⁶	2,200	8,200	17,000

For comparison purposes 4.5 per cent was the estimated mode share for public transport in Perth around 2000 and 7.5 per cent is the estimated public transport mode share in Perth by 2020.

Whilst public transport journeys in the City of Bunbury are likely to increase to about four times the current level by 2031, an estimated daily patronage level of about 8,000 trips per day or about 1,400 trips per peak hour is still a relatively small system. 1,400 trips could be accommodated by between 40 or 50 buses with an average passenger load between 35 and 50, which is below the capacity of standard buses. However, buses operating at this level of occupancy in peak periods would be a significant improvement on the efficiency of existing operations. Note, that the above figures relate to travel within the City of Bunbury only. In reality the system will be about 50 per cent larger as it will also operate outside the City of Bunbury in the Shires of Capel, Harvey and Dardenup.

6.2. Public transport network and service delivery strategy

The public transport strategy proposed for the City of Bunbury is based on the public transport planning principles outlined in Section 2.8. Although this ITS has been prepared for the City of Bunbury, the public transport plan ultimately prepared must cover the wider Greater Bunbury sub region.

Because patronage is low it has been difficult in the past to justify high frequency services. Low frequency services, in turn, contribute to low levels of patronage. **It is clear that something must be done to break out of this pattern of low frequency and low patronage.**

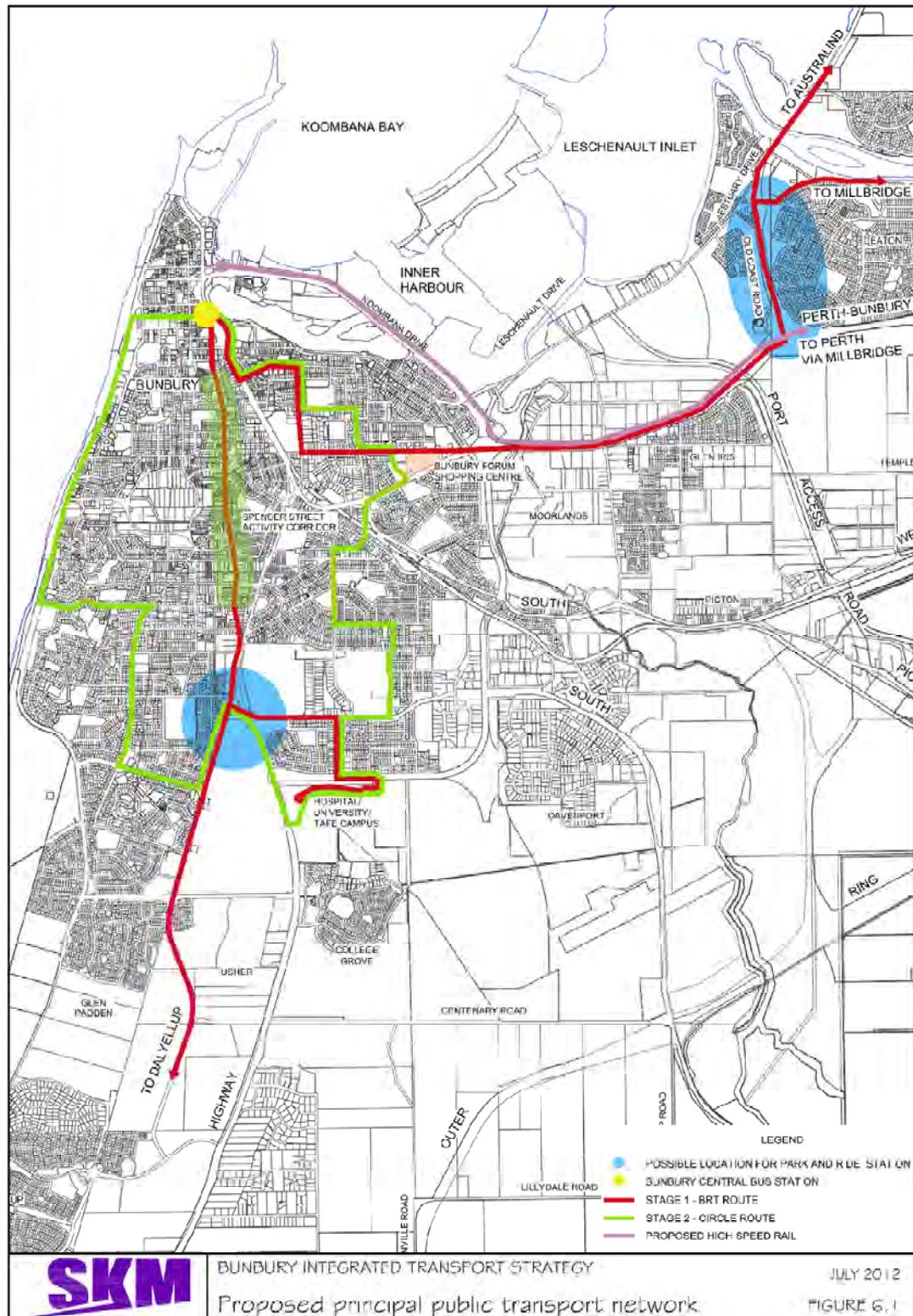
A two stage route improvement strategy is proposed based on the plan shown in **Figure 6.1**. The strategy and the proposed routes will need to be discussed with a number of key stakeholders, most notably the Public Transport Authority, the Bunbury City Transit operator and the four local authorities comprising the Greater Bunbury sub region.

Stage 1 of the plan is a bus rapid transit system (BRT) linking Dallyellup with Australind with a single route through the Bunbury city centre. Key features of the proposed stage 1 BRT system are:

¹⁶ Includes trips generated outside the City of Bunbury



■ Figure 6.1 Preliminary proposed principal public transport network





- Park and Ride (P & R) to provide access to the BRT route. One P & R station is proposed in South Bunbury near Hay Park and one near the Old Coast Road, South of Estuary Drive, near Eaton;
- A 10 minute peak service and a 15 minute inter- peak service is proposed to operate on the inner section of the route between the two P & R stations. Services would “through route” through the Bunbury city centre bus station, providing a quality service from both the South and the North East to the Bunbury city centre, but also to the proposed Spencer Street activity corridor, the Strickland Street employment area and the Bunbury Forum Shopping Centre;
- Buses from the south would originate at two locations – Dallyellup and the combined health, university and TAFE campus in South Bunbury. All buses would pass through the P & R station near Hay Park;
- Buses from the East and North East would originate at two locations – Australind and a terminus at Millbridge east of Eaton, to the east of the Collie River;
- Initially service frequency beyond the P & R stations would be 20 minutes during peaks and half hour between peak periods, but these could be increased over time depending on demand;
- Priority would be provided for buses where necessary along the route. Initial locations that would be considered for priority include :
 - a) From the southern end of Spencer Street near Goldsmith Street to the Northern end of Parade Road near Adam Road;
 - b) At traffic signals along Spencer Streets and through the city centre;
 - c) Direct signalised priority access between Strickland Street and the Australind Bypass.

Stage 2 of the Public Transport Strategy is implementation of a circle route as shown in **Figure 6.1**. The intention of this route is to provide a medium to high frequency service that links a number of suburbs to the east and west of the stage 1 BRT route to the City Centre and the P & R near Hay Park. It also provides an important linkage from Bunbury suburbs to the South Bunbury Health / education campus and the Bunbury Forum Shopping Centre. It also provides a public transport service along Ocean Drive which could become a tourism activity corridor in the future.

These proposals and their timing would need to be agreed with the PTA.

6.3. Bunbury to Perth high speed rail

The Public Transport Authority and the WAPC are currently examining options for a high speed rail link between Perth and Bunbury. Current provisional planning shows an alignment along Koombana Drive with a station in central Bunbury immediately to the east of Blair Street (refer **Figure 6.1**). The WAPC has also flagged potential stations / interchanges near the Koombana Drive / Australind By Pass roundabout and at Millbridge to the east of Eaton.



The high speed rail project could bring significant benefit to Bunbury in the long term. The intention of the current State Government study is to agree the route and station locations and to reserve land for implementation in the longer term.

If high speed rail linking Perth to Bunbury is to be provided, it is rational that a station is provided close to the Bunbury City Centre. A station/ interchange at Millbridge, as proposed by the WAPC, would provide a good terminus for one leg of the BRT system proposed in this study to link Bunbury to its north eastern suburbs. There would appear to be less justification for a potential station / interchange near the Eelup Roundabout , as foreshadowed by the WAPC in its draft Greater Bunbury Strategy (June 2011). A station at this location is too close to central Bunbury and would parallel rather than link with the proposed BRT system. Because of its proximity to the Port of Bunbury there is no real prospect of high density development around a station at this location.

6.4. LPS-ITS intentions, strategies and actions (public transport)

LPS-ITS intentions:

- Increase the mode share of public transport in the City of Bunbury from about 1.5 per cent in 2011 to 4.5 per cent by 2031 and 7.5 per cent by 2051;
- Support long term planning for a high speed rail connection linking Perth with Bunbury.

Key strategies:

- Introduce a high frequency bus rapid transit (BRT) system linking Dalyellup and Australind through the city centre with Park and Ride stations in South Bunbury and near Eaton within the next 3 to 5 years;
- Introduce a high to medium frequency circle route bus system to supplement the BRT route described above before 2020;
- Assist State Government agencies to master plan and reserve land for a high speed rail connection from Perth to Bunbury with a station close to the Bunbury City Centre and a potential station / interchange at Millbridge;

Three year actions:

- Reach agreement with the PTA on a BRT system for Bunbury;
- Work with the PTA and key stakeholders on development of a BRT master plan to confirm the route and bus priority measures and to investigate site options for park and ride to consider for reservation under the Region and Local Planning Schemes.;
- Work with the PTA and the WA Government to facilitate agreements on alignment and stations for a high speed rail connection on approach to and within central Bunbury with a view to reserving land under the Regional and Local Planning Schemes.



7. Cycling

7.1. Benefits of cycling

There are significant benefits that can be achieved through increased levels of cycling that apply both to individuals and to the broader community. The most important benefits are:

- **Reduced congestion on the road system.** An increase in mode share of total travel by cycling from 2 per cent to 5 per cent by 2031 and to 8 per cent by 2051 has potential to reduce the number of car driver trips by about 10 per cent in the longer term, making a significant contribution to lowering congestion levels;
- **Improved health and fitness.** The US surgeon general recommends adults exercise for 30 minutes and children for 60 minutes most days. The Heart Foundation and the Heart and Diabetes Institute provide similar guidelines and recommend cycling as a valuable and appropriate form of exercise for most people. There has been a major rise in both diabetes and obesity in Australia during the last 30 years. 60 per cent of Australians and 25 per cent of Australian children are now overweight or obese – a level that is 2.5 times as high as it was in 1980. The WA TravelSmart program has found that improved health and fitness was one of the two main motivators to use the car less;
- **Energy efficiency and less use of petrol and fossil fuels.** Increased cycling will result in savings in energy and less use of petrol and fossil fuels;
- **Cost Savings to Governments.** The cost to provide cycling facilities will be less than the cost to upgrade roads to transport the equivalent number of people by car over time;
- **Less cost to individuals.** People who cycle will be able to drive less, making savings on fuel, car maintenance and parking. Some people may be able to reduce their car ownership – say from 2 cars to 1 car per family. The RACWA in 2011 has estimated the annual cost of car ownership from \$8,358 for the least expensive small car surveyed to \$15,480 for the most expensive large car surveyed. (<http://www.racwa.com.au/go/search> then click operating cost guide);
- **Improved accessibility to activities by people of all ages.** Cycling is available as a means of transport for young people and people without a driving licence.

7.2. Current cycling, trends and potential future demand.

Cycling within the City of Bunbury is currently estimated to be less than 2 per cent of all transport trips. Journey to work by bicycle in 2006 was 160 daily trips (1 per cent mode share) having reduced from 209 daily trips (1.5 per cent mode share) in 2001 (ABS census data). This is a very low level of cycling by any comparison and at this point of time there is no evidence to suggest that cycling in Bunbury is increasing.



Travel to work data from the Australian Census in Australia’s capital cities shows that bicycle travel to work has increased slightly since 2001, but on average remains low and, in many cases no higher than it was in 1991 (refer **Table 7.1**).

■ **Table 7.1 Mode share journey to work by bicycle – Australian capital cities**

City	1981	1991	2001	2006
Sydney	0.4%	0.6%	0.6%	0.7%
Melbourne	1.2%	1.1%	1.0%	1.3%
Brisbane	1.1%	1.4%	1.1%	1.1%
Perth	1.2%	1.6%	1.1%	1.2%
Adelaide	2.4%	2.0%	1.2%	1.5%
Hobart	0.6%	0.7%	1.0%	1.1%
Canberra	2.1%	2.0%	2.3%	2.5%
All Cities	1.1%	1.1%	0.9%	1.1%

In Perth, cycling to work has reduced by 33 per cent from 1991 to 2006. The Perth Transport Metropolitan Strategy estimated bicycle mode share for all travel at 5.7 per cent in 1991. The current estimate of bicycle mode share in Perth is less than 2 per cent. Compulsory helmet legislation and a major decrease in cycling by children are the major reasons for the drop in popularity of cycling in Perth.

In Perth, as in other Australian cities, cycling mode share in the inner suburbs is much larger than in the outer areas (2.5 per cent to 4 per cent as against 0.2 per cent to 0.5 per cent in outer areas). **Table 7.2**, sourced from the Victorian Cycling Strategy (2009) shows significant growth of cycling in inner city areas of Melbourne, but very little growth in regional Victoria.

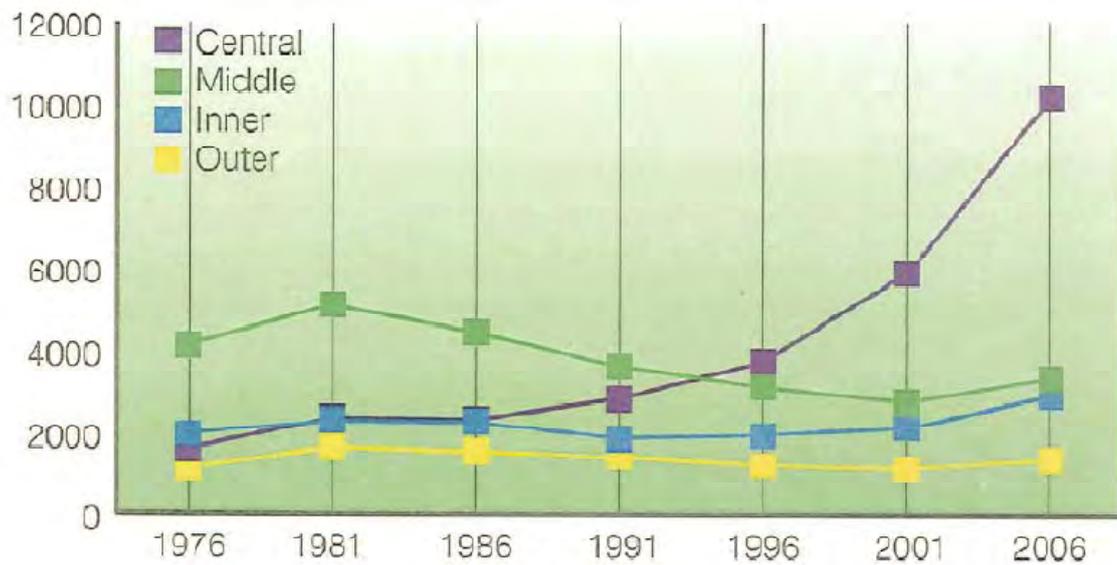
■ **Table 7.2 Growth in “cycle only” journeys to work – Melbourne LGAs**

Place of work	2001 daily journeys	2006 daily journeys	Average annual growth rate 2001 – 2006%
Melbourne LGA	4,163	7,225	11.7%
Nine other inner LGA's	3,981	5,981	8.5%
Balance of Melbourne statistical division	4,039	4,835	3.7%
Non-metropolitan Victoria	6,098	6,250	0.5%
Total Victoria	18,281	24,291	5.8%

■ **Source : Victorian Cycling Strategy, March 2009**



■ **Figure 7.1 Cycling trips to work – different regions of Melbourne**



■ **Source: Vic Roads – Cycling to work in Melbourne**

Figure 7.1 shows that cycling to work in the three central city municipalities in Melbourne (Melbourne, Yarra and Port Philip) increased more than four times between 1986 and 2006. The recently released Draft Western Australian Bicycle Network Plan provides figures showing that daily bicycle travel to the Perth CBD has increased from about 3000 trips per day in 1998 to about 16,000 trips per day in 2010. So, in summary, whilst overall growth of cycling in Australia’s large cities is low, there is evidence of quite high growth in inner city areas and for bicycle travel to the CBD.

There are four main reasons for the higher level of cycling in inner city areas:

- A number of good quality cycling paths have been constructed that link inner suburbs to the CBD;
- Average travel distances are less for inner city residents (refer **Table 7.3**);
- Increased congestion on roads around the CBD;
- Increasing price of motoring, particularly parking in the CBD.



■ **Table 7.3 Average travel distance (all modes and bicycle)**

Area	All trips (Km)	Bicycle trips (Km)	Approx Area Population
Perth Metropolitan	8.0	4.2	1.7m
Inner Perth	6.6	5.1	700,000
Perth NW Corridor	9.0	2.1	300,000
Perth SW Corridor	9.1	1.8	200,000
Sydney Metropolitan	8.3	Not known	4.5m
City of Sydney	4.1	Not known	160,000
City of Newcastle	5.3	Not known	150,000

An interesting observation from **Table 7.3** is that whilst all mode trips distances are longer in outer areas of Perth, bicycle trips are much shorter. The likely reason for this is that there are very few bicycle work trips in outer areas. Most of the bicycle trips that do exist are likely to be short trips by children.

The above analysis tends to suggest there is scope for a significant increase in cycling within the City of Bunbury the in next 20 to 40 years. As most residents within the City of Bunbury are within 5kms of the city centre, this means that almost all residents of the City of Bunbury are within practical cycling distance to the city centre.

As congestion on Bunbury’s street system and the cost of motoring increases, more people will consider cycling as a travel option. However, the number of people who actually choose to cycle will be constrained unless convenient, safe cycling facilities are provided.

Therefore the mode share target for cycling in the City of Bunbury, as shown in **Table 7.4**, is based on safe, quality cycling facilities being provided.

■ **Table 7.4 Bicycle mode share targets for City of Bunbury**

	2011	Target 2031	Target 2051
Estimated mode share	2%	5%	8%
Estimated daily trips	2,275	7,000	14,000

7.3. Major barriers to cycling

The biggest barrier to cycling in Western Australia, as in many other places, is the perception that it is unsafe to cycle in mixed traffic on busy roads, combined with an inadequate network of off road bicycle facilities. An added disincentive to cycling is the lack of end of trip facilities such as bicycle parking, lockers and showers.



Many bicycle planners are experienced cyclists who are willing to cycle in mixed traffic and they assume what is acceptable for them should be acceptable to others. However, the vast majority of people are not prepared to risk injury, and their bicycle remains unused, apart from the occasional recreational trip on local streets or shared paths on weekends.

There is evidence from around the world that cities that have developed networks of cycling routes separated from general traffic have been the most successful in increasing cycling mode share. Pucher and Buehler (2008)¹⁷ provide a good summary of the success achieved in the Netherlands, Denmark and Germany in increasing cycling mode share. The mode share of cycling in these countries dropped by around 60 per cent to 70 per cent between 1950 and 1975. In the mid 1970s these countries adopted a policy transformation to reduce dependence on car travel and turnaround the sharp drop in cycling. A major strategy was the development of networks of safe cycling routes, including dedicated cycle paths, some bicycle lanes on lower volume streets and bicycle safe local street connections.

The success of the strategy adopted in the Netherlands, Denmark and Germany can be compared to that in the UK which took a minimalist approach to cycling (refer **Table 7.5**)

■ **Table 7.5 Long term changes in cycling mode share**

	1950	1975	2005
The Netherlands	52%	20%	27%
Denmark	42%	14%	18%
Germany	18%	6%	10%
UK	12%	2%	1%

Within countries there is significant variation in the success of different cities in achieving large increases in cycling. Copenhagen, for example, had by 2008 achieved a 29 per cent cycling mode share that is much greater than the Danish average. In terms of rebound, the experience of Berlin is noteworthy. By the mid 1970s cycling had reduced to about 3 per cent of all transport trips, only marginally more than in the UK. From 1975 to 2001, the number of cycling trips in Berlin nearly quadrupled to reach a mode share of around 10 per cent, which is almost 10 times the UK average. The foundation of the successful strategy adopted in Berlin was based on the implementation of a safe connected bicycle network. Pucher and Buehler (2008) comments as follows:

“In 2004, for example, Berlin (3.4 million inhabitants) had 860 km of completely separate bike paths, 60km of bike lanes on streets, 50km of bike lanes on sidewalks, 100km of mixed use pedestrian bike paths, and 70km of combined bus-bike lanes on streets.”

¹⁷ Pucher and Buehler. “Making Cycling Irresistible: Lessons from the Netherlands, Denmark and Germany” Transport Reviews, Vol. 28, 2008.



The lessons to be learned from the European experience is that busy roads and streets are a significant deterrent to cycling and that cycling will only be increased if connected safe networks of dedicated cycle paths on busy streets and bike lanes on lower volume streets are provided. If a turnaround is to be achieved in Bunbury a safe connected bicycle network of significant size and coverage will be required.

7.4. Current Bunbury Bicycle plan

The City of Bunbury Bicycle Plan (Cardno Eppell Olsen, April 2010) was adopted by the Bunbury City Council in June 2010 as a “guiding document” for future bicycle network and infrastructure planning. The Bunbury Bicycle Route Plan proposed by Cardno Eppell Olsen is shown in **Figure 7.2**.

The summary of the findings of the plan were:

- *“That the existing shared path network is of generally good quality and forms an effective base for the proposed casual path system;*
- *But that existing shared path facilities are often not continuous, with substantial gaps throughout the City;*
- *On-road cycling facilities tend to be of relatively poor quality due to the rural road design and lack of cycling infrastructure, with some isolated exceptions;*
- *The main commuting routes into the Bunbury city centre are of relatively poor quality with a number of safety constraints;*
- *Many of the existing intersection road crossings require modification to ensure effectiveness and safety.”*

7.4.1. Comment on current bicycle planning in Bunbury

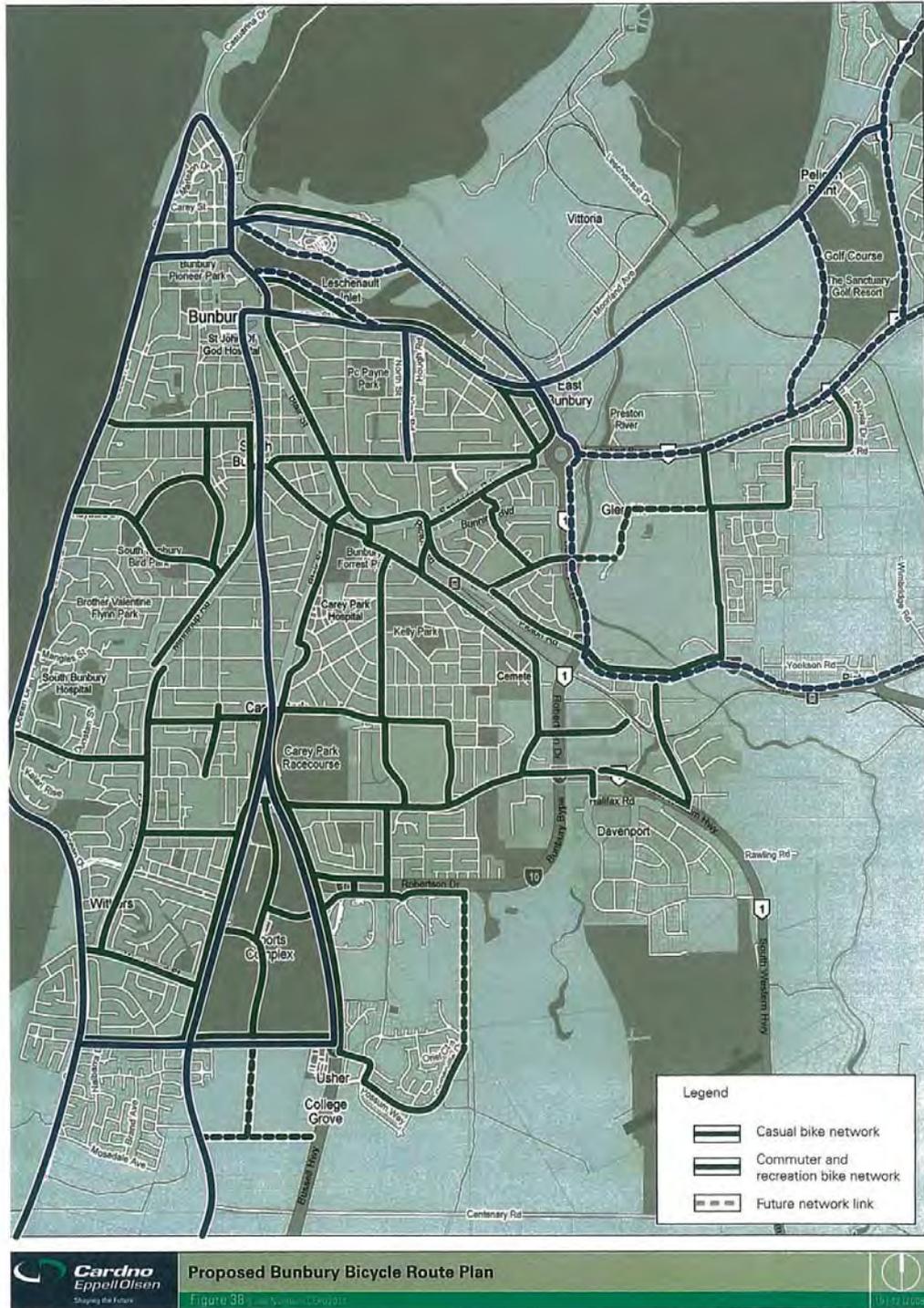
The proposed Cardno Eppell Olsen network plan is a significant step forward for bicycle planning in Bunbury. SKM supports the development of a fine grained bicycle network along the lines of that shown in Figure 7.2.

The principal shortcoming of the current plan is that it may be over optimistic in its goals to achieve significantly higher rates of cycling in the future based on current planning policy objectives. The plan does not acknowledge the current very low proportion of cycling in Bunbury and relies on past strategies such as the Perth Metropolitan Transport Strategy (1996) and Bike Ahead (1996) for strategic guidance and proposes that the Bunbury Bike Plan “*mirror the objectives*” of these plans.

With respect to Perth planning, the Cardno Eppell Olsen report states that “*current trends indicate that if no action is taken, cycling will account for only 8% of non commercial trips*” by 2031. SKM considers this to be very unlikely. Cycling mode share in Perth dropped from 5.7% in 1991 to less than 2% in 2012. Whilst there has been some minor increase in recent years, continuing with current policy and practice is most unlikely to see cycling in Perth increase above 3% mode share by 2031.



■ **Figure 7.2 Bunbury Bicycle Route Plan**



■ **Source: Cardno Eppell Olsen, April 2010.**



The current plan is largely based on the opinions of current users, who, by definition, are people prepared to ride on the existing network. SKM, based on experience summarised in section 7.3, is of the view that more consideration needs to be given to the many non – cyclists, who do not ride regularly because of perceived concern for safety when riding in mixed traffic or on bike lanes on busy roads.

This view is acknowledged to some extent by Cardno Eppell Olsen in its report:

“Experience in the field also suggests that there remains a large latent demand for cycling, waiting to be fulfilled through improved infrastructure, safer routes and education.”

SKM considers that the recommendations in the current plan for a more connected bicycle network should be supported and built upon, In particular, consideration should be given to construction of dedicated Copenhagen style bicycle paths that provide separation of cyclists from traffic.

7.5. Strategies to increase cycling

The following strategies to increase use of cycling and increase the safety of cycling in Bunbury are based on years of experience in some of the world’s great cycling cities.

Originally developed in the Netherlands many cities around the world have adopted the following principles for bicycle planning and design.

- **Coherence:** Consistent quality; ease of wayfinding, choice of routes;
- **Directness:** No unnecessary detours; faster than a car, constant speed; minimum delays;
- **Attractiveness:** Perception of a pleasant route; personal safety; ability to ride side by side;
- **Safety:** ¹⁸ Mix if possible; separate if necessary; no hard conflicts;
- **Comfort:** Smooth surfaces; minimal stops, protection against weather.

7.5.1. Plan, design and implement a connected principal network of bicycle routes

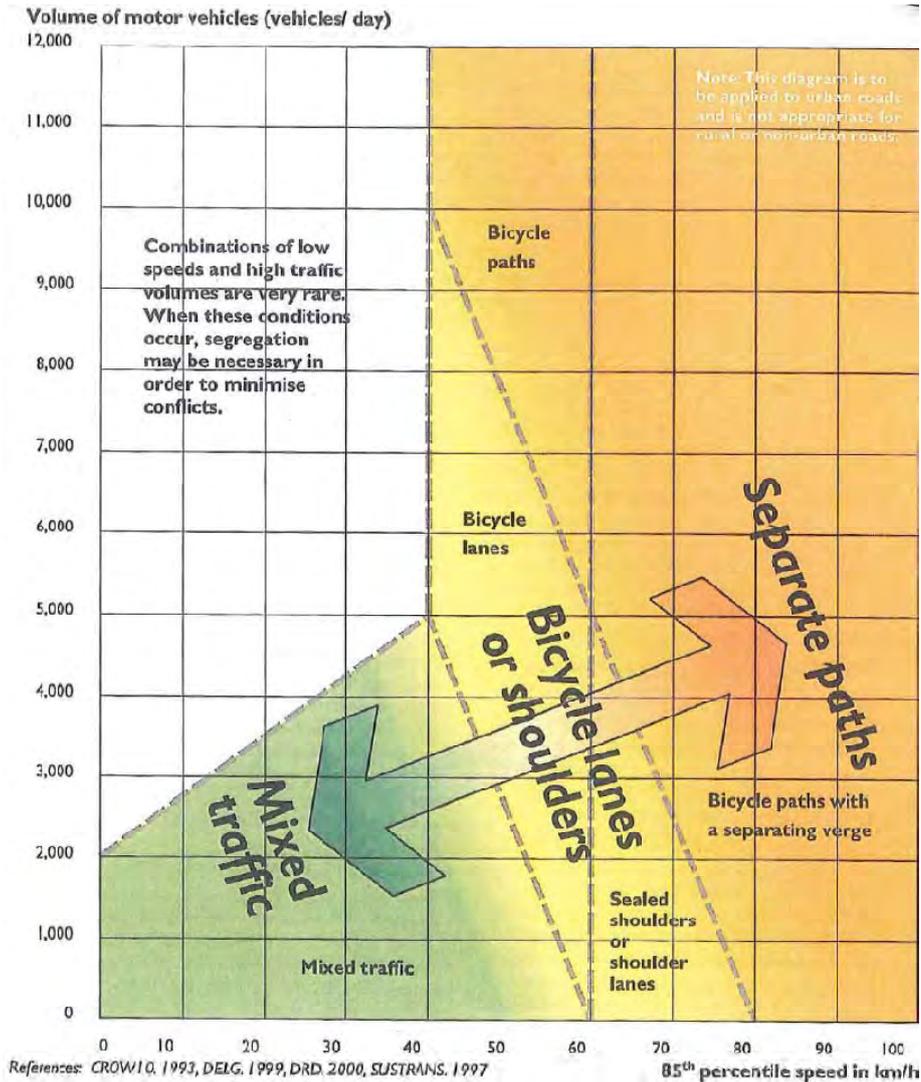
- Plan the network based on the principles of coherence, directness, attractiveness, safety and comfort;
- Make sure that the network provides for continuity of routes and a choice of routes for riders;

¹⁸ In the Netherlands cyclists often mix with traffic in slow speed streets, but on more major roads dedicated space is frequently provided.



- Plan and implement a range of bicycle route connections – cycling in mixed traffic on low speed low volume streets and separate paths on higher speed higher volume roads (refer **Figure 7.3**).

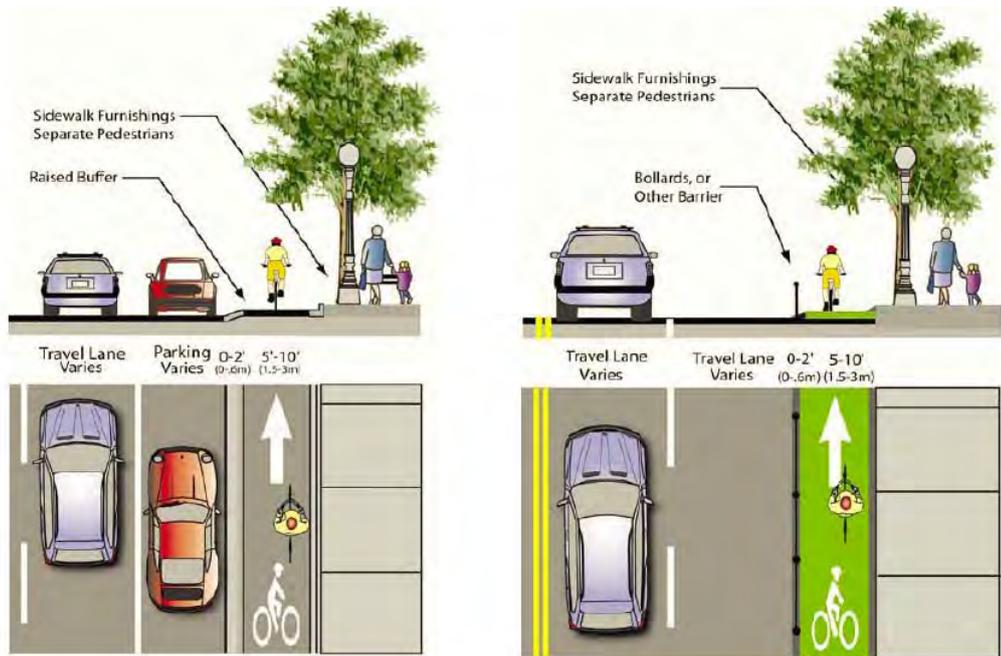
Figure 7.3 Separation of bicycles and motor vehicles according to traffic speed and volume.



- Source: Austroads : Cycling Aspects of Austroads Guides (2011)**
- Consider use of so called “Copenhagen style bike paths”. On busy streets these are normally one way on each side of the street. (Refer **Figure 7.4**). On less busy streets, two way Copenhagen style paths on one side of the street can be considered, especially where there are limited driveways or crossovers. Two way Copenhagen style paths require a greater level of control at busy intersections;



- Augment the City of Bunbury Bicycle Plan (2010) with the development of bicycle design guidelines for use in Bunbury, based on world's best practice (eg Design Manual for Bicycle Traffic; CROW, 2006). This is the approach taken in Portland, Oregon, the US City that has been most successful in achieving mode share growth in cycling;
- **Figure 7.4 Portland Oregon adaptation of Copenhagen style bike paths**



- **Source: Alta Planning & Design, Portland Oregon 2009.**
- Augment the City of Bunbury Bicycle Plan (2010) and the Bunbury CBD Walkability and Wayfinding Strategy (March 2010) by developing and implementing a comprehensive wayfinding and signage system that provides direction guidance to key destinations and localities served by the proposed principal bicycle network;
- Make sure that lighting for bike paths and lanes meet the users needs. Cyclists are vulnerable to debris on the paths and potholes. Also make sure paths and bicycle lanes are well maintained and free of overhanging tree branches;

The proposed introduction of Copenhagen style bicycle paths is new to Perth. It is proposed that a pilot project or similar be introduced to assess their suitability. Whilst the design of these paths can be adapted to suit local circumstances, there are a number of fundamentals that should be incorporated in design:

- There should be physical separation between cyclists and traffic;
- The bicycle path should be located between the property line and car parking, rather than between car parking and moving traffic;

- The bicycle path should be located close to traffic at signalised and other intersections to ensure that cyclists are as clearly visible as possible to motorists, including those performing turning manoeuvres.

Examples of Copenhagen style paths in use in Australia are shown in **Figures 7.5 and 7.6.**

Figure 7.5 One way Copenhagen style path (Melbourne)

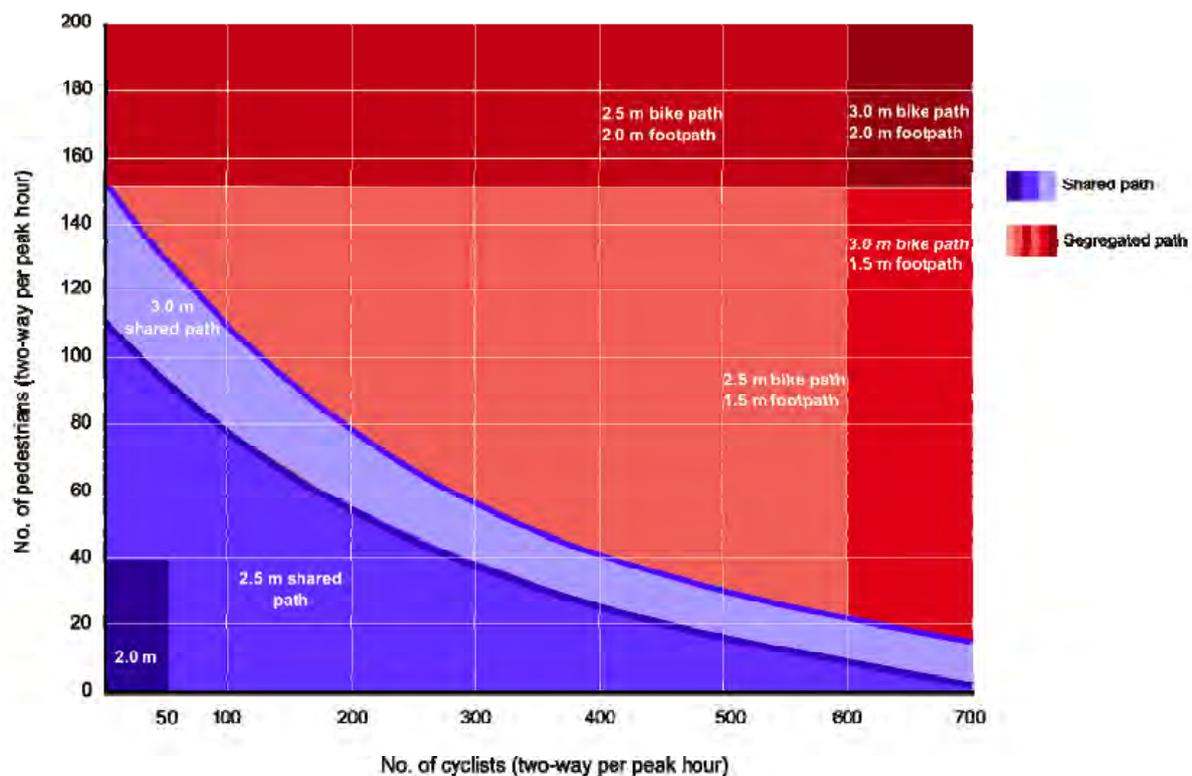


■ **Figure 7.6 Two way Copenhagen style path (Melbourne)**



7.5.2. Use shared paths to complement the principal bicycle network

- Ensure local shared paths are integrated into the broader bicycle networks, to provide for local access by cyclists, particularly for young people, access to schools, recreation areas etc;
- The width of the shared paths and the potential need to separate pedestrians from cyclists should be based on projected long term usage. **Figure 7.7** can be used to provide guidance on path width and the need for segregation.
- **Figure 7.7 Guidance on use of shared and dedicated paths**



7.5.3. Plan and develop safe and bicycle friendly intersection improvements and modified traffic signals

- Assess each intersection on the principal bicycle network and provide appropriate priority and safety measures for cyclists;
- Consider the use of brightly coloured bike paths or lanes at intersections and discuss options with Main Roads;
- Use advanced green signals for cyclists and advanced cyclists waiting positions at signalised intersections on the principal bicycle network;
- Modify design of roundabouts on the principal bicycle network to provide a segregated bicycle lane and advanced give way for cyclists on approach and slower entrance speed for vehicles.

7.5.4. Assess the potential of implementing slow speed environment in local streets

- Consider lowering the speed limit in local streets within the City of Bunbury to 40kph;
- Modify design of local streets to assist in compliance with lower speeds as part of a long term program of street upgrades;
- Where a local street has low traffic volumes and provides a useful link in the bicycle network with potential for medium to high use by cyclists, consider designating the street as a bicycle priority street. (Refer **Figure 7.8**).

Figure 7.8 Bicycle priority street – The Netherlands



7.5.5. Provide a range of end of trip facilities to encourage cycling

- Provide adequate public parking for cyclists in the Bunbury city centre, activity centres and other public facilities such as recreation centres and reserves. Design the bicycle parking to maximise security (lighting, video surveillance etc) and to provide shelter for bicycles and to enable them to be appropriately locked and secured;
- Consider developing standards for appropriate levels of bicycle parking at private developments that are in accord with the potential demand for cycling in this report. Prior to adoption, these standards would need to be assessed holistically with car parking standards to



ensure there is no overall loss in the provision of parking. For existing businesses, provide encouragement to owners and leasees to provide adequate bicycle parking;

- Work with the development industry and businesses on the provision of other end of trip facilities such as showers and changing facilities.
- Provide for safe, sheltered and secure bicycle parking at public transport park and ride stations, future high speed rail stations and at other major public transport stops in activity centres.

7.5.6. Develop a bicycle access plan to the Bunbury city centre

- Augment the City of Bunbury Bicycle Plan (2010) by undertaking a city centre street access plan that enables cyclists to mix with general traffic in a safe, low speed environment on the majority of city centre streets;
- Make provision for at least one dedicated bicycle route through the city centre with good linkages to the proposed City of Bunbury principal bicycle network.

7.5.7. Plan and develop a cycle to school plan

- Work with all schools in the City of Bunbury to encourage safe cycling to schools and develop safe cycling facilities (either on safe local streets or through provision of shared paths) to each school and to associated recreational facilities used by school students.

7.5.8. Promote cycling as a safe and healthy means of transport and involve the community in bicycle planning

- Develop an awareness campaign that focuses on the benefits of cycling;
- Provide a web site and blogs that will provide the community with access to up to date and relevant data on bicycle planning and design including that undertaken in leading bicycle cities;
- Work with local businesses and educational institutions to establish education and training programs for safe cycling;
- Establish a relationship with the local police to provide guidance and encourage cyclists to employ safe cycling practices;
- Establish a City of Bunbury cycling group, led by the City of Bunbury and with representation of doctors, educators and the community to promote cycling as a safe and healthy means of transport.

7.6. LPS-ITS intentions, strategies and actions (cycling)

LPS-ITS intentions:

- Make cycling in Bunbury a safe and highly valued form of transport;
- Increase the mode share of cycling in the City of Bunbury from about 2 per cent at present to 5 per cent by 2031 and to 8 per cent in the longer term around 2050.



Key strategies:

- Plan, design and construct a connected comprehensive network of bicycle routes (ie the Bunbury Principal Bicycle Network) based on the five principles of coherence, directness, attractiveness, safety and comfort;
- Develop and implement a comprehensive city wide wayfinding and signage system;
- Use shared use paths and a “local” bicycle network system for access to schools, small centres and to connect as feeders to the principal bicycle network;
- Modify the local street environment, where possible, to cater for safe bicycle usage;
- Provide parking for bicycles and other end of trips facilities;
- Develop a bicycle access plan for the Bunbury city centre;
- Promote cycling as a safe and healthy means of transport.

Three year actions

- Undertake a pilot project (or similar) to enable an evaluation of a Copenhagen style cycle path in Bunbury along one of the major commuter routes into the city (eg Spencer Street).
- Establish a Bike Planning Implementation Working Group, with a quarterly meeting cycle synchronised with the annual budgeting process, to review the implementation of scheduled works and to priorities new works in forward plans (including preparation of grant submissions where appropriate) in accordance with the adopted City of Bunbury Bicycle Plan. Establish a Bike Planning Implementation Working Group, with a quarterly meeting cycle synchronised with the annual budgeting process, to review the implementation of scheduled works and to priorities new works in forward plans (including preparation of grant submissions where appropriate) in accordance with the adopted City of Bunbury Bicycle Plan Adopt a 20 year plan for cycling including a principal bicycle network in Bunbury based on the approved strategies.
- Review the City of Bunbury Bicycle Plan (2010) by 2015 with regard to the recommendations and strategies of the LPS-ITS, including:
 - Establishing a community cycling reference group to promote cycling in Bunbury and to assess the feasibility and viability of the strategies proposed in this study;
 - Following consultation, formally consider the proposed bicycle planning principles and strategies and approve or modify as necessary;
 - Preparation of an internally revised 20 year plan for cycling that includes a Bunbury Principal Bicycle Network Plan based on the approved strategies, and an associated prioritised and costed schedule of casual, commuter and recreational infrastructure upgrades and remedial maintenance works for informing the preparation of the 10 year Capital Works Plan and Asset Management Plans.



8. Walking

In this report, reference to walking and pedestrians should be taken to include people in a wheelchair and other people with disabilities requiring the use of similar aids.

Walking is an important part of an integrated transport system. Its importance will grow as more people use public transport and as activity centres and corridors become more prominent.

Walking is a universal means of transport that is available to and used by almost everybody. It is a particularly important and independent means of transport for a variety of people, including those requiring the use of wheelchairs, those who are blind or partially blind, young people and some elderly people that do not have a driving licence.

8.1. Benefits of walking

Walking provides many of the same benefits to individuals and to society in general as does cycling. . According to Heart Foundation data, physical inactivity accounts for around 6% of the burden of disease in Australia and contributes to poor employee health and absenteeism. In turn it is estimated that poor health and absenteeism costs Australian business \$7 million annually.^{19, 20} Increased levels of walking can:

- Provide an independent means of travel to people who, for one reason and another, are unable to travel by other means, other than being driven by or assisted by others;
- Assist in reducing congestion;
- Improve health and fitness;
- Provide a low (or zero) cost means of travel.

Walking is also an essential part of travel by other modes – walking to/from bus stops and train stations, walking to/from car parks and walking to/from some bicycle parking areas. This means that walking makes an important contribution to improving accessibility to a variety of places and activities by people of all ages.

¹⁹ National Heart Foundation of Australia, 2007, The Burden of Cardiovascular Disease in Australia for the Year 2003 (2006). Report by Vos T and Begg S, Centre for Burden of Disease and Cost Effectiveness, University of Queensland School of Population Health.

²⁰ National Heart Foundation of Australia, 2005, The Shifting Burden of Cardiovascular Disease in Australia, report by Access Economics Pty Limited.

8.2. Current levels of walking, trends and potential for future demand

Walk to work trips in the City of Bunbury are low at 2.4 per cent (2006) having decreased from 2.6 per cent in 2001. This is similar to the proportion of walk to work trips in Perth in 2006 (2.7 per cent), although Perth walk to work trips are now on the increase from a low of 2.2 per cent in both 1996 and 2001. Over a long period of time, walk to work has declined by 39 per cent in all Australian capitals from 5.6 per cent in 1976 to 4.0 per cent in 2006.

In the Perth Metropolitan area, walk to work trips are considerably higher in inner municipalities as shown in **Table 8.1**.

■ Table 8.1 Mode share walk to work by locality (2006)

Location	Percentage
Perth	30.5%
Subiaco	10.3%
Fremantle	11.3%
Scarborough	2.2%
Maylands	2.9%
Clarkson	2%
Marangaroo	1%
Wanneroo	1.5%
Perth Metro	2.7%

Walking used to be the main mode for travel to school. **Table 8.2** summarises figures taken from the NSW Household Travel Surveys.

■ Table 8.2 Mode of transport to schools, Sydney

	1971	1999 – 2003
5 – 9 year olds (walk)	57.7%	25.5%
5 – 9 year olds (driven)	22.8%	66.6%
10 – 14 year olds (walk)	44.2%	21.1%
10 – 14 year olds (driven)	12.2%	47.8%

Source: Hiddle, P van de Ploeg et al, School of Public Health, University of Sydney

The Perth walking strategy published in 2000 confirmed walking to school at 23 per cent with students driven to school at 52 per cent. (Perth Walking: The Metropolitan Region Pedestrian Strategy, Department of Transport, Perth, 2000).



Walking to school is now less than half what it was in the 1970s. This trend is evident across Australia.

Walking for all trip purposes is higher than walk to work, however, data is less readily available. The Perth and Region Travel Survey provides the following data for Perth Regions (**Table 8.3**).

■ **Table 8.3 Walking mode share all purposes (2003 – 2006)**

Region	Percentage
Perth inner area	12.8%
Perth S/E Corridor	7.5%
Perth Metro	10.7%

These figures show that overall walking in Perth has increased slightly since the 10 per cent estimated in 1991 in the Perth Metropolitan Transport Strategy.

This limited data suggests that there is potential for some increase in walking if population and density increases within the City of Bunbury and particularly if walking conditions are improved to make it more comfortable, convenient and safer. In the longer term neighbourhood street network changes, such as those promoted in Liveable Neighbourhoods, (refer **section 8.3**) will provide the opportunity for more people to walk.

The mode share targets for walking in the City of Bunbury are as shown in **Table 8.4**.

■ **Table 8.4 Walking mode share targets for City of Bunbury**

	2011	Target 2031	Target 2051
Estimated mode share	8%	10%	12.5%
Estimated daily trips	9,100	14,000	22,000

There is potential for these walking mode shares to be increased beyond that shown in **Table 8.4** if the percentage of children walking to school can be increased significantly, in addition to an increase in people walking to work.

8.3. Context of Liveable Neighbourhoods

The Western Australian Planning Commission (WAPC) endorsed the fourth edition of *Liveable Neighbourhoods* in 2007 as an operational policy to replace a range of issues based development control policies. *Liveable Neighbourhoods* is intended to be an integrated planning and assessment tool for the preparation of structure plans and subdivision layouts to guide the further development



of Perth and the regional cities and towns of Western Australia (i.e. new 'greenfield' sites at the urban edge, or on large 'brownfield' urban infill sites).

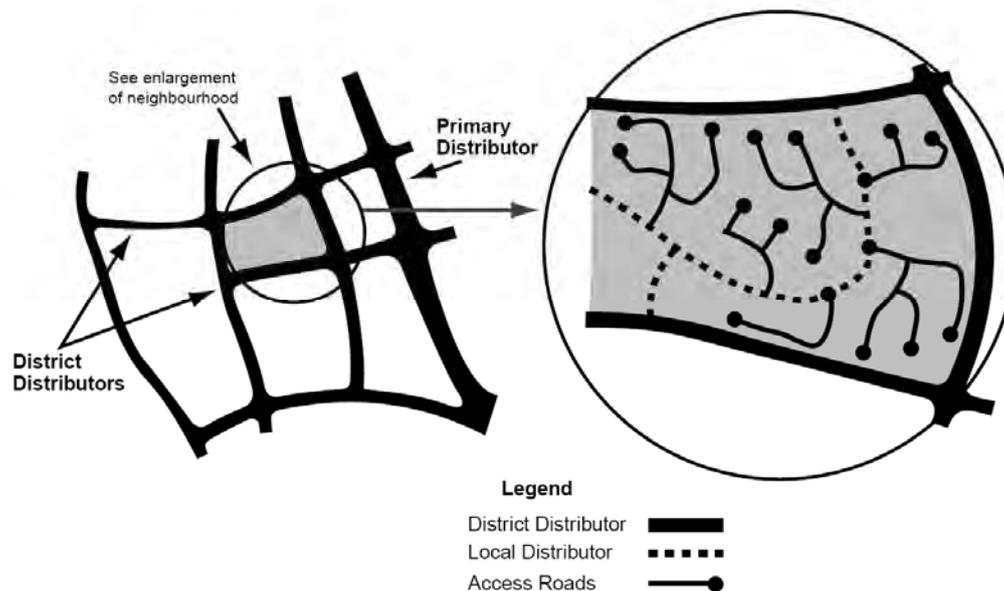
Liveable Neighbourhoods has undergone a protracted period of testing and review, but its purpose has remained essentially consistent with it being a neighbourhood design code that seeks to facilitate the development of more liveable and sustainable communities. As such it has express relevance to integrated transport and land use planning, in that its main aims are to:

- provide for an urban structure of walkable mixed use neighbourhoods in order to reduce car dependence;
- provide an interconnected network of streets to facilitate safe, efficient and pleasant walking, cycling and driving;
- foster a sense of community and strong local identity in neighbourhoods;
- facilitate mixed use urban development, which is capable of adapting over time as the community changes; and
- provide an innovative approach to sustainable urban development in a bid to create better neighbourhoods.

Since its voluntary introduction in 1997, the *Liveable Neighbourhoods* community design code initiative has arguably been more influential on urban form in Western Australia, including the design of neighbourhoods and centres, than any other planning policy in recent times. However, due to the long lead times between urban planning and established development, its overall results have yet to be comprehensively assessed (LPSACN, 2012).

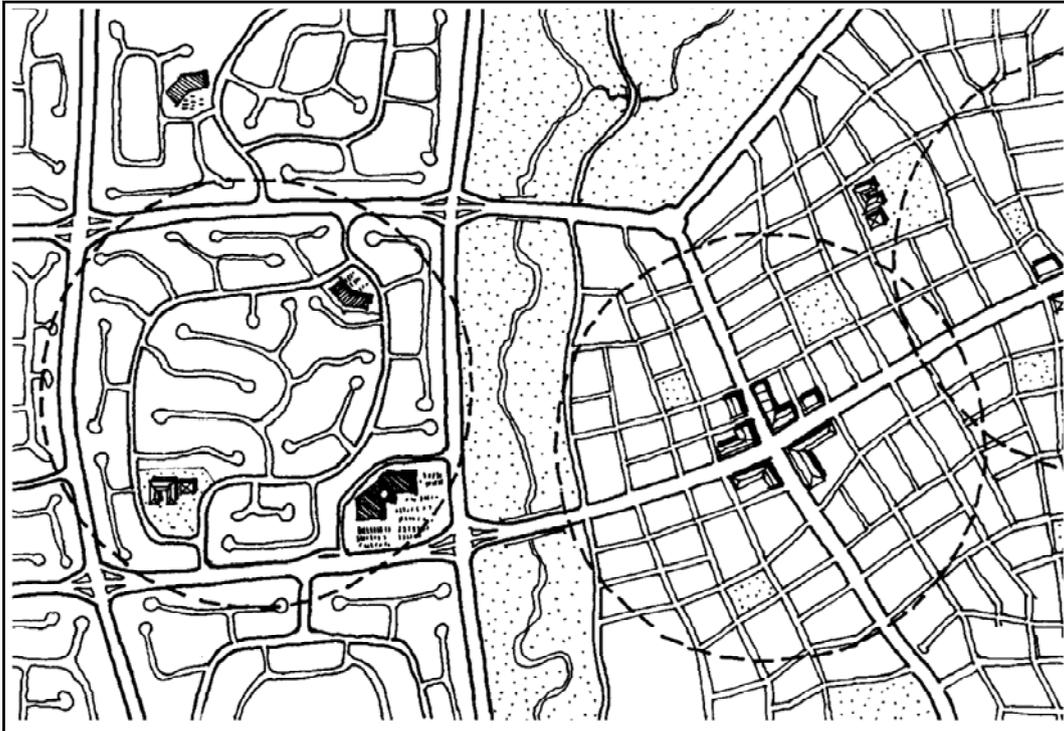
Prior to *Liveable Neighbourhoods* coming into effect, the development control policies of the WAPC promoted more conventional subdivision planning according to 'cells', which located neighbourhoods between arterial roads in large single land use components. Neighbourhood centres comprising shops, open space and a school were then located within this cell. Access was gained via a curvilinear hierarchical street structure with a segregated pedestrian network (see **Figure 8.1**). This model of suburban development reflected a car dominated approach to planning that generally persisted in much of the planning in Australia and North America up until the 1990's. Such planning models were deliberately created in response to, and in return have facilitated the dependence upon, private cars as the primary means of personal transport. This, in turn, required extensive main road systems to move people and goods any significant distance between where they live, work or shop.

- **Figure 8.1** Extract from DC1.4 Functional Road Classification for Planning, showing illustrative layout of road hierarchy and network.



Liveable Neighbourhoods marked a return to more traditional approaches to subdivision and urban design by seeking to integrate land uses within a network of interconnected streets designed for all users. It promotes neighbourhood centres being located at the intersection of major streets to provide for retail exposure. Large parks and standard sized schools are located between neighbourhoods so that walking access to the centre is not compromised (see **Figure 8.2**). This envisages each residential neighbourhood being configured as an interconnected responsive network of streets (as distinct from the rigid grid that typifies many traditional urban areas, or the spaghetti like cul-de-sac mazes typical of modern suburban areas); thus facilitating easy and intuitive through movement or ‘permeability’ for pedestrians and cyclists as well as motorists.

Figure 8.2 Extract from Liveable Neighbourhoods regarding Element 1, showing comparison between conventional and traditional road layouts.²¹



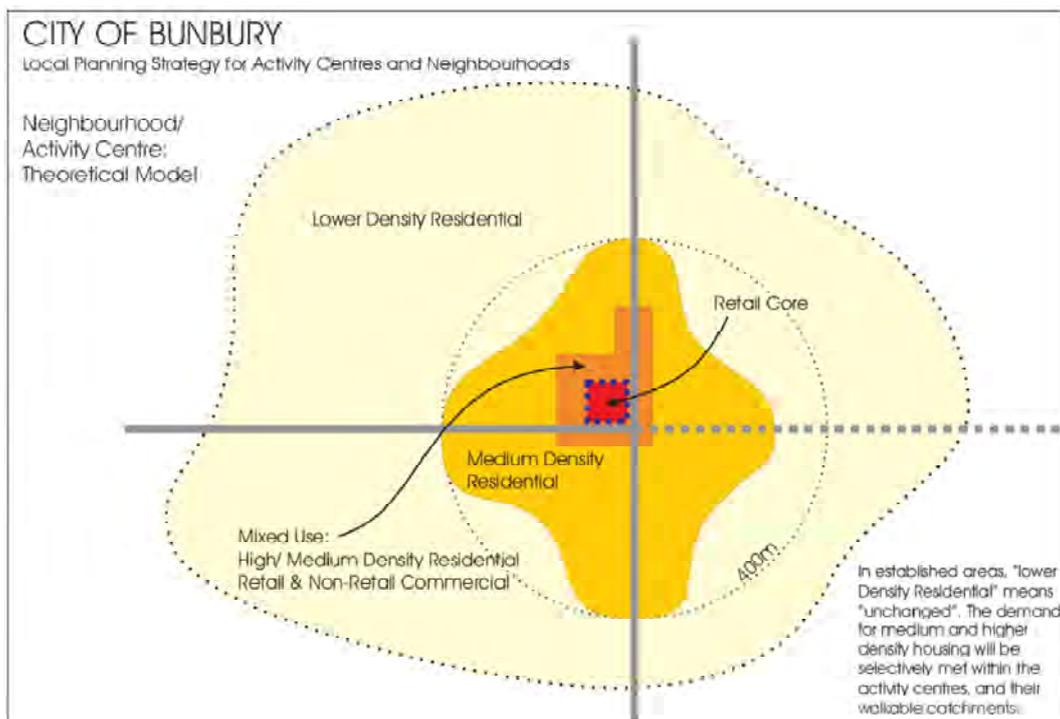
Since Bunbury has experienced most of its growth since the 1950's, it has been the conventional planning theories and models that have been applied throughout much of its development, and hence, has fundamentally influenced the design of Bunbury's transport systems. Such models of subdivision and zoning have advocated the separation of dormitory suburbs away from places of employment and the dominance of large stand alone shopping centres and showroom complexes at the expense of traditional main streets and neighbourhood centres (e.g. the corner stores).

To redress the problems associated with the city's urban form whilst also facilitating appropriate urban renewal and infill redevelopment to accommodate a projected regional population of around 150,000 - the City of Bunbury sought to implement the principles of *Liveable Neighbourhoods* through its adoption of both the Local Planning Strategy for Activity Centres & Neighbourhoods (LPSACN) and associated R-Code Omnibus Amendment. In summary, the Strategy and subsequent amendment has established a planning framework that provides for the following desired outcome (see **Figure 8.3**):

²¹ Diagram from page 19 of *Liveable Neighbourhoods Community Design Code*, Edition 1, December 1997.

“A local activity centre, comprising retail and other facilities, is centrally placed within the neighbourhood to create an identifiable community focus, with the centre strategically located on the street grid to benefit from some passing traffic as well as serving local residents – the neighbourhood area is based on a 400-450m radius, five minute walk to the centre. Having sufficient residential density is crucial if the concept is to work effectively, because the higher the neighbourhood population the greater the number of walking and cycling trips to the centre – thus reducing overall car dependence – and the greater the likelihood that the centre itself will be adequately supported. At the wider level, the neighbourhood units are repeated and clustered to form a town. The LPSACN embodies these key design principles while recognising the difficulty of applying what is, in effect, an idealised model to an urban fabric that is already largely established.”

Figure 8.3 The ‘ped-shed’ concept as applied in adapting Liveable Neighbourhoods principles to the Bunbury context.²²



In doing so, the LPSACN promotes urban design of both ‘brownfield’ and ‘greenfield’ areas that maximises their accessibility, especially for pedestrian access, to facilities at the centre of a neighbourhood, district or city centre (i.e. and activity centre). As such, the LPSACN applied the

²²

City of Bunbury Local Planning Strategy for Activity Centres & Neighbourhoods (December 2010), adopted 22 March 2011.



walkable catchment calculation technique (also referred to as the ped-shed calculation) in accordance with appendix 3 of *Liveable Neighbourhoods*. This technique is based upon well established evidence that typically most people will consider walking a distance of up to 400 metres (five minutes walk) to daily activities, or 800 metres (10 minutes walk) to a train station, major bus station, or town centre. A well connected street network should achieve at least 60% efficiency (meaning that 60% of the area in a 400 metre radius of the destination can be reached by a 400 metre walk along streets).

8.4. Barriers to walking

The major barriers to walking are:

- Urban development patterns with low density creating long walking distances from home to work and other activities;
- Subdivisions created with indirect street patterns that increase walking distances;
- Lack of footpaths along some streets;
- Lack of pedestrian crossing facilities of major streets and at intersections;
- A perception by parents that walking to school and for other activities is more dangerous than it actually is (both from a road safety point of view and the “stranger/danger” factor).

8.5. Strategies to increase walking

The following strategies designed to increase the level of walking are based on:

- Development of walking routes that are safe, direct, comfortable, convenient and well connected;
- Use of behaviour change programs such as TravelSmart to encourage and promote walking in conjunction with other active modes;
- Comprehensive plans to increase walking (and cycling) to schools;
- Improved maintenance of paths and enforcement to ensure paths are not obstructed by parked vehicles.

8.5.1. Upgrade the path network

- Provide a path on at least one side of local streets and on both sides of neighbourhood connectors, distributors and major arteries;
- Provide safe crossing points of all major roads and distributor roads at regular intervals and points of high demand using a combination of signalised crossings, zebra crossings and island (median) crossing points and, in a limited number of places, bridges or underpass of major roads;



- Separate cyclists and pedestrians where warranted by usage and future demand;
- Reduce delay to pedestrians through short signal cycle times and provision of zebra crossings where possible.

8.5.2. Transform the Bunbury central area into a high quality safe walking environment

- Implement the findings of the Bunbury CBD walkability and wayfinding strategy.

8.5.3. Introduce a safe walk to school program

- Make sure the pedestrian network around the schools is safe and convenient to use by school children;
- Provide safe crossing points of streets and intersections and employ school crossing personnel where necessary;
- Introduce safe walking programs such as the “walking school bus” with the full planning and involvement of the school and parent organisations; and
- Promote safe driver behaviour through appropriate local area traffic management measures and by policing vehicle speeds within 40kph school zones - in order to ensure the safety of children and parents using pedestrian pathways and road crossing points.

8.5.4. Ensure paths are well maintained and kept clear

- Undertake regular maintenance to fix potholes, etc;
- Regularly trim trees branches and require adjacent residents to trim trees on their property;
- Establish an education and enforcement program targeted at parking on footpaths.

8.5.5. Promote walking as a safe and healthy means of transport and involve the community in pedestrian pathway planning

- The Heart Foundation supports a network of community based walking groups across Australia, including approximately nine groups in the City of Bunbury, such as “Walk-it Bunbury”. Walking groups are self organised and coordinated by volunteers in neighbourhoods, clubs and workplaces.
- The Heart Foundation walking network is part of a broader Heart Foundation work agenda to encourage and support walking and other physical activity. Of relevance to the LPS-ITS and planning generally, is that this agenda includes resources such as Healthy Spaces and Places and Healthy by Design (focusing on enhancing supportive environments for physical activity)



and a communications/social marketing component aimed at raising the profile of walking as a fun, free and accessible physical activity option.

8.5.6. LPS-ITS intentions, strategies and actions (walking)

LPS-ITS intentions:

- Increase the mode share of walking in Bunbury from 8 per cent in 2011 to more than 10 per cent by 2031 and more than 12.5 per cent by 2051.

Key strategies:

- Upgrade the path network and provide safe, convenient street crossings;
- Transform the Bunbury central area into a high quality, safe pedestrian precinct;
- Introduce safe walk to schools programs;
- Promote and facilitate community based and workplace walking groups in support of the Heart Foundation Walking programme; and
- Maintain and keep paths free of obstructions such as tree branches and parked cars.

Three year actions:

- Undertake a footpath and pedestrian street crossing audit for all Bunbury streets;
- Adopt a “pedestrian first” policy for movement in the Bunbury city centre;
- Discuss means to increase walking to all schools within the city and develop and prioritise walk to school plans;
- Establish a combined education and enforcement campaign to raise community awareness of the problems associated with the parking of vehicles over footpaths and cycleways in order to keep these paths clear of obstructions. The key messages being - that this poses a danger to pedestrians and cyclists and a blockage to wheelchair, pram and mobility scooter users, etc.



9. Parking in the city centre

In section 4 of this report analysis was undertaken on how people would travel to a city centre of double its current size over 30 to 40 years. It is estimated that the mode share of car driving would decrease from the current estimated level of 79 per cent to about 60 per cent over a period of 30 to 40 years. Walking and cycling to the city centre is expected to double over this period and public transport could increase from a low level of 2 per cent to about 15 per cent over a 30 to 40 year timeframe. The strategy to provide park and ride as part of the major public transport system will result in people parking outside the city centre and travelling to the city by public transport. This will result in the need for lower levels of parking in the city centre and travelling into the city over time, particularly private parking for work purposes.

The 2011 parking review undertaken by Luxmoore Parking for the City of Bunbury showed that, on average, there is a vacancy rate at city centre car parks of 32 per cent. The May 2012 update review report undertaken by Luxmoore Parking Consulting showed the average occupancy to be 71% and the maximum occupancy during the survey to be 82%. The parking occupancy was less than the target of 85 per cent in all areas at times of peak demand. This indicates that the current level of parking is appropriate to cater for demand, given the current parking charges.

If, as intended, the mode share of walking, cycling and public transport increases and car driving decreases, then it follows that the level of parking required for the same intensity of development will decrease. It is appropriate therefore that minimum levels of car parking required for city centre development be decreased over time in parallel with improvements to the alternative modes of transport-walking, cycling and public transport. It is recommended that the City of Bunbury review its minimum levels of car parking in the city centre in 2015, following an assessment of public transport improvements introduced and the availability of parking space within city centre public car parks.

The price of parking and the supply of private parking will have an impact on how many people choose to drive and how many choose to walk, cycle or use public transport to the city centre. A parking demand management strategy, which includes provision of park and ride outside the city centre, less parking in the city centre and a gradual increase in price for city centre parking will assist in reducing the amount of driving. This in turn will contribute to reduced levels of congestion, improved amenity for residents, business and visitors and improved safety for people walking and cycling in the city centre.

Reduced minimum levels of car parking required for future developments in the city centre over the next 30 to forty years will result in a cost saving. However, reduced levels of parking and driving will mean increased travel on foot, by bicycle and on public transport. This will require an increase in spending to provide safe infrastructure and improved services for travel by these modes.



It is therefore recommended that a portion of the money saved by provision of reduced levels of parking be charged to developers as “cash in lieu” and used to improve walking, cycling and public transport.

9.1. Parking supply and pricing strategy

There is general support for the findings of the Luxmoore Parking Consulting report (May 2012). The points below reinforce a number of key issues in the broader context of the LPS-ITS planning.

- Continue to regularly undertake a comprehensive review of car parking demand management study with a view to gradually reducing the minimum level of parking required in the Bunbury city centre over time;
- Apply a cash-in-lieu payment amounting to half of the cost saving from the reduced level of parking provided. Applying half the cost saving, rather than the whole cost saving, enables the developer to share in the cost saving from reduced parking. If the whole cost of reduced parking was taken in cash-in-lieu, developers would not voluntarily reduce the level of parking they provide, resulting in the Council not receiving cash-in-lieu for park and ride and the other purposes outlined below. The cash-in-lieu payment to be paid into a trust account. Funds in the trust account only be used for park and ride, public parking in or on the periphery of the city centre, bicycle parking or bicycle access improvement, public transport improvements or improvements to walking in the city centre;
- The price of public car parking (including on-street parking) be reviewed annually with a view to maintaining car park occupancy below 85 per cent;
- Every five years, a broader based review of car parking be undertaken to assess the quantum of public parking to be provided in the city centre and at park and ride stations and to review the pricing policy for parking and the charges for cash-in-lieu.

9.2. LPS-ITS intentions, strategies and actions (parking)

LPS-ITS intentions:

- Provide an adequate level of parking to meet demand for car travel to the city centre that is consistent with improvements to other modes of transport – walking, cycling and public transport.

Key strategies:

- Review the price charged for public parking on an annual basis with a view to modifying demand and maintaining car park occupancies below 85 per cent;
- Implement a reduced minimum level of private parking for developments in the Bunbury central area in association with a cash-in-lieu payment to be used for improvement to public



transport (including park and ride) walking and cycling improvements and provision of public car parking, when required.

Three year actions:

- Continue and monitor periodically the staged implementation of the recommendations set out by Luxmore Parking Consulting, in its May 2012 review of CBD parking in Bunbury;
- Review minimum parking requirements for developments in the Bunbury city centre and the Bunbury central area in 2015, in the light of improvements implemented to public transport, walking and cycling and the intention to increase the proportion of travel by these modes to / from city centre.
- In 2015, review and update as necessary, city centre and central area parking policies in consultation with business and the broader community; and
- In the light of the proposed LPS-ITS strategies, undertake an assessment of the likely demand for increased levels of public parking in the Bunbury central area within 10 years, 20 years and up to a feasible limit over the longer 30 to 40 year timeframe and commence an investigation into potential locations, viability and feasibility for public parking, as recommended in the Luxmore Parking Consulting report dated May 2012.

10. Streets for living, business and movement

The intentions and strategies for street planning and design outlined in this report are generally in accordance with the principles outlined in *Liveable Neighbourhoods* (Western Australian Planning Commission, 2008, as updated from time to time). *Liveable Neighbourhoods* specifically states that it “ is not intended to be a traffic engineering manual. It provides a guide to principles for designing integrated networks and street design and construction”

In particular this study supports the following principles advocated in *Liveable Neighbourhoods*:

- A highly interconnected street system aimed at reducing local travel distances and related emissions and energy use;
- More land efficient street reserves, including narrower pavement and lane widths that concurrently promote reduced vehicle speeds, reduced kerb radii and increased requirements for footpaths and large street trees.

A select number of streets will need to be developed as freight routes and high volume traffic arteries. These routes are generally unsuitable for living and mixed use businesses with direct access from the street. They are designed for the movement of large numbers of vehicles, for the movement of commercial vehicles and large trucks. Speed limits on these roads are generally 60kph or more.

However, the principal function for most residential and mixed use streets is for living, local businesses in mixed use centres and local access. Accordingly there is no requirement to move large volumes of traffic on these streets, nor is there a requirement for traffic to travel at other than low speeds.

Most of the street network in Bunbury is already in place. There will, therefore be limited opportunities to modify the network. However over time, streets will need to be reconstructed and this may provide an opportunity to re-design some streets more in keeping with the wishes of residents for slower and safer local streets.

10.1. Local street design

“For too long the focus has been on the movement function of residential streets. The result has often been places that are dominated by motor vehicle to the extent that they fail to make a positive contribution to the quality of life”.

Source: Manual for streets – UK Department of Transport, 2007

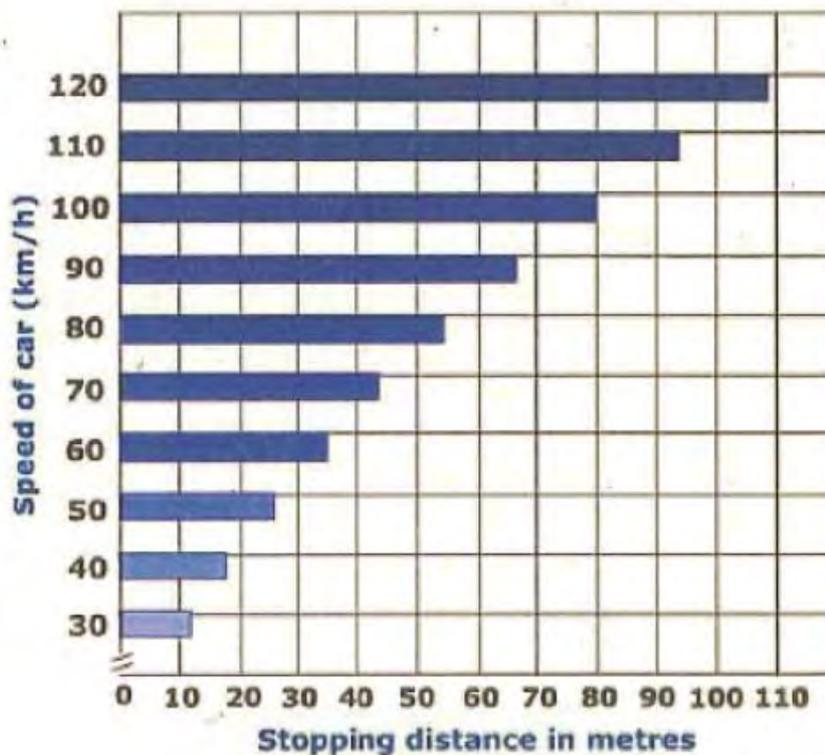
Residents almost always want the traffic on the streets where they live to travel slower. They almost never request streets to be redesigned to encourage faster traffic. On purely local urban



streets, there is no transport need for vehicles to travel at a speed greater than 30kph. People generally travel short distances on local streets and the time advantage of a higher speed limit would be negligible in the context of overall daily travel.

There is a significant safety benefit if streets can be designed for slower traffic speeds. Average stopping distances for different speeds are shown in **Figure 10.1**.

■ **Figure 10.1 Vehicle stopping distances for different speeds**



Vehicle stopping times are based on average reaction times plus average braking times. On average it takes about 11.5 m to stop from 30 kph and 27 m to stop from a speed of 50 kph. A vehicle travelling at 50 kph would still be travelling at 40 kph if it were to hit a pedestrian 12 m away. A design speed of 30 kph is therefore appropriate for local streets. There are various ways in which the design of the street can achieve lower driving speeds:

- Limit length of straight sections;
- Narrow road pavement;
- Encourage on-street parking;
- Create single lane passing areas;
- Reduce forward sight distance;
- Create small radii on entry to the street.



Not all of the above will be practical or desirable in every case, but the holistic design should provide a clear message to the driver that other than low speed travel is unacceptable.

In the past, it was common practice to construct local streets to a width of 7.2 meters. **Figure 10.2** shows a street in undulating dunal land where the custom is to park on the verge leaving the entire road pavement available for moving traffic. Typical traffic speeds on this local street are about 60 kph, notwithstanding the applicable general urban speed limit of 50kph.

■ **Figure 10.2 Local 7.2 m wide street with no parking**



Figure 10.3 shows how, with different parking customs, a similar width local street has significantly greater side friction and much lower speeds – around 30 – 40 kph on most occasions.



■ **Figure 10.3 Local 7.2 m wide street with parking**



Figure 10.4 is an example of how traffic management measures have been introduced in local streets to reduce traffic speeds. Residents' reaction to these measures is varied, but they are often considered a barely acceptable response to unacceptably high speeds as a result of a poorly designed local street.

■ **Figure 10.4 Wide local street with traffic calming**

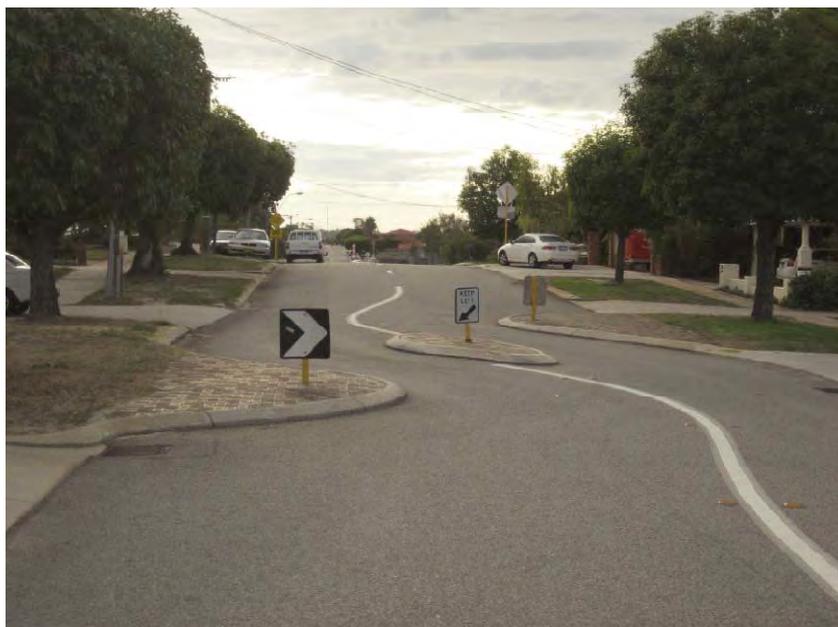


Figure 10.5 is yet another response to lower traffic speed on a street with a design similar to that in **Figure 10.2**. This treatment has provided embayed parking that has been successful in reducing traffic speeds in both directions.

■ **Figure 10.5 Indented parking used to create one lane slow point**



These examples demonstrate some of the deficiencies of local street design that permits traffic to travel much faster than is necessary or desirable. In some cases, high speed traffic and pressure from local residents has resulted in traffic calming devices being retrofitted.

10.2. Neighbourhood connector and distributor streets

These streets typically carry traffic volumes of between 3,000 and 15,000 vpd. There is a realistic expectation that these streets permit free flow of traffic in both directions. However, as with local streets they often encourage or permit traffic to travel too fast.

Outside of activity corridors and mixed use centres it is reasonable for these streets to have a design speed of 50 kph. **Figure 10.6** shows how a neighbourhood connector in a new subdivision has used a median island, indented parking and tree planting to effectively maintain traffic speeds of below 50 kph.



- **Figure 10.6 Neighbourhood connector in new subdivision**



Figure 10.7 shows how a wide distributor street has been modified to slow traffic by provision of central tree planting and kerbside bicycle lanes.

- **Figure 10.7 Distributor road modified with central tree planting**





Management of traffic through urban villages or activity corridors pose particular problems. In these areas there are often high volumes of pedestrians with a need to cross relatively high volumes of traffic that is often travelling at an unacceptable high speed.

Figure 10.8 shows Scarborough Beach Road through the Doubleview centre.

■ **Figure 10.8 Scarborough Beach Road, Doubleview**

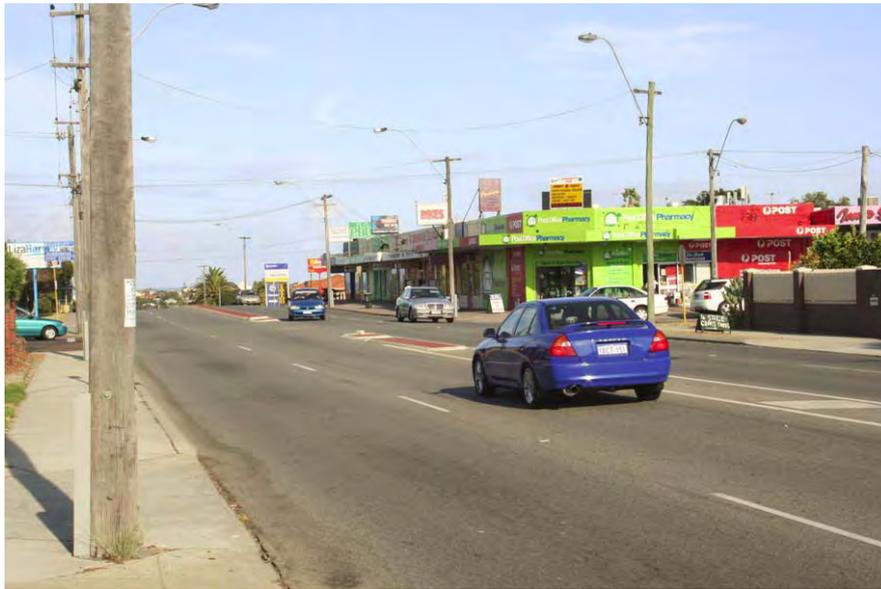


Figure 10.9 shows Scarborough Beach Road through the Mt. Hawthorn centre.

■ **Figure 10.9 Scarborough Beach Road, Mt. Hawthorn**





The traffic volumes along both section of this road are similar, but the street design, traffic speeds and accident records are very different. In the Doubleview section, a significant volume of traffic travels faster than 60 kph resulting in this length of street being classified as a black spot (131 recorded road crashes on a 330 m length of road in 5 years). The speed through the Mt Hawthorn section is in the range 30-40 kph and this section of street has a significantly better safety record.

The general urban speed limit of 50 kph would be expected to apply to most neighbourhood connector and distributor roads in Bunbury, although there could be a few instances on major distributors where a 60 kph speed limit would apply. However, there are some locations along these streets (through strip shopping centres and activity centres) where lower speed limits and changes in design to support lower speed is appropriate.

The concept of **context sensitive planning and design** has been developed to enable streets along a continuum with similar traffic volumes and similar classifications to be designed in different ways. The US Institute of Transportation Engineers and the Congress for New Urbanism have combined to prepare a recommended practice for “*Designing Walking Urban Thoroughfares: A Context Sensitive Approach*”. This report provides useful advise on the reasons why a different design approach is preferred in activity centres and guidelines for design.

10.3. LPS-ITS intentions, strategies and actions (street planning and design)

10.3.1. Local streets

LPS-ITS intentions:

- Newly constructed or re-constructed local streets be designed for low speed traffic, for the safe use of residents and visitors, including children, people with disabilities and the elderly.

Key strategies:

- Undertake modified local street design where appropriate, in accordance with a 30kph design speed, for implementation as part of a systematic program of street upgrades associated with the need for road pavement re-construction or re-surfacing.
- Develop a palate of options for local streets designed to keep traffic speeds low including:
 - narrow road pavements;
 - creative use of landscaping to reduced forward vision;
 - creative design for on-street parking;
- Consult with residents on design options for their street.

Three year actions:

- Establish a process for the re-design of local streets as part of systematic long term street upgrade program



10.3.2. Neighbourhood connectors and distributors roads

LPS-ITS intentions:

- Design neighbourhood connector and distributor streets to provide options for local and district travel at speeds between 30 kph and 50 kph according to function and adjacent land uses.

Key strategies:

- Ensure the connector and distributor system is well connected to avoid bottlenecks and an over concentration of too much traffic on too few routes;
- Use context sensitive planning and design to modify the design and speed environment to take account of adjacent land uses, schools, activity centres and the like.

Three year actions:

- Establish a policy and practice for the planning and design of neighbourhood connector and distributor streets based on the concept of context sensitive planning and design;
- Consult with the community on draft policy and practice guidelines.



11. Bringing it all together- a sustainable mobility management approach

There are many different strategies and actions that can be developed as part of an integrated transport strategy. If not properly managed there is a danger that some of the strategies may be pulling in opposite directions.

The intention of the LPS-ITS is that not only will the different strategies be integrated, they will produce positive synergy. In this way the impact of the integrated strategy will be greater than the sum of its components. To assist with this overall integration we have introduced the concept of sustainable mobility management which incorporates the various strategies included in the preceding sections of this report.

11.1. Sustainable mobility management

In many cities around the world, it is now recognised that a broad suite of strategies is required to manage and shape the demand for travel in a way that will improve the liveability of the city, protect and enhance the environment and provide good accessibility for all residents and visitors. The need to make a distinction between traditional demand management measure, network management and service delivery is becoming less important. Indeed it may be more productive to present a holistic plan where the various parts are dependent upon one another and where synergies exist making the benefits of the whole greater than its constituent parts.

Sustainable mobility management (SMM) is a term used to describe a strategy that incorporates demand management, but also includes transport network management and service delivery improvements with a view to delivering a high level of overall accessibility. A sustainable mobility management strategy for Bunbury accepts that car travel will remain the predominant mode of transport for the foreseeable future. However, it differs from some more traditional strategies in that, instead of accepting and encouraging car growth at the expense of other modes, it provides more options for travel and provides some disincentives to driving to encourage greater use of alternative modes- walking, cycling and public transport.

While some major investment in transport infrastructure will be required as Bunbury grows, an objective of SMM is to maximise benefits with a reduced level of expenditure. Reduced levels of traffic on the road network, as a result of SMM strategies will reduce congestion, improve traffic conditions for commercial vehicles and freight and delay the need for major road construction.

For Bunbury, the following suite of measures can be grouped under the heading of sustainable mobility management:

- Behavioural change programs, such as TravelSmart;
- Policies and plans to support more walking, cycling and public transport;



- Improved public transport facilities and services;
- Network improvement plans and other measures to support walking and cycling;
- Reallocation of street space to provide priority for public transport and to provide more convenient safer routes for pedestrians and cyclists;
- Parking management policies and plans;
- Pricing and charging mechanisms;
- Freight logistics and selected rail and road upgrades along major freight movement corridors.

A major advantage of sustainable mobility management is that it uses supply measures for public transport and cycling in combination with travel demand management measures (parking and pricing policy) to induce greater use of public transport, walking and cycling and less use of cars.

11.2. Sustainable mobility management intentions

The intention of the sustainable mobility management approach is to provide a coordinated, integrated and sustainable high level strategic approach to the delivery of transport improvements for the City of Bunbury in both the short term and the long term. In particular it is the intention of the ITS to plan the transport system in a integrated manner to support the City's vision and objectives for city planning.

The role of the Bunbury transport system is to provide a high level of accessibility for all to jobs, education, shops, entertainment and other activities as the city grows. It is intended the future transport system will:

- Provide a high level of connectivity in the network;
- Offer travel choice for a variety of travel purposes;
- Support sustainable growth opportunities through integration with land use planning;
- Be an economic enabler;
- Promote health and fitness by encouraging more walking and cycling;
- Provide an efficient freight network to serve the port and the broader region;
- Meet the lifestyle needs of the community by limiting segregation and integrating communities;
- Be affordable and equitable for all social and age groups within the community;
- Meet expectation for regional transport whilst minimising impacts on local communities;
- Be environmentally responsible;
- Be adaptable and sustainable.

Three year actions:

- Undertake discussions with key stakeholders on the recommendations contained in this report.



- Make the report readily available to the general community and undertake community consultation.
- Develop a City of Bunbury Integrated Strategy following stakeholder and community consultation.
- Establish a monitoring and performance appraisal mechanism to review the implementation programme.

11.3. Strategic merit test

To ensure strategies and plans proposed in the City of Bunbury integrated transport strategy are compatible with the City's vision and objectives for city planning it is proposed that a strategic merit test be applied to test strategic fit and to filter projects for inclusion in an implementation plan. The strategic merit test would assess specific projects against social, environmental and economic needs of the Bunbury community. In particular the strategic merit test would assess projects against their ability to:

- Make a substantial contribution to **congestion** reduction at a regional level – more than local impacts that may move congestion from one area to another.;
- Contribute to **land use- transport integration** by matching appropriate transport improvements with priority growth areas;
- Recognise that **improved access to certain regions** and along some **strategic corridors** cannot be satisfied by increasing capacity for car drivers and must be addressed by improving capacity and service for alternative modes;
- Understand the **merits of managing demand** for certain modes at certain times when increasing supply would most likely just increase demand and limit benefits;
- **Give priority to the vehicles that provide the most benefit** – vehicles carrying the most people, freight and delivery vehicles and emergency services;
- **Remove bottlenecks** in the network without creating new bottlenecks and provide consistent capacity and service levels along corridors and routes;
- **Provide workers and visitors with a range of different travel options** with a view to encourage people to use more efficient means of travel, particularly to congested centres and more short trips.
- **Improve the safety of the transport network** for people travelling by all modes.

11.4. Sustainability mobility management strategies

- Improve accessibility of travel to work, education, shops and other activities;
- Reduce car dependency by improving options for travel by other modes;



- Develop a public transport system that provides good accessibility to the Bunbury city centre and other activity centres;
- Make Bunbury a cycling city with high quality safe cycling facilities;
- Make walking a safe, convenient travel option within Bunbury city centre and other activity centres;
- Develop a comprehensive travel demand management strategy incorporating lower levels of parking and increased price for parking over time;
- Ensure local, neighbourhood and distributor streets are planned and designed for reduced speeds and improved safety and amenity for pedestrians, cyclists and other visitors to the city.

11.5. LPS-ITS intentions, strategies and actions – integrated sustainability mobility management

LPS-ITS Intentions:

The intention of the sustainable mobility management approach is to provide a coordinated, integrated and sustainable high level strategic approach to the delivery of transport improvements for the City of Bunbury in both the short term and the long term. In particular it is the intention of the ITS to plan the transport system in a integrated manner to support the City's vision and objectives for city planning.

Key Strategies:

- Improve overall accessibility for travel to work, education, shops and other activities;
- Reduce car dependency by improving options for travel by other modes;
- Improve transport and land use planning integration through development of transport improvement plans for different precincts and regions (eg: city centre and activity centres);
- Integrate demand management and behaviour charge programmes with improvements to public transport cycling and walking;
- Design streets, according to function, to appropriate (low) design speeds to maximise safety and amenity and to encourage cycling and walking.

Three Year Actions

- Undertake discussions with key stakeholders on the recommendations contained in this report.
- Make the report readily available to the general community and undertake community consultation.
- Develop a City of Bunbury Integrated Transport Strategy following stakeholder and community consultation.
- Establish a monitoring and performance appraisal mechanism to review the implementation programme.

