5. Economic development

Desired regional outcome

A strong, ecologically sustainable and diversified economy, building on new and existing regional and subregional competitive advantages and specialisations.

FNQ has a vibrant economy that has demonstrated strong growth over time. The strength of the region's economy lies in the quality and depth of its primary and tourist industries, which underpin economic activity. The region's close proximity to many of Australia's trading partners in Asia and the South Pacific presents many opportunities for greater economic activity. FNQ has the potential to be a leader in tropical and climate change expertise, building on its developing resource base in knowledge and service industries.

The continuing movement of people into the region will drive employment forward. The region's capacity to create employment and support the preferred pattern of development requires specific subregional strategies focusing on:

- preserving the region's natural economic and environmental advantages
- diversifying the region's economic base
- continuing to provide suitable and appropriately located land for industry and economic activity
- continuing to support primary industries in rural locations
- developing skills to support industry and regional growth.

Other factors that support economic growth and development include providing infrastructure and services, such as transport, freight and information and communication technology, education and research institutions, and water and energy.

The region is an attractive place to live and work, with its tropical lifestyle and high quality of life. Maintaining this attractive lifestyle will be important in attracting skills and investment for a sustainable economy.

5.1 Economic growth and diversification

FNQ has a growing economy traditionally based on agriculture and tourism industries. There are areas of good-quality agricultural land surrounding Mareeba–Dimbulah, Atherton, the southern Tablelands, the coastal plain between Cairns and Cardwell and the Mossman area. Tourism is based on the Wet Tropics and the Great Barrier Reef World Heritage areas. Potential for mining activities is increasing, particularly in the Mount Garnet and Chillagoe corridor.

Continued diversification of the region's economic base is important to minimise the effects of global trends and major events—including from climate change—on the region's overall economy. The natural and rural values provide great economic opportunities and further economic pursuits must ensure those values remain. However, this relatively narrow economic base places the region in a vulnerable situation. Tourism, mining and to a lesser extent primary industries, are susceptible to external influences such as international trends and commodity markets. The region's economic base needs to be diversified in order to develop greater robustness. This will provide a wider range of employment and economic opportunities for the community.

Cairns is the major commercial, business and service centre for FNQ, Cape York, the Gulf of Carpentaria and Papua New Guinea. Cairns accommodates key regional infrastructure such as an international airport, seaport, HMAS Cairns naval base and a campus of James Cook University. Innisfail, Tully, Atherton and Mareeba are major regional activity centres that provide commercial, business, retail and services for the urban community and surrounding rural areas.

The region's employment opportunities are largely concentrated in Cairns. A greater range of employment options should be encouraged outside of Cairns in locations convenient to residential areas to ensure employment options and diversity are available across the region.

The regional plan supports the expansion of established areas of economic activity and identifies areas of emerging and future employment (see maps 11 and 12).

Objectives

- A diversified regional economy characterised by industries and economic activity centres, which build on existing regional and subregional competitive advantages and specialisations.
- The region's economic base diversifies, based on industries and activities, which complement the significant environmental values of the region.
- Economic development minimises the region's contribution to the causes of climate change and ensures industries are resilient to its impacts.
- An adequate supply of suitable and appropriately located commercial and industrial land is available to support the diverse range of businesses and industry sectors needed for regional economic development and developing liveable and sustainable communities and activity centres.

Land use policies

5.1.1 Land use planning and development activities provide opportunities for diverse and innovative economic growth.

5.1.2 Strategically located land and buffers are secured to meet the current and future requirements of locally and regionally significant business and industry uses, including long-term provision beyond the timeframe of the FNQ Regional Plan.

5.1.3 Commercial and industrial sites and areas with identified potential for local and regional economic development are protected from incompatible development, when deciding planning scheme amendments and development applications.

5.1.4 Job creation and employment diversification opportunities are maximised in centres of economic activity, as indicated in maps 11 and 12.

5.1.5 Self-containment throughout the region is promoted through the integration and co-location of a mixed range of employment opportunities with residential development.

5.1.6 Economic growth occurs in a sustainable manner that protects ecological processes and maintains cultural, physical and social wellbeing of people and communities.

5.1.7 Economic activities with a direct connection to the rural, natural or resource value of the surrounding area are encouraged in regional landscape and rural production areas, provided they do not include permanent residential development and are of an appropriate scale.

5.1.8 Adequate strategic port land at Cairns and Mourilyan is made available for coastal uses, such as commercial fishing, other land based marine activities and logistics (including bulk sugar terminal, live cattle or forestry cargo handling facilities).

Aligned strategies

5.1.A Opportunities for economic development in Indigenous communities are investigated and provided.

5.1.B Economic data is regularly updated, particularly following release of census data, to assist economic planning and development for the region.

5.1.C An education/industry/government partnership is developed to support and promote research and development on measures to increase industry's resilience to climate change and to capitalise on business opportunities, including a local biofuels industry and potential renewable resource areas.

5.1.D The impact of climate change on the region's economy is assessed and industry sectors assisted to adapt.

5.1.E Economic development strategies are developed for Centres of Enterprise such as marine, aviation and other industry sectors such as international education.

Explanatory notes

Diversifying the regional economy is a primary aim of the Queensland Government's Centres of Enterprise initiative. The initiative aims to grow FNQ's aviation and marine services sector and develop commercial opportunities across a range of other sectors that enhance specific expertise developed in the tropics.

Under the initiative, industry stakeholders implement action plans that develop export opportunities, build industry capacity and attract business, to achieve critical mass in the sector. Economic development strategies already exist or are being developed for some of the subregions and existing local government areas. Climate change and its potential impacts need to be considered when developing economic strategies. The potential impacts may provide threats to the tourism industry and opportunities for the agricultural industry. The increasing role of Cairns as a regional, domestic and international airport hub is likely to increase employment opportunities in aviation and related industries. This will include expansion into more sophisticated services of the education and training, finance, brokerage, insurance, aviation and marine industries.

Economic development strategies already exist or are being developed for some of the subregions and existing local government areas. Climate change and its potential impacts need to be considered when developing economic strategies. The potential impacts may provide threats to the tourism industry and opportunities for the agricultural industry.

The increasing role of Cairns as a regional, domestic and international airport hub is likely to increase employment opportunities in aviation and related industries. This will include expansion into more sophisticated services of the education and training, finance, brokerage, insurance, aviation and marine industries.

There is a potential shortfall of industrial land in the Cairns urban area in the long term, despite the overall adequate supply of industrial land across the region to meet economic growth in the medium term. Additional industrial land will be needed in Cairns in the long term to support regional economic growth and the population growth predicted for Cairns.

The time frame for the potential deficit depends on the use of existing (zoned and vacant) industrial land and designation of additional industrial land to provide for the predicted future demand. Matters affecting the existing supply of land include specific site constraints limiting the developable footprint, loss of land to competing uses (residential, commercial and community) and landowners' willingness to develop lots for industry rather than higher order commercial uses.

Given there is very little suitable land available in the Cairns northern corridor for industrial development and the predicted population growth for the southern corridor of Cairns, most of the industrial land shortfall to service the Cairns urban area and regional economic growth will need to be provided in the southern growth corridor.

The longer term supply of industrial land in Cairns, particularly in the southern corridor, will need to be further investigated and monitored, to secure a suitable supply of industrial land for regional economic development in proximity of the region's future workforce and supply and demand chains.

A range of criteria will need to be considered when locating regionally significant industrial land, including access to major transport networks, appropriate infrastructure provision and the need to buffer medium–high impact and large-footprint industry from residential or sensitive land uses. Strategically located land in areas with suitable regional arterial, port, airport or rail access should be secured for business and industry serving the wider region or importing and exporting goods and services outside SEQ.

In the interim, the Queensland Government has developed the Woree Business and Industry Park. The estate is largely made up of larger footprint and regionally significant industrial businesses. The estate is zoned General Industry and is suitable for a wide variety of industries.

Given the shortage of industrial land to service the growing population in the Cairns northern corridor, opportunities to secure additional industrial land for

appropriate low-impact industry should be identified as part of the Smithfield Town Centre planning process. Providing industrial land at Smithfield will require the support and commitment of the relevant landowners and developers.

Across the region there may be a requirement for amendments to local planning schemes to secure an appropriate supply of industrial land to match the predicted demand. Zoning of additional or alternative land parcels for industry may be necessary to address:

- the predicted long-term minor deficit in industrial land supply (Atherton)
- imbalances in the supply of land across the region (e.g. Cardwell–Tully and Malanda Millaa–Millaa) as a result of changes in industry sector requirements.

Further investigation may also be required regarding the suitability and availability of some land already zoned for industrial purposes in Innisfail.

Emerging major employment and economic activity opportunities include:

- future industrial land at Edmonton, east of the current Bruce Highway
- Edmonton major regional activity centre, west of the current Bruce Highway
- industrial land at Mareeba and Woree
- mining and extractive industries in the Mount Garnet to Chillagoe corridor
- tourism on the Atherton Tablelands.

Mixed-use development at Edmonton will contribute to a vibrant and sustainable town centre, which balances key economic and community goals. The Edmonton major regional activity centre will be positioned around the proposed Edmonton public transport station and will integrate multiple modes of transport including bus services, taxis, cycling, walking and private vehicles. The Edmonton major regional activity centre will grow into a transit oriented community providing a range of local job opportunities for residents in Edmonton and the southern corridor.

Areas west of the Atherton Tablelands (part of the North East Minerals Province) have known and potential minerals deposits. Following the recent growth in minerals exploration this area is expected to stimulate increased production of mineral ore and concentrate in the long term.

Defence is a strong employment contributor, and stimulates the economy by providing employment and services to the region. Planning needs to carefully consider the needs of Defence to ensure facilities are protected from incompatible land uses.

To provide employment close to where people live, existing major employment and economic activity areas will also need to grow or diversify. These include:

- Cairns central business district
- Cairns International Airport
- public and private hospitals in Cairns
- entertainment, cultural and convention centres in Cairns
- educational and research centres at James Cook University
- major activity centres at Smithfield, Earlville, Westcourt, Innisfail, Tully, Atherton and Mareeba
- Cairns and Mourilyan seaports and HMAS Cairns naval base
- industrial land at Bungalow–Portsmith, Manunda, and Innisfail
- sugar mills at Tully, South Johnstone, Babinda, Gordonvale, Mossman and Ariga and the dairy factory at Malanda
- tourist nodes at Cairns central business district, Cairns North, Cairns northern beaches and Port Douglas.

Employment and economic activity centres in FNQ are indicated on maps 11 and 12.

Sustainable economic development and employment have been identified by the Queensland Government as a priority for Aboriginal and Torres Strait Islander communities including:

- assisting Indigenous people to increase their economic independence and employment opportunities
- improving their quality of life by building local and regional business capacity.

An Indigenous Business Development Grant Scheme has been established for this purpose.

5.2 Industry and business development

The FNQ region is in a strong position to build on its natural competitive advantages, which are centred on tourism and primary industries. In addition, key specialised industries that have arisen in the region include aviation, marine services and tropical expertise. There is significant potential for the region to expand business opportunities into new areas to capitalise on the region's strengths.

Objective

- Promote and expand business activity, increase business competitiveness and encourage regional exports and import replacement.

Land use policies

5.2.1 Future mining and extractive industries and associated processing operations are protected from conflicting land use and supported by appropriate infrastructure.

5.2.2 An adequate supply of land to accommodate future growth in operations, and suitable facilities to support diversified aviation and marine trades and services, are provided at air and seaports.

5.2.3 Use of existing infrastructure to support industry development is maximised and new infrastructure supports industry requirements and is planned in line with industry demand.

5.2.4 Opportunities for expansion of business and industry are facilitated and promoted through the identification, protection and planning (including reuse and rehabilitation) of suitable sites.

5.2.5 New business and industry initiatives, including home-based business, that build on local strengths and opportunities are facilitated and supported in rural towns and villages.

5.2.6 Planning should consider the needs of specialised industries, such as Defence, to avoid encroachment from conflicting land uses.

Aligned strategies

5.2.A Raise business competitiveness by using the Queensland Government's export, business improvement, sectoral development, and education and skills programs.

Explanatory notes

The government has named Cairns and the FNQ region as centres of enterprise for regional aviation, tropical expertise and marine. The initiative works to build the economic strength of Queensland's regions.

A wide range of programs support economic and business development. These include:

- the Queensland Investment Incentives Scheme
- Significant Regional Projects Scheme
- Business and Industry Transformation Incentives Scheme
- an industry and sectoral projects scheme (DTRDI, 2008b).

These programs are aimed to encourage:

- innovation
- greater productivity
- growth in exports
- stronger regional economies
- new investment
- improved business capability.

Manufacturing in the region is associated with the processing of primary products and providing equipment and engineering services to agriculture, mining and tourism. The region has a diverse manufacturing sector that includes industries such as food and beverage, biotechnology, aviation, marine, electronics, general light manufacturing, steel fabrication and boat building. With close proximity to Papua New Guinea and other Pacific markets, the sector is well positioned for the future.

Marine tourism and commercial and recreational fishing are significant economic activities for the region, recognised nationally and internationally. The marine industry is well established and supplies products and services to defence, recreational and commercial

markets. The diversity of coastal conditions allows every aspect of sea training to be undertaken. Cairns is a major supplier of marine training in the state, and this sector is growing rapidly.

Mining in the region has re-emerged on the wave of a global resource boom. This has stimulated exploration and mine development. Herberton has become a major zinc producer and Mareeba has considerable metallic and non-metallic mineral diversity. There is also considerable activity in the adjacent Etheridge Shire that could generate downstream activity in service centres in the region. This broader area is part of the North East Minerals Province. The region has strong links to external mining activities as a base for fly-in/fly out mining operations in remote areas.

Providing services to the mining industry is important to the regional economy and may provide opportunities for future economic diversification and growth.

Construction, wholesale and retail, finance and business services are also significant industries primarily based on supporting primary industry, tourism and the needs of a growing regional population. Investment in buildings, equipment and infrastructure is expected to continue to drive growth of industry in the region. Future growth opportunities include growing service areas nationally and internationally, and providing support for the growing biotechnology industry.

Knowledge and service industries cater to an emerging world market, particularly in developing nations. These industries include education, research, training, health and professional services.

5.3 Innovation and technology

The region has potential to become an internationally recognised centre of tropical expertise. Scientists and practitioners are developing unique knowledge through adaptation to the local environment in areas such as tropical health, environmental management, primary industries, and tropical living—encompassing Aboriginal and Torres Strait Islander culture, built environment, disaster management, tourism and education.

Excellent educational institutions—from primary to tertiary levels—and vocational centres serve the region. Domestic and international demand continues to grow.

The international education industry is a major contributor to the local economy.

The Australian Government's announcement of funding to establish a School of Tropical Dentistry will provide a boost to James Cook University and to the dental workforce in northern Australia in the long term. Other initiatives such as this in the future could foster innovation and provide regional benefits.

The ongoing development of the James Cook University Smithfield campus will be a key factor in diversifying economic activity and increasing access to education and training in the region.

A key issue for industry is developing the skill base and critical mass required to meet the increased demand for services. In many industries there is currently a shortage of skilled and experienced workers. The reasons for skill shortages are complex and varied. They are likely to be symptomatic of economic conditions, demographic change, cyclical changes in labour demand, emerging demands of new technology and regional issues.

The development of enabling technologies is crucial for innovation. Building capacity in enabling technologies ensures the creation of new employment opportunities, causing traditional industries to become competitive in rapidly changing global markets. The convergence of technologies, such as Information Communication and Technologies, biotechnology, environmental management, manufacturing and mining technology, when combined with creativity is pivotal to providing the foundation for future productivity gains. Developing these technological capabilities in the region will enhance both existing and emerging industries.

Objective

- Foster innovation and develop technological capabilities in the region to enhance existing and emerging industries.

Land use policy

5.3.1 The development of a range of regional education and training infrastructure that is accessible and attractive to the community and international students and supports skills development in the workforce is provided for in the principal and major regional activity centres (see section 4.2).

5.3.2 Sites are identified for the development of mixed-use business parks and knowledge precincts in principal regional activity centres and major regional activity centres and collaborative planning approaches promoted to ensure the development of world class facilities where opportunities arise.

Aligned strategy

5.3.A Research and innovation infrastructure is developed in the region.

Explanatory notes

James Cook University delivers world-class education and research outcomes across a range of disciplines, with particular emphasis on subjects of special relevance to the tropics and its location in Australia and the Asia–Pacific region. Currently there are 3200 students in Cairns, but there is potential for this number to grow.

The Australian Tropical Forest Institute is housed on the James Cook University Cairns campus, and features the Tropical Landscapes Joint Venture and Australian Tropical Herbarium. This combines collections from the Australian National Herbarium in Atherton, the Queensland Herbarium in Mareeba and the university campuses with state-of-the-art molecular science laboratories essential for modern plant research. It is also home to the Reef and Rainforest Research Centre.

Tropical North Queensland TAFE provides vocational education and training for more than 13 000 students annually from campuses located at Cairns, Innisfail, Tully, Atherton, Mareeba and Mossman.

A new agri-science hub is being developed at Mareeba that will focus on research, development, extension, education and training. This will bring together the regional scientific capacity of the Department of Primary Industry and Fisheries in one location. The Australian Agricultural College Corporation's Mareeba campus will also be relocated and incorporated into the hub.

There are a number of private English language schools in Cairns catering for international students.

The Cooperative Framework on Tropical Science, Knowledge and Innovation was formally entered into by the governments of the Northern Territory, Queensland and Western Australia in 2004. This 10-year agreement expresses the desire and commitment of the three governments to work together to:

- realise the potential of tropical science, knowledge and innovation to enhance the economic performance of northern Australia and the nation as a whole
- protect the unique tropical landscapes
- improve the quality of life of people living in the tropics of Australia and other nations.

5.4 Primary industries

Primary industries form a significant sector of the economy. Activities include agriculture, horticulture, dairy farming, fishing, aquaculture, mining and forestry. These industries have benefited from high-quality natural assets including agricultural land, water, forests and fisheries resources.

There are substantial differences in production areas and crops within the region. Sugar and banana production dominates coastal areas while dairying is the major farming activity on the Tablelands. Primary agricultural products include vegetables, tropical fruits and beef.

Fish habitats form the basis of the commercial, recreational and Indigenous fisheries in Queensland. These three fishing industry sectors are important from an economical, social and cultural perspective.

The commercial fishing catch is worth $15–20 million annually to the regional economy, while recreational fishing is a popular leisure activity with ongoing economic benefits from local and tourist participation. These fisheries have significant flow-on benefits for regional and national economies. Fishing also has significant cultural heritage value to the Indigenous communities in FNQ. Other marine-related industries include the aquaculture farming of redclaw, prawns, fish and crocodiles.

Objective

- Maintain a profitable and sustainable agricultural sector in rural areas and fishing industry adjacent to coastal areas, producing and marketing a diverse range of products for domestic and export markets.

Land use policies

5.4.1 Sites and corridors for infrastructure that supports agricultural development, are identified, maintained and protected to support the operation of those facilities and the ongoing operation of agricultural industries.

5.4.2 Threats to primary production from incompatible development are identified and managed through land use planning and where appropriate, by developer-established buffers.

5.4.3 Potential conflict between primary industries and urban activities is managed through land use planning and, where appropriate, developer-established buffers.

5.4.4 Areas for permanent or periodic food markets that increase access to fresh produce and support regional and local primary producers and food industries are planned, supported and maintained.

5.4.5 Value adding of primary products is encouraged close to the source of production to diversify farm and local economies and reduce transport requirements.

Aligned strategies

5.4.A Opportunities to develop regional and local food economies are investigated and collaborative efforts to promote local food consumption are supported.

5.4.B Long-term food supply needs are considered in land use, resource and infrastructure planning by conserving and enhancing productive land, water supply and transport routes.

5.4.C Alternative agricultural land use options are investigated to promote diverse, efficient, resilient and strong rural economies.

5.4.D Climate change considerations are included in farm management and risk planning in the agribusiness sector.

5.4.E A sustainable fishing industry located adjacent to coastal areas is facilitated, producing and marketing a diverse range of products for domestic and export markets.

5.4.F Strategically and historically important fishing grounds are identified and maintained for current and future fish harvesting commensurate with ecological sustainability.

Explanatory notes

State Planning Policy 1/92: *Development and Conservation of Good Quality Agricultural Land* protects agricultural land as an economic resource. The Department of Natural Resources and Water has mapped areas of good-quality agricultural land that support the agricultural industry (see map 6). Detailed maps of good-quality agricultural land can be viewed at Department of Natural Resources and Water offices. Planning Guideline *Separating Agricultural and Residential Land Uses* (Department of Natural Resources et al, 1997) provides guidance on establishing buffers to minimise conflicts between agricultural operations and incompatible urban activities.

The Department of Primary Industries and Fisheries has delegated responsibility under the *Environmental Protection Act 1994* for assessment and approval of intensive animal industries (feedlots and piggeries) and can provide advice on appropriate separation distances between sensitive land uses.

There are considerable opportunities to enhance the region's agricultural industry through expansion of existing activities, development of value-adding processes and the introduction of new crops.

The local and regional food movement is a collaborative effort to build more

self-reliant local and regional food economies. This involves integrating food production, processing, manufacturing, distribution and consumption to enhance the ecological sustainability of localities and regions. It also promotes diverse, efficient, resilient and strong rural economies. Access to fresh produce also provides a range of health benefits for the community.

Management of fish habitats is delivered through the *Fisheries Act 1994*. The key provisions deal with marine plants and other fish habitats, declared fish habitat areas and waterway barriers. Marine plants include salt marsh, mangrove and seagrass communities and may include *Melaleuca* and other tidal plant species. Private development extending onto fish habitats is to be avoided.

Where there are no locations for constructing new public infrastructure other than on fish habitats, the development impacts should be temporary or minimised through design, scale of development, and best management practice during construction and operation phases.

Where development impacts to fish habitats are likely, appropriate offset and onsite mitigation measures are to be addressed and implemented. Offsets may include land exchange of fish habitats, greater security for existing fish habitats, restoration of degraded fish habitats and funding of fish habitat research to facilitate better management (see sections 1.1 and 1.2).

Department of Primary Industries and Fisheries policies, codes and guidelines on the management of fish habitats document in detail the specific management principles and technical considerations for:

- marine plants
- declared fish habitat areas
- insect control
- dredging and extractive activities
- offsets
- mitigation
- waterway barriers
- restoration
- buffers
- ponded pastures
- erosion
- beach replenishment.

5.5 Tourist development

Tourism has been the fastest growing industry in FNQ over the past three decades and provides significant employment benefits for the region. The development of the Cairns international airport, improved access to high-quality natural attractions such as the reef and rainforests, and increased global travel has contributed to this growth.

The region's tourism industry is predominantly based on natural and cultural features. Tourist activities are primarily concentrated between Mission Beach and Cape Tribulation along the coast, and those areas of the Great Barrier Reef with direct access from Cairns, Port Douglas and Mission Beach. Key visitor attractions include the Great Barrier Reef, the Wet Tropics rainforest, scenic landscapes, natural areas and a tropical climate. Protection of the natural attractions and character of the region is important to the sustainability of the tourism industry in the region.

Although the tourism industry is looking to diversify into areas such as cultural and business tourism, nature-based activities are expected to remain the major drawcard and the focus of product promotion for the region. Sustainable opportunities must be identified and developed to cater for nature-based tourism needs over the long term. Future opportunities in the tourism sector lie in:

- the potential to increase the region's business tourism market
- ecotourism with the presence of two World Heritage listed sites located side by side in the region
- the expansion of cultural tourism.

Objective

- FNQ's international reputation as a world-class destination for nature-based and sustainable tourism is maintained and enhanced.

Land use policies

5.5.1 Tourist development that incorporates a permanent residential component may be undertaken only within the urban footprint.

5.5.2 Tourist development, including development that incorporates short-term accommodation for tourists, may be undertaken within the regional landscape and rural production area where there is an identified need in a subregion and the accommodation:

(a) is of a nature and scale that is sympathetic to the maintenance of the regional landscape and rural production values

(b) minimises the impact on good-quality agricultural land

(c) avoids areas of high ecological significance and coastal hill slopes and headlands (see sections 1.1 and 2.3).

5.5.3 Where tourist development is located within a strategic rehabilitation area, the development should result in an increase in ecological connectivity or habitat extent through rehabilitation of native vegetation cover.

5.5.4 Tourist attractions (that do not include residential or tourist accommodation) may be developed in the regional landscape and rural production area where such development:

(a) is of an appropriate scale for the locality

(b) is a facility functionally dependant on being linked with the rural, ecological or resource values of the locality

(c) where located in areas of high ecological significance, provides opportunities to present and interpret the ecological values of the area and is designed and operated to have no more than a minor or inconsequential impact on ecological values of the area and any impacts are offset

(d) where located within a strategic rehabilitation area, increases ecological connectivity or habitat extent through rehabilitation of native vegetation cover.

5.5.5 Workers accommodation may be provided in tourist development in the regional landscape and rural production area, where there is limited alternative housing and/or limited workforce available locally.

Aligned strategies

5.5.A Ecotourism infrastructure development and maintenance (such as visitor facilities) reflects best practice minimal impact design and procedures appropriate to the setting and maximise presentation opportunities.

5.5.B Safe, reliable and appropriate access to ecotourism attractions is provided.

5.5.C The cumulative number, location and type of visitor sites is managed so that they do not adversely affect World Heritage values while maximising options for presenting the area.

5.5.D Adequate and appropriate levels of private and public infrastructure are provided on a timely basis to support and enhance the ecologically sustainable development of the leisure and business tourism industry.

5.5.E The development of sustainable cruise shipping infrastructure and services is facilitated.

Explanatory notes

FNQ offers a choice of tourism styles, from conventional hotels and apartments in main centres such as Cairns and Port Douglas to small-scale nature based tourism ventures focused on the natural environment. The regional plan aims to maintain a mix of tourism choice by focusing medium to large-scale tourism developments in urban-footprint areas, while allowing smaller scale tourism developments within regional landscape and rural production areas. This also allows for opportunities for economic diversification for rural landholders.

In the regional landscape and rural production area the intention is that proposals for small scale tourist accommodation be considered through the usual local government development assessment processes and do not trigger the FNQ Regulatory Provisions (see part D).

It is recognised that some medium to large-scale tourism developments may be appropriate within the regional landscape and rural production area, but these require more detailed assessment of the possible impacts of the development on the regional landscape values, and on neighbouring communities. The infrastructure requirements to service large developments—such as roads, power and water—also need to be considered. Medium to large-scale tourism accommodation developments in a regional landscape and rural production area will be managed through the FNQ Regulatory Provisions.

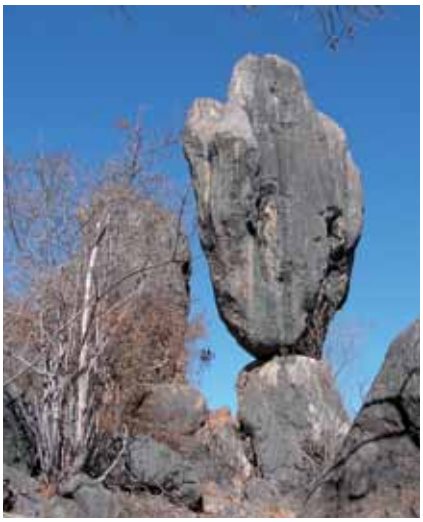
Integrated resorts that incorporate a permanent residential component within the resort complex are not considered consistent with the landscape values of the regional landscape and rural production area. These would undermine the intent of the preferred settlement pattern for the region (see part D). However, this does not preclude the provision of workers' accommodation or a caretaker's residence associated with medium to large-scale tourist accommodation in the regional landscape and rural production area, where there is limited alternative housing and/or limited workforce available locally.

The plan recognises the requirement of low-impact, nature-based tourism attractions to be located within or in close proximity of areas of high ecological significance. These facilities play an important role in increasing the knowledge of visitors about the values that makes FNQ a region of outstanding ecological significance and improving the overall visitor experience. Smaller scale tourism development that includes short-stay accommodation for visitors may also be appropriate for locations adjoining areas of high ecological significance or in strategic rehabilitation areas. These areas can provide attractive locations for this type of development and will generally result in enhanced ecological connectivity or habitat extension (see section 1.1).

The *Queensland Tourism Strategy* (Department of Tourism et al, 2006), combined with a destination management plan for Tropical North Queensland, provides a detailed strategy for growing tourism in FNQ and Queensland as a whole. The *Tropical North Queensland Destination Management Plan* (Tourism Queensland, 2005) is a directional rather than a prescriptive document. It should be used as a guiding tool for the development of tourism strategies and business plans, and as a basis for further planning and discussion between partners and stakeholders.

The *Queensland Cruise Shipping Plan* (State Development et al, 2002) provides a whole-of-government framework for developing cruise shipping by adding value to industry initiatives and planning, developing, managing and marketing cruising in Queensland waters.

The *Tablelands Tourism Strategic Development Strategy* (Global Tourism and Leisure Pty Ltd, 2003) and the *Atherton Tablelands, Cairns Highlands Investment Environment* (Tablelands Futures Corporation, 2007) have identified a need for greater variety in tourist accommodation types in the region. In particular there is a shortage of high-quality and/or medium to high-volume tourist accommodation on the Atherton Tablelands. This in turn has implications for the tourism industry in the area.



6. Infrastructure

Desired regional outcome

Timely provision of infrastructure to meet community and industry needs in a cost effective and efficient manner, consistent with retention of the region's environmental, social and economic values.

Rapid population growth and low density urban development in FNQ has made it difficult to provide well located and timely infrastructure. Increasingly, the form and density of development must be planned to assist in providing efficient and cost effective infrastructure and services. Infrastructure helps shape and attract development. The provision of new infrastructure and the maintenance of existing assets are strategic tools to achieve the preferred pattern of development. Map 13 shows the location of region's key infrastructure.

It is intended that key infrastructure will proactively support the preferred development pattern rather than react to demand. Key challenges include:

- maximising the use of existing infrastructure by managing it efficiently and effectively
- finding better ways to prioritise and coordinate new infrastructure projects
- establishing the correct balance between funding new infrastructure and
- maintaining existing assets
- incorporating climate change resilience into new and existing infrastructure
- harnessing innovative funding and delivery mechanisms.

Timely provision of appropriate infrastructure is also critical to achieving the government's economic development and employment objectives. For example, development at Mount Peter is dependent on the availability of transport, energy and water infrastructure.

6.1 Infrastructure, planning and coordination

Significant cost and service efficiencies can be achieved by improving coordination between individual infrastructure agencies and between infrastructure, land use and economic planning agencies.

Infrastructure planning will be undertaken by the government to support the regional plan, establishing priorities for regionally significant infrastructure over the next five, ten and twenty year planning timeframe. Infrastructure planning will ensure state agencies align their infrastructure and service priorities with the regional plan. It will also provide greater coordination of infrastructure and services provided by state agencies and government owned corporations, as well as local government and the private sector.

Infrastructure planning is the principal mechanism for identifying, prioritising and delivering infrastructure projects to support the regional plan and is based on the principle that strategically focused infrastructure investment will help to lead and support the preferred pattern of development and achieve key policy outcomes. In some instances, this means implementation ahead of existing need.

Objective

- Infrastructure is proactively planned, coordinated and provided to support desired regional growth in an efficient and effective manner, minimising the region's contribution to the causes of climate change and to build resilience to the impacts of climate change and oil vulnerability.

Land use policies

6.1.1 Development in the areas planned for urban growth is appropriately sequenced to facilitate more efficient provision of infrastructure and services and reduce costs.

6.1.2 Infrastructure is supplied in a coordinated, efficient and orderly way, and encourages urban development in areas where adequate infrastructure exists or can be provided efficiently.

6.1.3 Demand for resources is managed in order to maximise the efficient use of transport, energy and water resources and delay the need for additional infrastructure provision.

6.1.4 Key sites, corridors and buffer areas for current and future regional infrastructure and services are identified, preserved, protected and where appropriate, proactively acquired and managed.

6.1.5 Where adverse impacts cannot be avoided, impacts on key sites, corridors and buffer areas are minimised or mitigated in accordance with best practice.

6.1.6 New infrastructure corridors avoid areas at risk from flooding, storm surge, bush fires or cyclone damage or are designed and constructed to mitigate the risk.

6.1.7 Queensland Government infrastructure priorities are considered when preparing structure plans, master plans and priority infrastructure plans.

Aligned strategies

6.1.A Desired regional growth is supported by coordinating, planning, prioritising and sequencing infrastructure through infrastructure plans, strategic plans, programs, budgets and statutory planning.

6.1.B Infrastructure development within an area of high ecological significance is located, designed and operated to avoid impacts on the ecological values and where avoidance is not possible, impacts are minimised (see section 1.1).

6.1.C Opportunities for infrastructure providers to work collaboratively to coordinate the planning, provision and sequencing of infrastructure sites and corridors are encouraged and facilitated.

Explanatory notes

Infrastructure coordination takes place at national, state, regional and local levels. To ensure coordination with local government, the Queensland Government is holding regular subregional infrastructure forums with councils. These forums complement other state and local government infrastructure processes such as the Main Roads and Local Government Road Management and Investment Alliance 2002-2007 and will ensure a shared understanding of infrastructure issues and priorities.

The FNQ Infrastructure Plan is a key mechanism for implementing the FNQ Regional Plan in future years. An infrastructure plan provides opportunities to plan, review, monitor, prioritise, sequence and report (unpublished) on infrastructure projects on a region-wide basis. The FNQ Infrastructure Plan is linked to the State Budget.

In preparing structure plans, master plans and priority infrastructure plans local government should take account of Queensland Government infrastructure priorities. Priority Infrastructure plans are prepared by local government in accordance with IPA Chapter 5, Part 1 and the *Integrated Planning Regulation 1998* (s4).

To achieve the strategic intent of the regional plan, sites and corridors for infrastructure such as transport and freight networks, pipelines, dams, transmission and distribution lines must be identified and preserved well ahead of time. Where possible, infrastructure sites and corridors should avoid areas of high ecological significance (see map 3), particularly east–west corridors across coastal lowlands. Infrastructure planning may identify a number of investigations where, dependent on circumstances, it would be prudent to preserve potential corridors and sites at an early stage (see policy 1.1.1).

Infrastructure Corridors

Infrastructure corridors can contribute to the fragmentation of habitat and the disruption of ecological processes that underpin the biodiversity values of the surrounding land. Infrastructure projects within FNQ should seek to:

- manage ecologically significant sites and conserve the habitat of endangered flora and fauna
- reduce impacts on flora, fauna and dependent ecosystems through appropriate and practical measures, including minimising vegetation clearance for infrastructure works and undertaking revegetation and restoration works
- where practicable, to enhance connectivity and reduce the barrier effect of infrastructure corridors on the safe passage of animals and responding to changes in habitat preferences contributed to by climate change and other causal factors
- take effective measures to protect water quality in receiving waters
- support research and education in matters related to ecology and the implications for responsible infrastructure design, construction, operation and maintenance.

Co-locating infrastructure has the potential to reduce the need for new infrastructure sites and corridors, thereby reducing the overall cost to the community. For example, emergency services, transport and public utilities could be co-located in generic infrastructure corridors.

The Queensland Government's Smart State Strategy supports education, training and skills, research and development, and innovation. It provides funding initiatives for infrastructure to support research facilities and technology incubators.

Demand management aims to make better use of existing infrastructure by modifying consumer behaviour, rather than directing limited resources towards major new or upgraded infrastructure. The principles of demand management are commonly considered in relation to transport, water and energy resources.

Demand management initiatives can include a broad range of economic, social planning and regulatory tools, such as:

- educational or incentive measures to bring about voluntary changes to consumer behaviour, including reductions in use
- the introduction of technology to make better use of existing resources
- restrictive pricing measures designed to reflect the true cost or increase the comparative attractiveness of alternatives.

6.2 Infrastructure funding

The annual State Budget process is the principal mechanism for identifying, prioritising and delivering infrastructure projects. It also assists the coordination of infrastructure and services owned by state agencies, government-owned corporations, local government and the private sector.

Timely funding of infrastructure is required to ensure orderly development that supports the preferred settlement pattern. Funding of regional infrastructure must address whole-of-life costs to ensure equity between current and future beneficiaries and users. Where appropriate, options for funding and delivery of these projects will be evaluated through the Queensland Government's value for money framework. This framework promotes innovation and ensures maximum effectiveness of planned investment.

Objective

- Facilitate efficient funding of infrastructure to new and existing urban areas.

Land use policies

6.2.1 State infrastructure agreements are developed between the Queensland Government and benefiting landowners and developers, where state infrastructure is provided.

6.2.2 Funding and charging mechanisms for infrastructure in the region are efficient, appropriate and transparent.

Aligned strategy

6.2.A Funding and charging policies for infrastructure services in the region are efficient, appropriate and transparent.

Explanatory notes

The value for money framework was developed to provide the basis for the implementation of Queensland's public private partnerships policy. It provides a comprehensive set of procedures by which to evaluate the full range of project delivery options for infrastructure and identifies the best value for money outcome for government and the community. The framework has been endorsed by the Queensland Government and applies to all infrastructure projects above $100 million over the life of the asset.

There are a number of funding and charging mechanisms used to finance infrastructure projects and services. These include:

- federal and state taxes
- local government rates
- state agency funding
- special purpose levies
- user charges
- private investment
- public private partnerships
- developer contributions.

Where the government is providing major new infrastructure to facilitate development in the region, landowners and developers of new areas who stand to benefit significantly will be required to contribute to infrastructure provision through a state infrastructure agreement or contribute works or land in lieu.

6.3 Energy

FNQ is experiencing increasing demand for energy, driven by strong population and economic growth, major industrial development and changing lifestyles, including increased use of electrical appliances such as air conditioning. The two critical electricity issues facing the region are security of supply and the internal distribution of high voltage electricity. Long-term planning is essential to ensure that the region's electricity needs can be met in an efficient, effective and environmentally acceptable manner and on a basis which gives greater guarantee of supply.

The Queensland Government is committed to ensuring that consumers have access to reliable, secure and competitively priced energy. At the same time, the government recognises the need to manage and reduce greenhouse gas emissions through cleaner energy production and enhanced energy efficiency to achieve a sustainable energy sector for the benefit of all Queenslanders.

Reducing greenhouse gas emissions from Queensland's energy sector is a key energy policy focus. The government has introduced regulations and incentives that will ensure the state's continued energy security, while balancing industry competitiveness and climate protection. These measures do not include nuclear power. In response to community concern, the government has legislated to prohibit the development of nuclear facilities in Queensland.

The Queensland Government has determined that there is a need to set a target for greenhouse gas emission reductions. In 2007 Australian Government jurisdictions agreed that a national emissions trading scheme would place Australia on a path towards achieving a 60 per cent reduction in national emissions by 2050, compared with 2000 levels.

The Australian Government confirmed in 2008 that an emissions trading scheme will commence in 2010. Emissions trading is central to achieving the government's goal of reducing Australia's greenhouse gas emissions by 60 per cent by 2050.

Objective

- Sustainable energy generation, transmission and distribution capacity is provided and maintained; using viable alternative energy sources where practicable, to service existing and future settlement patterns and meet the needs of a growing population and industry.

Land use policies

6.3.1 Viable renewable energy source generation, including sugar mill, landfill, hydro, solar and wind farm generators, are recognised as acceptable land uses and supported for their contribution to reducing greenhouse emissions.

6.3.2 Energy efficient principles are included in the design and layout of new urban areas and developments.

6.3.3 Demand management principles are implemented in the design and construction of new development to improve energy efficiency and reduce energy demands.

6.3.4 Underground electricity is provided in new urban areas where appropriate.

Aligned strategies

6.3.A The reliability and security of electricity supply is enhanced to support regional growth.

6.3.B Reticulated gas is provided in major greenfield areas where appropriate.

6.3.C Redevelopment and infill sites connect to reticulated gas where available.

Explanatory notes

The majority of the region's electricity supply is provided from Powerlink and is distributed by Ergon Energy. The primary supply consists of two major powerlines, one along the coastal plain from Ingham and a second along the Tablelands through Ravenshoe and Mareeba.

There are hydro-electric power stations at Tully and Barron Gorge. Both of these facilities are used to supplement the supply from the state grid. Proposals have been considered for development of a large hydroelectric scheme known as the Tully-Millstream to expand the region's generation capacity. The future of this scheme is dependent on the long-term strategies adopted by government to meet state and regional electricity demands. The scheme is currently not in the government's forward electricity generation strategy.

On 3 June 2007, the Queensland Government released its *ClimateSmart 2050* strategy containing several new energy policy initiatives to assist Queensland in meeting the Queensland Government's greenhouse gas emissions target. ClimateSmart 2050 positions Queensland's stationary energy sector to invest in new technologies and maximise energy conservation in Queensland businesses and homes.

Key elements of the Queensland Government's new Smart Energy Policy (outlined in *ClimateSmart 2050*) to reduce greenhouse gas emissions through cleaner, diversified generation include:

- Queensland renewable energy fund
- 10 per cent renewable and low emission target scheme by 2020
- solar feed-in tariff
- increase of the Queensland gas scheme target from 13 per cent to 18 per cent.

These new initiatives will stimulate investment in renewable energy and gas fired power stations in Queensland to diversify the state's energy generation mix, and provide support for households to install domestic solar power systems. The smart energy policies will build on the outcomes already achieved by the Department of Mines and Energy in reducing the state's reliance on coal based generation through:

- the Queensland 13 per cent gas scheme
- investment in renewable energy
- geothermal energy legislation
- green energy consumer products.

Renewable energy plays an important role in the state's generation mix with biomass (primarily bagasse or sugar cane waste) the most commonly used renewable resource in Queensland. Currently the state has the capacity to generate approximately 400 megawatts of biomass-fired electricity. The use of biomass as an energy source has added value to Queensland's sugar industry. Geothermal exploration permits have also been issued in FNQ region.

Currently, renewable energy generation accounts for 3.2 per cent of Queensland's electricity generated each year. This includes both on- and off-grid electricity generation. Under the 10 per cent renewable and low-emissions target scheme, electricity retailers will be required to source 10 per cent of their annual energy sales from Queensland based renewable and low-emissions generators by 2020.

The government has invested in a number of renewable energy generation assets in FNQ, including:

- Barron Gorge hydro station
- Kareeya hydro station
- Koombooloomba hydro generator
- Wind Hill wind farm.

As a result of national competition reforms, the electricity industry in Queensland operates as an open market. The government's principal role in this market is to ensure a supportive investment climate exists which encourages timely investment to meet emerging demands.

The electricity generation sector is competitive, with substantial private sector interest in providing future generating capacity. The government will monitor investment activity to ensure there is adequate generation capacity for the region as it grows.

A major challenge for providing gas distribution networks in FNQ is the distance from natural gas supplies and the lack of infrastructure such as pipelines. Liquid Petroleum Gas (LPG) is currently imported into the region. There is potential to diversify to Liquefied Natural Gas (LNG) in FNQ over time. There are reticulated gas systems in some suburbs of Cairns and in Port Douglas. Reticulated gas should be provided in major greenfield areas, and redevelopment and infill sites, where appropriate.

In ClimateSmart 2050, the government commits to all its office buildings being carbon neutral by 2020 and to offset emissions from the vehicle fleet, offsetting 50 per cent by 2010 and 100 per cent by 2020.

The Queensland Government is proposing a number of improvement measures that will help make new and existing Queensland homes more energy and water efficient, and become more adaptable to people's changing lifestyles.

As it will not be practical or cost-effective to install all of the proposed improvement measures into existing buildings, new and renovated homes will have different improvements to existing homes. The improvements proposed are:

Require all new houses be built to a 5-star (out of 10) energy equivalent rating, proposed from 1 January 2009

Investigate requiring all new units to be built to a 5-star (out of 10) energy equivalent rating

Investigate providing better recognition of outdoor–indoor living areas in Queensland's building standards

Investigate developing a star rating for building materials

Investigate banning residential estate covenants which restrict the use of energy efficient design features and fixtures.

The proposed improvement measures for new and renovated homes will focus on improving designs so that houses are constructed with inherent features that will deliver sustainable outcomes for the life of each building. Designers of new homes will be encouraged to use more environmentally sensitive features such as better orientation of rooms, ceiling and wall insulation, natural ventilation, and indoor–outdoor connections provided by decks and patios. It is also proposed to increase the required energy-and water-efficiency ratings of fixtures such as light bulbs, tap ware and toilets.

For existing homes the improvement measures will include phasing-out the installation of electric hot water systems in gas reticulated areas from 1 January 2010. It is also proposed that owners of existing houses and units complete a sustainability declaration at point-of-sale and point-of-lease (rent). The declaration will assist in raising Queenslanders' awareness of the benefits of sustainable housing features.

From 1 March 2006, changes to the Sustainable Building Queensland Development Code required new houses to be more sustainable, ensuring they use energy more efficiently. This is anticipated to result in new houses using 33 per cent less electricity. As part of these laws, all new houses are required to have energy efficient lighting in at least 40 per cent of the house and greenhouse efficient hot water systems such as solar, heat pump or gas hot water.

In 2006, the government committed to mandating a blend of five per cent ethanol in all petrol produced in Queensland by 2010. This mandate supports the government's $7.3 million *Queensland Ethanol Industry Action Plan 2005-2007* (Department of State Development and Innovation, 2005) to develop Queensland's ethanol industry and future. This initiative will reduce greenhouse gas emissions by approximately 500 000 tonnes each year.

6.4 Waste

Urban growth will place pressure on local governments to deal with the waste generated by an increasing population. Local governments in the region are already actively seeking ways to manage waste more efficiently. Specific initiatives include reviewing options to promote reduction, re-use and recycling of wastes together with improved coordination of waste management strategies. Local government amalgamation may result in further coordination of waste strategies.

The proximity principle—fostering and encouraging local solutions for waste management and resource recovery—will be encouraged where feasible. The focus will be more on providing local facilities rather than regional, such as transfer stations. Recycling and other waste recovery facilities may need to be regional to achieve economies of scale and for proximity to transport infrastructure. Landfill facilities should also be regional but these are the least preferred method on the waste hierarchy.

The preferred location for any future landfill facilities is the western side of the Great Dividing Range, removed from the Wet Tropics, the coastline and Great Barrier Reef. Any future landfills should be located in geologically stable areas that are not flood prone or adjacent to areas of high ecological significance (see map 3 and section 1.1).

Objective

- Manage solid waste in the region to minimise adverse impacts on the environment and the community and promote sustainable waste management practices.

Land use policies

6.4.1 An integrated and coordinated network for sustainable waste management and resource recovery is adopted across the region to achieve greater resource use efficiencies and effectiveness, and better environmental, social and economic outcomes.

6.4.2 Future landfills and resource recovery facilities are located in geologically stable areas that are not flood prone now or in the future, or within or adjacent to areas of high ecological significance.

6.4.3 Development assessment criteria for commercial and multi-unit dwellings includes provision for space and access for waste bins, including recycling.

Aligned strategies

6.4.A Waste generation is avoided in the first instance. Where waste generation cannot be avoided, practices are implemented to reuse, recycle or recover wastes and materials prior to disposal.

6.4.B Waste disposal to landfill is minimised through applying waste recovery techniques which gain optimum recovery of reusable and recyclable materials.

6.4.C Waste is recognised as a resource and diversion of wastes for further processing, reuse and recycling is facilitated.

6.4.D Pollution of waterways and the reef is reduced through storm water quality improvement devices and litter prevention and management (see section 7.1).

6.4.E The proximity principle is adopted by fostering and encouraging local solutions for waste management and resource recovery, while recognising that some facilities need to be regional to achieve economies of scale and be close to transport infrastructure.

6.4.F Best practice waste pricing is adopted balancing the true cost of waste management and encouraging waste reduction, reuse, and recovery.

Explanatory notes

The expanding population in FNQ results in more waste being produced each year. Finding ways to curb waste production and make better use of finite and precious resources is a key issue for the future sustainability of the region.

Some of the challenges for FNQ are:

- the appropriate location of waste and resource recovery infrastructure
- the need to stimulate investment in new resource recovery infrastructure
- improving resource recovery from households, businesses and building construction
- how to maximise transport efficiency in the waste industry
- finding ways to reduce greenhouse gas emissions from landfills and throughout product lifecycles
- educating consumers about purchasing choices and consumption

The EPA will develop a new waste management strategy to tackle these issues and provide a clear direction for a more sustainable future.

The *Environmental Protection (Waste Management) Policy 2000* and the *Environmental Protection (Waste Management) Regulation 2000* clarify waste management practices in Queensland and provide improved environmental outcomes. Developed in conjunction with local government and industry, the legislation benefits Queensland communities through safer disposal practices and cost savings from improved planning and management of waste services.

The policy provides a preferred waste management hierarchy and principles for achieving good waste management. The waste management hierarchy moves from the most preferred to least preferred method:

- waste avoidance
- waste reuse
- waste recycling
- energy recovery from waste
- waste disposal.

The principles for achieving good waste management include:

- the polluter-pays principle—all costs associated with waste management should, where possible, be worn by the waste generator
- the user-pays principle—all costs associated with the use of a resource should, where possible, be included in the price of goods and services developed from that resource
- the product-stewardship principle—the producer or importer of a product should take all reasonable steps to minimise environmental harm from the production, use and disposal of the product.

These principles and the waste management hierarchy provide a basis for waste management programs that may be required as a condition of approval for an environmentally relevant activity for industry, for voluntary industry waste reduction programs and for state and local government waste management strategic plans.

The *State of Waste and Recycling in Queensland 2006* report gives a high level overview of current rates of waste generation, recycling and waste sent to landfill. The report shows approximately 85 per cent of 87 000 households have access to kerbside recycling. Tablelands, Cassowary Coast and Cairns regional councils provide kerbside recycling to varying degrees. Council size and remoteness currently have a significant bearing on councils' ability to provide this service.

As part of a regional waste initiative organic waste is being transported and processed in Cairns at the Bedminster bioconversion plant. Collected recyclable materials from Cairns Regional Council are sorted into different products at a materials recycle facility in Cairns for processing and reuse.

Solid waste disposal facilities in the region are both local government and privately owned. Existing waste management infrastructure in the region comprises of an estimated 17 operating landfills, 29 waste transfer stations and one material recycle facility in Cairns. Springmount waste management (landfill) facility near Mareeba has 140 hectares of land and is expected to last 50 years. Springmount has the potential to produce green electricity from the landfill gas.

6.5 Information communication technology

Communications play a critical role in economic development, education and the health and wellbeing of communities, particularly those located in remote areas.

Improved information communication technology (ICT) services are needed if residents of FNQ are to optimise global communication opportunities.

The Australian Government has principal responsibility for the policy and regulatory environment of the telecommunications industry. State and local governments are constrained in the range of actions available to them to influence investment in telecommunications infrastructure. The regional plan has a limited role in this regard.

Objective

- Provide affordable access to reliable and robust high speed telecommunication throughout the FNQ region to ensure access to markets, information and services.

Land use policies

6.5.1 Planning schemes include code provisions that seek to improve connection to the digital network in new residential subdivision and commercial and multi-unit development in the urban footprint.

Aligned strategies

6.5.A Access to reliable and robust high speed telecommunications is facilitated throughout FNQ.

6.5.B Early provision of conduits or optic fibre in new developments, multi-tenanted buildings and major infrastructure projects is considered to reduce time delays and the cost of providing telecommunications infrastructure and services.

6.5.C Opportunities for telecommunications is considered when installing public utility networks such as underground electricity and water.

Explanatory notes

In recent years, the ICT policy environment has been progressively deregulated. While a more competitive marketplace for infrastructure has developed, the incumbent infrastructure provider is still the main supplier of the last mile—the connection to the individual or end user, mainly using existing copper wire connections.

There is duplicated access to advanced fibre optic telecommunications in many metropolitan areas, but gaps in most outlying and more remote areas. The optimal technology to provide the next generation broadband is still considered to be fibre optical cable, but other technologies such as Asymmetric Digital Subscriber Line (ADSL) and wireless technology will also be used in particular situations to satisfy demand, particularly in multistorey buildings, and outlying and remote areas.

At present in Queensland, there are differing processes applied by state and local governments when assessing approvals for telecommunications infrastructure. State and local governments are working together to review this, with the aim of providing a consistent approach to infrastructure approvals across the State.

Broadband services are an indispensable component of business growth and efficiency in modern economies as well as being a powerful enabling technology for the ICT industry and an important ICT industry sector in their own right.

In March 2008, the Australian Government recognised the need for broadband through its commitment to a National Broadband Network costing $4.7 billion and servicing 98 per cent of the homes and businesses across Australia. The Australian Government indicated that the remaining 2 per cent are to have improved broadband services over five years. The Australian Broadband Guarantee funding program of $270.7 million over four years provides the basis for this improvement.

The Regional Telecommunications Independent Review Committee presented its report, *Framework for the Future*, to the Australian Government on 5 September 2008.

The Queensland Government has instituted improvements in the telecommunications infrastructure in Queensland through initiatives such as the Reef Network, SmartNet and Northern.net.

The Reef Network delivers high speed communications to Queensland's coastal region through underground fibre optic cable running under the 1820 kilometres rail corridor between Brisbane and Cairns. The network has significantly reduced the costs of high speed communications to Queenslanders living in the coastal regions.

Through the SmartNet procurement process, individual agreements have been reached between the Queensland Government and ICT providers. These agreements provide for:

- installation of fibre optic cable into the CBD areas of Cairns and business grade broadband infrastructure into 30 towns across Queensland
- an alternative high capacity rural broadband network.

Northern.net, a joint Australian and Queensland Government project, has extended broadband into regional areas in North Queensland, resulting in 28 small towns now being able to access residential grade (and in many cases business grade) broadband for the first time. Towns in Far North Queensland provided with broadband through Northern.net include Babinda, Cardwell, Chillagoe, Dimbulah, Herberton, Millaa Millaa, Mossman, and Yarrabah.

7. Water management

Desired regional outcome

Water for the region is safe, reliable and adequate for community needs and water quality meets human use and environmental requirements through the ecologically sustainable development of the region's water resources.

Water is a precious and limited resource necessary for life. Climate variability, climate change and other risks highlight the need to diversify water sources. The sustainable management of the water cycle is crucial to the ecological health of the region. The region's waterways support a wide range of natural ecosystems including World Heritage areas. In addition water is necessary for urban development, irrigation, power generation, recreation, and cultural and social activities. The ongoing need for water must be balanced with the needs of the environment. Further, residents will need to adapt to climate variability.

Based on current demand projections, the region will need more potable water by 2031 to meet future urban and rural growth. Demand for water is increasing as a result of population growth, increased economic activity and the expansion of irrigation areas. Urban demands are likely to increase primarily in the northern beaches of Cairns and the southern corridor between Cairns and Gordonvale. Increases are also expected in the northern Tablelands, Atherton, Port Douglas and Mission Beach.

Urban centres must apply demand management initiatives to reduce pressure on the region's water resources. It is also important for water efficiency gains to continue to be sustained by the rural sector. The region's water catchments are shown in map 14.

7.1 Protection of waterways, wetlands and water quality

Far North Queensland is renowned for its waterways and wetlands, and has many unique and highly valued environmental, natural, ecological and recreationally important catchments. Some of these catchments receive the highest rainfall levels in Australia, and the waterways can have significant water flows, particularly during the wet season and tropical cyclones. They can contain high levels of biodiversity, provide water purification, flood mitigation, rural and urban water supplies, extractive resources and electricity generation, attract nature-based tourism, and contain significant cultural heritage values. Often they provide the only natural feature in urbanised areas and provide recreational opportunities, scenic amenity, and a sense of place that are highly valued by residents.

Land use changes and developments in catchments have resulted in significant impacts on the physical condition of the region's waterways and wetlands. Urbanisation of catchments generally results in increased run-off, with related erosion, channel widening, filling in of wetlands and flooding. Many urban waterways have been cleared of native vegetation, diverted, converted to concrete drains, or replaced with stormwater pipes. Natural drainage systems and wetlands that have been replaced with artificial ones have far fewer of the desirable values.

Declining urban stormwater water quality, together with point sources of waste water, are a significant threat to water quality in and from urban centres. Rural activities and vegetation clearing can also contribute nutrients, sediments and other pollutants affecting riverine, estuary, wetland and coastal water quality. Lowering of water tables can result in acid sulfate soil exposure.

Maintaining water quality is critical to the ecological health of the region's waters, including the Great Barrier Reef lagoon. Vegetated areas along waterways and wetlands play a vital role in filtering sediment and nutrient run-off, maintaining water quality. It is therefore important that vegetation clearing and development in such areas is avoided, and where possible, these areas should be rehabilitated. Wherever practical, development needs to be set back from waterways and wetlands.

The focus of the following policies is on protecting and restoring the region's water quality and the physical condition of waterways and wetlands. Nonetheless, implementation of these policies will also provide significant benefits to other waterway and wetland values, including biodiversity, ecological values, wildlife corridors, open space and amenity in urban areas, and will also support policies to reduce the risk of flooding and the impacts of natural disasters.

Objective

- Protect and improve the physical condition, ecological health, environmental values and water quality of surface water and groundwater systems, including waterways, wetlands, estuaries and waters of the Great Barrier Reef lagoon.

Land use policies

7.1.1 Development is planned, designed, constructed and managed in accordance with best practice environmental management to protect environmental values and meet water quality objectives of the *Environmental Protection Policy (Water) 1997* (EPP Water) for regional surface water, groundwater and wetlands.

7.1.2 Areas with high probability of acid sulfate soils are identified in local government planning schemes, and planning provisions and development complies with requirements and management measures in the *State Planning Policy 2/02 Planning and Managing Development Involving Acid Sulfate Soils* (SPP 2/02).

7.1.3 Urban development, other than for required community infrastructure, is set back from wetlands through the adoption of appropriate buffer zones, to maintain water quality and ecological functions and services of wetlands.

7.1.4 Urban development, other than for required community infrastructure, is set back from waterways through the adoption of appropriate buffer zones, to maintain water quality and ecological functions and services of waterways.

7.1.5 In certain waterway areas urban development, other than for required community infrastructure, is set back from waterways through the adoption of appropriate waterway envelopes rather than by buffer zones, to maintain water quality and ecological functions and services of waterways.

7.1.6 Planning schemes, related policies and planning instruments identify and protect appropriate waterway envelopes and waterway or wetland buffer zones, and development decisions ensure new urban development, other than for required community infrastructure, is located to avoid waterway envelopes and buffer zones.

7.1.7 Where required community infrastructure is located in a waterway envelope or buffer zone, its impact on the waterway or wetland is minimised in extent by co-locating such infrastructure wherever practicable.

Aligned strategies

7.1.A Point source release of waste water or contaminants to waters is addressed using the management hierarchy under the EPP Water, to protect or enhance environmental values and meet the water quality objectives of receiving waters.

7.1.B Urban stormwater is managed within a total water cycle management framework that includes enhanced recycling, water sensitive urban design in development, use of stormwater for water supply and avoiding or minimising contaminated stormwater release to receiving waters (see section 7.2).

7.1.C Environmental values and the achievement of water quality objectives are monitored to assess the health of waterways and the effectiveness of management actions.

7.1.D Voluntary restoration of vegetation in waterway envelopes is encouraged especially where it addresses strategic regional priorities.

Explanatory notes

The land use policies in this section apply to planning scheme reviews, master planning, community infrastructure designations and subsequent development assessment under IPA that may impact on wetlands and/or waterways. The land use policies apply to development proposals in all regional land use categories. To clarify, the land use policies on wetland or waterway buffer zones or on waterway envelopes do not apply to existing agricultural activities.

EPP Water and SPP 2/02

The *Environmental Protection (Water) Policy 1997* (EPP Water) describes the community and government endorsed environmental values, and water quality objectives to be achieved to protect and enhance these values. This requires managing the water quality discharged by urban point sources of waste water, as well as urban diffuse and rural diffuse stormwater sources. Environmental values and water quality objectives are not only important for consideration in the assessment of potentially polluting activities under the *Environmental Protection Act 1994* but should also be taken into account in development assessment, planning, works and community actions not assessed by the EPA. A complementary State Planning Policy (Water Quality) is in preparation.

The *Queensland Best Practice Environmental Management Guideline – Urban Stormwater* (EPA, 2008d) demonstrates how development and its construction can achieve best practice environmental management. This guideline replaces a number of guidelines including the Stormwater Quality Control Guidelines for Local Government 1998, and the Model Urban Stormwater Quality Management Plans and Guideline 2001.

Local governments should identify areas with high probability of acid sulfate soils in their planning scheme; ensure developments to which *State Planning Policy 2/02: Planning and Managing Development Involving Acid Sulfate Soils* (Department of Natural Resources and Mines, 2002) applies is assessable against the planning scheme; and ensure the planning scheme includes a code consistent with section 5 of the SPP.

Wetland Buffers

A wetland buffer has two components:

- a support area adjacent to the wetland which maintains and supports the environmental values of the wetland.
- a separation area around the support area which protects the wetland from external threats.

Examples of the role of the support area include:

- maintaining hydrological processes (connectivity, hydrological regimes)
- supporting biodiversity by providing habitat for semi-aquatic wetland dependent species
- allowing for wetland migration due to, e.g. erosion or sea level change
- adding to the aesthetic qualities of a wetland
- providing roost sites for water birds
- shading fish habitats
- maintaining bank stability and condition.

The separation distance role includes:

- trapping and filtering sediments of surface runoff traveling to the wetland from surrounding land
- providing a physical barrier to herbicide and pesticide spray drift from adjacent crop dusting activities and
- providing an attractive visual barrier to other adjacent land uses.

Assessment methodologies, together with design and operation of development may be used to determine appropriate wetland buffers. However, in the absence of detailed local assessment the suggested minimum wetland buffers from a wetland are:

- 200 metres from a wetland of high ecological significance (see map 3)
- 100 metres from a wetland of general ecological significance (see map 3) or each high bank of an estuary channel.

Waterway buffers

Assessment methodologies, together with design and operation of development may be used to determine appropriate setbacks. However, in the absence of detailed local assessment the suggested minimum setbacks from a waterway or water body are:

- 100 metres of each high bank of a waterway with high intact riparian biodiversity
- 50 metres of each high bank of a waterway of stream order five or greater

Guidance on determining appropriate wetland buffers is provided in the *FNQ Waterway Guideline*.

Waterway envelopes

The Department of Natural Resources and Water (NRW) will determine and map waterway envelopes for the major drainage paths within new urban areas whenever planning schemes are made or reviewed and when Master Planned Area Structure Plans are prepared. The width of the mapped envelope will be determined for a particular reach of waterway based on allowances for future waterway bank erosion; for potential waterway widening should the upstream catchment becomes urbanised; for potential waterway migration over time; and for overland flow interception (to protect water quality).

Figure 9: Wetland buffers
Source: Queensland Wetlands Programme (EPA, 2003c).

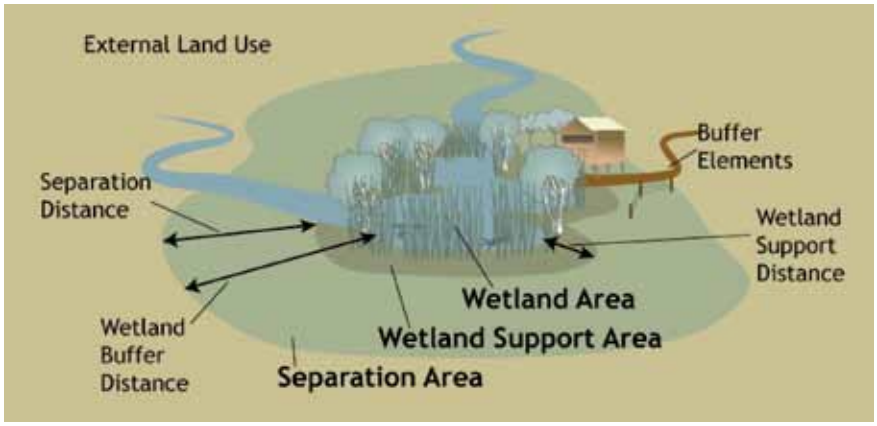
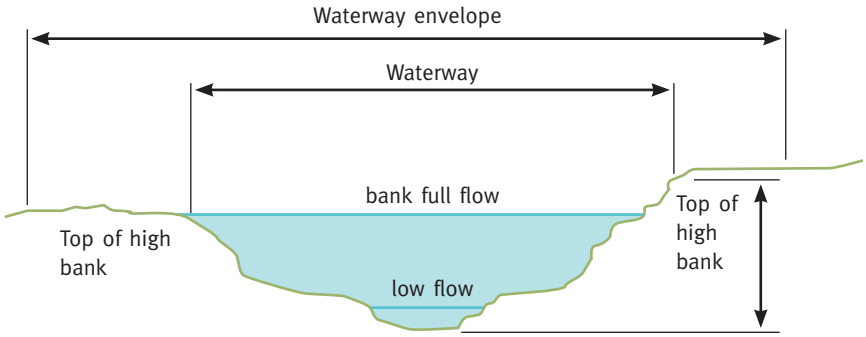


Figure 10: Features that comprise a waterway envelope



The area within a wetland or waterway buffer zone or a waterway envelope can have values for biodiversity, ecological values, wildlife corridors, open space, amenity and flood management. Where planning schemes identify and protect a buffer zone, and all or part of the area is also mapped as high ecological significance or general ecological significance (see map 3), the relevant policies in section 1.1 should also be reflected in the planning scheme for the overlap area.

Development in waterway envelopes and wetland or waterway buffer zones

Land uses and development that is generally appropriate in waterway envelopes and wetland or waterway buffer zones are conservation, open space, and required community infrastructure for which no suitable alternative exists.

Clearing of native vegetation within waterway envelopes and wetland or waterway buffer zones—including clearing that is assessable development—should occur only for required infrastructure, for which no suitable alternative exists. Existing disturbed areas within waterway envelopes and wetland and waterway buffers should be revegetated to offset vegetation losses caused by development in these areas. This could include a combination of native woody vegetation and a grass filter strip.

Where required community infrastructure needs to be located in the waterway envelope or wetland or waterway buffer zone, it should be minimised in extent by co-locating such infrastructure where practicable, such as attaching pipelines and cables to bridges (refer also to sections 6.1 and 8.1).

The policy does not affect the underlying tenure of land within waterway envelopes and wetland or waterway buffer zones. However, where the envelopes and wetland or waterway buffers are over public lands, it is possible that the local government might wish to utilise these areas for passive outdoor recreation. Development for such recreation would be permitted where it is related to the public's enjoyment of the waterway or wetland and there would be no adverse impact upon their physical processes and ecological values. Examples include walking and cycling paths that contribute to a sense of community and place (refer to sections 3.5, 8.1 and 8.2).

The FNQ Waterway Guideline provides guidance on assessing required community infrastructure that may occur within waterway envelopes and buffer zones.

As well as the EPP Water and SPP 2/02, there are a number of government instruments relevant to IPA Regional Planning, aimed at the ecologically sustainable management of water, waterways and wetlands. These include:

- *Cardwell-Hinchinbrook Regional Coastal Management Plan 2003* and *Wet tropical Coast Regional Coastal Management Plan 2003*, which provide assessment criteria for development within 100 metres of a wetland
- requirements and guidelines made under the *Water Act 2000*, including land and water management plan requirements, drainage and embankment requirements, Declared Catchment Areas, and Riverine Protection Permit requirements
- *Regional Vegetation Management Code: Coastal Bioregion* which provides criteria for assessable vegetation clearing in proximity to wetlands and watercourses.
- *Sustaining the Wet Tropics: a Regional Plan for Natural Resource Management 2004-2008*.

Water quality improvement plans prepared under the natural resource management plan for FNQ will assist in achieving the desired regional outcomes for the regional plan. These plans have been prepared for the previous Douglas Shire and the Tully River, and are in preparation for the Barron River and Trinity Inlet. It is intended to prepare water quality improvement plans for the Russell, Mulgrave, Johnstone, and Herbert Rivers in 2009.

The *Queensland Water Quality Guidelines* (EPA, 2006b) are technical guidelines for the protection of aquatic ecosystems. They complement the National Water Quality Strategy and include locally and regionally relevant water quality data for fresh, estuarine and marine waters.

Under the *Water Act 2000*, NRW is progressively preparing water resource plans on a catchment basis. These plans determine bulk water allocations between various water uses, including for environmental flows, to ensure the availability of water and water quality for water-dependant ecosystems to sustain ecological processes and environmental values.

The *Reef Water Quality Protection Plan 2003* is a joint initiative of the Queensland and Australian Governments. The goal of the plan is to halt and reverse the decline in water quality entering the Great Barrier Reef lagoon within 10 years. The plan focuses on ways to improve water quality through improved farming and grazing practices, to reduce diffuse sediments and nutrients from entering the reef waterways.

Under the *State Coastal Management Plan* (EPA, 2001a), local governments are to implement best practice environmental management for all waste water treatment plants by 2010.

Local governments are also to achieve a goal of 100 per cent beneficial reuse of average dry weather flows of treated water reclaimed from waste water treatment plants by 2018. Industry, community groups and governmental agencies all have activities underway to improve the quality of water flowing into the Great Barrier Reef lagoon.

The catchments of the Staaten River and Hinchinbrook Island have been declared wild rivers under the *Wild Rivers Act 2005*, in recognition that they have been almost untouched by development and are therefore in near natural condition, with almost all of their natural values intact. They are important because they help sustain healthy ecosystems for native plants and animals; support sustainable economic activities, such as grazing, fishing and eco-tourism; and provide unique opportunities for recreation and tourism. Water allocations, mining and certain developments under IPA, such as agriculture, animal husbandry and material change of use are restricted in such areas, and developments in these areas must comply with the Wild Rivers Code.

To assist local governments achieve waterway health outcomes the state government may provide financial assistance. Funding for the Water and Sewerage Program (WASP) is subject to the general conditions of funding under guidelines issued by the Department of Local Government, Sport and Recreation.

Through the Queensland Wetlands Programme wetland mapping has been conducted for the study area and is available in a number of formats including online through Wetland*Info* website. In addition multiple wetland management tools are also available through Wetland*Info*.

Technical guidance on the provisions of water supply, sewerage and stormwater management services is provided in various state government guidelines including:

- Total Management Planning Guidelines
- Water Supply and Sewerage Planning Guidelines
- Queensland Water Recycling Guidelines
- Queensland Water Recycling Strategy
- Queensland Urban Drainage Manual.

Revegetation

Revegetating waterway envelopes and wetland or waterway buffer zones is desirable, especially where it provides opportunities for addressing regional rehabilitation priorities in the strategic rehabilitation areas shown on map 3. Revegetating waterway envelopes and wetland or waterway buffer zones is also supported by Water Quality Improvement Plans. The Queensland Government's objective under the *Strategy for the Conservation and Management of Queensland's Wetlands* (EPA, 1999) is to avoid further loss or degradation of natural waterways and other wetlands unless overriding public interest can be shown.

Landholders and community groups make an invaluable contribution to waterway restoration across the region. The *draft Wetland Management Handbook: A Guide to Managing Wetlands in Intensive Agriculture with Farm Management System* (DPI&F, 2008) and *SmartCane Riparian and Wetland Areas on Cane Farms: SmartCane Best Management Practice Booklet* (Smith, 2008) and various integrated catchment management plans provide further guidance in this regard. Voluntary restoration of waterways can have multiple benefits, including the creation of strong and resilient communities within the region.

Targets

- By 2010, local governments use best practice environmental management to prepare and implement urban stormwater management plans for all urban centres with populations greater than 10 000, or with populations greater than 5,000 if located within 10 kilometres of tidal waters.
- By 2018, local governments achieve a goal of 100 per cent beneficial reuse of average dry weather flows of treated water reclaimed from waste water treatment plants.

7.2 Total water cycle management

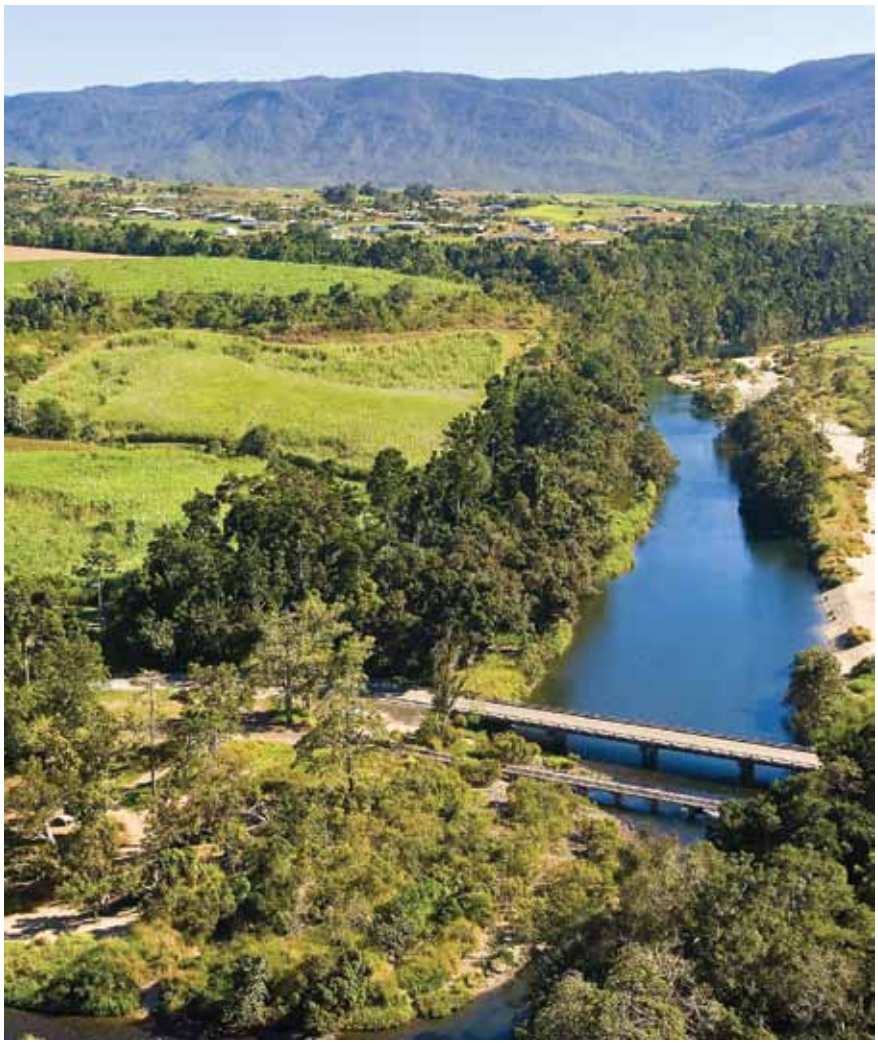
Total water cycle management recognises the finite limit to the region's water resources and the inter-relationships between the uses of water and its role in the natural environment.

Key principles of total water cycle management include:

- consideration of all water sources including groundwater, surface water, wastewater, sea water and stormwater
- using all water sources sustainably
- allocating and using water equitably
- integrating water use and natural water processes, including maintaining environmental flows and water quality.

The government is currently developing a recycled water regulatory framework to ensure a consistent and robust approach is applied to water recycling schemes across the state. The key objectives of the framework are to protect public health and ensure water recycling infrastructure continues to operate, particularly where a recycled water scheme is critical to a community's urban water supply.

Local government subsidies for water and sewerage infrastructure are provided by the Queensland Government through the water and sewerage program. Projects that reduce consumption or water losses or improve sewerage treatment and disposal are eligible for subsidy under this scheme. The environment infrastructure program, commencing in 2008, will provide subsidies for a wider range of projects, including stormwater, flooding and erosion control. Local government is required to adopt total water cycle management principles, minimise water losses and adopt water consumption targets in order to qualify for subsidies.



Objective

- Water is acknowledged as a valuable and finite regional resource that needs to be managed on a total water cycle basis, balancing the uses of water and its role in the environment.

Land use policies

7.2.1 Best practice principles are adopted in the planning, design and construction of water cycle infrastructure (including water supply, sewerage, stormwater drainage and water quality).

Aligned strategies

7.2.A Water planning in FNQ is based on the principles of total water cycle management and considers the impacts of climate change.

7.2.B Improved catchment management to maintain water quality and the health of the Great Barrier Reef is achieved in accordance with the *Reef Water Quality Protection Plan 2003*.

7.2.C Best practice environmental management principles are adopted in the planning, design and operation of sewage and wastewater collection, transport, treatment, disposal and reuse.

Explanatory notes

The Queensland Government's strategic priorities for water in the region are to:

- ensure more efficient management and use of water
- increase the supply of water to accommodate growth in the region
- diversify water supplies to manage climate variability, climate change and other supply risks
- ensure policy frameworks and subsidies support total water cycle management
- review institutional arrangements to ensure efficient, sustainable and equitable coordinated regional water planning and the delivery of bulk water supply and treatment services.

Urban and rural residential water cycle infrastructure (including water supply, sewerage, drainage and water quality) must be planned for in a priority infrastructure plan and charged for under an infrastructure charges schedule. Desired standards of service for each network must be set.

The FNQ Regional Organisation of Councils development manual sets out procedures and requirements that are consistent with IPA and its supporting legislation. They represent best practice in accordance with accepted current state and national standards for design and construction.

Reticulated sewerage infrastructure is generally provided only in major urban centres. Proposals are currently being considered to provide sewerage services to a number of smaller towns, however, most villages and rural residential developments rely on onsite disposal systems such as septic tanks. The region's reticulated sewerage systems all provide at least secondary level of treatment, with treated effluent generally being discharged to local waterways or coastal waters.

7.3 Water planning

The National Water Initiative Agreement, signed in June 2004, commits Queensland to work with the Australian Government and other states and territories to progress national water reforms. In order to provide for sustainable management and efficient use of water resources implementation of water reforms by state and local government has been underway in FNQ for a number of years. The Queensland Government is currently preparing water resource plans across the state to determine bulk water allocations between various water uses, including environmental flows.

Objectives

- Water in the region is sustainably managed to provide for the allocation and use of water for the physical, economic and social well being of the people of Far North Queensland and for the environment.
- Security of supply is increased and overall system costs minimised by planning and coordinating regional water supplies.

Land use policies

7.3.1 New development and its sequencing is consistent with projected water supply development scenarios in the FNQ regional water supply strategy.

7.3.2 Development occurs in locations that have sufficient available water as determined by the applicable Water Resource Plan and Resource Operations Plan.

7.3.3 Land for potential significant water resource development, such as dams, weirs or agricultural irrigation, is identified and protected from urban development or incompatible uses.

Aligned strategies

7.3.A The water planning process is open, transparent and equitable and ensures water is managed in an ecologically sustainable way whilst achieving the best use of available water supplies.

7.3.B Efficient and cost effective regional water supply infrastructure is provided to maintain or enhance reliability and levels of service while ensuring maintenance of environmental and social values of source streams and aquifers.

7.3.C Climate change considerations and new projections are integrated into:

a) decisions about water infrastructure

b) water-quality management of dams and reservoirs

c) water-quality improvement programs

d) assessment of flood risk in urban and infrastructure planning

7.3.D Water supply sources are diversified to reduce dependence on vulnerable supplies.

7.3.E New water supply infrastructure must be reflected in water resource plans and operated in accordance with the resource operations plan; therefore these plans provide the primary constraints and opportunities for land use development.

Explanatory notes

The *FNQ Draft Regional Water Supply Strategy* was released in September 2007. The strategy identifies where there are potential water supply shortfalls in the long-term and opportunities and constraints for new or augmented supply sources. In particular, climate change creates risks for yield and the reliability of water supplies in the region. Map 15 identifies key water resources in the region.

Water resource plans are either in place or being developed for all catchments in the FNQ area. These plans determine the volume of water available for water users after environmental flows have been provided to ensure protection of water dependant ecosystems.

A water resource plan for the Barron Basin was developed in 2002 and a *Barron Resource Operations Plan* in 2005. These planning documents provide a balance between environmental needs and human consumption in the short term. The operations plan sets out the rules and requirements that guide the day-to-day management of stream flows and water infrastructure to achieve the *Water Resource (Barron) Plan 2002* objectives.

A water resource plan has also been developed for the Mitchell River, which covers part of the former Mareeba Shire. It is anticipated that water resource planning will commence in the Wet Tropics area in 2008–2009.

The resource operations plan sets up a process for granting new water entitlements, and in some areas establishes rules for trading water allocations, which is a mechanism to allow water to move to the highest value use. This promotes efficient use of water as a scarce resource. In addition, a resource operations plan provides enhanced certainty and security for human consumptive water use and for the environment.

Trading rules are set to provide for a water market—a mechanism to allow water to move to the highest value use—which in turn promotes efficient use of a scarce resource. The trading rules ensure that the movement of water occurs within sustainable bounds. The Hinchinbrook Wild River Declaration 2007 includes rules for the allocation and management of water and water related development on Hinchinbrook Island. The Staaten Wild River Declaration 2007 includes rules for the management of water related development.

7.4 Water demand management

A key challenge in planning for future urban growth is ensuring efficient use of our precious water supplies and reducing water consumption through improved management of our demand for water. Numerous strategies are underway to improve water use efficiency in urban and rural areas.

Objective

- Incorporate demand management in planning and building standards to manage consumer behaviour and demand for water.

Land use policy

7.4.1 Demand management principles are adopted in the planning, design and construction of water cycle infrastructure, including water supply sewerage and drainage.

Aligned strategies

7.4.A The sustainable allocation and best use of water is achieved by:

a) facilitating the highest value and best use of water through trading existing water entitlements

b) promoting efficient use of water, for example, by improving demand management and reusing and recycling water.

7.4.B Water use efficiency is promoted by encouraging water efficient technologies and practices.

7.4.C Ensure all urban water providers adopt minimum residential water consumption targets identified when implementing the FNQ regional water supply strategy.

7.4.D Initiatives to improve water efficiency in the rural sector are promoted.

7.4.E Industrial and commercial developments are encouraged to meet best practice approaches in minimising water use and using water efficiently.

7.4.F Best practice water pricing is adopted, based on a structure that reflects the true cost of water and encourages more efficient use.

Explanatory notes

The FNQ regional water supply strategy recommends that urban centres within the strategy area undertake end use analysis and develop and implement demand management programs. The development of residential water consumption targets are part of the implementation of the strategy. The draft strategy applied a target of 10 per cent reduction in per capita water usage over three years to forecasts for all urban centres. The Cairns City Council's Water Demand Management Strategy also contains a number of demand management initiatives.

The timing for additional sources of water could be extended if effective demand management measures are embraced across the region. This relates to how efficiently the community uses and manages its water resources. New infrastructure needs to include demand management principles (including metering and water efficient devices) to reduce consumption. Existing infrastructure also needs to be adequately maintained to minimise water loss. These measures can delay the need for additional water infrastructure.

Following the review of the Local Governing Bodies Capital Works Subsidy Scheme, subsidies for traditional and alternative sources of supply, pressure and leakage management, and measures to reduce water consumption will be linked to their cost effectiveness. The *Water Act 2000* requires water service providers to develop and implement leakage management plans.

Subsidies to promote the widespread take up of water efficient devices, water recycling and use of fit-for-purpose water by business are available through the government programs ecoBiz and Statewide Business Water Efficiency Program. The government is also working to reduce commercial and industrial water use and is developing water consumption targets for high-rise buildings. The government's Water Smart Buildings program promotes water efficient practices in state buildings and across state programs.

Building Codes Queensland has introduced a mandatory sustainable building part in the Queensland Development Code that requires the installation of 3-star rated or AAA rated shower heads, dual flush toilets and pressure-limiting devices in new houses. Mandatory water savings targets applied across the state from 1 July 2007 to applications lodged for construction of new houses.

Queensland's WaterWise program will continue to provide education materials for schools, community groups and the general public on water efficiency. The Home and Garden WaterWise Rebate Scheme provides rebates to householders across the state from July 2006 to June 2009.

To support better water efficiency, the Queensland Government is also:

- implementing the Rural Water Use Efficiency Program to assist farmers in introducing water efficiency practices to their farms
- preparing guidelines to assist local governments in providing water consumption information on consumer water bills
- requiring water service providers to issue water use information to tenants of residential rental properties to enable greater water consumption awareness
- developing standards and guidelines for usage based residential water tariffs and pricing recycled water
- developing guidelines for the formulation of outdoor water conservation plans which will be required of water service providers
- undertaking the Queensland Government's responsibilities for the ongoing implementation of and expanding the Water Efficiency Labelling Standards Scheme for domestic appliances
- investigating how local government can equitably share the cost of meeting water consumption targets amongst water consumers.

7.5 Water supply

More efficient management of existing water supplies and identification of new supplies are required to provide for the projected increase in population by 2031.

The FNQ regional water supply strategy identifies the government's investment priorities for additional water supplies, including investigating new dams and weirs, and supporting water recycling and alternative water sources.

The strategy recommends an appropriate balance of water supplies to meet regional demands, taking into account likely yields, costs of supply and supply risks for each source. One of the constraints in providing for future water supply is the high environmental value of much of the region. Substantial areas of water catchment are protected by national park tenure and World Heritage listing, and the impact of water storage or water extraction on these values needs to be carefully considered.

Opportunities to maximise the use of existing water supplies are being fully explored.

Objective

- Assured supplies of water are provided to meet the needs of growth and development in the region.

Land use policies

7.5.1 Future catchment and storage areas as indicated in the FNQ regional water supply strategy are identified and protected through land use planning.

7.5.2 Opportunities for water harvesting and storage on site are supported in new urban development.

Aligned strategies

7.5.A The impact of drought, climate change and other supply risks are minimised by diversifying water supply sources.

7.5.B New and upgraded existing dams and weirs are developed as part of an integrated water supply system where appropriate.

7.5.C Recycled water and stormwater are used as alternatives to potable water where appropriate and on a fit-for-purpose basis.

7.5.D Greywater reuse is provided for in sewered areas, having regard to the protection of water quality and public health.

7.5.E Desalination is used as an alternative water supply source where appropriate (for example, where it is cost effective and in the public interest).

7.5.F Groundwater aquifers are managed on a sustainable and controlled basis for water supply and storage.

Explanatory notes

The Queensland Government is promoting the utilisation of existing water supplies more efficiently, including the use of recycled water (including dual reticulation) in residential development and public spaces. The aim is to balance water demands and supplies across the region.

The FNQ regional water supply strategy seeks to ensure sustainable allocation and best use of water is reached by adopting a hierarchy of three key principles:

- facilitating the highest value and best use of water through trading of existing water entitlements
- promoting efficient use of water (for example, by improving demand management and by reusing and recycling water)
- developing additional least cost water supply sources where demands cannot be met through the above measures, and where unallocated water is available.

There is potential to develop additional and alternative water sources in the region through the construction of new dams, raised dams, stormwater harvesting (including rainwater tanks), wastewater reuse, reuse of irrigation runoff or desalination. Establishing new dams is a very expensive and lengthy process, and is not without environmental and social costs. There are only a few suitable locations in FNQ for new dams. These potential sources, as indicated in table 7 and map 15, must be protected from inappropriate development. Map 16 shows existing developed water resources in FNQ.

The government is utilising existing water supplies more efficiently and promoting the use of recycled water (including dual reticulation) in residential development and public spaces.

Recycled water is already in use in the region by industry, agriculture and for irrigating open space areas. Expanding the use of wastewater may reduce the need for potable water, potentially delaying infrastructure upgrades. However, new infrastructure may be required for this option.

Stage one of the sustainable housing policies made installation of rainwater tanks in new houses and apartments mandatory in accordance with the Queensland Development Code. Stage two of this policy will review further measures and consider extending this mandate to cover renovations, apartments and other accommodation.

The *Plumbing and Drainage Act 2002* and the Queensland Plumbing and Wastewater Code complements the government's commitment to water savings through the implementation of a wide range of measures including sub-meters, expanded use of treated greywater and blackwater re-use trials. Desalination technology is improving and may become economically and ecologically viable in the future.

The *Water Act 2000* requires water service providers to develop drought management plans to ensure communities are prepared for periods of drought.

Regional water service providers need to gather common and consistent information about water consumption and wastewater management as part of their regular reporting regimes.

Table 7: New and contingent supplies for further investigation

New and contingent water supply options—Far North Queensland	
North Coast	Daintree River intake Wonga bore field Whyanbeel Creek intake High Falls Creek intake Mossman River intakes Mossman River aquifer South Mossman River intake Mowbray River aquifer
Cairns area	Northern beaches aquifer Barron River—Lake Placid extraction Mulgrave River aquifer Mulgrave River—run of river intakes
Tablelands	Raising Tinaroo Falls Dam Off stream storage for Yungaburra Atherton Basalt aquifer—North Johnstone River Off stream storage from North Johnstone River Off stream storage for Ravenshoe supplies Accessing supplemented water from Tinaroo Falls dam Wild River supply options Raising Collins Weir Walsh River supply options Algoma Weir Hodgkinson formation Lake Mitchell
Non-site specific options	Rainwater tanks Water recycling Greywater reuse Seawater desalination Purified recycled water Surface water harvesting through privately owned dams

Source: Far North Queensland draft Regional Water Supply Strategy

7.6 Rural water

Rural communities need reliable and safe water supplies to meet domestic needs and support a diversity of agricultural pursuits. Some rural communities are concerned that urban growth will create competition for water between rural and urban users.

Since 1999 water efficiency gains have been achieved through stage three of the rural water use efficiency initiative. Targets by industry groups vary from a modest commitment for a significant percentage of growers participating in best practice management programs through to a 15 per cent reduction in water usage.

It is anticipated that water resource planning will commence in the wet tropics area in 2008–2009. As stated earlier, the Barron Resource Operations Plan was finalised in 2005. Such plans will provide a sustainable framework for managing, taking and allocating water, including rural water use.

The FNQ regional water supply strategy includes a component to address rural water issues. These issues include the efficiency of water use, water management, on-farm management practices for recycled water and additional supplies of water for rural use.

Irrigation is primarily concentrated in the Barron River catchment, particularly in the Mareeba Dimbulah Water Supply Scheme. Alternative economic sources of water for rural use could link to irrigation farming expansion in the future. The water supply strategy identifies several thousand hectares of land suitable for irrigated agriculture. Existing and future water resources, infrastructure and irrigation areas need to be protected from encroachment.

Objective

- Ensure rural water needs are met in an efficient and sustainable way.

Land use policy

7.6.1 The security and efficiency of the water infrastructure network for existing and future primary production areas is maintained and protected from incompatible land uses.

Aligned strategies

7.6.A Water resource management and allocation decisions incorporate consideration of rural water use requirements.

7.6.B The efficiency of rural water use is improved, particularly irrigation systems.

7.6.C Planning for the efficient use of rural water accounts for the likely impacts of climate change.

7.6.D Alternative suitable sources of water for rural use are investigated and utilised where appropriate.

8. Transport

Desired regional outcome

Communities are connected through an integrated transport system that promotes tourism, public transport use, walking and cycling, provides safe, efficient and effective movement of goods and people, and facilitates access to places and services.

The quality of life for people living in FNQ relies on a transport system to connect the wider community with goods, services, employment and other people. Efficient and effective transport is also essential for future economic development. The vitality of the region relies on connections with other regions, both domestic and international.

The Cairns International Airport provides international and domestic air services for the region and is integral to the tourism industry. It is Australia's busiest regional airport and the fifth busiest overall. Major seaport facilities at Cairns and Mourilyan Harbour also provide opportunities for freight and tourism. Cairns is home to Queensland's only naval base, HMAS Cairns.

Freight and passenger rail services operate daily between Cairns and Brisbane. Rail facilities also exist between Cairns and the Tablelands and currently carry freight and tourists. The region also has an extensive network of cane rail tracks throughout the coastal plain servicing sugar mills.

The region has an established arterial road system with external linkages to Cape York, the Gulf of Carpentaria and southern areas of the state and country. New roads, better road networks, and improvements to existing roads are being planned to ensure effective regional connections.

Further development of the freight system is important to support economic development, particularly mining and agriculture. Over time, an effective, integrated network of roads, railways, sea ports and airports will support the competitiveness of industry and business and meet community needs.

There are challenges facing transport. Increased vehicle travel means more emissions, congestion and road accidents. It is also a good indicator of demand for road maintenance and upgrades. Modelling indicates that without land use changes, and supporting policy intervention, FNQ's total vehicle kilometres travelled is projected to increase significantly beyond the corresponding population increase of approximately 73 per cent. A compact urban form, greater self-containment, a network of transit oriented communities and aligned policy initiatives can significantly reduce demands on the transport network.

Greenhouse gas emissions, air and noise pollution, accidents, and congestion must be managed effectively to assure future ecological sustainability for FNQ. Rising fuel prices and climate change also present threats to meeting transport and economic needs. Alternative transport and fuel sources will become increasingly important.

It is important to improve the viability and attractiveness of more sustainable transport modes in Far North Queensland. The Queensland Government has introduced qconnect in Cairns and Innisfail to improve public transport services. A network of cane rail and other corridors in Cairns could be used for transit in the future. Walking and cycling networks will provide greater travel choices as well as significant health and environmental benefits.

All levels of government will continue to have a role in managing and developing the FNQ transport system.

8.1 Integrated transport and land use planning

While an important function of the regional plan is to define urban footprint areas, it should also influence the pattern of development within and outside these areas to ensure transport efficient land use patterns are produced. This outcome will significantly reduce the overall transport task and encourage more healthy and environmentally friendly modes of transport such as walking, cycling and public transport. These outcomes reduce the community's expenditure on transport infrastructure, transport services, vehicle use and fuel use, and it also reduces greenhouse emissions.

Objective

- Achieve an efficient, integrated transport system that meets community needs, supports a more compact pattern of urban development, promotes the self-containment of travel in subregions within FNQ and maintains efficient transport connections within the region and with other regions.

Land use policies

8.1.1 Land use and transport planning are integrated to support efficient land use, efficient movement of people and goods, and industry competitiveness and growth.

8.1.2 Towns and cities are planned to be relatively self contained with employment and community services, to reduce the need for residents to travel to other towns or cities for jobs and services.

8.1.3 The urban fabric of towns and cities is designed to locate residential areas as close as possible to activity centres, including economic, retail, educational, recreational and community centres.

8.1.4 Subdivisions are planned so the road and pathway network caters for walking and cycling in all directions, and efficient public transport coverage, where available, is facilitated.

8.1.5 The staged provision of transport infrastructure occurs in sequence with the preferred pattern of development.

8.1.6 Appropriate forms of transit oriented communities are established in public transport nodes along transit corridors (as indicated on map 17) in accordance with tables 8 and 9 and in sequence with state infrastructure provision.

8.1.7 Intermodal connectivity between rail, road, air or sea transport is enhanced through freight and passenger terminals.

8.1.8 Industries and freight dependent development are located in proximity to access points to regional transport corridors that facilitate access to markets and labour force.

8.1.9 Complementary industries are co-located to minimise transport requirements and increase resilience to potential impacts of oil vulnerability.

8.1.10 Transport planning considers the risk of major catastrophic events, such as cyclones or floods, and transport infrastructure is located and designed to avoid or minimise the impact of such events (see section 4.7).

8.1.11 Opportunities are enhanced for travel by public transport, cycling and walking at and to major destinations including employment and education locations, health, welfare and support services, shopping centres, and recreational and social venues.

8.1.12 Appropriate end-of-trip facilities, including bicycle parking, showers and change rooms, are incorporated into developments that are likely to attract or generate significant numbers of bicycle trips, such as business centres, workplaces, community facilities, educational facilities and retail developments.

Aligned strategies

8.1.A The community's access to employment, education and services is improved while transport emissions are reduced.

8.1.B Planning for public transport is integrated with planning for other modes of transport.

8.1.C Cyclist and pedestrian requirements are integrated into future planning and infrastructure.

8.1.D Climate change considerations are included in programs to improve the appeal and amenity of public transport.

8.1.E Appropriate public transport coverage is provided, and priority allocated on the road network where warranted.

Targets

Transport policies in the regional plan and other strategies will be implemented in pursuit of the desired regional outcomes and the following specific targets that achieve at least:

- 10 per cent of all Cairns Southern Corridor trips by public transport by 2016
- 20 per cent of all Cairns Southern Corridor peak hour trips by public transport by 2036
- 40 per cent job self-containment in Cairns Southern Corridor by 2036
- 50 per cent increase in person trips by cycling in FNQ by 2011
- 100 per cent increase in person trips by cycling in FNQ by 2021.

Explanatory notes

The form of cities and towns and the relationships between land uses and transport networks have a fundamental influence on:

- the number of trips people need to make
- the distances people need to travel
- the proportion of trips that can be made by public transport
- the cost-effectiveness of, and level of service provided by, public transport
- the proportion of trips that can be made by walking or cycling
- safety and amenity
- road capacity and efficiency
- location of transport corridors.

Integrated land use and transport planning facilitates access to facilities, services, goods, and other infrastructure and promotes economic and social development across the region.

Intermodal transportation involves the use of more than one mode of transport to transfer goods or people efficiently. Transport terminals facilitate transfer between modes as well as providing storage facilities. Clustering of like industries and storage facilities in strategic locations, particularly key freight transport nodes, maximises transport efficiencies.

It is important to minimise the impacts of catastrophic events such as cyclones and floods, through careful location, design and construction of transport facilities.

A range of travel choices reduce the need to travel by car, create shorter journeys, provide safer and easier access to jobs, schools and services, support more efficient use of land and existing infrastructure and maintain the environmental benefits of compact development.

Access to a public transport system that conveniently connects people with goods, services, places and other people is important in large urban centres like Cairns and Innisfail.

Transit oriented communities

Transit oriented communities are mixed use residential and employment areas designed to maximise the efficient use of land with higher self-containment (need to define) and better access to public transport. A transit oriented community has a walker and cycle friendly component with a public transport stop or station surrounded by relatively higher density residential development, employment or a range of mixed uses.

Benefits of a transit oriented community

Transit oriented communities provide benefits at both local and regional levels. Regional benefits can include:

- reduced congestion pressures through:
  - shorter more localised trips because of greater self-containment
  - more trips by walking and cycling
  - increased public transport usage
- air quality benefits due to a reduced reliance on cars
- better transport efficiency and reduced transport costs for people
- provision of a variety of housing options
- shorter easier trips for work and recreation, saving time spent on travelling
- more equitable access to community facilities and employment protection of open space and scenic amenity through the containment of urban sprawl
- more efficient use of land and infrastructure.

Local benefits can include:

- an increased sense of community
- safer, more vibrant urban centres
- improved access to work, shopping and recreational facilities
- an increased variety of services and facilities located closer to where people live and work
- reduced reliance on private vehicles
- higher quality pedestrian and cycling environment
- improved connectivity with neighbouring precincts.

Establishment of transit oriented communities

Establishment of transit oriented communities in Cairns is an important element in the preferred pattern of development for FNQ. Transit oriented communities would incorporate appropriate higher densities but would be complemented by lower densities in a diverse housing mix. Table 8 outlines high level principles for transit oriented communities in Cairns. Table 9 outlines a typology of transit oriented communities in Cairns. Future transit oriented communities should be planned in accordance with tables 8 and 9.

This will ultimately involve master planning for individual localities (see section 4.3). Master planning activities would be staged over time and be based on priorities identified by state and local government. Master planning should be undertaken prior to transit oriented development and initiated in sequence with planned state and local infrastructure delivery.

Potential transit oriented communities in Cairns are the public transport nodes of Palm Cove, Smithfield, Redlynch, Cairns central business district, Earlville, Edmonton, and Gordonvale as indicated on map 17.

Further investigation is required to confirm the preferred locations and types of transit opportunities in the future. A Cairns Transit Network project is currently investigating future corridors and nodes for a bus based public transport system.

Transit oriented communities become viable when oriented around a public transport station on a bus rapid transit system with a high frequency of services. Master planning for transit oriented communities should be coordinated with planning for a rapid public transit system. Public transport nodes in Cairns have the greatest potential for facilitating transit oriented communities as these centres of activity already serve as interchanges or termini for existing public transport services. Therefore it is important that development occurring in public transport nodes does not preclude future transit oriented communities.

Interim development in a public transport node (see map 17) should be configured and designed to allow the future development of a transit oriented community. For example, large land parcels should be protected from subdivision and smaller land parcels consolidated wherever possible. Robust infrastructure and flexible development in public transport nodes is needed to ensure transit oriented communities are established in the future.

Transit oriented communities will vary in size depending on local constraints and opportunities. The typology in table 9 outlines a range of transit oriented community types to reflect differing scenarios. Over time specific types will be assigned to selected localities, based on transit node and frequency, connectivity and accessibility, role in a broader network, aspirations for the future, amenity, infrastructure and service capacity, land availability and market interest.

Catchment sizes will relate to pedestrian and cyclist accessibility, generally within a comfortable 10 minute walk or ride of the transit station, or 400–800 metres and up to 1.2 kilometres in key nodes. Walking distances can be affected by topography, climate, season, intervening roads and other physical features. Appropriate layout and design of shared paths can increase catchment size.

Appropriate uses will vary in each community and could include residential, commercial, retail, recreational and community facilities. Transit oriented communities should promote transit supportive land uses to reduce dependence on private car travel. Car parking provision in activity centres and transit communities should be reduced over time. This reflects proximity to high frequency transit services and access to goods and services in mixed use centres.

Principles and typology

Transit oriented community principles (see table 8) could also apply to mixed use developments with lower levels of public transport but in walking distance of major destinations and lower-order centres.

New public transport facilities should be located in areas with mixed use development potential (both greenfield and infill) and be designed to allow for direct pedestrian and cycle connections to adjacent communities. Tables 8 and 9 describe the principles and character of transit oriented communities in more detail.

Table 8: Transit oriented communities—principles for Cairns City

Location	Principle
Level of infrastructure and services	Development is focused on nodes or corridors with higher frequency transit services and where infrastructure capacity exists or is viable to provide.
Level of development	Development occurs at a higher scale, appropriate to the locality and the local government planning scheme intent.
New development	Transit oriented community principles are applied in new developments where transit stations exist or are proposed.
Land Use	
Type	Transit oriented communities are dominated by transit supportive land uses.
Density	Incorporate higher densities appropriate to the location of the proposed transit oriented community.
Mix	Transit oriented communities integrate an appropriate mix of use and services (according to the centre) as indicated in Table 9—Transit oriented community—typology for Cairns.
Activity	Transit oriented communities contribute to greater activity in the location to provide a sense of vitality and security.
Employment	Transit oriented communities provide a mix of uses and services that contributes to local employment.
Housing	Transit oriented communities provide a range of housing options to meet the diverse needs of the community.
Design	
Adaptability	The built form allows adaptation or redevelopment over time to adjust to changing communities.
Built form	Transit oriented communities incorporate best practice tropical design to promote character, amenity and maximise energy and water efficiency.
Open space	Transit oriented communities create a sense of place and provides a high quality public realm to promote social cohesion, interaction and safety.
Integration	Transit oriented communities are designed to seamlessly integrate the transit station with the surrounding community.
Parking	Car parking is located, designed and provided in a way that supports walking, cycling and public transport accessibility and promotes mode shares.
Transport	
Mode share	Transit oriented communities contribute towards targets for cycling and public transport mode shares and encourage a higher mode share for walking.
Transport efficiency	Transit oriented communities facilitate connections between modes and maximises public transport efficiency.

Table 9: Transit oriented communities—typology for Cairns City

TOC Type	Land use mix	Connectivity	Residential density	
			Core (400-800 m from transit station)	Fringe (800-1200 m from transit station)
Type 1—City	A mixture of the following: • high density multi–unit dwelling • primary office and service centre • centre for entertainment for example, theatres, cinemas, civic theatres, convention centre, restaurants, nightclubs, cafes, bars, regional gallery • primary employment centre • higher order retail	• hub of transit system, including rapid transit and local bus • access to long distance bus and rail and ferry • strong pedestrian and cycle connectivity	150 dwellings per hectare	100 dwellings per hectare
Type 2—Urban	A mixture of the following: • combination of high density multi-unit, medium density multi-unit, town houses, shop top living • alternative office centre • secondary service centre • minor entertainment for example, cinema, restaurants, bars, cafes • strong employment centre • retail focus	• linked to principal and major regional activity centres by rapid transit • local bus services • strong pedestrian and cycle connectivity	100 dwellings per hectare	70 dwellings per hectare at fringe
Type 3—Village	A mixture of the following: • combination of medium density multi-unit, town houses, shop top living • lower order retail • small business and commercial • higher density residential in surrounding areas and even on site.	• linked to principal and major regional activity centres by rapid transit • local bus services • strong pedestrian and cycle connectivity	70 dwellings per hectare;	40 dwellings per hectare
Type 4—Neighbourhood	A mixture of the following: • medium density multi-unit housing around station • town houses • dual occupancy • detached dwellings on compact lots (villas and cottages) • minor retail/conveniences • childcare • home businesses	• linked to rapid transit by local bus services • access to principal and major regional activity centres by rapid transit	40 dwellings per hectare	30 dwellings per hectare
Type 5—Specialist activity centre	One or more of the following: • medium-density multi-unit housing around station • town houses • institutional housing • education • hospital • sport & recreation • related minor uses (convenience shop, cafes, small office) • tourist attractions	• linked to principal and major regional activity centres by rapid transit • local bus services • strong pedestrian and cycle connectivity	Not specified	Not specified

8.2 Transport networks

The layout and design of new neighbourhoods and suburbs have a significant impact on future travel demands and behaviours. Most new urban development occurs on relatively small land parcels. Incremental and fragmented development makes it difficult to build neighbourhoods that support pedestrians, cyclists, public transport and efficient transport networks. The design of a well connected street network can save travel time and cost and reduce greenhouse gas emissions through reduced vehicle travel.

It is important to have a transport network across the region that provides safe, efficient and effective transport for people and goods. It must be environmentally sustainable and offer good access and amenity in order to support industry competitiveness and growth and liveable communities.

Objective

- Highly connected transport networks provide strong links between activity centres and surrounding areas, to enable good accessibility, route and mode choice.

Land use policies

8.2.1 Integrated network planning, including a functional road hierarchy, protects and enhances regional and local connectivity, efficiency and safety.

8.2.2 Streets are carefully planned to provide facilities that equitably address the needs of pedestrians, cyclists, public transport and vehicles.

8.2.3 The street network has high street connectivity, both within the development and to the surrounding area.

8.2.4 A managed network of streets clearly distinguishes between arterial routes and local streets, based on function, legibility, convenience, traffic volume, vehicle speed, public safety and amenity.

8.2.5 A transport network is established which provides convenient linkages to activity centres, schools, public transport stops and stations, and other destinations within or adjoining the development.

8.2.6 Road and street networks are configured to allow efficient bus service that can be conveniently and safely accessed by foot from most dwellings.

8.2.7 A safe, convenient and legible cycle network, including on-road and off-road routes, is provided to meet the needs of all cyclists and people using mobility scooters.

8.2.8 A safe, convenient and legible network for pedestrians is provided, principally along street networks and adjacent to watercourses, linking residences and providing access to points of attraction within and beyond developments.

8.2.9 The Principal Cycle Network for FNQ (as indicated in map 18) is progressively implemented through cooperation between local government, state agencies and the private sector.

Explanatory notes

Transport networks include private motor vehicle, public passenger transport, walking and cycling networks. Integrated network planning, including a functional road hierarchy:

- contributes to overall transport efficiency
- provides adequate levels of safety
- facilitates community access to the transport network.

It is important that a network plan is reflected in transport plans, planning schemes, infrastructure plans, structure plans and master plans. When applied in

greenfield, infill and redevelopment sites, network plans should:

- have a highly-interconnected street network that clearly distinguishes between elements of the various transport network hierarchies
- establish good internal and external access for community
- encourage walking and cycling and supports public transport
- minimise the impact of through traffic or mitigates traffic impacts where through traffic is necessary
- improve use of land and the efficient provision of public transport infrastructure and services to maximise community benefit.

Contemporary urban design practices for new urban communities are outlined in the Queensland Government's Shaping Up guideline, the *Queensland Residential Design Guidelines and Commonwealth Government's Australian Model Code for Residential Development (AMCORD) Guidelines* (Commonwealth of Australia, 1995). The Institute of Public Works Engineering Australia's Queensland Streets standard for streetworks design is currently being revised.

Road networks in urban areas should be designed in accordance with the Far North Queensland Regional Organisation of Councils (FNQROC) Development Manual so that the required transport function of each road link in the network is achieved. That is the safety, speed, capacity, amenity, public transport coverage and level of access permitted on roads and streets.

Development should be designed so that Queensland Transport can cost-efficiently deliver the minimum standard of public transport. Generally a target of 90 per cent of dwellings within 400 metres of a planned or existing bus stop is considered appropriate.

Travel patterns and behaviours are influenced by transport network design on two levels:

- Regional—travel behaviour is influenced by the connectivity between towns and cities.
- Local—travel behaviour is influenced by the connectivity of local street networks and the provision of safe and direct pedestrian and cycle and public transport routes within neighbourhoods.

The street network should be highly interconnected to help limit travel distances and to promote walking, cycling, public transport usage and a strong sense of community. This creates a responsive network where motorised traffic volumes and speeds are managed.

Complete streets which incorporate facilities for cars, bicycles, pedestrians and public transport, are designed and operated to enable safe access for all users. Pedestrians, cyclists, motorists and public transport riders of all ages and abilities are able to safely move along and across a complete street.

Walking and cycling should be safe, convenient and attractive transport modes, providing a genuine, sustainable alternative to private cars. These activities are also enjoyed as recreational activities in their own right. There are health benefits where neighbourhoods are designed to encourage people to walk and cycle.

The *Queensland Cycle Strategy* (Queensland Transport, 2003) set a target for areas outside SEQ to increase cycling 50 per cent by 2011 and 100 per cent by 2021. To achieve this target, FNQ must adopt a regional approach to encouraging cycling by:

- linking cycle routes across local government boundaries to provide a safe, interconnected network
- supporting compact urban communities and locating key services near residential areas
- providing high quality end-of-trip facilities such as bike racks, bike lockers, showers and changing rooms in regional activity centres
- ensuring public roads are planned, designed and operated to optimise cycle access and safety.

The Principal Cycle Network for FNQ identifies key links between and in regional activity centres. The network will be used to plan and prioritise state and local government and private sector investment in cycling. The plan recognises two types of routes:

1) Principal cycle routes—the most important routes for cycling in the region, serving a variety of shorter trips (less than 20 kilometres) for work, school, shopping, recreation and tourism.
2) Iconic recreation routes—two major spines to enable long-distance cycle touring along the coast and highlands of FNQ.

For more information on the Cairns Transit Network and the FNQ Principal Cycle Network contact Queensland Transport.

8.3 Transport infrastructure

Identifying and protecting transport infrastructure and corridors is critical to sustaining current transport operations and meeting future transport needs. It is important that potential conflicts between key transport infrastructure and urban development are mitigated so the community can continue to enjoy the transport benefits of this infrastructure with manageable impacts on adjacent land uses.

Objective

- Affordable and efficient air, sea, rail and road transport infrastructure supports a vibrant economy and meets community and tourist needs.

Land use policies

8.3.1 The strategic freight network in FNQ, as indicated on map 19 is protected from encroachment from urban activities and incompatible land uses.

8.3.2 Regionally significant corridors for future bypasses, as indicated on map 19, are protected from encroachment from urban activities.

8.3.3 Opportunities for rapid transit are protected, including the preservation of disused cane rail corridors for future needs, as indicated on map 17.

8.3.4 High order road corridors are to be appropriately buffered from new development to mitigate road traffic noise and visual impacts.

8.3.5 Adequate measures are adopted to preserve amenity for noise sensitive land uses in transit oriented communities.

8.3.6 Compatible land uses, such as industry, commercial, retail and other employment activities are located near major transport corridors.

8.3.7 Current and future transport infrastructure needs are appropriately provided for as part of any development adjacent to major transport corridors.

8.3.8 Cairns and Mourilyan sea ports and Cairns Airport and Mareeba Aerodrome, and their access roads and operations, are protected from urban activities that may impact on current or future operations, except where permitted in land use plans for strategic port land.

8.3.9 Disused rail corridors and ancillary infrastructure are preserved where feasible, to meet current and future demands for alternative transport or movement of freight.

8.3.10 The concurrent use of rail corridors for non-rail transport and communication purposes is promoted, consistent with corridor lease terms and without compromising safety and rail operations.

Aligned strategies

8.3.A Air transport is facilitated to meet basic access and regional development needs in rural and remote communities.

8.3.B Transport infrastructure facilitates:

- safer roads to support safer communities
- efficient and effective transport to support industry competitiveness and growth
- fair access and amenity to support liveable communities
- environmental management to support environmental conservation
- a mode share consistent with sustainable outcomes.

8.3.C Shoulders on the higher order road network are progressively sealed to improve cyclist and general traffic safety.

8.3.D Overtaking lanes are progressively provided on roads with higher vehicle volumes.

Explanatory notes

A safe and efficient transport network will be critical for the prosperity, livability and development of the region over the next 20 years. Road transport is an integral part of the network for moving people and goods. The efficiency of this network is critical for industry competitiveness and growth and quality of life. FNQ also has a significant drive tourism industry which relies on road transport.

The Department of Main Roads (DMR) has developed a network of priority freight routes and is working towards improvements that will allow greater access for freight efficient vehicles. Protecting these routes from encroachments and incompatible adjacent land uses is important for future costs, transport efficiencies and local amenity.

Large Freight Efficient Vehicles (FEVs) provide considerable savings in cost and labour which are becoming increasingly important in light of rising fuel costs and labour shortages. Vehicle combinations larger than semi-trailers do not have as of right access to public roads because of limited ability to negotiate corners and safety for other users. They range in length from 21m B-Double to 53.5m road trains.

These vehicles are restricted in relation to which roads that they can use. The Kuranda Range section of the Kennedy Highway, for example, is only suitable for semi-trailers. In the short term efforts will be made to improve the safety and efficiency of the existing routes. On the Kuranda Range Road section for example various measures are being rolled out with over $4 million allocated for road improvements in the 2008-09 and 2009-10 financial years. The corridor identified for a four lane upgrade is being preserved and investigations are continuing for ways to improve the link and plan for the longer term.

New transport infrastructure can have significant land requirements. Potential

land acquisition has significant economic and social impacts. Therefore it is important to identify and protect current and future corridors. Opportunities can be lost or compromised as land is developed. New land uses can encroach on major transport corridors such as main roads, busways and railway. Where development occurs adjacent to a major transport corridor, appropriate provision needs to be made for current and future transport infrastructure needs.

Incompatible land uses with the freight network include those uses that either have an impact on the operation of a road, railway or port or are impacted by the operation of a transport corridor to the extent that it should be avoided. Noise, visual amenity, safety, efficiency, sustainability and access are factors that need to be considered.

There are also amenity considerations for sensitive land uses near transport infrastructure. The preferred option is to avoid placing noise and visually sensitive land uses near transport corridors where practicable. If development is unavoidable, then design and construction should include appropriate development layout and building orientation and adequate buffers and insulation to mitigate noise and visual impacts for the receiving environment. Transport infrastructure providers also have a role in mitigating noise and visual impacts for the receiving environment.

The *Road Traffic Noise Management: Code of Practice* (Department of Main Roads, 2007) provides guidance and instruction for the assessment, design and management of the impact of road noise.

Utilising public transport options will take considerable pressure off congested roads which might otherwise not be able to cope, even with upgrades. The majority of movement in FNQ is still expected to be by road, even with a successful public transport system. Appropriate planning for managed growth in road traffic is therefore still needed.

The Department of Main Roads *Queensland AusLink Network Forward Strategy 2009-10 to 2013-14* outlines desired improvements for federally funded AusLink network roads. The *Road Implementation Program* outlines short term road improvements for other state controlled roads and roads of local and regional significance.

The railways that connect Cairns to the south and inland areas are important for freight and passenger travel and tourism. For rail, there are opportunities and challenges in improving the share of the freight task, particularly for heavy long distance loads. There are opportunities for some freight movement by rail from the Tablelands.

The *Rail Network Strategy for Queensland* (Queensland Transport, 2001) identifies specific strategies relating to policy and planning for the future of Queensland's rail infrastructure and rail corridors.

Rail corridors present a unique opportunity for transport and communication services. However, concurrent uses need to be consistent with corridor lease terms and must not compromise safety and rail operations. It is possible to utilise disused rail corridors for recreational purposes, including walking, cycling or horse riding trails. The future use of disused railway lines on the Atherton Tablelands is the subject of an Atherton Tablelands rail trails feasibility study.

Disused cane rail corridors may ultimately provide opportunities for future public transport systems to service transit oriented communities and growing urban areas in Cairns.

State Planning Policy 1/02 *Development in the Vicinity of certain airports and aviation facilities* (Queensland Transport, 2002a) sets out the state's interest concerning development in the vicinity of airports and aviation facilities considered essential for the state's transport infrastructure. The policy applies in the vicinity of designated airports and aviation facilities but does apply to those facilities themselves. State Planning Policy 1/02 applies to Cairns and Mareeba airports in FNQ.

The *Cairns Port Authority Land Use Plan* (CPA, 2006) and *Port of Mourilyan Land Use Strategy* (Ports Corporation of Queensland, 2003) are statutory documents, similar to a local council planning schemes, to control land uses on strategic port land. The *Port of Mourilyan Land Use Strategy 2003* is intended to be used in conjunction with the Port of Mourilyan's Environmental Management Plan. The *Coastal Protection and Management Act 1995* includes buffers for coastal dependent state significant land uses such as sea ports.