Regional Development Australia

NORTHERN QUEENSLAND

- Far North Queensland and Torres Strait
- Townsville and North West Queensland
- Mackay-Isaac-Whitsunday
- Fitzroy and Central West

NORTHERN QUEENSLAND STRATEGY

BUSINESS CASES FOR

INVESTING IN REGIONAL ROADS, DEVELOPING AGRICULTURAL DISTRIBUTION HUBS AND SUPPORTING REGIONAL AVIATION AND AIR FREIGHT FOR EXPORTS

FINAL REPORT

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NORTHERN QUEENSLAND STRATEGY

BUSINESS CASES FOR INVESTING IN REGIONAL ROADS, DEVELOPING AGRICULTURAL DISTRIBUTION HUBS AND SUPPORTING REGIONAL AVIATION AND AIR FREIGHT FOR EXPORTS

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REGIONAL DEVELOPMENT AUSTRALIA

NORTHERN QUEENSLAND

- Far North Queensland and Torres Strait
- Townsville and North West Queensland
- Mackay-Isaac-Whitsunday
- Fitzroy and Central West

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Special Terms and Abbreviations

Outside earnings – Income earned from outside the region including from overseas exports and regional exports to the rest of Australia and including spending by visitors for various purposes.

Regional roads – Means all those roads controlled by the Queensland Department of Transport and Main Roads apart from the Bruce Highway and excluding local roads.

Northern Queensland – In this report, covers the regions covered by the four Regional Development Australia Committees established in the four regions of Far North and Torres Strait, Townsville and North West Queensland, Mackay-Isaac-Whitsunday and Fitzroy and Central West (see Map 1.2 and Statistical Note below).

Statistical Note – **Regional boundaries** - In 2011, the Australian Bureau of Statistics made major changes in Australia's Geographical Classifications.

The following table gives statistical boundaries roughly equivalent to the Regional Development Australia boundaries.

Regional Development Australia	Up to 2011	Post 2011
RDA Fitzroy and Central West (1)	Fitzroy and Central West Statistical Divisions	SA4 Fitzroy plus Outback Queensland SA2 Barcaldine-Blackall, Longreach and Central West
RDA Mackay-Isaac-Whitsunday	Mackay Statistical Division	SA4 Mackay
RDA Townsville and North West Queensland (1)	North & North West Statistical Division	SA4 Townsville plus SA3 Outback North
RDA Far North and Torres Strait	Far North Statistical Division	SA4s Cairns North and South plus SA3 Outback Far North

NOTE: (1) It should be noted that the RDA boundaries differ marginally from the above in that Boulia Shire is in Central West Statistical Division but is included in the RDA Townsville and North West.

Statistical boundaries used for the main regional cities are the Statistical Sub Division pre 2011 and the SA3 divisions of Rockhampton, Mackay, Townsville and Cairns North and South after 2011.

Statistical Note – **Gross Regional Product figures** – There are real difficulties in construction of accurate values of Gross Regional Product at regional level. The latest State Government figures, described as "Experimental Estimates" for the four regions of Northern Queensland were for 2010/11. Based on these, and taking into account workforce, prices and other changes, estimates have been made for total Northern Queensland and for that part of Northern Queensland not along the Bruce Highway. It is stressed that these figures are order of magnitude estimates and are not to be regarded as precise.

SUMMARY OF MAIN FINDINGS

INTRODUCTION

(1) Northern Queensland

The Northern Queensland region in brief:

- Over 1.2 million km^2 north of the Tropic of Capricorn.
- 73% of total state area.
- Population 964,000.
- Production includes mining, agriculture, fisheries and internationally renowned tourism destinations.
- Gross Regional Product of $80 billion.

(2) An outsized contribution to national growth

Northern Queensland has been making an outsized contribution to Australia's economic prosperity in recent years.

The one in 25 Australians who live in the Northern Queensland area produce:

- Almost 1 in 5 of Australia's export dollars;
- 9 out of 10 of Queensland's mining dollars, 1 in 5 of Australia's mining dollars;
- 1 in 10 of Australia's agricultural production dollars.

In addition, Northern Queensland is:

- Third to Sydney and Melbourne in international holiday visitors;
- A major contributor to Australia's seafood and aquaculture production.

(3) Keeping the momentum moving

The four Regional Development Australia committees in the area have come together to present three elements of a Northern Queensland Strategy to contribute to the development of strategies for the development of Northern Australia.

Three Business Cases to improve transport and distribution deficiencies

Northern Queensland has long suffered from constraints with internal transport systems, lack of direct connectivity with outside markets and poorly developed distribution systems that have impacted the rate of development.

The three business cases presented, all relate to transport and distribution:

- Investing in Regional Roads (apart from the Bruce Highway);
- Developing Agricultural Distribution Hubs;
- Supporting Regional Aviation and Air Freight for Exports.

Since the need for upgrading of the Bruce Highway connecting the Northern Queensland major cities with Brisbane has been recognised with significant funding made available of $8.7bn over ten years, it has not been included as part of the business cases for the purpose of this study.

(5) Major new dimensions of growth potential

Northern Queensland covers an area as big as New South Wales, Victoria and Tasmania.

Realities of areas and distances leads to four distinct regions as represented by the four Regional Development Australia committees, each with its own main city with a typical hub relationship to the area it services – Rockhampton, Mackay, Townsville and Cairns.

The region is rich in resources such as energy, water, minerals and natural marine and land-based assets for tourism with much potential for future growth.

Emerging technologies, especially those of relevance to operating industry and business in the tropics, and new markets will be drivers of growth for the region in the future.

Primary industries

A highly efficient sugar industry is moving into a new dimension that will see it produce much more than raw sugar.

The pastoral industries are set to expand to meet growing demand for protein in Asia.

Other crops including fruits and vegetables are set to have prospects of breaking out of Australian markets and into export markets.

Importantly, cropping is expanding and moving north and west with new investment ready to take place.

Significant Commonwealth Government / CSIRO studies into agricultural expansion on the Flinders and Gilbert Rivers have been completed, providing evidence for future expansion of irrigated crops.

New mining developments

Although some mining is moderating, coal mining is set to move further west with the opening up of the Galilee Basin accompanied by coal gas development.

More oil and gas production is highly prospective in the Central West and North West.

Mining of large bauxite deposits in Cape York seems likely to expand.

The further development of rich mineral deposits in the North West is also likely.

New tourism waves

As incomes move up in China, a new major surge of tourism development is on its way with some of the largest integrated resort developments in the world proposed.

(6) Population passing one million

Population of Northern Queensland is set to break the 1 million level in a few years indicating the area is growing up rapidly from a tropical frontier to a developed and comfortable place in which to live.

However continuing strong growth requires attention to and support for development of transport and distribution systems.

INVESTING IN REGIONAL ROADS

(7) Fundamental to realisation of potential

Previously lower levels of development of Northern Queensland has meant that the area's land transport system is in major need of upgrading if the area's potential is to be fully realised.

(8) Attention needed now to regional roads

The need for major upgrading of the Bruce Highway connecting the Northern Queensland major cities with Brisbane has been recognised. Funding of $8.7bn over ten years has been announced by the Commonwealth and Queensland Governments.

With much of the area's economy based on industries such as mining, agriculture, fisheries and substantial segments of tourism, located in areas away from the main east coast centres.

There is now a need to step up funding for regional roads to:

- reduce costs of operation in these areas;
- improve connectivity between these industries and the major ports and regional cities;
- improve connectivity between Northern Queensland and the rest of Australia, apart from Brisbane.

(9) System of east-west and north-south connectors

The Northern Queensland current road network is composed of major east-west routes that connect the hinterland to the coastal cities, importantly connecting the mining and agricultural/ grazing industries to the ports for access to markets. These are the Capricorn Highway, Peak Downs Highway, Flinders / Barkly Highways, and Kennedy / Gulf Developmental Roads.

The network also includes major north-south routes for movement of freight. There is:

- A sub-coastal route of the Kennedy and Gregory Development Roads which provides an alternate route to the Bruce Highway;
- A direct inland route from the Tablelands via the Kennedy Developmental Road Hann Highway section to Hughenden and Barcaldine, direct to Melbourne via Bourke and Cobar, with a branch to Adelaide. (The geography of Australia is such that much of Northern Queensland lies directly north of Melbourne;
- A far western route from the Gulf to Birdsville which incorporates the Burke, Diamantina and Eyre Development Roads.

(10) Vehicle kilometres on regional roads

Analysis of vehicle movements indicate that the 10,000km plus regional road system generates two billion vehicle kilometers, slightly more than the Northern Queensland section of the Bruce Highway.

(11) A need to cater for new developments

A number of major developmental factors will increase the need for additional road development over the next decade:

- The extension of coal mining into the Galilee Basin, oil and gas activity in the Central West and North West, expansion of bauxite mining in Cape York Peninsula, and continuing development of mining in the North West and Gulf regions;

- The development of expanded new areas of agricultural production in the Gulf rivers, in Cape York and in the Fitzroy and Burdekin basins;
- A major new phase in tourism development based on tourism out of Asia, especially as China expands rapidly over the coming decade, and
- As the population of Northern Queensland passes the one million mark.

Increasing demand for port and airport access for links with the Asia-Pacific and especially China, will also increase demand on road networks.

(12) A need to improve external connectivity

The National Highway system aims to link major cities and regions. While Northern Queensland has relatively efficient direct links with Brisbane, Sydney and Darwin, efficient direct links with Victoria, South Australia, Central Australia and south west of Western Australia are lacking.

(13) Current rates of expenditure

Current expenditure rate on regional roads in Northern Queensland (excluding one-off national disaster spending and outlined in the Queensland Roads Investment Program), is running at the rate that, if projected over 10 years, would result in an expenditure of $4.8bn.

Major additional investment is needed in upgrading to rectify deficiencies in the existing system, to cater for new development and better external connectivity with the rest of Australia.

(14) Return on investment

There are two major benefits of an increased level of road funding in the area:

- reducing inefficiencies and costs of the current poorly developed system;
- stimulating economic growth.

Reducing inefficiencies and costs

Northern Queensland experiences an annual wet season with periods of intense rainfall.

Examination of road closure information indicates high annual averages extending to 60-80 days in the Far West and North West. At the extreme, the Cape York Peninsula area is cut off 4-6 months every year. To the south, a few days or even hours closure on connecting roads to the Bowen Basin can have a significant economic impact due to the sheer volume and value of supplies to mining operations and mining communities.

Analysis of road closure data and regional main roads indicate that an average of 106,000 vehicle days a year are involved, about twice the number of vehicle days of road closures on the Bruce Highway.

Analysis of potential benefits indicate the following;

- Reduction in damage to roads and a need for reconstruction following extreme rainfall events that cost over $700m in 2013/14 and 2014/15;
- Potential savings to road users from road closure disruptions in travel times and other consequent actions;

- Potential savings from loss of business and disruption to output due to road closures affecting mining, the pastoral industry, tourism and communities in a regional economy with outside earnings of about $40bn per annum.
- General upgrading leading to better roads and savings in vehicle operation and in shorter travel times.

Economic impacts

The improvement of regional roads affects almost every aspect of the economy.

Impacts indicated are as follows:

- Of the order of 80% of the output of Northern Queensland's base industries, earning outside income, including mining, primary industries and tourism, is affected by the regional roads. This represents an amount of $40bn per annum (mining 90%, agriculture 7%, tourism 3%.) or of the order of $400bn over a 10-year period based on current 2014 prices and earnings.
- Of the order of 35% of Northern Queensland's employment is affected by regional roads (25% in the regions and a further 10% in the cities), accounting for of the order of $30bn in Gross Regional Product per annum and potentially of the order of $300bn over a 10-year period at 2014 prices and current production levels.
- Potential major new investments affected by the efficiency of the regional roads include Galilee Basin with a projected investment of $40bn, South of Embley's $1.2bn bauxite project, mineral and gas projects in the North West and West, along with new cropping areas in the Gulf and the Peninsula with one alone proposing an investment of over $1bn.

(15) Recommendations

Based on the road needs identified, it is recommended that to attend to additional developmental needs, a substantial additional amount of funding is needed over and above the normal expenditure on maintenance and organic improvements.

In order to achieve strategic development of the road network to support major industries, businesses including tourism and communities, the development of a Queensland Western Roads Action Plan is highly recommended. Such a plan would be developed on the basis of defining the network objectives, analysing the existing network including safety and productivity issues, reviewing the performance gaps, prioritising works according to need and impact and developing a plan of works for implementation. It would be developed in a partnership between all levels of government, the Regional Road and Transport Groups, industry and road user groups and regional development stakeholders.

DEVELOPING AGRICULTURAL DISTRIBUTION HUBS

(16) Background

If the Queensland Government's objective of doubling agricultural output by 2040 is to be met, and the Commonwealth Government's objectives of Northern Australia becoming a major supplier of agricultural products are to be achieved, Northern Queensland will need to be a major contributor.

For this to be achieved, major development of transport and distribution systems will be needed.

In the first place will be a need for better distribution systems to achieve greater penetration of local markets. The second will be better transport and distribution hub arrangements to attract container shipping direct into northern seaports and exploitation of air freight opportunities (see Section 4).

(17) Weaknesses in distribution between regions

A major weakness however is the distribution system. The whole transport system is dominated by movements from Brisbane to each of the regions with backloading when available from the northern regions. The system of inter-regional transport between the different regions is relatively poorly developed. It can be easier to find transport from northern centres to Brisbane than to the other regions.

(18) Overseas markets – bulk and specialist shipping

In relation to overseas markets, a number of commodities have developed specialised shipping arrangements to ship in bulk, or in the case of live cattle, in specialised stock carriers. These arrangements are generally working satisfactorily, although problems of capacity of some roads to take larger freight efficient vehicles to ports has been raised.

(19) Developing direct container shipping

Shipping arrangements for those primary industry products using container shipping are in major need of attention if Northern Queensland's agricultural potential is to be fully exploited. Those products using container shipping finding their way onto overseas markets are generally having to export via Brisbane, a situation of disadvantage to production in Northern Queensland that will need to change.

The study reviewed the capability of the Northern ports to change this situation in relation to container shipping. While there has been overseas container shipping calling at Gladstone and Townsville to load minerals; aluminium in Gladstone and copper and zinc in Townsville, most containerised agricultural product continues to be shipped via Brisbane.

Potential primary products from Northern Queensland include meat, seafood (including expanding aquaculture production), dairy products, fruit and vegetables (including mangoes, avocados, lychees and citrus), cotton, some high grade wheats, rice, cassava. Some of the pulses and grains currently being shipped in bulk are also potential container cargoes. The research also identified some processed primary industry products as potential cargoes such as refined sugar.

The problem does not lie so much with the ports (although Cairns and Mackay currently have some depth problems for the larger container ships being used). The problems to be overcome lie in four directions:

a) The availability of base load export cargoes on an annual basis;

b) The need to achieve critical mass of container ship services available to various destinations;

c) A need to attract reverse trade of imports;

d) The poorly developed land transport system between the Northern Queensland regions compared with that between the regions and Brisbane.

It is evident that Townsville is most advanced in overcoming the problems of gaining critical mass for exporting and importing. It is the largest city in Northern Australia, is within four hours' drive of Cairns as the second largest city in Northern Australia and services a population of 575,000 within a four hour drive radius. Within this radius, Cairns, Mackay and Townsville are experiencing higher than national and state average population growth. As an example of imports to service the region's population, Bunnings is now importing directly into Townsville rather than through ports in the south.

(20) Return on investment

Investments in the transport and distribution system and in particular achieving a major increase in direct container exports out of Northern Queensland ports has the potential to facilitate an expansion of the $7bn agricultural sector including:

- A major expansion of sugar production for products other than raw sugar, including refined sugar and over time, citric acid, power drinks and bioplastics, involving a large investment and tapping into major emerging markets in Asia. The additional refined sugar potential from the Mackay region alone is of the order of $200m a year or $2bn over a 10-year period;

- A continuing expansion of the beef industry through reducing costs of shipping beef to overseas markets. Current value of meat being transported south is estimated at $2.8bn a year or $28bn over a 10-year period.

- A continuing expansion of other primary industries including fruit and vegetables, cotton, pulses and grains, rice, cassava and seafood.

However just as important, will be the impact of developing direct imports from overseas on improving the viability of shipping services and in reducing freight rates for export. Direct imports will also reduce costs of products in the Northern Queensland regions down to levels available to consumers in southern Australia (eg. currently, Bunnings imports through Townsville), but also of inputs to a whole range of industries including increasing the competitiveness of manufacturing in Northern Queensland.

(21) Recommendations

General

Investment needed mainly involves actions to encourage and support private enterprise investment and business development.

There is a need for two separate, although not entirely mutually exclusive, strategies.

Strategy to improve penetration of local Australian markets

By and large the distribution to southern Australian markets seems to be working well.

One government investment needed is the final sealing of the direct inland route to provide better road access to Melbourne and Adelaide markets.

There is however a substantial need to improve distribution to local markets.

Achieving greater penetration of local markets will require a combined effort at producer, community and government level to play a facilitative role and initiate actions to encourage:

- Major retail chains to establish more distribution centres in the north and better systems for buying in local produce;
- Specialist food wholesalers to set up hubs in the north that will maximise buy in of local fresh and processed produce;
- Local groups to be established to promote locally produced fresh and processed produce.

Strategy to break into overseas markets

Bulk and specialised shipping exports

By and large these arrangements are working relatively well, but attention will be needed to the issue of road capacities to handle different sized freight efficient transport vehicles, especially for live cattle.

New agricultural areas support

There is a need to plan for the development of ports and access to ports for some of the new agricultural production areas.

Container shipping

This is broken into two parts, 'General support' and 'Containerised transport and distribution'.

General support*:*

- **Markets -** Achieving an improved flow of market intelligence into the area and ensuring that the special needs of Northern Queensland's range of products is taken into account in the negotiation of Trade Agreements and protocols.
- **Commercial -** Encouraging the development of and working with specialist export merchants and agents.
- **Quality -** Assisting marketing through adopting systems of 'traceable food security' and encouraging and, if necessary, supporting the development of disinfestation facilities and Modified Air Processing capability.
- **Production -** Accelerated research to improve crop yields and mechanisation fisheries and aquaculture, especially in those crops and products likely to be in demand in overseas markets. Helping ensure that input costs, especially electricity, are kept under control.

Containerised transport and distribution:

- **Shipping Services -** Working with the shipping companies to develop both exports and imports and more direct services to a wider range of overseas ports.
- **Port Development -** Encouraging investment by port authorities / operators in appropriate port facilities;
- **Land Transport -** Recognition of the critical need to increase road and rail service connectivity between Northern Queensland regions to facilitate concentration of cargoes for export and to facilitate distribution of imports;

SUPPORTING REGIONAL AVIATION AND AIR FREIGHT FOR EXPORTS

(22) An important role of aviation in the economy

Distances within Northern Queensland and relatively poor land transport developments along with distances from major centres in Australia and overseas has meant that air transport has been historically disproportionately important to Northern Queensland. A strong participation in domestic and international tourism has added to that importance.

There are over 54 certified or registered aerodromes in Northern Queensland, about 30 with regular passenger services recording over 9.7 million passenger movements.

(23) Important that governments continue support for remote airports and services

Federal and State Governments have been important in supporting regional aerodrome development and regional air services and there is a need for that support to continue.

(24) Need to reduce costs of regional operations

Costs of operation of regional services are being unduly increased by regulation issues, high costs of fuel in remote airports, airport fees, poor facilities development limiting aircraft sizes, government overuse of charter flights versus use of regular services, limitations of size of market, and unnecessary restrictions on airfares. The use of daily in/out flights to remote centres is seen as more efficient.

(25) Problems with FIFO need addressing

Widespread use of fly-in/fly-out workforce for mining has caused problems in regional community development that were highlighted by a Commonwealth Parliamentary Committee inquiry.

There is a need for the recommendations of the Parliamentary Committee of Inquiry into FIFO in relation to issues such as taxation and provision of government services to be addressed to help ensure that more workforce and services are provided by local communities.

(26) Major air freight opportunities

Domestic air freight is not a growth sector due to competition from road transport. International air services out of Cairns, especially to Hong Kong and Japan are carrying almost $200m of exports especially of seafood and occasionally fruit and vegetable products while some imports also arrive from Japan. This freight volume has a very important role in increasing the viability of tourism related services. Air freight capacity is set to expand massively, especially to China, with proposed new major tourism projects at Cairns and in the Whitsundays likely to accelerate development.

(27) Potential exports

Expanded outbound freight opportunities include exports of seafood, meat and dairy products, along with seasonal fruit and vegetables. The last mentioned require an investigation into the balance between the seasonality of tourism and supplies from different crops to achieve year round volumes.

28) Potential imports and distribution

Major potential import of high value products such as for medical uses is likely to be available for use within Northern Queensland. However shorter flying time distances from Asia plus the availability of substantial amounts of backloading space on domestic aircraft (50,000 tonnes), road and rail, mean that imports could be delivered into southern markets competitively.

A need to treat imported medical supplies would enhance the establishment of treatment facilities for outbound fruit and vegetables to meet protocol requirements.

(29) Return on investment

Action to support the development of airports will result in private enterprise investment of well over $2bn over a period of time. The main airports are estimated to currently generate in operations and airport dependent industries of the order of 47,000 jobs and add of the order of $3.9bn to Gross Regional Product.

Government support for remote aerodromes will help maintain the viability of communities (as identified in Section 2 on Roads), that account for of the order of $40bn in outside earnings for Northern Queensland, mainly from overseas.

A policy of increasing services especially to the mining industry from local communities as opposed to importing them from outside Northern Queensland, will help strengthen the regional service structure with benefits to the development of population and other industry sectors, such as agriculture and tourism.

International air freight exports from Northern Queensland currently generate almost $200m in earnings. A four-fold increase in exports would take this up to $800m and towards $1bn leading to an expansion of seafood, meat, dairy and fruit and vegetable production in Northern Queensland. Most importantly, the air cargo movements will help the viability of expanded air services that will result in increases in tourism income currently standing at about $6.5bn and in Gross Regional Product.

(30) Recommendations

As with the Agricultural Distribution System, the investment that needs to take place is primarily in actions to encourage and support private enterprise investment and business development.

The aviation strategy is composed of four coordinated sub strategies as follows:

Airport Investment Program

The major airports of Cairns, Townsville, Mackay, Mount Isa and Longreach have been privatised in recent years and for these airports, what is important is for government clearance of development plans and investments, and provision of adequate public access. There will be a particular need for investment in airport development to support the Galilee Basin development.

There will be a need for investment in international air freight handling capacity to key airports to take advantage of the new air freight opportunities the increase in tourism will bring.

Many of the remote airports receive assistance from the Commonwealth and Queensland Governments and it will be important to continue this.

Aviation services development strategy

This strategy is aimed at improving internal connectivity between the main cities and between the main cities and their servicing hinterlands.

Special deficiencies relate to links between Rockhampton and Mackay and their hinterlands and a review is needed of State support programs for air routes to attend to this deficiency.

To improve connectivity between the main cities and generally throughout Northern Queensland, it is proposed that the three factors of 1) growing demand from population and business activity, 2) potential tourism development, and 3) mining services, be coordinated in proposals put to aviation operators to increase services, use larger aircraft and keep costs down.

The Commonwealth and Queensland Governments that generate a substantial part of demand, will have a key role to play and will need to review their travel and service policies in relation to use of charters versus regular services and their provision of a range of health and social services.

Part of the 'Aviation Services Development Strategy' also needs to be aimed at reducing costs and improving efficiency for air service operators.

Regional mining services provision policies

The strategy envisages a combined move by governments to implement the recommendations of the Parliamentary Committee on FIFO services and a concerted regional program to expand the provision of regional services.

Air freight trade development strategy

The strategy parallels the Agricultural Distribution Hubs Strategy and envisages:

- **Market development -** Gaining improved market intelligence on potential export markets and potential import distribution possibilities, government attention to market access for tropical products in trade negotiations including import protocols and trade barriers, and support for the dairy, meat and fruit and vegetable industries to exploit market opportunities.

- **Investment in facilities -** Investment in airport warehousing and cargo transfer systems to domestic flights and other means of transport, and investment in disinfestation facilities

- **Supply -** Attention to reducing seasonality of supply of fruit and vegetable availability and coordination with high and low tourism flows, and support for expansion of aquaculture production to supplement export capacity of wild caught species.

- **Transport and distribution -** Attention to road and rail freight systems between the Northern regions, and development of inward and outward air freight to nearby Pacific Islands.

- **Commercial development -** Encourage the development of the export and import business/merchant sector to coordinate and exploit the opportunities.

OVERALL RECOMMENDATIONS

It is recommended that:

- Governments support special funding to upgrade Northern Queensland roads, including the development and implementation of a Queensland Western Roads Action Plan, to strategically plan, prioritise and upgrade the major arterial freight and tourism routes that connect rural industries to ports, support freight movements between the south and north and promote tourism in regional areas in order to improve productivity and efficiencies and reduce impacts of major weather events;

- A special Commonwealth, State and Regional Taskforce be established to set in train a strategy to improve direct shipping capacity (especially container shipping) and air freight capacity (in association with tourism related air services), to Asia and elsewhere. This should also include aspects of improving local distribution of agricultural products, general support for agricultural trade development and relevant port and airport investment.

- A regional aviation strategy be adopted that will involve taking up with the Commonwealth and Queensland Governments and regional interests, the need for attention to a range of issues to encourage investment in regional airport development, improvement of regional air services and adoption of a policy of local provision of services to mining.

1.0 BACKGROUND

1.1 THE NORTHERN QUEENSLAND STRATEGY – BUSINESS CASES

The four Regional Development Australia regions of Northern Queensland account for 76% of the population of Northern Australia. As such, these regions have been major contributors to Australia's economic growth in recent decades.

Previously underdeveloped mining, agricultural, marine and tourism resource endowments, along with strategic proximity to the rapidly industrializing countries of eastern, south eastern and southern Asia, means that there is a strong potential to continue making a dynamic contribution to Australia's economic growth.

Against a background of a renewed national interest in keeping the momentum of development of Northern Australia moving, the four Regional Development Australia committees have come together to produce three business cases as part of a Northern Queensland Strategy, to focus attention on actions that need to take place in three critical fields if the potential of Northern Queensland is to continue being realised.

The area has long suffered from underdeveloped internal transport systems, lack of connectivity with outside markets and poorly developed distribution systems that have retarded development.

All three business cases relate to transport and distribution. All three business cases aim to identify the investment needed, including in actions and policies that will support private enterprise investment. The three business cases are as follows.

- **Investing in Regional Roads** – The business case seeks to identify the return on investment for funding strategic regional roads across Northern Queensland (excluding Bruce Highway). The business case examines the major deficiencies in the regional road infrastructure, the costs associated with down time or closure of regional roads and the effect on the regional economy. It seeks to identify the overall principles enabling infrastructure needed to grow economic prosperity and community connectivity.

- **Developing Agricultural Distribution Hubs** – The business case examines the cost and benefits of establishing and improving agricultural distribution systems in Northern Queensland. It considers the impact of the key strategic enablers in the region such as transport systems, infrastructure and services, power security and affordability; water supply; and the effect of disaster events on the agricultural supply chain.

- **Supporting Regional Aviation and Air Freight for Exports** – As part of export enhancement and key infrastructure development in Northern Queensland, this business case examines the critical elements of a Northern Queensland aviation strategy, and provides a business case for priority airport expansion in the north. The business case focuses both on freight and passenger movements, including a focus on liveability through connectivity in the regions.

1.2 NORTHERN QUEENSLAND

1.2.1 Background

Queensland north of the Tropic of Capricorn covers a large area. As **Map 1.1** illustrates, it covers an area equivalent to the States of New South Wales, Victoria and Tasmania

Although populations are currently much lower than in south eastern Australia, realities of areas and distances leads to a series of state sized commercial regions (equivalent to those of the four Regional Development Australia committees).(see **Map 1.2**).

The Cairns/Far North Queensland region is as deep from north to south as the State of New South Wales. All three regions of the Far North and Torres Strait, Townsville and North West, Fitzroy and Central West cover areas equivalent or more than the State of Victoria. The smallest in area, the Mackay region, equals that of Tasmania.

However the area is tropical. Historically it represented strong challenges for a society derived from north western Europe. It was late being settled and initial progress was slow and hard won.

The area is rich in underlying natural resources. It accounts for over 30% of Australia's water runoff. Its biggest river basin, the Mitchell, has a water runoff just below that of the whole Murray Darling basin.

While evaporation rates are higher in the north, plant growth is much less restricted by low temperatures. Satellite modelling and CSIRO estimates of plant growth potential as measured by carbon absorption, termed NPP (Net Primary Productivity), indicate that the Northern Australia's plant growth potential per hectare exceeds that of southern Australian with most of that plant growth potential in Northern Queensland (see **Maps 1.3**).

The area has some of the richest mineral resources, biggest mines and largest export terminals in the world. Natural tourism resources, especially of the Great Barrier Reef, tropical rainforests, islands and beaches, and the iconic "Waltzing Matilda" Outback, are outstanding.

1.2.2 Underlying factors leading to growth

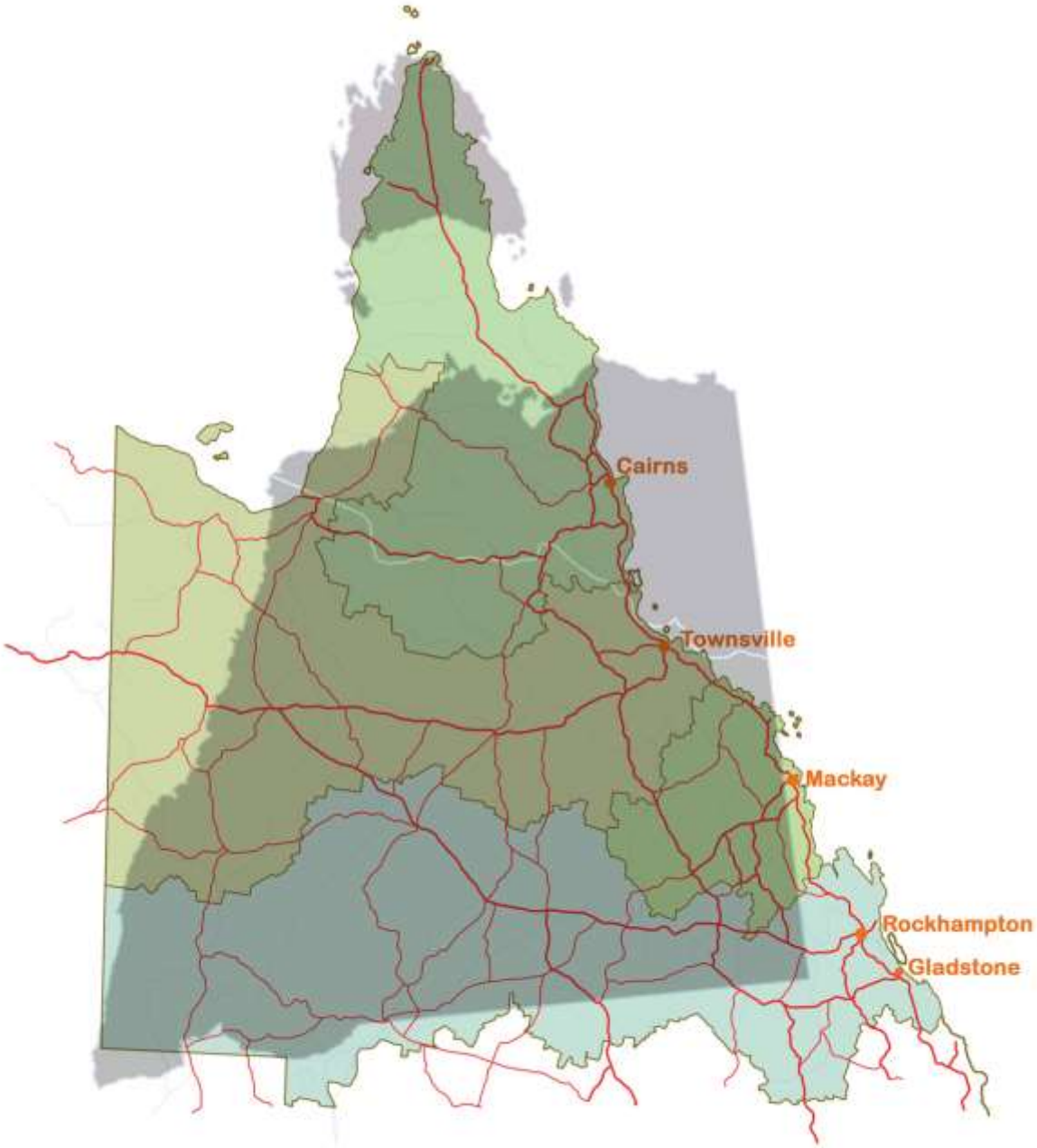
Four major underlying factors have been leading to the progressive realisation of this resource potential in the form of growth of outside earnings, from overseas and from regional exports to the rest of Australia.

Growing global economies, especially in nearby Asia, have been reaching out for previously marginal and more distant resources.

Transport developments have been breaking down barriers of remoteness from major markets in southern Australia and overseas, including the impacts of bulk carriers on mining and agricultural products, of road trains and better roads on primary industries, of wide bodied jets on tourism.

Technology suited to the tropics has been adapted and developed in a wide range of industries including mining, tourism and agriculture. In the case of agriculture. It has not just been in superior plants and animal breeds, but across a broad front including mechanisation of tropical crops to offset high wage costs, fast passenger catamarans, reef platforms and underwater viewers in tourism, improved weather warning systems, stronger building systems and introduction of air conditioners, superior detergents and insecticides, making the area a more comfortable place in which to live.

Map 1.1 – Area of Northern Queensland Compared with New South Wales, Victoria and Tasmania

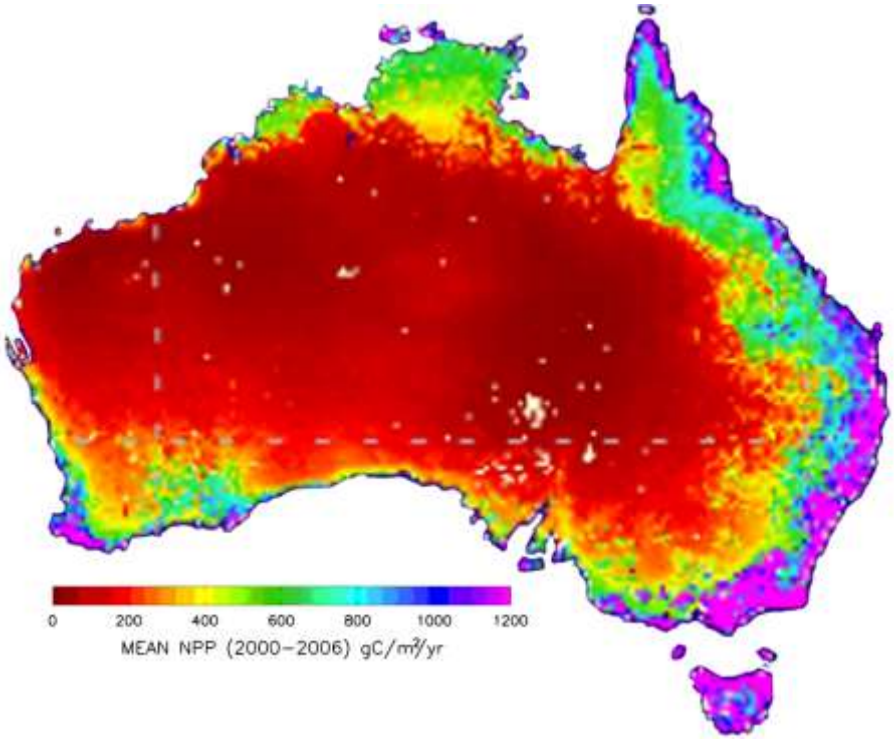


Map 1.2 – The Four RDA Regions of Northern Queensland

Note: Local Government boundaries as at mid-2013.

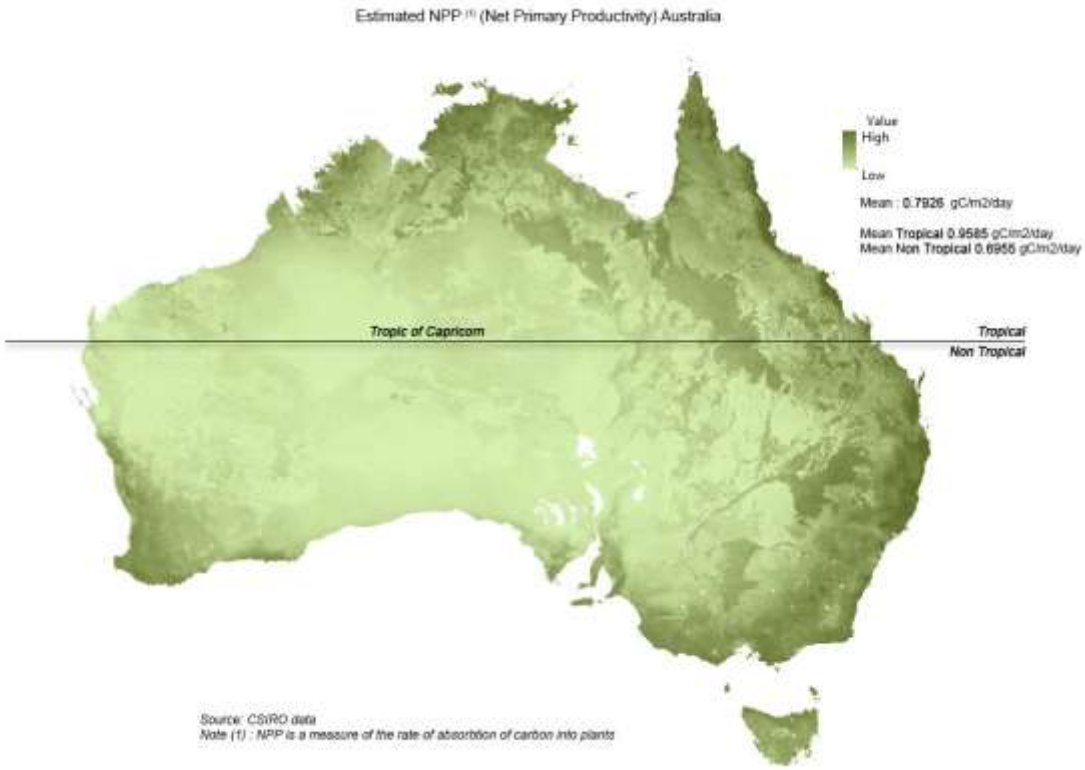
Since then, new Councils have come into existence of Douglas, Mareeba, and Livingstone Shire Councils de-amalgamated from Cairns, Tablelands and Rockhampton Regional Councils respectively.

Map 1.3a – NPP (Net Primary Productivity), Australia – Satellite Derived



Source: University of Montana from Modis Satellite Data, 2000-2006

Map 1.3b – NPP Australia Wide, CSIRO Data



Finally success breeds success factors have kicked in as infrastructure has developed and population increased, making a whole range of higher order services available and in the process, reducing real costs of living in the region.

1.2.3 An outstanding contribution to the Australian economy

Against this background, Northern Queensland has made a major contribution to Australia's economic development. With 1 in 25 of the Australian population, Northern Queensland accounts for:

- about 1 in 5 of Australia's merchandise export dollars, including substantial amounts of commodities like cotton, meat, seafood and fruit and vegetables, that are shipped via Brisbane;
- 1 in 5 of the value of Australia's mineral production and 9 in 10 of Queensland's value;
- 1 in 10 of Australia's gross value of agricultural production dollars, including 33% of Australia's beef cattle herd.

In addition, Northern Queensland makes a major contribution to Australia's and Queensland's seafood production.

Northern Queensland makes a major contribution to Australia's international holiday tourism with the area attracting international holiday visitors at levels next to Sydney and Melbourne, above Brisbane and the Gold Coast and ahead of the States of South Australia and Western Australia.

1.3 SUPPORTING A NEW ERA OF GROWTH

1.3.1 General

The underlying factors outlined in the previous Section 1.2.2 leading to broad based accelerated growth in Northern Queensland, are continuing.

On the growth trajectory of the past decade, it can be expected that almost 30% of all global growth will take place in the tropical zone over the next 20 years and about a third on the North's doorstep in Eastern, South Eastern and Southern Asia. By 2032, this area is set to account for almost 40% of the global economy.

Being near to this great global growth area, Northern Queensland, with its improved management skills, technology, and infrastructure, will be in a special position to help cater for Asia's accelerating demand for minerals, energy, primary products and tourism experiences.

Northern Queensland can be expected to play a major role in meeting:

- Tthe Commonwealth Government's objectives being manifested in the Northern Development White Paper process;
- The State Government's development priorities that emphasise the economy's basic foundations of mining, agriculture, tourism and construction to achieve expanding export incomes and a doubling of agricultural production.

Changing factors like demand patterns in major markets, commodity prices and exchange rates are leading to some changes in emphasis in the opportunities available.

As background to looking at the critical needs of improving transport infrastructure and distribution patterns, the following sections outline what those opportunities look like over the next five to ten years.

1.3.2 Primary Industries – A further major growth phase

1.3.2.1 General

There is a renewed interest in the expansion of primary industries in tropical Australia.

- World food prices have been high and markets in Asia are growing strongly.
- Continuing improvement in agricultural technology suited to the tropics has been taking place.
- The population and infrastructure of Northern Queensland has been expanding.

In fact, the Queensland Government's Agricultural Vision to double production by 2040 will only happen if more than a doubling takes place in Northern Queensland.

If Australia is to fulfil ABARE's prediction that Australia has the scope to increase its exports by 140% by 2050, the previously underdeveloped Northern Queensland regions have a major role to play. The recently released Queensland Agricultural Land Audit details the very substantial untapped potential.

As set out in Section 1.2 and illustrated by **Maps 1.3**, the underlying plant growth potential is there to achieve major expansion.

Over the past 30 years, major advances have been made.

- The sugar industry has become a world leader in efficiency in growing, milling and placing sugar in world markets and now competes internationally without special government assistance.
- Improved cattle breeds suited to the area and other efficiency improvements have led to major expansion of cattle herds and production. Tropical Australia now has more beef cattle per km2 than southern Australia.
- A whole new dimension of diversified cropping has developed in the Central Highlands in cotton, grains and citrus production and further north, in tropical and offseason fruit and vegetables.

A further major growth phase is developing involving:

- Continuing strong growth of the beef industry to meet increasing demand in Asia for protein and a potential opportunity to export dairy products;
- A new phase developing in the sugar industry as the industry's efficiency provide a base for value adding manufacturing of more than raw sugar;
- Cropping expanding westward and northward into new areas not previously cropped;
- The fruit and vegetable industries that now supply markets in southern Australia exploiting opportunities to supply expanding markets in Asia;
- Efficiency improvements in aquaculture and mariculture leading major expansion into domestic markets and an opportunity to join wild caught species in supplying overseas markets;
- Development of algae farming and tree crops to produce biofuels.

The following table gives current values of agricultural production in Northern Queensland.

Table #1.1: Gross Value of Agricultural Production, Northern Queensland, 2010/11

Crops	$ 1.86 bn
Livestock disposals	$ 2.44 bn
Livestock products	$ 0.11 bn
Total	**$ 4.41 bn**

Source: Australian Bureau of Statistics.

The above total of approximately $4.5bn is at farm gate prices only. Added to this is a substantial post-gate value of processing (sugar mills, meatworks), storage and transport. When these are added, total could be expected to be in the order of $7bn.

The following looks at the potential to increase this over the coming decades if favourable policies and conditions are in place.

1.3.2.2 Expanding markets for cattle and beef

Almost all reports on the developing demand for Australian agricultural commodities in Asia refer to growing markets for protein and for Australian live cattle and beef.

In the 1960s, J H Kelly estimated the carrying capacity of Northern Queensland at about 14 million head. The current level of 8.5 million is still well short of that figure.

After the severe blow delivered by the ban on live cattle exports, live cattle exports have been recovering rapidly with a major bounce back of numbers and shipments out of Northern Queensland ports up strongly. There are existing abattoirs in Rockhampton, Biloela, Mackay and Townsville.

A number of initiatives are being looked at to establish additional abattoirs west of Townsville and in the Tablelands area.

The cattle industry is heavily dependent on roads and rail. It is a major user of specialised cargo ships for live exports and containerised export shipping. Prime cuts of beef can also be exported by air.

1.3.2.3 A dairy industry opportunity

The dairy industry located in Northern Queensland has been experiencing some tough times in recent years.

However it is a highly efficient producer with some distinct product advantages for Asian markets. It has strategic distance advantages in potentially participating in the burgeoning demand for air transported fresh milk in China. (More details are given in Section 4.)

1.3.2.4 A new phase of development for the sugar industry

The Northern Queensland sugar industry is one of the most efficient in the world in the growing of sugar, producing raw sugar and shipping it to world markets in bulk. It is so efficient in powering its mills using bagasse waste from the process that it is producing increasing amounts of surplus 'cogenerated' electricity for sale into the grid.

The obvious next step for it is to go in the direction of further processing to produce a range of products other than raw sugar, as is happening elsewhere overseas. To be competitive with some of these products however, the industry will need to invest in a scale of plants that will exceed domestic market requirements and look to international markets to absorb much of its output.

The Northern Queensland industry has advantages of large compact growing areas with mills close to seaports. Most of the further processed output however would need to move to overseas markets in containers. This potential is covered in some detail in Section 3. A number of sugar companies in the different districts are moving in this direction.

1.3.2.5 Cropping spreading northward and westward into new areas

There is plenty of evidence that the cropping frontier for sorghum, cotton and some other crops is moving northwards as suitable varieties come available and experience with these crops develops.

Expanding world markets for sugar are also leading to confidence to expand into new areas and there is interest in new crops like guar (a crop long grown in India but with a modern use for 'fracking' for gas and oil extraction), and pongamia, a high yielding tree for biofuel (again long grown in India). Rice and cassava are now being grown commercially in the Burdekin area.

There are four different proposed developments in the Gulf rivers catchments of the Flinders and Gilbert and with interest growing in the upper Mitchell Basin. Potential crops include cotton and cattle silage. Strathmore Station, one of the largest in Australia, is proposing to grow large areas of sorghum and fodder, including bringing cattle down from the Peninsula. There is a major potential to further expand agriculture in the Dimbulah area in the Mitchell catchment.

Agriculture continues to expand in the Cooktown district with proposals to extend cropping to sugarcane. Down the track, some two million hectares of soils suitable for cropping have been identified in Cape York Peninsula.

In the coastal catchments, there is more potential to develop irrigated agriculture on the upper Burdekin. The existing Burdekin scheme could be expanded by raising the dam wall. Schemes based on the proposed Urannah and Connors dams in the Burdekin and Fitzroy catchment areas have been put forward and the Fitzroy agricultural area is being promoted.

1.3.2.6 Extending markets for fruit and vegetables into Asia

Potentially, growing markets in Asia for fruit and vegetables represent an opportunity.

The sealing of the last link in the Bruce Highway in the 1970s was followed by a large expansion of fruit and vegetable production of both tropical crops and offseason, now worth of the order of $600m per annum, for markets in southern Australia.

Northern Queensland now has highly experienced growers in crops like mangoes and lychees that have been tentatively pushing into Asian markets using air transport.

The potential for large increases is there, in terms of management, expertise, land and water. One of the major barriers is cost efficient transport capacity.

1.3.2.7 Aquaculture and mariculture expansion

Apart from wild caught fisheries, there is already a significant aquaculture and mariculture capacity in Northern Queensland that has developed a high level of efficiency.

Table #1.2: Total Production Aquaculture Industry, Northern Queensland

	tonnes	$m
2007-08	4,486	58.7
2009-10	5,783	70.3
2010-11	5,508	62.4

Source: Aquaculture Production Survey Queensland, 2010-11.

There have been new breakthroughs in the local production of some feed stocks which in the past, have needed to be imported at great cost. Recent CSIRO studies have identified that with removal of non-science based restrictions, the sector has a potential for a very large expansion based on local markets and given the sector's growing efficiencies and competitiveness, a potential to move into international markets. Apart from the east coast, topography and conditions are favourable in the Gulf and Peninsula areas. Appendix 6 gives a case study.

1.3.2.8 Biofuels

A research project is underway investigating the viability of growing algae using power plant carbon emissions to provide a source of biofuels.

Plantings of pongamia, a tree crop producing biofuels, have been commenced.

1.3.3 Mining – New growth potential

The rise in mining income has had a major impact on Northern Queensland regional economies but also on the areas outside Northern Queensland, especially Brisbane and South East Queensland as supply hubs and sources of fly-in workers.

The following tables show the very strong rise that has taken place in value of mineral production in recent years in the various regions, with its strongest effect being on the Mackay and Fitzroy regions. The table below compares with mineral production in Northern Queensland in 2003/04 indicating a three-fold expansion.

Table #1.3: Value of Mineral Production, Northern Queensland Regions (Growth 2003/04 to 2011-12)

	2003/04	20011/12	Growth
	$m	$m	%
Mackay	$2,984 m	$18,100 m	+507%
Fitzroy	$2,733 m	$11,036 m	+304%
North West	$4,125 m	$5,776 m	+40%
North	$945 m	$442 m	(-53%)
Far North	$370 m	$839 m	+158%
Total	**$12,136 m**	**$36,201 m**	**+198%**

Source: Queensland Mines & Energy.

A more detailed version of the table showing commodities is given in Appendix 1.

The major rise in production has been especially of coal from the Bowen Basin. Earliest development of these coal deposits commenced in the 1960s, immediately west of Gladstone in the Moura area, but over a period of time development has moved west and north. The next development will be to move further west to exploit the reserves of the Galilee Basin.

A major construction phase has been sparked off to build three LNG plants at Gladstone drawing on coal seam gas from the Surat Basin. Although the construction phase is nearing completion, it can be expected the plants will add major additions to Australia's export earnings.

The following **Charts #1.4** show some long term mineral price movements. The recent downturn in coal prices has seen the development of new mines in the Bowen Basin slow and a number of marginal mines close. Planning to open out the Galilee Basin and other mines has been proceeding, but timing of commencement of construction has been thrown into doubt by the coal price movements.

There are six prospective developments.

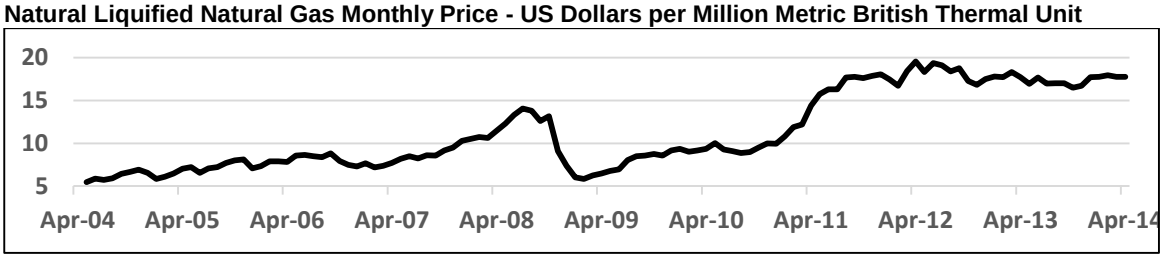
Table #1.5: Major Proposed Coal Projects in the Galilee Basin

Project	Company
South Galilee Project	▪ AMCI Bandanna
China First	▪ Waratah Coal (Clive Palmer)
Kevin's Corner Alpha West & Alpha	▪ GVK Hancock (Gina Reinhardt)
Carmichael	▪ Adani (India)
China Stone	▪ Macmines (China)

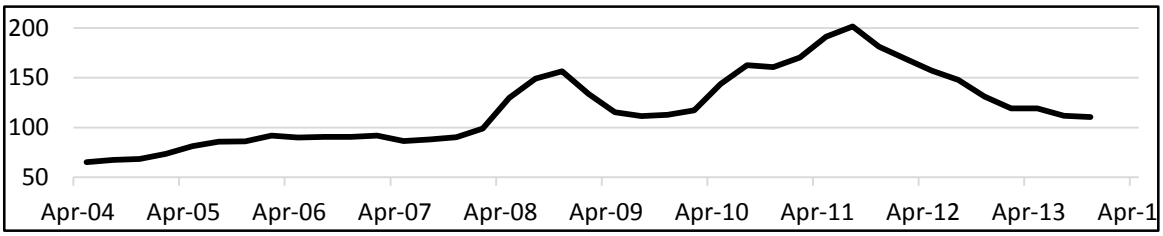
Cockatoo Coal (formerly Blackwood Coal) and Guildford coal are also actively progressing coal exploration in the far north Galilee Basin.

Charts #1.4: Movements in Mineral & Gas Prices

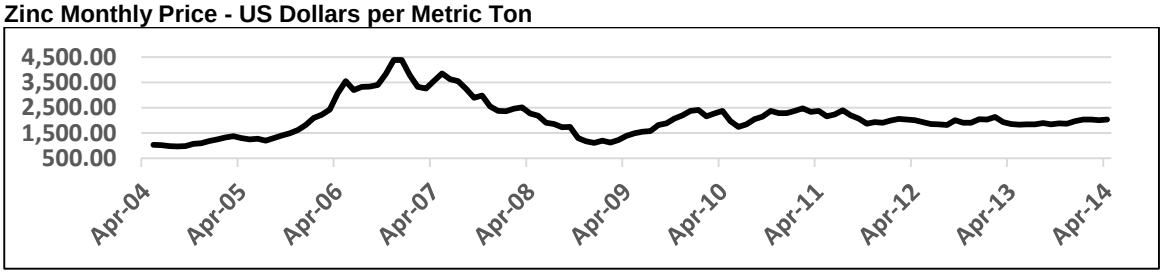
Natural Liquified Natural Gas Monthly Price - US Dollars per Million Metric British Thermal Unit



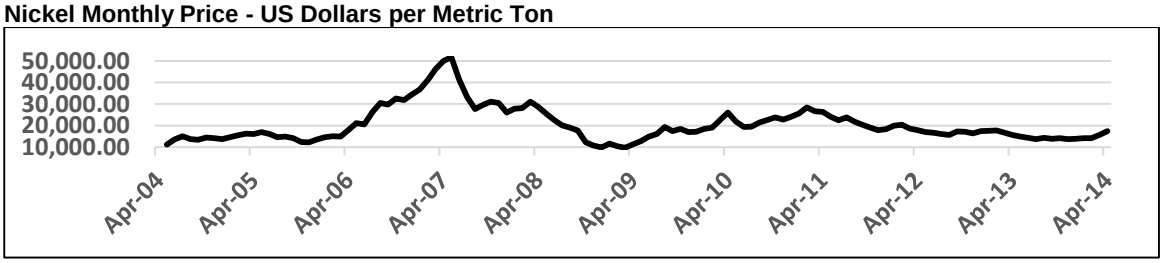
Coal, Australian Coking coal Monthly Price - US Dollars per Metric Ton



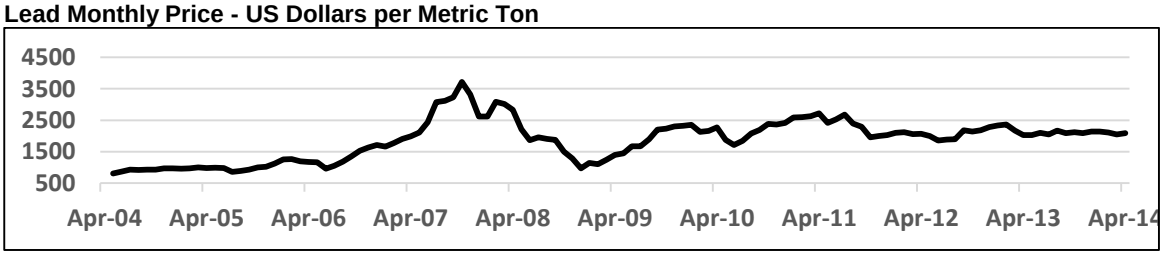
Zinc Monthly Price - US Dollars per Metric Ton



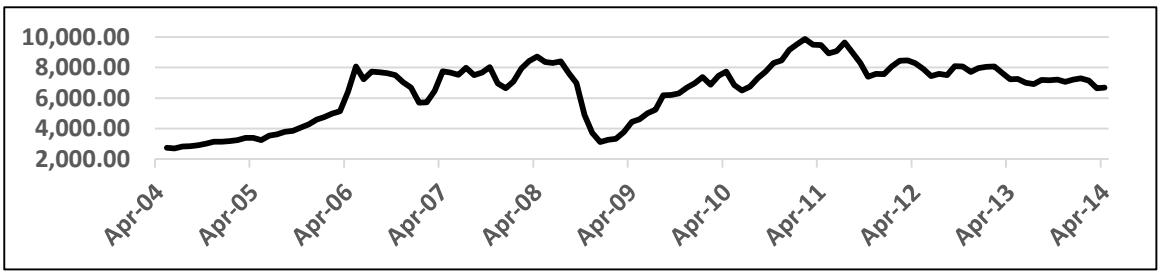
Nickel Monthly Price - US Dollars per Metric Ton



Lead Monthly Price - US Dollars per Metric Ton



Copper Futures End of Day Settlement Price



Source: Index Mundi.

Table #1.6: Galilee Coal Mining, Likely Scale of Development

Project	Company	Capacity mtpa	Estimated cost	Estimated employment	
				Construction No.	Operational No.
Alpha Coal	GVK	32	$8.2bn	4,000	1,800
Carmichael	Adani	60	$7.1bn	2,600	3,900
China First	Waratah	40	$8.8bn	3,000	2,300
Kevin Corner	GVK	30	$4.2bn	1,800	1,600
China Stone	McMines	45	$5.0bn	2,120	3,000
South Galilee	Bandanna	17	$4.1bn	2,000	1,280
Total		**224**	**$37.4bn**	**15,520**	**13,880**

Source: Bureau of Resources & Energy Economics-Resources & Energy Major Projects, Oct 2013.

The previous table gives likely scale of development of the major mines proposed. Total project value is of the order of $40bn creating more than 15,000 construction jobs and potentially 14,000 permanent jobs once operational.

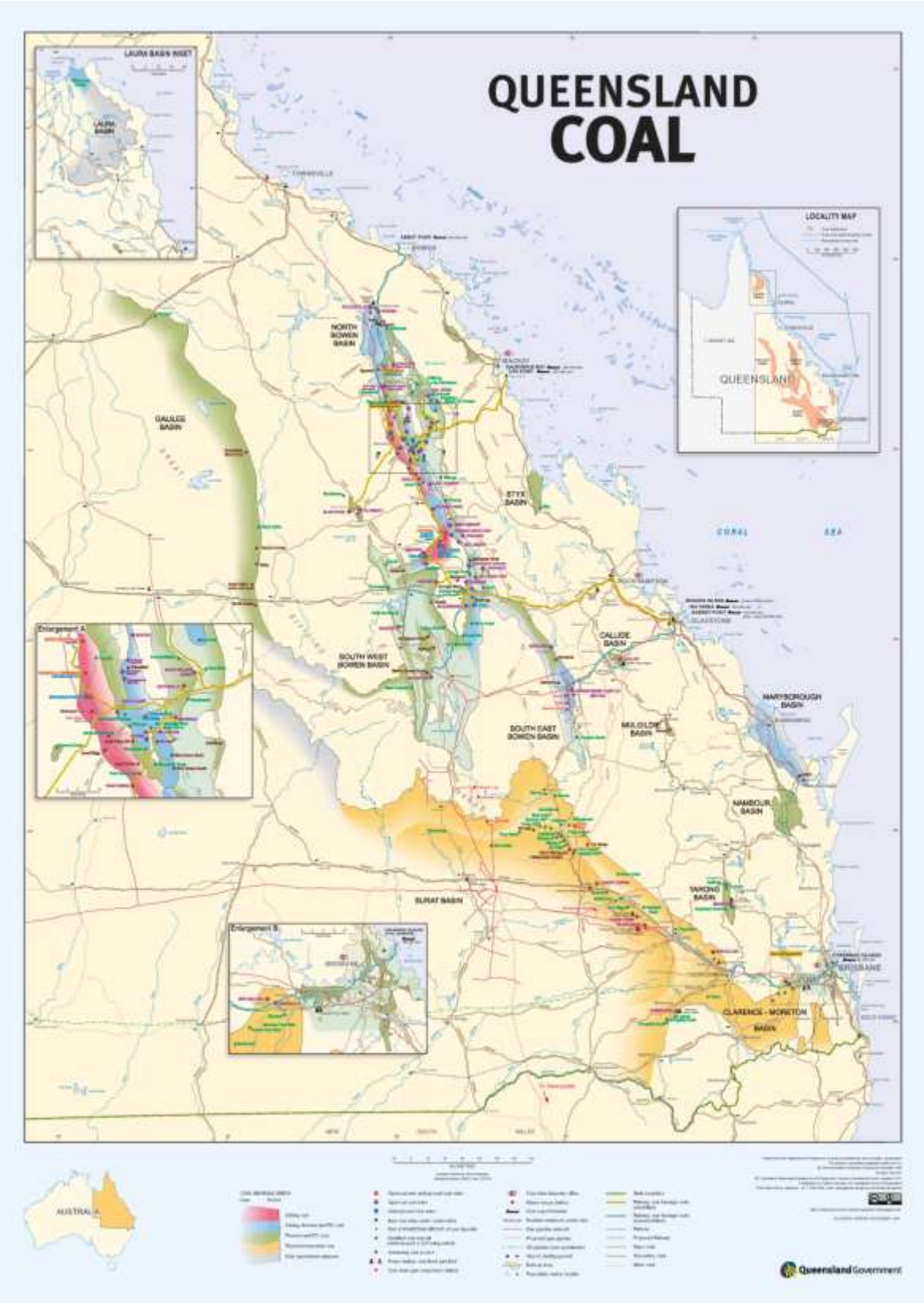
Map 1.4 gives the location of the Bowen and Galilee Basins' coal reserves. **Map 1.5** shows location of the proposed coal mines in the Galilee Basin with that of Adani (Indian interests) and GVK (Hancock) the most advanced.

It should be noted that the Galilee Basin stretches north to the Pentland area west of Townsville and there are proposals for a power station development based on coal deposits in that area. Gas and shale oil deposits extend into the North West and Gulf area and there are reports of possible commercial deposits in the Gulf area near the Queensland border.

The North West is already a major established minerals producer with the industry contributing $1.9 billion to GRP in 2011-12 (see location of mines, **Map 1.6**). However, the area retains excellent prospectivity across a range of existing and new commodities.

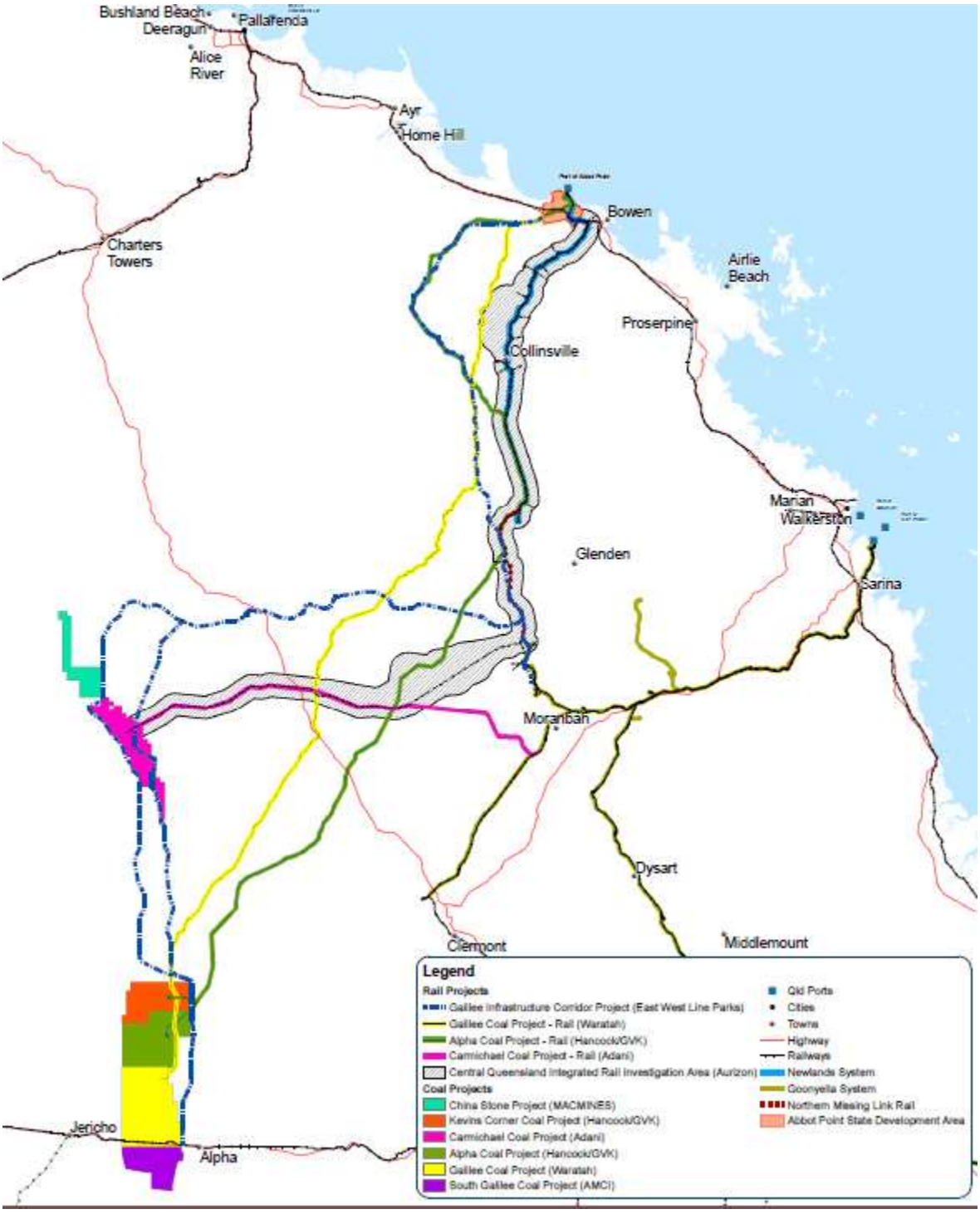
According to the North West Queensland Strategic Development Study, completed in May 2014, the North West region has potential to maintain its position as a major world producer of copper, gold and zinc while also becoming a moderate producer of iron ore and coal. There are also highly prospective uranium deposits. Major investors active in the region include Glencore Xstrata and BHP Cannington. While MMG's Century mine will close in 2015-16, their Dugald River mine is being developed.

Map 1.4 – Location of Galilee and Bowen Basin – Coal Exploration Permits



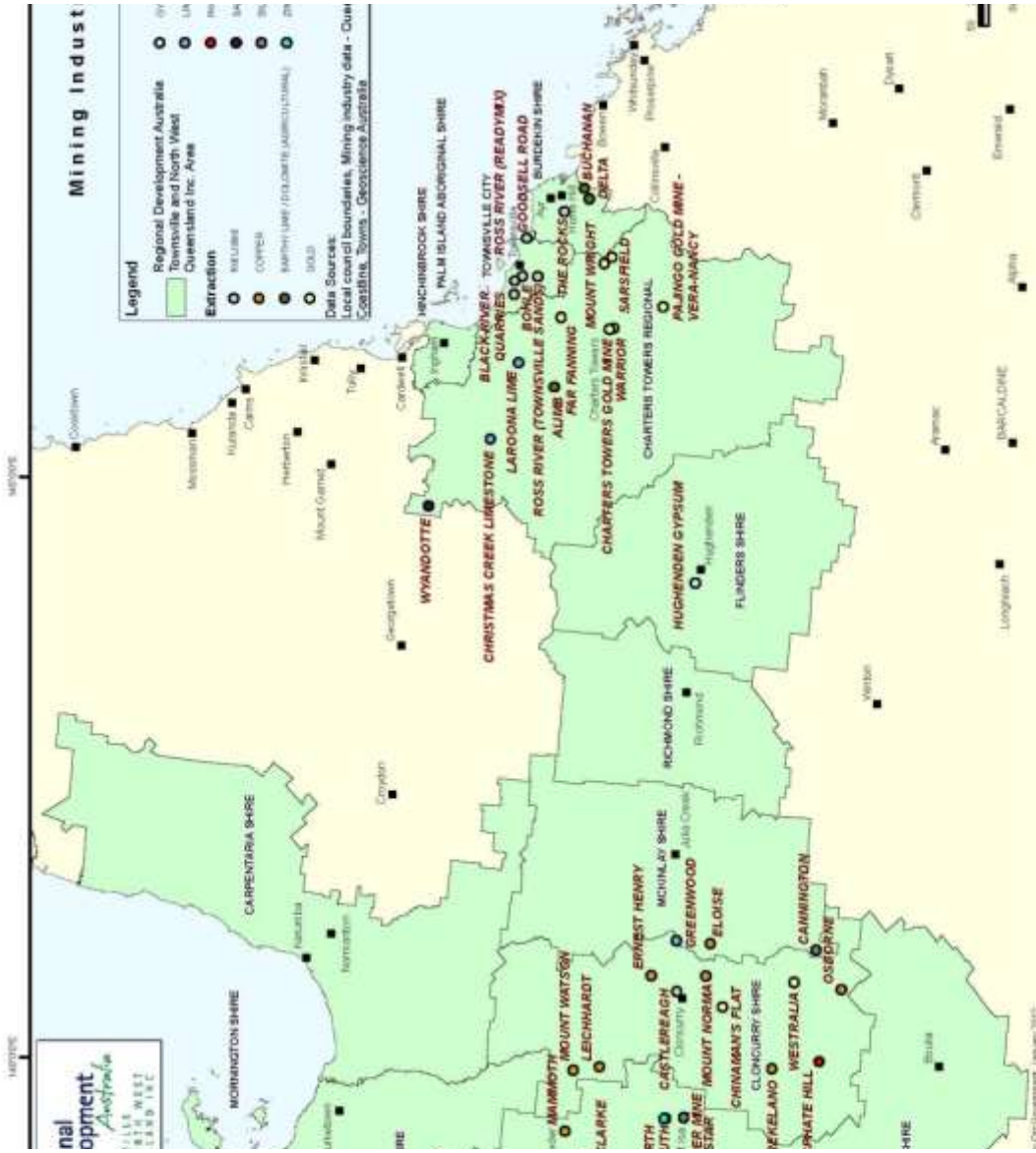
Source: Queensland Government.

Map 1.5 – Galilee Basin Proposed Mine Locations



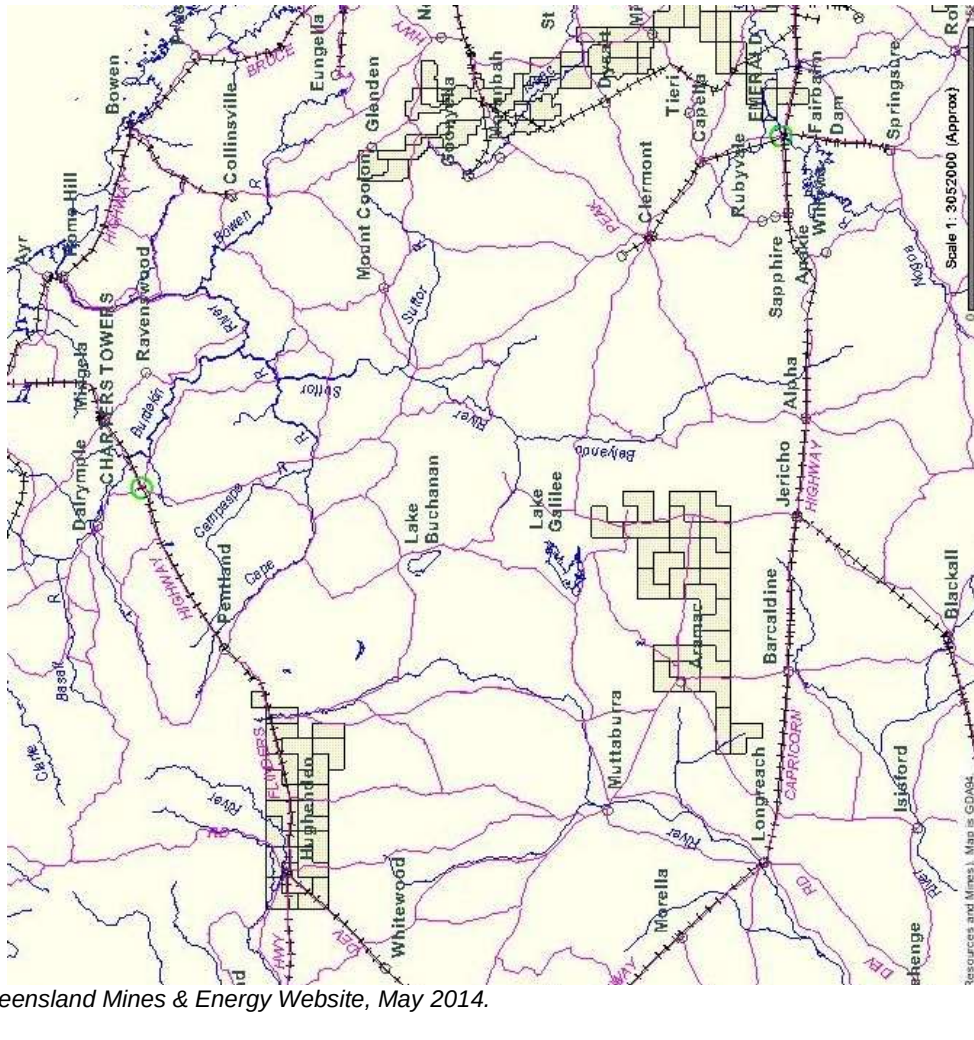
Source: Queensland Government. Press Release-Minister for State Development, Infrastructure & Planning.

Map 1.6 – Existing Mining and Extractive Industry Locations, Townsville Hinterland and North West Queensland



Source: RDA Townsville & North West.

Map 1.7 – Commercially Prospective Gas Areas in the Aramac Area



Source: Queensland Mines & Energy Website, May 2014.

In the Far North, the major prospective expansion is the continuing development of the bauxite deposits in Cape York involving Rio Tinto's $1.2bn South of Embley project that will see export capacity raised from current levels of less than 20 million tonnes pa to a prospective future 50 million tonnes pa, with value of production rising from current levels of about $600m pa to levels reaching up to $1.5bn, leading to a further expansion of Weipa township. Further south are the Aurukun deposits.

The North East mineral province behind Cairns and Townsville is seeing a continuation of small base metal and gold operations, a resurgence of tin mining, small magnetite developments, early development of world class diatomite and perlite deposits and potential development of small coal and coal gas deposits in the area.,

While the three LNG plants on Curtis Island, Gladstone, are nearing completion, it is believed that insufficient sources and pipelines are in place to supply the needs of the three LNG plants. Opening up of additional gas sources and pipelines will continue. There will be a demand to go further west into the Galilee Basin to tap into coal seam gas sources in that area.

Map 1.7 shows commercially prospective gas development areas around Aramac. In a wider context, **Maps 1.8** shows location of prospective gas deposits in Australia.

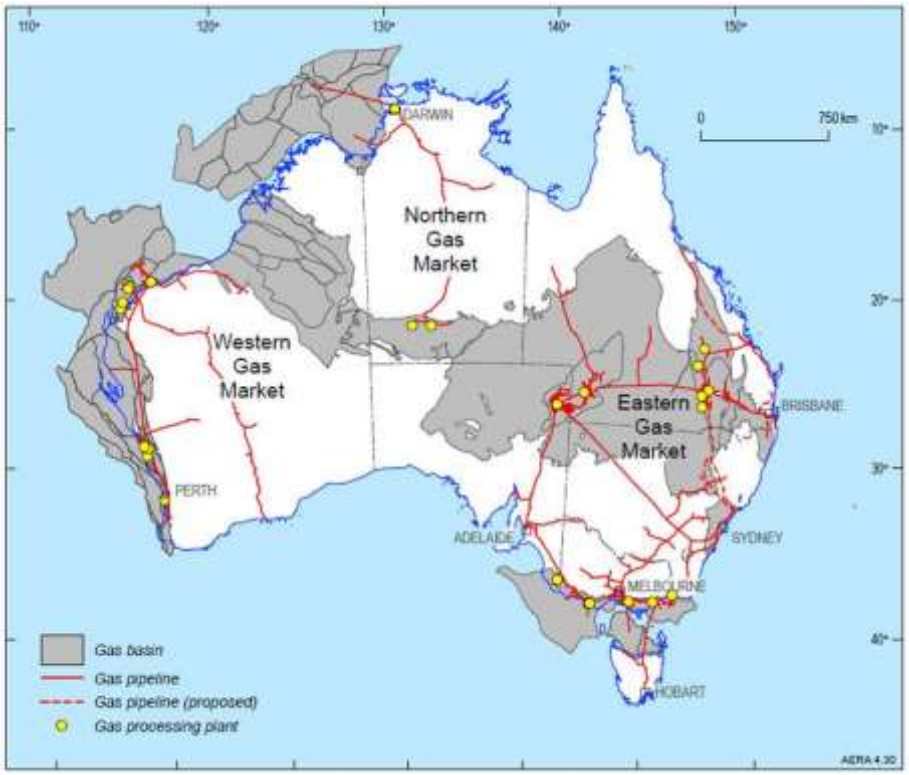
In summary the major prospective additional projects in Northern Queensland relating to hydro carbons are:

- A go ahead for the Galilee Basin mines sooner or later that will involve rail development to link to Moranbah and to Abbot Point;
- Expansion of supply for three LNG plants on Curtis Island (Gladstone) including tapping into sources in the Galilee Basin/Aramac area;
- Strong search activity in the west and north-west areas and possible further gas developments in those areas from conventional deposits.

Overall, while the frenetic pace of mining development has been slowing, there are still many opportunities for further development.

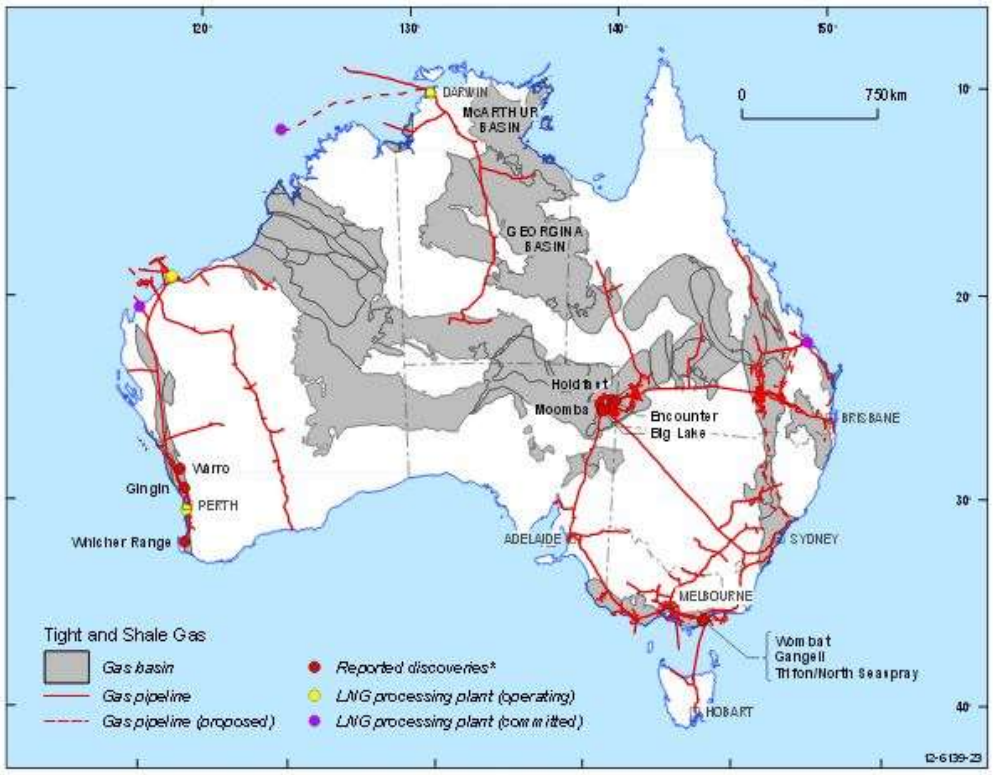
Maps 1.8 - Location of Prospective Gas Basins in Australia

Gas



Basins with Tight Gas & Gas Resource Potential

Shale Oil



Source: Geoscience Australia.

1.3.4 Tourism – A new wave

Northern Queensland plays a major role in Queensland's and Australia's tourism. The following Table #1.7 (over) gives domestic and international visitors by regions and expenditure.

Tourism earnings including day trips are estimated to be making about a $6.5bn contribution to the Northern Queensland economy.

The following table gives means of transport to and from the regions by air indicating its importance in some regions but highlighting that in most regions, travel by road is still dominant.

Table #1.8: Visitor Means of Transport to Region, Percent by Air

	Domestic	International
Cairns	61%	59%
Townsville	40%	24%
Whitsundays	41%	25%
Mackay	29%	32%
Rockhampton	18%	16%

Source: From Tourism Research Australia NVS & IVS.

Figures for total visitors to Northern Queensland are not readily available.

The following table compares international visitor numbers to Cairns / Tropical North Queensland region and Whitsundays with those to other regions of Australia.

Table #1.9: International Holiday Visitor Numbers to Main Australian Regions, Year Ended June 2013

Sydney	1,429,000
Melbourne	847,000
Tropical North Queensland	555,000
Gold Coast	531,000
Brisbane	490,000
Perth	285,000
Whitsundays	176,000 (1)
Adelaide	154,000

(1) *Note: Twelve months Dec 2013.*

Source: Tourism Research Australia NVS & IVS.

The table indicates that in international holiday visitors, Northern Queensland sits next to Sydney and Melbourne, above the Gold Coast and Brisbane individually. Numbers are well ahead of the States of Tasmania, South Australia and Western Australia.

For international visitors, there are strong linkages in visitation between the northern regions and other centres in northern Australia.

The picture that emerges is one of tourism being very important in the economy with expenditure generated contributing an inflow of the order of $6.5bn a year with a much higher degree of impact per dollar of expenditure on local employment and demand for goods and services than generated by mining, and on a par with agriculture.

Table #1.7: Visitor Statistics for Northern Queensland, Year Ending Dec 2013

Region	Domestic Day Trip Visitor '000	Domestic Overnight				International Overnight				Total Visitors	Visitor Total Expenditure
-	-	Holiday '000	VFR '000	Business '000	TOTAL '000	Holiday '000	VFR '000	Business '000	TOTAL '000	'000	$m
Mackay	1,006	154	186	280	620	43	26	11	80	1,706	[3] $500m
Outback [1]	0	124	0	129	253	12	0	0	12	265	[4] $247m
SGBR [2]	2,912	496	561	412	1,469	95	17	6	118	4,499	[2] $1,470m
Townsville	1,374	322	383	179	884	81	12	0	93	2,351	$967m
Tropical NQ	2,503	948	345	271	1,564	627	29	17	673	4,740,	$2,809m
Whitsundays	386	315	118	0	433	176	0	0	176	995	[5] $706m

[1] Note: Includes some areas in South West Queensland.
[2] Note: Includes Bundaberg and North Burnett Regional Council area. Expenditure is domestic only.
[3] Note: $500m is only for domestic overnight and day trips and does not include international expenditure.
[4] Note: $247m is only for domestic overnight visitors and does not include the other categories.
[5] Note: $706m only includes domestic and international but no day trip expenditure.

Source: http://teq.queensland.com/Research-and-Insights/Domestic-Research/Queensland-Research

Local Government Areas included in the above Regions are as follows:
Mackay: *Mackay and Isaac Regional Councils.*
Outback: *Mount Isa, Mount Isa Region, Northern Highlands, Barcaldine - Blackall, Charleville, Far Central West, Far South West, Longreach.*
Southern Great Barrier Reef: *Rockhampton Regional Council, Livingstone Shire Council, Gladstone Regional Council, Banana Shire Council, Central Highlands Regional Council, Bundaberg Regional Council, North Burnett Regional Council.*
Townsville: *Townsville, Charters Towers, Ayr, Ingham.*
Tropical NQ: *Far North Queensland region plus,Carpentaria, Mornington, Burke and Unincorporated Islands.*
Whitsundays: *Whitsundays Regional Council.*

Visitation by domestic visitors and by motor vehicle is spread throughout. Visitation by air and international holiday visitation is heavily concentrated in the Great Barrier Reef areas in the Far North, Whitsundays, Capricorn Coast and Townsville/Magnetic Island next. Drive tourism dominates over the other areas and is estimated to have a value of $1.3bn per annum.

Tourism in Northern Queensland grew strongly over the 1980s and 1990s with the development of aircraft and aviation, especially international visitation, but also domestic trade to the coastal resorts. A special segment started emerging in the 1990s of international backpackers who have since come to provide a transitory workforce in the tropical fruit and tourism industries. Road borne tourism generally showed a slower growth but with a very strong market segment emerging of older retired couples – the 'grey nomads'.

The growth in international traffic was characterised by a spread from initially North American visitors, to Western Europe and subsequently other European countries, to Japan and Korea and more recently to China and India.

The Asian financial crisis checked growth in the late 1990s but a fall in the Australian dollar saw growth come back in the first half of the 2000s. From about 2006, the high dollar with an attendant strong reduction in the Japanese market, had a major suppressing effect on international and domestic visitor numbers.

There are a number of major reasons why a further strong surge in growth is likely to take place:

- The large 'baby boomer' generation is moving into the 'grey nomad' age group;
- The potentially massive Chinese market is starting to produce a growing number of international visitors with early signs of increases from India;
- The Australian dollar has moderated and seems unlikely to go back to the extreme highs of recent years.

The following tables illustrate the growth in Chinese income levels and the growing numbers coming to Australia and Northern Queensland.

Tables #1.10: Growth in Chinese Income Levels
(a) Growth Chinese Economy 2002 to 2012

Years	GDP US dollars trillion	% GDP 'real' growth	GDP per capita (Int $ PPP)
2002	1.45	*9.1%*	2,891
2003	1.64	*10.0%*	3,227
2004	1.93	*10.1%*	3,625
2005	2.26	*11.3%*	4,115
2006	2.71	*12.7%*	4,759
2007	3.50	*14.3%*	5,562
2008	4.52	*9.6%*	6,201
2009	4.99	*9.2%*	6,798
2010	5.93	*10.4%*	7,571
2011	7.33	*9.3%*	8,411
2012	8.23	*7.8%*	9,185

Source: United Nations.

(b) China's Outbound Visitor Numbers [(1)]

	Number million		Growth %	
2006	35 m			
2007	41 m		*18.6%*	
2008	46 m		*11.9%*	
2009	48 m		*4.0%*	(GFC)
2010	57 m		*20.4%*	
2011	70 m		*22.4%*	
Total increase	**36 m**	**Av annual growth**	***15.3%***	**pa.**

[(1)] Note: Includes travel to Hong Kong, Macau & Taiwan.
Source: Travel China Guide.

(c) Growth in Chinese Visitor Numbers to Northern Queensland and Australia

	Northern Queensland [(1)]	Australia
2000	6,682	106,807
2001	14,936	145,134
2002	10,789	168,032
2003	11,970	161,116
2004	26,360	227,394
2005	33,325	268,442
2006	34,184	289,779
2007	55,276	329,813
2008	47,022	347,319
2009	38,503	343,821
2010	62,734	408,327
2011	73,757	490,427
2012	102,075	573,071
Average annual growth	**26% pa.**	**15% pa.**

[(1)] Note: As represented by visitors to the Cairns region as a gateway to Northern Queensland.
Source: Tourism Research Australia – International Visitor Survey.

Population of China is 10 times that of Japan. Under favourable exchange rates, the Japanese market rose to over 200,000 visitors to Northern Queensland per annum, indicating as incomes rise in China and under favourable exchange rates, eventual Chinese visitor numbers to Northern Queensland could potentially reach two million.

Proposals for new casino licenses and growing numbers are sparking off major proposals for investment in new hotel/integrated resort proposals, especially the Aquis Resort proposal at Cairns and two Whitsunday Coast proposals.

The projects will compete with the more than 30 casinos that have been established in Macau and major integrated resorts that are being established in South East Asia.

Box 1 gives details of the main projects proposed.

Box 1 – Significant Tourism Proposals

The $8.2bn Aquis Resort Project - The Great Barrier Reef Aquis Resort project proposed to be developed on the coast at Yorkey's Knob, just north of Cairns airport, will involve a projected $8bn investment over two phases in an integrated resort. Construction workforce is projected to peak at about 3,750 direct, and with 'flow-on' effects, generate substantial ongoing employment of approx. 10,000 jobs after phase 1.

In the Whitsunday area, there were two proposals of $5bn each - One at Airlie Beach, which leveraged off plans to upgrade Whitsunday Coast airport to international standard, and the other at Laguna Quays involving a new international airport on the coast. The proposals each involved projected expenditure of over $5bn and workforce implications can be expected to be equivalent.

$2 billion resort redevelopment on Great Keppel Island. - Construction of stage one of the project, which includes the 250-room international hotel at Fisherman's Beach, a 250-berth marina at Putney Beach, 150 marine precinct apartments, a ferry terminal, an airstrip and resort staff accommodation, is expected to begin late next year, 2015. Greg Norman, who has designed an 18-hole championship golf course for the resort development, will spruik the project to international investors in a bid to gather the crucial funds.

$1.4 billion integrated tourism and residential community at Ella Bay, near Innisfail - The project proposes the creation of three resort precincts (accommodating 2,000 tourists), four residential precincts (540 residences), a retail village, an 18-hole golf course and cassowary research and education centre on the site of a 450-hectare cattle property. Over a 15-year construction period, the workforce is expected to peak at 400 and once operational, employ more than 800 full-time staff as well as 240 part-tine peak-season jobs. The development is likely to generate $256million a year in expenditure by visitors staying in the region and $50 million in State government taxes and duties.

Integrated Sport and Entertainment Centre in Townsville - This proposed $300m centre will be the first venue of its scale and quality in Northern Australia. In economic terms, the construction of the ISEC facility is estimated to generate 570 new jobs and $81million in value added activity. The ongoing operation of the ISEC facility, combined with expenditure from visitors who would have otherwise not visited Townsville, is projected to generate an incremental annual contribution of 31 new jobs and $2.6 million in value added activity. The ISEC facility will also incorporate the nation's first National Centre for Indigenous Sporting Excellence, a concept that advances pathways raised in the Federal Parliament's Standing Committee on Aboriginal and Torres Strait Islander's recently released "Sport: More Than Just a Game" report.

Unlike many mining and energy resource projects, tourism projects typically create more ongoing jobs than what is required during construction phases.

The proposals will have a massive impact on construction, visitor numbers, employment and population, including (as is identified in Section 4), on international airline and air freight capacity. Improved roads will help disperse additional visitors to other regions.

1.3.5 Regional population, manufacturing and services

Table #1.10 gives residential population growth trends in Northern Queensland over the period since 2003-2013.

Table #1.10: Long Term Growth, Northern Queensland, Estimated Residential Population, 2003-2013

Northern Regions	2003	2013	Growth	
			No.	%
Rockhampton/Fitzroy SD & Central West SD	201,088	241,943	+40,855	+20%
Mackay/Mackay SD (1)	141,183	180,200	+39,017	+28%
Townsville/North SD & North West SD	223,759	269,234	+45,475	+20%
Cairns/Far North SD	226,165	272,677	+46,512	+21%
Total	**792,195**	**964,054**	**+171,859**	**+22%**

Note: SD means Statistical Division.
(1) Note: Mackay Statistical Division is equivalent of Mackay-Isaac-Whitsunday region.
Source: Australian Bureau of Statistics Cat 3218.0.

The figures confirm the long term growth of the area is outstripping that of most non-metropolitan regional areas of southern Australia and the overall national averages. Total population in Northern Queensland is fast approaching the one million mark and twice that of the State of Tasmania. Unlike most non-metropolitan regions of southern Australia, population outside of the main regional cities has been increasing.

While the impetus for growth has come from expansion of natural resource based agriculture, mining and tourism earnings, as is typical in a modern economy, most of the growth has taken place in the four main regional cities. The following table illustrates.

Table #1.11 Long Term Growth, Northern Queensland's Major Regional Cities, Estimated Residential Population, 2003-2013

	2003	2013	Growth	
			No.	%
Rockhampton (SA3)	98,779	118,043	19,264	+20%
Mackay (SA3)	93,642	121,909	28,267	+30%
Townsville (SA3)	147,999	189,287	41,288	+28%
Cairns (SA3) (1)	116,729	153,566	36,837	+32%

(1) Note: Cairns is composed of Cairns North and Cairns South SA3s.
Source: Australian Bureau of Statistics Cat 3218.0.

Looking forward, it can be expected that on a repeat of the growth rate of the past long term growth rates, total residential population will pass the one million mark in 2016 and by 2050 be around 1.7 million. Against this background, it can be expected there will be a growing opportunity for the development of a more sophisticated manufacturing and services sector and growing levels of import requirements and interconnectivity between and within the regions.

Previous low levels of population and service industries have meant that there has often been a lag in the level of services provided. The regional cities have been in a catch up situation compared with the levels the greater population and economic activity would justify. This has meant that services continue to be imported when they could be more efficiently supplied from within the regions.

The following sections suggest that the slow down in mining development could provide an opportunity for expensive imported services to be replaced by more efficiently delivered services from the regional capitals and district towns in the major mining regions.

1.3.6 Potential return on investment

Investment in improved transport and distribution systems in Northern Queensland will be against a background of them making a disproportionate contribution to State and National economic growth.

Table #1.12 gives estimated Gross Regional Product as estimated by the Queensland Government in 2010/11.

Table #1.12: Gross Regional Product, Northern Queensland, 2000/01-2010/11 (current prices)

	2000/01	2010/11	*% Growth*
Fitzroy/Central West	$8,463 m	$21,661 m	*+156%*
Mackay	$6,304 m	$22,807 m	*+262%*
North/North West	$9,228 m	$18,434 m	*+98%*
Far North	$6,696 m	$12,286 m	*+83%*
Total	**$30,691 m**	**$75,188 m**	***+144%*** *

**Note: Equivalent to 97% Real, excluding inflation, ie. 7% pa.*
Source: Queensland Treasury & Trade, Experimental Estimates of Gross Regional Product, March 2013.

Estimated total Gross Regional Product of the four regions at $75bn in 2010/11 is thus estimated to be about seven times that of Papua New Guinea, and three times that of Tasmania. With 21% of the population, Northern Queensland accounts for 28% of the State's Gross State Product. Growth 2000/01 to 2010/11 averaged 9.4% per annum (7% Real). Current 2013/14 Gross Regional Product is estimated at about $80bn.

Looking forward over the next ten years, real growth in Gross Regional Product in Northern Queensland seems likely to range between 4% pa and a repeat of the last 10 years at 7% pa. On this basis, it could be expected that by 2023/24, GRP would be in the range of $118bn to $157bn (current 2013/14 dollars). The cumulative amount of Gross Regional Product generated over the next ten years is estimated to be in the range of $1.0 trillion and $1.2 trillion (2013/14 dollars).

Revenue earned by governments over the ten years, estimated at a ratio of 26% of total GRP, can be expected to be of the order of $260bn to $310bn.

Northern Queensland contributes significantly to economic activity of both South East Queensland and south eastern Australia. A large part of Northern Queensland's $45bn per annum outside earnings, accruing outside Northern Queensland (particularly from mining in the Bowen Basin), in the form of supply of inputs, fly-in workforce, gross operating surpluses and provision of services.

2.0 BUSINESS CASE – INVESTING IN REGIONAL ROADS

2.1 GENERAL

While the development of South Eastern Australia was historically achieved through the development of a large network of railway lines and subsequently of rural roads, previously lower levels of development in Northern Queensland has meant that the area's land transport system is in major need of upgrading and development if the potential of the area is to be realised. While there is still justification for building new and for upgrading rail lines for mineral developments, the burden of land transport these days falls heavily on roads, with increasing use of larger freight efficient vehicles. Development of some of the new cropping areas will be completely dependent on road transport.

While the east coast rail system, proposed coastal shipping and funding available for major upgrading works on the Bruce Highway will improve connectivity between the major northern cities and with South East Queensland, there is an important need for allocation of funding for a major upgrading of regional roads other than the Bruce Highway to improve:

- Connectivity between regional areas and the major regional cities;
- Connectivity between Northern Queensland and areas of Australia other than Brisbane and South East Queensland.

The following presents the case for a major investment in regional roads in Northern Queensland over a 10-year time frame, over and above the normal run of expenditure that has been occurring in the area. A large amount will be needed if the potential contribution of the area to further national development and population growth is to be achieved.

2.2 CURRENT REGIONAL ROAD SYSTEM

The current system of major regional connector roads in the area reflects the large area covered and the four distinct regions involved, each with its own major regional city.

The regional road system (see **Map 2.1**) consists of a series of major east west connectors between the main regional cities and the regions they service.

Rockhampton – Capricorn Highway to Barcaldine with on-linkage via Landsborough and Kennedy Developmental Road to Longreach, Winton and Boulia.

Mackay – Peak Downs Highway to Clermont.

Townsville – Flinders Highway to Mount Isa and thence via the Barkly Highway to the Northern Territory.

Cairns – Kennedy Highway through the Tablelands but with three branching spines:

- The Peninsula Developmental Road to the north;
- The Burke Developmental Road section to the Lower Mitchell and Kowanyama;
- The Gulf Developmental Road to Normanton and thence via unsealed road across to Borroloola in the Northern Territory.

This east/west system is added to by lower order connections:

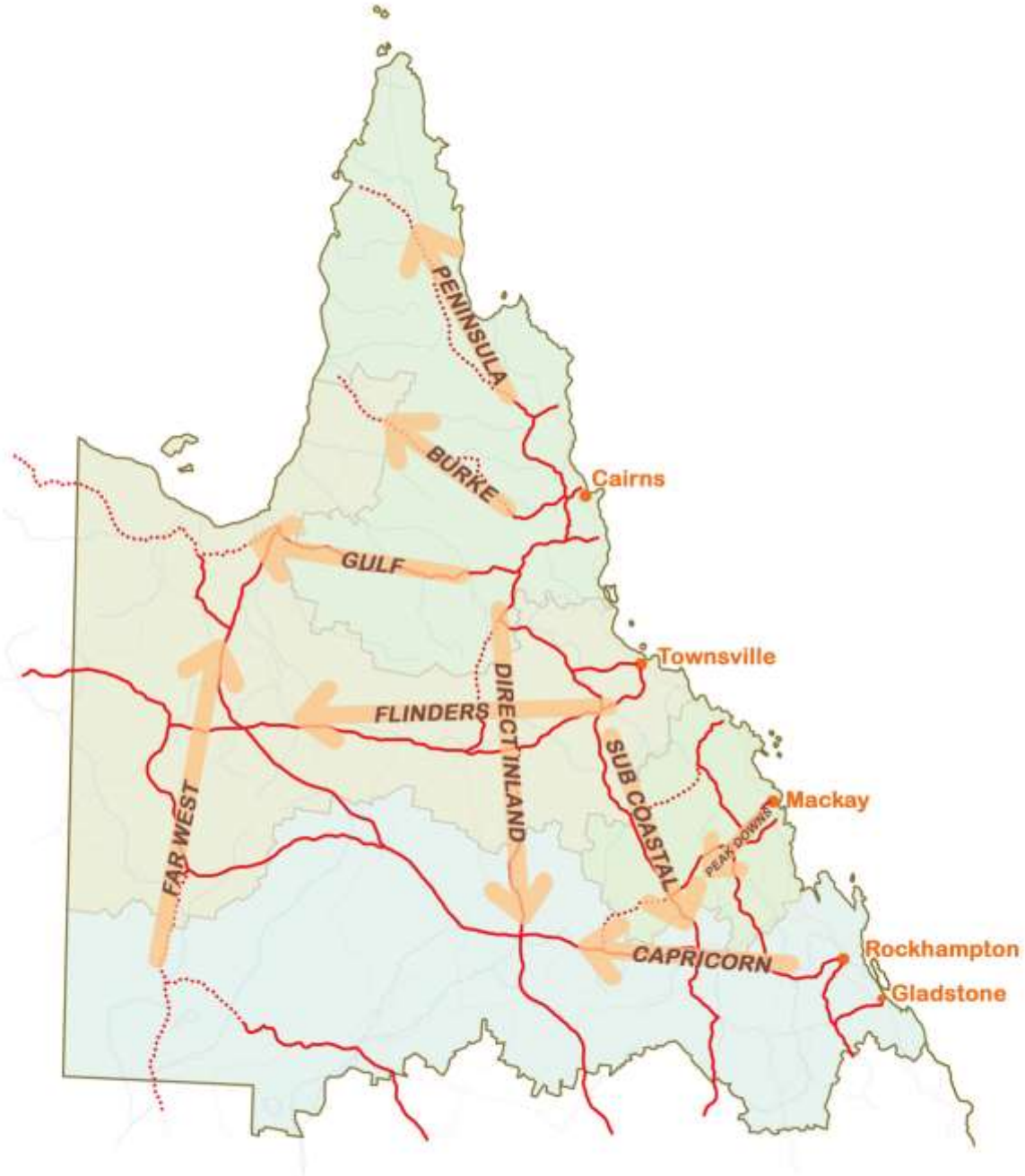
- The Bowen Developmental Road linking into the Bowen Basin coal fields from Bowen;
- The Harvey's Range Road linking Townsville via the Gregory and Kennedy Developmental Roads with the Gulf Development Road;
- The Kennedy Developmental Road from Hughenden to Winton, linking Townsville to Boulia and the Far West;
- The Palmerston Highway linking from Innisfail up to the Kennedy Highway and thence to the Gulf Developmental Road along with the Gillies and Rex Range Roads from Gordonvale and Mossman.

There is a north-south system apart from the Bruce Highway.

- A sub coastal route - The Kennedy Developmental Road runs south from the Tablelands to the Lynd Junction where it splits with the Gregory Developmental Road forming a sub coastal route through Charters Towers, Clermont, Emerald and then the Dawson and Carnarvon Highways to south east Queensland. This provides an alternative route to Brisbane and Sydney.
- A direct inland route runs from the Lynd Junction via the unsealed Hann section of the Kennedy Developmental Road to Hughenden and then on sealed roads south (either via Winton, Longreach, Barcaldine or Torrens Creek, Aramac Barcaldine). It continues down the Landsborough Highway, then to Charleville, Bourke, Cobar and Griffith to Melbourne with a branch off to Adelaide.
- A far western underdeveloped route runs from Normanton in the Gulf south to Cloncurry, Mt Isa, Boulia and Birdsville including the Burke and Eyre Developmental Roads.

The Landsborough Highway with the Warrego Highway provides a route between Brisbane via Barcaldine, Longreach and Winton to Cloncurry to Mount Isa and thence to Darwin.

Map 2.1 – Regional Road System (excluding the Bruce Highway)



2.3 TRAFFIC VOLUMES

The following table gives estimates of comparative connector traffic on regional main roads compared with the Bruce Highway. The estimates are based on road traffic counts away from town centres multiplied by the kilometre between town centres, ie. the connector traffic. (Further notes are given in Technical Note Appendix 5.) While not a precise measure, it gives an indication that the length of regional main roads is about ten times that of the Bruce Highway but that regional road connector vehicle kilometres are about the same as those along the Bruce Highway and probably higher if all regional roads are included.

Table #2.1: Estimated [(1)] Annual Through Traffic, (2012 / 2013)

Road	Road length (km)	Vehicles per km pa ('000)	Annual VKM (m)
Bruce Highway (Benaraby – Cairns)	**1,173**	**1,734**	**2,034**
Other roads [(2)]			
Captain Cook Highway	99	1,635	162
Mulligan Highway	262	290	76
Peninsula Developmental Road	567	42	24
Palmerston Highway	79	442	35
Kennedy Highway	244	900	220
Gulf Developmental Road	443	87	38
Burke Developmental Road	1,034	40	41
Barkly Highway	323	238	77
Wills Developmental Road	499	22	11
Diamantina Developmental Road	1,123	18	20
Eyre Developmental Road	177	12	2
Birdsville Developmental Road	273	16	5
Flinders Highway	784	270	211
Landsborough Highway (Augathella - Cloncurry section)	942	175	165
Thomson Developmental Road	310	26	8
Capricorn Highway	577	672	388
Kennedy Developmental Road	823	33	27
Torrens Creek - Barcaldine Road	337	31	10
Gregory Developmental Road	364	157	57
Gregory Highway (Clermont - Emerald section)	109	620	68
Bowen Developmental Road	258	172	44
Peak Downs Highway	266	1,104	293
Dawson Highway (Banana - Springsure section)	240	141	34
Dawson Developmental Road	245	20	5
Central Highlands N-S Highways and Developmental Roads	582	96	56
Total	**10,960**	**7,258**	**2,077**
Total Northern Queensland	***12,133***	***8,992***	***4,111***

[(1)] Note: See Technical Note Appendix 5, for explanation of basis of calculation.
[(2)] Note: Includes more important roads but not all roads in the National and State systems.
Source: Cummings Economics derived from vehicle count data from Queensland Department of Transport & Main Roads.

2.4 INTERNAL ROAD NEEDS TO SUPPORT ADDITIONAL DEVELOPMENT

As covered in Section 1, a number of new dimensions are developing in the economy of Northern Queensland including:

- The extension of coal mining into the Galilee Basin (see **Map 2.2**), oil and gas activity in the Central West and North West, the likely expansion of bauxite mining in Cape York Peninsula and continuing development of mining in the North West and Gulf areas and Bowen Basin;
- The development of expanded agricultural areas in the Fitzroy and Burdekin basins, the Gulf Rivers basins and in Cape York;
- A major new phase in tourism development based on tourism out of Asia, especially as China expands rapidly over the coming decade;
- Based on the foregoing, as shipping and air links to Asia, especially China, grow strongly with needs to access ports and airports and distribute imports;
- As the population of Northern Queensland passes the one million mark.

All of these developments have implications for the road system over and above a general need to bring the whole system up to better standards.

Map 2.2 – Location of Mines & Potential Road Access, Galilee Basin

2.5 IMPROVING EXTERNAL CONNECTIVITY

The current national roads program has an underlying principle of connecting capital cities. As a result, there are three national routes linking Perth, Adelaide and Brisbane with Darwin.

In the scheme, Northern Queensland is treated as the equivalent of a capital city, with the Bruce Highway linking Brisbane to Cairns and the Flinders / Barkly Highways linking Townsville via Mount Isa to Darwin.

Connectivity with the rest of Australia would be improved by stronger direct linkages with Melbourne, Adelaide, Central Australia and Perth.

While it is not suggested that the routes involved become full national highways, it is suggested that the special national connectivity of the following routes linking Northern Queensland more directly with the nation's other important regions should be considered for special Commonwealth funding, especially to improve current low standard links.

Northern Queensland Regions –Melbourne, Adelaide and Canberra link

The geography of Australia is such that Melbourne is almost due south of Cape York Peninsula. The inland route from the Tablelands area via Hughenden, Barcaldine, Charleville, Bourke, Cobar, provides a more direct route from Northern Queensland to Melbourne and Adelaide but also Canberra. Lack of mountains, rivers and urban development, means that it is a highly freight efficient and easily travelled route.

It is suggested that sealing of the last unsealed section between the Lynd and Hughenden would have important effects in improving connectivity for freight, tourism and primary industry movements. It is suggested that this is a section of special national importance and that the Commonwealth should prioritise completion of the last 100km unsealed link in the 2700km route to Melbourne. Sealing the last unsealed section between Torrens Creek and Aramac would also improve connectivity.

Northern Queensland Regions – Central Australia and Perth link

Present sealed links between Northern Queensland regions and Perth are circuitous via south eastern Australia or via the 'Top End' Kimberley area.

The Outback Highway Development Council, including the Shires of Winton and Boulia, along with interests in the Red Centre and Western Australia, have been seeking funding for the establishment of a nation building third transcontinental link across the centre of Australia.

Road building conditions across most of the unsealed sections are excellent, with flat terrain and few river crossings. The route involves major potential travel distance savings for freight movements between Queensland and Western Australia, with the nation's major mining areas at either end. It would help connect Northern Queensland's major tourism destinations with Alice Springs and the Red Centre and eventually through to Perth.

As with the direct north/south inland route, it is suggested that the objective be to achieve progressive upgrading with, where possible, local governments undertaking the work in Queensland and Western Australia, with tourism flows playing an important role in initial traffic development.

Savannah Way link
A third route providing external connectivity especially of tourism importance initially, is the Savannah Way linking the Tablelands across the lower Gulf to the Northern Territory 'Top End' and then through to Broome.

On the eastern side, the route is sealed to Normanton and on the western side, the route is sealed from Borroloola right through to Broome. There is a missing unsealed link from Normanton through across the border to Borroloola.

2.6 SUMMARY OF ROAD NEEDS IDENTIFIED

As commented on previously, a large part of the road system of Northern Queensland needs a general upgrading:

- To make it much less weather susceptible including regular and costly extreme event damage due to previous low levels of engineering;
- To reduce travel times, vehicle operating costs and improve safety.

Section 2.8.2 looks at this in further detail.

On top of this, upgrading the system is needed to underpin major new developments and to improve connectivity internally and with the rest of Australia.

Based on the foregoing, the following sets out a summary of additional road development needs over and above the need to maintain and progressively improve the system.

The Galilee Basin
Upgrade transport links to service the Galilee Basin from Rockhampton, Mackay and Townsville including:

- Creation of Emerald as an 'Inland Port' to divert heavy transports off road to rail from Brisbane to Emerald;
- Upgrade Capricorn Highway, Emerald to Alpha;
- Upgrade other roads leading into the Galilee Basin mines from the west, east and north.

There is a need to pay special attention to the movement of large mass / oversize vehicles, from the coastal ports, where such equipment is unloaded.

Sub Coastal Route to Brisbane and Sydney
Upgrade road to extend the triple road train route from Clermont to Emerald.

Upgrade the Dawson and Carnarvon route to the south to improve flood immunity, and to improve connectivity of Northern Queensland with southern Queensland and through to Sydney.

Inland Route
Upgrade the 'Inland Route' connecting the regions of Northern Queensland with Melbourne and Adelaide by completion of sealing of the Aramac Torrens Creek road and the Hann section of the Kennedy Developmental Road between Hughenden and the Lynd Junction.

Far West
Improve roads to cater for increased oil and gas activity and tourism movements.

Trans Continental Route
Upgrade the Donohue Highway section of the Outback Highway from Boulia to the Northern Territory border. The Outback Highway stretches from Winton in Queensland via Boulia and Alice Springs to Laverton in Western Australia and is a tourism and freight route.

Northern East-West Connectors and North West Development
Continue upgrading of the Flinders/Barkly Highway route to the North West Mineral Province and as the main connector of Northern Queensland with Darwin and the Kimberley region.

Upgrading of the Savannah Way tourism route from Normanton to the border and to provide access between prospective gas and mineral developments and the port of Karumba.

Upgrade the Burke Developmental Road from the Flinders Highway to the port of Karumba.

New Gulf Rivers Agricultural Areas
General upgrading of the roads in the area including widening of old narrow sections of the Gulf Developmental Road and extension of sealing of the Burke Developmental Road to Chillagoe.

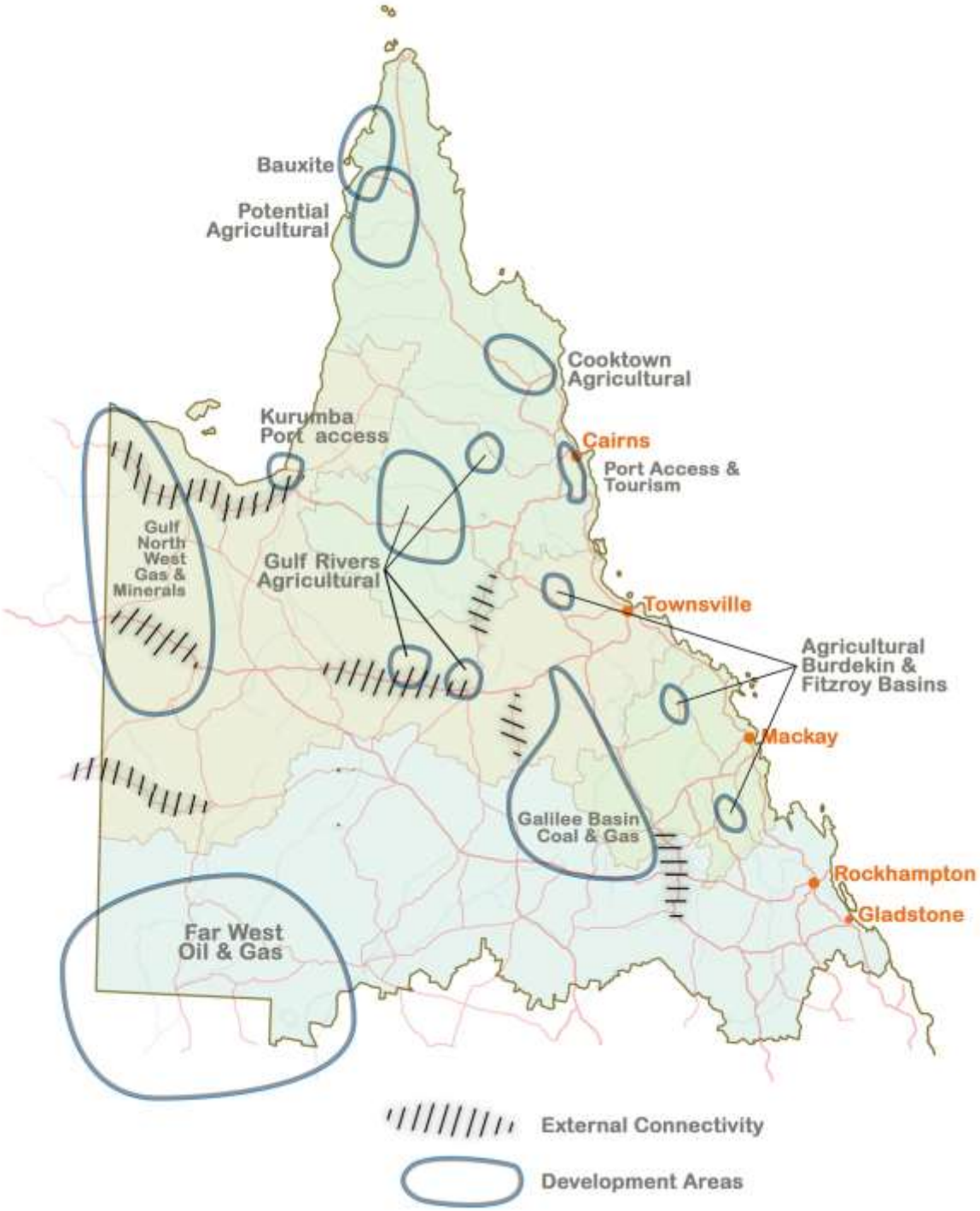
Port Connectors
Upgrading of the road links into the port of Mourilyan for export of minerals, timber and live cattle and upgrading of the Kuranda Range Road to take minimum freight efficient B-double size vehicles to facilitate:

- Movement from Cairns as a major port and freight hub;
- The inward movement of building materials and workers to support major new tourism developments.

Peninsula Development
Continuing the program of sealing of the Peninsula Developmental Road from Laura to Weipa with upgrading of links into communities in the area to support the continuing expansion of the bauxite mining operations, to open up agricultural potential, and to assist communities develop viable employment opportunities.

Map 2.3 illustrates the expected new developments that need to be catered for and road needs to improve connectivity.

Map 2.3 – Outline of Special Major Road Needs to Cater for Expected New Developments and Improved Connectivity



2.7 ROAD FUNDING

2.7.1 Queensland roads

Queensland Department of Transport and Main Roads gives proposed expenditure on roads in Queensland in its Queensland Transport and Roads Investment Program 2013-14 to 2016-17. Funding is shown under the headings 'Approved 2013/14' and 'Indications 2014/15 and 2015/17'. The following table analyses for the four Main Roads regions that cover areas roughly equivalent to the four RDA regions in total and excluding Bruce Highway and once off National Disaster Relief and Recovery Assistance funding.

Table #2.2: Summary Road Expenditure by Year, Northern Queensland

($'000.000)	Approved	Indicative		Total	Average per annum
	2013-14 $m	2014-15 $m	2015-17 $m	$m	$m
Bruce Highway & one off NDRRA [(1)]					
Bruce Highway	351	268	165	**784**	197
NDRRA	382	393	0	**775**	194
Total	**733**	**661**	**165**	**1,559**	**390**
Other road expenditure					
Central Queensland	460	112	202	**774**	193
Mackay	61	94	140	**295**	74
North	283	70	150	**503**	126
Far North Queensland	185	48	104	**338**	84
Total	**989**	**325**	**596**	**1,910**	**477**
Total Northern Queensland	**1,722**	**986**	**761**	**3,469**	**867**

(1) Note: National Disaster Recovery and Relief Assistance funding.

Source: Queensland Government, Queensland Transport & Roads Investment Program.

The table indicates a total amount of $1.9bn on the Northern Queensland regional roads, ie. an average of $477m per annum excluding 'one off' NDRRA funding.

Projecting this rate of expenditure over a 10-year period, gives a total for Northern Queensland regional roads of $4.8bn.

The Commonwealth Government has subsequently announced in agreement with the State, an $8.7bn funding for the Bruce Highway (Commonwealth share $6.7bn) over a 10-year period. However only part of this will be allocated to sections in Northern Queensland, estimated at about $5.6bn.

2.7.2 Funding compared with other areas of Australia

Tables, Appendix 2, compare road funding around Australia with the levels for Northern Queensland per 1,000 people and per 100 km^2.

Rates of expenditure per 1,000 population are usually lower for more densely populated regions. National average is $0.690m per 1,000 persons and Queensland average is $0.647m. Average for the four Northern Queensland regions is $0.804m. This is below the Northern Territory of $0.895m.

In relation to area, average of $0.073m per 100 km^2 is well below the national average of $0.204m, the State average of $0.171m.

2.8 RETURN ON INVESTMENT

2.8.1 General

Regional roads have a pervasive effect through the economy.

At one extreme, lack of road access can result in no development occurring except for rich mineral deposits (eg. Cape York). At the other extreme, continuing improvements of an existing road system can provide efficiencies and cost reductions to offset cost increases such as labour, to keep important industries competitive and viable in international markets (eg. grazing industry, Central West).

Measuring the benefits of investment in roads is usually done in two ways:

- Economic efficiency benefit cost analysis as a public investment;
- Economic impact in terms of developing or sustaining industries and economic activity.

The following looks at:

- Some of the deficiencies in the road system that cause heavy economic efficiency costs and inefficiencies that a general increase in funding can help reduce.
- The value of the industries and economy that the regional roads underpin.

2.8.2 Value of attending to underlying deficiencies in the current road system

Northern Queensland experiences an annual heavy wet season that can be accompanied by extreme rainfall events resulting in widespread flooding and road closures. Unless roads are well constructed, widespread damage can occur.

Extent of road closures, especially on unsealed roads, can depend on the strength and duration of the wet season, topography (especially larger rivers and creeks with poor crossings), and soil conditions (eg. Western Downs black soil). Those regional roads that have only a light seal on them need to be closed at times to heavy traffic to protect surfaces. Unsealed surfaces are more subject to closures to protect road surfaces. Elevating the road is often necessary to reduce road closure and damage effects.

As an example, Table Appendix 3, analyses detailed road closure information for a number of the Northern Queensland road regions.

Examination of road closure figures in Appendix 3 indicates that most of the regional roads identified have road closure problems worse than those identified for the Bruce Highway.

Analysis of the data indicates that while the main regional connector highways have only moderate road closure periods, in areas away from these main connectors, road closure periods can be prolonged and up to an average of 60-80 days a year in the far west. At the extreme, the whole of Cape York area suffers from annual road closures of 4 to 6 months.

Appendix 4 summarises other studies that draw out the type and level of impacts of flooding including: on the Bruce Highway, Rockhampton, Ingham as a rural service town and at the extreme, a community of 1,000 population in the Peninsula subject to 4 to 6 months of road closure a year.

Costs tend to come from three directions:

Cost of special disaster reconstruction after extreme rainfall events damage due to poorly developed roads;

- Costs of disruption to road users / transport operations including travel time hold-ups on freight, business and personal travel;
- Resulting business costs to industries including mining, grazing and tourism, but also to regional service towns and communities.

Cost of special disaster reconstruction alone is massive. In 2013/14 and 2014/15, some $775m was spent under the National Disaster Relief and Recovery Assistance (NDRRA),, ie. the equivalent of over one and a half years of normal spending recorded on Northern Queensland regional roads. Better constructed roads will help; reduce damage and need for this type of expenditure.

Cost of road travel / transport operation holdups and related adjustments can also be costly.

Table Appendix 3 seeks to quantify extent of road-closures on 'connector' traffic across the whole Northern Queensland road system. It analyses road closure data for the road system and the vehicle days involved. (Note: Traffic immediately surrounding cities and towns is excluded.) It indicates that the Northern Queensland regional road system records an average of over 600 road closure days somewhere in the system involving over 100,000 vehicle days of 'connector' traffic per annum (ie. excluding around cities and regional towns). This is about twice the level per annum of the Bruce Highway section in Northern Queensland.

In addition to travel time and related costs, road closures also result in very large direct costs to business for regional industries and service towns and communities.

For communities and graziers, costs of prolonged road closures can be heavy with:

- Graziers reporting losses from not being able to sell cattle year round;
- Additional investment needed in fuel and other storage including expensive refrigeration capacity;
- Occasional needs to fly in emergency supplies and move people by air at high cost.

For the mining sector, the costs can be very heavy if lack of access to urgently needed replacement of parts, equipment and inputs leads to temporary or partial disruptions and shutdowns. Only a few days or hours road closures on connecting roads into the Bowen Basin can have significant economic effects due to the sheer volume and value of supplies to mining operations and mining communities.

For instance, the Peak Downs Highway carries large amounts of fuel on a daily basis to mines in the Bowen Basin and hold ups can result in very costly disruptions.

Insufficient data is available to estimate these effects accurately. However as set out in Appendix 4, analysis of business losses from the 2011 Rockhampton floods led to an estimate of 14 days of closures resulting in a loss of $35m or 0.77% of Rockhampton city's estimated Gross Regional Product.

While it is not possible to translate these effects through to impact on the economy, the areas serviced by the regional roads contribute something of the order of $40bn in outside earnings. Estimated GRP for the area is of the order of $20bn per annum. The economy is thus turning over at a rate of about $110m per day in outside earnings, especially from mining, and Gross Regional Product at about $55m per day. The large number of over 600 road closure days occurs somewhere on the roads involved and is likely to result in very substantial losses.

But the effects of poor regional roads are not just a matter of road closures.

Rougher and more uneven surfaces, more bends and less well engineered roads, can affect vehicle operating expenses and travel times. Appendix 3 includes an analysis of the potential impact of these factors.

In summary, the preliminary analysis in Appendix 3 indicates that an upgrading of the whole system could have the following benefits:

- Reduction in damage to roads from extreme rainfall events and a need for reconstruction;
- Potential savings to road users from road closure disruptions to road users / transport operations in travel times and other consequent actions;
- Potential savings from costs to business and disruptions to output due to road closures affecting mining, the pastoral industry, tourism and communities;
- General upgrading leading to better roads and savings in vehicle operation and in shorter travel times.

2.8.3 Economic activity dependent on improving the regional road system

Economic impact for major transport infrastructure is often measured in two ways:

1) The value of direct 'operational' expenditure and employment by the sector;
2) The value of expenditure and employment generated by 'dependent' industry activities.

Analysis of workforce data indicates that direct road transport operations of vehicle manufacturing and repair, road construction vehicle and fuel retailing, transport and rental, totalled 6% (see Technical Note Appendix 5), of employment and contribution to Gross Regional Product of the order of $5bn per annum in Northern Queensland.

In terms of 'road dependent' activities, roads impact on almost all aspects of a regional economy.

While the Bruce Highway impacts on movements of goods and people between the main regional cities and other centres along the coast from the south, the regional roads are responsible for movement over the rest of the area. Previous **Map 2.1** illustrates.

The following table identifies populations by regions that are not along the Bruce Highway.

Table #2.3: Estimated Residential Population of Areas not Serviced by the Bruce Highway

	2001	2011	Growth	
	No.	No.	No.	%
Far North				
Tablelands, Douglas, Peninsula, Torres	74,118	84,203	10,085	*+14%*
Fitzroy				
Biloela, Central Highlands, Central West	54,449	59,945	5,496	*+10%*
Townsville				
Charters Towers, Dalrymple, North West	44,503	47,818	3,315	*+7%*
Mackay				
Bowen Basin North, Clermont	23,220	28,431	5,211	*+22%*
Total	**196,290**	**220,397**		

Source: Australian Bureau of Statistics.

The population involved represents about a quarter of the population of Northern Queensland. However as Map 1.2 indicates, Northern Queensland not connected by the Bruce Highway is spread over an area of 1,196,826 km^2, ie. equivalent in area to the combined totals of New South Wales, Victoria and Tasmania.

Table #2.4: Area of Northern Queensland Not Connected by Bruce Highway Compared

	Km2
Far North region	263,257
Northern / North West regions	375,257
Mackay region	79,798
Fitzroy / Central West region	481,514
Total	**1,199,826**
cf New South Wales	800,809
cf Victoria	227,496
cf Tasmania	68,018
cf Total	**1,096,323**

Source: Australian Bureau of Statistics.

It is not just population affected, but the viability of industries.

For instance, almost all the pastoral industries are heavily affected by road access. Much of the Gulf fisheries are affected. Much of the region's cropping is affected on the Tablelands and the Central Highlands. Although much mining output is transported out by rail (or in the case of Weipa and Cape Flattery, direct by ship), most supplies come in by road. Where in Cape York supplies come in by ship, the lack of roads heavily affects operating costs. A large part of the area's tourism income is heavily affected by roads.

The following table estimates the gross value of those industries, in the areas serviced by roads other than the Bruce Highway, earning outside income for Northern Queensland.

Table #2.5: Estimate of Outside Income Earned by Industries in Northern Queensland Located in Areas Not Serviced by the Bruce Highway

		$m
Mining (100%)		$36,000 m
Primary Industries		$2,740 m
Livestock disposals (90%)	$2,198 m	
Livestock products (100%)	$104 m	
Cereals (90%)	$137 m	
Other crops (esp Tablelands/Central Highlands)	$300 m	
Tourism		$1,200 m
Fisheries (Gulf/Peninsula) (est)		$60 m
Total		**$40,000 m**

Source: Cummings Economics from:

- *Mining – Queensland Department of Mines & Energy;*
- *Primary Industries – Australian Bureau of Statistics;*
- *Tourism – Tourism Research Australia NVS & IVS.*

At Northern Queensland's developmental stage, the economy is heavily based on those industries earning outside income that locate activities in the area. Much of the service industry structure simply follows. For instance, a substantial amount of activity in the major regional cities is directly dependent on these industries and the influence of roads and road transport upon them. These include meatworks, mineral processing, mining industry inputs, and some fishery inputs and handling. In tourism, a major part of the expenditure by visitors in the major regional cities will be from 'drive tourism' involved in using roads other than the Bruce Highway and visits from the regional areas to the coastal cities. Even those visitors who fly in will use roads other than the Bruce Highway to tour as 'fly drive' visitors or by coach tours.

Analysis of census workforce data indicates that of the order of 16% employment in the main regional cities can be identified as related to the non-Bruce Highway regional areas defined, ie. about 10% of the total employment in Northern Queensland.

While it is difficult to measure the proportion of the activity related to road transport, for some of the above sectors it is very high. For example, a substantial proportion of the costs of remote cattle stations reaching up over 10% are accounted for by inward transport of stores, outward movement of stock and costs of personnel moving to and from regional towns. The world competitiveness of some of these activities is largely dependent on road transport efficiency and transport costs.

In summary, the indications are that:

- Of the order of 80% of the output of Northern Queensland's base industries, earning outside income, including mining, primary industries and tourism, is affected by the regional roads, an amount of $40bn per annum (mining $36bn), or of the order of $400-$500bn over a 10-year period based on current 2014 prices and earnings.

- Of the order of 35% of Northern Queensland's employment is affected by regional roads (25% in the regions and a further 10% in the cities), accounting for of the order of $30bn in Gross Regional Product per annum and potentially of the order of $300bn over a 10-year period at 2014 prices and current production levels.

- Potential major new investments affected by the efficiency of the regional roads involved includes Galilee Basin with a projected investment of $40bn, South of Embley's $1.2bn bauxite project, and new cropping areas in the Gulf and the Peninsula with one alone having proposing an investment of over $1bn.

- Consequent substantial increases in government revenue.

2.9 REGIONAL ROADS RECOMMENDATIONS

Based on the road needs identified, it is suggested that to bring the Northern Queensland regional road system up to a reasonable standard and to attend to additional developmental needs, a substantial additional amount is needed over and above the normal expenditure on maintenance and organic improvements.

In order to achieve strategic development of the road network to support major industries and businesses, including tourism and communities, the development of a Queensland Western Roads Action Plan is highly recommended. Such a plan would be developed on the basis of defining the network objectives, analysing the existing network including safety and productivity issues, reviewing the performance gaps, prioritising works according to need and impact and developing a plan of works for implementation. It would be developed in a partnership between all levels of government, the Regional Road and Transport Groups, industry and road user groups and regional development stakeholders.

3.0 BUSINESS CASE – DEVELOPING AGRICULTURAL DISTRIBUTION HUBS

3.1 GENERAL

As identified in Section 1, the regions of Northern Queensland have a large and growing value of agricultural production. The area, accounts for about a third of Australia's water run-off, and has a very large potential to expand production under both natural rainfall and irrigation regimes.

However current transport and distribution arrangements represent an impediment to expanding markets both locally and overseas. This business case seeks to identify the investments, actions and policies needed to remove some of these impediments.

3.2 HISTORICAL IMPORTANCE OF TRANSPORT & DISTRIBUTION SYSTEMS

The importance of transport advances to the development of agriculture in the area can be identified by looking back into the past.

Apart from the mechanisation of harvesting, the advent of bulk sugar ships and the installation of bulk sugar handling in ports in the 1960s was a major factor in the sugar industry reducing costs and breaking out of its formerly protected industry status by the late 1980s.

Apart from the introduction of superior cattle breeds, the advent of road trains, improved roads and live cattle carriers, has played a major role in the strong expansion of the cattle industry across northern Australia.

The final sealing of the Bruce Highway in Central Queensland and better road transport vehicles underpinned the development of the major $600m tropical and off-season fruit and vegetable industry in the north supplying major markets in the south.

Development of tourism air services in wide bodied jets to Japan and Hong Kong in the 1990s, opened up important air freight markets for marine products in Asia.

3.3 FACTORS AFFECTING AGRICULTURAL DISTRIBUTION SYSTEMS

3.3.1 General

The broad sense of a 'distribution hub' is understood to be a point of consolidation for distribution into other elements of the supply chain. In this sense there are already many agricultural distribution hubs in the agricultural supply chain in Northern Queensland at various levels of consolidation and distribution.

At the lower end of the chain are the individual farm units. These source external inputs, with the most significant usually being feedstock, fuel, fertilisers, off-farm water and power supplies. The output is then either:

- processed and/or packaged on farm;
- processed and/or packaged at another centre.

The process depends on the nature of the farm product, together with the scale and business model of the farm unit.

There are major and obvious differences between the supply chains for instance between sugar, other broad acre crops, such as grains, legumes and beans, field crops, pastoral and horticultural production.

In some cases Intermediate hubs are provided by transport companies which usually provide facilities at which various non-bulk and packaged product of different types are consolidated for transport direct to (usually wholesale) markets. These include cold rooms in the case of products requiring a cool chain to market.

Another point of consolidation for distribution to market are sea and air ports for especially international export, but including distribution to southern Australian destinations in the case of agricultural production from the area of study.

There are then the major wholesale market distribution points, such as the Brisbane and Sydney fruit and vegetable markets and separate fish markets.

The major retail chains also have their own distribution hubs, which link into these general distribution systems, as well as in some cases running somewhat independent supply chains, with direct contracts with major agricultural producers. Their major hubs are consolidation and distribution points for their retail store chains. As such they are only to a minor extent agricultural distribution hubs, as store lot consignments are assembled and distributed from these facilities, with fresh agricultural produce making up only a portion of each consignment.

A point of contention has long been the apparent inefficiency in sending product thousands of kilometres south for part of it to be returned for sale in the local market. In the case of fresh foods which have not been significantly processed along the chain, irrespective of the quality and efficiency of the handling systems and cool chain.

However it should be noted that even a local distribution system will not deliver 'farm fresh' or anything close to it if the handling systems are poor and cool chain is not continuous and efficient. This is often an issue in local distribution, as small volumes make it more difficult to support effective supply chains.

Box 2 - Case Examples

Carter & Spencer provided three case examples illustrating the challenges of local distribution.

1. They has occasion to seek transport of one pallet of limes and one pallet of lychees from the Atherton Tablelands to their Townsville store. They rang multiple transport companies and none could or would take the pallets in a cool chain. There was one shuttle service available, but did not offer a cool chain. The final solution was to send the pallets to Brisbane, then back to Townsville.
2. They have 30 shops in Northern Queensland. In the case of lychees for instance, they might order 30 cartons of lychees only for distribution across all shops. It is more cost effective for Carter and Spencer to consolidate loads in Brisbane and send them north, three times per week.
3. A lychee grower near Ingham with a consignment of lychees for Brisbane could not get direct transport to Brisbane. They had to get a local carrier to first take it to Townsville. However the cold stores in Townsville had only one temperature setting, unsuitable for lychees. Carter and Spencer stored the fruit overnight in their distribution centre cold store.

The relatively small volumes required make it difficult to consolidate into full loads for transport companies, especially if loads are only part cool chain dependent.

An issue for most agricultural producers is their cropping cycle and the perishable nature of their crop. Once the crop is harvested, producers generally need to sell the whole crop as quickly as possible or as is the case for sugar cane, have it processed within hours of harvest. Many horticultural and field crops have a particularly short window. As an example, mango, citrus and lychee producers have a window of opportunity of perhaps two to three weeks in which to earn their annual income. All the rest of the year's activity is in preparation for this short window.

Their focus is on getting product quickly to the most viable markets. The most viable markets being defined as those they have access to, the most likely to provide the highest net return and have the capacity to take all the production.

The highest net return is often through markets geographically distant from the point of production. This is due to the ability to use large volume transport vehicles, with full loads, complete cool chains, the location of large customer bases and the fact that local markets are the least likely to pay premium prices for local produce in season. Locals are more likely to buy produce from road side stalls, small shops supplied by 'hobby farms', have their own personal supply and / or buy boxes of 'seconds' at farm gate.

Another factor to consider is the distribution of regions across which the same or similar crops are grown, together with seasonality. Some crops are produced at different times in different parts of Australia. Many field crops may grow in southern States in summer, while the same might be produced in Northern Queensland during the winter months. Mangoes and other tropical horticulture crops can come from the Northern Territory, Cape York, North, Central, (Southern Queensland and Northern NSW to a lesser extent). The further north, the earlier the production tends to be.

Added to the domestic position, supermarket chains place a premium on shelf space. They would prefer to stock items that can be supplied twelve months per year. Accordingly, where access protocols allow, fruit and vegetables and other perishable commodities (e.g.: seafood) will be imported where possible, especially in the 'off-season' for Australian production. This is also an opportunity for Australian export, being in the southern hemisphere, production is counter seasonal to countries in the northern hemisphere.

3.3.2 Evolutionary changes in distribution systems

A long term trend has been the consolidation of farming enterprises into larger and larger operations. This has been either through family farming operations steadily expanding their land holdings or through corporations setting up large scale operations. In both cases the business model is focussed on sound business principles and efficiencies of scale.

The scale of operation and production justifies on farm infrastructure for consolidation and distribution of product direct to major domestic markets, or to points of export to major markets. There are also varying degrees of vertical integration, with these operations controlling broader areas of the demand chain. For instance some have their own transport fleet.

Due to their scale, they do not need to transport farm production to an intermediate transport consolidation point for transport to market.

At the other end of the scale, there are still viable smaller operations that are low cost, efficient operations, often using family labour and / or produce niche, differentiated or value added product.

These smaller operations, in the case of horticultural production are now also increasingly sending their field picked product to larger operations for packing and distribution to market. This is further consolidating horticultural distribution around bigger hubs.

In the tourism and food service industries, there has been an emerging awareness over the past ten years or so of the importance of food experiences that are memorable, good quality and different as a part of any holiday. This is tending to support increased local distribution systems for niche producers located in tourism regions. Again the small volumes are an issue in putting in place efficient supply chains.

3.3.3 Local distribution systems

In recent years there have been initiatives to improve the penetration of farm product into local markets. Regular 'Farmers Markets' have been in place informally for some time, but more recently more formal enterprises have been established.

Both Far North Queensland and the Whitsundays have also been running specific projects on building regional food profiles and local penetration. There are also various internet listings for farmers markets and organisations seeking to link producers and consumers.

The Whitsundays Food Circle Project Final Report draws some typical conclusions as to supply chains:

> *During this 18 month project it was identified that the Whitsunday horticulture industry consists of two sectors;*
>
> *1) large scale, commercial growers predominantly based in Bowen and Gumlu;*
>
> *2) small to medium scale growers, which include backyard hobby or lifestyle farmers with potential to develop their business. The supply chain for these two industry sectors is significantly different and in order to develop both in a sustainable manner, two strategies are required.*
>
> *The strategy for large-scale commercial growers with existing national supply chains is to make their operation more efficient through a collaborative approach to value-add packaging, preparing for new markets such as export and supplying into the value-add food production chain as well as crop diversification to extend the growing season and produce high-yield crops.*
>
> *The development strategy for small to medium producers is to focus on local markets by strengthening regional supply chains such as a farmers market and local wholesale distributors and to develop relations among growers to enable value-adding and resource sharing.*

To some extent, local wholesale supply chains have evolved through the operation of specialist firms like Simon George. These organisations focus on supply to the hospitality industry, but also supply to some extent to retailers. They have their own transport fleet and work with local producers in sourcing the relatively small supply volumes required.

The major retail chains have their own specific supply chains.

3.3.4 Wider distribution systems

Coming out of the background research and discussions for this report, was a need for more development of what could be referred to as “production and distribution hubs” clustered around specific industries. This is as opposed to distribution hubs that were consolidation points for different products in one complex. (This is apart from point of export hubs with appropriate cargo consolidation facilities.)

These industry production and distribution hubs may be large scale ‘corporatised’ farming units and / or industry processing centres.

Emanating from these hubs, there is a need for the most cost effective and complete demand/supply chains into target markets. This includes access to regular points of sea or airport export capacity into target markets, with efficient road transport links and continuous cool chain, including at destination.

Also identified as being important is that market access protocols are in place and the industry has market development and entry strategies.

Commercial aspects are also important including relationships, contracts, distribution systems and trusted agents in export market destinations.

3.3.5 Export – Market access constraints

Fresh fruit and vegetables are usually included in the list of commodities restricted in access to export markets by quarantine protocols. This is ostensibly to protect the importing countries from pests and diseases that could impact their own industries.

However it is widely understood that the protocols are often influenced by political considerations where countries are generally resistant to the particular imports and / or as retaliation for some trade issue between the countries involved in the trade. Putting in place an agreed protocol may take years for each commodity.

Therefore a potential export hub to be effective needs to match the types of products produced regionally, with transport access to specific destination countries with which there are agreed protocols in place for the specific products to be exported.

For instance, increases in freight capacity to and from Chinese ports will not facilitate its development as a fruit and vegetable export hub until and unless there are agreed protocols in place for the specific products.

There are air exports of mangoes direct into Japan, using approved Vapour Heat Treatment (VHT) protocol.

There are also currently air freight exports indirectly into China through Hong Kong. However, the volumes are small.

The types of treatment protocols available are also relevant to development of agricultural distribution hubs. Very broadly the types available are fumigation, irradiation, or temperature (cold or hot) and modified atmospheres. Various doses and protocols, species specific are required. The variations include:

Chemical treatments	Physical treatments
Fumigation (various chemicals)	Water Treatment
Fumigation + Refrigeration	High Temperature Forced Air
Cold Treatment + Fumigation	Vapour Heat
Controlled Atmosphere, High Temperature Treatments (CATTS)	Cold Treatment
	Irradiation
	Radio Frequency Heating
	Quick Freeze

A long standing issue is the wide-spread use of methyl bromide as a fumigant. It has been the most widely used agricultural fumigant in the world for the control of pests and plant diseases. It is used to control pests and diseases in food, agricultural and forestry commodities after harvest, before or during storage or transportation and/or at time of import to control quarantine or storage pests.

However in the 1990's it was identified as an ozone depleting substance, in addition to being a hazard to human health. Since then its use has been steadily phased out globally through the auspices of the United Nations Environmental Program. The vehicle has been the '*Montreal Protocol on Substances that Deplete the Ozone Layer'.*

Knowing Methyl bromide was to be phased out has spurred a search for alternative treatments and products, and has placed pressure on regulatory authorities to approve alternatives. A 2010 UN report outlined the current global situation and the alternative treatments under investigation or approved. (United Nations Environment Program 2010 Report of the Methyl Bromide Technical Options Committee – 2010 Assessment. ISBN: 978-9966-20-000-6).

Under the Protocol, there is an exemption for use in quarantine and pre-shipment (QPS) treatments. However there is still a trend away from the use of this chemical for all purposes. For instance the European Union has banned its use for QPS purposes as from 2010. Further where new access protocols are being negotiated, methyl bromide is now less likely to be an approved protocol.

For instance in recent years mangoes, lychees and papaya have gained access to New Zealand based on an irradiation protocol. It has also been an approved protocol for various commodity imports into the USA for a number of years. Despite initial anticipation of consumer resistance, this seems to have dissipated in the New Zealand market, with export figures displaying healthy increases. In the US there seems to be little remaining debate.

Where it is suitable for the commodity, irradiation has generally been gaining ground as an alternative protocol. ASEAN (Association of Southeast Asian Nations) has put in place a 'Model Protocol for The Use of Irradiation as a Quarantine Treatment for the Export and Import of Fresh Fruit and Vegetables for ASEAN'.

(Food Handling Publication Series No 2, ASEAN Cooperation in Food, Agriculture and Forestry).

The relevance of the above is:

1) There are a variety of treatments possible, which vary with species and approved protocols as to suitability.
2) It is unlikely that one distribution hub could offer all variations
3) Some are reasonably straightforward and are probably more appropriately dealt with on farm and / or in packing sheds
4) Some require specialist and expensive plant, usually beyond the capacity of individual producers. In these cases, there is likely to be a case for their location in or near the agricultural export distribution hub, especially if the catchment area for the product has a wide geographic spread. Irradiation plants are an example.

3.3.6 Disinfestation plants

The closest plant to Northern Queensland offering services including irradiation is located at Narangba, just north of Brisbane, owned and operated by Steritech Pty Ltd, which also has plants in New South Wales and Victoria. (www.steritech.com.au). The processes offered are gamma irradiation, ethylene oxide fumigation and heat treatment processes. It is understood plant capacity is largely taken up with sterilisation of medical goods, including single use instruments sourced from China.

There are three types of irradiation systems. Gamma rays, x-rays, or electron (e-beam) systems are available. Gamma Rays are cobalt systems and run continuously once the cobalt rods are activated. They are oriented to treatment of medical and inanimate equipment due to their ability to deliver high doses and so achieve sterilisation and penetration. It may be difficult for these plants to deliver the dosage rates required within tolerance ranges for some food products.

E-beam plants are only suitable for low penetration depth treatments, whereas x-rays can penetrate whole pallets of commodities. In both these cases their power usage is high, but may be better able to provide dosage rates suitable for foods.

In 2000 a proposal to establish an electronic (E-beam) plant in Northern Queensland was developed. The proponents attempted to attract local investment and commitment over a long period of sustained effort, but in the end the project did not proceed and it was decided to attempt to establish a plant near Brisbane. This also did not eventuate.

Two of the issues at the time were the limited air freight capacity and ability to guarantee minimum plant throughputs required for it to be viable. The targets were 33 tonnes per week in year one, building to 130 tonnes per week by year five, ie. 6,760 tonnes per annum. Capital investment required at the time was of the order of $5.5 million. In addition the proponent also factored in the need for significant funds to establish the protocols into target export markets where they were not already in place for irradiation.

Investment in a new disinfestation plant located in Northern Queensland is likely to be a key factor in facilitating development of agricultural export hubs in the region. Due to the changed circumstances in capacity and international trends in QPS, it is now more likely to be a viable project. However an issue is the seasonal nature of fruit and vegetable production. A disinfection plant requires a regular base load to be attractive to operators.

3.3.7 Sea transport of perishables

Attention is drawn to the impact of emerging technologies for the transport of perishable goods. For instance irradiation can prolong the shelf life of meats, while Modified Atmosphere Processing (MAP) can also achieve increased shelf life by delaying the ripening / maturing process in fresh foods.

In the case of MAP, it can be applied to packaged product or to whole shipping containers and generally also requires a cool chain. Reportedly, it is for instance now possible to transport fresh mango by sea from Queensland to the United Kingdom, using MAP sea containers.

MAP involves arriving at the correct treatment protocol and gas mix while is optimal for the food involved. It is not a case of a generic MAP process. Each fruit or other food type requires R&D to arrive at the specific gas mix most suitable.

The first point is that any export hub development involving sea freight should include an examination of the feasibility and desirability of MAP facilities on site as part of the hub services. Secondly, MAP may open up export options by sea for product that might otherwise be shipped by air. The sea transport option is likely to be more cost effective where there is no particular need for speed to market, apart from shelf life.

3.4 TARGET MARKETS

The viability of export hub development in Northern Queensland will be largely dependent on the level of access to target markets available through each hub. Merchants will always find the most cost effective way to get product to market.

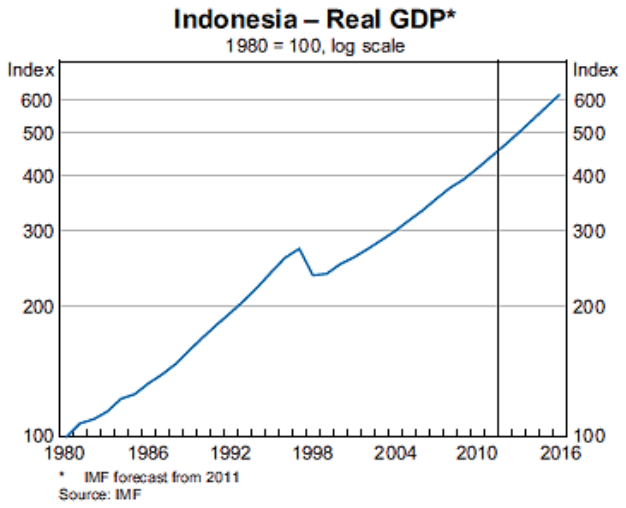
Global attention is on the evolution of the Chinese economy and there is increased inwards Chinese investment taking place from that country.

However this should not be the entire focus for the region. One of the issues for Northern Queensland is the size of Chinese markets and the lack of mature relationships and systems across the demand chain. These 'soft infrastructure' issues are just as much a part of agricultural distribution systems as are the hard infrastructure items.

In turning towards China, agricultural production should not ignore other trading partner opportunities. Some of these are long term and mature and include especially Indonesia, Malaysia and Guam as a relatively unexplored opportunity area. These may include more accessible markets in terms of scale and market opportunity.

Indonesia is a particular example. It has an estimated population of some 244.5 million (as at 2012). This makes it the fourth most populous nation in the world and the second most populous in Asia after China. Australia ranks 8th as an import source and 10th as an export destination for Indonesia. Total trade between the countries was worth $A10.7 billion in 2012 -13. Primary industry exports to Indonesia have been increasing steadily since 2007-08 from about $A1.5 billion to about $A3 billion in 2012-13, with major components being wheat, cotton and live cattle. (**Source**: DFAT Fact Sheet).

Real GDP growth has been on a robust upward trajectory since 1980, as illustrated in the following International Monetary Fund forecast chart:



A 2004 publication, researched and developed in 2003, makes the following observation in the introduction: "*Australia's food exports to Indonesia are dominated by live cattle, beef, dairy products and wheat and flour. But a host of niche high value-added products, many produced by small and medium sized Australian companies, find good markets in Indonesia and Austrade sees promising potential for further growth in a range of food product segments.*"

It goes on to describe the nature of the opportunities, pointing out the large number of affluent Indonesians and, emergence of supermarket chains, the premium people place on quality and food safety and the tradition of eating out. (Reference: DAFF, (2004) *Food Exporters' Guide to Indonesia*, ISBN 0 642 539197).

The key points to be drawn in the context of this project are:

- Transport links to Indonesia are fundamental to development of export hubs, production and distribution systems into Indonesia;
- There are long term trading relationships in place
- There are likely to be 'bountiful niche' opportunities in what is an increasingly sophisticated and affluent consumer market
- Market opportunities may be more manageable than China
- It is in Australia and Indonesia's joint best interests to have an ongoing close strategic relationship. Trade exchanges contribute to the strength of this.
- After PNG it is our closest and certainly our largest neighbour.

The main issue in the context of this project is that Northern Queensland has limited direct access through its present export hubs. This is apart from one dedicated vessel that supplies the Freeport mine in Indonesia.

Singapore is a recognised global distribution hub including as a distribution point into Indonesia. Accordingly wide body passenger aircraft links plus appropriate shipping services could facilitate better access to not only this market from north Queensland, but also Singapore itself and Malaysia. Singapore, as a major global aviation hub, could also facilitate passenger numbers into Northern Queensland. Obviously the freight and passenger load has to be sufficient to justify these services.

3.5 OTHER PRODUCTION & INPUT COSTS

3.5.1 Electricity and fuels

Apart from transport, cost effective and reliable power supply is also fundamental to the development and ongoing viability of existing production and distribution hubs, be they farm units or processing centres. It is also fundamental to the consideration of development of new areas of production. As to security, all significant production hubs have back up power plants usually in the form of diesel powered generators. Northern Queensland are prone to extreme weather events and producers are accustomed to dealing with them. The weakness is road access. If roads are cut for an extended period, the risk is that diesel may run short at the point of use.

Affordable and reliable power is critical to future development. More localised generation is badly required, which would relieve the inefficiencies in the current system as well as contain costs and contribute to the region's competitive positioning. The proposed development of a power station in the northern Galilee Basin could reduce transmission distance losses substantially (see report, Townsville Enterprise 2014).

As to fuels, they make a major contribution to farm input costs directly through on farm usage and indirectly due to transport costs. The cost of petroleum derived fuels will increase over time. This will inevitably further erode the competitive position of agricultural production in northern Australia as compared to competitors with shorter supply chains.

There is a global R&D race to find cost effective and viable alternative fuels. Bio-diesel is now certainly produced, but production from food sources such as grains are not sustainable. Other options such as algae have production costs which to date cannot compete with petroleum based product. In a country such as Australia, it would be in the National interest to develop production capability in industrial fuels. The current research taking place in relation to growing algae to provide biofuel is promising.

3.5.2 Extreme weather events

It should be noted that the current distribution system for export of containerised agricultural products makes it very vulnerable to extreme weather events cutting the north coast rail and Bruce Highway leading at times to extreme costs of having to urgently bring in coastal shipping to move perishable crops south or use interior roads. Direct export via northern ports would reduce this risk.

3.5.3 Water availability

It should be noted that expansion of crops for export in some areas will be tied to expansion of water availability through construction of additional water storage and distribution systems.

3.6 INDUSTRY PERSPECTIVE

Growcom is the peak representative body for the fruit and vegetable growing industry in Queensland. Its submission to the Joint Select Committee on Northern Australia (February 2014), outlines the conditions necessary to improve market penetration and viability for existing ad proposed horticultural production and places some emphasis on market research and development. Extracts from this submission follow:

Growcom, after consultation with members and local growers associations, strongly supports the concept of maximising the potential of Northern Australia. However, we contend that the focus should be on removing barriers and constraints to existing enterprises and growing new markets. The domestic market is often oversupplied resulting in low prices and poor profitability. There must be a clear primary focus on growing demand for Australian fruit and vegetables, both here and overseas……

…….

The ABARES report What Asia Wants (2013) identifies a number of important trends and highlights that there is not a great untapped market for Australian horticultural products just sitting there waiting for us to exploit. While there is evidence to suggest that there will be increased demand for protein and dairy products that cannot be met domestically within Asian countries, the same cannot be said for the majority of horticultural products. In fact, countries like Thailand are major producers of horticultural products and have significantly lower costs of production. This doesn't mean there are not opportunities for Australian horticultural products but rather that we have to be smart about accessing them, focusing on particular products and market windows.

Based on the information in the ABARES report and a recent KPMG report on Chinese Investment as well as anecdotal evidence from growers already exporting to Asia, the key opportunities are:

- *High quality products with a strong, traceable food safety dimension for wealthier Asian consumers.*
- *Counter-seasonal products which don't compete with local growers.*
- *Niche products not grown domestically.*

…….

Additionally we see the following actions as critical to improve our access to Asia Pacific markets:

- *A mapping exercise to determine what commodities are wanted and when by which countries. The What Asia Wants report is a good start but the break down into just fruit and vegetables is too broad and provides no real guidance as to what the opportunities are. There is also no insight into counter-seasonal opportunities.*
- *Market access negotiations progressed in a timely manner for a suite of horticultural commodities and continuation of the work being done to overcome trade barriers to horticulture. This includes ensuring biosecurity protocols are reasonable and realistic.*
- *Research into opportunities for high value commodities.*
- *Agricultural research and development extension into the Asia Pacific region*
- *Increased expertise within the Department of Agriculture regarding trade issues with Asia and a dedicated go to person to assist with trouble shooting for each major trading partner (e.g. a dedicated "Indonesia expert") as each country is unique.*

…….

CSIRO and Australian Bureau of Agricultural and Resource Economics and Sciences (ABARES) are working together to identify markets for irrigated agriculture products from across northern Australia and to develop efficient value chains to capitalise on existing and future market opportunities. The paper was to be released in May, but is now likely in July. ABARES are undertaking the market research, which the CSIRO are developing high level supply chain models for six proposed production areas, one being in Northern Queensland.

3.7 TRANSPORT SERVICES & INFRASTRUCTURE NEEDS

3.7.1 General

The following outlines the transport and distribution efficiency developments that need to happen to support the next wave of development of primary industries in Northern Queensland.

a) Meeting the transport and distribution needs of new agricultural areas opening up in Northern Queensland.

b) The next wave of development of the sugar industry involving an opportunity to supply a wider range of output than raw sugar to domestic and international markets.

c) The extension of the markets that have developed for the regions' agricultural products in southern Australia to overseas markets including the use of:
   - Direct container shipping links with Asian ports;
   - A new wave of air freight capacity coming available as the tourism market from China opens up.

The following looks at the initiatives necessary to achieve these outcomes over time.

The question of air freight is covered in Section 4.

3.7.2 Meeting the needs of new agricultural development areas

Basic transport and distribution infrastructure is already in place in the existing and potentially expanding cropping areas served by the ports of Gladstone, Mackay, Townsville and Cairns.

However as set out in Section 1, expansion of cropping is and can be expected to increasingly take place in a number of new areas in which there was no or little cropping in the past. These include in the:

- Upper Burdekin;
- Flinders, Gilbert River and Upper Mitchell catchments;
- The Cooktown district;
- Cape York.

While all the production from the Upper Burdekin and much of the production from the Flinders and Gilbert catchments can be expected to move through the existing east coast ports, for some of the production, Karumba will be the nearest seaport. Although constrained by depths, there is need for the potential of this port to be examined as an outlet for agricultural products other than the current live cattle exports. The North West Queensland Strategic Development Study, also flagged a potential need to upgrade this port for mineral exports.

The expansion of agriculture in the Cooktown district over the past decade has been strong and now stands at close to $100m. With plans being canvassed to extend sugar growing into the area, there is a need to look at potential port development.

With the upgrading of the Peninsula Developmental Road, there are prospects of Weipa expanding its role to become an agricultural export port for expanded production based on the two million hectares of soils suitable for cropping, identified in the area. The port has in the past handled live cattle shipments and is again being looked at for this purpose. As a deep water, west facing port, Weipa is well positioned in relation to trade especially with Indonesia, Singapore and South East Asia. The investment need, at this point in time, is in basic evaluation studies and planning.

3.7.3 Developing direct container export shipping

Currently almost all agricultural production in Northern Queensland that uses containers for export to overseas markets moves south through the port of Brisbane.

The distances involved mean that the cost of transport of containers to the northern regions and their return often matches and exceeds the cost of shipping overseas. On the other hand, the volume of competitive container shipping and range of services to different overseas ports means that cheaper freight rates can be available out of Brisbane, along with more direct services and shorter voyage times.

A major factor also is the availability of reverse trade, of imports. Two-way flows keep costs down. Prospects for container shipping out of northern ports are affected by market size and distribution systems for imports. Australia imports more than it exports and agricultural products can often access competitive back-loading rates.

Other important considerations include:

- The availability of government services like customs, quarantine and inspection and complimentary business services like export and custom agents;
- Suitable warehousing and storage facilities;
- Availability of port facilities for different types of containers (eg. refrigeration), and extent of container storage areas;
- A wide range of agricultural products being concentrated at a port over a year helps reduce seasonality problems;
- Land transport services and the availability of freight to fill containers on the outward leg to the agricultural production area and thus reduce transport costs to ports.

In relation to the last point, the balance of freight movements in Queensland is strongly in favour of northward movements from Brisbane resulting in cheaper back-loading rates being available for southward movements.

Amount of back-loading available for road and rail out of Northern Queensland is mainly from agricultural products of tropical fruits and vegetables and offseason produce moving south to southern markets. The following gives estimates of tonnages indicating availability of almost 500,000 tonnes per annum.

Table #3.1: Estimated Tonnages of Produce South Bound (tonnes)

Fruit, nuts, vegetables and cotton	**2009-10**	**2010-11**	**2011-12**
Far North Queensland	327,773	261994	328,904
Townsville/Burdekin	15,109	51,724	37,946
Mackay region including Bowen	55,711	114,584	79,274
Fitzroy	31,399	49,563	49,591
Total	**429,992**	**477,865**	**495,715**
Meat			
Townsville			130,000
Mackay			150,000
Rockhampton			280,000
Total			**560,000**

Source: Fruit, nuts, vegetables and cotton - Australian Bureau of Statistics, Agricultural Statistics. Meat – estimated from industry information about meatworks output.

Currently the majority of fruit and vegetables (believed to be up to 80-90%), moves by road. Almost all the meat moves by rail.

While the foregoing factors generally work against the development of containerised services from the Northern Queensland ports, it needs to be recognised that the cost of concentrating cargo into a distant port can be relatively high compared to the overseas freight rate; the further north from Brisbane, the higher the penalty.

If the transport system is not well developed into the regional ports, costs of concentration can be very high. For instance, an advised $1,800 basic container freight rate out of Townsville to Asia compares with an advised cost of sending a container south to the Central Highlands or north to the Tablelands for filling and return of about $1,300-$1,600.

The availability of backloading rates to Brisbane by road and rail and the large volumes of transport available compared to sporadic carriage between the regional cities and primary producing areas outside their own immediate region can mean that it is simpler to ship to Brisbane. Previous case study, Box 2, illustrates the problems to be overcome.

The limited extent of container shipping calling at the northern ports has been driven in the past by availability of mining output in the form of copper, zinc, nickel and aluminium or by coastal type vessels carrying general cargo to service Cape York, Torres Strait Islands and mines in Papua Indonesia and Papua New Guinea.

The following table gives container trade through Northern Queensland ports.

Table #3.2a: Container Trade, Northern Queensland Seaports

Financial year		**2008-09**	**2009-10**	**2010-11**	**2011-12**	**2012-13**
Export (TEUs)						
Full	Cairns	9,152	7,511	7,881	6,737	7,846
	Gladstone	552	198	542	1,908	3,122
	Rockhampton	82	90	969	451	621
	Mackay	0	0	0	0	0
	Townsville	12,203	115,756	16,625	19,294	19,329
	Total	**21,989**	**123,555**	**26,017**	**28,390**	**30,918**
Empty	Cairns	102	20	251	36	25
	Gladstone	0	3	37	29	76
	Rockhampton	0	3	37	29	76
	Mackay	0	0	0	0	0
	Townsville	3,472	2,692	4,706	4,606	4,891
	Total	**3,574**	**2,718**	**5,031**	**4,700**	**5,068**
Total exports		***25,563***	***126,273***	***31,048***	***33,090***	***35,986***
Import (TEUs)						
Full	Cairns	1,544	1,151	2,492	1,306	1,065
	Gladstone	43	0	64	99	266
	Rockhampton	739	449	288	694	1,170
	Mackay	0	0	0	0	0
	Townsville	7,405	7,690	10,815	12,674	12,064
	Total	9,731	9,290	13,659	14,773	14,565
Empty	Cairns	8,136	6,502	7,316	5,377	6,825
	Gladstone	312	0	725	1,918	2,730
	Rockhampton	14	9	0	0	73
	Mackay	0	0	0	0	0
	Townsville	8,281	9,317	10,293	12,988	13,889
	Total	16,743	15,828	18,334	20,283	23,517
Total exports		***26,474***	***25,118***	***31,993***	***35,056***	***38,082***
Total throughput		***52,037***	***151,391***	***63,041***	***68,146***	***74,068***

Table #3.2a: Container Trade, Northern Queensland Seaports Cont'd

Financial year	2008-09	2009-10	2010-11	2011-12	2012-13
Percentage of containers exported empty					
Cairns	1%	0%	3%	1%	0%
Gladstone	0%	1%	6%	1%	2%
Rockhampton	0%	3%	4%	6%	11%
Mackay	na	na	na	na	na
Townsville	22%	2%	22%	19%	20%
Total	**14%**	**2%**	**16%**	**14%**	**14%**
Percentage of containers imported empty					
Cairns	84%	85%	75%	80%	87%
Gladstone	88%		92%	95%	91%
Rockhampton	2%	2%	0%	0%	6%
Mackay	na	na	na	na	na
Townsville	53%	55%	49%	51%	54%
Total	**63%**	**63%**	**57%**	**58%**	**62%**

TEU = 20 foot equivalent units

Source: Queensland Government, Dept of Transport & Main Roads, "Trade Statistics Queensland".

Townsville is by far the most advanced with 19,000 full export containers and 13,000 full import containers. However it should be noted that this currently compares with container numbers through Brisbane of full export 323,000 and full import containers 459,000***Table #3.2b: Trade by Container, Northern Queensland Seaports – No. of Larger Commercial Vessel Calls Within the Containers' Category (excluding coastal trade, eg. Freeport Indonesia trade)***

Financial year	2011-12	2012-13
Cairns	0	0
Gladstone	27	34
Port Alma (Rockhampton)	27	40
Mackay	0	0
Townsville	155	126
Total North Queensland	**209**	**200**

Source: Queensland Government, Dept of Transport & Main Roads, "Trade Statistics Queensland".

Table #3.2c: Northern Queensland Seaports – Export volumes Northern Queensland Seaports by Commodity (2012-13)

Export (tonnes)	Cairns	Gladstone	Mackay	Townsville	Total
Meat	61.4	0.0	0.0	353.7	**415.1**
Dairy	41.4	0.0	0.0	59.0	**100.4**
Fish	0.0	0.0	0.0	0.0	**0.0**
Fruit & vegetables (incl pulses [1])	520.7	96,566.6	85,650.0	2,807.2	**185,544.5**
Refined copper	0.0	0.0	0.0	198,633.0	**198,633.0**
Refined zinc	0.0	0.0	0.0	39,109.0	**39,109.0**
Aluminium	0.0	334,883.0	0.0	0.0	**334,883.0**
Nickel	0.0	0.0	0.0	16,998.0	**16,998.0**
Refined lead	0.0	0.0	0.0	129,623.0	**129,623.0**
Total non-ferrous metals	9.0	335,101.9	0.0	513,642.5	**848,753.4**
Confidential items	173,000.0	229,000.9	465,667.2	924,432.2	**1,792,100.3**

[1] Note: Fruit and vegetables exported from Gladstone and Mackay include bulk export of pulses of chickpeas and mung beans. Port of Gladstone website reports exports of 63.950 kg chickpeas to India and 27.500 kg to Bangladesh in 2012-13. 2011 Production of chickpeas in the Fitzroy NRM is 71.500 kg, and 36.000 kg in the Mackay SA4. There are media reports about cane growers in the Mackay region trialling chickpeas and soya bean as fallow crop

Source: Queensland Government, Department of Transport & Main Roads, "Trade Statistics Queensland".

The following looks at the prospects of the regions' individual main seaports that handle general cargo becoming substantial ports of export of agricultural products in containers.

It should be noted that apart from trade through these main general cargo ports, very large amounts of Northern Queensland exports are handled through specialised bulk export ports including: Hay Point, Dalrymple Bay, Abbott Point, Lucinda, Mourilyan, Cape Flattery, Weipa and Karumba.

Gladstone

Most shipping from Gladstone involves bulk import of bauxite for processing, export of alumina, coal and in future, LNG. The following table provides a profile.

Table #3.3: Profile of Exports & Imports, Gladstone Port (tonnes)

Financial year	2008-09	2009-10	2010-11	2011-12	2012-13
Export tonnes					
Alumina	4,094,263	4,214,205	3,794,339	3,909,386	4,891,708
Aluminium	368,535	322,675	334,661	373,726	334,883
Cement/clinker	1,131,896	1,278,273	1,197,842	1,185,476	1,101,711
Coal – Barney Point	3,803,285	4,787,636	3,956,642	4,115,675	2,934,912
Coal – RG Tanna	52,396,680	55,602,406	49,232,706	55,638,013	54,378,793
Grain	446,449	240,762	260,218	338,245	386,879
Other	563,506	582,363	657,547	683,131	614,065
Total exports	**62,804,614**	**67,028,320**	**59,433,955**	**66,243,652**	**64,642,951**
Import tonnes					
Bauxite	13,106,900	13,195,900	13,549,380	13,671,250	16,321,662
Caustic soda	1,481,785	1,440,717	1,500,702	1,687,585	1,889,707
Petroleum product	881,405	843,576	830,432	1,048,074	1,292,214
Other	871,554	857,158	1,090,216	1,139,032	1,147,226
Total imports	**16,341,644**	**16,337,351**	**16,970,730**	**17,545,941**	**20,650,809**
Total throughput	**79,146,258**	**83,365,671**	**76,404,685**	**83,789,593**	**85,293,760**

Source: Queensland Government, Dept of Transport & Main Roads, "Trade Statistics Queensland".

There is occasional container shipping calling at Gladstone mainly to pick up containerised mineral/metal products (aluminium). There is limited import. Swires Shipping makes calls at Gladstone on three routes.

In the port's hinterland is the Central Highlands production of meat, citrus, cotton that are currently largely exported overseas via Brisbane. Some grains (eg. Durum wheat), are believed to provide potential container exports. While almost 100,000 tonnes of pulses are being exported in bulk, it is believed that a large part of pulses going out of Brisbane are by containers. A check with grain traders indicates that while large buyers may require bulk shipments, the only reason containers are not being shipped out of Gladstone and Mackay is container shipping costs from those ports. The indications are that if sufficient container shipping started using the port, pulses could become available as a containerised cargo. Packing facilities are probably best located at the port.

In addition, in a recent development, a major market has opened up in China for sorghum grain for wine production that is believed to be currently being shipped to China in containers via Brisbane.

Table #3.4: Potential Primary Product Tonnages, Gladstone Port (2011-12)

Commodity	Tonnes
Meat	280,000
Citrus (2010-11)	2,664
Mangoes	540
Cotton	43,465
Pulses (part)	100,000
Sorghum (part)	300,000

Source: Australian Bureau of Statistics-agricultural statistics and for meat-industry information.

Brisbane is relatively close to the Central Highlands area. To compete for the export of citrus which is seasonal, it has been identified that Gladstone would need to:

- Have a much wider range of competitive shipping available with short sailing times when needed seasonally;
- Have availability of special containers;
- Provide a source of packaging, chemicals and other inputs to fill containers moving from the port to citrus growers to reduce costs of transport to the port.

Market is mainly China.

Cotton is being transported to Brisbane by road. Main market is China. The amount grown in Central Queensland is relatively small compared with other growing areas. The crop can be stored for long periods and does not have a transport seasonality problem. The major barrier would be the range of container shipping available and the fact that production is still small compared with other areas.

There are two meatworks in Rockhampton and one at Biloela. The two meatworks in Rockhampton have an estimated production of 278,000 tonnes which would represent about 13,900 containers, ie. about 270 per week. One of the Rockhampton meatworks does not store at the meatworks but ships directly to Brisbane for storage where it is included with the meat from the company's major meatworks in South East Queensland and its Townsville meatworks. The other company has its storage at Rockhampton, but ships via Brisbane. Queensland Rail have developed services of trains with special refrigerated capacity up to Townsville and offer excellent rates for backloading. Special arrangements would need to be made for transport to Gladstone and the port would need to gear up to handle refrigerated containers.

The major underlying problem for the northern ports however, is that meat is sold in a wide range of cuts and qualities and to a wide variety of markets. By and large, the services out of the northern ports are to a narrow range of ports, mainly in Asia. To become a distribution centre for meat, services to a wider range of ports would be needed. While meat might come down from further north, it would come by rail on a train bound for Brisbane and the freight rates to Gladstone may work out to be much the same.

It is believed the special type wheat that might be exported in containers would be to China. Potential tonnages are not known. There would appear to be no special problems for it being shipped via Gladstone if services were available.

The other factor relates to imports. To become a successful container port, Gladstone would need to develop as a distribution centre for imports. The port's position in relation to the mining industry might help with some imports, but it would have problems being competitive with Brisbane in relation to consumer goods.

Mackay

The following table gives Mackay port trade. In the Mackay Whitsunday region, Mackay seaport has the potential to handle containers.

Other ports in the region of Abbott Point, Hay Point and Dalrymple Bay handle very large volumes of exports but are bulk ports and not configured in a way that could be developed for container handling. While there have been some previous proposals to develop Abbott Point as a multi modal port that could handle containers, it is believed that these proposals are not being proceeded with.

Table #3.5: Profile of Exports & Imports, Mackay Port (tonnes)

Financial year	2008-09	2009-10	2010-11	2011-12	2012-13
Export tonnes					
General cargo	5,130	38,887	32,854	73,051	167,987
Grain	310,909	278,406	350,056	386,324	332,850
Refined sugar	314,843	337,107	312,271	298,941	318,493
Sugar	698,735	765,215	575,522	382,966	754,647
Other	59,811	61,722	124,221	144,360	103,053
Total exports	*1,389,428*	*1,481,337*	*1,394,924*	*1,285,642*	*1,677,030*
Import tonnes					
Petroleum product	876,398	923,405	1,044,895	1,256,756	1,448,406
Other	136,687	143,102	112,168	170,620	144,531
Total imports	*1,013,085*	*1,066,507*	*1,157,063*	*1,427,376*	*1,592,937*
Total throughput	**2,402,513**	**2,547,844**	**2,551,987**	**2,713,018**	**3,269,967**

Source: Queensland Government, Dept. of Transport & Main Roads, "Trade Statistics Queensland".

Mackay seaport is currently confined to handling bulk exports and imports only and receives little or no direct container shipping. Some heavy equipment for mining is shipped through the port.

It currently is not well geared to handle a volume of containers although there are areas in the port that could be developed for that purpose. Current proposals for a coastal shipping service from Brisbane to Mackay and Townsville return could change that. Currently port channel depth of 8.6 metres could not handle the larger container ships without tidal restriction.

Section 1.3 refers to the major opportunity happening for the sugar industry to move into a new era of value adding/further processing aimed at overseas as well as local markets. The Mackay region seems the best placed to achieve this in the short run with major implications for it developing as a container port.

The following canvasses the types and volumes of product that would support investment in appropriate container handling facilities at Mackay seaport and attraction of suitable sized container ships.

Refined sugar

Refined sugar is already being produced and is being shipped in a specialised bulk carrier that is getting towards the end of its life. The specialised ship takes on bulk refined sugar and delivers it in packed form at destination. It is proposed to change to shipping in containers in the future.

Initially quantity involved would be 100,000 tonnes a year, ie. about 4,000 containers or 200 containers on a fortnightly schedule. It is envisaged that this could ramp up progressively to 640,000 tonnes per annum, ie. 600 containers per week or 1200 per fortnight.

Overseas markets are mainly in China.

The volume of production is relatively low and freight rates have been negotiated for rail freight to Brisbane. Proposals for a coastal service out of Brisbane could carry output to Brisbane. It is difficult to see costs of land transport to Townsville or Gladstone being cheaper than to Brisbane unless there was a change in distribution systems.

The tonnages involved offer prospect of it becoming a base cargo to attract direct container shipping to Mackay port.

Other sugar industry products

Technology available is seeing sugar mills potentially turn into producers of a range of products.

While ethanol from bagasse fibre is a likelihood in the future, its output would not require containerised shipping. However the production of citric acid would, with prospective quantities of 50,000.

Sugar cane provides a prime source for the manufacture of bioplastics and production plants are now being developed in Brazil based on sugar cane and in Europe based on sugar beet. A major advantage of bioplastics is that they are biodegradable and in an environmentally conscious world, companies such as Toyota would like to have their vehicles all biodegradable. The output is in the form of pellets that would be transported in containers. Major potential markets have been identified in China.

An efficient processing plant would need to be large and export oriented with product capable of being shipped direct to be competitive. Potential tonnages would be large.

Other Products

The meatworks at Mackay ships 150-190 containers a week to Brisbane. It is closer to the port than the Rockhampton meatworks are to Gladstone. However the distribution factors outlined in relation to Gladstone would apply.

Mackay port would seem to be as well placed as Gladstone to handle the 100,000 tonnes of cotton/cotton seed for export but again the same factors would apply. The Durum wheat would also be a potential export along with containerised pulses and sorghum if container shipping rates could be brought down.

For citrus, Mackay would need to have seasonal capacity but also develop as a supply point for inputs such as packaging and other special requirements. Mackay is also relatively close to the Bowen and Burdekin areas for export of fruit and vegetable output that might find a market in Asia.

Imports

A negative for Mackay is imports. While special requirements for the mining industry might provide some volume, it would face a problem in developing as a distribution centre for consumer goods. However there would be prospects of developing backloading rates to larger markets in Brisbane for imports landed at Mackay.

Townsville

In tonnages, Townsville is second to Gladstone among Northern Queensland' ports, however first in containers. The following table gives commodities handled.

Table #3.6: Profile of Exports & Imports, Townsville Port (tonnes)

Financial year	2008-09	2009-10	2010-11	2011-12	2012-13
Export tonnes					
Copper concentrate	454,050	302,138	213,874	180,492	276,305
Copper (refined)	205,500	201,358	228,520	272,221	198,633
Fertiliser	773,619	779,810	828,105	866,066	810,338
General cargo	150,018	150,126	145,404	191,633	163,846
Lead concentrate	325,585	401,910	381,792	373,058	365,430
Lead (smelted)	153,192	152,029	113,658	164,430	129,623
Magnetite	0	0	278,476	846,523	773,177
Molasses	244,463	185,237	233,710	381,782	254,731
Sugar	1,078,520	1,190,898	958,720	1,490,541	1,091,626
Zinc concentrate	544,104	695,858	776,315	808,480	889,953
Zinc ferrites	67,218	56,726	154,328	210,651	210,175
Zinc (refined)	158,945	137,143	289,014	156,889	139,109
Other	162,573	157,948	123,153	392,942	131,467
Total exports	***4,317,787***	***4,411,181***	***4,725,069***	***6,335,708***	***5,434,413***
Import tonnes					
Cement	460,538	453,124	466,668	482,254	540,158
Nickel ore	2,618,563	3,680,603	3,719,507	3,978,616	3,958,967
Petroleum products	987,897	1,016,206	941,103	1,111,296	1,112,244
Zinc concentrate	228,476	158,341	258,309	250,230	322,078
Other	471,560	533,360	490,480	726,809	737,944
Total imports	***4,767,034***	***5,841,634***	***5,876,067***	***6,549,205***	***6,671,391***
Total throughput	**9,084,821**	**10,252,815**	**10,601,136**	**12,884,913**	**12,105,804**

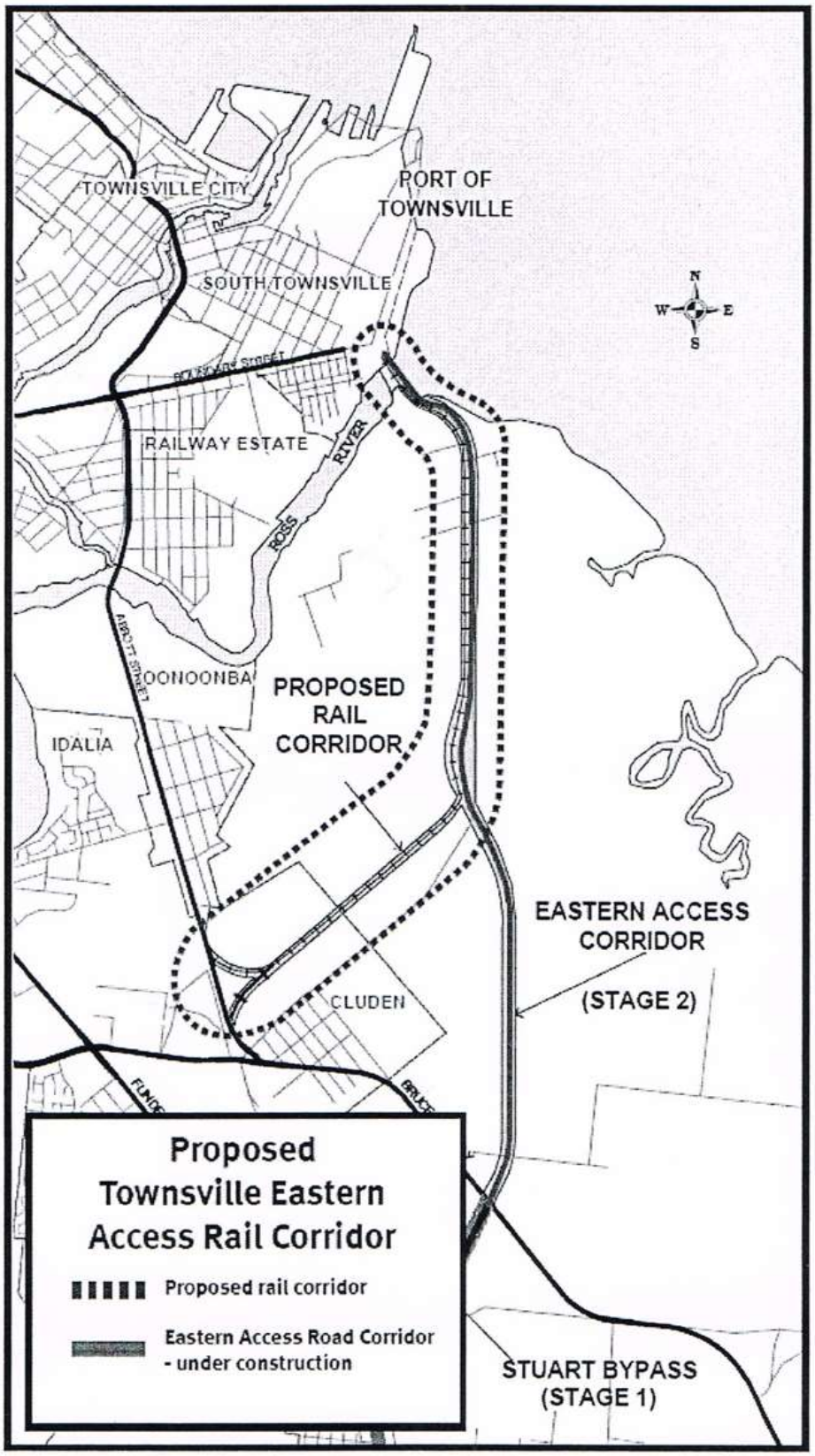
Source: Queensland Government, Dept of Transport & Main Roads, "Trade Statistics Queensland".

Townsville seaport has a depth of 11.9 metre channel. The new access road, allowing triple road trains direct access to the port, is now operational. Townsville seaport is planning major upgrading capital works including two new container cranes at a cost of $5m and $5.5m and major additional land reclamation. The port has existing rail access via through suburban areas with limitations on length of trains that can access the port. A new access is proposed, the Townsville Astern Access, that will allow 1.4 km trains to access from the north coast line. A State Development area has been established adjacent to the port.

As indicated in the earlier table, Townsville is the most developed of Northern Queensland' ports in handling containers, including full import containers. Container shipping services include from New Zealand, to and from Port Moresby and Lae and to and from Asian ports. Regular services are offered by six different companies; (Asia) Marianna, Kyowa, Swires, Haiwin; (New Zealand), Sofrana; (Papua New Guinea) Consort Express. (**Map 3.2** illustrates.)

The upgrade is estimated to increase port capacity from 15.6m tonnes to 21.0 million tonnes.

Map 3.1 – Proposed Townsville Eastern Access Rail Corridor



Source: Port of Townsville.

Map 3.2 – Container Shipping Services

Source: Cummings Economics from Industry information.

The container trade to Papua New Guinea ports is now outweighed by that with Asian ports. The Papua New Guinea trade is almost all northwards general cargo, with limited backloading.

The following table gives some of the major export cargoes moving by containers.

Table #3.7: Containerised Export Tonnages Townsville by Commodity (2012-13)

Export tonnes	Tonnes
Meat	13,014
Refined copper	198,633
Refined zinc	139,109
Refined nickel	16,998
Smelted lead	129,623

Note:

** Refined copper is exported to Canada and China by Xstrata*
** Lead ingots are exported to England*
** Meat and meat by products are mainly exported to the USA and China*
** Nickel is exported to South East Asia and Europa by QNI*
** Zinc ingots are exported to Europe, South East Asia and North America.*

Source: Port of Townsville.

While exports of minerals of copper and zinc attracted the services, substantial imports have developed out of China including cement, bitumen but also the requirements of Bunnings stores in the northern centres. This is reflected in the 12,000 containers now coming in full compared with the 19,000 full going out. Apart from distribution to markets within Northern Queensland, backloading rates are available to southern markets.

While 2012-13 exports included, only 13,000 tonnes of meat (including to Papua New Guinea), the shipping companies report that little by way of containerised agricultural product is being exported to Asia. Small amounts of fruit and vegetables, dairy products and some meat are recorded being included in the cargoes to Papua New Guinea.

Prospective containerised agricultural cargoes from the immediate region are not high at present. The Townsville meatworks currently ships to consolidated hubs in Brisbane about 130,000 tonnes a year and Townsville faces the same problems as outlined for Gladstone. Proposals to establish a meatworks at Charters Towers or Cloncurry could help change this.

Expansion of cotton growing in the future to a point where a cotton gin was established could potentially add volume. Production of rice and cassava in the Burdekin area has started and is believed to be resulting in small volumes being exported. This could grow in the future. While substantial tonnages of fruit and vegetables are grown in the Burdekin and Bowen districts, freight rates and other barriers such as voyage times have not led to any major exports developing.

As with the port of Mackay, there is an eventual potential for non-raw sugar containerised exports. NQBE's new sugar mill at Ingham is moving in this direction.

The problems for attracting products from the other regions is the high cost of freight to China ($1,800 cf as low as $800 ex Brisbane) and $1,300-$1,600 to send a container from Townsville to the Tablelands or Central Highlands and return.

Townville Port seems well positioned to become a distribution hub for Northern Queensland. It is the most advanced towards gaining critical mass potential with most inbound and outbound containers, and opportunity for lower freight rates with relatively high rates of full containers for both inbound and outbound freight.

Cairns

The following table gives export and import trade through the port of Cairns.

Table #3.8: Profile of Exports & Imports, Cairns Port (tonnes)

Financial year	2008-09	2009-10	2010-11	2011-12	2012-13
Export tonnes					
General cargo	151,352	133,280	142,952	192,305	160,403
Sugar	221,546	297,115	197,024	157,239	187,023
Other	60,572	54,770	57,370	49,073	60,465
Total exports	**433,470**	**485,165**	**397,346**	**398,617**	**407,891**
Import tonnes					
Petroleum product	537,504	499,335	528,146	532,083	543,985
Other	115,500	121,914	99,795	98,952	103,732
Total imports	653,004	621,249	627,941	631,035	647,717
Total throughput	**1,086,474**	**1,106,414**	**1,025,287**	**1,029,652**	**1,055,608**

Source: Queensland Government, Dept of Transport & Main Roads, "Trade Statistics Queensland".

While Cairns seaport is the second among Northern Queensland' ports for container trade, this trade is mainly coastal to Torres Strait and Weipa but also to supply Freeport Indonesia's giant mining operation in Papua Indonesia with cargo assembled from the rest of Australia. Freeport's vessels carry about 100 containers on a 10-days to fortnightly circuit. Most containers come back empty.

There are no direct shipping services to mainland Asia. As with Mackay, current channel depths at 8.0 metres would pose tidal restrictions for use by the larger container ships. Proposed deepening to over 9 metres would improve access but still have tidal constraints for the larger container vessels.

Although the region produces over 300,000 tonnes of produce for shipment south, the biggest component is bananas that are unlikely to be competitive in Asian markets against production from countries like the Philippines. Sporadic shipments are made through southern ports of fruit and vegetable produce. Substantial prawn production mainly goes onto the domestic market. The region has a substantial capacity to expand fruit and vegetable production for export but transport costs are a deterrent. There are proposals to re-establish a meatworks in the region that would provide quantities for export.

As with the Mackay region, the region's sugar industry could eventually be a source of containerised non raw sugar products. Mills in the area are already moving in this direction.

There is no cargo evident at present that would provide a base cargo to support calls by container services.

On the import side, the Cairns / Far North Queensland region has the largest population of Northern Queensland. It supports 13 trains a week from Brisbane with consumer goods and building material. The Aquis integrated resort development could possibly stimulate sufficient demand for imported building materials and other goods to support container vessel calls from China. Cairns is well placed to use backloading rates to distribute southwards.

Conclusion

The following table summarises findings from the foregoing analysis of the four main general cargo ports.

Table #3.9: Assessment of Potential for Large Containerised Shipping for Agricultural Products, Northern Queensland Ports

	Gladstone	Mackay	Townsville	Cairns
Existing Base				
Export Cargoes				
Minerals	✓	x	✓	x
Agricultural	x	x	x	x
Existing Imports				
Mining supplies	x	x	✓	x
Building materials	x	x	✓	x
Consumer goods	x	x	✓	x
Potential Exports				
Minerals	✓	x	✓	x
Agricultural products				
Base [(1)]	✓	✓	x	x
Other	✓	✓	✓	✓
Existing port depths capable of taking larger container vessels	✓	x	✓	x

[(1)] Note: Includes for Mackay, refined sugar.

Each of the ports and regions will wish to pursue prospects of developing container trade and there will be opportunities to build up containerised freight demand based on local industry and population growth,

However, it is evident that Townsville currently offers the best prospects for building up critical mass of container trade to a range of markets that could compete with Brisbane and shorten supply lines. Townsville is the largest of the cities. Cairns and Mackay are within four hours' drive. The storage facilities and transport systems between the Northern regions need attention.

Build-up of potential containerised primary production from the Mackay and Fitzroy regions is mounting to levels that could attract direct container shipping in the future to Mackay and Gladstone seaports.

3.8 RETURN ON INVESTMENT

Investments in the transport and distribution system and in particular achieving a major increase in direct container exports out of Northern Queensland ports has the potential to facilitate:

- A major expansion of sugar production for products other than raw sugar, including refined sugar and over time, ethanol, citric acid, power drinks and bioplastics, involving a large investment and tapping into major emerging markets in Asia. The additional refined sugar potential from the Mackay region alone is of the order of $200m a year or $2bn over a 10-year period;
- A continuing expansion of the sugar industry including into new growing areas;
- A continuing expansion of the beef industry through reducing costs of shipping beef to overseas markets. Current value of meat being transported south is estimated at $2.8bn a year or $28bn over a 10-year period.
- The current $600m a year fruit and vegetable industry breaking into overseas markets in a serious way.
- The expansion of the current $130m per annum cotton industry into other northern regions.
- The expansion of pulses, some of the grains and the nascent rice and cassava industries.
- The direct export of prawns and potential exports of substantial aquaculture output.

However just as important will be the impacts of developing direct imports from overseas in reducing costs of products in the Northern Queensland regions down to levels available to consumers in southern Australia, but also in reducing costs of inputs to a whole range of industries, increasing the competitiveness of manufacturing in Northern Queensland.

3.9 AGRICULTURAL DISTRIBUTION HUBS RECOMMENDATIONS

3.9.1 General

Investment needed mainly involves actions to encourage and support private enterprise investment and business development.

There is a need for two separate, although not entirely mutually exclusive, strategies:

1. Strategy to improve penetration of local Australian markets;

2. Strategy to further break into overseas markets.

The second is the most important but improvements in the first could play a role in achieving the second.

3.9.2 Strategy to improve penetration of local Australian markets

By and large the distribution to southern Australian markets seems to be working well.

One government investment needed is the final sealing of the direct inland route to provide better road access to Melbourne and Adelaide markets.

There is however a substantial need to improve distribution to local markets.

Achieving greater penetration of local markets will require a combined effort at producer and community level with government playing a facilitative role and initiate actions to encourage:

- Major retail chains to establish more distribution centres in the north and better systems for buying in local produce;

- Specialist food wholesalers and retailers to set up hubs in the north that will maximise buy in of local fresh and processed produce;

- Local groups to be established to promote locally produced fresh and processed produce.

3.9.3 Strategy to further break into overseas markets

The strategy envisages a number of coordinated actions that will help realise the potential for Northern Australia to become a much larger supplier of agricultural products to Asia and world markets and for Queensland to achieve its objective of doubling agriculture production by 2040.

Bulk and specialised shipping exports

By and large these arrangements are working relatively well, but attention will be needed to the issue of road capacities to handle different sized freight efficient transport vehicles, especially for live cattle.

New agricultural areas support

There is a need to plan for the development of ports and access to ports for some of the new agricultural production areas.

Container shipping cargoes

The strategy envisages combined actions by community, industry, business and government organisations at two levels with strategies aimed particularly at the development of direct containerised shipping out of northern ports with best short term prospects being through the port of Townsville.

General support strategy:

- **Markets** - Achieving an improved flow of market intelligence into the area; and ensuring that the special needs of Northern Queensland's range of products is taken into account in the negotiation of Trade Agreements and protocols.

- **Commercial** - Encouraging the development of and working with specialist export merchants and agents.

- **Quality** - Assisting marketing through adopting systems of 'traceable food security'; and encouraging and, if necessary, supporting the development of disinfestation facilities and Modified Air Processing capability.

- **Production** - Accelerated research to improve crop yields and reduce costs through mechanisation and the like, especially in those crops and products likely to be in demand in overseas markets; and helping ensure that input costs, especially electricity, are kept under control.

Containerised transport and distribution strategies:

- **Shipping Services -** Working with the shipping companies to develop both exports and imports and more direct services to a wider range of overseas ports.

- **Port Development -** Encouraging investment by port authorities / operators in appropriate port facilities including improved rail and road access.

- **Land Transport -** Recognition of the critical need to increase road and rail service connectivity between Northern Queensland regions to facilitate concentration of cargoes for export and to facilitate distribution of imports.

4.0 BUSINESS CASE – SUPPORTING REGIONAL AVIATION AND AIR FREIGHT FOR EXPORTS

4.1 INTRODUCTION

As in south-eastern Australia, large areas covered by Northern Queensland and distances between major regional cities have led to aviation playing a major role in the economy. In the northern regions, this role has historically been magnified by a comparatively underdeveloped land transport system, distances from major metropolitan centres in southern Australia and an opportunity and need to develop direct air links with the Asia Pacific region to the immediate north

Historically, these factors have led to the regions of Northern Queensland playing a key role in the development of a strong Australian aviation sector. Australia's national carrier, Qantas, started its life in Winton and Longreach as the Queensland and Northern Territory Aerial Service. Early Cairns aviator, Tommy McDonald, pioneered the coastal route from the major northern cities down to Brisbane. Bush Pilots Airways, played a significant role in the development of regional aviation's role in tourism. The Aerial Ambulance and the Royal Flying Doctor Service were pioneers in the use of aircraft for emergency and medical services.

The aviation sector continues to be a vital factor in the growing contribution that Northern Queensland makes to the Australian economy.

The following **Table #4.1** gives passenger movements for those airports on a regular public transport service in terms of international, domestic and regional.

Table #4.1: Passenger Numbers

MAJOR DOMESTIC AIRLINES (a) (b) (c) (Number)

Year	Cairns	Emerald	Gladstone	Hamilton I	Mackay	Moranbah	Mount Isa	Proserpine	Rockhampton	Townsville
2011-12	3,054,803	30,514	75,711	436,498	881,916	0	148,967	215,583	419,400	1,321,940
2012-13	3,270,176	81,997	263,959	428,445	952,188	16,962	175,355	235,052	497,000	1,280,418

(a) By stages for Domestic, and Uplift/Discharge data for international and regional.
(b) Includes inbound and outbound passengers
(c) Regular Public Transport (RPT) operations only

REGIONAL AIRLINES (Number)

Year	Bamaga	Biloela	Cairns	Cloncurry	Cooktown	Emerald	Gladstone	Hamilton I	Longreach	Mackay	Moranbah	Mornington I.	Mount Isa	Normanton	Palm I	Proserpine	Rockhampton	Thursday I	Townsville	Weipa
2011-12	12,629	18,454	383,778	8778	9,005	204,246	280,175	16,596	34,141	244,231	119,345	10,608	90,958	6,952	28,120	0	331,233	99,426	301,906	71,339
2012-13	12,892	19,160	370,012	7519	8,713	213,948	193,645	18,275	30,042	163,743	132,518	10,179	88,310	7,343	26,721	0	214,101	93,651	289,268	68,071

INTERNATIONAL AIRLINES (Number)

Year	Bamaga	Biloela	Cairns	Cloncurry	Cooktown	Emerald	Gladstone	Hamilton I	Longreach	Mackay	Moranbah	Mornington I.	Mount Isa	Normanton	Palm I	Proserpine	Rockhampton	Thursday I	Townsville	Weipa
2011-12	0	0	504,200	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2,733	0
2012-13	0	0	515,971	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

TOTAL PASSENGERS (Number) (Domestic, Regional and International Airlines)

Year	Bamaga	Biloela	Cairns	Cloncurry	Cooktown	Emerald	Gladstone	Hamilton I	Longreach	Mackay	Moranbah	Mornington I.	Mount Isa	Normanton	Palm I	Proserpine	Rockhampton	Thursday I	Townsville	Weipa
2011-12	12,629	18,454	3,942,781	8,778	9,005	234,760	355,886	453,094	34,141	1,126,147	119,345	10,608	239,925	6,952	28,120	215,583	750,633	99,426	1,626,579	71,339
2012-13	12,892	19,160	4,156,159	7,519	8,713	295,945	457,604	446,720	30,042	1,115,931	149,480	10,179	263,665	7,343	26,721	235,052	711,101	93,651	1,569,686	68,071

Provisional data for 2012-13
Source: Bureau of Infrastructure, Transport & Regional Economics, Airport Traffic Statistics, 2012-13.

The area's airports and aviation services play an important role in the economy through providing:

- Important business and social links within the regions and with the rest of Australia and overseas;
- Services to the area's important but dispersed rural industries and centres;
- Access for the area's large and important tourism industry and local tourism services;
- Important fly-in/fly-out workforce and service delivery to the regions' large mining sector;
- The opportunities for industries in the regions to access international air freight markets and import goods direct from overseas;
- Locations for air defence and border protection services;
- A range of emergency services.

The engineering maintenance and other services required to support the industry, including education and training, add a further dimension to the regional economies.

The current value of the sector to the regional economies has not been recently assessed in detail. However there is sufficient information from previous studies to give an indication of likely order of magnitude figures.

Studies in 2011 put the value of Cairns airport to the regional economy of 21%, made up of:

Airport Operations
Employment 6,300
Value added to the regional economy $600m
Airport Dependent Industries
Employment 23,200
Value added to the regional economy $1,850m

Similar studies put the value of Mackay airport at:

Airport Operations
Employment 690
Value added to the regional economy $110m
Airport Dependent Industries
Employment 12,900
Value added to the regional economy $1,050m

The following gives an estimate based on the above for the combined four regional airports of Cairns, Townsville, Mackay and Rockhampton.

Airport Operations
Employment 8,990
Value added to the regional economy $1,010m
Airport Dependent Industries
Employment 46,600
Value added to the regional economy $3,920m

We thus have an estimate that aviation industries centred around the airports of the four main cities including airport dependent activities add about 56,000 jobs in the regional economies and value of about $5bn to the regional economies, ie. about 7% of regional activity.

4.2 OVERVIEW OF AIRPORTS & THEIR DEVELOPMENT

4.2.1 General

- There are 54 certified and registered airports in the Northern Queensland region (see **Map 4.1**).
- Over 30 have regular passenger air services.
- Many have been earmarked for development and additional services either by Governments or the owners.
- 20 have been identified by Queensland Government as being an airport of economic significance.[1]

The following provides information on a number of the key airports and developments taking place or planned.

4.2.2 Main and regional airports and airport projects

1. **Cairns airport** is privately operated by NQ Airports Pty Ltd. The airport has direct Regular Public Transport (RPT) services to all the major metropolitan centres and a total of 11 centres in Northern Queensland and 9 outside Northern Queensland. There are RPT international services to 7 international centres in the Asia Pacific region. In addition, there are numerous air charter services and smaller services to centres, mainly related to mining and including 5 in Papua New Guinea and one in Papua Indonesia.

   NQ Airports have a $920m redevelopment plan over 20 years to cater for expected international and domestic tourism and general aviation growth. There is a substantial aircraft engineering and maintenance sector associated with Cairns airport. There is an opportunity for the region to position itself as a maintenance hub for aircraft, particularly in the 30-72 seat aircraft market as Cairns Airport has the only recognised service facility for Bombardier's Dash 8 Q-series aircraft in the Southern Hemisphere. It also is recorded as having the largest avionics facility in Australia.

2. **Townsville airport** is operated by Queensland Airports Limited (which also operates Mount Isa and Longreach airports), jointly with the Department of Defence. Townsville airport has direct services to Cairns, Mackay and Moranbah, Brisbane, Sydney and Melbourne, Mount Isa and Darwin, Cloncurry, Winton and Longreach.

   It is currently undergoing a terminal upgrade ($30 million), as part of a $50 million master plan with projected passenger numbers at 3.36 million by 2030. The airport has a dynamic general aviation maintenance sector. The Northern Australia Aerospace Centre of Excellence (NAACEX) that apart from servicing commercial aircraft and providing a paint facility is developing capacity to service military aircraft such as the Black Hawk and Chinook helicopters complimenting the city's role as a major army and air base.

[1] Economic Directions Statement Queensland Airports 2013 – 2023, Queensland Government. page 6

Map 4.1 – Certified & Registered Airports Northern Queensland Regions

Source: Cummings Economics from Civil Aviation Safety Authority.

3. **Mackay airport** is also privately operated by NQ Airports Pty Ltd. The airport has direct services to Townsville and Rockhampton, Brisbane, Sydney and Melbourne, with services to the Gold Coast due to commence in July 2014. Passenger flows have increased strongly in recent years related especially to the mining industry workforce. The airport is planning major expansion under its master planning. The State Government is assisting Mackay airport and Mackay Regional Council to solve infrastructure and planning issues necessary to allow future growth of the airport at the same time as efficient movement of traffic.[2] NQ Airports have a $900m expansion plan over a 20-year period, with direct domestic flights to Sunshine Coast and Newcastle, and international flights to New Zealand planned to be in operation by 2019.

4. **Rockhampton airport** has services to Brisbane, Gladstone, Mackay, with links to Townsville and Cairns. The Airport is used by both domestic and international airlines and facilities include unrestricted wide-bodied operations and a mix of wide-bodied aircraft including the B747 to B777 and A340 types. It provides valuable international heavy-lift air freight capabilities, a defence force role, charters and training.

5. **Whitsunday Coast airport** is operated by Whitsunday Regional Council. The airport is serviced by regular daily flights aboard wide-bodied jet aircraft including B737 & A320 type aircraft. Jetstar and Virgin Australia provide a direct flight to & from Brisbane and connections to southern ports. Tiger Airways commenced a direct flight service to Sydney on 1 April 2014**.**

   Whitsunday Regional Council is seeking support to upgrade the airport to international standard to increase tourism opportunities and agricultural exports to domestic and international markets. One of the proposed integrated resort projects, if proceeded with, would be a further stimulus for such an upgrading.

6. **Mount Isa airport** is operated by Queensland Airports Limited. It has major domestic airline links with Brisbane and regional links with Townsville and Cairns and Darwin, along with other small centres in the west. Mount Isa's passenger mix is predominately business based accounting for 48% of all travel. The visiting friends and relatives market (VFR) accounts for 24% of travellers. There is a high frequency of travel in Mount Isa due to the nature of the fly in fly out (FIFO) market as well as the region's remoteness.[3]

7. **Gladstone airport** is owned and operated by Gladstone Regional Council. The number of aircraft movements at Gladstone Airport in 2012/13 increased to 21,300 of which include B717, E190 and B737-800 aircraft. General aviation traffic has also grown and varies from large corporate jets to recreational flyers and helicopters carrying out emergency flights, sea pilot transfers and transit connections to Heron Island. There are QantasLink and Virgin services to Brisbane. QantasLink has introduced direct services to Sydney.[4]

8. **Weipa airport -** Most people travel to and from Weipa by air, via a daily QantasLink air service from Cairns which connects with southern flights. There are also several charter airlines with operate out of Weipa and are available for passenger and freight transport.

[2] Economic Directions Statement Queensland Airports 2013 – 2023, page 21.
[3] Source: ABS Census data, 2006, Mount Isa Airport Passenger Survey, 2009.
[4] Ibid.

9. **Horn Island (Ngurapai) airport** is owned and operated by the Torres Strait Islands Regional Council. It is considered to be the gateway to the Torres Strait and the Northern Peninsula Area. QantasLink operates a twice-daily RPT service between Horn Island and Cairns. Westwing Aviation operates daily RPT services to the majority of the Torres Strait Islands. Other operators who offer charter services throughout the Torres Straits & Northern Peninsula Area include Barrier Aviation, Skytrans, Cape York Air and Cape Air Transport. Additional to this, Reef Helicopters and Cape York Helicopters also provide helicopter charter services.

10. **Moranbah airport** is a privately operated airport mainly servicing FIFO traffic for the Bowen Basin coalfields. It receives RPT flights from centres including Cairns, Townsville and Brisbane.

11. **Emerald airport** - The Central Highlands Regional Council owns and operates the Emerald Airport. It is serviced by two commercial airlines, QantasLink and Virgin with over 60 services per week and has recently been upgraded.

12. **Cloncurry airport** is owned by Cloncurry Shire Council and is an ageing facility, first constructed in the early 1940s. In the last four years the airport has seen pax growth of 128% with 94% of pax being FIFO. Pax numbers are forecast to reach 100,000 over the next two years (2014/15). Virgin Australia operates twice weekly non-stop flights from Brisbane using Embraer E190 jets. Queensland Government will commit $500,000 from the Royalties for the Regions program towards a $3.6 million upgrade of airport terminal and apron.

13. **Longreach airport** is operated by Longreach Regional Council. Longreach airport's new passenger terminal opened in September 2012. QantasLink operates services from Brisbane and Rex Aviation operates services from Townsville. The airport is considered to be of military significance due to its important role associated with the Jindalee Operational Radar Network.

Note: Laguna Quays - It is important to note that while Whitsunday Regional Council is proposing that the Proserpine Whitsunday Coast airport is upgraded, the major $5bn proposed resort project at Laguna Quays could involve the development of a new international airport at Laguna Quays on the coast. It should however be noted that Laguna Quays is less than 30km from Whitsunday Coast Airport.

In addition to the above, the following airports have regular air services – Birdsville, Bedourie, Doomadgee, Mornington, Normanton, Karumba, Kowanyama, Pormpuraaw, Aurukun, Bamaga, Cooktown, Palm Island, Julia Creek and Hughenden.

4.3 INTERNAL CONNECTIVITY ISSUES

4.3.1 General

Consideration of internal connectivity issues falls into a number of different fields:

- support for development of dispersed rural centres and their connectivity with the major regional cities;
- the development of improved connectivity between the major centres;
- support for tourism development;
- support for mining development;
- the development of defence, surveillance and emergency services;
- the development of engineering maintenance and support services including education and training.

4.3.2 Support for rural communities and development

The development of the northern regional economies still relies heavily on dispersed rural and resource-based industries. It is extremely important to the continued economic health and development of these areas that there is strong connectivity with the major regional cities that provide business services as well as important social support services in fields like education, health and cultural activities.

Map 4.2 shows regular passenger services into the dispersed rural centres in the regions supported by the Queensland Government.

4.3.3 Government support

Regional services and the smaller regional aerodromes receive substantial government support.

The Australian Constitution provides the state and territory governments with the power to regulate regional aviation as it is predominately an intra-state trade issue.

Regional aviation refers to that part of the aviation industry that engages in scheduled commercial airline activity between regional areas or between regional areas and capital cities. Traditionally, regional aviation services have been identified as those airlines performing regular public transport services and whose fleets contain exclusively low capacity aircraft (38 seats or less or with a payload of 4,200 kilograms or less). However, Australia's regional airlines now commonly use larger aircraft. Some regional areas are also serviced by jet aircraft operated by major domestic airlines.

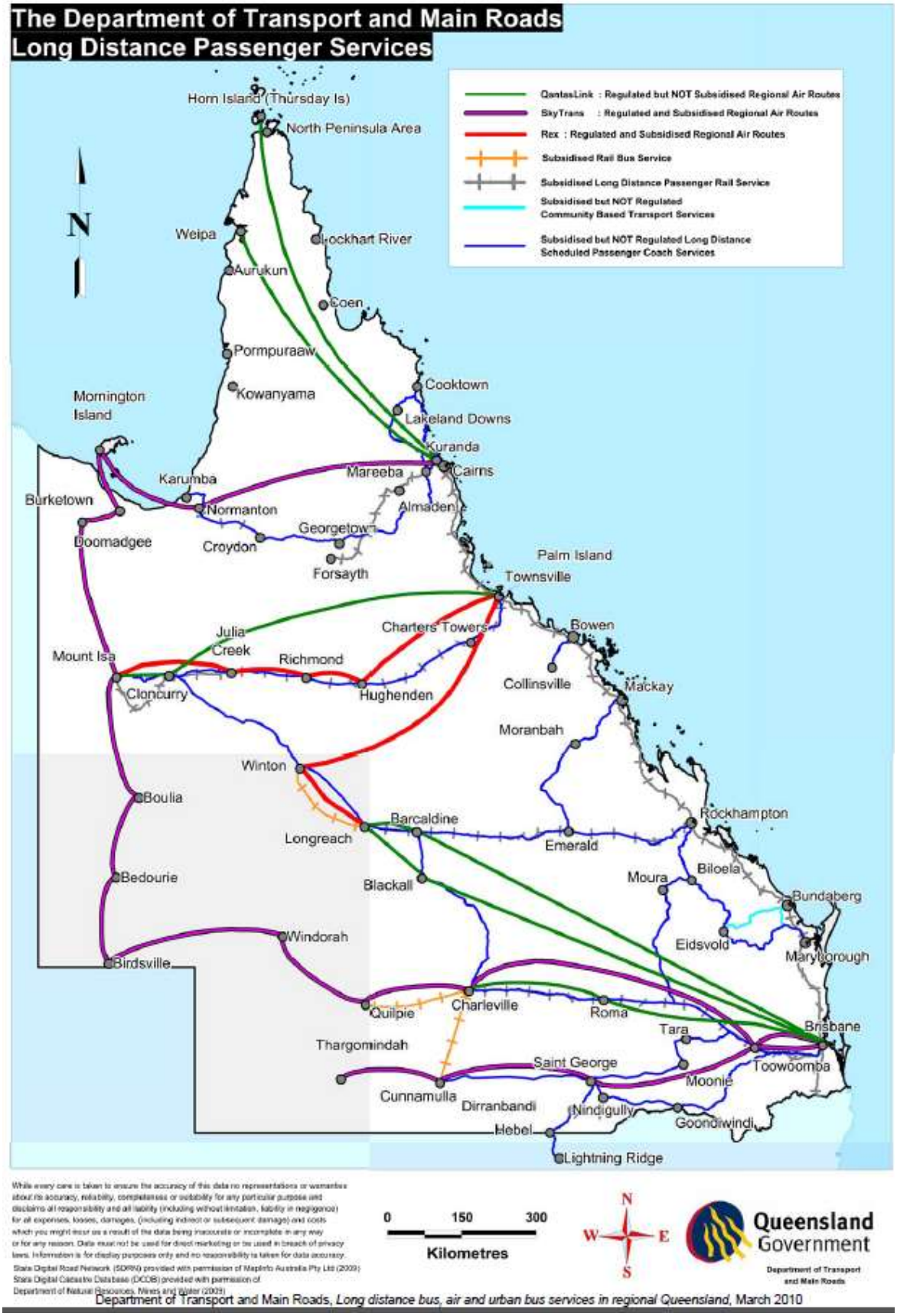
Intra-state aviation services are regulated in Queensland, New South Wales, South Australia and Western Australia. The remaining states and territory are deregulated.

Commonwealth Government

The Remote Air Services Subsidy (RASS) Scheme is part of the Commonwealth Government's Regional Aviation Access Programme (RAAP). RASS subsidises a regular weekly air transport service for the carriage of passengers and goods such as, educational materials, medicines, fresh foods and other urgent supplies to communities in remote and isolated areas of Australia. Mail is carried on these flights under a separate contract with Australia Post.

The RASS subsidy is paid directly to the air operator. Air operators providing air services under the RASS Scheme are required to service specified RASS communities.

Map 4.2 – Internal Regional RPT



Department of Transport and Main Roads, *Long distance bus, air and urban bus services in regional Queensland*, March 2010

The air operators with current contracts in North Queensland are:

- Channel country (freight only) – Chinta Air
- Channel country – Chartair
- Cape York – West Wing
- Gulf Country – West Wing

Air operators are contracted with the Commonwealth Government for a fixed term.

Other funding provided by the Commonwealth Government under the Regional Aviation Access Programme (RAAP) to improve air services in North Queensland include:

- The Remote Aviation Infrastructure Fund (RAIF) - Provides for airstrip upgrades at remote indigenous communities receiving a weekly flight under the RASS Scheme and where the airstrip is not at the required Regular Public Transport (RPT) aviation safety standard.
- The Remote Aerodrome Inspection (RAI) Programme -Provides identified remote Indigenous communities with annual inspections and related services to assist those communities to meet their aviation safety obligations.
- The Remote Airstrip Upgrade (RAU) Programme - Provides funding to improve the safety and access of airstrips in remote and isolated communities in Australia. Under Round Two of the RAU programme, $9 million in Commonwealth Government funding was allocated to 39 projects over the next two years (refer to Table x for approved Queensland projects). *Senator McLucas stated in her press release dated 27th May 2014, that at the Senate Estimates the government had axed the RAU after 2014-15.*

Table #4.2: Regional Aviation Access Program – Remote Airstrip Upgrade Component – Round 2 – Queensland Approved Projects

Applicant	State	Aerodrome	Project	Total Project Cost $	Australian Government Funding 2013-15 $ (GST excl)
Aurukun Shire Council	QLD	Aurukun	Install PAALC unit and upgrade electrical components.	15,000	7,500
Blackall-Tambo Regional Council	QLD	Blackall	Upgrade aerodrome lighting & cabling. Install new transformer.	225,432	112,716
Charters Towers Regional Council	QLD	Greenvale	Resheet runway	210,000	105,000
Charters Towers Regional Council	QLD	Greenvale	Install solar runway lighting and illuminated wind direction indicator.	51,930	25,965
Charters Towers Regional Council	QLD	Pentland	Install runway lighting and illuminated wind indicator.	51,930	25,965
Kowanyama Aboriginal Shire Council	QLD	Kowanyama	Upgrade perimeter fencing, runway lighting & drainage; install windsock.	840,000	840,000
Lockhart River Aboriginal Shire Council	QLD	Lockhart River	Repair and resurface aerodrome pavements and upgrade the runway drainage.	700,000	650,000
Longreach Regional Council	QLD	Isisford	Reseal the runway and taxiway and erect animal proof boundary fence.	625,500	312,750
Longreach Regional Council	QLD	Yaraka	Reseal the runway and taxiway and erect animal proof boundary fence.	405,000	202,500
Mount Isa City Council	QLD	Camooweal	Install runway perimeter fence and upgrade drainage.	190,000	95,000
Murweh Shire Council	QLD	Augathella	Install runway perimeter fence.	42,000	21,000
Woorabinda Aboriginal Shire Council	QLD	Woorabinda	Repair and seal the runway; extend and seal the aircraft parking area; line mark pavements.	188,440	188,440

Source: Commonwealth Government – Department of Infrastructure and Regional Development website

The Remote Aerodrome Safety Programme (RASP) provided assistance to upgrade aerodromes in remote and isolated communities to facilitate the delivery of essential goods and non-commercial air services including health care. This programme has closed.

The Airservices Australia Enroute Charges Payment Scheme provides a subsidy to air operators providing aeromedical services through a reimbursement of their Airservices Australia enroute air navigation charges. The Commonwealth Government has announced that a new and better targeted En Route Charges Payment Scheme will be introduced.

Queensland Government

Contracted air services

The Queensland Department of Transport and Main Roads regulates and in some cases subsidises a number of regular passenger transport air services to ensure rural and remote areas have year round access to a range of essential business, educational, medical and cultural services.

The Queensland Government commits around $8.5 million per annum to ensure the continued operation of these services. Tenders close for these contracts on 27th June 2014 with new contracts commencing on 1st January 2015 for a period of 5 years with an option for 2 years.

The contracts stipulate that the air operator will offer a range of fares up to a maximum fare. Airfares will be indexed annually plus there is provision for extraordinary circumstances.

Previous **Map 4.2** provides details of the current subsidised and regulated long distance air services in regional Queensland. The new contracts will not include a regulated or subsidised air service from:

- Cairns to Weipa
- Cairns to Horn Island or
- Townsville to Cloncurry

This means there will be no maximum cap on air fares on these routes from 2015. Should the routes fail to attract competition or revenues fall, it is possible that an aircraft operator will increase fares above the current maximum air fare.

The current contract holders for each of the regulated air services routes in North Queensland are:

- Western 2 (Brisbane-Toowoomba-Charleville-Quilpie-Windorah-Birdsville-Bedourie-Boulia- Mount Isa) – Skytrans
- Gulf (Cairns-Normanton-Mornington Island-Burketown-Doomadgee-Mount Isa) – Skytrans
- Northern 1 (Townsville- Winton-Longreach) – Regional Express or REX
- Northern 2 (Townsville-Hughenden-Richmond-Julia Creek-Mount Isa) – Regional Express or REX
- Northern 3 (Townsville-Cloncurry-Mount Isa) – QantasLink
- Central 2 (Brisbane – Blackall/Barcaldine – Longreach) – QantasLink
- Horn Island (Cairns – Horn Island) – QantasLink
- Weipa (Cairns – Weipa)– QantasLink

Freight is also an important component of the subsidised and regulated long distance air services. A large percentage of the freight is time critical eg blood samples, documents and mechanical parts for the fishing and mining industries. The freight carried is dictated by the type of aircraft with some aircraft being more freight friendly than other aircraft. Some freight is opportunistic but is welcomed as the state government expects the aircraft operator to maximise revenue. An example is live mud crabs from Karumba when the roads are closed due to flooding. The ability to provide a reliable supply of a perishable product to an interstate market is important to the reputation and economy of Karumba.

Other funding provided by the state government to improve air services in North Queensland include:

- Department of Transport and Main Roads – Transport Infrastructure Development Scheme (TIDS) - Provides support for a range of projects, including those which have the purpose of enhancing the safety and accessibility of regional/remote airports.
- Department of Local Government, Community Recovery and Resilience – Local Government Grants and Subsidies Program (LGGSP) - Provides grants to local governments to assist with priority infrastructure improvements, essential to the needs of local communities, including airport/airside infrastructure.

4.3.4 Comparative airfares

Table #4.3 over gives a comparison of air fares on the regional routes and airfares between some of the regional cities and southern metropolitan centres. The right hand column shows cents per kilometer.

The table illustrates the disparity in cents per kilometer on the regional routes with amounts over a $1 per kilometer on some routes to 20¢ and below Cairns Brisbane and Cairns Sydney. Among the highest fares per kilometer are those on flights linking the Northern Queensland regional cities.

4.3.5 Service deficiencies and opportunities

There are obvious deficiencies in the air links available between the main regional cities and the rural areas that they traditionally service. Noticeable, is the lack of air services between Rockhampton and Mackay and their servicing hinterlands. While there are services out of Brisbane to centres like Longreach, Barcaldine and Blackall and to Emerald and Moranbah, there are no services out of Rockhampton and Mackay. This is to the detriment of their strong development as regional servicing centres and the efficient provision of services to centres in their hinterland. State Government subsidies and other incentives are made available on a number of the routes out of Brisbane to ensure their viability. It is suggested that the pattern of these subsidies and incentives be reviewed in the interests of the efficient development of these regions. Another apparent area for attention, is the lack of air services into Georgetown and Croydon where major prospective rural developments are set to take place.

Clearly additional rural development along with mining and tourism development discussed below will help provide the population increases and increases in passenger volumes that will make air services more viable with, in some cases, a lesser need for subsidisation.

Positive also for the development of better air services would be greater funding for the increased delivery of a range of health education and other social services into rural centres where they are currently badly deficient. These local deficiencies lead to expenses for families having to travel to the main regional cities to access these services.

Table #4.3: Queensland – Regional Air Services, Comparison of Air Fares

From	To	Company	Adult Airfare One way Thursday 5th or Friday 6th June	Adult Airfare One way Mon 9th or Tues 10th June	Flight distance	Flight time	$/km
Gulf route - subsidised contract							
Cairns	Normanton	Skytrans	378	378	506 km	1 hr 30 min	0.75
	Mornington Is.		480	958	687 km	2 hr 50 min (4 hr 50 min)	0.70 -1.39
	Burketown		456	892	667 km	3 hr 50 min (3 hr 50 min)	0.68 – 1.33
	Doomadgee		482	899	744 km	4 hr 35 min (3 hr 5 min)	0.64 – 1.21
	Mount Isa		299	378	782 km	2 hr 5 min	0.38 -0.48
1. Skytrans operates an unregulated & non-subsidised flight direct from Cairns to Mount Isa. Higher charge for Mon and Tues is due to flight being Cairns to Mount Isa and connecting to Gulf flight. 2. Flight time in brackets is combined flight time ie not including stopover time at Mount Isa airport.							
Western 2 route – subsidised contract							
Brisbane	Windorah	Skytrans	599	393	1,060 km	4 hr 15 min	0.37 – 0.57
	Birdsville		619	476	1,374 km	5 hr 40 min	0.35 – 0.45
	Bedourie		687	483	1,409 km	6 hr 40 min	0.34 – 0.49
	Boulia		755	492	1,417 km	7 hr 30 min	0.35 – 0.53
	Mount Isa		797	530	1,571 km	8 hr 30 min	0.34 – 0.51
Cairns to Weipa – regulated but not subsidised							
Cairns	Weipa	QantasLink	205	366	623 km	1 hr 40 min	0.33 – 0.59
Cairns to Horn Island – regulated but not subsidised							
Cairns	Horn Island	QantasLink	220	419	793 km	1 hr 40 min	0.28 – 0.53
Regulated but not subsidised							
Longreach	Brisbane	QantasLink Fully flexible	529		991 km	1 hr 55 min	0.53
Longreach	Brisbane	FlightCentre (FlexiSaver) flying Qantas	391		991 km	1 hr 55 min	0.39

Table #4.3: Queensland – Regional Air Services, Comparison of Air Fares Cont'd

From	To	Company	Adult Airfare One way Thursday 5th or Friday 6th June	Adult Airfare One way Mon 9th or Tues 10th June	Flight distance	Flight time	$/km
Non – subsidised or regulated routes							
Cairns	Aurukun	Skytrans	519	519	558 km	3 hr 10 min	0.93
	Bamaga	Skytrans	299	499	760 km	2 hr 5 min	0.39 – 0.66
	Coen	Skytrans	498	498	448 km	1 hr 15 min	1.11
	Pormpuraaw (Edward River)	Skytrans	506	506	494 km	2 hr 10 min	1.02
	Lockhart River	Skytrans	529	529	525 km	2 hr 0 min	1.01
Cairns	Townsville	FlightCentre (FlexiSaver)	390		284 km	0 hr 50 min	1.37
Cairns	Mackay		530		597 km	2 hr 5 min	0.88
Cairns	Rockhampton		483		874 km	4 hr 10 min	0.55
Cairns	Brisbane		279		1,391 km	2 hr 5 min	0.20
Cairns	Sydney		320		1,971 km	3 hr 0 min	0.16
Cairns	Melbourne		419		2,311 km	3 hr 25 min	0.18
Cairns	Darwin		570		1,677 km	2 hr 35 min	0.34
Townsville	Brisbane		369		1,112 km	1 hr 50 min	0.33
Mackay	Brisbane		305		797 km	1 hr 25 min	0.38
Rockhampton	Brisbane		252		518 km	1 hr 10 min	0.49
Mount Isa	Brisbane		549		1,573 km	2 hr 10 min	0.35
Emerald	Brisbane		355		653 km	1 hr 25 min	0.54
Brisbane	Sydney		345		753 km	1 hr 35 min	0.46
Brisbane	Melbourne		405		1,381 km	2 hr 25 min	0.29
Sydney	Melbourne		346		706 km	1 hr 35 min	0.49
Mackay	Rockhampton		370 (1)		279 km	50 min	1.33
Townsville	Mackay		345 (1)		330 km	1 hr 00 min	1.05

(1) Note: Thursday/Friday 12/13 June 2014

Source: Airline and Flight Centre websites on the days indicated.

It would seem more efficient in some cases to provide facilities locally but manned by specialist staff on a fly-in basis rather than obliging rural residents to travel to distant centres to access these services. For instance the development of 'birthing suites' in remote centres serviced by fly-in staff would appear to be much more efficient than expecting mothers to travel away from their families to distant centres with attendant social disruption and great costs of accommodation for family members.

4.3.6 Factors affecting regular air services to smaller centres

Airlines operating services to rural and remote communities from the major regional centres are impacted by a variety of factors.

The following gives some of the factors affecting costs and efficiencies of services.

- **Regulations** applied to the aviation industry have increased significantly over the past two years, and this has increased airline operating costs. One airline provided the example of having increased its safety staff from one person to a department of six, and on top of that, increasing quality assurance staff from around 3 people to 14.

  In one case, it was reported that new regulations had been introduced at such a rate that CASA seemingly struggled to keep up with enforcing airline compliance with newer regulation.

  In 2015, the same safety regulations applied to regular passenger transport services (RPT), will be applied to Charter flights hence it is likely charter costs will increase as a result of having to implement increased safety measures.

  In addition, it was reported that aerodrome regulations were causing undue costs of operation and cost of airport facilities.

- **Fuel impacts** the cost of operations both in terms of its availability and cost. The cost of fuel in Cairns for example is $1.13 per litre compared with up to $3 per litre in the remote communities. In these remote communities, demand for aviation fuel is low, so it is bought in small quantities, and in smaller containers which results in high freight costs.

  It is also challenging in some remote communities to have staff who are competent in aviation fuel handling and quality control procedures and this contributes to the lack of fuel supplies. The limitation of refuelling spots en-route mean that instead of being able to uplift a full load of 36 passengers out of Mount Isa, on the Doomadgee, Mornington Island, Normanton, Cairns route, uplift must be dropped to 28 passengers – a 22% reduction in capacity.

- **Airport Fees** can account for 18-20% of cost of operations, but will vary. Many regional and rural aerodromes are owned and operated by local Councils. Qantas, which is looking to cut costs by $2 billion, wrote to all regional airports asking them to review landing fees; Virgin Australia has done the same thing. Another airline reported that airport fees varied between $130 per landing up to $1000 which included airport management fees at one airport. The position taken by airline operators is that if local councils want to encourage frequent and regular services, with affordable airfares, the airport infrastructure needs to be treated as a community service and operated on a cost neutral basis, rather than as a revenue earner.

- **Regional Aviation Access Programme (RAAP)** is the Commonwealth Government's program to provide funding assistance for access and safety upgrades to remote

aerodromes. There are a number of airports in the NQS region where current airport facilities impose a limit on aircraft size, where there is sufficient demand to operate a larger aircraft. The larger the aircraft, the cheaper the seat cost.

- **Charter Flights:** If the State Government made use of RPT services instead of chartered flights in the Northern Queensland region where appropriate, existing funds can be reallocated towards RPT services instead. This could enable RPT operators to reduce fares and increase frequency of services.

- **Flight Patterns:** Another aspect of Charter flights is that those airports where there is a small kiosk, or bar, find that with RPT flights, passengers will purchase a coke, or a pack of chips while waiting to board. With Charter flights the passengers walk straight through the terminal without buying anything.

  Twice daily flights (out and back in the morning and then out and back in the evening) between regional centres and remote communities would provide a number of benefits. The outgoing flight on a Monday morning for example would have a load factor of 90% with an average fare of $400 carrying in the main, government workers. On the return journey, the load factor would be around 30% the average fare $150 and passengers members of the community taking the opportunity to travel into the regional centre for medical appointments, shopping excursions, to visit friends or relatives or any one of a myriad of reasons. These same people would have most of the day in the regional centre, and then return to their community on the afternoon flight – which would have a similar load factor of 30% and $150 airfare. The aircraft would then pick up the government workers, having given them the whole day in community, and return home with 90% load and airfare averaging $400. In simpler terms, the community members would be the backload.

- **Size of the market** is obviously the biggest influence on airfares, frequency and viability of services. In a nutshell, the Cairns/Horn Island market is around 100,000 and Cairns/Weipa is around 80,000 and NPA (Bamaga) is around 14,000. One company will not consider operating a route which is below 40,000 and most routes in the NQS region are 10,000 or less – indicating the importance of subsidies in the smaller markets.

- **Airfares:** Where 70% to 80% of passengers either work for or are contracted to do work for the government, they will travel regardless of the fare. Since the demand for these services are relatively inflexible, there is no incentive for operators to reduce their fares to a more competitive level to stimulate demand.

4.3.7 Connectivity between the regional cities

It is a sad fact that considerations of service availability and cost can lead to it being cheaper and easier for meetings between the regions to be held in Brisbane rather than internally within Northern Queensland. Of course continuing growth of population in the main regional cities will help overcome this situation. The use of aviation services to support tourism and mining development as outlined below could also play a role in strengthening interconnectivity within the North.

4.3.8 Support for tourism development

Air services play an extremely important role in bringing visitors into Northern Queensland.

The following looks at the role that aviation services can provide in moving visitors around the northern regions and in providing sightseeing and adventure experiences for tourists at a range of destinations in the northern regions.

Cairns airport obviously provides a major access point for international visitors into the area.

The only larger jet link within Northern Queensland of special international tourism importance is Cairns/Hamilton Island with on-linkages to Brisbane.

It is suggested that with the continuing growth of international tourism (especially from Asia as outlined in Section 1), support for a coordinated approach could see tourism flows supporting greater inter-connectivity between the major regional centres and tourism areas.

A significant tourism hub has developed around Longreach and Winton presenting an iconic Australian experience of potential international interest. So far, these centres have failed to attract substantial international visitation. Another potential tourism growth area in which aviation access is vital is the Torres Strait area, and attractions at Mount Isa might be incorporated with Central West Outback tours.

The viability of the international services into Northern Queensland is heavily dependent on overseas visitors as opposed to other elements of traffic. One of the viability problems in sustaining more extensive international links comes from the lack of outbound traffic and especially front of aircraft business traffic. The number of people living in Northern Queensland will soon pass one million. It is estimated by North Queensland Airports that apart from those living in the immediate region, over 90% of those travelling overseas would travel via Brisbane. Growing direct inter-connectivity within the northern regions would help increase the proportion supporting direct international air links from Northern Queensland.

One of the negative factors that needs to be addressed relates to travel agency booking systems. Domestic airline links from regional centres to Brisbane will show up in itinerary planning. If those links involve narrow bodied regional airline links, they will tend not to show up. Any concerted effort to expand inter-regional tourism inter-linkages will need to include consideration of this issue.

A third aspect of aviation related tourism in Northern Queensland relates to the use of aircraft to provide sightseeing and adventure tourism experiences. Fixed wing aircraft, helicopters and seaplanes are being used extensively to provide sightseeing of the reefs, coasts and rainforests of the area. There are three adventure skydiving operations. As tourism development increases, these types of operations offer an opportunity to augment tourism attractions and airport viability.

4.3.9 Support for mining

Use of aviation to provide workforce on a fly-in/fly-out basis to mining operations has become a major feature of development of mining activity in Northern Queensland.

Up until the mid-1990s, new mining developments, including in locations remote from major centres, involved establishing residential townships.

The imposition of Fringe Benefits Taxes on subsidised mine workers' accommodation in the 1990s, plus improvements in aircraft and a need at times to expand workforce rapidly, saw virtually all new major mines established since then using a FIFO workforce.

The negative aspects of this development have been subject to a Commonwealth Parliamentary review, which made a range of recommendations to improve the prospects of more workforce and services being provided from within the regions.

Regional centres in the Fitzroy and Mackay regions tended to lose out as major FIFO developed out of the Brisbane area and Cairns to the Bowen Basin coal fields, the LNG developments at Gladstone, but also to North West Queensland.

On the other hand, further north, Townsville and the Cairns/Cassowary Coast/Tablelands area tended to benefit, due to distance from Brisbane, including becoming a FIFO and mining services source for mining developments in the eastern Northern Territory area, Papua Indonesia and Papua New Guinea.

New dynamics in mining development in Northern Queensland include:

- A reduction of activity in the Bowen Basin due to lower world coal prices;
- A completion of the construction work on three LNG plants at Curtis Island, Gladstone, $66b and over 9,000 construction jobs (www.grc.com);
- A completion of the Wiggins Island Coal Export Terminal at the Port of Gladstone, $2.5b and 800 construction jobs (wicet.com);
- The likely commencement of construction and mining in the Galilee Basin in the coming years with investments worth of the order of $40bn;
- The likely construction workforce needed at Weipa in the future for the $1.2bn South of Embley project and down the track, at Aurukun;
- Expansion of the north-west minerals province with a focus on copper, lead, zinc and potentially uranium.

It would seem that the current hiatus in development in the Bowen Basin, and the resulting pressure on the mining companies to achieve efficiency gains and reduce costs and the shift of new construction further west to the Galilee Basin, could represent an opportunity for the northern regions to increase their services, including workforce provision, to mining developments by promoting lower cost provision of workforce from established regional towns in the area.

There is an economic efficiency argument in pursuing this.

A whole of government examination of the costs to government, including:

- provision of services in FIFO source areas,
- write off for tax by mining companies of costs of flying people in and accommodating them in temporary accommodation,
- at times, unused capacity to deliver services in nearby towns,
- growing surplus labour availability in the regional centres, and
- external benefits to other industries (agricultural, pastoral and tourism),

is likely to establish a case for increasing labour and service provision from regional centres.

4.4 DEVELOPMENT OF INTERNATIONAL AIR FREIGHT OPPORTUNITIES

4.4.1 Current situation

Although it is possible to move air freight in dedicated freighters, Australia wide, only a small percent of international air freight moves in dedicated freighters, with over 90% moving in the passenger aircraft cargo holds. By and large, dedicated freighters cannot compete on cost with freight on passenger services.

While substantial air freight is carried domestically, competition from fast delivery truck type services has been increasing, resulting in no or little growth in air freight.

Most of the aircraft used on regional routes and types commonly used on domestic routes tend to have limited air cargo capacity. The following gives estimated air cargo capacity on domestic flights from northern airports.

Table #4.4: Approximate Maximum Annual Air Freight Capacity on Regular Passenger Flights *(tonnes)*

	Cairns	Townsville	Mackay	Rockhampton	Gladstone
To Northern regional cities	3,206	5,167	3,654	2,471	778
To Darwin	1,259	104	0	0	0
To Southern capitals	32,133	13,833	8,358	3,199	4,913
(Brisbane)	(11,956)	(11,545)	(7,702)	(3,199)	(4,357)
(Sydney)	(13,207)	(1,196)	(656)	(0)	(555)
(Melbourne)	(6,188)	(1,092)	(0)	(0)	(0)
To international destinations	15,311	0	0	0	0

Note:
** direct flights only*
*** based on maximum aircraft freight capacity reported by Qantas, Virgin and/or Air Canada*

Cairns, Townsville and Mackay have substantial capacity to Brisbane.

The only airport moving international export freight is Cairns airport, although Townsville airport records $1bn in imports of metals which is believed to be 'gold' moving under high security from Papua New Guinea through to the Perth Mint.

Tonnages of international freight through Cairns airport are shown in the following table.

Table #4.5: Approximate maximum international freight capacity from Cairns International Airport (tonnes)

Regular passenger flight destinations	Annual capacity
Tokyo	5,132
Osaka (seasonal variations)	3,299
Hong Kong	3,120
Shanghai (currently seasonal)	761
Port Moresby	2,333
Rabaul (PNG)	222
Guam	374
Auckland (seasonal)	69
Total	***15,310***

Note:
** direct flights only*
*** based on maximum aircraft freight capacity reported by Qantas, Virgin and/or Air Canada*

Air freight tonnages showed a peak in the mid-2000s followed by a decline due to the strong reduction of air services from Japan.

As the following table indicates, exports are mainly sea foods while imports are mainly technical equipment.

Table #4.6: Composition of Value of Exports from Cairns Airport ($)

Selection of products	2009	2010	2011	2012	2013
Fruit, nuts and vegetables	3,105,130	2,660,212	1,681,654	2,075,502	2,959,046
Fishing and aquaculture	50,026,458	51,580,451	49,219,844	26,374,981	26,912,095
Seafood processing	15,356,106	11,400,000	11,102,471	32,000,878	39,407,483
Pharmaceutical and medicinal product manufacturing	5,074,504	6,491,270	1,504,435	3,429,028	9,259,443
Metal product manufacturing	1,623,028	2,106,344	3,408,292	3,939,648	10,003,773
Aircraft manufacturing and repair services	12,119,456	9,258,840	13,336,159	18,547,852	23,792,420
Mining and construction machinery manufacturing	17,865,847	14,668,295	17,247,306	19,888,464	12,866,641
Sum of items not readily classified	11,009,618	12,009,947	12,152,324	11,095,764	10,833,986
Other	37,151,969	36,700,675	44,669,731	67,197,456	59,288,273
Total	***153,332,116***	***146,876,034***	***154,322,216***	***184,549,573***	***195,323,160***

Source: Australian Bureau of Statistics.

Table #4.7: Value of Imports into Cairns Airport ($)

Selection of products	2009	2010	2011	2012	2013
Leather product manufacturing	3,667,218	3,017,516	2,589,320	3,722,584	4,228,261
Cloting, textile and knitted product manufacturing	394,999	627,941	375,760	1,017,032	1,953,959
Copper, silver, lead and zinc smelting and refining	4,108	32,984,381	25,634,419	0	0
Other metal product manufacturing	629,807	99,411,469	1,209,465	33,375,277	1,597,065
Automotive vehicle/ parts manufacturing	1,514,358	2,019,949	1,421,862	6,649,679	1,169,529
Aircraft manufacturing and repair services	7,474,944	8,800,602	10,999,819	13,028,085	7,544,328
Professional and scientific equipment manufacturing	4,718,334	7,216,168	4,616,967	12,933,099	12,653,736
Communication equipment manufacturing	802,354	2,717,840	5,022,078	6,089,534	9,862,852
Mining and construction machinery manufacturing	760,450	629,716	915,901	851,715	5,013,658
Other machinery and equipment manufacturing	3,255,875	3,859,621	4,650,245	5,065,545	6,685,577
Sum of items not readily classified	10,050	38,503	38,756	16,752	728,420
Other	4,344,553	5,676,256	6,290,038	4,886,179	6,629,255
Total	*27,577,050*	*166,999,962*	*63,764,630*	*87,635,481*	*58,066,640*

Source: Australian Bureau of Statistics.

The Papua New Guinea exports are believed to be restricted by the cargo space available on the type of aircraft being used.

Main export destinations have been Hong Kong and Tokyo and import origins Tokyo and Hong Kong.

Map 4.3 – Air Freight Connectivity with the Nearby Asia/Pacific

Source: Cummings Economics from Darwin and Cairns Airport Data, Dec 2013.

Seafood exports have played a major role in maintaining the viability of the Cathay services to Hong Kong, especially live fish for the restaurant trade with product believed to be moving via Hong Kong into mainland China.

While dedicated freighters have been periodically used to Papua New Guinea, longer term viability has been a problem.

Thus in summary, air cargo is playing an important role:

- In the development of a number of export industries, especially in seafood;
- In supporting delivery of services, especially mines in Papua New Guinea;
- In supporting the viability of passenger services generating large amounts of tourism/visitor income.

4.4.2 Future prospects

Future prospects for rapid expansion of air freight into Northern Queensland are bright.

North Queensland Airports (who operate both Mackay and Cairns airports), have been carrying out a program of heavy exploration and promotion of opportunities including conduct of a seminar and trade show recently, the “Tropical Queensland Export Exchange”, in May 2014.

Of critical importance will be a go ahead for the proposed major $8.2m Aquis Great Barrier Reef Integrated Resort project (see details, Section 1).

As recorded in Section 1, numbers of Chinese visitors are already approaching 150,000 a year despite limited direct links. The potential size of the Chinese market is massive. If the Aquis project proceeds as planned, up to 5-7 new flights a day will be generated out of major Chinese cities using sizes of aircraft that would provide a carrying capacity of 33,000 to 46,000 tonnes of cargo each way. This compares with current cargo capacity of about 15,000 tonnes. The flights generated would give Cairns the largest air freight capacity in Australia from China.

The large integrated resorts and associated other developments are also expected to generate additional flight capacity from countries other than China. Total air freight capacity into Cairns can thus be expected to reach up to the range of 60,000-70,000 tonnes a year.

The following table shows comparative international air freight movements of metropolitan centres.

The capacity available would enable Cairns airport to handle volumes above those currently moving through Perth and Adelaide and on a par with Brisbane. This represents a major opportunity to establish a major air freight export and import hub, especially relating to Australia’s growing economic relationship with Asia.

Similarly, if plans for either a $5bn Laguna Quays, or an alternative $5bn Airlie Beach integrated resort development in the Whitsundays, or the upgrading of the Whitsunday Coast airport are progressed, substantial air cargo space could become available direct to and from that area.

Expansion plans for Mackay airport to cater for international flights, and potential to expand international travel through other airports such as Rockhampton and Townsville, could result in significant cargo space being developed across Northern Queensland.

Table #4.8: International Air Freight Movements, Major Australian Airports (tonnes)

Airport	2009	2010	2011	2012	2013
Cairns	**5,476**	**5,863**	**5,966**	**5,305**	**5,472**
Export	3,952	3,615	3,444	3,485	3,641
Import	1,524	2,247	2,521	1,820	1,831
Sydney	**349,935**	**391,060**	**408,593**	**418,242**	**413,569**
Export	119,567	123,332	123,972	125,413	130,691
Import	230,367	267,728	284,622	292,830	282,878
Melbourne	**192,957**	**216,869**	**228,323**	**238,096**	**245,345**
Export	95,453	96,753	102,591	110,192	115,962
Import	97,504	120,116	125,732	127,904	129,383
Brisbane	**81,203**	**95,351**	**101,307**	**103,091**	**106,076**
Export	44,204	46,442	47,609	47,224	52,926
Import	36,999	48,909	53,698	55,867	53,150
Perth	**60,970**	**71,187**	**69,878**	**79,426**	**81,956**
Export	32,593	32,731	29,549	32,274	39,431
Import	28,377	38,456	40,329	47,152	42,525
Adelaide	**19,043**	**18,896**	**18,041**	**19,327**	**21,273**
Export	11,929	10,074	8,552	9,017	10,434
Import	7,114	8,822	9,489	10,310	10,840
Gold Coast	**4,261**	**6,627**	**5,940**	**6,240**	**4,654**
Export	1,376	1,252	1,105	1,210	1,009
Import	2,886	5,376	4,835	5,030	3,645
Other airports	**510**	**549**	**424**	**379**	**451**
Export	71	166	167	85	60
Import	439	382	257	293	391
Total Australia	**714,356**	**806,402**	**838,472**	**870,105**	**878,795**
Export	309,146	314,365	316,989	328,900	354,153
Import	405,210	492,036	521,483	541,205	524,642

Source: Australian Bureau of Statistics.

The following canvasses the type of air cargo that is likely to be involved. As a general statement, it is expected that, as for Australia as a whole.

- Exports will be dominated by primary product;
- Imports will be dominated by higher value manufactured goods;
- Imports will tend to exceed exports.

4.4.3 Potential exports

Base and seasonal cargoes

One of the major factors affecting the viability of exports of primary products in the past has been seasonality of production.

The following identifies that one of the key considerations is the year-round availability of product with those products available to support year-round flows termed in the following as 'base' cargoes.

Seafood/ocean products

Air cargo exports out of the area in the past has been dominated by seafood/ocean products, in particular:

- Live restaurant trade fish;
- Fresh tuna;
- Northern crayfish;
- Aquarium fish.

This is a mature trade that is well established and has been in place for decades, with experienced exporters and well established business links. These are generally high quality wild caught species.

Seafood cargo to Hong Kong supports continuation of the Cathay Pacific service on this route, enabling it to accept 30%-40% passenger loadings. It is therefore worth noting that freight loadings can assist Northern Queensland as a destination in maintaining and securing passenger services.

There is potential to increase seafood exports, despite fisheries resource limitations. The Torres Strait fishery has some capacity for expansion of the catch, including tropical rock lobster, already exported.

The coast from the Tropic of Capricorn north to Cape York, down the west coast of the Peninsula and around to the Northern Territory border, is equivalent to that from the Tropic around to Adelaide. The resource is very large and capable of being expanded on a managed basis, without long term damage to stocks. It is important however that unreasonable environmental constraints not based on science are avoided.

It is envisaged that supplies from Northern Queensland would be supplemented by product coming in from adjacent areas in Papua New Guinea, the Solomon Islands and Vanuatu.

Also of potential is the growing capability of the aquaculture/maricultural industries. As set out in Section 1, removal of non-science based restrictions on the sector is likely to see a major expansion of prawn and barramundi production.

It is worth noting that aquaculture is more resistant to cyclone damage than all horticultural industries and many other agricultural crops. While it is more resistant to direct damage, flood damage generated from cyclones may be an issue, depending on site selection.

While all aquaculture production has been able to be sold on the domestic market in the past, the industries' technological development is moving into an efficiency level and cost structures that in other primary industries has seen Australia finding major overseas markets.

In addition, important technological advances have been occurring in redclaw and potential farming of northern crayfish. High value crocodile skins are currently produced and exported from the area to the world fashion leather market by one specialist producer and as a sideline to a number of farms with additional tourism income. This industry is also likely to be capable of viable expansion in the future.

Redclaw crayfish are one of the aquaculture species with export potential. They have a high level of acceptance in Hong Kong, but very low volumes are exported, generally through the Sydney fish markets. The market potential is quite large and if developed could make a significant contribution to the export base loads required out of Cairns Airport and regional export earnings.

Appendix 6 gives a case study of a proposed aquaculture bioremediation project in the Burdekin Shire.

Meat

There are overseas markets for high quality chilled beef.

One company alone report that they export by air from Brisbane stores of the order of 5,000-7,000 tonnes per annum.

Existing and proposed new abattoirs in Northern Queensland are likely to be able to export substantial quantities of high quality beef for which markets in Asia are expanding. Enquiries from Asia are also indicating a demand for lesser grades for export.

The ability to provide certified Halal meat would be required for certain target markets (Indonesia, Malaysia included). However this is not simple. There are firstly a number of different Halal systems, depending on the consumer group to which the meat is consigned. Secondly to run the system, the abattoir will need access to appropriate Muslim employees, so a Muslim community resident near the abattoir site will probably be required.

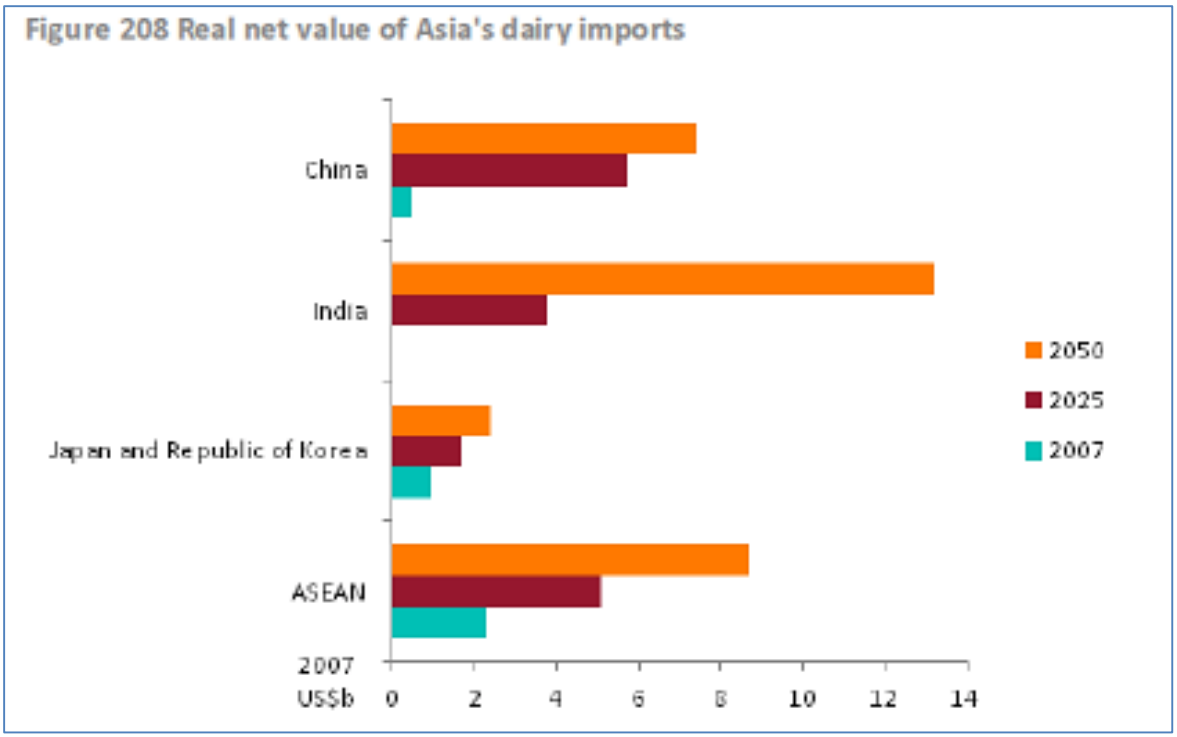
Due to labour costs in Australia, export opportunities for chilled meats are likely to centre on chilled sides, for boning out in the destination market and high grade cuts. Chilled sides could be transported by sea, whereas it may be cost effective for high grade cuts to be air cargo freight.

Dairy products

Demand for dairy products in China and elsewhere in Asia has been expanding and is expected to continue expanding. New Zealand has established export of fresh milk to China. The Tableland dairy industry is a cost efficient producer confined by the size of local markets.

It is capable of expansion to produce substantial volumes for air transport to China. China buyers are interested in quality Australian product packaged in Australia with guarantees of quality. New technology enabling bulk shipment in bladders carrying up to one tonne in bulk is now becoming available for overseas markets.

Dairy products are the third category of potential to provide ongoing base loading out of Cairns Airport. The ABARE publication *What Asia wants – Long term food consumption trends in Asia* (Research Report 13.12 October 2013 - ISBN: 978-1-74323-149-4; ABARES project:43399), for instance identifies dairy as a major area of import expansion in key Asian markets, as the following table (page 257) from the report indicates:



The regional dairy industry clearly presents a strong opportunity for producing economic flow on effects into the regional economy if it were to be one of the base load commodities.

The local industry has some particular strengths:

1. Closest geographically in Australia to Asian markets, identified as being a key opportunity by ABARE
2. Produces the highest quality milk in Australia, so should be able to achieve a price premium. (It has consistently won awards to this effect)
3. The dairy is one of the very few, if not the only one in the Pacific Rim that does **not** have a 'Pacific taint' flavour, discernable and unappealing to the Asian palate.
4. Current factory production is running at less than half its annual 130 million litre production capacity
5. Alternatives to dairy are extremely limited in the area, due to the nature of the land and rainfall
6. There is already strong interest from some 20 different parties to secure milk for export from this facility. (Some are more serious than others and an assessment has not been made).

There are some significant barriers to translating these strengths into economic outcomes for the region. The industry produces 50 million litres at present and is reported to have a capacity to expand and to handle 130million litres. Milk represents another potential year-round base cargo.

Fruit and vegetables

Quantities of locally produced high quality fruits like mangoes and lychees have been transported by air in the past. The area's seasons compliments those of the northern hemisphere tropics.

Past problems have been:

- Seasonality and lack of additional air cargo space;
- Low air freight rates, space availability and low back-loading road transport costs to the south, leading to produce being exported via Brisbane and even Sydney airports.

The extent of available space potentially developing as a result of the expansion of the Chinese market could change the situation. What would be necessary in this field, would be to seek to have a range of production available from the northern regions to smooth seasonal peaks. The area already produces a very wide range of fruit and vegetable crops for local and southern markets and is likely to be able to achieve fairly steady volumes over a period of time.

Some of these products will require treatment for shipment and the negotiation of import protocols (see Section 3.3.5).

Although cost of producing bananas in the area compared with South East Asia currently rules them out as a potential major export, it is notable that quantities of bananas have been exported to Japan in the past that were grown under special chemical free conditions.

4.4.4 Imports

The Northern Queensland airports will be well positioned to act as an import hub if major air freight capacity develops on flights from China. Distance to Northern Queensland airports from Asia is shorter than to southern centres.

Apart from local needs of a wide range of manufactured goods including hospital supplies, electronic equipment, etc., it can be expected that freight rates to fill the space will be low. It is expected that against this background, it will be competitive to distribute southwards by air or road transport. The balance of both air, road and rail freight transport to the south, is still dominated by northbound movements. There is a great deal of back-loading capacity. Low rates are generally available for the different means of transport.

Some 5-7 services from China a day, plus existing and further developed air services elsewhere, would potentially deliver of the order of 60-70,000 tonnes of air cargo capacity a year.

There is a capacity for southward movement of about 500,000 to 600,000 tonnes a year by rail. Southbound primary produce moves mainly by road at a rate of the order of 500,000 tonnes a year. The dominant flow is still northwards with back-loading opportunities available. As set out in previous table**,** current air freight capacity available out of Northern airports is estimated at over 50,000 tonnes per annum and this can be expected to grow.

Storage packing and transport facilities at the airport will be needed:

- for on-carriage by air;
- for road transport to pick up in B-double size trucks including repacking for road transport;
- for transfer to rail.

In relation to the latter, railway lines pass close to most of the Northern Queensland airports and consideration could be given to developing spur lines or sidings at the airports.

Apart from on-carriage of imports to major southern centres by air, road or rail, there is a potential for local distribution within Northern Queensland. Special attention will need to be given to the development of two-way road transport flows between the major Northern Queensland cities to keep cost down. There are prospects of a two-way flow developing of produce from these regions coming in for export and distribution of goods imported by air.

The proposed development of air services from Papua New Guinea, Solomon Islands and Vanuatu to bring in produce for export, could be used for distribution of imports.

4.4.5 Commercial structures

The realisation of both the export and import opportunities will require the development of commercial structures to organise marketing and logistics over and above what exists at present, especially the receiving in of exports and distribution of imports, from/to the other Northern Queensland regions.

4.4.6 Treatment of exports and protocols

These questions are covered in Section 3, Agricultural Distribution Hubs.

4.4.7 Trade constraints

The question of trade constraints on goods handled through air export is covered in the “Agricultural Distribution Hubs”, Section 3.

4.5 RETURN ON INVESTMENT

Action to support the development of airports can be expected to result in private enterprise investment of well over $2bn over a period of time in a sector where the main airports are estimated to currently generate in operations and airport dependent industries of the order of 47,000 jobs and add of the order of $3.9bn to Gross Regional Product.

Government support for remote aerodromes will help maintain the viability of communities as identified in Section 2 on Roads, that account for of the order of $40bn in outside earnings for Northern Queensland, mainly from overseas.

A policy of increasing services especially to the mining industry from local communities as opposed to importing them from outside Northern Queensland, will help strengthen the regional service structure with benefits to the development of population and other industry sectors, especially agriculture and tourism.

International air freight exports from Northern Queensland currently generate almost $200m in earnings, especially for the marine industries. Identified prospective increase in international air cargo capacity is from about 15,000 tonnes to 60-70,000 tonnes. A four-fold increase in exports would take this up to $800m leading to an expansion of seafood, meat, dairy and fruit and vegetable production in Northern Queensland. If resort projects proceed in the Whitsundays and elsewhere, and additional capacity becomes available, the increase is likely to be more.

Imports on inbound flights being distributed to elsewhere in Australia will help fill excess capacity available on southward transport movements and help reduce freight costs for other commodities.

Most importantly, the air cargo movements will help the viability of expanded tourism based air services that will result in major increases in tourism income currently standing at about $6.5bn

4.6 AVIATION RECOMMENDATIONS

4.6.1 General

As with the Agricultural Distribution System, the investment that needs to take place is primarily in actions to encourage and support private enterprise investment and business development.

The aviation strategy is composed of four coordinated sub strategies:

1. Airport Investment Program;
2. Aviation Services Development Strategy;
3. Regional Mining Services Provision Policy;
4. Air Freight Trade Development Strategy.

4.6.2 Airport investment program

The major airports of Cairns, Townsville and Mackay, along with Mount Isa and Longreach have been privatised in recent years. For these airports, it is important is for government clearance of development plans and investments, and provision of adequate public access. Extension of privatisation / sale of airports to private operators where feasible and desirable, could help introduce extra private investment into the sector.

There will be a particular need for investment in airport development to support the Galilee Basin development.

The increase in tourism, especially from China, represents an opportunity for Northern Queensland and there will be a need to encourage investment in necessary upgrading.

Many remote airports receive assistance from Commonwealth and Queensland Governments, which makes an important contribution to connectivity and regional development and is recommended to continue.

4.6.3 Aviation services development strategy

This strategy is aimed at improving internal connectivity between the main cities and between the main cities and their servicing hinterlands.

Special deficiencies relate to links between Rockhampton and Mackay and their hinterlands and a review is needed of government support programs for air routes to consider this deficiency.

To improve connectivity between the main cities and generally throughout Northern Queensland, it is proposed that the three factors of 1) growing demand from population and business activity, 2) potential tourism development, and 3) mining services, be coordinated and proposals put to aviation operators to increase services, use larger aircraft and keep airfares down.

The Commonwealth and Queensland Governments generate a significant part of overall demand for air services. Reviewing travel and service policies in relation to chartered services to consider where it may be possible to make use of regular services instead, can go a long way to enable regular service operators to expand services to the benefit of the whole community.

Part of the 'Aviation Services Development Strategy' also needs to be aimed at reducing costs and improving efficiency for air service operators, including:

- Review the impact of regulations on operating costs and aerodrome development and operating costs;
- Review fuel costs in remote areas;
- Attention to landing fee costs;
- Continue upgrading of some airports using the RAAP program to enable them to take larger more cost efficient aircraft as part of the 'Airport Investment Program';
- Encourage efficient direct one day in/out services in the morning and in/pout services in the afternoon to maximise back-loading airfares for community as opposed to government traffic.

4.6.4 Regional mining services policies

Policies are needed to address the negative impacts of widespread fly-in/fly-out, on the efficient provision of workforce and support services from local and regional communities.

The Parliamentary Committee set up to investigate FIFO *issues,* identified biases in taxation treatment and provision of government support services that worked against the provision of local regional workforce and support services.

The strategy envisages a combined move to implement the recommendations of the Parliamentary Committee and a concerted regional program to expand the provision of regional services.

4.6.5 Air freight trade development strategy

This strategy aims to exploit the opportunity to achieve a large increase in air freight out of Northern Queensland with reverse direct importation and distribution of goods from Asia.

Fundamental to achieving this strategy is government support for private enterprise investment in major resort developments to open up the tourism markets and other business links, and achieve expanded direct passenger air services with attendant air freight capacity.

It is a 'trade' development strategy with attention to generating direct imports as well as exports.

This strategy is closely related to, and some aspects need to be coordinated with, the 'Agricultural Distribution Hubs Strategy' in Section 3.

The strategy envisages:

Market development

- Attention to improved market intelligence on potential export markets and potential import distribution possibilities;
- Attention to market access for tropical products in trade negotiations including attention to import protocols and trade barriers;
- Support for the dairy, meat and fruit and vegetable industries to exploit market opportunities.

Investment in facilities

- Investment in airport warehousing and cargo transfer systems to domestic flights and other means of transport;
- Investment in disinfestation facilities.

Supply

- Attention to balancing seasonality of supply of fruit and vegetable availability and coordination with high and low tourism flows;
- Support for expansion of aquaculture production to supplement export capacity of wild caught species.

Transport and distribution

- Attention to road and rail freight systems between the Northern regions;
- Development of inward and outward air freight to nearby Pacific Islands.

Commercial development

- Encourage the development of the export and import business / merchant sector to coordinate and exploit the opportunities.

5.0 OVERALL RECOMMENDATIONS

INTRODUCTION

Northern Queensland has made an outstanding contribution to national economic growth over the past decade and is poised to make a major contribution over the next decade.

However Northern Queensland has long suffered from constraints with internal transport systems, lack of direct connectivity with outside markets and poorly developed distribution systems that have impacted the rate of development.

The four Regional Development Australia committees north of the Tropic of Capricorn have come together to present three priority elements of a Northern Queensland Strategy to support the development of Northern Australia.

New Dimensions of Potential Growth

The region is rich in resources such as energy, water, minerals and outstanding tourism assets with much potential to supply rapidly expanding Asian markets.

Emerging technologies, especially those of relevance to operating industry and business in the tropics, and new markets, will be enablers of growth for the region in the future.

Potential new developments include:

Primary industries

- The sugar industry moving to produce much more than raw sugar;
- Pastoral industries expanding to meet growing demand for protein in Asia;
- Other crops breaking into overseas markets;
- Cropping moving north and west into new production areas;
- New technologies leading to potential expansion of aquaculture and biofuels production.

Mining

- Opening up the Galilee Basin coal developments;
- Prospective gas developments in the Far West and North West;

The Northern Queensland region covers an area equivalent to the States of New South Wales, Victoria and Tasmania.

Its population will pass 1 million in 2016.

It has an estimated Gross Regional Product of $80bn.

The 1 in 25 Australians who live in Northern Queensland:

- **Produce almost 1 in 5 of Australia's export dollars;**
- **Produce 9 out of 10 of Queensland's mining dollars and 1 in 5 of Australia's mining dollars;**
- **Produce 1 in 10 of Australia's agricultural production dollars.**

The area attracts the most international holiday visitors after Sydney and Melbourne.

- Expansion of bauxite mining in Cape York;
- New mining prospects in the North West and North East Mineral Provinces.

Tourism

- A major new surge of tourism development, especially out of China, including some of the largest integrated resort developments in the world.

INVESTING IN REGIONAL ROADS

Fundamental to realisation of potential

Previously lower levels of development of Northern Queensland have meant that the area's road system is in major need of upgrading.

The need for upgrading of the Bruce Highway connecting the Northern Queensland major cities with Brisbane has been recognised. Funding of $8.7bn over ten years has been announced by the Commonwealth and Queensland Governments.

Much of the area's economy is based on industries such as mining, agriculture, fisheries and substantial segments of tourism, located in areas away from the east coast.

If the area is to maximise its future contribution to national growth, there is a need to step up funding for regional roads.

The 10,000km of regional roads in Northern Queensland account for 2,000 million vehicle kilometres of connector traffic between towns and cities, equivalent to the Bruce Highway.

Reducing inefficiencies and costs

There is a need to upgrade the whole system to reduce excessive wet season road closure and damage:

- Large amounts are being regularly spent from disaster relief funds due to susceptibility of poor roads to extreme events.
- Large numbers of road closure days occur in the system each year causing large travel disruption and costs to the economy.

Improving the standards of roads could save large amounts in vehicle operating costs and travel time costs.

Catering for new developments

There is a need for improvements to cater for new developments in:

- Mining, especially the Galilee Basin, in Cape York and the North West and gas in the Far West and North West;
- Expanded agricultural areas in the Gulf Rivers, Cape York and the Burdekin and Fitzroy basins.
- Catering for expanding tourism use.

A System of East-West and North-South Connectors

External connectivity

There is a need to expand external connectivity, especially with Melbourne, Adelaide, Central and Northern Australia.

Return on investment

A major investment in regional roads will:

- Help underpin the viability of Northern Queensland's mining, agricultural and tourism base industries in the non coastal areas earning an estimated $40bn per annum of mainly export income.
- Help major new developments such as the $40bn Galilee Basin projects, and new cropping areas in the Gulf and Peninsula, one alone having a proposed investment of $1bn.
- Provide substantial benefits to the State's Gross Regional Product and government revenue.

Recommendations

- Investment into Northern Queensland regional roads and the development and implementation of the Queensland Western Roads Action Plan which will ensure a strategic and collaborative approach to the development of the regional roads network in Queensland including major roads in the north.

DEVELOPING AGRICULTURAL DISTRIBUTION HUBS

Achieving growth in agriculture

Northern Queensland will need to be a major contributor if Commonwealth and State objectives are to be achieved of doubling agricultural production by 2040 and increasing northern agricultural exports to a growing Asian market.

Overcoming weaknesses in the agricultural distribution system

There will need to be a major development of transport and distribution systems, especially to:

- Increase penetration of local markets;
- Develop direct container and air freight services from northern ports & airports.

Penetrating local markets

Action is needed to encourage:

- More distribution hubs in Northern Queensland by major retail chains;
- Specialist food distributors to increase local purchases;
- Local groups promoting greater awareness of local food products.

Developing container shipping

The current situation where almost all containerised agricultural exports move south through Brisbane, limits growth opportunities for northern producers. Current services out of northern ports cater mainly for minerals.

Developing container shipping for agricultural products needs:

- Base load cargoes spread throughout the year;
- Critical mass of services available to different overseas ports to be achieved;
- A reverse import trade;
- An improvement in inter-regional transport.

Potential cargoes include processed primary products including refined sugar along with seafood, meat, dairy products, fruit and vegetables, cotton, pulses, high grade wheat, sorghum, rice, cassava.

Return on investment

There are prospects of greatly expanding the $7bn agricultural sector.

Growing direct imports will help lower export freight rates, benefit consumers but also reduce costs and improve competitiveness of Northern Queensland's manufacturing and other industries.

Recommendations

Proposed strategy is at two levels:

General support

- Enhancing market intelligence and the region's products included in negotiation of trade arrangements and protocols;
- Encouraging and working with specialist commercial export merchants and agents;
- Enhancing quality through traceable food security systems, disinfestation plants and use of modified atmosphere technology;
- Accelerated research to improve crops and reduction of costs including of inputs like electricity.

Transport and distribution

- Working with shipping companies and others to develop exports / imports, and additional shipping services;
- Encouraging appropriate port investment;
- Recognition of the need to improve transport services between the northern regions.

SUPPORTING REGIONAL AVIATION AND AIR FREIGHT EXPORTS

Background

Aviation has long been of disproportionate importance to the Northern Queensland region.

There are some 54 certified and registered aerodromes, over 30 with regular passenger services accounting for 9.7m passenger movements.

Remote airports and services

There is a need for the Commonwealth and Queensland Governments to continue policies and funding supporting remote airport development and to extend support for additional air services from some regional centres to remote areas.

Need to reduce costs of regional operators

A range of issues have been identified that affect costs of regional air services including policy/regulation issues, high fuel costs, landing charges, poor facilities, and government charters that need attention.

FIFO issues

There is a need to increase supply of services to mining from local communities and to address the recommendations of the Parliamentary Committee of Inquiry into the damaging effects of fly-in/fly-out on local communities.

Major air freight opportunities

Developing tourism from Asia is promising to greatly expand direct flights into Northern Queensland.

This has potential to greatly expand air freight exports of primary products, especially seafood, meat, dairy products and seasonal fruit and vegetables. Extra flights will potentially lead to increased imports, such as high value medical supplies and equipment.

Return on investment

Airport operation and airport dependent industries are currently estimated to add 47,000 jobs and $3.9bn in Gross Regional Product to the Northern Queensland economy.

Benefits include:

- Support for over $2bn per annum planned in future airport development;
- Support for communities that account for $40bn in outside earnings;
- Support for the $6.5bn tourism sector;
- Expansion of air freight exports from $200m to of the order of $1bn.

Recommendations

An aviation strategy is proposed to include:

- Airport investment;
- Aviation services development;
- Local provision of services to mining;
- Air freight development linked to agricultural distribution hubs development.

BUSINESS CASES FOR

INVESTING IN REGIONAL ROADS, DEVELOPING AGRICULTURAL DISTRIBUTION HUBS AND SUPPORTING REGIONAL AVIATION AND AIR FREIGHT FOR EXPORTS

APPENDICES

APPENDIX 1

Table - Value of Mineral Production, Northern Queensland, 2011-12 ($'000)

Mineral		Total Q'ld	Total Nthn Q'ld Regions	Northern Queensland					
				Far North	Northern	North West	Mackay	Fitzroy	Central West
Fuel	Black Coal	**29,709,089**	28,843,967				18,066,313	10,777,654	
	Crude Petroleum	**1,066,289**	42,891				34,049	4,140	4,702
	Total	**30,775,378**	**28,886,858**	**0**	**0**	**0**	**18,100,362**	**10,781,794**	**4,702**
Metal	Bauxite	**595,841**	595,841	595,841					
	Copper	**2,420,590**	2,420,590	57,730	26,451	2,336,409			
	Gold	**711,705**	553,206	11,707	367,812	2,451		171,236	
	Iron Oxides	**58,718**	58,718		13,301	45,417			
	Lead	**1,883,216**	1,883,216	4,915		1,878,301			
	Silver	**21,368**	0						
	Tin	**39**	39	39					
	Titanium Minerals	**130,131**	0						
	Wolfram	**882**	882	882					
	Zinc	**1,641,432**	1,641,432	132,489	34,488	1,474,455			
	Total	**7,463,922**	**7,153,924**	**803,603**	**442,052**	**5,737,033**	**0**	**171,236**	**0**
Non-metal	Clays	**6,174**	0						
	Diatomite	**597**	0						
	Dimension Stone	**5,303**	2,127	316				1,811	
	Gems and Ornamental Stones	**887**	0						
	Gypsum	**1,368**	1,368			443			925
	Limestone	**28,120**	18,814	1,572	21	1,979		14,931	311
	Magnesium Rich Materials	**54,775**	53,913	179	371			52,924	439
	Ornamental Stones	**58**	58					58	
	Peat	**48**	48	48					
	Perlite	**661**	495	495					
	Phosphate Rock	**37,088**	37,088			37,088			
	Salt	**11,842**	11,842					11,842	
	Silica	**37,749**	34,374	32,979				1,395	
	Zeolite	**70**	70					70	
	Zircom	**132,913**	0						
	Total	**317,653**	**160,197**	**35,589**	**392**	**39,510**	**0**	**83,031**	**1,675**
Total	**All Minerals**	**38,556,953**	**36,200,979**	**839,192**	**442,444**	**5,776,543**	**18,100,362**	**11,036,061**	**6,377**

Source: Queensland Department of Mines and Energy.

APPENDIX 2

Road Related Expenditure Compared

Table - Total Road-Related Expenditure by State/Territory (a) and Selected Queensland Regions (b)

Road transport	2001–02	2002–03	2003–04	2004–05	2005–06	2006–07	2007–08	2008–09	2009–10	2010–11	2011–12
						$ millions					
Far North								258	144	209	188
Northern (c)								331	145	259	246
Mackay/Whitsunday								177	92	141	102
Central Queensland (d)								172	189	227	244
NSW	1,909	2,046	2,282	2,534	2,589	2,715	2,812	3,274	3,637	3,121	3,346
VIC	993	1,546	1,378	1,640	1,375	1,603	1,742	1,949	1,951	2,070	2,176
QLD	1,148	1,149	1,053	1,102	1,319	1,608	1,744	2,313	2,167	2,801	2,955
SA	364	404	301	315	346	411	257	347	331	351	334
WA	571	575	471	627	798	860	954	876	894	1,168	1,143
TAS	163	185	188	147	221	184	199	202	221	231	226
NT	57	51	68	66	158	158	145	188	179	178	211
ACT	106	105	155	149	152	155	204	193	229	256	256
Subtotal	5,311	6,061	5,896	6,580	6,958	7,694	8,057	9,342	9,609	10,176	10,647
Other	3,561	3,574	3,545	3,396	3,420	3,337	3,733	4,430	4,070	5,221	5,044
Total (e)	8,872	9,635	9,441	9,976	10,378	11,031	11,790	13,772	13,679	15,397	15,691

(a) The expenses by purpose data in this table are consistent with the underlying transactions data reported in 5512.0 for each jurisdiction. These data do not necessarily align with the data published by each Treasury. For further information on other differences please see the Explanatory Notes in the publication.

(b) Roads Investment Allocations have been used to estimate Queensland regional share.

(c) Northern region consists of Northern and North West statistical divisions prior to 2013-14

(d) Central Queensland region consists of Fitzroy and Central West statistical divisions prior to 2013-14

(e) Includes Commonwealth, Multi-jurisdictional sector and Local Government expenses by purpose.

Sources: Australian Bureau of Statistics , Government Finance Statistics, Cat No. 5512.0, Australian Bureau of Statistics, Regional Population Growth, Australia (Cat No.3218.0) 2012-13, Queensland Department of Main Roads, Queensland Roads Implementation Program, 2008-09 to 2012-13

Table - Per 1,000 Persons Total Road-Related Expenditure by State/Territory (a) and Selected Queensland Regions (b)

State	2001–02	2002–03	2003–04	2004–05	2005–06	2006–07	2007–08	2008–09	2009–10	2010–11	2011–12
					$ millions per 1,000 persons						
Far North								1.003	0.552	0.790	0.702
Northern (c)								1.319	0.567	1.000	0.930
Mackay/Whitsunday								0.001	0.545	0.825	0.582
Central Queensland (d)								0.001	0.836	0.990	1.002
NSW	0.292	0.309	0.343	0.379	0.384	0.397	0.405	0.464	0.509	0.432	0.458
VIC	0.208	0.317	0.280	0.329	0.272	0.311	0.331	0.363	0.357	0.374	0.386
QLD	0.321	0.307	0.275	0.281	0.329	0.391	0.413	0.534	0.492	0.626	0.647
SA	0.242	0.266	0.197	0.205	0.223	0.262	0.162	0.216	0.203	0.214	0.202
WA	0.300	0.294	0.238	0.312	0.389	0.408	0.439	0.391	0.390	0.496	0.469
TAS	0.344	0.387	0.389	0.302	0.452	0.373	0.399	0.401	0.434	0.452	0.441
NT	0.283	0.253	0.336	0.321	0.756	0.739	0.659	0.832	0.779	0.770	0.895
ACT	0.330	0.321	0.471	0.450	0.454	0.452	0.586	0.544	0.633	0.696	0.682
Subtotal	0.276	0.307	0.296	0.326	0.340	0.369	0.379	0.431	0.436	0.456	0.469
Other	1,378.096	1,529.966	1,504.669	1,426.291	1,437.579	1,327.367	1,391.353	1,540.334	1,332.242	1,675.008	1,603.306
Total (e)	0.460	0.489	0.474	0.494	0.507	0.530	0.555	0.635	0.621	0.689	0.690

(a) The expenses by purpose data in this table are consistent with the underlying transactions data reported in 5512.0 for each jurisdiction. These data do not necessarily align with the data published by each Treasury. For further information on other differences please see the Explanatory Notes in the publication.

(b) Roads Investment Allocations have been used to estimate Queensland regional share.

(c) Northern region consists of Northern and North West statistical divisions prior to 2013-14

(d) Central Queensland region consists of Fitzroy and Central West statistical divisions prior to 2013-14

(e) Includes Commonwealth, Multi-jurisdictional sector and Local Government expenses by purpose.

Sources: Australian Bureau of Statistics , Government Finance Statistics, Cat No. 5512.0, Australian Bureau of Statistics, Regional Population Growth, Australia (Cat No.3218.0) 2012-13, Queensland Department of Main Roads, Queensland Roads Implementation Program, 2008-09 to 2012-13

Table - Total Road-Related Expenditure per 100km2 by State/Territory (a) and Selected Queensland Regions (b)

Road transport	2001–02	2002–03	2003–04	2004–05	2005–06	2006–07	2007–08	2008–09	2009–10	2010–11	2011–12
						$ millions per 100km2					
Far North								0.095	0.053	0.077	0.069
Northern (c)								0.085	0.037	0.067	0.063
Mackay/Whitsunday								0.196	0.102	0.157	0.113
Central Queensland (d)								0.033	0.037	0.044	0.047
NSW	0.238	0.255	0.285	0.316	0.323	0.339	0.351	0.409	0.454	0.390	0.418
VIC	0.436	0.680	0.606	0.721	0.604	0.705	0.766	0.857	0.858	0.910	0.957
QLD	0.066	0.066	0.061	0.064	0.076	0.093	0.101	0.134	0.125	0.162	0.171
SA	0.037	0.041	0.031	0.032	0.035	0.042	0.026	0.035	0.034	0.036	0.034
WA	0.023	0.023	0.019	0.025	0.032	0.034	0.038	0.035	0.035	0.046	0.045
TAS	0.240	0.272	0.276	0.216	0.325	0.271	0.293	0.297	0.325	0.340	0.332
NT	0.004	0.004	0.005	0.005	0.012	0.012	0.011	0.014	0.013	0.013	0.016
ACT	4.496	4.453	6.574	6.319	6.446	6.574	8.652	8.185	9.712	10.857	10.857
Subtotal	0.069	0.079	0.077	0.086	0.091	0.100	0.105	0.122	0.125	0.132	0.138
Other	1,635.737	1,641.709	1,628.388	1,559.945	1,570.969	1,532.843	1,714.745	2,034.910	1,869.545	2,398.254	2,316.950
Total (e)	0.115	0.125	0.123	0.130	0.135	0.143	0.153	0.179	0.178	0.200	0.204

(a) The expenses by purpose data in this table are consistent with the underlying transactions data reported in 5512.0 for each jurisdiction. These data do not necessarily align with the data published by each Treasury. For further information on other differences please see the Explanatory Notes in the publication.

(b) Roads Investment Allocations have been used to estimate Queensland regional share.

(c) Northern region consists of Northern and North West statistical divisions prior to 2013-14

(d) Central Queensland region consists of Fitzroy and Central West statistical divisions prior to 2013-14

(e) Includes Commonwealth, Multi-jurisdictional sector and Local Government expenses by purpose.

Sources: Australian Bureau of Statistics , Government Finance Statistics, Cat No. 5512.0, Australian Bureau of Statistics, Regional Population Growth, Australia (Cat No.3218.0) 2012-13, Queensland Department of Main Roads, Queensland Roads Implementation Program, 2008-09 to 2012-13

APPENDIX 3

ESTIMATIONS OF ORDER OF MAGNITUDE SAVINGS FROM UPGRADING OF NORTHERN QUEENSLAND REGIONAL ROADS

Some detailed road closure data

The following gives detailed road closure data for the three Northern Queensland Road Regions of Fitzroy, Central West and North.

Table – Average Annual Days of Road Closures, Central West, Fitzroy and Northern Regions

Central West, Dec 2009 - Feb 2014		**Duration of road closures (aggregate of rounded number of days)**		
Segment ID	**Road name**	**2009-2014**	**Av days per year**	
5732	Ilfracombe Aramac Road	362	85	
717	Jundah Quilpie Road	360	85	
5705	Longreach Muttaburra Road	305	72	
93C	Diamantina Development Road	286	67	
87A	Dawson Developmental Road	285	67	
7165	Isisford Emmet Road	169	40	
81A	Eyre Developmental Road (Bedourie)	168	40	
552	Clermont Road	163	38	
716	Isisford Blackall Road	158	37	
80A	Birdsville Developmental Road	158	37	
5701	Muttaburra Road	142	33	
7103	Blackall Adavale Road	133	31	
443	Tambo Road	116	27	
5703	Aramac Torrens Creek	112	26	
93B	Quilpie Windorah Road	112	26	
99D	Kennedy Developmental Road	108	25	
5705	Cramsie Muttaburra Road	103	24	
93D	Diamantina Development Road	103	24	
81B	Eyre Developmental Road (Birdsville)	96	23	
5803	Richmond Winton Road	95	22	
441	Blackall Road (Barcaldine Regional LLG)	90	21	
441	Blackall Jericho Road (Blackall Tambo LLG)	87	20	
95A	Thomson Developmental Road	68	16	
572	Aramac Muttaburra Road	59	14	
95B	Thomson Developmental Road	46	11	
715	Isisford Ilfracombe Road	44	10	
13B-13G	**Landsborough Highway (total)**	**42**	**10**	
573	Barcaldine Aramac Road	27	6	
16C-16C	**Capricorn Highway (total)**	**22**	**5**	(the two parts of the road are often closed simultaneously)
13E	Landsboroiugh Highway (section)	16	4	(therefore, the total road closure is not equal to the sum of the two sections)

16C	Capricorn Highway (section)	16	4
16D	Capricorn Highway (section)	16	4
13D	Landsborough Highway (section)	7	2
13B	Landsborough Highway (section)	6	1
13C	Landsborough Highway (section)	4	1
13F	Landsborough Highway (section)	4	1
13G	Landsborough Highway (section)	4	1
99C	Kennedy Developmental Road	4	1

Fitzroy Region (JAN 2010 - APR 2014)	**Number of days that part of the road was closed**	
Road	**Total**	**Per Year**
10F Kunwarara Road	15.5	4
16A Capricorn Highway	44	10
26A Leichhardt Highway	74.5	17
27B Gregory	12.5	3
41E Burnett Highway	19.5	5
46C Dawson highway	47	11
46D Dawson Highway	114.5	26
85A Taroom Bauhinia Downs Road	235	54
85B Fitzroy Developmental Road	159.5	37
87A Dawson Developmental Road	263.5	61
181 Hanson Road	1	0

Northern Region (JAN 2010 - APR 2014)	**Number of days that part of the road was closed**	
Road	**Total**	**Per Year**
Flinders Highway	44	10
Gregory Developmental Road (total)	83	19
A) Balyando Crossing - Charters Towers section	83	19
B) Charters Towers - The Lynd section	45	10
Hervey Range Road	27	6

Note: Data for the Mackay region, North West and Far North was not available for inclusion in this table.
Source: Queensland Transport and Main Roads.

The study, "*Economic Impacts of North Queensland of Closure of the Bruce Highway*" cites trouble spots with average number of hours/days closed due to flooding of:

Cluden area (Townsville ..... 16 hrs..... 0.7 days

Haughton River ..... 36 hrs..... 1.5 days

Sandy Gully (Whitsundays)..... 210 hrs..... 8.9 days

Between Bowen & Proserpine ..... 252 hrs..... 10.5 days

The majority of the regional roads in the areas covered have road closure problems worse than the Bruce Highway.

Estimated average annual road closures and costs

The following gives estimated average number of days of road closures for different main roads for all the Northern Queensland road regions. It should be noted that this is road closure days and vehicle days and may not necessarily equate in detail to disruption costs to industries and the economy

Table - Estimated Annual Road Closures, (5-year average) & Vehicle Days Affected [(1)]

Road	Average AADT)	Road length (km)	Days that part of the road was closed	Vehicle days
Bruce Highway (Benaraby – Cairns)	**4,751**	**1,173**	**12**	**55,233**
Other roads				
Captain Cook Highway	4,480	99	1	4,200
Mulligan Highway	795	262	2	1,639
Peninsula Developmental Road (estimate)	115	567	120 [(2)]	13,800
Kennedy Highway	2,465	244	0	924
Gulf Developmental Road	237	443	29	6,768
Burke Developmental Road	109	1,034	156	16,988
Barkly Highway	653	323	0	245
Wills Developmental Road	60	499	39	2,356
Diamantina Developmental Road (Windorah-Boulia)	28	577	63	1,800
Eyre Developmental Road	34	177	42	1,417
Birdsville Developmental Road	45	273	28	1,270
Flinders Highway	739	784	6	4,432
Landsborough Highway (Augathella-Cloncurry)	479	942	8	3,680
Thomson Developmental Road	72	310	19	1,372
Capricorn Highway	1,840	577	10	18,974
Kennedy Developmental Road	91	823	38	3,493
Gregory Developmental Road	430	364	8	3,546
Gregory Highway (Clermont-Emerald)	1,699	109	2	3,504
Bowen Developmental Road (Collinsville-Balyando)	138	177	6	827
Peak Downs Highway	3,025	266	2	4,538
Dawson Highway (Banana-Springsure)	386	240	22	8,464
Dawson Developmental Road	55	245	36	1,973
Total		***9,335*** [(3)]		***106,214***
Total Northern Queensland		***10,508***		***161,446***

[(1)] Note: See Technical Note Appendix 5, for explanation of basis of calculation.
[(2)] Note: Estimated 4-month closure.
[(3)] Note: The total road lengths do not agree with those in previous table due to unavailability of road closure data for some roads.
[(4)] Note: AADT Average Annual Daily Traffic.
Source: Cummings Economics derived from vehicle count and road closure data from Queensland Department of Transport & Main Roads.

Road closures

Costs of road closures fall into two categories:

a) The cost of disruption of road travel / operations;

b) Consequent costs of the disruptions to industries, business and communities.

The following seeks to estimate (a) above.

Analysis has not been extended to vehicle types but the following table indicates estimated travel time costs including freight for various types of vehicles. (Source, see Technical Note Appendix 5.).

Car (personal/visitor)	$612
Car (business)	$1,403
Semi trailer	$1,116
Road train	$2,022

Inquiries among road cattle transport operators indicate total annual costs, including drivers and vehicle depreciation, of between $500,000 and $600,000 per annum, and that on 250 working days per annum, daily cost of $2000 to $2400.

Most traffic will not just sit and wait for road inundation to recede. However avoiding this can result in heavy costs of diverting around other routes or not travelling at all and those who would otherwise be using the roads adjusting their business to accommodate the problem.

Insufficient information is available to accurately measure these costs. The following seeks to gain some order of magnitude idea of what might be involved.

From the travel time costs given above, it is likely that over the regional road system, average travel time cost of a vehicle/day hold up would be of the order of $800. Based on the data available, total vehicle days are estimated at 106,000. On the basis that cost is of travel time lost, averaging $800 per vehicle, the total annual cost would calculate at $85m.

Of course, as discussed above, many will modify their behaviour to avoid this cost, through diverting on other roads or adapting their business/individual travel patterns. However these adjustments will be at some cost but almost certainly below the travel time saving cost. Thus as an order of magnitude figure, it is likely that the costs in travel times or other consequent costs will be somewhere below but up towards $85m per annum.

Disruption costs to industry and communities would need a great deal of surveying to identify.

Appendix 4 gives some previous case studies.

Obviously the mining industry can be heavily affected if road closures lead to disruption and partial or full closure of operations (eg. fuel supplies). The amount of economic activity in the area serviced by regional roads is very large.

In the Rockhampton Case study, the losses were estimated to be 51% of the effects on vehcicle operations (travel time, etc.). Compared to Rockhampton, most industries and businesses in the regional road areas could be expected to be much more dependent on the road system and the ratio is likely to be much higher and could at least equal the potential costs to vehicle operations estimated above.

Estimated benefits of road upgrading on vehicle operating costs and travel times

Standard national vehicle operating cost data indicates that vehicle operating costs are reduced by road upgradings as follows.

Table - Estimated Vehicle Operating Cost Savings

	Approximate saving	Estimated saving per km
Poor gravel road to moderate level sealed road		
Heavy vehicles	32%	44¢
Light vehicles	29%	10¢
Poor sealed road to top level sealed road		
Heavy vehicles	35%	42¢
Light vehicles	24%	7¢

Source: Based on Austroads parameters 2009. Adjusted for inflation. (See Technical Note Appendix 5.)

The above Table indicates that annual traffic flows on the regional main roads identified is of the order of 2 billion.

A detailed exercise has not been carried out. However assuming a lower level of road improvement than that given above (eg. mid gravel to low level sealed road or low level sealed to mid level sealed road), giving an average of a low 5¢ per vehicle kilometer, vehicle operating cost savings on the 2,000 million vehicle kilometer recorded, saving would be of the order of $100m per annum

These types of upgrading are also likely to reduce travel times. A modest 5% reduction in travel times can be expected to result in travel time savings averaging across vehicle types of about $2.15 per hour. With estimated vehicle kilometre at 2,000 million and with assumption about average travel speed 80km per hour, total saving would be about $56m a year over the system. (See Technical Note Appendix 5.)

Safety is another factor with risk of accident higher on poorly developed roads.

APPENDIX 4

COSTS OF FLOODING AND ROAD CLOSURES

Rockhampton 2011 Floods

A study by John Rolfe and others of the Central Queensland University, Rolfe 2011, identified estimated costs based on the assumptions made as follows of:

- Road closure vehicle operation impacts $68m;
- Impact on economic activity $35m or about 0.77% of Gross Regional Product for Rockhampton or 51% of the estimate of vehicle operation impacts.

Bruce Highway Closures

AEC carried out a study for the North Queensland Roads Alliance in February 2012 (ref AEC 2012) that identified sectors of the Northern Queensland economy dependent on the Bruce Highway and estimated Gross Value Added contribution of those sectors to Northern Queensland economy (Mackay region north) of about 13% of Gross Regional Product and 17% of employment.

A 24-hour delay on the Bruce Highway in 2010/11 was estimated to cost trade of $3.38m, Gross Value Added (including flow-on) $2.5m and 29 FTE jobs (including flow-on).

Travel time costs of hold ups at example trouble spot areas on the Bruce Highway with the worst being at Sandy Gully in the Whitsundays region was estimated to be of the order of $60.8m in 2010/11.

Ingham by-pass Road

An impact assessment by Marsden Jacobs (ref Marsden Jacobs 2010), gave results of a local business survey. Of respondents, 90% indicated that their business income decreased as a result of flooding and while road closures were in place.

Of those reporting losses, 59% recorded less than$500 per day, but some reported reaching up over $20,000 per day. No overall cost was provided.

Remote Community of 1,000

An Initial Economic Impact Study carried out for Mareeba Shire Council in 2007 by Cummings Economics on upgrading the Burke Developmental Road, Mareeba to Kowanyama, reported on thorough surveying in the Kowanyama community in the Western Peninsula area (population of 1,000). The community is cut off for 4-6 months every year through closure of the Burke Developmental Road from Mareeba and from Normanton.

Costs of road closures were estimated as follows:

Building costs – 15% added ..... $300,000 pa

Council accumulates extra stock worth about $1m @ 7% for 4 months . $28,000 pa

Ergon extra stock ..... est $22,000 pa

Council staff costs ..... $100,000 pa

Special air charters to bring in staff and technicians ..... $200,000 pa

Vehicle losses when trying to travel through..... $50,000 pa

Retail stores air freight of perishables ..... $130,000 pa

Retail stores build-up of stock @ 7% for 4 months ..... $14,000 pa

Retail stores need for additional storage including refrigeration
$1m @ 7% for 4 months..... $28,000 pa

Retail stores stock write off because of cold storage problems..... $26,000 pa

Retail stores fly in of technicians ..... $50,000 pa

Estimated annual road closure costs estimated at $1.5m for population of 1,000, ie. approximately $1500 per person.

APPENDIX 5

TECHNICAL NOTES

Calculation of vehicle kilometers:

1) Exclude road segments in cities and towns / road segments with measurement points in towns and villages (peaks in the data) in order to focus on through traffic instead of local transportation.

2) Multiply average number of vehicles per year (on the measurement points) by the length of the (selected) road segments to calculate the annual vehicle kilometers.

3) Calculate vehicle kilometers between main population centers:

    a. Aggregate the total number of vehicle kilometers of road segments between the different population centers, excluding the road segments with measurement points in cities and towns;

    b. Assume that through traffic in towns and villages is equal to the traffic on other road segments and use the total length of the road (including road segments with measurement points in towns and villages) to estimate total annual vehicle kilometers.

4) Aggregate the estimated total annual vehicle kilometers of the different parts of the main roads (the vehicle kilometers between population centers) to calculate the total annual vehicle kilometers of the main highways and developmental roads in Northern Queensland.

Calculation of annual duration of road closures:

1) Dataset includes duration and location of various types of road closures in Northern Queensland between 1 January 2009 and May 2014;

2) Group data by highway/ developmental road;

3) Select only the road segments that are “closed for all traffic” or “closed for through traffic”;

4) Calculate the duration of each road closure in number of days;

5) In case of multiple closures on the same road, only include the longest lasting closure (assuming that it does not matter whether there are only one or multiple closures on the road – through traffic will always be obstructed);

6) For every road: calculate the average annual number of days that part of road was closed by dividing the aggregate of the closures by 5⅓ (because data was gathered between 1 January 2009 and May 2014).

Calculating of estimated cost of the road closures:

1) Align total vehicle kilometers and "total annual number of days that part of the road was closed" for each highway / developmental road;

2) Note that road closure data was only accessed for 87% of the road system (in kilometers), including most of the main roads, implying that the total estimated cost will be a slight underestimation;

3) Estimate the average daily number of vehicles per road by dividing the total daily vehicle kilometers by the length of the road;

4) For each road: estimate the annual number of "vehicle days" of the road closures by multiplying the daily number of vehicles on the road by the average annual number of days that the road was closed (assuming that all vehicles aim to drive from one end of the road to the other and that it doesn't matter which part of the road is closed);

5) For each road: estimate the total cost of road closures by multiplying the vehicle days of the closures by $ 800 – the average cost of a day not-travelled (assuming that vehicles don't travel instead of using an alternative route).

Vehicle operating costs:

Estimates of benefits in vehicle operating costs of upgrading are based on Austroads national estimates for vehicle operating costs as published by RTA NSW Economic Parameters for 2009. These estimates, which are based on Austroads data, are adjusted for inflation CPI Brisbane. They are for base grade 2% and curvature, ie. for relatively flat grades and straight roads with low traffic densities. Note steeper roads with more curvature and higher traffic densities would result in higher costs and savings. The costs are based on national averages. Actual fuel, tyres and repairs in the areas covered are likely to be higher.

Classifications used are:

Poor gravel and moderate level sealed – Classification G2 to S3

Poor sealed to top level road – Classification S1 to S5.

Travel time savings:

Travel time savings are derived from Austroads 2012 Guide to Project Evaluation Part 4 – Project Evaluation Data Table 3.4 (value as at June 2010), and are adjusted for inflation by CPI Brisbane.

Operational workforce in road transport:

The operational workforce in transport is taken to include the following ANZSIC classification groups:

- Motor vehicle manufacturing
- Road construction
- Motor vehicle wholesaling
- Motor vehicle retailing
- Tyre, automotive parts and fuel retailing
- Road transport
- Postal services
- Vehicle renting and hiring
- Vehicle repairs

APPENDIX 6

Case Study: Aquaculture Bioremediation Project in Ayr, Burdekin Shire

This project is one of the first of its kind anywhere in the world and uses algae to bio-remediate waste water from the Pacific Reef Fisheries (PRF) prawn farm.

One of the greatest impediments to increasing aquaculture production is waste and water management. An innovative new solution has been developed in Northern Queensland by MBD Energy Limited in partnership with James Cook University and has already been successfully trialled. It involves a low cost bioremediation system that enables water to be discharged at the same or lower levels of nitrogen and phosphorous as the water that is drawn into the facility from the Great Barrier Reef.

With the expansion of this technology into a commercial demonstration stage, the stage will be set for significant expansion in aquaculture in Northern Queensland and more broadly. The system can be replicated over and over again to provide sustainable algae-based water remediation services and to sell high-grade algae nutritional products in Australian and overseas markets.

Australia currently imports more than 70% of its seafood, much of it from Thailand and China. In the meantime, Northern Australia's prawn industry has not seen any expansion over the past 15 years.

More than 80% of the world's farmed fish are grown in China. Declining ocean stock volumes has led to a consistent increase in aquaculture, which now accounts for more than 50 percent of all shellfish consumption.

Northern Queensland has a significant opportunity to become a world leader in sustainable aquaculture.

APPENDIX 7

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