20. Economic Environment

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20. Economic Environment

20.1 Introduction

This section of the EIS presents the existing baseline economic environment, a description of likely future economic activity in the corridor and an assessment of the potential economic and investment impacts of the construction and operational phases of the GUP on the state and SEQ regional economies.

20.2 Methodology

The economic impact analysis of the proposed capital works and operational expenditure for the GUP has been conducted through the application of input-output modelling, the development of a Cost Benefit Analysis (CBA) framework and also an assessment of existing and future transport and industrial activity impacting on the GUP corridor.

The analysis of economic impacts has been undertaken in the following steps:

- Identification and description of existing major economic activity with particular emphasis on current trade throughput at the Port of Brisbane facilities passenger throughput at Brisbane Airport and commercial industrial activity in the ATC precinct;
- Description and assessment of future economic activity in the Gateway Motorway corridor to 2012 and beyond identifying proposed developments in the ATC including Brisbane Airport and the Port of Brisbane, which have been endorsed in master planning documents;
- The development of the CBA to identify project benefits in terms of travel time savings, vehicle operating costs savings, road safety savings and environmental savings; and
- Development of the economic input-output model to compare the existing regional and Queensland economies "with" and "without" the GUP construction and operating expenditure over the concession period. The modelling identifies a range of direct economic impacts on the regional and state economies for the construction and operational phases through the estimation of additional Gross Output, Gross Regional Product/Gross State Product (ie value added), household income (ie wages and salaries) and employment.

Therefore, the methodology identifies and addresses the existing and future economic environment in and around the GUP corridor by considering the commercial/industrial development opportunities that may be reasonably expected to arise over the next decade and beyond and also the quantifiable regional and state economic and investment impacts which have been modelled to result from the construction and subsequent operation of the GUP.

20.3 Existing Economic Environment

TOR Requirements:
This section is to describe the existing economic environment that may be affected by the project. Consideration should be given to:

- the existing toll arrangements;
- current property values;
- number of properties directly affected by the project;
- the local and regional economy and the significance of the project in this context; and
- regional workforce characteristics and employment levels and the employment opportunities during the construction and operational phases of the project.

20.3.1 Background

The Gateway Motorway provides Brisbane's most significant bridge crossing and north south orbital road bypassing the CBD. The transport significance of Gateway Motorway is such that it connects the Bruce Highway to the north, the Pacific Motorway in the south and to the Logan and Ipswich Motorways in the west. The Gateway Motorway is a primary business and freight related corridor and is also a state nominated dangerous goods route.

Traffic using the Gateway Motorway is a function of existing and forecast population and commercial/industrial land use in and surrounding the Gateway Motorway corridor. This section of the EIS covers the commercial and industrial precincts and economic activity which directly impacts on the Gateway Motorway environment namely:

- ATC;
- Brisbane Airport;
- Port of Brisbane; and
- Western industrial areas.

20.3.2 Australia TradeCoast

The ATC precinct is situated on both sides of the Gateway Motorway and is fast becoming the major manufacturing, transport, warehousing and logistics hub in SEQ and on the Australian eastern seaboard. The ATC has been identified as the key generator of traffic on the Gateway Bridge. It contributes around 46% of average weekday traffic volume which is estimated in 2003 to be around 87,000 vehicles per day. Brisbane's sea port and airport are critical infrastructure and service elements of the ATC which have been instrumental in attracting business and general land take up in the precinct.

Traffic monitoring has identified that the Gateway Motorway south of Airport Drive has been operating at its capacity in peak directions for at least the past 5 years. Flows in contra peak directions are also approaching capacity. The peak flows have been spreading as a result of the capacity issues.

Southern Side of Brisbane River

Key international and national businesses have established and/or expanded their activities in the ATC commercial and industrial estates over the past 10 years supplementing long standing businesses in the area.

The Port of Brisbane Corporation (PBC) is a significant landholder on the southern side of the Brisbane River and controls approximately 120ha of developed and undeveloped land holdings, namely:

- Port of Brisbane Business Park comprising 60ha of commercial offices, industrial premises, warehousing and storage on Fisherman Islands which is predicted to be fully leased in the next 2 years and possibly earlier;
- Colmslie Business Park comprising 16ha to accommodate coldstores, industrial warehousing, distribution and commercial offices; and
- Whyte Island Industrial Estate comprising 40ha of land partially accommodating the Caltex Refinery and with the potential to accommodate transport, storage, and distribution activities when Fisherman Islands is fully occupied.

A number of significant business and industrial parks have been constructed to supplement the pre-existing industrial parks in the ATC precinct. In particular, Metroplex on Gateway which is owned by Macquarie Goodman has been a major commercial success with many prominent international and national companies recently locating to this complex.

Major business and industrial parks on the southern side of the Brisbane and their key tenants include:

Metroplex on Gateway (corner Lytton Road and the Gateway Motorway)

- Capral Aluminium
- Fisher and Paykel
- LG Electronics
- Volvo Penta
- Edwards Dunlop Paper
- HPA
- Filtronics

Queensport Area

- Swire Cold Storage and Distribution Services
- LEP Mainfreight

Hemmant (Gosport St)

- Bunning's Distribution
- Gateway Container Park
- Longreach Logistics
- One Steel Distribution
- CC Container Services

Lytton Industrial Estate (DSDI)

- Berri
- ACI Plastics
- Yamaha

Whyte Island (PBC)

- Caltex
- Patricks Logistics (Hazardous Goods only)

Fisherman Islands (PBC)

- P&O
- Patricks
- Island Packing and Storage
- Smith Bros
- Chalmers Industries
- The Warehouse Group

Murarrie Industrial Estate (adjacent to Gateway Motorway)

- Nestle
- P&O Cold Storage
- Swire Distribution
- Inghams Chickens
- Goldman Fielder
- Protran Logistics

Colmslie

- Patricks Intemodal
- Mobil

Northern Side of Brisbane River

The existing commercial and industrial land uses on the northern side of the Brisbane River within the direct influence of the GUP are the following:

- Brisbane Airport's Export Park precinct which has Crazy Clarks distribution facility, Sandvik and Qantas Freight among its major tenants;
- Brisbane Airport's Export Park East (former international airport area) housing the air freight and logistics companies DHL and Brambles;
- Brisbane Airport's Aerotech Park with Qantas and Virgin Blue maintenance facilities, Aviation Australia Training College, Australian Aerospace, EADS and other aviation companies;
- PBC's Eagle Farm Estate comprising 26ha which accommodates industrial warehousing, commercial offices and distribution; and
- Private commercial and industrial parks including Citiport Industrial Estate (Eagle Farm) and Brisbane Gate Industrial Park (Hendra).

The northern side of the Brisbane River has some of the regions largest freight logistics and distribution centres at Eagle Farm and Hendra including Toll, NQX, Coles Myer Target. Similarly a number of significant and large manufacturers are located there including Smorgon Steel, G James Glass and Aluminium, BP, Shell and Incitec.

20.3.3 Brisbane Airport

The airport is accessed from the Gateway Motorway at Airport Drive and has a full 24-hour operations (no curfew) and is 2,700ha in size.

BAC purchased the long term lease (50 years plus an option for an additional 49 years) for Brisbane Airport from the Commonwealth Government in 1997.

Over the past 7 years, BAC has invested over $450 million in significant development works as part of its strategic vision to transform Brisbane Airport from a traditional state capital air passenger hub to the Airport City concept.

Total passenger movements at Brisbane Airport were 12.3 million for the year ending 30 June 2003 comprising of 9.2 domestic air passengers and 3.1 international air passengers. Domestic air passenger movements have grown an average annual rate of 4% since 1996 while international passengers have grown steady despite the unsettled international scene resulting from September 11, SARS, the demise of Ansett and route rationalisation. Both domestic and

international passenger growth is forecasted to increase by an average annual growth of 5.7% and 6.5%, respectively over the next 10 years.

Air freight at Brisbane Airport has doubled over the past decade with over 150,000 tonnes transported to/from Brisbane Airport in 2003.

Brisbane Airport currently has a significant economic impact on SEQ with more than 8,000 people working full time at the airport and more than 18,000 (inclusive of the full time employees) directly dependent on the airport's activity for their income.

BAC has recently produced the Brisbane Airport 2003 Master Plan which contains the planning framework for the development of the airport to 2023 and which will create significant business, industry and employment opportunities for the region.

20.3.4 Port of Brisbane

The Port of Brisbane, particularly its port facilities at Fisherman Islands, is a major driver of economic activity in SEQ and Queensland in general. Total trade through the port in 2003 was approximately 25 million tonnes including container throughput of 570,256 twenty foot equivalent units (teus). The port accounts for over $7 billion of total overseas commodity exports (91.4%) from SEQ. This existing trade currently results in significant heavy vehicle traffic from the north and south via the Gateway Motorway to the Port's Fisherman Islands facilities.

Fisherman Islands has eight deep-water container berths and three deep-water bulk berths. The first stage of the relocation of port activities from Hamilton on the northern side of the river to Fisherman Islands is currently planned to take place in late 2004/early 2005 with the relocation of Patricks.

P&O Ports, in conjunction with the PBC, is also relocating its general cargo operations from Hamilton to Fisherman Islands and also its car storage operations from Eagle Farm to Fisherman Islands. This relocation will be completed by 2005. Twenty eight hectares of land on Fisherman Islands have been allocated to a long term motor vehicle precinct.

20.3.5 Western Industrial Areas

The western industrial areas of Brisbane, Ipswich and Logan are those areas of commercial/industrial activity from Salisbury westward along the Ipswich Motorway and Logan Motorway corridors to Ipswich. These areas includes some of the major generators of heavy vehicle traffic including:

- Rocklea Markets;
- Major supermarket distribution centres around Acacia Ridge and Richlands;
- Major transport and logistic depots (Toll, FLC Interstate Transport, Linfox, etc);
- Building and construction materials establishments;
- Australia Meat Holdings at Dinmore;
- Carole Park Industrial Estate;
- Food manufacturers; and
- Acacia Ridge Rail Terminal

The western industrial areas are major sources of transportation (containers, general freight and other commodities) has a major influence on moving freight to/from the Port of Brisbane, Brisbane Airport and generally to other northern destinations via the Gateway Motorway. It is estimated in the recent Brisbane Urban Corridor (BUC) Study (2003) that over 2,500 trucks per day access the Gateway Motorway from the BUC.

20.4 Future Environment

20.4.1 Brisbane Airport

The Gateway Motorway is the spine of the ATC precinct, and the upgrading of the Motorway is essential if the Brisbane Airport, the Port of Brisbane's Fisherman Islands facilities and the numerous industrial and business parks are to develop to their potential.

In particular, the Brisbane Airport's 2003 Master Plan identifies unprecedented aviation and industrial development opportunities over the next 20 years. BAC's has a vision in which the Brisbane Airport will:

- capture to develop into a premier Gateway Airport, serving as a major international hub and a major centre for aviation maintenance and training; and
- a principal generator of economic growth and employment in the SEQ region.

The above will be primarily achieved by the construction on the parallel runway 01/19 to the immediate north west of the existing main runway within the next ten years and provide capacity improvements to meet forecast aviation growth. The development of a number of major industrial and commercial precincts will serve as the cornerstone of the Airport City concept.

The major precincts to be developed are as follows:

Brisbane Airport Domestic Precinct: Proposed terminal expansion including additional retail, commercial and hotel development to accommodate domestic passenger throughput of approximately 15 million by 2012/2013 at an average annual growth rate of 5.7%.

Brisbane Airport International Precinct: Terminal expansion, hotels, car parking, commercial offices and logistics centre to accommodate increases in international passenger throughput of approximately 6.5 million by 2012/2013 at an average annual growth rate of 6.5%.

Export Park: Expansion of existing area to accommodate major freight, warehousing and distribution uses. Other activities planned include training and education facilities such as flight simulator pilot training and aircraft maintenance training.

Banksia Place: Business park adjacent to Airport Drive comprising a mix of business, commercial, express freight and hotel activities.

Number 1 Airport Drive: Fully integrated airport business retail and leisure centre including direct factory outlets, mixed use business, retail and offices.

Airport Industrial Park: Light industry and general industry purposes.

Aerotech Park: Continued presence as Brisbane's major aviation and aerospace businesses including heavy maintenance facilities for Qantas, Alliance Atlantics, National Jet Systems, EAD's and Department of Defence.

Northern Development Area: Expansion of precinct in line with general aviation activity, airport support activities and proposed parallel airway development.

BAC has indicated in its 2003 Master Plan that proposed developments will be staged to match future industry trends and demands and that the timing of investments may be subject to global influences outside the control of BAC. Notwithstanding there are compelling reasons which indicates that the proposed developments at the airport are likely to proceed as planned over the next decade and that the upgraded Gateway Motorway will be required to support this planned development.

20.4.2 Port of Brisbane

The Port of Brisbane is likely to consolidate its position as Australia's fastest growing port with continued population growth of over 2% in the SEQ and expanded industrial and business activity in the region.

The Port of Brisbane is in a similar situation to other Australian capital city ports in that its trade throughput is heavily influenced by the prevailing and forecast economic conditions in the USA, Japan and the expanding markets of South East and North Asia.

Total trade throughput is forecast to increase from 24.6 million tonnes in 2003 to 37 million tonnes in 2013 (an average annual growth of 5.3%) while container throughput was 570,256 teus in 2003 and is forecasted to increase to 1,377,020 million teus in 2013 (an average annual growth of 13.4%).

The provision of port, road and services infrastructure to support this forecast growth in trade will be required over the next decade. The failure to do so could have deleterious impacts on the continued success of the port in attracting trade and more importantly on the ongoing ability of SEQ to capitalise on continued population and economic growth.

To address port related infrastructure requirements for the future, the Port of Brisbane Corporation (PBC) commenced work in 2003 to reclaim 230 hectares of land at Fisherman Islands. The Future Port Expansion Seawall project will, when completed in mid 2005, adds an extra 1,800 metres of quayline to provide for additional berths and port land. The seawall will be progressively filled with material from maintenance dredging over the next 20-25 years.

The other significant strategic decision of the PBC has been to relocate port related operations, primarily general cargo and car import and storage activities, of P&O Ports/Patricks from Hamilton to Fisherman Islands by 2005.

As a result of this proposed relocation, a major urban renewal riverside project at Hamilton will be planned. The PBC has established the Northshore Development Group to develop a master plan for the 80 hectare site between the Royal Queensland Golf Club to the proposed Portside Wharf Cruise Terminal. It is proposed to progressively develop this land over the next 1-15 years in line with market demand.

This major initiative signals the longer term vision for current commercial/industrial land west of the Gateway Motorway at Eagle Farm to be earmarked for urban renewal.

20.4.3 Other Commercial and Industrial Developments

The proposed commercial and industrial developments which have been planned to accommodate airport and port related growth are significant and have been described in detail above.

There are a number of other new and/or planned developments on both the northern and southern side of the Brisbane River within the ATC area which will increase the volume and concentration of industry in and around the Gateway Motorway.

The DSDI has developed the Rivergate Marine Precinct to the immediate east of and adjacent to the southern toll plaza on the Gateway Motorway. Laminex Industries is currently constructing its production headquarters on the site and other major companies such as City Beach and Big Country will follow.

The other major industrial precinct in which DSDI has been involved are the Murarrie and Lytton Industrial Estate. A number of leading companies have already leased land for further industrial development.

To the west of Rivergate on the other side of the Gateway Motorway, the Queensport Quays Business Park is being marketed. This 62ha site is the final stage of the highly successful Metroplex on Gateway development and will provide industrial land for development ranging from 2,000 sqm to 12,000 sqm.

The Portlink Estate at Hemmant is another project which is currently being marketed to the industrial and commercial market.

The above proposed developments are indicative of the strong commercial interest in the ATC area. These developments are meeting existing strong demand which is likely to continue into the future. Sales of 1 hectare industrial allotments in the Metroplex on Gateway Estate were reported to be around $120 sqm in 1999/2000. Prices have continued to escalate strongly over the past 4 years with recent sales above $150 sqm. The commercial property sector has stated that prices have risen by up to 25% to 30% and that new developments such as the Portlink Estate on Lytton Road, Hemmant could possibly sell for up to $200 sqm.

Therefore the market for quality industrial land has been very strong over the past 4 years and the proposed investment in the Gateway Motorway and also seaport and airport infrastructure will more than likely have a sustained beneficial impact on commercial and industrial land prices in the corridor.

20.4.4 Traffic Management

The major impact of the project will be traffic restrictions along the road corridor during construction activities. These impacts however will be temporary in nature and short in duration.

The proposed works will require the closure of lanes at various times and detouring traffic around road works, this will result in delays to traffic movement along the road. Restrictions or detoured accesses may be experienced at properties and adjoining roads as construction activities are undertaken.

The corridor will have long term benefits for the businesses in the region through improved travel time and driving safety along the motorway. The extent of any adverse impacts is dependent upon machinery being used, the type of activities being undertaken and the portion of the corridor being worked on.

Implementing traffic management procedures in accordance with the *Manual for Uniform Traffic Control Devices* (Queensland Transport 1995) will minimise impacts to local businesses due to loss of business access. Scheduling of night works would reduce the affect of construction works on traffic movement.

Minimising disturbance to business access should be an objective of the traffic management elements of the EMP. The Construction Contractor should also undertake monitoring of the effectiveness of traffic management and access actions.

20.4.5 Network Performance

Traffic modelling which has been undertaken in conjunction with this EIS has predicted that the Gateway Motorway, if not upgraded, will result in the deterioration of the road network performance causing in turn substantial delays, congestion, diversion of traffic to elsewhere in the network, increased accident rates and economic and social costs.

The substandard performance of the Gateway Motorway would have deleterious impacts on SEQ with businesses in these corridors including the Brisbane Airport and Port of Brisbane likely to bear these impacts and costs at a time when these businesses are projected to increase in commercial activity.

The proposed upgraded Gateway Motorway including the duplication of the Gateway Bridge would provide additional road capacity thereby increasing travel speed, relieving congestion and improving accessibility to businesses in the ATC and beyond. Regional arterial roads would be positively affected by the Gateway upgrade with reductions in daily traffic (primarily north south traffic), estimated in the order of 5% in 2011 and 10% in 2021.

20.5 Construction and Operations Impacts

TOR Requirements:
This section is to define and describe the objectives and practical measures for protecting or enhancing economic values, to describe how nominated quantitative standards and indicators may be achieved for economic impact management, and how the achievement of the objectives will be monitored, audited and managed.

The assessment of economic impacts, including any changes to existing tolling arrangements, should address the following requirements:

- describe the likely response of affected communities and identify possible beneficial and adverse impacts (both immediate and cumulative). These impacts should be considered both at the regional and local level. Attention should be paid to:
  - impacts on local and state labour markets, with regard to the source of the workforce. This information is to be presented according to occupational groupings of the workforce. The impact of both construction and operational workforces and associated contractors, on housing demand, community services and community cohesion is to be addressed. The capability of the existing housing stock, including rental accommodation, to meet any additional demands created by the project is to be discussed; and

– comment should be made on how much service revenue and work from the project (eg provisioning, catering and site maintenance) would be likely to flow to existing communities/businesses in the area of the project; • the effects of the Project on local and regional residents, including land acquisition and relocation issues and property valuation and marketability should be described for the construction and operation phases of the development; and • the economic impacts of the proposed project on Aboriginal people within the study area, based on a program of consultation with the local Aboriginal communities.

20.5.1 Introduction

The purpose of the economic impact analysis is to quantify the direct economic impact and potential economic value of the GUP. The University of Queensland's Centre for Economic Policy Modelling (CEPM) has undertaken this analysis as a subconsultant to Connell Wagner.

The direct economic impacts of the GUP are estimated at two levels:

- Brisbane Moreton Statistical Division; and
- State of Queensland.

The study presents results of the economic impact analysis in terms of gross regional product, value added, household income (wages and salaries) and employment (full-time equivalents) at the relevant regional and statewide areas.

20.5.2 Approach

The GUP will have an economic impact on the economies under consideration in a number of different ways, and primarily in terms of its construction and operational phases. The activity of both phases will have linkages with other regional firms through the purchases of goods and services as inputs into their operations, and through the employment of workers who will in turn spend most of their wages in the local economy.

The term *economic impact* refers to the effects of an economic activity (eg that of the project) on an economic system such as the regional or state economy.

The most common way to measure these impacts is through estimation of the effects of the activity on key economic indicators, namely on the addition to the gross output, gross regional product (GRP) of the region through value-adding, household income earned in the form of wages and salaries, and level of regional employment. These effects are measured in terms of monetary units and employment.

Estimations of the impact of the construction and operational activity of the GUP on these indicators are measured using the project costs schedules and estimations of labour and wages and salaries as supplied by the consulting engineers.

The local region for the purpose of this study is defined as the Brisbane Moreton Statistical Division. The State is the State of Queensland.

20.5.3 Assumptions and Data Reconciliation

The following assumptions have been adopted in this analysis:

- The construction and expenditure profiles, including full time equivalent (FTE) employment figures, were estimated from data supplied by consultants to GUP Evans and Peck Pty Ltd. These data were supplemented by data in the CEPM's inhouse databases.
- All employment figures are in FTE jobs. This could be described as a technical interpretation of employment, in that it aggregates man hours into FTE. Care should be taken in interpretation of employment results as the number of FTE jobs involved do not necessarily reflect the actual number of people involved.
- All results are in real terms, that is they represent 2004 values. Modifications were made to the tables and data supplied where necessary in order that these should be consistent.
- Capital Expenditure (construction phase) will take place.
- All materials will be sourced locally except for steel, concrete/sand/gravel and technical components in particular e-toll facilities.
- All plant to be locally sourced.
- FTE calculated from total hours (provided for construction phase)
- FTE based on 38 hour week, 48 weeks a year.
- Total Hours during operations calculated from total wages at $30/hr.
- Where no breakdown of components in structures could be performed due to insufficient information, all expenditure was allocated to other construction.
- All concrete/sand/gravel imported from Queensland.
- Geofabric material, steel and e-toll facilities imported from interstate.
- Any interpretation of results should be regard estimates as indicative only.

Most importantly, the following results only include direct economic impacts from the construction and operations phases of the project. Indirect impacts which may flow through the economy as a result of the multiplier effect have not been included. At the time of this EIS there was no acceptable economic model available to identify these indirect impacts in an accurate and defensible manner.

20.5.4 Construction Phase

This section presents the direct economic contributions of the GUP in terms of its construction phase.

The construction and expenditure profiles were estimated from data supplied by the Connell Wagner, primarily through Evans and Peck Pty Ltd. The data give considerable details on the construction of the GUP. Various electronic data, including spreadsheets, were supplied. These data were supplemented by data in the CEPM's inhouse databases.

Section 20.5.3 assumptions and the following should be noted:

- Yearly development and construction costs include cost of labour;
- The comments on FTE and interpretation as in Section 20.5.3 also apply; and
- Some rounding of the figures occurs.

At a total cost of $1.2-$1.4 ($2002) billion the GUP construction project represents a sizeable project, with estimated full time employment of 5,919. This would indicate an output/FTE of $239,399. Although it is estimated that construction of the GUP would take place over several years, for the purpose of this study, the impact of total construction only is measured.

Data received from Connell Wagner, mainly through Evans and Peck Pty Ltd, indicated the following direct effects:

Table 20.1 Initial (Direct) Effect, Total Construction, GUP, Brisbane Moreton and Queensland

Contribution to:	Amount
Gross Regional Product	$683,008,612
Wages and Salaries	$465,837,097
Employment (FTE)	5,919

These figures show that the total construction cost is associated with $683m in value added (GRP) as well as with $465m paid to the labour force by way of wages and salaries.

20.5.5 Operations Phase

The comments on FTE and interpretation as in Section 20.5.3 of this report are reiterated:

All employment figures in this section are in FTE jobs. This could be described as a technical interpretation of employment, in that it aggregates man hours into FTE. Care should be taken in interpretation of employment results as the number of FTE jobs involved do not necessarily reflect the actual number of people involved. Some rounding of the figures occurs.

Data received from Connell Wagner, mainly through Evans and Peck Pty Ltd, indicated the following initial (direct) effects of the annual operational activities of the GUP excluding major maintenance.

Table 20.2 Initial (Direct) Effect, Annual Operations, GUP

Contribution to:	Amount
Gross Output	$24,570,000
Gross Regional Product	$15,406,481
Wages and Salaries	$11,748,711
Employment (FTE)	258

Table 20.2 represents the initial or direct impact of the GUP operations and maintenance within the Brisbane Moreton and Queensland economies on an annual basis. The operations activity will have linkages with other regional firms through the purchases of goods and services as inputs into their operations, and through the employment of workers who will in turn spend most of their wages in the local economy.

20.6 Cost Benefit Analysis

20.6.1 Background

This report presents the findings of the Cost Benefit Analysis (CBA) which has been undertaken to comparatively assess, the Do Minimum Base Case with the Do Minimum plus GUP Reference Case.

The CBA framework has been developed to assess the economic efficiency of the GUP's resource allocation by quantifying in monetary terms the project's costs (ie CAPEX and OPEX) and benefits (ie travel time savings, vehicle operating costs savings, road safety and environmental benefits). The CBA has derived investment decision criteria of Benefit Cost Ratio (BCR) and Net Present Value (NPV) to assist agencies to better understand the economic viability of the GUP Reference Case.

The GUP in all traffic modelling and tolling options consists of the following capital works:

- Six laning of the Gateway Motorway from the Mt Gravatt – Capalaba Road to Wynnum Rd (ie additional two lanes), and eight laning between Wynnum Road and Lytton Road (ie additional 4 lanes);
- Duplication of the Gateway Bridge to the east of existing bridge and northern and southern off roads;
- New four lane northern deviation from Lavarack Road to Nudgee Road;
- Additional airport interchange; and
- Existing Gateway Bridge modifications.

The Reference Case has been modelled in this CBA with the project cashflows allocated across the construction period. The Do Minimum Base Case aligns with the Traffic Model M201 while the Do Minimum plus GUP Reference Case aligns with Model M203. The "Do Minimum" comprises a number of MR specified highly probable road projects which will impact on the general road network and hence traffic volumes. MR has also stated that there will be no early staged road user benefits with the GUP being fully commissioned in early 2011.

The tolling option for the Reference Case M203 assumes current toll levels ($2.20/$5.50) with CPI indexation from 2011 thereafter.

In accord with road CBA, the following costs and benefits have been quantified, where appropriate, for the Reference Case:

- Planning, land acquisition and relocation, design, construction and construction management costs (ie CAPEX);
- State costs, contractors' minor and major maintenance and relevant operating costs including all tolling costs (ie OPEX);
- Travel time savings;
- Vehicle operating costs (VOC) savings;
- Accident savings; and
- Environmental benefits (where they can be monetised).

Expenses which are associated with a project's financing such as depreciation and interest payments are not included in CBA. The equivalent value of such expenses is already captured in the CBA through the application of the discount rate to the cost of the project.

Tolling revenue is not a specific identifiable benefit of the project in the context of the CBA. The tolling charge represents a means by which some of the benefits of the project in terms of reduced travel time, improved vehicle operating conditions and improved safety, all of which are already included in the CBA framework, can accrue to the end user.

20.6.2 Reference Case M203

Data

The CBA evaluates the net differences between the "Do Minimum" Base Case with the Reference Case M203, respectively. The GUP CAPEX and OPEX cashflows for the Reference Case has been taken from the GUP Assumption Register. It is assumed that the Do Minimum Base Case equates to the Do Minimum component in the Reference Case and hence cancel each other out. This assumption has been supported by MR.

CAPEX

The CBA has used CAPEX estimates in assistance with the GUP Assumption Register.

OPEX

OPEX has been assigned over the Assessment Period for the Reference Case M203 in accord with the GUP Assumption Register comprising of State Costs, Contractor Costs General and Major Periodic Maintenance.

20.6.3 Results

Investment criteria which have been calculated for the Reference Case in this CBA are the standard NPV, Present Value (PV) of Costs and Benefits and BCR.

The *PV Benefits* has been segmented by benefit type namely travel time savings, VOC savings and accident savings. The *PV Costs* refers to the present value of the capital investment only. Recurring tolling and maintenance costs in line with the whole of life concept for the project have been included by instruction. The PV is the equivalent value in the base year of a benefit (or cost) to be incurred at some other point in time following the application of the discount rate (ie 6% in the case of this study).

The *NPV* is the value of the discounted total future benefits minus discounted total future costs over the assessment life of the Reference Case. A positive NPV is an economic criterion for proceeding with the project although risk and other non CBA factors also need to be considered.

The *BCR* is equal to the discounted total benefits over the assessment life of the Reference Case divided by the discounted total costs (ie CAPEX and OPEX). A ratio greater than 1 indicates that the Reference Case is economically viable in the context of the CBA although there maybe other non CBA factors (eg available program funding, social and environmental) which may have to be considered in bringing the project to fruition. The higher the BCR indicates that the Project Case has greater economic merit. For example BCR value of 2.0 would represent that the benefits of the project case result in a 100% return on project costs under the modelling assumptions.

A summary table of the CBA investment criteria using a discount rate of 6% is provided in Table 20.3.

Table 20.3 PVs, NPV and BCR for Reference Case (Discount Rate 6%)

Reference Case	PV of Total Benefit $m	NPV $m	BCR	Type of Benefit							
				Travel Time		VOC		Accidents		Environment	
				$million	%	$million	%	$million	%	$million	%
Reference Case M203	$4,867m	$3,597m	3.83	$4,200m	86.3	$615m	12.6	$26.4m	0.5	$25.2m	0.5

The main results of the CBA with regard to the discount or PV benefits Travel Time savings and PV VOC savings over the 30 year assessment period are as provided in Tables 20.4 and 20.5 for the Reference Case M203.

Table 20.4 Reference Case M203 PV Travel Time Benefits by Vehicle Class

Vehicle Class	Total PV TT	% of PV TT	% of PV Total Benefits
	M203	M203	M203
Cars	$3,328m	79.2%	68.4%
Light Commercials	$298m	7.1%	6.1%
Heavy Vehicle	$573m	13.7%	11.8%
Total Travel Time	**$2,670m**	**100%**	**86.3%**

Table 20.5 Reference Case M203 PV VOC Savings by Vehicle Class

Vehicle Class	Total PV VOC	% of PV VOC	% of PV Total Benefits
	M203	M203	M203
Cars	$400m	65.1%	8.2%
Light Commercials	$57.5m	9.3%	1.2%
2 axle	$39.1m	6.4%	0.8%
3 axle	$118m	19.2%	2.4%
Total Travel Time	**$615m**	**100%**	**12.6%**

The major findings from the CBA modelling area as follows:

- The net returns over the assessment period are a NPV of $3,597 million which equates to a BCR of 3.83;
- The GUP Reference Case returns a discounted or PV Total Benefits of $4,867 million over the 30 year assessment period;
- Total Costs while discounted OPEX comprises $116 million reflecting the impact of lesser discounted values in the latter years of the assessment period;

- PV Travel Time savings are the largest contributor to total PV Benefits with $4,200 million or 86% of Total PV Benefits for the Reference Case M203. Cars are the dominant vehicle class contributing around 79% of PV Total Travel Time savings and 68% of Total PV Benefits;
- PV VOC savings are the second largest contributor to total PV Benefits with $615 million or 13% for the Reference Case M203;
- Within the VOC savings stream, cars contribute $400 million or almost 65% to total PV VOC savings while 3 axle trucks contribute $118 million or 19% of total PV VOC savings;
- PV Accident savings are $26.4 million or approximately 0.5% of total PV Benefits for the Reference Case M203; and
- PV Environment benefits for the Reference Case M203 are $25.2 million or 0.8% of total PV Benefits.

The NPV and BCR provide a strong economic justification to proceed with GUP Reference Case over the construction timeline with NPV Benefits of $3,597 million and a BCR of 3.83 over the 30 year assessment period.

Economic parameter values which have been assigned to road user benefits namely travel time, vehicle operating costs and accidents are in June 2002 prices and have been taken from Austroads standards. If the parameter values for road user benefits are escalated to June 2004 prices using CPI changes for Brisbane, the PV benefits would increase by 6.1% to $5,163 million over the 30 year assessment period and result in a higher project BCR of 4.07. Therefore the BCR range for the M203 would be between 3.83 and 4.07 with the latter reflecting the escalation of road user benefits to current 2004 prices.

These BCR results are lower than the Gateway Bridge Preliminary Assessment Report's (2003) findings. That study concluded that "the cost benefit ratio of the project is realistically expected to be in the range of 5.0 to 8.0." The difference in BCRs is, inter alia, primarily attributed to traffic modelling outputs and assumptions regarding the probable prospective road projects which comprise the Do Minimum road network, variations in CAPEX and OPEX and finer user of economic parameter values assigned to travel time and vehicle operating costs savings.

The CBA highlights that the operation of the GUP will reduce traffic delays, congestion and accident costs. The BCR and NPV specify that the aggregate performance of the road network would be significantly positively affected by the GUP which would have its primary impacts in reducing vehicle hours and to a lesser extent vehicle kilometres travelled while having the net effect of increasing travel speeds in the network post beyond 2011.

20.7 Conclusions

The GUP represents a significant investment catalyst which will result in major economic benefits accruing to the State and to the SEQ region.

From a Queensland perspective, the major direct benefits are in terms of net additions to GRP/GSP and job creation. The CEPM model estimates that in its construction phase the project will raise GRP above its current level by $683 million and by an additional 5,919 full time jobs generating wages and salaries in the order of $466 million. In terms of employment, the project would play a major role in continuing the strong level of non residential construction industry in SEQ.

The operations phase of the GUP over a 30 year assessment period will also result in increases in GRP of $15.41 million annually and the ongoing provision of 258 full time jobs generating a wages and salaries of $11.75 million annually.

Aside, from these direct impacts on the regional economy, the construction and operations phases will result in indirect impacts as the project's expenditure flows-on through other sectors of the economy. Indicatively, it is estimated that these indirect impacts will benefit the Finance, Property and Business Services sectors. Currently there are no economic modelling tools available to accurately identify these flow on or indirect impacts.

The CBA provides a strong justification for the project proceeding with a BCR of 3.83 and a NPV of $3,597 million over a 30 year assessment period. Approximately $4,200 million in PV Benefits (or 86% of accrue from significantly improved travel time or alternatively reduced vehicle hours travelled in the forecast road network. It is estimated that the BCR would increase to 4.07 if economic parameter values were escalated from June 2002 prices to June 2004.

The GUP will also have beneficial impacts on the major economic drivers in the ATC precinct namely the Brisbane Airport and the PBC's facilities at Fisherman Islands. Brisbane Airport's national and international passenger throughput is forecast to grow by 5.7% and 6.3% per annum respectively or approximately from a total 12.3 million passengers in 2003 to approximately 23 million passengers by 2012/13. An upgraded Gateway Motorway including a second airport interchange will be integral to the ongoing successful operations of the airport and the proposed supporting industrial/commercial development at the airport.

Similarly the PBC's Fisherman Islands facilities and other land development in the Australia TradeCoast will also generate major additional road infrastructure demand which will add further justification to have the upgraded Gateway Motorway operational by 2012. The Port's total trade is forecast to increase from the current 24.6 million tonnes to 37 million tonnes in 2013 at an average growth of 5.3%. The provision of the GUP by 2012 will significantly enhance the Port's ability to attract increased trade and the ATC locational advantages as one of key commercial/industrial precincts on Australia's eastern seaboard.

Future economic development of the ATC and SEQ in general will require efficient and convenient landside transport links to both the Port of Brisbane's facilities and Brisbane Airport. The failure to achieve an acceptable future level or road performance on the strategically important Gateway Motorway could result in a major loss of economic opportunities for the region and Queensland.