Airport Link

Phase 2 – Detailed Feasibility Study

CHAPTER 2

PROJECT RATIONALE

- October 2006

Contents

2. Background and Project Rationale

This chapter addresses elements of Section 2 of the Terms of Reference. It provides the background leading to the project proposal, including general information on the local, regional and strategic context. It provides the specific objectives and justification for the project and the likely consequences of not proceeding with the project. Particular reference is made to the anticipated economic and social benefits of the project and the project's relationship with the objectives of integrated transport and land use planning for both Brisbane and the South East Region of Queensland.

2.1 Background and Strategic Context

Over the years many studies have been undertaken on Brisbane's limited river crossings and the impact on congestion, going back to the Cross River Commission of 1926 and the Wilbur Smith study of 1965. A system of ring road freeways and other freeways were proposed catering for orbital and radial movements. Finding a balance resulted in revised freeway alignments in 1969. A number of these projects have been completed during the past 36 years, but changing community attitudes to those transport strategies that consisted of surface freeways and the realisation that the city form upon which the Wilbur Smith Study was based was different to that which had developed, mitigated against fulfilment of the proposed system (as envisaged) in the 1980s. Other influences included lack of funding, a review of design processes, a public transport re-think, the establishment and consolidation of major regional centres in Brisbane.

More recently, traffic studies by Council and the State Government Agencies show traffic congestion in much of Brisbane's arterial road network is caused by cross-city traffic. This traffic is forced to travel via the CBD or inner suburbs utilising the arterial road network, highlighting Brisbane's lack of cross city facilities and poor orbital or "ring road" system.

2.1.1 The Transport Plan for Brisbane (2002-2016)

The policy basis for Brisbane City Council's transport planning is largely contained with *The Transport Plan for Brisbane 2002-2016*. This plan developed a set of coordinated actions and strategies aimed to achieve a range of transport outcomes for Brisbane to 2016, including:

- Providing attractive, quality public transport that encourages people to leave their cars at home;
- Managing travel demand so that traffic growth is kept below population growth;
- Coordinating transport and land use to make it easy to travel across Brisbane using sustainable forms of travel;
- Providing a safe and efficient road network that minimises traffic impact on neighbourhoods and the environment;
- The delivery of goods on time to the right place so that freight moves efficiently and safely throughout Brisbane while protecting residential areas; and
- Providing more clean and green transport as safe and attractive alternatives to driving.

The Project is identified within the *Transport Plan for Brisbane* as one element of major infrastructure that could be delivered and financed by the private sector to address deficiencies in the orbital road network of Brisbane. Such major infrastructure included the North-South Bypass Tunnel and the Airport Link.

2.1.2 TransApex

Since the release of the *Transport Plan for Brisbane*, the Airport Link Project has featured within the TransApex policy of Council as part of a wider set of transport infrastructure links around the city in order to take traffic away from Brisbane's CBD and inner and middle suburbs. The TransApex Strategic Context Report identified key deficiencies in Brisbane's current road network structure to include:

- A lack of strong and legible road connections catering for "cross-town" movements – connections, which are commonly known as orbital or ring roads. Fundamentally, this type of road system would allow for cross-city traffic (traffic that does not have an origin or destination in the CBD) on higher-standard road connections. This would help remove through traffic from the radial road network, benefiting the inner city areas, including the CBD.

The TransApex Strategic context also noted that if we were to only improve the current radial road network capacity, rather than improving specific cross-town links, we would risk making travel to the CBD via private vehicle more attractive.

The TransApex Prefeasibility Report, March 2005 identified that the Airport Link's primary function would be to provide an alternative high-speed route to the CBD bypass network or beyond, for airport and northern suburbs traffic using the East-West Arterial, Sandgate, Gympie and Lutwyche Roads.

Preliminary assessment also identified that the Project would:

- Support the development of a significant bus facility along Lutwyche Road, such as the Northern Busway; and
- Facilitate potential Transit Oriented Developments (TODs).

2.1.3 South East Queensland Regional Plan 2005-2026

The State's *South East Queensland Regional Plan 2005-2026* (SEQRP) and its supporting Infrastructure Plan and Program (SEQIPP) includes support for the full feasibility study for the Project in the first phase of the Infrastructure Plan. The SEQRP establishes a range of desired regional outcomes, principles and policies to guide the development of SEQ through to 2026. The SEQRP recognises the significant role Council has in transport in the region and provides in-principle support from the State as a partner in the detailed feasibility study of the Airport Link Project.

Relevant desired regional outcomes to be delivered through SEQRP and SEQIPP include:

- **Sustainability** – The region grows and changes in the most sustainable way; generating prosperity, maintaining and enhancing quality of life, and providing high levels of environmental protection.
- **Strong Communities** – Cohesive, inclusive and healthy communities with a strong sense of identity and place, and access to a full range of services and facilities that meet diverse community needs.
- **Urban Development** – A compact and sustainable urban pattern of well-planned communities, supported by a network of accessible and convenient centres close to residential areas, employment locations and transport. This outcome includes the theme of integrated land use and transport planning with the policy to facilitate appropriate forms of "transit oriented development".
- **Economic Development** – A strong resilient and diversified economy – growing prosperity in the region by utilising its competitive advantages to deliver exports, investment and sustainable and accessible jobs.

- **Infrastructure** – Regional infrastructure and services are planned, coordinated and delivered in a timely manner to support existing and future settlement patterns and desired community outcomes. This outcome is supported by the Infrastructure Plan (SEQIPP) that identifies an investment program for the Airport Link Project within the Orbital Road Network theme of SEQIPP. The identified strategic transport needs for transport infrastructure investment in Greater Brisbane within the SEQIPP are:
  - Quality public transport connections between Principal Activity Centres;
  - Better transport links to industrial and logistics centres, particularly to the Australia Trade Coast; and
  - Orbital road networks that link centres outside the inner city, reduce traffic congestion and provide a sound basis for future traffic management.
- **Integrated Transport** – A connected and accessible region based on an integrated transport system that supports more compact urban growth and efficient travel; connects people, places, goods and services; and promotes public transport use, walking and cycling. This includes the need for a quality orbital roads network such as the Airport Link to support connectivity of urban centres and to bypass major road congestion points. This will be accompanied by enhanced public transport services and better walking and cycling facilities on existing routes.

2.1.4 Project Objectives

The primary objective of Airport Link is to provide relief to congested roads in Brisbane's northern suburbs, connect activity centres and provide a sound basis for future traffic management by linking to strategic road connections allowing cross-city travel movements to bypass the Central Business District and inner suburbs.

Specific project objectives for the Airport Link have been developed from the identified State and Council outcomes for regional planning, infrastructure provision, and integrated land use and transport planning for South East Queensland and in particular the Greater Brisbane area.

(1) Improve Transport Sustainability in Brisbane's inner northern suburbs

(a) Road transport

- Ease traffic congestion on key routes
- Improve accessibility across and within Brisbane's northern suburbs
- Improve journey time reliability for road users including freight
- Contribute to an appropriate road hierarchy
- Enhance the connection between communities
- Improve road safety
- Improve road network legibility/navigability

(b) Public transport, pedestrians and cycles

- Improve opportunities and travel times for public transport e.g. Northern Busway
- Enhance the pedestrian and cycle network
- Accommodate transit oriented development
- Facilitate a better balance between public transport and private vehicles use

(2) Enhance liveability of our communities

- Minimise community impact of project footprint
- Reduce through traffic and heavy vehicles through suburban streets
- Facilitate planning and urban regeneration
- Seek to improve urban amenity and community safety

(3) Enhance the Environment

- Seek to improve local air quality along the corridor
- Seek to improve water quality
- Reduce road traffic noise along the corridor
- Protect significant flora and fauna
- Protect cultural heritage
- Mitigate and manage environmental construction impacts

(4) Support Economic Development

- Meet the access needs of tourism, trade and industry
- Enhance access to and competitiveness of major activity centres
- Create new employment and improved land use opportunities

(5) Provide an Affordable Solution

- Deliver an affordable and cost effective solution (with appropriate toll levels)

2.2 Problem Definition and Project Justification

The Transport Plan for Brisbane, TransApex and the SEQRP identify the need for a system of motorway-standard orbital (ring) roads to address the high-levels of congestion in Brisbane and enhance accessibility. These plans and policy objectives also include initiatives for public transport as well as alternatives such as walking and cycling to support the desired urban form to accommodate the predicated additional people moving to South East Queensland (SEQ) over the next decade and beyond.

Brisbane's transport infrastructure has not always been implemented in response to demand, or strategically developed to encourage sustainable travel behaviour. The result is a transport network that:

- Has a predominantly radial, CBD focus with few if any options to bypass the city centre on existing surface roads;
- Has poor road connectivity between Brisbane Airport, the CBD and western areas;
- Has limited capacity on major roads like the Western Freeway, Riverside Expressway and Lutwyche Road;
- Ends motorways at low quality arterials producing a discontinuous motorway system;
- Draws traffic though local centres;
- Has high numbers of signalised intersections along major roads like Lutwyche Road, Sandgate Road, Gympie Road;
- Consists of poorly defined traffic routes that are difficult to navigate; and
- Inhibits the movement and patronage of public transport.

Even with major increases in non-motorised and public transport travel, the existing road network will not sustain future travel demands generated by growth in population and the economy. A range of transport infrastructure solutions is becoming critical and increasingly urgent to maintain a liveable city.

2.2.1 Population Growth

As stated in the SEQRP, South-East Queensland has experienced high and sustained population growth since the 1980s growing at an average of 55,300 persons each year (or over 1,000 people per week) between 1986 and 2004. It is estimated that by 2026, South-East Queensland will be home to 3.71 million people – an increase from 2.77 million in 2006 at an average increase per year from 2001 to 2026 of 50,000 people. These SEQ

regional population projections are based on the medium series projections, which are considered to be the most likely outcome (PIFU (2003)[1]).

Within South East Queensland, the Brisbane Metropolitan area is the fastest growing metropolitan area in Australia[2]. The Brisbane Metropolitan area growth represents more than a quarter of all projected population growth in Australia over the next 25 years from 1.8 million in 2004 to 2.6 million in 2026.

With the population growth forecast for the Brisbane metropolitan area combined with real increases in travel behaviour due to the increasingly dispersed urban footprint, the travel demand on key inner-city routes is similarly forecast to grow significantly. As modelled in Chapter 5 – Traffic and Transport, the estimated number of person trips of all types by this population in 2026 will be of the order of 8.8 million. **Table 2-1** gives the projections of population, employment and estimates of person trips for the Brisbane Metropolitan area for the ABS Medium Series population scenario.

As land use and growth patterns vary across the Metropolitan Area, this will result in changes to travel demand particularly at key locations served by the project, such as Brisbane Airport, the Australia TradeCoast (ATC) North precinct and Chermside.

Table 2-1 Brisbane Metropolitan Area Population Forecasts

Year	Population (1)	Employment (2)	Total Person Trips (3)
2004	1,773,000	804,800	6.1 million
2012	2,074,500	1,025,400	7.2 million
2016	2,221,500	1,130,900	7.7 million
2022	2,439,600	1,253,500	8.4 million
2026	2,583,700	1,320,500	8.8 million

Table Notes:

(1) Source: Australian Bureau of Statistics – Medium Series, 2005.

(2) Employment opportunities consistent with ABS Medium population projection

(3) Trips by all modes including walk/cycle.

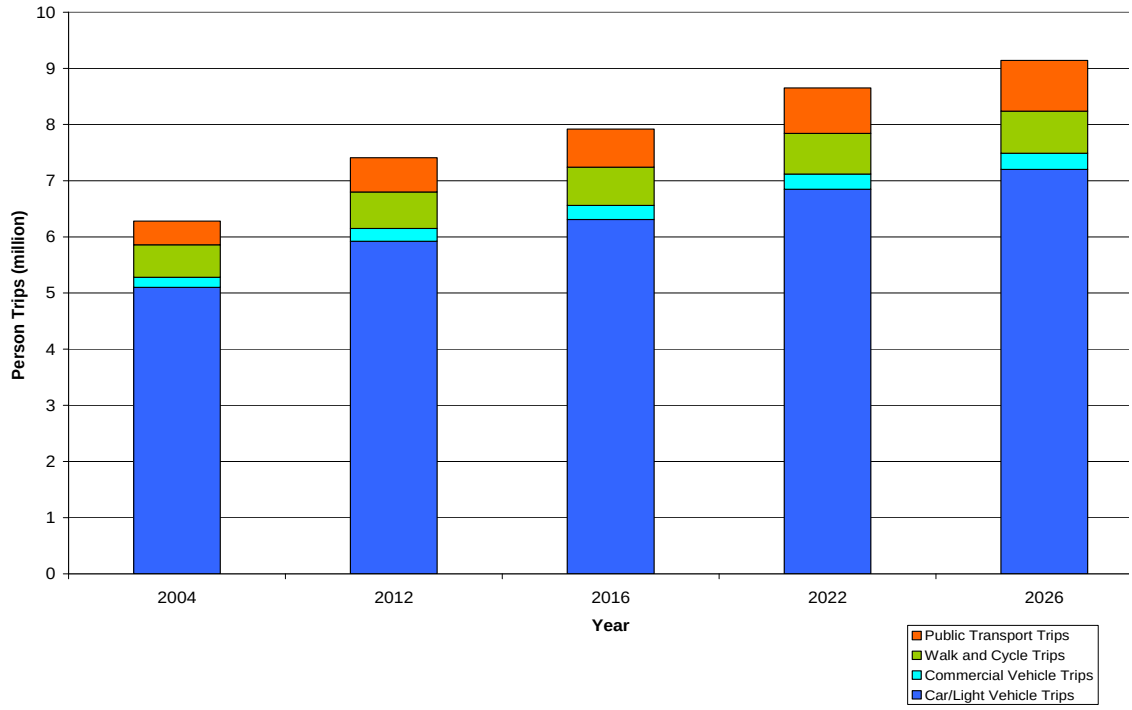
2.2.2 Increased Vehicle Trips

Growth in population and consequent travel demand is placing enormous pressure on Brisbane's existing road and public transport services – particularly in the CBD and the inner suburbs. **Figure 2-1** summarises the estimated growth in the travel task (in terms of person trips) by the various travel modes – vehicle, public transport, and walk/cycle travel. This demonstrates how travel demand is forecast to grow in a sustained manner across all modes.

[1] Dept Local Government & Planning (Population & Information Forecasting Unit), 2003, Queensland Government Population Projections 2003, 2001 Geographical Boundaries.

[2] The Brisbane Metropolitan Area is also identified as the Brisbane Statistical Division (BSD) and includes the City of Brisbane and the surrounding area extending to Caboolture in the north, Beenleigh in the south, Ipswich to the west and Redland Shire to the east.

Figure 2-1: Forecast Growth in Average Weekday Travel Demand Within Brisbane Metropolitan Area (Person Trips)



Average weekday traffic volumes have been forecast for roads in the Brisbane Metropolitan Area for the years 2012, 2016, 2022 and 2026, for a road network that does not include the proposed Airport Link. Estimated average weekday traffic volumes for 2004 have also been identified to allow comparison. The travel demand forecasts incorporate the effects of significant enhancements in public transport. **Table 2-2** summarises the growth in travel demand at the metropolitan level.

Table 2-2 Forecast Growth in Weekday Travel Demand - Metropolitan Area

Parameter	2004	2012	2016	2022	2026
Population (million)	1.77	2.07	2.22	2.44	2.58
Person Trips by Motorised Travel Modes	5,519,200	6,530,200	6,987,900	7,657,400	8,093,700
Public Transport Trips	415,400	607,100	677,000	807,200	895,600
% PT Trips	7.5%	9.3%	9.7%	10.5%	11.1%
Car/Light Vehicle Trips	3,611,000	4,239,800	4,534,300	4,940,700	5,216,500
Commercial Vehicle Trips	177,600	231,000	249,700	272,200	287,600
Total Vehicle Trips	3,788,600	4,470,900	4,783,900	5,212,900	5,504,100
% Growth in Vehicle Trips compared to 2004		18%	26%	38%	45%

These forecasts show that even with significant growth in public transport mode share, a sustained growth in vehicle travel demand is indicated both at the Brisbane Metropolitan area level and within the Inner North area. In the metropolitan area 44% more vehicle trips are expected by 2026, even with the number of public transport trips more than doubled. Within the study corridor, north-south travel movements within the Inner North area are forecast to increase by 49% between 2004 and 2026, a sustained growth rate of 1.8% pa. East-west demands are forecast to grow by 55 to 65 % in a similar period, a growth rate of over 2.0% pa. These growth trends are

similar for commercial vehicle movement, indicating that the adverse effects of truck travel through the surface network in the Inner North areas for access to the rapidly growing ATC precinct will become even more significant over time.

The Airport Link Project enables such a connection of traffic from the ATC precinct, from Sandgate Road and from Gympie Road into the North-South Bypass Tunnel and the Inner City Bypass, thus removing traffic from the CBD and adjacent roads and bridges.

The Airport Link Project has been considered in the Transport Plan as part of a balanced and integrated approach to relieve inner-city congestion and address the City's transport challenges. Other measures include enhanced public transport services on important routes, and enhanced opportunities for cycle and pedestrian trips, providing greater flexibility in the transport system.

2.2.3 Issues with Existing Road Network

Brisbane's existing road network was based on the pattern of intercity links to other towns and regional centres. The major roads that grew from these early transport links now form a series of radial corridors focused on the CBD. Ipswich Road, Lutwyche Road, Logan Road and the Pacific Motorway are examples of the radial structure of Brisbane's existing road network. More recent projects such as the Gateway Motorway, Inner City Bypass, Logan Motorway and North-South Bypass Tunnel have been, or are being constructed to address deficiencies in the road network structure.

A detailed analysis of the existing traffic and transport conditions in the City is presented in Chapter 5 – Traffic and Transport.

2.2.4 Declining Levels of Service

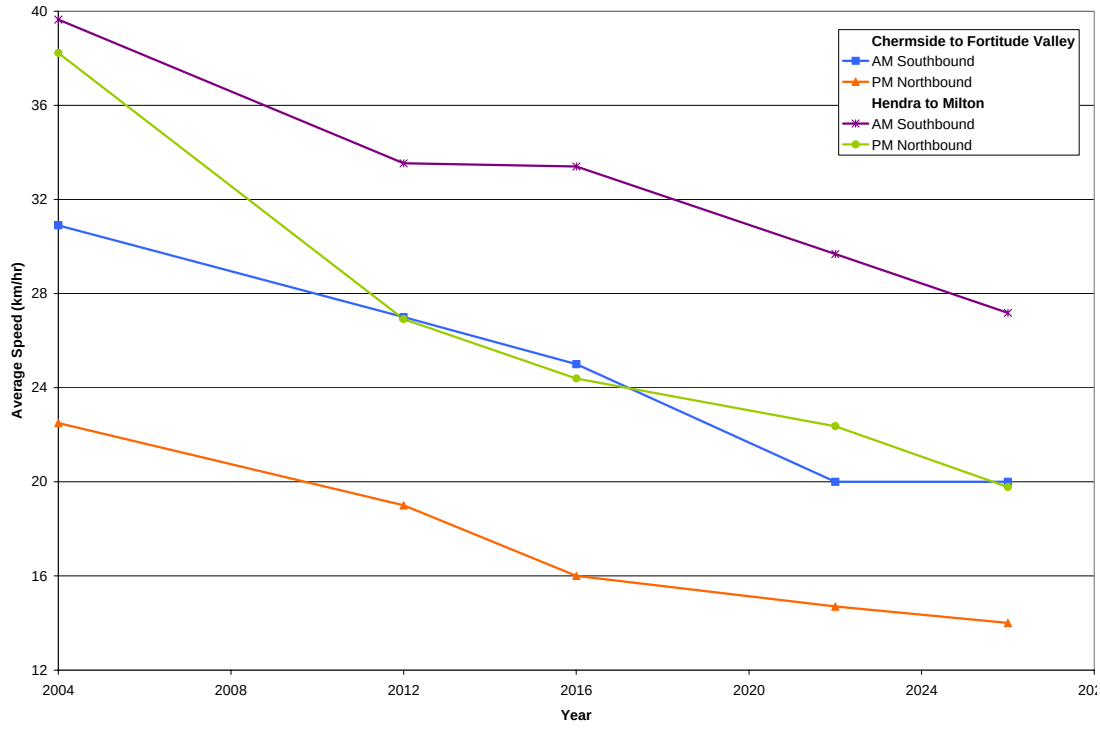
The impact of the through-traffic is evident from the analysis of average peak travel speeds for some of the major cross-city routes. With increased demand and higher congestion levels, there is a general decline predicted in the level of service on the road network across the years. Peak period journey travel times are forecast to increase significantly compared to the current level.

For example, without the Airport Link Project, even with enhanced mode share to public transport, traffic conditions on the Lutwyche Road/Gympie Road corridor are forecast to deteriorate over time. Traffic volumes through the Lutwyche shopping precinct would grow by over 30% by 2026.

Figure 2-2 illustrates the forecast decline in travel speed for two examples of typical journeys through the Inner North area. By 2016 for a peak period trip from Chermside to Fortitude Valley, an average travel speed of 25 km/hr is forecast compared to 31 km/hr currently, declining to less than 20 km/hr by 2026. A more severe deterioration is forecast for the PM peak, with forecast 2026 northbound PM peak speed of only 14 km/hr.

Similarly on Sandgate Road even greater growth would occur due to its proximity to the ATC precinct and its connecting role to the Brisbane CBD, the Metropolitan area's other major economic activity area. Almost a doubling of current traffic levels is likely by 2026, and a sharp decline in level of service would be associated with this demand growth. A morning peak period southbound trip from Hendra to Milton in 2026 would experience an average travel speed of 27 km/hr (compared to 40 km/hr currently), with the PM peak speed of only 20 km/hr for the northbound trip.

Figure 2-2 Forecast Decline in Travel Speed on Key Routes Without Airport Link



Increasing levels of congestion on the road network will have a range of consequences:

- Daily patterns of life for people suffer due to wasted travel time and increased fuel costs;
- The environment is degraded due to increased emissions from congested traffic conditions;
- Public transport users in buses suffer due to delays and unreliability;
- Local amenity and safety for street system users such as pedestrians and cyclists is diminished;
- Both industry and the community are impacted by higher transport costs for goods and services;
- Businesses and residents in inner areas served by the congested networks experience restrictions to their accessibility; and
- Community safety and security is compromised due to delays for emergency vehicles.

Assessment of existing travel demand in Brisbane's inner north indicates that on the arterial roads about 60% of trips are cross-city, 35% are destined for the Central City with only 5% local traffic. Much of the traffic congestion in the arterial network in the inner north of Brisbane's radial road system is caused by traffic wanting to get "somewhere else" but being forced to use the roads through the suburbs.

2.2.5 Journey Times

There are substantial benefits available in travel speed, and therefore reduced travel times. **Table 2-3** provides evidence of the travel time benefits of the Airport Link Project for the road network.

Table 2-3 Effects of Airport Link on Travel Times and Speeds for Key Routes

Route		Direction	Without APL		With APL				APL Time Benefits			
					via APL		On Surface		via APL		On Surface	
			(min)	(km/h)	(min)	(km/h)	(min)	(km/h)	(min)	(%)	(min)	(%)
AM Peak Hour												
2004												
A	Chermside to Fortitude Valley	Southbound	14	31	-	-	-	-	-	-	-	-
B	Nundah to Fortitude Valley	Southbound	14	33	-	-	-	-	-	-	-	-
C	Hendra to Fortitude Valley	Southbound	14	34	-	-	-	-	-	-	-	-
D	East Brisbane to Chermside	Northbound	20	32	-	-	-	-	-	-	-	-
E	Stafford to Hendra	Eastbound	11	41	-	-	-	-	-	-	-	-
F	Hendra to Milton	Southbound	17	40	-	-	-	-	-	-	-	-
2012												
A	Chermside to Fortitude Valley	Southbound	17	27	9	50	14	32	7	44%	3	17%
B	Nundah to Fortitude Valley	Southbound	16	29	10	57	13	35	6	39%	2	16%
C	Hendra to Fortitude Valley	Southbound	15	31	9	59	14	35	6	39%	2	11%
D	East Brisbane to Chermside	Northbound	19	33	13	48	17	36	6	32%	1	8%
E	Stafford to Hendra	Eastbound	13	35	9	50	12	39	4	33%	1	9%
F	Hendra to Milton	Southbound	20	34	14	51	19	35	6	29%	1	5%
2022												
A	Chermside to Fortitude Valley	Southbound	22	20	11	42	16	28	11	49%	6	29%
B	Nundah to Fortitude Valley	Southbound	19	24	10	53	14	33	9	46%	5	27%
C	Hendra to Fortitude Valley	Southbound	18	27	11	52	15	32	7	40%	3	17%
D	East Brisbane to Chermside	Northbound	23	26	17	35	22	28	6	26%	1	6%
E	Stafford to Hendra	Eastbound	19	24	11	38	15	31	7	39%	4	23%
F	Hendra to Milton	Southbound	22	30	15	46	20	32	7	31%	2	9%

Route		Direction	Without APL		With APL				APL Time Benefits			
					via APL		On Surface		via APL		On Surface	
			(min)	(km/h)	(min)	(km/h)	(min)	(km/h)	(min)	(%)	(min)	(%)
PM Peak Hour												
2004												
A	Fortitude Valley to Chermside	Northbound	20	23	-	-	-	-	-	-	-	-
B	Fortitude Valley to Nundah	Northbound	15	30	-	-	-	-	-	-	-	-
C	Fortitude Valley to Hendra	Northbound	16	30	-	-	-	-	-	-	-	-
D	Chermside to East Brisbane	Southbound	21	30	-	-	-	-	-	-	-	-
E	Hendra to Stafford	Westbound	12	37	-	-	-	-	-	-	-	-
F	Milton to Hendra	Northbound	18	38	-	-	-	-	-	-	-	-
2012												
A	Fortitude Valley to Chermside	Northbound	23	19	14	33	17	26	9	41%	6	26%
B	Fortitude Valley to Nundah	Northbound	22	21	14	39	17	27	8	37%	5	22%
C	Fortitude Valley to Hendra	Northbound	21	23	14	40	18	28	8	36%	4	18%
D	Chermside to East Brisbane	Southbound	23	27	13	46	17	36	9	41%	5	23%
E	Hendra to Stafford	Westbound	15	31	10	44	13	36	5	33%	2	14%
F	Milton to Hendra	Northbound	25	27	14	49	23	30	11	43%	2	9%
2022												
A	Fortitude Valley to Chermside	Northbound	30	15	18	25	21	21	12	41%	9	29%
B	Fortitude Valley to Nundah	Northbound	27	18	15	35	19	25	12	43%	8	29%
C	Fortitude Valley to Hendra	Northbound	25	19	15	36	19	25	10	40%	6	24%
D	Chermside to East Brisbane	Southbound	22	29	17	36	21	29	4	21%	0	1%
E	Hendra to Stafford	Westbound	24	19	10	43	16	28	14	58%	8	32%
F	Milton to Hendra	Northbound	30	22	16	45	25	27	14	48%	5	17%

The routes chosen in **Table 2-3** have been selected to encompass examples of key travel patterns within the area such as north-south travel associated with the Central City (Chermside to Fortitude Valley, Nundah to Fortitude Valley), cross-city movements (Chermside to East Brisbane, Stafford to Milton) and travel to the ATC/Brisbane Airport precinct (Hendra to Milton, Hendra to Fortitude Valley).

Travel time benefits during peak periods offered by Airport Link on most routes increase over time. In most cases, the forecast travel times are longer in the evening peak than the morning peak. The travel time benefits offered by Airport Link on the cross-city routes (routes D, E and F) are significant, averaging approximately 30% in the morning peak hour and 40% in the evening peak. The time savings for these routes are greatest on the east-west routes to the ATC/Brisbane Airport precinct (E and F) in the evening peak in 2022. Airport Link also provides significant travel time benefits on radial routes, averaging over 40% in both AM and PM peak hours.

Traffic choosing the un-tolled surface links instead of Airport Link would also benefit from the project, though to a lesser degree. Average benefits of approximately 10% to 15% on cross-town routes and 20% to 30% on radial routes are forecast for this traffic.

2.2.6 Cost Savings

The following costs have been included in the evaluation of the 'do minimum' option and the Airport Link Project:

- Road user costs (e.g. travel time costs, vehicle operating costs, traffic accidents);
- Environmental and social effects; and
- Public transport costs.

The two main influences on costs are the forecast total vehicle hours travelled (VHT) and the forecast total vehicle kilometres travelled (VKT) in the Brisbane road network for the do-minimum and the Airport Link option. The VHT and VKT differences between the 'do-minimum' scenario and the 'Airport Link' option for each modelled year are shown in **Table 2-4**. This shows that the Project reduces the amount of travel on lower order roads in the network (local district and suburban routes) and redistributes travel to Motorway routes. The Arterial road network is also benefited by travel distance and time reductions. A very small (<0.2%) increase in overall vehicle kilometres of travel in the network is forecast.

Travel Time Savings

Projects that improve traffic flow and provide motorists with improved journey time, less congestion in the network and enhanced network reliability that may result in time savings are assessed as having economic value.

Calculation methodology is explained in Chapter 16 - Economics and the estimated travel time savings by category of vehicle are shown in **Table 2-5**.

Table 2-4 Network Performance With & Without Airport Link

Road Type	Without Airport Link			With Airport Link			Difference		% Difference	
	VHT	VKT	Speed km/h	VHT	VKT	Speed Km/h	VHT	VKT	VHT	VKT
2012										
Motorway	272,900	22,103,000		277,100[3]	22,290,000[4]		4,200	187,000	1.5%	0.8%
Motorway (AL Tunnel)	-	-		-	331,000		-	331,000	-	-
Expressway	12,100	616,000		12,300	596,000		200	-20,000	1.7%	-3.2%
Arterial	452,200	20,203,000		440,300	19,954,000		-11,900	-249,000	-2.6%	-1.2%
Suburban	170,100	8,186,000		165,700	8,075,000		-4,400	-111,000	-2.6%	-1.4%
District	98,900	3,329,000		97,200	3,291,000		-1,700	-38,000	-1.7%	-1.1%
Local	53,800	1,317,000		53,000	1,295,000		-800	-22,000	-1.5%	-1.7%
Total	1,059,900	55,754,000	52.6	1,045,600	55,833,000	53.4	-14,300	79,000	-1.3%	0.1%
2022										
Motorway	358,000	27,777,000		362,600[3]	27,977,000[4]		4,600	200,000	1.3%	0.7%
Motorway (AL Tunnel)	-	-		-	397,000		-	397,000	-	-
Expressway	13,900	644,000		14,300	625,000		400	-19,000	2.9%	-3.0%
Arterial	542,900	23,360,000		523,700	23,090,000		-19,200	-270,000	-3.5%	-1.2%
Suburban	204,700	9,581,000		198,200	9,429,000		-6,500	-152,000	-3.2%	-1.6%
District	120,600	3,873,000		116,000	3,803,000		-4,600	-70,000	-3.8%	-1.8%
Local	77,600	1,508,000		75,300	1,472,000		-2,300	-36,000	-3.0%	-2.4%
Total	1,317,600	66,742,000	50.7	1,290,200	66,793,000	51.8	-27,400	51,000	-2.1%	0.1%
2026										
Motorway	408,800	30,070,000		411,400[3]	30,255,000[4]		2,600	185,000	0.6%	0.6%
Motorway (AL Tunnel)	-	-		-	410,000		-	410,000	-	-
Expressway	14,600	653,000		15,200	632,000		600	-21,000	4.1%	-3.2%
Arterial	593,400	24,585,000		572,800	24,300,000		-20,600	-285,000	-3.5%	-1.2%
Suburban	225,400	10,224,000		218,500	10,077,000		-6,900	-147,000	-3.1%	-1.4%
District	132,800	4,129,000		129,300	4,065,000		-3,500	-64,000	-2.6%	-1.6%
Local	93,100	1,608,000		91,400	1,577,000		-1,700	-31,000	-1.8%	-1.9%
Total	1,468,200	71,269,000	48.5	1,438,500	71,317,000	49.6	-29,700	48,000	-2.0%	0.1%

Table Notes:

(3) Includes AL Tunnel VHT (4) Excludes AL Tunnel VKT

Table 2-5 Present Value of Travel Time Savings by Vehicle Type

Vehicle Segment	Present Value ($)	% of Travel Time Benefit
Cars (Business)	$317,062,108	18.6%
Cars (Private)	$1,252,596,236	73.6%
Light Commercial	$81,353,350	4.8%
Heavy Commercial	$52,009,500	3.1%
Travel Time Benefits Total	**$1,703,021,194**	**100%**

Vehicle Operating Cost Savings

Road projects can directly affect the cost of operating vehicles through improved traffic flow and better road conditions. Vehicle operating cost (VOC) savings will be derived from improved road conditions that impose less stress on vehicles. The methodology used to calculate the value of VOC savings potentially effected through the project is outlined in Chapter 16 – Economics and **Table 2-6** shows the findings by road type and vehicle segment.

Table 2-6 Present Value of Vehicle Operating Costs

Vehicle Type	Cars	Heavy Vehicles	Total
Road Type	**Present Value ($)**	**Present Value ($)**	**Present Value ($)**
Motorway	-$300,148,273	-$163,504,210	-$463,652,483
Expressway	$7,724,965	$691,863	$8,416,828
Arterial	$330,099,266	$250,461,338	$580,560,604
Suburban	$119,136,240	$84,124,667	$203,260,908
District	$62,869,731	$38,159,023	$101,028,754
Local	$30,548,209	$23,207,791	$53,756,000
Present Value ($)	**$250,230,138**	**$233,140,472**	**$483,370,610**

Road Safety Benefits

The standard process for quantifying the accident reduction benefits arising from changes in the road network is outlined in Chapter 16 of this EIS and **Table 2-7** presents the estimated savings by road type.

Table 2-7 Discounted Road Safety Benefits

Road Type	Present Value ($)
Motorway	-$35,762,341
Expressway	$1,385,266
Arterial	$54,235,681
Suburban	$37,116,218
District	$16,238,268
Local	$8,082,354
Road Safety Total	**$81,295,447**

The disbenefit to the Project of -$35.76 million from motorways is the result of the increase in VKT on the motorway arising from the shift of daily traffic from the arterial and suburban road network to the motorway network.

2.3 Need for the Project

2.3.1 Regional Planning

The Queensland Government established the Regional Framework for Growth Management as part of the SEQ 2001 regional planning initiative and has updated the RFGM to address sustained pressures from strong population growth. Within this framework and under pressure of continued population growth the Queensland Government has released its *South East Queensland Regional Plan 2005-2026* (SEQRP). It is supported by amendments to the IPA such that local governments will be required to amend their planning schemes to give effect to the directions of the SEQRP. The strategic directions of the SEQRP are relevant to assessment of the need for the Airport Link project. The SEQRP articulates a regional vision, supported by six strategic directions

to achieve the preferred form for future development. These are detailed in Chapter 12 – Land Use and Planning.

The SEQRP is framed to achieve a range of sustainable social, economic and environmental outcomes which respond to community values and the imperatives of growth management. The SEQRP anticipates that quality of life and economic development opportunities will be enhanced by integration of land use and transport planning, and integrated delivery so that future growth will be focussed on transport routes and nodes. It also recognises that an integrated transport network of roads, railways, ports and airports is essential to supporting Brisbane's competitiveness. Its key strategies include:

- Integration of land use and transport systems, including intensifying residential uses near transit facilities;
- Maintaining and enhancing the region's strategic freight network through the Western Corridor to the Australia Trade Coast, as well as major linkages to domestic markets;
- Supporting employment opportunities in close proximity to transport services and at Regional Activities Centres including the CBD, by designating appropriate land use and facilitating supporting physical and social infrastructure; and
- Strengthening Brisbane CBD's role as the key centre for commercial activity, with higher population and business densities resulting from urban consolidation, and driving greater business activity and efficiency.

2.3.2 Regional Transport Planning

The *Integrated Regional Transport Plan*, or IRTP, (QT 1997) is now overtaken by the SEQRP, to the extent there are inconsistencies between the two, in terms of establishing a pattern of development and delivery of major transport infrastructure. The IRTP sought to achieve an integrated solution to the SEQ region's traffic and transport challenges by establishing ambitious targets for mode share in public transport. Subsequent to the IRTP, the Queensland Government recognised and addressed the continued trend towards travel in private motor vehicles, and released an implementation measure for the IRTP, namely *Transport 2007* (QT 2001). *Transport 2007* advocates an investment program in several key policy areas, including safe mobility, environmental values, travel demand management, land use planning, cycling and walking, and integrated public transport.

Traffic analysis for *Transport 2007* indicated that all arterial roads close to the Brisbane CBD are subject to significant traffic congestion during peak periods. Cross-city trips are placing a considerable load on the road network because there are limited direct routes for these trips. Transport 2007 did not propose measures to divert through-traffic but noted that any proposed future tunnel or ring road would need to provide an effective alternative, thereby reducing congestion on radial routes, trip time and emissions. *Transport 2007* also noted that IRTP acknowledged the need for ring roads and bypasses in key situations.

The preferred approach taken in *Transport 2007* was to first make better use of existing road capacity by managing the increasing travel demands within the region, while not ruling out the possibility of new cross-river road infrastructure. Measures were advanced to encourage people to modify their travel behaviour and choose travel modes such as public transport, cycling and walking.

2.3.3 Brisbane Transport Planning

The Brisbane City Council released the Transport Plan for Brisbane 2002 – 2016 in 2002 and is now in the process of reviewing and updating this important planning tool. Among the objectives of the Transport Plan (2002) are several of the initiatives of the IRTP and Transport 2007:

- Developing a sustainable transport system;

- Restraining growth in peak period car travel demand;
- Providing efficient and sufficient road capacity;
- Ensuring efficient freight movement;
- Providing for pedestrians and cyclists;
- Coordinating transport and land use;
- Ensuring social justice; and
- Maintaining environmental quality.

In promoting an integrated approach to land use and transport planning, the Transport Plan anticipates that Brisbane roads will be extremely congested by 2016, if no new road, public transport or travel demand management initiatives are implemented now. Along with the NSBT Project, the Airport Link Project was identified as one of several priority measures for resolving transport problems within Brisbane.

2.3.4 Integrated Transport Planning

The SEQRP notes that the region is well positioned to adopt an integrated transport solution consisting of an integrated public transport system (bus, ferry, rail), and new roads and improvements to existing roads to address the most congested parts of the network. Integrated transport planning (at both local and regional level) in Brisbane over the last 15 years has recognised the need to increase public transport use for commuter and other movements, with increases in pedestrian and cycle movements.

The SEQRP notes that:

- The use of cars in the region is growing faster than the population;
- Private cars will continue to be used into the future for the majority of trips in South East Queensland; and
- Transport has negative impacts such as greenhouse gas emissions, air and noise pollution, accidents and congestion.

Increasing the attractiveness and viability of walking, cycling and public transport is a key strategy to provide additional flexibility in the system. Public transport provides access for the whole community including those who do not have cars or who cannot drive, and walking and cycling networks provide flexibility as well as significant health and environmental benefits.

To achieve these objectives, public transport needs to be more attractive, for which increased road capacity is critical and a priority action as most bus transport will continue to rely on the surface road network. An efficient transport system, including an efficient arterial road network, is vital to Brisbane's economic future. The present and expected future traffic and transport scenario, in a 'do nothing' or 'do the minimum' approach, is and will become a greater constraint on the City's competitive economic advantage. The Regional Plan and the *South East Queensland Infrastructure Plan and Program 2005 - 2026* identifies a number of key transport infrastructure actions to be undertaken in the Greater Brisbane & Western Corridor. They include:

- Complete the orbital road system in Brisbane to complement an overall network of north-south and east-west arterial connections;

- Investigate optimal solutions for TransApex[3];
- Extend the busway network;
- Extend transit lanes on the Pacific Motorway;
- Implement bus priority measures; and
- Construct additional river crossings for pedestrians and cyclists.

2.4 Justification for the Project

The primary objectives of various planning studies and policy statements by both State and Council broadly identify the following objectives for integrated land use and transport planning:

- **Liveable communities** – a land use and transport system that improves and supports our urban environment with appropriate connectivity on suitable transport networks that are fit for purpose.
- **Safer communities** – a land use and transport form that supports the safety and security of users.
- **Sustainable communities** – a land use and transport form that values, conserves and supports the continuity and health of human and ecological processes.
- **Economic communities** – a land use and transport system that supports economic prosperity and growth through the efficient and effective exchange of goods and services.

2.4.1 Environmental Effects

There are a number of environmental effects that result from the use of motorised vehicles including air, noise and water pollution, and greenhouse gas emissions (climate change). Congested traffic produces more emissions than free-flowing traffic, affecting air quality. The character of traffic noise is also different and less predictable than that produced by efficient traffic streams. Noise from congested roads sometimes requires noise barriers, which are visually obtrusive and affect local breezes.

The operation of the Airport Link Project will reduce total VKT, resulting in a reduction in emissions. There may also be reduced emissions from less time spent sitting idling and accelerating at intersections and on heavily congested roads. Whilst the monetary value of environmental gains is uncertain, and the marginal and average costs differ between environmental effects, values shown in **Table 2-8** below are taken as current estimates and used in the economic analysis. On these values the environmental benefit of the project is of the order of $11 million.

Table 2-8 Transport-Related Environmental Costs

Description	Unit value (cents/VKT)
Greenhouse gas emissions	1.37
Air pollution	0.57
Noise	0.43
Water pollution	0.28
Total environmental externality	2.65

Table Note: Source: Victorian Department of Infrastructure, Investment Appraisal and Evaluation Guidelines, June 2002

[3] *TransApex* – policy developed for an integrated transport solution for Brisbane.

2.4.2 Social Costs

In addition to the more readily-identified economic costs, traffic congestion has a range of social costs at both household and community level which are less readily identified. Such costs of traffic congestion include:

- Diminished environmental conditions in the urban area (air pollution, traffic noise);
- Diminished urban amenity as convenience and accessibility within the urban area becomes constrained;
- Constrained social interaction as accessibility reduces;
- Increased risk of traffic accidents, leading to increased risk of injuries and fatalities;
- Reduced opportunities for efficient and accessible public transport, necessary for people with low incomes or constrained mobility; and
- Increased travel times, especially in commuting, leading to reduced recreation or family time.

These social costs are not borne equitably through the community, with people of limited or constrained resources usually bearing a greater proportion of the social costs of traffic congestion. In the context of the study corridor, people living along the major traffic routes such as Gympie Road, Sandgate Road and Lutwyche Road are less likely to have the resources to respond to increases in traffic noise or air pollution from traffic congestion by relocating to less impacted areas. Those who do relocate risk the loss of access to community facilities and infrastructure upon which they rely for other needs.

People who can afford to choose are increasingly motivated to reduce time spent in traffic by living and working in inner suburbs or other areas well served by uncongested routes and public transport. Demand increases land value and therefore housing costs in accessible areas. This reduces choices for lower income households, and restricts their choices about where to live and work.

Community Costs

Brisbane Airport is growing as the population of South East Queensland grows, with the Brisbane Airport Corporation estimating that the 12 million passengers using the airport in 2005 will have grown to 35 million by 2026. Despite the improved capacity of the Airtrain rail link and the Inner City Bypass and Gateway Arterial duplication to deal with this growth, linkage of the Airport with the CBD and the inner and middle suburbs remains inadequate to cope with these projected increases. Efficient operations at Brisbane Airport are important to the functioning of the Brisbane and regional community.

The environment near congested roads is affected by air pollution, noise, and the visual impacts of road infrastructure. Road corridors, in combination with traffic volumes, reduce connectivity within and between suburbs, and major routes often transect areas with lower socio-economic indicators (e.g. Bowen Hills and Lutwyche). The ‘busy-ness’ of congested roads also detracts from peaceful enjoyment of other surrounds. In combination, congestion affects the environmental values of communities.

Access to recreational, cultural and learning facilities is constrained by congestion. Road-based public transport must compete for road space with other traffic. People spending their limited non-work hours in congested traffic conditions is undesirable generally and is inconsistent with the *Living in Brisbane* strategies being pursued by the Brisbane City Council.

2.5 Benefits of Airport Link

Easing road traffic congestion in the inner northern suburbs will enhance their liveability, particularly if the freed road capacity is taken up by enhanced public transport services, improved cycle links and more

comfortable and attractive pedestrian connections. Airport Link can improve the road network by fulfilling important transport functions.

Airport Link will function as an intra-state road network connection, providing an underground link to other motorway standard connections, catering for long distance movements between major economic regions within South East Queensland, by linking the Brisbane CBD with the ATC precinct including Brisbane Airport. It will also provide an underground linkage between this major economic area and locations external to South East Queensland. Although the Gateway Motorway is an obvious connection to the ATC the Airport Link provides an alternative connection to the ATC precinct from southern and western areas, via the Airport Link, NSBT, and the Pacific Motorway, or via the Airport Link, NSBT and the Ipswich Motorway, respectively.

Airport Link will support the regional road network by providing a high-speed underground link for radial and orbital trips. Specific examples of Airport Link's regional road network role include:

- A motorway-standard connection to the NSBT and the southern and eastern suburbs, and to the Inner City Bypass and the southern and western suburbs via Coronation Drive and Milton Road;
- An improved arterial orbital route connecting Stafford Road and the East-West Arterial and easing congestion on Kedron Park Road-Rose Street-Junction Road, which has sensitive adjoining land-uses; and
- Increased radial arterial road capacity, allowing public transport initiatives in the Lutwyche road corridor (e.g. Northern Busway), and improved amenity and road safety along both Lutwyche Road and Sandgate Road corridor.

Key benefits of the Airport Link are summarised as:

- Easing of traffic congestion on key arterial roads in the northern suburbs, such as Lutwyche Road and Sandgate Road (refer to Chapter 5 – Traffic and Transport);
- Creating opportunities for enhanced public transport operations on freed-up surface arterial roads, possibly supported by HOV lanes on Lutwyche Road and Sandgate Road;
- Relieving traffic congestion and improving travel time reliability, particularly for freight vehicles and surface public transport supporting competitiveness of industry and business;
- Improving the travel environment of pedestrians and cyclists on the surface network and providing flexibility for travel as well as significant health and environmental benefits, by reducing traffic demands on the local road system, particularly through activity centres and near public transport stations;
- Protecting the amenity of inner urban redevelopment areas, particularly those in close proximity to high quality public transport, from the adverse impacts of vehicular traffic, leading to potential consolidation of inner urban areas and enhanced travel demand management (refer to Chapter 12 – Land Use and Planning);
- Relieving congestion-induced constraints on accessibility and mobility in the inner northern suburbs by providing an alternative high-speed, underground route for cross-city and radial trips;
- Easing congestion-related air pollution within the corridor along the benefited arterial routes and little impact, if any, to the regional airshed while catering for increased travel demand (refer to Chapter 9 – Air Quality);
- Reducing road traffic noise for properties fronting the major arterials to benefit from reductions in traffic congestion (e.g. Lutwyche Road, Sandgate Road) (refer to Chapter 10 – Noise and Vibration);
- Enhancing connections between the major employment centres, such as the CBD, Royal Brisbane Hospital and the University of Queensland, with Brisbane Airport and the Australia Trade Coast (refer to Chapter 16 – Economics);

- Creating manageable and beneficial impacts on land use patterns in the inner northern suburbs, as areas presently blighted by traffic congestion become available for redevelopment and other areas have reduced potential for blight as a consequence of future traffic congestion; and
- Responding to existing and forecast future traffic congestion with greatly reduced surface impacts as compared with the provision of additional road capacity as surface improvements either to existing arterial roads or as new roads requiring property acquisitions and extensive surface works.