SHAPING UP

A guide to the better practice and integration of transport, land use and urban design techniques

Shaping urban communities to support public transport, cycling and walking in Queensland

Copies of Shaping Up are available from:

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‘Shaping Up’ is a signature project of the “Integrated Regional Transport Plan for South East Queensland (IRTP)”. A key objective of the IRTP is to provide a more sustainable transport system which moves passengers more efficiently, supports economic development and reduces the need to travel by car.

It is intended that these guidelines become a readily available tool to enable local government transport and land use planners and the development industry to better achieve the objectives of the IRTP not only in South East Queensland, but across the whole of the State.
Ensuring Queensland remains an enjoyable place to live and work is an important responsibility of both government and the community.

As the number of people living and working in Queensland grows, the high costs of reliance on the use of private cars are becoming more noticeable through:

- the financial costs of providing additional road capacity
- the social costs imposed on nearby communities
- the environmental costs of air pollution
- increasing congestion and delays
- adverse impacts on business and industry.

Sprawling communities separated from employment, shopping and other attractions mean people need to use their cars, instead of being able to walk, cycle or use public transport to fulfil daily needs.

For these reasons it is not just transport policies, but land use policies as well that will play a key role in the future of the State. Shaping Up provides the ideas and opportunities to design our communities better.

These guidelines emphasise the need for land use and development decisions to build on and support the existing transport system. They also emphasise the importance of making public transport, walking and cycling more competitive with car travel. The guidelines show how land use and transport planning can be integrated to meet the major travel and environmental challenges ahead. Better designed neighbourhoods will offer the lifestyle benefits of reduced car dependency and increased access to local activities.

We fully support these Shaping Up guidelines and congratulate the wide range of people who contributed to their development. We recommend their use by all levels of government, the development industry, and land use and transport planners throughout Queensland.

By putting the guidelines into practice, together we can plan and develop more livable communities for the future.

Minister for Transport and
Minister for Main Roads

Minister for Communication and Information,
Local Government and Planning

President, Local Government Association of Queensland

Queensland Department of Transport: Shaping Up
Acknowledgements

These Guidelines were developed from advice provided by the private sector and State and Local Government agencies including Queensland Transport, the Department of Communication and Information, Local Government and Planning, Main Roads, Queensland Rail, Brisbane City Council, Gold Coast City Council, Pine Rivers Shire Council, and the Local Government Association of Queensland.

Therefore, the Guidelines incorporate the wide range of expertise available in Queensland on:

- sustainable urban development;
- land use planning and urban design;
- transport planning (which reduces the growth in car travel and supports the effective operation of alternative modes of travel);
- plan making and development control decision making; and
- development and infrastructure planning.

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Preface

The Integrated Regional Transport Plan for South East Queensland (IRTP) maps out a solution for a better transport system by outlining the actions that State and Local Governments must take to meet the challenges facing the region over the next 25 years.

The IRTP highlights the importance of planning for a transport system which moves people more efficiently, supports economic development and reduces dependency on private motor vehicles.

The IRTP also promotes better designed neighbourhoods that provide easier access to public transport, and walking and cycling facilities.

Shaping Up is a signature project of the IRTP, aimed at improving the future planning of local communities. These guidelines provide ideas and opportunities for local government and land developers to achieve better designed and more livable communities.

Of course some of these concepts will be more applicable to “greenfield” situations than for use in “retro-fitting” older areas which had developed in ways that are now seen as less than ideal. In the latter instances, the “best” treatments, to apply now, may be different from the treatments one would apply if starting afresh. Nevertheless, these guidelines will challenge planners to find the best solution in any given situation.

Shaping Up has been developed by Queensland Transport, in partnership with Main Roads, the Department of Communication and Information, Local Government and Planning and the Local Government Association of Queensland.

Through the IRTP and initiatives like Shaping Up, Queensland will continue to prosper and grow, with our standards of livability and economic development enhanced by a well planned and sustainable transport system.

Bruce Wilson
Director-General
Queensland Transport
1 Introduction

1.1 Background

Both land use and transport planning have a major influence on where and how people travel. ‘Shaping Up’ is a guide to developing urban areas to reduce the overall reliance on the private car and its detrimental effects on the environment. It outlines ways in which land use and transport planning and urban design can reduce both the number and length of trips. It also shows how land use planning and urban design can support other more environmentally friendly ways of travel such as walking, cycling and the use of public transport.

Powerful forces link land uses and transport systems. The location of land uses strongly influences both travel demand and the efficiency of public transport services. At the same time, the availability of roads and transport services often determines the location and distribution of different land uses.

1.2 Responding to community concerns

Past approaches to land use and transport planning have tended to focus on facilitating the use of cars without considering alternative ways to travel.

Such approaches are being increasingly challenged by growing community concerns about liveability, environmental responsibility and social equity.

Integrated transport planning combines both land use and transport planning to achieve better economic, environmental and social outcomes. Therefore, it can help to address each of these major community concerns:

**Liveability**

Liveability can be improved by designing compact cities that bring land uses closer together. This helps to build communities, improve overall accessibility and provide high levels of convenience and amenity. It reduces congestion and both the loss of time and cost of travel. It also reduces pressure on environmental and economic resources.

**Environmental sustainability**

Environmental sustainability can be improved by reducing the need to use private cars and by reducing both the number and length of car trips. This reduces greenhouse gas emissions (in the form of carbon dioxide released from petrol combustion) responsible for the threat of global warming and climate change. Environmental sustainability reduces noxious gas and particle emissions that pose local health risks and produce unsightly smog. Reduction in noise pollution and improved environmental amenity will also result.

**Social equity**

Social equity can be improved by providing improved access to a variety of convenient, safe and attractive ways of travel. This is especially important for those without ready access to a car. The availability of public transport is clearly important in this regard. Consequently, careful attention needs to be given to designing urban areas to enable cost effective and efficient provision of public transport services. It is equally important to design public transport facilities (and their integration with other activities) to meet user needs.
1.3 Using These Guidelines

These guidelines are designed to inform and influence planning decisions at the State, regional, local area and site specific levels. Therefore, they should be used by:

- Private sector investors and developers;
- Local Government traffic and transport engineers and planners;
- State Government traffic and transport engineers and planners;
- Consultant traffic and transport engineers and planners;
- Local Government elected representatives;
- Community groups with an interest in improving transport and access; and
- Other Queensland Government decision makers.

The guidelines will be used more regularly by those concerned with site specific, local area and corridor planning issues. However, the document also aims to influence the planning processes taking place at the State and Local Government levels.

These guidelines should inform each level of planning. They should be used together with other relevant planning documents to guide the integration of transport and land use planning. For example -

**STATE LEVEL**

- Planning, Environment, and Transport Legislation
- State Government Capital Works Programs
- AUSTROADS and other guidelines

**REGIONAL LEVEL**

- Regional and Sub-Regional Frameworks for Growth Management
- Integrated Regional Transport Plans

**LOCAL GOVERNMENT AREAS AND DISTRICTS**

- Planning Schemes and Strategic Plans
- Integrated Local Transport Plans
- Infrastructure and Operations Strategies

**LOCAL AREAS**

- Development Control Plans, Local Area Plans
- Local Government Works Programs
- Queensland Residential Design Guidelines

**PROJECT AND SITE SPECIFIC**

- Master planned sites
- Individual developments
- Impact Studies and Assessments
- Development assessment, approvals and conditions

Public transport to meet user needs.

Different vehicle contributions to urban transport greenhouse gas emissions

Shaping urban futures.
Companion Guides

Although comprehensive design standards are available for most elements of the transport system, they tend to focus on the detail of the individual elements rather than on relationships between these elements and surrounding land uses.

Since the objective is to have a document which can be used in providing practical guidance, theoretical and policy discussions have been kept to a minimum.

These guidelines are intended to be used with other related documents such as AUSTROADS Guides to Traffic Engineering Practice and the Queensland Residential Design Guidelines.

How to use these guidelines in practice

These guidelines have been set out so that the reader can quickly focus on their own particular area of interest or planning situation to be addressed.

A number of different themes closely associated with efforts to increase walking, cycling and public transport use are discussed in Chapter 2. Its sections address alternatives to the car (walking, cycling and public transport); urban and regional planning; transport corridors; transport interchanges; and residential development.

Each theme is dealt with in terms of:
- the main issues needing to be addressed; and
- a set of better practice initiatives.

Chapter 3 then discusses how these issues can be addressed using practical applications dealing with:
- Regional Transport Corridors
- Business and Activity Centres
- Existing Public Transport Interchanges
- New Public Transport Interchanges
- New Residential Subdivisions
- Medium Density Developments
- Business Centre Intersections.

Each practical application is illustrated through:
- setting of a scene which describes a typical set of circumstances;
- the features and lost opportunities of an inappropriate development pattern; and
- a preferred pattern of development (what to do and key success factors).
2.0 Increasing Public Transport, Cycling and Walking

Public transport, cycling and walking are viable alternatives to car travel. However, land use planning can dictate that car travel is the only viable means for both local and long distance travel. Alternatively, it can encourage land use patterns that support the use of public transport, cycling and walking. Land use planning can also favour street networks and patterns of development which reduce both the number and lengths of car based trips.

The first two sections in this Chapter outline the main issues and better practice initiatives related to:

- Alternatives to car travel, and
- Urban and regional planning

Frequently however, the finer points of land use planning and urban design determine the willingness of people to travel in different ways. Convenience, accessibility and safety are often the most important factors. Accordingly, the latter sections of this Chapter deal with the main issues and better practice initiatives related to:

- Transport Corridors
- Business and Activity Centres
- Public Transport Interchanges, and
- Residential Areas

Further examination of these themes continue in Chapter 3. The Chapter demonstrates how various land use and locational factors can come together to produce either a pattern of development with few realistic alternatives to using the car, or to create a pattern of development providing realistic opportunities to walk, cycle or use public transport as an alternative to car travel.

2.1 Providing alternatives to car travel

Encouraging more public transport, cycling and pedestrian trips is vital for reducing reliance on car travel.

Without adequate public transport, cycling and pedestrian facilities, many young, elderly and other people who do not have ready access to a car, can find it difficult to move about and get to essential facilities.

The negative economic, social and quality of life impacts of traffic congestion have been outlined in Chapter 1.

Peak period congestion can only be partly addressed by encouraging changes to trip starting times.

The use of travel demand management measures (such as road pricing, parking supply and pricing, car pooling, provision of transit lanes, and public transport incentives) can have a significant impact on improving travel efficiency and environmentally responsible travel. However, an overall reduction in car trips can also be achieved through measures which aim to encourage travel by public transport, cycling and walking.

A basic objective should be to ensure that walking, cycling and public transport are as attractive as possible in their own right.
Public Transport Operations

Creating positive attitudes to public transport is critical to the implementation of strategies to reduce car trips. The way in which the community perceives the operation of public transport creates an image about service quality which is often difficult to change.

Main issues

- The increasing complexity of urban living poses a challenge for public transport. Greater responsiveness to personal needs will be required in the future. Increasing the flexibility of public transport services is therefore important. (“Hail and Ride” services, where buses pick up and set down passengers ‘on demand’, is one way to provide greater flexibility in meeting user needs).

- Giving priority to public transport is important if passengers are to perceive public transport as being an efficient and effective way to travel. (This can be achieved by the provision of busways or bus lanes and by giving buses and taxis priority at lights and at intersections).

- It is important to concentrate land uses that generate high public transport demand. Passengers will often have to complete difficult transfers between different services to reach dispersed destinations. Such destinations are inefficient to service because they divert public transport from efficient routes with high passenger loadings. Services will also be less frequent if demand for public transport is not concentrated.

- The lack of services early in the life of newly developing areas often leads to higher car usage and a reluctance to use public transport. Such reluctance is likely to continue even when the suburb matures, even when public transport services improve.
Better practice initiatives

- The efficiency of public transport infrastructure is measured by how effectively it moves people rather than vehicles.
- Physical and land use planning enables public transport operators to effectively serve their markets. People are able to walk to public transport. (Ideally 90% of potential passengers should live within 400 metres of their nearest bus stop for peak period services or within 800 metres of rail services).
- Public transport systems and networks are designed to provide flexibility to adjust to travel demand patterns as they change over time. (Walking distances to public transport stops are reduced in areas of older population).
- New developments are guided to locations adjacent to existing public transport routes (or to natural extensions of such routes).
- ‘Greenfield’ public transport policies ensure the provision of public transport early in newly developing areas.
- Comfortable and convenient transfers are provided between travel modes to maximise public transport attractiveness.
- Public transport is integrated. All major bus and rail services and interchanges are linked through a public transport network plan.
- Public transport services are integrated. Schedules and timetables are co-ordinated for inter-connections between services. Improved reliability of services ensures timely connections. Timetable and routing information and ticketing are integrated.
- Bus routes ensure all buses pass through the major interchanges on most bus routes.
- Service areas are increased by using smaller ‘on-demand’ buses and taxis.
- Programs are in place to combine cycling with public transport.
- Land uses that attract a high proportion of people dependent on public transport are located close to transit stops. (These include senior citizens residences, hospitals, entertainment and community centres). This ensures public transport is easily accessible and enables more frequent, higher quality services.
- Lower density land uses that attract public transport users capable of walking further, are located towards the edge of the convenient walking area. (Thus Universities, TAFE colleges and high schools are located about 400 metres from bus interchanges and up to 800 metres from rail stations).

Intelligent transport systems assist operation and planning of public transport.

Real time public transport information.

Flexible public transport with a variety of vehicle types and sizes.
Public transport stops

The location and design of public transport stops can have a major impact on decisions about which mode of transport to use.

Main issues

- Transport stops need to be easily accessible, safe and attractive to use.
- They need to be integrated into the overall design of the neighbourhood.

Better practice initiatives

- The future locations of public transport stops and interchanges are clearly identified for developing areas.
- The locations of stops and interchanges are identified in collaboration with the public transport operators and incorporated in Local Area Plans, Development Control Plans and subdivision designs.
- Turning circles for buses are provided at each stage of new subdivisions to enable buses to operate until through routes are completed.
- Bus stops, bus shelters and bus priority measures are provided early in urban developments.
- Direct pedestrian access is provided to public transport stops from the residential areas, shopping centre or business area they serve (see Appendix: Land Uses that Support Public Transport).
- Passenger safety and security are enhanced by passive surveillance from nearby residences or other activities (especially during weekends and at night).
- Major public transport stops and interchanges have a higher level of security including provision of surveillance cameras and security guards.
- Safety audits are conducted of all public transport stops, interchanges and terminals and their pedestrian access. Appropriate improvements are made when necessary.
- Landscaping is kept below knee height, incorporating only high branching trees. Solid walls and fences are avoided to improve actual and perceived safety.
- Stops provide seating, shelter, security lighting and passenger service information.
- Shelters are set back from the kerb edge but passengers have a clear and unimpeded view of approaching buses or taxis.
- Complementary pedestrian facilities (eg. telephones, drinking fountains, postal boxes) are located near stops.
- Provision is made for secure bicycle parking.
Cycling

Planning for cycling needs to recognise the different requirements of recreational cyclists, school children cycling to and from school, and commuters cycling to and from work.

Main issues

- Cycling should be recognised as an important means of transport, as well as a popular recreational activity. Reduced car dependency can be achieved through education and awareness raising programs (especially for school aged children) and by providing improved cycle facilities.
- Barriers to greater use of bicycles in urban areas include lack of safety, poor road design and road condition, the deterrent effect of steep grades, and lack of facilities (e.g. lockers and showers).
- Public transport to schools is dominated by bus services which are expensive for the community to provide. Segregated cycle networks providing safe access, have the potential to reduce the demand for subsidised school bus services.

Better practice initiatives

- Cycling habits are strongly influenced by Area Bike Plans which integrate the “4 E’s”:
  - Encouragement to promote the bicycle as a legitimate road vehicle.
  - Engineering works to ensure that on-road cycling is safe and to provide off-road facilities wherever appropriate.
  - Education in relation to bicycle safety, particularly for school children.
  - Enforcement of lawful cycling behaviour by local government and police.
- Direct and safe cycle routes are provided to schools and significant activity centres.
- The planning and design of roads and streets recognises the needs of cyclists (particularly where there is no alternative to cyclists riding on busy streets).
- Kerb side lanes are widened and riding surfaces kept smooth and clean. (Gutter gratings are designed for safe crossing by cycles).
- Cycle paths for school children are segregated from other traffic. (This is important as many parents do not allow their children to cycle to and from school in traffic for safety reasons).
- Safety audits are conducted and local action plans implemented to improve bike safety.
- Advanced stop lines allow cyclists to wait at signalised intersections ahead of other traffic. (This increases motorists’ awareness of cycles being present and encourages them to take more care).
- Ample cycle parking and secure bike storage is provided (particularly at public transport interchanges, major stops, and at major business and activity centres). An assessment of the likely cycle patronage guides the amount of space initially provided for cycle parking.
Pedestrians

Much can be done to encourage walking by improving the pedestrian environment and increasing pedestrian accessibility.

Main issues

• The quality of pedestrian spaces is a strong determinant of whether people will use them. Desirable, attractive public spaces have a scale which is appropriate to pedestrians.

• Direct routes, through interconnected pedestrian networks and interesting surroundings, are particularly important.

• Special attention needs to be given to real and perceived pedestrian safety. This is especially important for women and children walking at night and weekends.

Better practice initiatives

• ‘End of trip’ facilities such as lockers, showers and changing rooms are provided at major destinations. (These are required in newly constructed government buildings for major developments and in public amenity facilities).

• Public transport stops are provided as close as possible to destinations (such as housing, shopping centres, entertainment venues and workplaces - see Appendix: Land Uses that Support Public Transport).

• Calm traffic conditions are created on street networks in business and activity centres, major intersections, and residential areas.

• A connected pedestrian network is provided (particularly to local business and activity centres and public transport).

• Pedestrian safety is improved by providing multiple routes (that enable pedestrians to by-pass potentially unsafe situations), high standards of lighting and restricting landscaping to high branching trees and plants that grow below knee height. Nearby land uses are planned to provide passive surveillance, especially at night and at weekends.

• Pedestrian safety audits are conducted and local action plans implemented to improve pedestrian safety.

• Protection is provided against the harshest weather conditions. Particular consideration is given to direct summer sun, prevailing winter wind, and the direction of heavy rain.

• Trees are used to create comfort by providing shade and a better microclimate. Where appropriate, deciduous trees are planted to admit winter sun and lattice with appropriate planting used to create a controlled, variable and pleasant level of shelter.
2.2 Urban and regional planning

Patterns of urban and regional development, and the resultant distribution of land uses, can have a major influence on total transport needs; car ownership and use; the availability of alternative ways to travel; and both the effectiveness and viability of public transport.

Integrated transport planning combines land use planning with transport objectives to improve economic viability, social vitality and the environmental sustainability of communities.

Main issues

- Passengers have to travel longer distances if shopping, employment, entertainment, educational and community facilities are isolated or dispersed.

- The integration of transport and land use planning is essential if realistic choices are to be provided for how people travel. Both urban and regional land use planning must be integrated with road and public transport planning. Urban design should ensure that walking and cycling and the use of public transport are viable options. Public and community facilities need to be placed in locations that are accessible by all modes of travel. (See Appendix: Land Uses that Support Public Transport)

- Many urban areas have been planned mainly with car users in mind. This inevitably results in development largely dependent on the car with alternative ways of travel poorly supported.

- The statutory planning scheme and its associated instruments (eg. Development Control Plans, etc) and State and Local Government transport capital works programs are the primary mechanisms for controlling development at the land use/transport interface. There is often a lack of integration between these planning tools and transport planning.

- Effective land use and transport planning increasingly depends on introducing outcome based performance measures, rather than prescriptive controls.

Better practice initiatives

- Integrated Regional Transport Plans (IRTPs) are prepared for economic regions.

- Integrated Local Transport Plans (ILTPs) are prepared for each local government area.

- Land use and transport strategies are integrated and prepared concurrently.

- Common objectives and performance criteria are adopted for land use and transport planning.

- Targets for the number of trips that should be made by public transport, walking and cycling are established and implemented through State and Local Government planning processes.

- Transport and land use models are used to predict the number and types of trips for different land uses strategies.
2.3 Transport corridors

Urban growth often takes place along corridors created by major highways or railway lines. The way in which these transport corridors are planned and designed at the regional level can have major implications for public transport use. Corridor planning and the distribution of land uses also impacts significantly on public transport costs, operational efficiency and funding requirements.

Main issues

- The community and key decision makers need to fully appreciate the potential variety of public transport modes. Depending on patterns of travel demand, there may be flexibility in providing public transport with variations in vehicle type and size and demand responsive services.
- Public transport is more cost effective and efficient if organised along a linear corridor with highly accessible activity nodes.
- Highway road capacity is frequently lost to local traffic and traffic merely seeking to cross regional highways. This can be avoided if alternative local arterial and collector road networks are developed to cater for sub-regional traffic movements. The major highway can then be used for regional and long distance traffic. The resulting improvement in traffic efficiency and freight flows also increases economic efficiency and business competitiveness of the region.

Accessibility criteria are established for different land uses in planning schemes and development control plans. These criteria are used to identify key road, cycle, pedestrian and public transport links and then to prioritise construction projects. (See Appendix: Land Uses that Support Public Transport)

Planning Schemes state that the majority of residences, major employment generators and entertainment facilities, should be located within convenient walking distance of public transport (800 metres for rail stations, 400 metres for bus interchanges).

Development proposals and development applications are assessed against these accessibility criteria.

Easy access to public transport is required to be provided early so that locational choices are influenced by the availability of public transport.

Development incentives are used to encourage the provision and use of public transport.

Land uses which generate the most trips, such as major shopping and business centres, are located adjacent to existing or future public transport interchanges, stations or stops. Ideally, these developments incorporate interchanges close to the centre of pedestrian activity. (See Appendix: Land Uses that Support Public Transport)
2.4 Business and activity centres

The location of jobs, retailing and recreational activities can have an important influence on the number and length of trips and on the ability of public transport operators to offer realistic public transport alternatives to the use of the private car.

Changing technology and the growth in service sector employment means that many growth activities no longer need to be widely separated from each other or from residential land uses. Increasingly, business and activity centres provide substantial employment and generate many trips. Much can be done to ensure these centres are accessible for people travelling in a variety of ways. This includes making those centres attractive to people using public transport.

**Better practice initiatives**

- Public transport planning is based on clearly established performance objectives (e.g., access, cost recovery, frequency and reliability of service).
- Technical options are identified to meet those objectives.
- Development is concentrated along major corridors based on a main ‘line haul’ public transport route (with feeder routes wherever appropriate).
- Major activities, employment nodes and higher density residential areas are encouraged near stations, significant stops and interchanges along public transport routes.
- Urban development is compact; concentrated along public transport corridors, and focused around key business and activity nodes which incorporate public transport interchanges.
- Local arterial and collector road networks are established to allow easy access within the corridor thereby directing sub-regional traffic away from regional highways.
- A grid of local arterial roads (typically at 2 km spacing) and collector roads (typically at 1 km spacing between the arterials) disperses traffic and reduces traffic volumes so that pedestrian orientated and public transport supporting development can front these roads.
- A network of local roads provides convenient local access to the interior of this grid.
- The overall road network ensures 90 percent of the urban area is within 400 metres of public transport stops located on the arterial and collector road network. (This also supports faster public transport services and enables stops to be 250 metres apart).
- A mix of business and residential land uses are concentrated at clearly defined nodes located at the intersection of local arterials where ‘line haul’ public transport services converge. This concentrates trips at a discrete number of locations which allows multi-purpose trips and increases public transport passenger loadings.
- Public transport interchanges are integrated into these mixed-use business and activity nodes. This increases public transport use and enables easy and convenient passenger transfers between bus, rail and taxi services.

Improving reliability by giving public transport priority.

Area which is more than 400 m walking distance from the nearest stop.

Road layout with bus stops to allow 90% of the area to be within 400 m walking distance.

Major activity nodes should be located adjacent to line-haul public transport routes.
**Main issues**

- The intersections of the local arterial and collector road network create natural opportunities for business and activity nodes. Public transport focused at these nodes can provide the most convenient opportunities to change the type of transport used and for passengers to transfer between different routes and services.

- High public transport trip generating land uses are best integrated into business and activity nodes at these intersections. (Such land uses include regional and sub-regional shopping centres; institutions such as hospitals, universities and TAFE colleges; major office developments and entertainment facilities - see Appendix: Land uses that support public transport). These activities are only able to sustain minimal public transport services if they are located as isolated developments at dispersed sites.

- Integrating large employment generators into business and activity centres also enables a greater variety of retailing, community facilities and services to be provided than would otherwise be the case if these land uses were dispersed to isolated sites. Multi-purpose trips will result, which reduces the overall amount of travel required.

- Separating different land uses tends to isolate residences from workplaces, shops and services. It forces people to undertake long, single purpose trips, thus reinforcing car dependence and disadvantaging people without ready access to cars.

- The greater number of dwellings and jobs within an area, the greater the prospects for reducing trip lengths and car dependency.

- Increasing the mix of land uses in business, industrial and residential areas can significantly reduce car dependency, trip lengths, levels of congestion and pollution.

- Business and activity centres need to be principally designed to provide safe and convenient pedestrian movement. Motorised vehicles should not be allowed to dominate the operation and design of these centres. Road widths and design speeds should be reduced so that vehicles behave in pedestrian-friendly ways. Cycleways are separated from pedestrian paths wherever possible.

**Better practice initiatives**

- In ‘greenfield’ growth areas, mixed use town centres are developed with higher intensity business and residential land uses adjacent to public transport interchanges.

- Existing activity nodes are strengthened as the focal point for shopping, diversified employment and community facilities together with improved public transport facilities. This is supported by increasing the intensity of land uses, developing vacant sites and redeveloping land previously used for car parking. (This may be accompanied by a reduction in parking requirements, increasing parking charges, and the change from surface parking to multi-level parking structures).
2.5 Public Transport Interchanges

Interchanges are places where passengers transfer from one form of transport to another, or between services using the same mode of travel. However, interchanges are much more than this. Interchanges are important access points to communities, to civic and recreational facilities; to shopping, business and employment centres, and to residential areas. They are also a major focus of activity in their own right.

- New shopping and employment generating activities are guided to the existing town centre in smaller urban areas with only one central activity node.
- Intensification and diversification of land uses is encouraged at selected locations, where substantial ‘strip development’ has already occurred along local arterial roads, so that the arterial develops into a public transport orientated mixed-use activity corridor.
- Land uses are diversified and intensified near existing institutions on large sites, to transform them into integrated business and activity centres that can support multi-purpose trips and the efficient provision of public transport services.
- Public transport routes provide links between each business and community activity centre. This also improves the efficiency of public transport services.
- Major public transport interchanges or public transport stops are located close to and integrated with the “heart” of activity at each business centre (ie. the point of highest pedestrian accessibility, close to the greatest concentration of workers).
- Lower density land uses and space-consuming land uses are located toward the edges of the walkable area (400 metres from town centres and bus interchanges, 800 metres from rail stations).
- Pedestrian accessibility is high. Blocks of substantial length (ie. greater than 80 metres without a path or road) have mid-block pedestrian links, thus allowing increased accessibility through the block.
- Parking requirements are continually reviewed and lowered as walkability, and cycling and public transport availability increases.
- Parking plans are developed and implemented for all major centres.
- Cycling is encouraged by the provision of direct, safe cycle routes and the provision of facilities such as bike lockers, showers and changing rooms.
- Walking is encouraged by the provision of direct, safe pedestrian networks focused on public transport interchanges where activities are concentrated.

Queensland Department of Transport: Shaping Up
Main issues

- Interchanges provide the public ‘gateway’ to local businesses and to the community. Therefore they can play an important role in creating the business environment and establishing the identity and public image of the community. They need to be located and developed to enhance these roles.

- Local communities are best able to identify initiatives which could improve use of public transport. Decisions about the design of public transport facilities need to meet the identified needs of local residents, workers and the business community.

- Interchanges can be designed to help integrate communities and to provide a focus for activities. Careful attention is needed to ensure the location and design do not segregate or sever the communities they serve.

- Provision often needs to be made for convenient pedestrian access to the full range of public transport services (including bus, rail, ferry and taxis).

- Walking, cycling and private transport needs to be properly catered for at interchanges.

- The design and operation of interchanges need special attention to maximising passenger convenience. One of the main advantages of using the car is its convenience and its ability to provide a high door-to-door level of service in comparison with public transport. The need to break a journey to change transport mode or to transfer between public transport services can act as a significant disincentive to public transport use.

- The concentration of people at interchanges can provide trade and commercial advantages for nearby businesses. These, in turn, can provide convenient services (such as food, drinks and newspapers), interesting activities (that reduce perceived waiting times) and added security (from passive surveillance) for those using the interchange.

- Reserving undeveloped land close to public transport for later infill is counter-productive. Such a strategy is likely to reduce the chance of the centre operating effectively. It is better to ensure that planning provisions allow building and land uses to change and intensify over time.

Better practice initiatives

- The interchange is recognised and treated as a land use in its own right.

- Its location is selected to maximise its visibility, accessibility, convenience and safety.

- Businesses providing convenience services are located close to the interchange because it is a focus for pedestrians that creates trade for these businesses.

- Consideration is given to compatibility with adjacent land uses. (Night time and weekend activities are encouraged nearby but land uses that could create social or safety problems are avoided).
2.6 Residential areas

Conventional residential development has assumed most people have ready access to a car. Consequently, other ways of travelling have not been fully considered, planned for or provided. There is growing awareness of the need to plan for safe and convenient public transport, walking and cycling in all residential areas.

**Main issues**

- Many subdivisions continue to be approved without strong connections between local streets. This results in longer, car based trips and often makes it impossible to introduce an efficient bus service.

- Mixed residential areas, with higher density forms of development, are best able to support public transport. Services are then also likely to be more frequent and operating at different times of the day.

- Better outcomes can result from adopting “density gradients”. (This involves placing the most intense land uses closest to the activity centre with a reduction in site densities the further the development is located away from the activity centre - see Appendix: Land Uses that Support Public Transport.)

- Most jobs are being created in small, service sector businesses many of which can be located in or near residential areas, without adversely affecting residential amenity. (It is estimated that over 75% of future employment will be in businesses which are readily compatible with residential land uses).

- The introduction of home based businesses and local employment in residential suburbs can reduce the need for long distance commuting and the use of the private car. However, this requires realistic opportunities to be created for small businesses to locate in affordable commercial premises close to the residential areas where they were first established.

- Interchanges are designed to ensure transfers are as seamless and convenient as possible by:
  - minimising time delays
  - minimising distances (eg. shared platforms)
  - avoiding level changes wherever possible
  - providing integrated ticketing
  - providing facilities (eg. bicycle storage for those changing their travel mode)
  - improving personal safety and security measures

- Park ‘n’ ride facilities are provided to intercept car traffic from areas where there is no public transport. These facilities are established at locations outside the area where traffic congestion is likely to be encountered.

- The land used for these park’n’ride facilities is redeveloped to become local employment nodes as outer area public transport services improve (or when they become part of an area suffering from congestion).

- Commercial activities for passenger convenience are encouraged (such as outlets providing food, drinks, books and newspapers that trade outside normal shop trading hours).
Better practice initiatives

- Compact clusters of higher density land uses (retail, residential, commercial and community facilities) are located along local arterial roads. This encourages walking and public transport use by reducing travel distances, and allows for improved public transport services by generating more balanced passenger loads in both directions, throughout the day.

- A target density of 25 dwellings per hectare (with a choice of building types) is adopted within 200 metres of all centres (including local centres), to support the efficient provision of public transport and to create a genuinely active pedestrian environment.

- New residential areas of less than 15 dwellings per hectare are avoided (because this will not support a frequent bus service).

- Neighbourhood designs maximise links between origins and destinations without relying on the car.

- Highly interconnected local roads, walkways and bikeways are required. (These are shown on indicative road layouts and bikeway plans for ‘greenfield’ areas likely to be subdivided in the near future).

- Existing residential areas are reviewed to identify simple ways to increase pedestrian accessibility.

- Flexible residential block layouts are favoured that enable a high level of pedestrian, cycle and traffic movement.

- Highly connected local street patterns are favoured that allow shorter local trips and enable public transport to efficiently service the area without the need to ‘back track’.

- Special attention is given to the directness, attractiveness and safety of walkways and bikeways.

- Planning controls encourage higher intensity of residential land uses within convenient walking distance of public transport interchanges and railway stations.

- Local employment is encouraged both within and close to residential areas.

- Planning provides for the development of mixed use local business centres. (Proposals are opposed that would only enable the development of local shopping without the prospect of other land uses).
3.0 Practical Applications

Introduction

This Chapter explains how land use, urban design and transport elements can come together to create patterns of development that support the provision of public transport and provide realistic opportunities for walking or cycling. It also shows how land use and transport planning can reduce both the number and length of trips by private vehicles.

Seven typical situations are examined to illustrate how land use and transport planning can ensure people have the choice of using either public transport, or walking or cycling to meet their daily travel needs. This ‘Preferred Pattern of Development’ is contrasted against a possible ‘Inappropriate Development Pattern’ that results in the loss of such opportunities.

In both cases it is accepted that private cars will continue to be used for many trips. However, the ‘Preferred Pattern of Development’ includes key success factors and actions that can be taken to provide realistic alternatives to always having to rely on the private car.

The seven practical applications selected are:

3.1 Regional Transport Corridors

Dealing with -

• an intercity highway between two regional centres,
• the location, development and expansion of employment nodes,
• residential estates,
• major entertainment / recreation / cultural facilities,
• utilisation of railways, railway stations, and
• arterial and collector roads.

3.2 Business and Activity Centres

Dealing with -

• the location and expansion of business centres,
• regional shopping centres,
• major institutions (eg, hospitals, TAFEs, etc),
• land use intensities and diversity,
• bus stations,
• bypass/freeways,
• line haul routes,
• walkable catchments,
• mixed use development nodes,
• car parking.

3.3 Existing Public Transport Interchanges

Dealing with -

• existing railway stations,
• feeder bus routes,
• disposal of vacant crown land,
• small shops and offices,
• park’n’ride facilities,
• bus/rail interchanges,
• taxi ranks,
• complementary commercial development,
• pedestrian spines and facilities.

These figures are extracts from the Preferred Pattern of Development diagrams for the relevant practical application.
3.4 New Public Transport Interchanges

Dealing with -
- business and town centres,
- institutional buildings and shopping centres,
- highway / railway,
- location of bus stations,
- integration with land uses,
- complementary land uses and facilities
- pedestrian circulation
- car parking,
- mixed use developments.

3.5 New Residential Subdivisions

Dealing with -
- detached housing,
- standard layouts,
- integration with adjoining areas,
- feeder bus routes and stops,
- increasing housing densities,
- inter-suburb connections,
- diversity of lot sizes,
- line haul bus routes and stops,
- pedestrian and cyclist links,
- mixed commercial centres.

3.6 Medium Density Developments

Dealing with -
- urban sites,
- differing housing densities,
- feeder bus routes,
- neighbourhood shops,
- density gradients,
- integration with adjoining areas,
- line haul routes and stops,
- local business and community centres,
- pedestrian and cyclist access.

3.7 Business Centre Intersections

Dealing with -
- major intersections on busy business centres,
- existing built form and land uses,
- new developments (shopping centres, showrooms, fast food outlets),
- road widening,
- bus stops,
- taxi ranks,
- pedestrian crossings,
- integrated loop road systems,
- rear car parking,
- cycle lanes,
- active frontages,
- pedestrian facilities and street furniture.
How To Use The Practical Applications

The applications have been placed in a hierarchical order from the largest scale (Section 3.1 Regional Transport Corridors) down to the smallest scale applications (Section 3.7 Business Centre Intersections). Each application is broadly set out to include:

- A brief overview which summarises the present situation, inappropriate and preferred development patterns;
- Setting the Scene - a concise description and sketch of a typical situation and/or transport planning context;
- **Inappropriate Development Pattern** - the main features of a response to the ‘scene’ which promotes increased reliance on cars, along with the opportunities which are lost when inappropriate development patterns are pursued.
  The ‘Inappropriate Development Pattern’ shows a combination of common land use, transport and urban design elements which make it difficult (sometimes impossible) to provide public transport or which prevent people from walking or cycling effectively. This results in increased reliance on private vehicles for trips.
- **The Preferred Pattern of Development** - ‘What to do’ to bring about development patterns which effectively reduce reliance on cars, along with key success factors.
  The ‘Preferred Pattern of Development’ shows how each of these problems can be addressed by improved land use and transport planning and better urban design. These diagrams show how to improve access to public transport and how to make it easier and safer for people to walk or cycle. Adopting these initiatives gives people realistic choices of alternatives to the car.

These applications have been carefully selected to reflect typical Queensland situations. Consequently, the insight provided and the advice on what to do to achieve better outcomes, have wide application throughout Queensland. In making practical use of these guidelines it is important to recognise the cumulative benefits that can result from taking action at different spatial scales and by combining different initiatives.

Most situations will not involve all of the adverse elements that make it difficult to provide public transport or prevent people walking or cycling that are identified in the Inappropriate Development Pattern. It is intended that users of these guidelines will identify which of the difficulties could eventuate and ensure that as many of the initiatives in the Preferred Pattern of Development as possible are included in proposals.

Clearly some initiatives can be more effective than others. Ideally, all the initiatives proposed should be taken. However, it is recognised that this is not always possible. In such circumstances, any of the initiatives should be actively pursued.

Generally, the ‘key success factors’ listed and the advice on ‘what to do’ is presented in order of their likely effectiveness in reducing reliance on the car.
Urban development is occurring in growth corridors at locations well away from existing towns and areas of employment. These growth areas are not well served by a local road network, generally relying on direct highway access. People are unaware that their car-based journeys are adding to the congestion, taking valuable time out of their everyday activities.

### Setting the Scene

- Two metropolitan centres are located 50 to 100 kilometres apart. They are linked by a highway of State or national significance and a railway line.
- Strong population growth along the corridor.
- Low level of rail use.
- Peak period congestion on the highway.
- Local traffic movements must use the highway.

### Main Features *(Refer to Figure opposite)*

- Two metropolitan centres are located 50 to 100 kilometres apart. They are linked by a highway of State or national significance and a railway line.
- A number of new employment nodes and residential enclaves have been established between the centres, away from the highway. They are separated by large areas of rural or non-urban land.
- The local town centres offer limited levels of amenity and few opportunities for work.
- The employment nodes and new residential areas rely predominantly on the highway for access. Some of the larger estates have dedicated highway access but the majority of estates utilise upgraded local roads that cross the highway.

### Inappropriate Development Pattern

- Additional road connections to the highway.
- Easier access to the highway.
- More lanes added to the highway.
- New inter-city highway/bypass proposed.

### Preferred Pattern of Development

- Compact development focused on activity nodes.
- Local linkages provided between activity nodes.
- Sub-regional vehicle trips use the new network of local arterial roads.

### Localised Traffic Movements are a Major Cause of Congestion

- Localised traffic movements are a major cause of congestion on the highway. Travel times are severely increased for residents in outlying areas and regional traffic which use the highway for mostly work-related trips.
Setting the Scene

REGIONAL TRANSPORT CORRIDORS
INSIGHT:
Development has mainly taken into account the needs of car users without also building in better opportunities for other ways of travelling.

Main Features
(Refer to Figure opposite)
- In the past, additional road connections to the highway have been constructed in an attempt to manage the increasing congestion. This falsely assumes that more connections will alleviate the congestion by enabling users to reduce the proportion of their trip on the highway. As a result, new interchanges are built and existing interchanges upgraded, incorporating grade separations (i.e., flyovers and underpasses) and the widening of the highway reserve in a number of locations.
- Continuing strong population growth in the region and expansion of commercial and residential areas along the corridor, combined with easier highway access provided by more connections, results in many more people having access to the highway. When completed, the upgrades have a discernible effect for a short period of time. However congestion quickly re-emerges as new residential development attracts even more traffic to the highway.
- The increasing use of the highway for local trips increases pressure on the relevant authorities to upgrade the highway and access points. The pressure is increased particularly by trips which simply cross the highway. Upgrades are provided in the form of additional lanes on the highway and upgraded interchanges. The additional lanes are constructed in stages to allow the highway to remain open at all times, increasing delays on the highway. More lanes attract more vehicles to the highway.
- At some point in time, the relevant authorities analyse expected growth in travel demand and determine that the highway will cease to function effectively. They propose an inter-city highway route. The extent of urban sprawl that occurred between the centres over 20 to 30 years has meant that the only available land for the duplicate highway is land which has regionally significant environmental or agricultural values. Alternatively the available land is undulating or flood prone and requires significant capital works to construct the new highway and results in detrimental environmental impacts.
- Residents in the vicinity of the proposed route may protest against the proposed inter-city highway. They have raised families in the area and do not perceive themselves as being part of the urban sprawl. However they also demand improved access to the key metropolitan centres.
- The resulting widely separated residential, commercial and employment nodes have a low level of connectivity and an escalating reliance on the increasingly congested highway for day-to-day activities. This dramatically reduces the functional efficiency and, therefore, the regional significance of the existing highway.
Entertainment and recreational facilities and other major venues which are high traffic generators located in isolated greenfield sites.

Residential development sprawls away from town centres and sources of employment.
Regional Transport Corridors

Preferred Pattern of Development

INSIGHT:
Development has taken into account the needs of car users but has also built in a wide range of opportunities for public transport and other ways of travelling.

What to do – In order of effectiveness
(Refer to the Figure opposite)

ESTABLISH LOCAL ROAD CONNECTIONS
- Construct local arterial roads between employment and residential nodes along the corridor (parallel to the highway) so that traffic movements can occur without the need to use the highway.
- Limit the development potential of areas which cannot be linked other than by the highway.

FOCUS ON PUBLIC TRANSPORT
- Plan for new urban development close to public transport facilities.
- Plan for the earliest practical introduction of public transport services and routes.
- Ensure new or upgraded public transport facilities are in place as demand increases and new road connections are built.

GREATER DIVERSITY IN THE EMPLOYMENT NODES
- Manage the growth potential of the employment nodes to achieve a greater diversity of business enterprises focusing on providing local employment opportunities.
- Devise incentives to attract business development to locations adjacent to existing and new public transport interchanges and town centres.

REDUCE THE NEED TO USE OR CROSS THE HIGHWAY
- Improve vehicular and pedestrian access sufficiently to forego the need to travel on the highway or be impeded by it.
- Focus development into residential and employment nodes which are preferably located on one side of the highway or strategically located to allow efficient access across the highway and which are linked by local arterial corridors.

REDUCE THE NUMBER OF ON & OFF RAMPS
- Reduce the number of on and off ramps to the highway so that local and sub-regional traffic movements are minimised. This traffic uses the upgraded local arterial road network.
- Introduce high occupancy vehicle (HOV) lanes, car pooling and other incentives and regulations to reduce the volume of cars using the highway.

Key Success Factors
(Refer to the Figure opposite)

1. Development is guided to locations that result in compact settlement patterns (which require fewer and shorter car trips and will enable the efficient provision of public transport).
2. The new local arterial network running parallel to the highway with appropriate cross-links provides greater accessibility within the corridor whilst increasing the overall traffic capacity.
3. Regional traffic moving between locations within the corridor is not forced onto the highway (local and sub-regional traffic movements are minimised on the highway).
4. The highway is then available for inter-city and long distance travel and road freight. (This will enhance the economic advantages of the region and its potential to attract investment).
5. New town centres and significant employment nodes are clustered along local arterial roads. Residential areas are located close by. (Thereby creating opportunities for greater local employment and more diversified business enterprises).
6. Most residential development is concentrated close to public transport. (Concentrated along the arterials, especially near the railway stations and around new and existing town centres).
7. High employment generators, higher density residential areas and mixed-use (business/residential and business/industrial) developments are concentrated within convenient walking distance of the new town centres with their bus and rail interchanges.
8. Major entertainment and recreational venues are located adjacent to the local arterial road (preferably within 800 metres of a railway station).
New local arterial road network provides greater accessibility and increases traffic capacity.

New town centres and employment nodes are clustered along the local arterials with residential areas located close by.

New residential development concentrated near town centres and employment nodes.

New residential development close to railway stations.

Preferred Pattern of Development
REGIONAL TRANSPORT CORRIDORS
Business centres and major institutions are significant generators of trips, and create complex travel patterns. These facilities can be expanded to become vibrant mixed use employment and activity nodes supporting public transport.

Setting the Scene

- Business centre dominated by a major regional shopping centre.
- Major institution at least 1.5 km from the centre.
- Main City-Coast Road and arterial roads increasingly congested.
- Main bus station poorly located, little priority given to express buses.

Inappropriate Development Pattern

- Freeway/bypass built for through traffic.
- Major institution expansion away from public transport.
- Regional shopping centre expansion away from other businesses.
- City-Coast Road remains congested, freeway/bypass becomes congested.

Preferred Pattern of Development

- Regional shopping centre diversified. Expansion located to create compact business and activity centre.
- Institutional node expansion incorporates business and community activities.
- Pedestrian and cyclist routes and facilities enhanced.

Main Features (Refer to Figure opposite)

- A business/activity centre has evolved on the main City/Coast Road, dominated by a major free standing regional shopping centre. Strip commercial/retail premises have been developed along the arterial roads, and nearby areas are being used for low intensity commercial developments. Townhouses and units have been built behind the strip commercial/retail premises and are interspersed with detached houses.
- A major institutional development (eg a hospital, TAFE, etc) has been established about 1.5 km away (either before or after the shopping centre).
- The main City/Coast Road and the road to the institution are becoming increasingly congested, particularly during peak periods. Traffic in the vicinity of the business centre and the institution is a confusing mix of local and through traffic at most times during the day.
- Public transport comprises solely feeder bus services which terminate at a bus station. This has been located inconspicuously in the car park at the side or rear of the shopping centre. Commuter parking is discouraged in the car park. The bus station is a hub for bus transport for several local schools and private bus companies converging their routes here. There is a bus stop at the institution.
- The bus station is largely isolated from potential patrons. The first 100m of its pedestrian catchment (Ped Shed) is car park and the next 100m includes industry. A range of mixed businesses and land uses are only likely 400m or more from the stops.
- Pedestrian facilities are virtually non-existent beyond the shopping centre arcades and footpaths, and in front of the strip commercial/retail premises. Although the shopping centre may have a retail ‘core’, it lacks an activity ‘heart’.
Setting the Scene

BUSINESS AND ACTIVITY CENTRES

LEGEND

- Major Shopping Centre/
  Major Institution
  (eg. hospital, TAFE etc.)
- Strip Retail/Commercial
- Medium Density
- Showrooms
- Light Industry
- General Urban
- Car Parking
- Feeder Bus Route
The nature and location of the expansion of the shopping centre and the major institution prevents each becoming part of a diversified business and activity centre. Public transport facilities are isolated and therefore under utilised.

### Main Features

(Refer to Figure opposite)

- A road bypass/freeway is built to detour through traffic around the business centre and institution. This provides short-term relief of the traffic congestion. The additional traffic attracted to the bypass/freeway creates new congestion patterns and intensifies the vehicular use of arterial roads that are connections to the bypass/freeway.
- A new bus station is connected to the highway/bypass at the edge of the institution’s expanded car park. It is assumed that this upgrading of the facilities will greatly increase bus patronage. Commuter parking is provided at the extremities of both the shopping centre and institution car parks.
- The bypass/freeway congestion in peak periods continues to grow.
- The end result is that the location of the bus stations and the lack of priority bus access on high demand routes continues to limit potential patronage at the shopping centre and the institution.
- The major institutional facilities expand away from the business centre, the bypass/freeway and the bus station. More car parking is required on site. This further increases congestion on the arterial roads, freeway and highway and isolates the bus station.
- Pedestrian and cyclist facilities remain unaltered with limited attention paid to walking and cycling.
- The City/Coast Road remains congested with car travel.

### Opportunities Lost

(Refer to Figure opposite)

- A The new bypass/freeway takes up valuable land within convenient walking distance of the Shopping Centre, the institution and their bus interchanges.
- B The new bypass/freeway becomes a barrier to local travel - dividing, separating and divorcing land uses. This prevents suitable land uses co-locating along side each forcing longer travel paths and creating greater reliance on private cars.
- C The bus stations serve only the Shopping Centre and the institution. This prevents each area growing into a public transport orientated, integrated business and activity centre.
- D The opportunity for a range of community and business activities to be close to the bus stations is lost because their immediate pedestrian catchments are car parks.
- E The bus station in the shopping centre car park creates an unsafe environment for nearby employees and residents who would otherwise use public transport.
- F The bus service does not support public transport use by commuters. Commuters have no option but to use their cars.
- G The institution has been located away from the business centre and is expanding further away. It does not support the creation of an integrated business and activity centre capable of being effectively serviced by public transport.
- H The major institution has not been developed as a multi-functional business or activity centre in its own right, limiting its economic development and employment role.
- I The limited trade generated by the institution limits the variety and range of retailing and services available to people at the institution.
- J The limited demand for public transport created by the institution makes it difficult to provide viable bus services, especially outside periods of peak demand.
- K The car parking surrounding the institution prevents other land uses taking advantage of the public transport facilities provided for the institution. (Having to cross the extensive car parking area also creates an unsafe environment for nearby residents who would otherwise make use of the institution’s public transport facilities).
City

Car park occupies land closest to bus station and isolates nearby residents.

Freeway/bypass through walkable catchment isolating nearby land uses.

Bus station at rear of development isolated from other land uses.

Expansions away from potential business heart.

Inappropriate Development Pattern
BUSINESS AND ACTIVITY CENTRES
Business and Activity Centres

Preferred Pattern of Development

INSIGHT:
Expansion of the shopping centre and major institution is used to create diversified business and activity centres. Other businesses and community activities are encouraged close to the public transport stations. These become a focus for activity.

What to do – In order of effectiveness
(Refer to the Figure opposite)

CREATE A CIVIC HEART
• Develop Government and community facilities at the most central point between the existing and likely future highest order retail, commercial, institutional and recreational facilities.
• Amend the Planning Scheme to facilitate public transport and pedestrian orientated development within 200m of the stations/stops and limit auto-orientated development in the same areas.
• Identify the development aspirations of key stakeholders (public and private), and seek mutually beneficial solutions which incorporate these principles.

DEVELOP PEDESTRIAN ACCESSIBLE AREAS
• Use pedestrian catchments (5 minutes walk or 400m from the ‘heart’ of activity) as the basis for delineating the boundaries of the town centre / civic core. Locate major pedestrian generators within this area.
• Identify the likely future market demand for high pedestrian generators and act to secure sites for these within the ped shed.
• Amend the Planning Scheme to focus on the strategic importance of key sites, and of sequential development within the pedestrian accessible area. Determine one or two main pedestrian spines between ‘anchors’ and intensively develop these.

INTEGRATE WITH EXISTING INFRASTRUCTURE
• Ensure public transport routes, stations and stops are integrated with the existing public transport networks.
• Follow existing road / transport corridors and use the existing infrastructure ‘at grade’ where possible.
• Ensure the routes and stations/stops serve areas of high concentrations of workers and connect areas/sites which need their strategic importance enhanced.

SERVICE KEY LOCATIONS
• Ensure the routes and stations/stops serve major shopping centres, tertiary education campuses, hospitals, railway stations, existing interchanges, major sporting facilities, etc.
• Locate the major public transport station/stop at the Civic Heart (or within 200m of it), and integrate its design with the public buildings and spaces (existing or future), especially pedestrian/cyclist facilities.
• Locate the station/stop in a direct line of sight (for pedestrians), and within 200m of a point central to the highest concentration of workers (not just shoppers), with direct pedestrian access.

PEDESTRIAN / CYCLIST FOCUS
• Ensure the Planning Scheme requires new developments (private and public) to provide pedestrian/cyclist facilities.
• Undertake a streetscape strategy for the Civic Heart and its pedestrian accessible area, producing a programmed series of public works improvements.

Key Success Factors
(Refer to the Figure opposite)

1 The bus system focuses on the emerging town centres at the intersection of the local arterial roads.
2 The shopping centre is diversified and expanded to become a town centre. The town centre is the focus for a range of higher intensity business and community land uses (including mixed business/residential buildings) that provide high public transport demand at all hours.
3 The institution provides the focus for another diversified activity centre on the local arterial road network and is easily integrated into the public transport network.
4 The opportunity exists for land uses to progressively intensify and a new activity node to form between the town centre and the institution (along the local arterial with its line haul bus services).
5 Public transport services can be efficiently provided because of the high level of demand created by the variety of land uses. (These support the provision of services at different times day and night).
6 Public transport efficiency is enhanced by clustering business and activity nodes along the public transport line haul route that use the local arterial road network.
7 The line haul public transport route is supported by feeder bus routes to the town centre and the institution-based centre.
8 The sites, close to public transport, are used for higher intensity land uses. Car parking is developed away from the arterial road network and bus service.
9 Car parking for the shopping centre and the institution does not occupy land with the most convenient pedestrian access to these activities and the public transport facilities. (Car parking does not occupy sites within 400m of the bus station and town centre, nor within 400m of the bus stop and centre associated with the institution).
10 Nearby residents and workers can safely and conveniently access the public transport stops by direct pedestrian routes. (These pass through areas where there is plenty of activity, a high degree of passive surveillance and which are well lit).
Expansion of institution and attraction of businesses and facilities to create 'activity node'.

Bus stops/stations focus activity at centres.

Expansion of shopping centre and intensified development to create a 'town centre'.

Business and Activity Centres with walkable catchments on 'line haul' public transport routes.

Preferred Pattern of Development
BUSINESS AND ACTIVITY CENTRES
Overview

Existing public transport interchanges have typically been restricted in their levels of service and patronage by a number of constraints. Their role in the future can be strengthened by making them the focus for more rail, bus, taxi, cycling and walking trips.

**PRESENT SITUATION AND ALTERNATIVE DEVELOPMENT PATTERNS**

### Setting the Scene

- **Existing retail/commercial area and railway station 'dying' due to new shopping centre separated from immediate area.**
- **Private bus operator offers limited service through railway station and town.**

### Inappropriate Development Pattern

- Rail patronage declines.
- Increased bus services are or remain uncoordinated with rail services.
- Land adjacent to rail station is sold for development with some park-n-ride allocation.
- Car travel becomes the best option for commuters.
- Safety and security concerns at park-n-ride.

### Preferred Pattern of Development

- Reinforcement of rail station as the focus for public transport.
- Coordination of timetables/through ticketing on bus/rail.
- New bus services to cater for feeder traffic to rail station.
- Land adjacent to rail station is redeveloped in stages to compliment existing business development.
- Establish pedestrian/cyclist spines to major facilities in the area.

### Setting the Scene

**Main Features** *(Refer to Figure opposite)*

- An existing business area, comprised of a number of retail and commercial premises and a railway station, has been languishing ever since a large free standing shopping centre opened about a kilometre away on a major arterial road.
- Rail patronage through the station has steadily dwindled over time, reflecting and accompanying the downturn in trade experienced in the business centre.
- Land between the business centre and the new shopping centre has been progressively developed for a variety of business uses, including some Government offices. A feeder bus route operates in the area with both the railway station and the shopping centre on route, but with minimal patronage.
Setting the Scene
EXISTING PUBLIC TRANSPORT INTERCHANGES

Queensland Department of Transport: Shaping Up
INSIGHT:
The bus/rail interchange and nearby land uses do not reinforce each other nor do they support the commercial viability of local businesses and the efficient provision of public transport. Consequently, increased public transport use is difficult to achieve.

Main Features
(Refer to Figure opposite)
- Rail patronage continues to dwindle over time and public transport is refocused to bus services. Regulation and rationalisation of Government subsidies requires private bus operators to expand their route coverage. Coincidentally, two private bus routes now service the station area creating a situation where there are two routes, two different sets of bus stops and two timetables.
- In a bid to rationalise land holdings and recapture rail patronage, the rail authorities excise the vacant railway land adjacent to the station and call for expressions of interest to develop the land for any purpose.
- A park-n-ride facility is built on the vacant land but awareness of its presence is low to most passing traffic on the major through road.
- Response to the call for expressions of interest is mediocre, reflecting the general downturn of development in the area. Limited integration of the site is achieved with the station, existing business centre and the shopping centre beyond the railway. Consideration is given to approaching the Local Government to purchase the land at commercial rates and to subdividing the site for Residential A lots.
- The park-n-ride area becomes poorly utilised despite being initially enthusiastically received by rail patrons who live in outlying areas and prefer to drive to the station. Lack of after hours safety is one of the major reasons cited by patrons for choosing other stations or not using the rail network at all.
- The overall impact of these outcomes is the accelerated decline of the local businesses which can be indirectly attributed in many ways to the unsafe and underutilised public transport facilities and open spaces. Car travel becomes the best option for most commuters.
- The business area continues to languish and trades below its potential.
Inappropriate Development Pattern

EXISTING PUBLIC TRANSPORT INTERCHANGES

- **Bus route bypasses the station.**
- **Vacant land and Park 'n' Ride occupy the most accessible land.**
- **Nearby residential areas divorced from the station.**
- **Major Shopping Centre and Taxi Rank about 1 kilometre away.**
- **Intersection upgraded.**

**LEGEND**
- Small Shops and Offices
- Housing
- Railway Land
- Vacant Railway Land
- Feeder Bus Route and Bus Stops
INSIGHT:
The development of the interchange and adjacent land becomes a catalyst for revitalisation of the area. The interchange becomes a focus for public transport use and transfers between public transport modes.

Preferred Pattern of Development

What to do – In order of effectiveness
(Refer to the Figure opposite)

Key Success Factors
(Refer to the Figure opposite)

1. The railway precinct is progressively developed with a diverse range of land uses that will support higher public transport use. (These may be commercial, higher density residential and/or mixed business/residential land uses).

2. The local street pattern reinforces the focus on the interchange with its transit supportive development. (New street and pedestrian connections are created where ever practicable).

3. The sites nearest the station are redeveloped first. (Unless they are likely to attract far more intensive land uses later - in which case they are developed for pedestrian friendly interim uses).

4. The interchange and adjacent redevelopment creates a distinctive ‘business image’ for the precinct that helps local businesses attract clients and increase trade.

5. Direct and convenient pedestrian and cyclist links are created between the interchange and the nearby business areas and the surrounding residential areas.

6. These pedestrian and cycle links pass active community and business areas. These are possible destinations but also increase personal safety by providing high levels passive surveillance.

7. These paths are well lit and landscaped with high branching trees and low growing plants below knee height to improve their attractiveness whilst maintaining safety.

8. Care is taken to link the interchange with the nearby shopping centre to provide safe and convenient access for pedestrians, cyclists and bus passengers.

9. A fully integrated, inter-modal transport interchange is developed with convenient pedestrian access provided between rail, bus and taxi services.

10. The interchange is the focus for these services and for local feeder bus services.

11. Service schedules are co-ordinated and set down facilities located to enable changes between services and public transport modes with the minimum of inconvenience and delay.

12. A range of pedestrian and cyclist facilities are provided. (These include convenience retailing and services, telephones and post boxes, lockers, secure bike parking, showers and toilet facilities).

13. Park ‘n’ ride facilities are only provided if the interchange is outside the area of congestion in the region and if it is best placed to intercept long distance commuters from outer areas. (When provided, such commuter parking is located towards the edge of the convenient walking distance from the interchange, with more intensive transport orientated land uses located in between).

REINFORCE THE EXISTING STATION

- Reinforce the existing station (rail or bus) as the focus of public transport services.
- Maximise the opportunities for increasing patronage including renovating the station, park-n-ride facilities (only where the station is at the extremities of the bus/rail network), direct unencumbered pedestrian cyclist access, bus stops and taxi ranks.

SEAMLESS TRANSPORT OPTIONS

- Co-ordinate and refocus transport modes (rail/bus/taxi/car/cycle/walk-in) to focus on the station and the destinations and travel times of users.

FOCUS ON USER NEEDS

- Respond to users needs for safety, convenience and timely delivery of service.
- Research these needs and work towards satisfying the most important desires.

CONNECT LOCALLY

- Connect the station with the major public and private facilities within easy walking/cycling distance.
- Amend the Planning Scheme to require new development en route to provide the pedestrian/cyclist spine, supplemented by programmed capital works.

INTEGRATED COMMERCIAL DEVELOPMENT

- Take a medium/long term redevelopment horizon for the effective and complementary use of commercially viable land.
- Ensure new development complements and does not duplicate existing local businesses, and is integrated with the urban fabric of the area.

ALLOW FOR FUTURE EXPANSION

- Allow for expanded future public transport possibilities such as busways and busway stations.
- Ensure the form and layout of the facilities have been determined with the longest time horizon in mind.
Pedestrian spine linking major shopping centre to public transport interchange.

Intensive transit orientated development concentrates residents and complementary businesses near the interchange.

Interchange provides direct pedestrian links between rail, bus and taxis.

New local street connections make the railway station and interchange more accessible to passengers who walk or cycle.

Public Transport Interchange incorporates:
- Railway Station
- Bus set down
- Parking for disabled
- Kiss-'n'-Ride
- Taxi Rank
- Convenience retailing
- Integrated service information and ticketing
- Pedestrian and cycle facilities

Preferred Pattern of Development
EXISTING PUBLIC TRANSPORT INTERCHANGES
The way in which Business Centres and Town Centres have grown and expanded has resulted in public transport facilities which are inappropriately located, inconvenient or unsafe to use and which are inefficient to operate.

### Setting the Scene

#### BUSINESS CENTRE
- A complex developed adjacent to a major road/highway.
- Bus station is separated from the complex.

#### TOWN CENTRE
- A traditional town centre developed adjacent to a major arterial road/highway.
- Bus stop is separated from the commercial precinct by vacant space.

### Inappropriate Development Pattern

**BUSINESS CENTRE**
- Bus station is moved next to the highway and becomes removed from the complex.
- Park’n’ride can only be provided away from bus station.

**TOWN CENTRE**
- Bus station is further expanded adjacent to the highway.
- Designated park’n’ride developed in vacant space (this adds to the separation of the public transport interchange from the town centre).

### Preferred Pattern of Development

**BUSINESS CENTRE**
- Public transport interchange is integrated with the complex.
- Easy access from interchange to highway.
- Easy pedestrian links to residential and employment.
- Diversity of activities on pedestrian routes.
- Increased diversity of uses in the complex.
- Improved cyclist facilities.

**TOWN CENTRE**
- Public transport interchange located as close as possible to the town centre.
- Interchange configured to reinforce and support development complementary to the town centre.
- Interchange supported with pedestrian and cycle spines linking new ‘hub’ with the town centre.

### Main Features (Refer to Figure opposite)

**IN A BUSINESS CENTRE** (top diagram)
- A ‘Complex’ (such as a regional or sub-regional shopping centre or major Government institution) has been developed adjacent to a major arterial road or highway.
- A range of business establishments and residential areas are adjacent to the complex.
- A bus station has been included on site but is separated from the complex and located so as to be ‘inconspicuous’ and away from the preferred parking spaces of the shoppers and users.

**IN A TOWN CENTRE** (bottom diagram)
- A town centre has developed on a rectangular grid with the most important buildings and facilities generally situated on the prominent roads/intersections (this is typical of many traditional Australian town centres).
- A highway is adjacent to the town centre.
- The public transport interchange (which could either be a railway station or bus station) is located adjacent to the highway and separated from the town centre by vacant space.
Setting the Scene

NEW PUBLIC TRANSPORT INTERCHANGES
New Public Transport Interchanges

3.4 Inappropriate Development Pattern

INSIGHT:
Development has mainly taken into account the needs of car users. Little attention has been given to also building in better opportunities for other ways of travelling. Public transport interchanges have not been integrated into the development.

Main Features
(Refer to Figure opposite)

IN A BUSINESS CENTRE (top diagram)
▶ Development of a busway results in the public transport interchange being moved to the busway, adjacent to the highway.
▶ This has the effect of making the interchange even more removed from the complex and further decreasing the potential walk-in catchment of the public transport interchange. This requires the interchange to be developed as a destination in its own right.
▶ The inability of the complex to cope with significant increases in car parking demand results in surface car parking and spill over parking in residential streets. The requirement for additional parking for the complex means the park’n’ride facilities are located far away from the interchange.

IN A TOWN CENTRE (bottom diagram)
▶ A new bus interchange is developed at the same location as the bus stop away from the town centre.
▶ The vacant space between the interchange and the town centre is developed as a car park.
▶ While this affords some benefits to the town centre, it reduces the potential for the town centre to be progressively developed with land uses which could complement the public transport interchange and its car park.
▶ The resulting urban form is incompatible with that of traditional design and layout of the town centre.

Opportunities Lost
(Refer to Figure opposite)

A Overall the location of the interchange reduces the potential for attracting higher levels of public transport use.
B Low intensity land uses (that are not high generators of public transport demand) occupy large areas of land within convenient walking distances of the interchange.
C The interchange is separated from high demand generators by car parking and major access roads
D (This also introduces the potential for unsafe pedestrian car/conflicts).
E This remote location reduces passive surveillance and is likely to result in perceived safety problems (especially for women and children at weekends and at night).
F The interchange is not integrated into the complex, diminishing its potential to become an anchor attracting trade to the complex.
G This location reduces accessibility and convenience (particularly for the elderly, the handicapped and those with young children).
H The lack of shelter and nearby convenience retail outlets further reduces passenger convenience.
Detached Housing

TOWN CENTRE

BUSINESS CENTRE

(Top Diagram)

Passengers forced to cross access road and car park to move between the interchange and the shopping complex.

Open space converted to Park 'n' Ride which passengers have to cross.

Low intensity uses occupy sites closest to interchange.

LEGEND

Complex (Institutional Building or Shopping Complex)

Commercial Premises

Homemakers Centre

Detached Housing

Parking

Bus Route and Transport Interchange/Bus Stop

Inappropriate Development Pattern

NEW PUBLIC TRANSPORT INTERCHANGES
The integration of public transport interchanges with Town Centres provides considerable benefits. These include better convenience and security for passengers. The interchange becomes a focus for the attraction of complementary activities which can only survive from the passing trade generated by the combination of land uses and facilities.

**Key Success Factors**

(Refer to the Figure opposite)

1. The interchange is located so that it becomes the focus of activity for the Town Centre.
2. It is located to be highly visible for potential passengers and the casual observer (e.g. by terminating vistas on high volume pedestrian routes or ‘closing off’ a public square).
3. High public transport demand generators (such as offices, entertainment and recreation facilities, libraries and other community activities) are located close to the interchange.
4. Higher intensities of residential development and mixed-use business/residential buildings are located within convenient walking distance of the interchange (400 metres for bus, 800 metres for rail).
5. The interchange is located adjacent to ‘active’ retail areas. Nearby activities then benefit from the concentration of customers created by the interchange. Adjacent retailing provides convenience goods and services to waiting passengers thus increasing passive surveillance (which improves safety). Nearby activities provide interest for waiting passengers (thus reducing perceived waiting times).
6. Walking distances are minimised for employees, shoppers and residents using public transport because of the provision of direct pedestrian routes (the active areas passed improves safety and shortens perceived walking distance).
7. Pedestrian shelter is provided on the main pedestrian routes to the interchange. Appropriate shelter, seating, street furniture, telephones and vandal resistant lighting are provided at the interchange to maximise comfort and convenience.
8. Direct access is provided for the different types of public transport between the interchange and the regional road network to reduce delays. (Possibilities including providing priority lanes for buses and taxis along congested routes and priority at signalised intersections).

**What to do – In order of effectiveness**

(Refer to the Figure opposite)

1. **IN A TOWN CENTRE**
   - Reinforce the existing station (rail or bus) as the focus of public transport services.
   - Maximum the opportunities for increasing patronage including renovating the station, park-n-ride facilities (only where the station is at the extremities of the bus/rail network), direct unencumbered pedestrian cyclist access, bus stops and taxi ranks.

2. **INTEGRATION WITH THE TOWN CENTRE**
   - Locate the public transport interchange as close as is practically possible to the heart of the town centre (preferably near or within a larger complex of complementary buildings and uses).
   - If this is not possible, locate the interchange to be within 400m of the heart of the town centre with direct and unencumbered pedestrian links.

3. **LINK THE INTERCHANGE TO THE MAIN ACCESS ROADS**
   - Link the interchange with the local loop roads or dominant business streets, ensuring quick access to the main access routes in/out of the town centre.
   - Provide for priority treatment of buses and taxis through intersections and along potentially congested roads.
   - Provide adequate commuter parking at other interchanges on the route.

4. **ALLOW FOR OTHER USES**
   - Configure the new interchange so that complementary uses (e.g. commercial developments and major civic buildings) are brought together to increase the diversity of the town centre and reinforce the role of the interchange.

5. **SUPPORT WITH STRONG PEDESTRIAN LINKS**
   - Support the new layout with strong pedestrian and cyclist spines linking the nearby employment and residential areas to the town’s ‘Main Street’.
   - Ensure pedestrians waiting for transport services are made comfortable with convenience facilities (telephones, seating, drinking fountains etc).
   - Ensure the pedestrian links between the interchange and the heart of the town centre are direct, unencumbered, protected from sun and rain and well lit at night.

6. **REDUCE CAR PARKING AS PUBLIC TRANSPORT IMPROVES**
   - Reduce car parking requirements and encourage intensive infill development on existing surface car parks as public transport services improve.
   - Enable dual use of car parking areas. Recognise difference between day and night peak usage when setting parking requirements. Allow car parks used during the day to be used for night time activities without requiring additional car parking spaces.
Preferred Pattern of Development

NEW PUBLIC TRANSPORT INTERCHANGES

Interchange becomes a focus for the Town Centre

Shops and offices generating large numbers of customers and high employment generators located close to interchange.

TOWN CENTRE

Queensland Department of Transport: Shaping Up
The integration of public transport interchanges with Business Centres provides considerable benefits. These include better convenience and security for passengers. The interchange becomes a focus for the attraction of complementary activities which can only survive from the passing trade generated by the combination of land uses and facilities.

### Preferred Pattern of Development #2

#### INSIGHT:

The integration of public transport interchanges with Business Centres provides considerable benefits. These include better convenience and security for passengers. The interchange becomes a focus for the attraction of complementary activities which can only survive from the passing trade generated by the combination of land uses and facilities.

#### Key Success Factors

- **1.** The interchange is located so that it becomes the focus of activity for the Business Centre.
- **2.** It is located to be highly visible for potential passengers and the casual observer (e.g. by terminating vistas on high volume pedestrian routes or ‘closing off’ a public square).
- **3.** High public transport demand generators (such as offices, entertainment and recreation facilities, libraries and other community activities) are located close to the interchange.
- **4.** Higher intensities of residential development and mixed-use business/residential buildings are located within convenient walking distance of the interchange (400 metres for bus, 800 metres for rail).
- **5.** The interchange is located adjacent to ‘active’ retail areas. Nearby activities then benefit from the concentration of customers created by the interchange. Adjacent retailing provides convenience goods and services to waiting passengers thus increasing passive surveillance (which improves safety). Nearby activities provide interest for waiting passengers (thus reducing perceived waiting times).
- **6.** Walking distances are minimised for employees, shoppers and residents using public transport because of the provision of direct pedestrian routes (the active areas passed improves safety and shortens perceived walking distance).
- **7.** Pedestrian shelter is provided on the main pedestrian routes to the interchange. Appropriate shelter, seating, street furniture, telephones and vandal resistant lighting are provided at the interchange to maximise comfort and convenience.
- **8.** Direct access is provided for the different types of public transport between the interchange and the regional road network to reduce delays. (Possibilities including providing priority lanes for buses and taxis along congested routes and priority at signalised intersections).

#### INTEGRATION WITH THE COMPLEX

- Locate the interchange so that it becomes an ‘anchor’ within the complex.
- If this is not possible, locate the interchange to be within 400m of the complex with direct and unencumbered pedestrian links.

#### LINK THE INTERCHANGE TO THE MAIN ACCESS ROUTES

- Link the interchange with the approach/service roads, ensuring quick access to the highway/freeway. (Do not take buses through car parks or access roads to car parks).
- Provide priority treatment for buses through intersections and along potentially congested roads.

#### RECONFIGURE THE COMPLEX

- Reconfigure the complex so that new and complementary uses (e.g. cinemas, indoor sport and recreation centres and/or major civic buildings around the new ‘town centre’) are brought together to increase the diversity of the complex and reinforce the role of the public transport interchange.
- Ensure the pedestrian links between the interchange and the complex are direct, unencumbered, protected from sun and rain and well lit at night.
- Provide multi-storey parking (if necessary) away from the interchange (but still within convenient walking distance).

#### SUPPORT WITH STRONG PEDESTRIAN LINKS

- Support the layout with multi-storey car parking and strong pedestrian/cyclist spines linking the new ‘town centre’ with the surrounding business and residential areas.
- Provide adequate commuter parking at other interchanges on the route.
- Ensure pedestrians waiting for transport services are made comfortable with convenient facilities (telephones, seating, drinking fountain etc).

#### REDUCE CAR PARKING AS PUBLIC TRANSPORT IMPROVES

- Reduce car parking requirements and encourage intensive infill development on existing surface car parks as public transport services improve.
- Enable dual use of car parking areas. Recognise difference between day and night peak usage when setting parking requirements. Allow car parks used during the day to be used for night time activities without requiring additional car parking spaces.

#### What to do – In order of effectiveness

- **IN A BUSINESS CENTRE**
  - Locate the interchange so that it becomes an ‘anchor’ within the complex.
  - If this is not possible, locate the interchange to be within 400m of the complex with direct and unencumbered pedestrian links.
- **LINK THE INTERCHANGE TO THE MAIN ACCESS ROUTES**
  - Link the interchange with the approach/service roads, ensuring quick access to the highway/freeway. (Do not take buses through car parks or access roads to car parks).
  - Provide priority treatment for buses through intersections and along potentially congested roads.
- **RECONFIGURE THE COMPLEX**
  - Reconfigure the complex so that new and complementary uses (e.g. cinemas, indoor sport and recreation centres and/or major civic buildings around the new ‘town centre’) are brought together to increase the diversity of the complex and reinforce the role of the public transport interchange.
  - Ensure the pedestrian links between the interchange and the complex are direct, unencumbered, protected from sun and rain and well lit at night.
  - Provide multi-storey parking (if necessary) away from the interchange (but still within convenient walking distance).
- **SUPPORT WITH STRONG PEDESTRIAN LINKS**
  - Support the layout with multi-storey car parking and strong pedestrian/cyclist spines linking the new ‘town centre’ with the surrounding business and residential areas.
  - Provide adequate commuter parking at other interchanges on the route.
  - Ensure pedestrians waiting for transport services are made comfortable with convenient facilities (telephones, seating, drinking fountain etc).
- **REDUCE CAR PARKING AS PUBLIC TRANSPORT IMPROVES**
  - Reduce car parking requirements and encourage intensive infill development on existing surface car parks as public transport services improve.
  - Enable dual use of car parking areas. Recognise difference between day and night peak usage when setting parking requirements. Allow car parks used during the day to be used for night time activities without requiring additional car parking spaces.
**Preferred Pattern of Development**

**NEW PUBLIC TRANSPORT INTERCHANGES**
INSIGHT:
Two major planning issues for residential development that relate to transport are the link between urban form and car usage, and the impact of traffic on the residential environment. Strong environmental, social, and economic arguments exist for reducing the reliance only on cars in new residential subdivisions.

### Setting the Scene
- A large semi-rural parcel fronts an outer suburban arterial road in a growth corridor.
- Plans are drawn up for the subdivision and development of the site.

### Main Features
(Refer to Figure opposite)
- A large semi-rural parcel of land is at the ‘edge’ of an expanding residential area. The area is in a growth corridor.
- The parcel is made up of vacant paddocks.
- The parcel fronts a major suburban arterial road.
- The parcel is purchased by a residential estate developer, and plans are drawn up for the subdivision and development of the site.

### Inappropriate Development Pattern
- Traditional detached houses on large blocks in curvilinear cul-de-sacs.
- A ‘dormitory suburb’.
- Travel movements forced onto arterial roads.

### Preferred Pattern of Development
- Street connections to facilitate local and external movements.
- 15 dwellings per hectare within 5 minutes walk or 400 metres of major bus stops.
- Range of lot sizes and dwelling types.

### Notes:
1. This section includes an additional Preferred Pattern of Development - based on the inclusion of a significant commercial activity (a mixed business centre) and an institutional development (a school) in the proposed subdivision.
2. There are subtle, but significant differences in the urban form and transport outcomes that need to be observed between the two preferred outcomes.
Setting the Scene

NEW RESIDENTIAL SUBDIVISIONS

Queensland Department of Transport: Shaping Up
New Residential Subdivisions

3.5 Inappropriate Development Pattern

INSIGHT:
Residential subdivisions have typically comprised low density housing on individual, large allotments. A curvilinear street layout with low levels of connectivity (e.g., cul-de-sacs leading off local collector streets) limits the range of possible land uses and provides few employment opportunities. Emphasis is usually placed on travel by car with little consideration given to safely providing other ways to travel.

Main Features
(Refer to Figure opposite)
- A new residential subdivision is developed on the site.
- There is limited connectivity within the subdivision pattern and between the site and adjacent sites.
- It is solely developed for detached houses on 600m² to 1000 m² blocks.
- The local street network is based on cul-de-sacs so as to minimise the extent of road works. (This layout is said to prevent rat running but traffic increases on the few through streets.)
- Pedestrian, cycle and vehicle movement between the development and adjacent areas is only possible on the arterial roads.
- The area becomes a dormitory suburb reliant on its residents commuting to distant jobs.
- The inflexible layout and design makes it difficult for the estate to respond to many changes in society (such as the reduction in household size).
- The lack of public transport and easy access leaves women, children, the elderly, and others without ready access to cars, socially isolated.

Opportunities Lost
(Refer to Figure opposite)
- The disconnected street pattern makes it necessary to travel by car using the collector and arterial street network - even when travelling locally.
- The poor pattern of streets makes it difficult to achieve new street connections between the existing community to the west, and the area still to be developed to the east.
- Few opportunities exist to walk or cycle. Safe, direct routes through the area are not provided for either pedestrians or cyclists.
- The poor connections through the area, and low density of residential development make it impossible to provide an efficient local bus service.
- Opportunities do not exist to meet the residential needs of various demographic groups and the travel needs of those with differing lifestyles.
- The parkland is potentially unsafe because there are few opportunities for casual or passive surveillance.
- The parkland and open space is not well used to create amenity and add value to adjacent properties.
Inappropriate Development Pattern
NEW RESIDENTIAL SUBDIVISIONS

- Detached Housing
- Park
- School
- Feeder Bus Route and Bus Stops
- No street connections

No East/West Local Street Connections
No North/South Local Street Connections
Local traffic forced onto collector roads
Local traffic forced onto arterial and collector roads
Park unsafe (fronted by back fences with no surveillance from residences or roads)
Inappropiate Development Pattern
NEW RESIDENTIAL SUBDIVISIONS
Insight:
The local street network improves access within the subdivision and through the area for vehicles, public transport, pedestrians and cyclists in a way that is cost effective, environmentally responsible and minimises the impact of traffic on the community.

What to do – In order of effectiveness
(Refer to the Figure opposite)

Key Success Factors
(Refer to the Figure opposite)

1. Strong east/west and north/south connections provide multiple opportunities to move locally without being forced to use the collector and arterial road system. (The capacity of these roads is therefore retained for longer trips and faster line-haul bus services).

2. The highly connected local street system allows high levels of interaction between the new subdivisions and the existing community with its facilities and services.

3. Multiple opportunities are created for pleasant, safe and relatively direct pedestrian and cyclist movement both through the subdivision and to attractors for trips within the subdivision.

4. Higher density housing is developed close to the major public transport stops. (This creates greater demand for business and public transport services and increases security and safety due to the higher level of passive surveillance).

5. The improved connections between local streets with clusters of higher density residential development make it attractive to provide a local bus service.

6. Town houses front the creek open space system with its cycle path. (The park front location maximises the amenity for this higher intensity residential use whilst the houses, in turn, improve safety for park users by fronting and overlooking the park).

7. Land uses and building types change in the middle of street blocks (or at rear lanes) so that ‘like uses’ and similar building types face each other.

8. Rear lanes are used to improve pedestrian accessibility and to enable rear car parking (thus enabling small lot development with frontages to the street).

Site Context and Sense of Place
- Identify significant internal and external influences such as habitat corridors, drainage and open space connections, and transport connections - major roads, public transport routes, etc.
- Determine the location and nature of proposed and existing features and facilities (natural and human-made) which create a focus for activities.
- Use the activity areas to achieve relatively self-contained, distinctive neighbourhoods with a strong sense of place.
- Define the preferred form of edge development to provide identity but also encourage integration with existing or future neighbourhoods.

Movement and Service Connections
- Establish major local movement systems into and out of the site, including opportunities for bicycle and pedestrian movements though and beyond the site.
- Establish the basic movement network, linking existing streets where necessary, and ensuring good local connectivity (being able to get to as many places as possible by as many means as possible), permeability (being able to move between streets, along pedestrian paths or laneways), and legibility (being able to easily ‘read’ the neighbourhood, and intuitively know where you are going).
- Ensure that walking time/distances between the home and bus stops are as short as possible and distribute local traffic movements onto local streets rather than arterial roads.

Density Gradients
- Design new neighbourhoods so that there are at least 15 dwellings per hectare within a 5 minute walk (or 400m) of the major bus stops. Provide medium density housing sites adjacent to the major bus stops.
- Trade off higher density housing sites closer to the major bus stops against low density housing areas.
- Provide a mix of lot sizes which meet the diverse and changing needs of the community. Design lots to be more easily consolidated for higher density dwellings close to the major bus stops.
- Provide for a range of home based employment opportunities.

Safety and Security
- Ensure that safety and security are considered in the street and allotment layout, open space provision and bicycle and pedestrian networks, dwelling design and orientation, and the location and design of non-residential facilities.
- Above garage and rear workplaces and studios can be accessed from the rear lane. Alternatively these spaces can be for residential purposes. This improves security by providing passive surveillance.
Preferred Pattern of Development
NEW RESIDENTIAL SUBDIVISIONS
New Residential Subdivisions

Preferred Pattern of Development #2
(with a Mixed Business Centre & Public Facilities)

INSIGHT:
A commercial and/or public facility can provide an important focus for the community. The subdivision layout reflects the importance of the facility, making it the focus of local travel.

What to do – In order of effectiveness
(Refer to the Figure opposite)

Key Success Factors
(Refer to the Figure opposite)

1. The highly connected local street system allows high levels of movement within and external to the estate without being forced to use the collector and arterial road system. (The capacity of these roads is therefore retained for longer trips and faster line-haul bus services).

2. Multiple opportunities are created for pleasant, safe and relatively direct pedestrian and cyclist movement both through the subdivision and to major attractions for such trips.

3. The creation of an integrated business, retail and community centre provides local employment, allows multi-purpose trips, and is the focus for public transport services and community activities. (Local businesses benefit from this increased level of activity. Passenger safety is increased by the night time and weekend activities taking place. It also enables successful home-based businesses to expand and remain in the locality).

4. Higher density housing is developed close to the local business and shopping centre. (This creates greater demand for business and public transport services and increases security and safety due to the higher level of passive surveillance).

5. The improved connections between local streets with clusters of higher density residential and commercial development make it attractive to provide a local bus service.

6. Town houses front the creek open space system with its cycle path. (The park front location maximises the amenity for this higher intensity residential use whilst the residences, in turn, improve safety for park users by fronting and overlooking the park).

7. Rear lanes are used to improve pedestrian accessibility and to enable rear car parking (thus enabling small lot development with frontages to the street).

8. Land uses change at the rear of lots, rather than on opposite sides of the street. (This enables privacy and traffic generation issues to be more easily addressed).
Preferred Pattern of Development
NEW RESIDENTIAL SUBDIVISIONS
The planning and design of residential areas needs to be based on an understanding of how individuals and households satisfy their needs for travel. It is necessary to appreciate how residential densities and the provision of safe and direct pedestrian and cycling routes affect travel patterns, and support cost effective public transport provision.

### Setting the Scene

- A large parcel of land has been ‘leap-frogged’ by suburban development and is now strategically positioned at the corner of an arterial and collector road.
- The parcel is surrounded by existing urban development, primarily detached houses.
- The site is generally flat with a watercourse and some remnant vegetation. Otherwise it possesses no outstanding physical features.
- A feeder bus route passes the site.
- The parcel is purchased by a medium density developer, and plans are being drawn up for the subdivision and development of the site.

### Inappropriate Development Pattern

- Standard duplexes and town houses, developed off an internal loop road.
- Local shops turn their back on the development.
- The internal park provides limited access and could prove to be unsafe.

### Preferred Pattern of Development

- A range of lot sizes and dwelling types is provided with higher intensity uses near bus routes and bus stops.
- Walking time and distances between home and bus stops are as short as possible.
- Safe, direct pedestrian and cycle routes are provided.
LEGEND

- Detached Housing
- Park
- Feeder Bus Route and Bus Stops

Setting the Scene

MEDIUM DENSITY DEVELOPMENTS
3.6 Medium Density Developments

Inappropriate Development Pattern

INSIGHT:
The higher densities are insufficient on their own to ensure better public transport services and increased public transport use.

Main Features
(Refer to Figure opposite)
- The site is developed with a staged release of standardised duplexes and townhouses, mostly on-ground 2 bedroom villas with double car garages.
- Pedestrians and cyclists must share the internal street network with vehicles. It has been designed to accommodate emergency and large delivery vehicles thus enabling drivers to achieve comparatively fast driving speeds. Many units have numerous car movements outside their front door.
- The buildings are orientated onto the internal loop road. This road has been designed to have minimal access points to external collector roads.
- Local shops are included in the development, at the junction of the arterial and collector roads. The shops are set at the back of the site, and turn their backs on the duplexes and town houses.
- There are no pedestrian, cycle or vehicle connections between the shops and the site, and so any trip to the shops means moving onto the collector or arterial roads.
- The existing bus stops remain and no attempt is made to integrate these with the new shopping area.
- The inflexible layout and design makes it difficult for the development to respond to many changes in society (such as the demand for a wider choice in housing forms).
- Additionally, significant changes in the workforce (particularly the increasing proportion of women in the workforce) means that there is little street life during the day (‘nobody’s home, everyone’s at work’).
- The lack of public transport and easy access to the neighbourhood shopping centre leaves women, children, the elderly and others without ready access to cars socially isolated.
- The external roads have not been designed to provide a safe and pleasant pedestrian environment integrated with adjacent areas. Consequently, the external roads are a hostile environment for pedestrians and become a dividing element between the new development and the existing community.
- The bus stops are unsafe because they are located adjacent to parks (probably with high vegetation) and little possibility of passive surveillance. Access to the bus stops is only available through these parks or along the arterial road which is fronted by high back fences.

Opportunities Lost
(Refer to Figure opposite)
- There has been no intensification of land uses along the arterial and collector roads to enable the introduction of additional bus services or to support the provision of additional bus stops.
- Opportunities have been lost to generate increased use of public transport and to reduce the walking distance of those using public transport.
- An activity node has not been created that will support local employment and concentrate demand for public transport.
- Employment opportunities are limited to the few jobs available at the local shops. Therefore, virtually all residents are forced to commute to more distant jobs.
- The development has directed trips and activity away from the local shops. This has reduced potential trade and, therefore, limited their economic and employment potential.
- Accessibility is poor with no direct pedestrian and cycle routes through the development or to the bus stops and the local shops.
- The bus stops are located away from the local shops. So, the location of the bus stops does not generate passing trade for the shops, nor support the use of public transport to get to the shops.
- The local shops have not developed as the focus for the local bus services and a convenient and safe place to change between services. Again this has reduced their trade and local employment potential.
Back fences fronting public space reduces safety.

Inappropriate Development Pattern

MEDIUM DENSITY DEVELOPMENTS

Bus stop located away from local shops and at unsuitable locations.

Narrow walkway potentially unsafe.

Land uses and access do not support local shops or better bus services.

LEGEND
- Local Shops
- Attached Housing
- Attached Housing (Duplex)
- Detached Housing
- Park
- Feeder Bus Route and Bus Stops
INSIGHT:
Higher development densities are concentrated along public transport routes close to interchanges to enable the provision of more frequent, cost effective services. Pedestrian and cycle networks and facilities are integrated into the design to support the increased use of public transport.

What to do – In order of effectiveness
(Refer to the Figure opposite)

Key Success Factors
(Refer to the Figure opposite)

1. The site is developed as a diversified local activity node.
2. Land uses, their intensity and both road and pedestrian access focus activity towards the local Business and Community Centre and bus routes.
3. A mixed-use, local Business and Community Centre is developed that provides opportunities for a wide range of local businesses to establish (thus reducing the number of residents forced to commute to jobs or forced to transact business or seek services elsewhere).
4. The Business and Community Centre also provides a focus for the local bus network and a safe and convenient place for passengers to change routes. (The local businesses increase their trade and passengers benefit from being able to make purchases at the start or end of their trip).
5. Combining community facilities with this centre enables multi-purpose trips, increases trade, and improves safety and security by generating ‘out of business hours’ use. This further supports public transport use and the provision of ‘off-peak’ services.
6. Safe and direct pedestrian and cycle routes are provided both within and through the development, and to the Business and Community Centre.
7. The bus stops are located at convenient locations with direct, safe access to the residential area and at the Business and Community Centre.
8. Safety is improved by developments directly fronting the bus stops, parkland and pedestrian routes, thereby increasing passive surveillance. Tall fences and narrow walkways without escape routes are avoided.
9. Residences, studios and workspaces are encouraged above rear garages and fronting or overlooking the rear lanes. This increases pedestrian safety at all hours for those using these lanes and improves the residential amenity of the ‘front’ streets.

NEIGHBOURHOOD LINKAGES
- Design and lay out the new development so that it builds on, and is integrated with, the larger neighbourhood.
- Focus local traffic movements onto local streets rather than arterial roads.
- Provide as many pedestrian and cycle linkages as possible, and ensure any road linkages have strong pedestrian and cycle components.
- Ensure that walking time and distances between the home and bus stops are as short as possible.
- Ensure the layout maximises the ability for any person to move from the home to the Business and Community Centre and bus stop without using a car.

BUSINESS AND COMMUNITY CENTRE
- Design and lay out the new development so that it will provide the most direct pedestrian and cycle connections to the Business and Community Centre.
- Orientate the centre to benefit from these connections.
- Make the linkages as attractive and safe as possible, with shady trees, graded walking and cycle paths, lighting, seats, etc.

DENSITY GRADIENTS AND DIVERSITY
- Design the new development so that there are at least 15 dwellings per hectare within a 5 minute walk or 400m of the Business and Community Centre.
- Provide a mix of lot sizes which meet the diverse and changing needs of the community.
- Design lots to be easily consolidated for higher density dwellings close to the business and community centre.
- Trade off higher density housing sites closer to the centre against low density housing areas.
- Provide for a range of home-based employment opportunities.
- Above garage and rear workplaces and studios can be provided from the rear lane. Alternatively these spaces can be for residential purposes.
- Focus on the needs of future residents, placing a high priority on reducing walking and cycling travel times and distances between homes and bus stops, community and commercial facilities.

SAFETY AND SECURITY
- Ensure that safety and security are considered in the street and allotment layout; open space provision; bicycle and pedestrian networks; dwelling design and orientation, and the location and design of non-residential facilities.
Preferred Pattern of Development

MEDIUM DENSITY DEVELOPMENTS
Most business and town centres have a main intersection where commercial activities have traditionally located. The intersection naturally carries considerable through traffic. At the same time, it is expected to be a focus for both business activities and for people wishing to use public transport.

### Setting the Scene

**Main Features** *(Refer to Figure opposite)*

- A major intersection forms the centre of the business area. It is the main focal point of pedestrian and vehicular activity. The main road running through this area was the main route joining a CBD with a coastal area or another centre. New urban development has been fuelled by 10 to 30 years of steady population growth. Increased traffic flows through the intersection make it an important focus of movement in the sub-regional or district level.

- Small shops and offices are on one or two corners.

- Service station on another corner.

- Pedestrian movements face delays and safety problems at the intersection.

- The corner offers high exposure to many thousands of vehicles each day. Sites have been developed for a franchised fast food chain, or homeware outlets.

- A service station is situated on another corner. It is set back from the intersection (its buildings and pumps are perpendicular to the diagonal of the intersection).

- The fourth corner of the intersection is part of a large future free standing shopping centre site.

- The quality of the pedestrian areas in the vicinity of the intersection is relatively poor, although there are signalised pedestrian crossings incorporated within the traffic lights system. The roads also do not cater for safe cyclist movements. High levels of traffic moving through the intersection raises safety concerns, produces air and noise pollution and significantly contributes to an uncomfortable environment.

- In terms of traffic function, the intersection is quickly approaching, saturation.

### Inappropriate Development Pattern

- Intersection capacity upgrade - increased number of lanes.

- Large fast food outlet on corner.

- Major shopping centre developed.

- Limited public transport.

### Preferred Pattern of Development

- Land use and transport plans develop intersection as an activity node.

- Provide alternative routes or disperse through traffic.

- Bus stops on all routes (close to intersection enable easy transfers).

- Cycle lanes and cycle facilities provided.

- Focus on pedestrian safety and pedestrian movement.
Setting the Scene

BUSINESS CENTRE INTERSECTIONS
INSIGHT:
The intersection is widened and designed to increase traffic volumes. Consequently, it is considered to be unattractive and unsafe by both pedestrians and cyclists. Businesses are easily accessed by motorists but not by those without ready access to cars. Public transport facilities are limited and lack integration with other activities.

Main Features
(Refer to Figure opposite)

- In response to the steady increases in the traffic volumes moving through the intersection, the relevant authorities progressively widen the intersection to increase its capacity. The main road is now three lanes in both directions. The cross road consists of two lanes in each direction at the intersection. Both have free left turn and protected right turn lanes.

- The original one and two storey buildings are demolished and the road widened as part of the redevelopment of the corner sites. The new premises will appear and operate in a vastly different way to the small shops and offices that existed prior to redevelopment. Typically, a large international fast food outlet is set back from the intersection to gain maximum exposure with a parking forecourt. Alternatively, the buildings may be replaced by a showroom development which again is set back from the intersection for exposure and due to the road widening. These premises will be developed as a consequence of the major shopping centre development on the opposite corner. They may include home centres (stocking bulky goods) or local shopfronts for banks.

- The service station will remain but is renovated to include convenience retailing and perhaps a small fast food component, ATM facilities and trailer/ute hire.

- One corner has been developed as a car park for the large shopping centre. Many parking spaces at the fringe of the complex are rarely utilised. Other fast food outlets may occupy the corner.

- There is now little, if any, pedestrian movement across the intersection. The addition of just one lane in each direction virtually doubles the distance that pedestrians must travel to cross the road and requires them to negotiate at least two pedestrian refuges en route. Cyclists rarely use the intersection due to safety problems associated with the high traffic volumes.

- The ‘heart’ of the business centre has now been destroyed and many former activities have been forced into the shopping centre. What was the ‘heart’ is now virtually exclusively dominated by the car, car parking and car-oriented businesses seeking maximum exposure to capture business from passing car travellers.

- Increasing the capacity of the intersection enables a greater flow of vehicles, it is only a short-term solution which just keeps pace with traffic volumes. The intersection eventually reaches saturation again and the same problem of traffic congestion needs to be addressed.

Opportunities Lost
(Refer to Figure opposite)

A The intersection has not developed as a local business and employment node and a public transport interchange.

B The business centre can not be used by bus passengers to change routes because only buses travelling in one direction set down passengers close to the intersection.

C There is no taxi rank conveniently located to service businesses and bus passengers at the intersection.

D The intersection is considered inconvenient and unsafe by cyclists. No provision has been made for cyclists travelling to the business centre, cycling through the intersection or cycling to use public transport.

E Businesses located at the intersection are mainly dependent on passing motorists. This limits both the types and number of jobs provided and the range of retailing and services available.

F The activities that exist are best accessed by car which provides little prospect for creating passing pedestrian trade.

G The intersection is considered unattractive and unsafe by pedestrians. There is little activity to attract pedestrians. There are few convenience or community services for nearby residents, local workers and those using public transport. There is little shelter, landscaping or street furniture.

H The bus stop is unattractive and inconvenient to use. It is separated by car parking from the shopping centre, and it is difficult (or impossible) to see approaching buses from the bus shelter. There are no facilities or nearby convenience shops for passengers.

I The bus stop is also considered unsafe (especially for women, the elderly and young children at night and weekends). It backs onto the car park, landscaping has resulted in tall vegetation nearby, there are no alternative pedestrian routes and no nearby land uses providing passive surveillance.
Inappropriate Development Pattern

BUSINESS CENTRE INTERSECTIONS

Poor pedestrian amenity and little pedestrian activity

Petrol Station
(upgraded with Fast Food Outlet & Ute/Trailer Hire)

Furniture Showrooms and Bulky Goods

Bus Stop inconvenient (accessed through car park), potentially unsafe with few facilities.

LEGEND

BUS STOP
(with shelter)
The intersection is progressively transformed into a pedestrian friendly business centre and local public transport interchange. This is achieved by the careful location of public transport stops, the sensitive design of public spaces, and the positive contribution of private developments to the revitalisation strategy.

**Preferred Pattern of Development**

**Key Success Factors**

1. Traffic at the intersection is reduced by dispersing through traffic on the local arterial and collector road network or by an integrated local loop road system.
2. Cycle lanes are provided to the intersection. Kerb side taxi ranks and any kerb side parking is indented to not inhibit cycle lanes.
3. Bus stops are close to the intersection to allow easy transfers between services. (Purchases can be made close to public transport stops, and the high level of activity improves passenger safety and provides interest during waiting times).
4. A taxi rank is close to the intersection with its bus stops.
5. Footpaths are widened to improve pedestrian amenity, to provide space and facilities for passengers, and to accommodate landscaping, seating, market stalls, outdoor eating or street entertainment.
6. Buildings are built up to the widened footpaths to create continuous ‘active frontages’ without blank walls or large gaps (over 20 metres).
7. Low intensity land uses which attract little trade are discouraged from the core of the business centre.
8. On-site car parking is not permitted between the footpaths and the fronts of buildings. (Kerb side parking may be permitted where the space is not required for bus stops / taxis).
9. On-site car parking is provided behind buildings, accessed from rear lanes rather than from the streets near the intersection where it interrupts pedestrian flows and can cause pedestrian safety problems.
10. Direct, safe and attractive pedestrian routes are provided to the intersection and public transport facilities. Security lighting, landscaping (with below knee height plants and high branching trees for safety), seating, and multiple routes (to avoid unsafe situations) are provided.
11. Special attention is given to passenger facilities near the bus stops and taxi ranks (lighting, seating with good visibility, shade and shelter, telephones, bike lockers, drinking fountains, public toilets, and information on routes, and timetables).

**RECOGNISE THE HEART OF THE BUSINESS CENTRE**

- Ensure land use and transport plans recognise the importance of the intersection for business and the community.
- Set limits to the number of lanes and control the speed of vehicles through the intersection.

**CREATE LOOP ROUTES FOR THROUGH TRAFFIC**

- Plan for and introduce alternative routes for through traffic, particularly heavy traffic routes.
- Establish a loop road system for through traffic around the intersection.

**MINIMAL TRAFFIC LANES FOR LOCAL CIRCULATION**

- Retain only those traffic lanes which are essential for the circulation of local traffic (do not install free turning dedicated left and right hand turn lanes).
- Install local area traffic management devices (such as speed humps) to dramatically reduce the speed of vehicles at key pedestrian crossing points.

**ADD CYCLE LANES AND BUS STOPS**

- Provide bus stops to allow transfers between services running in both directions.
- Include cycle lanes on approach roads and provide alternative cycle routes through the intersection.

**BUILD UP TO THE WIDENED FOOTPATHS**

- Wherever possible build up to the widened footpaths to maximise the pedestrian space in and around the intersection.
- Do not allow large gaps or setbacks that will destroy the active pedestrian frontages.

**RETAIN AND REINSTATE BUILT FORMS**

- Large ‘big box’ retailing with long blank walls is ‘sleaved’ into the interior of the block (directly accessible from car parking).
- Other business and retail activities (and only the entrance to these large stores) occupy the main street frontage. This maintains the ‘active frontages’ of the intersection, preserves pedestrian amenity and increases perceived pedestrian and passenger safety.
- Keep the building forms which represent the early periods of the intersection’s life, particularly where these forms demonstrate a true business and community function.
- Provide incentives for new development to be built up to the street, with generous awnings covering footpaths.
- Car parking is generally provided behind the buildings.

**CREATE A PEDESTRIAN FOCUS**

- Design the intersection so that attention is given to pedestrians, focusing on pedestrian safety.
- Install local area traffic management devices (such as speed humps) to dramatically reduce the speed of vehicles at key pedestrian crossing points.
Preferred Pattern of Development
BUSINESS CENTRE INTERSECTIONS
PUBLIC TRANSPORT EFFICIENCY

The main means of travel in urban areas are the motor car and public transport in the form of buses or trains. The degree to which public transport can be provided at a reasonable level of subsidy, is closely related to the land use mix and the densities of activities at both the origin and destination of a journey.

The following table shows a matrix of high and low land use densities. Each cell of the matrix defines the level of public transport likely to be achieved. Cells marked ‘✔’ indicate public transport provision is likely to be both economic and efficient. The cells of the matrix defined as ‘❐’ represent those instances where public transport can still operate efficiently but will need to be provided at a higher level of subsidy to cater for those without access to a car, as well as to attract car users to public transport.

For example, high densities at both the origin and destination of a journey are likely to enable public transport to be provided efficiently and economically, ‘✔’. It may also be possible to provide effective public transport if densities are high at either the origin or destination of trips. The low density origin to a high density destination case represents the typical work trip. At the low density non-work end of the journey, public transport needs to resemble the car in its convenience and ability to collect and distribute passengers.

<table>
<thead>
<tr>
<th>ORIGIN</th>
<th>DESTINATION</th>
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<tbody>
<tr>
<td>HIGH</td>
<td>MEDIUM</td>
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<tr>
<td>HIGH</td>
<td>✔</td>
</tr>
<tr>
<td>MEDIUM</td>
<td>❐</td>
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<tr>
<td>LOW</td>
<td>✔</td>
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</tbody>
</table>

LAND USE DENSITIES AND LIKELY PUBLIC TRANSPORT EFFICIENCY

The next table indicates the overall level of public transport orientation for a wide variety of land uses. This level of public transport orientation is classified as high, medium or poor - accordingly to whether the land use is likely to support a satisfactory level of service.

PUBLIC AND INSTITUTIONAL LAND USES

| LAND USES THAT SUPPORT PUBLIC TRANSPORT
<p>| LEVEL OF PUBLIC TRANSPORT ORIENTATION |
|-------------------------------------|------------------------------------|
| NOTE: Land uses noted as having MEDIUM levels can have HIGH levels if located and designed so as to increase public transport. | HIGH | MEDIUM | LOW |
| Apartment buildings/Attached houses/town houses | ✔ | ❐ | ❐ |
| Boarding houses | ✔ | ❐ | ❐ |
| Duplexes | ✔ | ❐ | ❐ |
| Detached houses on small blocks (&lt;700m²) | ✔ | ❐ | ❐ |
| Detached houses on &gt;700m² blocks | ✔ | ❐ | ❐ |
| Hostels | ✔ | ❐ | ❐ |
| Retirement villages | ✔ | ❐ | ❐ |
| Rural residential development | ✔ | ❐ | ❐ |</p>
<table>
<thead>
<tr>
<th>Public and Institutional Land Uses</th>
<th>Level of Public Transport Orientation</th>
</tr>
</thead>
<tbody>
<tr>
<td>NOTE: Land uses noted as having MEDIUM levels can have HIGH levels if located and designed so as to increase public transport.</td>
<td></td>
</tr>
<tr>
<td>HIGH</td>
<td>MEDIUM</td>
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<tr>
<td>Airports</td>
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<tr>
<td>Botanic gardens</td>
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<td>Camping grounds</td>
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<tr>
<td>Car parks</td>
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<tr>
<td>Caravan parks</td>
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<tr>
<td>Cemeteries</td>
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<tr>
<td>Circus sites</td>
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<td>Church, place of prayer etc</td>
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<tr>
<td>Clubs</td>
<td></td>
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<tr>
<td>Cultural/community centres, public halls, etc</td>
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<tr>
<td>Child care</td>
<td></td>
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<tr>
<td>Government offices</td>
<td></td>
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<tr>
<td>Hospitals</td>
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<td>Lawn bowls clubs</td>
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<tr>
<td>Libraries</td>
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<td>Parks &lt;1000m²</td>
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<tr>
<td>Parks &gt; 1000m²</td>
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<tr>
<td>Post office (shopfront)</td>
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<tr>
<td>Post office (mail collection/distribution centre)</td>
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<tr>
<td>Recreation facilities</td>
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<tr>
<td>Schools/TAFE Colleges/Universities</td>
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<tr>
<td>Showgrounds</td>
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<tr>
<td>Sporting Arena, stadium etc</td>
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<tr>
<td>Swimming</td>
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<td>Welfare premises</td>
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<td>Youth centres</td>
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<td>Zoos</td>
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<tr>
<td>COMMERCIAL LAND USES</td>
<td>LEVEL OF PUBLIC TRANSPORT ORIENTATION</td>
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<tr>
<td>-------------------------------------------------------------------------------------</td>
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<tr>
<td>Anchor stores (department, and discount stores, supermarkets, free standing shopping centres etc)</td>
<td>HIGH MEDIUM LOW</td>
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<tr>
<td>Automatic car washes</td>
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<tr>
<td>Automatic teller machines</td>
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<tr>
<td>Bakeries</td>
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<td>Banks</td>
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<tr>
<td>Bicycle sales/repairs</td>
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<td>Bowling allies</td>
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<td>Cafes</td>
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<td>Car parks</td>
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<td>Cinemas</td>
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<td>Child care centres</td>
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<tr>
<td>Day and night businesses</td>
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<td>Drive-in theatre</td>
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<td>Function rooms</td>
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<td>Funeral parlours</td>
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<tr>
<td>Fun parlours, amusement halls, etc</td>
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<tr>
<td>General &amp; convenience store (7/11, etc)</td>
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<tr>
<td>Gyms, keep fit centres, etc</td>
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<tr>
<td>Golf course</td>
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<tr>
<td>Golf driving range</td>
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<td>Hotel</td>
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<tr>
<td>Indoor recreation centres, skating rinks, indoor cricket, etc</td>
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<tr>
<td>Junk yards</td>
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<tr>
<td>Light industries</td>
<td></td>
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<tr>
<td>Locksmith, keys, etc</td>
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<tr>
<td>COMMERCIAL LAND USES (continued)</td>
<td>LEVEL OF PUBLIC TRANSPORT ORIENTATION</td>
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<tr>
<td>NOTE: Land uses noted as having MEDIUM levels can have HIGH levels if located and designed so as to increase public transport.</td>
<td>HIGH</td>
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<tr>
<td>Maternal and child welfare clinics</td>
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<td>Medical centres</td>
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<td>Motels</td>
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<tr>
<td>Motor vehicle storage yards</td>
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<tr>
<td>Night clubs</td>
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<td>Nurseries</td>
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<td>Offices</td>
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<td>Pharmacies</td>
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<td>Photo/fast film shops</td>
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<td>Printers</td>
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<tr>
<td>Radio stations</td>
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<tr>
<td>Restaurants</td>
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<tr>
<td>Service stations, car repairs, etc</td>
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<tr>
<td>Shoe repairers</td>
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<tr>
<td>Shops</td>
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<tr>
<td>Showrooms (indoor - furniture, white goods, appliances, etc)</td>
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<tr>
<td>Showrooms (outdoor - car, caravan and boat sales, etc)</td>
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<tr>
<td>Snack bars, fast food kiosks, takeaway food bars etc, walk in</td>
<td></td>
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<tr>
<td>Snack bars, fast food kiosks, takeaway food bars etc, drive in</td>
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<tr>
<td>Surgeries (Doctor’s, Specialists, etc)</td>
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<tr>
<td>Theme parks, tourist attractions, amusement parks, etc</td>
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<tr>
<td>Veterinary surgeries</td>
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<tr>
<td>Video rental outlets</td>
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<tr>
<td>Warehousing</td>
<td></td>
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<tr>
<td>Wharves</td>
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</tbody>
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Terms and Abbreviations

**Access lane:** A rear or side lane providing access to parking on lots with street frontage and/or short connections between access places or access streets principally to facilitate movement of service and emergency vehicles.


**Apartment:** A form of residential building where one dwelling is located above another.

**Arterial road:** A primary connecting road, from which smaller roads link to more local areas.

**Auxiliary Lane:** The portion of the carriageway adjoining the through traffic lanes, for speed-change or for other purposes supplementary to through traffic movement.

**Business and Activity Centre:** A mixture of residential, commercial, and public land uses concentrated in one location.

**Busway:** System of bus stations connected by dedicated rights-of-way for buses only.

**Capacity (Roadway):** The maximum number of vehicles that can pass a given point on a lane or carriageway during one hour under the prevailing carriageway and traffic conditions, without unreasonable delay or restriction to the drivers’ freedom to manoeuvre.

**Carriageway (Roadway):** That portion of the road devoted particularly to the use of vehicles, inclusive of shoulders and auxiliary lanes.

**Central Business District (CBD):** Area of intensive commercial and other activity at the centre of most cities and large towns.

**Channelisation:** A system of controlling traffic by the introduction of an island or islands or markings on a carriageway to direct traffic into predetermined paths usually at an intersection or junction.

**Channelised Intersection:** An intersection provided with channelising islands.

**Collector Road:** A road whose primary function is the distribution of traffic between arterial roads and residential streets.

**Cordon pricing:** Charging a fee to discourage motor vehicles from crossing a cordon thrown around a congested area.

**Cycleway:** That portion of road, street or public path set aside for exclusive use by cyclists.

**Degree of Saturation (Roadway):** The ratio, usually expressed as a percentage, of the number of vehicles entering a signalised intersection in a specified period, to the number which could enter, if all approaches were fully saturated during that period.

**Demand-responsive public transport:** Characterised by flexible routes and schedules responding partially or fully to the requests of individual passengers.

**Density:** Refers to site density, net dwelling density and gross dwelling density.

**Density Gradient:** Placing the most intense site density areas closest to an activity centre and site density is gradually reduced as the distance increase from the activity centre and development sites. It provides for a mix of housing and development which supports the provision of effective public transport.

**Design Speed:** A speed fixed for the design and correlation of those geometric features of a carriageway that influence vehicle operation. Design speed should not be less than the 85th percentile speed (the speed at which 85 percent of vehicles travel).

**Design Volume (DHV):** (a) The number of vehicles expected to use the transport route adopted for the purposes of design, normally expressed as of vehicles per hour. (b) The number of vehicles per hour for which the road is designed.

**Dwelling site:** Means the area set aside for the exclusive use of a dwelling.

**Frontage:** Means the street alignment at the front of a lot and in the case of a lot that abuts two or more streets, the boundary of which, when chosen, would enable the lot to comply with these provisions.

**Grade separation:** Separation of transport routes using over and underpasses.
Greenhouse gases: Gases (mainly carbon dioxide) contributing to global warming.

Greenway: Combination of public transport priority systems and traffic control services designed to allow small public transport vehicles to exclusive travel through street closures.

Gross Dwelling Density: Means the number of dwellings on the land occupied by dwellings plus local streets, open spaces, shops and service premises, primary schools, and half the width of adjoining sub-arterial or arterial roads.

Growth management: Ensuring that development and growth occurs in a way which achieves agreed social, economic and environmental objectives.

High-occupancy vehicle (HOV): Passenger vehicle carrying two or more occupants.

Infill housing: A general term used for new housing in existing residential areas and usually involving the use of a vacant site or the removal of an existing dwelling to enable construction of a larger number of dwellings.

Infrastructure (Transport): Fixed equipment (such as roads, railways and traffic lights) needed for transport services.

Integrated: Combined into a unified system taking into consideration all relationships. In terms of transport this means considering all modes, land use patterns and social, environmental and economic impacts.

Intersection: The place at which two or more roads cross.

IRTP: Integrated Regional Transport Plan for South East Queensland.

Key Centres: Key centres are the preferred locations for major employment growth through office, retail, community services, leisure and cultural facilities and government services, facilities and infrastructure.

Level of Service (Transport): A range of operating conditions bounded by volumes of travel speed.

Light rail: A modern electric train system capable of on-street running, but segregated from road traffic as much as possible.

Line haul: Fast, reliable, high passenger capacity public transport routes linking outer areas to major centres and the Central Business District.

Local area traffic management: means the process of planning and controlling the usage of streets within a local residential area to achieve goals, determined by affected parties, for the improvement of the residential environment.

Local Road: A road whose main function includes the distribution of traffic between arterial and collector roads, and residential areas.

Lot: means an area of topographical space shown on an approved plan of subdivision and on which it is intended to construct a dwelling or dwellings.

Major Centres: Strategically important urban centres throughout Queensland. They include the CBD’s, Key Centres and Major District Centres.

Median: The area separating the opposing traffic lanes of a divided roadway.

Net Dwelling Density: means the number of dwellings on the land occupied by dwellings plus internal public streets and incidental open spaces.

Parking Lane: An auxiliary lane primarily for the parking of vehicles.

Ped Shed: A pedestrian catchment area.

Performance criteria: Means criteria to be used in the preparation, submission and assessment of development proposals for measuring performance of the proposals against element objectives.

Public transport interchange: Place built for passengers to gain access to public transport or to transfer from one public transport vehicle to another.

Ramp metering (Roadway): Controlling the flow of traffic on a congested freeway by regulating access at entry ramps.


Refuge Area (Roadway): An area of carriageway set aside for the exclusive use of pedestrians or stationary vehicles.
Regional Framework for Growth Management (RFGM): The South East Queensland Regional Framework for Growth Management 1995 and Update 1996 which was developed through SEQ 2001 as a guide for growth and development in the region.

Ride-sharing: A form of transport, other than public transport, in which more than one person shares in the use of the vehicle, such as a mini-bus, van or car, to make a trip. Car-pooling and van-pooling are forms of ride-sharing.

Ring road: Road encircling an urban area to enable traffic to avoid the centre of that area.

Seamless public transport: Public transport services provided by different operators and different modes appear to the user as if they were a part of a single system of integrated services, fares and ticketing.

Semi-Mountable Kerb: A kerb designed so that it can be driven across in an emergency or on special occasions without damage to the vehicle.

Service contract: An agreement for the provision of transport services between a transport operator and the government.

Site: Means the lot(s) of land on which a building stands or is to be erected.

Site Density: Means the ratio of dwellings and the site area they occupy. The land area excludes local streets, open space and any other land not directly related to the dwellings.

Staggered “T” Junction: An intersection in which the carriageway of one road is offset so as not to be continuous across the other road.

Storey: Means a space within a building which is situated between one floor level and the floor level next above, or if there is no floor above, the ceiling or roof above. It does not include a room contained wholly with the roof space or a parking area contained wholly within a basement which is below the natural ground level.

Street: Means any street, lane, footway, square, court, alley, right of way, driveway or passage incorporating the full width from property line to opposite property line as well as the street pavement and the verge.

Street alignment: Means the horizontal geometry of the street reserve boundary.

Streetscape plan: Means the portion of the development plan showing the visible components within a street (or part of a street) between facing buildings, including the form of buildings, setbacks, fencing, landscaping, driveway and street surfaces, utility services and street furniture such as lighting, signs, barriers and bus shelters.

Sustainability: Maintaining into the indefinite future certain essential and desirable characteristics of the way we live and the environment in which we live.

Through Lane: A lane provided for the use of vehicles proceeding straight ahead.

Traffic calming: Traffic management techniques aimed at reducing the impact of traffic on local streets.

Traffic Control Device: Any sign, signal, marking or installation placed or erected under public authority for the purpose of regulating, warning or guiding traffic.

Traffic Island: A defined area within a roadway, usually at an intersection, from which traffic is intended to be excluded and which is used for control of vehicular movements and for pedestrian refuge.

Traffic Lane: A portion of the carriageway allotted for the use of a single line of vehicles.

Traffic Phase: A portion of a cycle during which a particular pattern of traffic movement is maintained.

Traffic Signals Cycle: One complete sequence of signal phases.

Transit-oriented development (TOD): Urban development comprising of mixed residential and commercial uses within comfortable walking distance of public transport and the core commercial area.

Transport system: Infrastructure, services and equipment to provide for the movement of people and freight.

Travel demand management (TDM): Measures to influence the demand for travel, and how and when this travel is undertaken, leading to an overall reduction in traffic congestion, energy and pollution costs.
**Trip:** A one way journey by an individual using any mode of transport.

**Trunk Collector:** A street connecting the internal street network serving residential development with the external, arterial road network.

**Turning Lane:** A traffic lane allotted to traffic turning either to the left or to the right.

**Urban development:** Establishment of new communities comprising residential, commercial and other areas.

**Urban form:** Broad shape and structure of an urban community and the distribution of its major features.

**Vehicle emission controls:** Government regulations limiting pollution from the exhausts of the diesel and petrol powered vehicles.

**Verge:** Means that part of the street reserve between the carriageway and the boundary of adjacent lots (or other limit to street reserve). It may accommodate public utilities, footpaths, storm water flows, street lighting poles and planting.

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