



Airport *Link*

environmental impact statement
supplementary report

APRIL 2007



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Government

Airport Link Environmental Impact Statement Supplementary Report

■ April 2007

Contents

1	Introduction	1
1.1	Purpose of Supplementary Report	1
1.2	Consultation on EIS	1
2	Project Description	4
2.1	Overview	4
2.2	Project Design	4
2.3	East West Arterial Gateway Motorway Intersection	10
2.4	Northern Busway	10
2.5	Construction with Other Major Projects	11
3	Submission Analysis	13
3.1	Overview of Key Issues	13
3.2	Project Rationale	46
3.3	Project Development	53
3.4	Project Description	56
3.5	Traffic and Transport	69
3.6	Topography, Geology, Geomorphology and Soils	88
3.7	Surface Water Quality	91
3.8	Air Quality and Greenhouse Gases	92
3.9	Noise and Vibration	112
3.10	Flora and Fauna	119
3.11	Land Use and Planning	123
3.12	Cultural Heritage	125
3.13	Social Environment	126
3.14	Urban Design, Landscape and Visual Environment	132
3.15	Economic Environment	138
3.16	Hazard and Risk	142
3.17	Draft Outline Environmental Management Plans	142
3.18	Urban Regeneration	145
3.19	Cumulative Impacts	145
3.20	Conclusions and Recommendations	146
3.21	Community Consultation	147
3.22	Issues Relevant to Volume 2 of the EIS	149
4	Recommendations	154
4.1	Recommendations	154
4.2	Performance-Based Approach to Project Implementation	154
4.3	Recommended Measures for Project Implementation	155
4.4	Recommended Measures for Construction	159
4.5	Recommended Measures for Operations	163

1 Introduction

The Supplementary Report was prepared in response to the submissions received to the Environmental Impact Statement (EIS) for the Airport Link Project during the notification period extending from Wednesday, 11 October 2006 to Friday, 8 December 2006. The EIS was prepared in accordance with terms of reference (TOR) issued by the Coordinator-General under the *State Development and Public Works Organisation Act 1971* (SDPWO Act). Following public display of the EIS, a number of submissions were received and these are summarised herein in Appendix A. Chapter 3 of this Supplementary Report responds to the issues raised in those submissions.

Following this process, the Coordinator-General will prepare a report evaluating the EIS. In that evaluation report, the Coordinator-General may:

- Evaluate the environmental effects of the project and any other related matters;
- State conditions for later IDAS approvals required for the project;
- Make recommendations for other approvals required for the project; and
- Impose conditions for the undertaking of the project, where there is no other mechanism for conditions to be imposed (“imposed conditions”).

In setting imposed conditions, the Coordinator-General may:

- State when the imposed conditions take effect; and
- Nominate an entity that is to have jurisdiction for the condition (“the nominated entity”).

1.1 Purpose of Supplementary Report

The Supplementary Report has a number of purposes:

- Providing comments and clarification of the project description in the EIS (Chapter 4);
- Summarising the submissions and providing technical responses to the issues raised in the submissions;
- Providing conclusions with regards the key issues raised in the submissions; and
- Providing recommendations to the Coordinator-General in relation to the Airport Link Project.

1.2 Consultation on EIS

Community consultation undertaken during the public exhibition period for the EIS aimed to:

- Notify the community that the EIS and project reference design have been lodged for assessment by the Coordinator-General and call for written submissions on the EIS;
- Satisfy the statutory requirements of the SDPWO Act in relation to the exhibition of the EIS and invitation for written submissions;
- Provide information to stakeholders and community members to enable their review of the EIS and project reference design; and
- Obtain input from Brisbane City Council and Queensland Government agencies on the EIS.

A range of communication and consultation activities were undertaken with community members and stakeholders to assist their review of the EIS. These included:

- Public display of the EIS and project reference design at six locations, including libraries and ward offices;
- Distribution of Newsletter 5 to approximately 150,000 households, businesses, property owners and other registered stakeholders;
- Four community information sessions and four staffed library displays;
- One joint meeting of the Airport Link Community Liaison Groups (North and South);
- Agency briefings to Council and Queensland Government agencies reviewing the EIS;
- Updating the EIS website and providing information through responses to the project information line, letters and emails; and
- Publication of the EIS on the project website and freely-available CD copies and hard-copies of the EIS In Brief.

There were a number of issues raised in submissions which were common to areas throughout the study corridor, while there were some other issues which were raised more frequently in particular locations. A brief summary of the key, common issues and the key, local issues is presented below.

Summary of Issues in Submissions

Key Common Issues

Concern about construction impacts such as:

- Air quality, due to potential dust nuisance;
- Noise and vibration from tunnelling and surface works;
- Disruption to local and regional traffic flows due to construction traffic and spoil haulage traffic in particular;
- Increased traffic hazards and safety concerns adjacent to worksites and some community facilities (i.e. Woolloowin State School, Kedron High School);
- Reduced connectivity due to worksite impacts on pedestrian and cycle routes and open space networks;
- Loss of locally important places and vegetation (i.e. Kalinga Park); and
- Duration of construction program, particularly in terms of impact on nearby community facilities and residential communities.

Concern about operational impacts such as:

- Increased traffic on some surface routes (i.e. Stafford Road and East West Arterial);
- Increased road traffic noise in some locations (i.e. Gympie Road and Stafford Road);
- Diminished air quality in proximity to the ventilation outlets, and potential health risk associations;
- Visual impact of the infrastructure on urban amenity;
- Impact on future land uses and regeneration potential around the surface connections; and
- Reductions in connectivity across major roads adjacent to the Project connections (i.e. Lutwyche Road, Sandgate Road and Campbell Street)

Key Local Issues

North-East Connection at Clayfield:

- Potential impacts of the ventilation station and outlet on residential properties in Alma Road, Clayfield, due to its proximity to residential properties, diminished air quality and health concerns, perceived scale and visual impacts, and reduced property values;
- Potential construction impacts on the community values, habitat values and landscape values of Kalinga Park;
- Potential increases in road traffic noise along Sandgate Road and the East West Arterial;
- Potential impacts on pedestrian and cycleway linkages between Clayfield, Woolloowin and Toombul in the vicinity of the portals and the construction work sites; and
- Potential traffic congestion on Sandgate Road and the East West Arterial, due to the congestion already occurring on the Gateway Motorway at Airport Drive and at the intersection of the East West Arterial and Nudgee Road.

North-Western Connection at Kedron / Lutwyche:

- Potential construction impacts on residential areas and community facilities such as the Woolloowin State School and the Kedron State High School, including increases in noise, dust, vibration and construction traffic and constrained access;
- Potential increases in traffic and associated noise along Gympie Road and Stafford Road, with related impacts on residential amenity, accessibility to properties, and road safety;
- Potential impacts on pedestrian and cycleway linkages between the Kedron Brook open space corridor and community facilities and residential areas in Kedron and Lutwyche;
- Potential impacts of the ventilation station and ventilation outlet on nearby residential areas and community facilities;
- Impacts on residential properties, particularly to the west of Lutwyche Road, and the impacts on commercial properties, particularly on Gympie Road and Stafford Road.

Southern Connection at Bowen Hills / Windsor:

- Potential construction impacts on residential areas, commercial areas and community facilities, including increases in noise, dust, vibration, construction traffic, and constrained access;
- Potential operational impacts including increased traffic flows through Hamilton Place and O'Connell Terrace, and constraints on access or connectivity to community facilities (i.e. Royal Brisbane Hospital, RNA Showgrounds);
- Potential design impacts including visual impact of elevated road infrastructure and the ventilation station, loss of views and aspect (i.e. The Mews apartments), constraints on connectivity via pedestrian and cycle paths; and
- Potential constraints on future urban development and regeneration prospects, particularly in the Bowen Hills area to the north of O'Connell Terrace.

2 Project Description

2.1 Overview

A 'Reference Project' was developed for the purposes of examining the feasibility of the Airport Link Project and assessing the benefits and impacts of that Project in accordance with the EIS TOR and other matters raised in development of the EIS and in consultation with government agencies, stakeholders and the community. The Reference Project is intended to inform the community and stakeholders about the scale and form of the Project, and its impacts and benefits.

Should the Coordinator-General recommend the Project proceed, and the Queensland Government then decide to seek proposals to undertake Airport Link, the subsequent tendering process could result in changes to the Reference Project. Further assessment and public notification may be required, if the Coordinator-General decides the changes warrant such action.

2.2 Project Design

Submissions to the EIS raised concerns about several of the potential impacts of the Reference Project, namely:

- The potential impacts of the connections at Bowen Hills, particularly to and from O'Connell Terrace and to and from Campbell Street;
- The potential impacts of the connections to the East-West Arterial and Sandgate Road upon traffic, pedestrian connectivity, local amenity and Kalinga Park in particular;
- The potential impacts of the ventilation outlet and stations generally and the Clayfield ventilation outlet and station upon adjacent properties in particular;
- The potential impacts of the connections at Lutwyche/Kedron upon community facilities, particularly during the construction phase, and upon amenity and connectivity during both construction and operation phases; and
- The potential impacts of the surface connections on the arterial road network at the Gympie Road – Stafford Road intersection.

The assessments presented in the EIS found that for most impacts, a combination of mitigation and management measures was available to address the concerns raised in submissions. For some aspects of the Reference Project, such as the Bowen Hills connections adjacent to *The Mews* apartments, the EIS found that impacts would be adverse and long-term. Such adverse impacts should be balanced against the increased transport benefits provided by the proposed infrastructure and the potential to further develop design treatments that are pursued as part of the project procurement and delivery phases.

2.2.1 Connections at Bowen Hills

The submissions have prompted consideration of possible refinements to design options and the criteria to be considered in the detailed design phase of the Project in response to some potential impacts identified in those submissions. These refinements might involve changes to some connections with the surface road network.

The connections at Campbell Street were proposed in response to the Project objectives for enhanced network connections and to service the city centre with high-quality connections to the motorway network. The city connections are considered to be important to maintaining the competitive advantage, role and function of the

city centre as the SEQ Region's principal centre. The city connections are considered to enhance the overall network function.

The elevated road structures connecting with the local road network in Bowen Hills at O'Connell Terrace and at Campbell Street are likely to cause a number of impacts, requiring mitigation through more detailed design investigations. The impacts of the reference design at Bowen Hills include:

- Changes to traffic circulation and pedestrian movements, particularly around Campbell Street, O'Connell Terrace and Hamilton Place;
- Property impacts in Campbell Street (Queensland Newspapers), Evans Street and in Windsor (Earle Street, Federation Street);
- Visual, acoustic and amenity impacts in Campbell Street (The Mews) and in Windsor (south of Federation Street);
- Visual and amenity impacts with the interchange of the Inner City Bypass and the North-South Bypass Tunnel at Bowen Hills.

Should the Airport Link Project proceed, detailed design development should seek to satisfy a number of criteria addressing both the potential impacts as well as Project objectives. The recommended criteria include, but are not limited to the following matters:

- Efficient connection to the local road network to provide enhanced access between the city centre and the motorway network, including Airport Link;
- Minimise, to the extent reasonable and practicable, direct impacts (i.e. land take) on properties in the vicinity of the connections with the local road network;
- Minimise, to the extent reasonable and practicable, construction impacts on sensitive receptors (i.e. Royal Brisbane Hospital, The Mews apartments, Tufton Street apartments) such that:
 - Air quality, noise and vibration achieves the environmental objectives and performance criteria, and satisfies the goals recommended in the draft Outline EMP (Construction) in Chapter 19 of the EIS;
 - Construction traffic uses major roads;
 - Construction worksites are screened and managed as quickly as possible; and
 - Construction car parking is managed and does not cause congestion or constraints upon local access or circulation;
- Minimise, to the extent reasonable and practicable, construction and design-related impacts on the Enoggera Creek riparian corridor, including its ecological, visual and landscape values;
- Minimise, to the extent reasonable and practicable, impacts such as road traffic noise, headlight glare, visual impacts and loss of privacy and aspect on existing sensitive land uses (i.e. The Mews apartments, Tufton Street housing), such that:
 - Road traffic noise achieves the environmental objectives and performance criteria, and satisfies the recommended goals for road traffic noise established in the draft Outline EMP (Operations) in Chapter 19 of the EIS;
 - Night lighting and headlight glare from the Project is less than 8 lux at the boundary of a sensitive receptor (i.e. The Mews apartments, Tufton St apartments);
 - Landscaping and urban design of the Project prevents visual access or loss of privacy to habitable rooms in adjacent residential buildings

- Maintain the potential for urban renewal and regeneration in Windsor and Bowen Hills generally and for a number of key sites (i.e. Queensland Newspapers, Queensland Rail land at Bowen Hills and Mayne, RNA Showgrounds) with regards:
 - Reasonable and practicable circulation and connectivity within areas of Windsor and Bowen Hills proximate to the Project;
 - Safe and convenient pedestrian and cycle access between key attractors (i.e. Bowen Hills station, Royal Brisbane Hospital campus, RNA Showgrounds);
 - Practical and functional access to key sites;
 - Potential for links with public transport; and
- Maintain opportunities for a high-quality urban design outcome for both the proposed infrastructure and adjacent development sites.

2.2.2 East-West Arterial and Sandgate Road Connections

The connections to the East-West Arterial and Sandgate Road are necessary to achieve the project objectives for Airport Link of relieving congestion on key arterials in the inner northern suburbs of Brisbane. The removal of these connections would be accompanied by a sub-optimal solution for the road transport network and would not deliver the predicted project benefits in the Sandgate Road corridor i.e. traffic reductions on Sandgate Road¹, urban regeneration opportunities at Clayfield and Albion. Traffic flows on Sandgate Road south of Junction Road are predicted to be reduced by 26 – 30% over the planning period for the project extending from 2012 to 2026. Similarly, traffic flows on Sandgate Road south of Bonney Avenue at Albion are predicted to be reduced by 25 – 30% over the planning period for the project extending from 2012 to 2026.

Consequently, the connections in the location and arrangement shown in the Reference Project are considered to be a workable and effective response to the project objectives. Also, the north-eastern connections minimise the impact of the project at the surface. However, the Reference Project design would entail the loss of a number of mature trees to accommodate the ramps connecting with Sandgate Road and the ventilation station and ventilation outlet.

2.2.3 Ventilation Stations and Outlets

The community concerns raised in submissions relate to impacts on ambient air quality, requirement for filtration of vitiated air, impacts on visual amenity, impacts on property values for properties in close proximity to the ventilation station, and increased potential for anti-social behaviour in the vicinity of the ventilation station. Responses to these and other related issues are provided in Chapter 3 of this Supplementary Report².

Throughout the development of the Reference Project, the location of the ventilation stations and outlets was considered against a number of criteria as set out in **Table 2-1**.

¹ Refer EIS Chp5, section 5.6.2 – Traffic Volume Effects of Airport Link

² Responses to submission issues relating to air quality can be found in section 3.9 of this Supplementary Report.

■ **Table 2-1: Ventilation Station – Site Selection Criteria**

Criteria	Requirements
Optimise function of ventilation outlet	<ul style="list-style-type: none"> ■ Proximity to extraction point to reduce fan loads and energy demands ■ Less than 500m from the extraction point favoured, if feasible and practicable
Minimise impact on ambient air quality	<ul style="list-style-type: none"> ■ Achieve adequate dispersion to achieve goals for ambient air quality ■ Separate from taller buildings by distance greater than 100m where possible
Minimise impacts on existing, sensitive land use	<ul style="list-style-type: none"> ■ Proximity to sensitive receptors (aged care, child care, schools, health care)
Achieve physical requirements	<ul style="list-style-type: none"> ■ Flood-free land for Q100 event ■ Surface drainage ■ Clear of tall vegetation
Provide safe and functional access	<ul style="list-style-type: none"> ■ Access for maintenance & emergency vehicles ■ Connection to reliable power source
Minimise visual impact	<ul style="list-style-type: none"> ■ Potential to be screened from major thoroughfares, open space & residential areas ■ Context in terms of building height & character ■ Built form for fan station & associated buildings
Minimise cost	<ul style="list-style-type: none"> ■ Construction ■ Operations (i.e. pumping, power)

The design development of the ventilation system for the reference project sought to address the criteria, while also addressing a complex range of functional and operational criteria. Some of the key design issues are discussed below.

Ventilation Arrangements

The ventilation design arrangements were developed in conjunction with the EIS process. The ventilation stations include an allowance for a possible filtration facility, should filtration be required at some future time. In the proposed ventilation arrangements, vitiated air is extracted from each tunnel, passes through the fan station and is then expelled through the ventilation shaft. This is a linear process, requiring the plant and equipment to be sited in a linear arrangement. If required later, a filtration facility would also require siting in a linear arrangement with the ventilation station.

The ventilation tunnel should be designed to allow the flow of vitiated air for angles less than 45 degrees to avoid losses in velocity and consequential increases in energy demand for operation of the ventilation system. For the reference design, the Clayfield connection would require five (5) exhaust fans to be housed within the ventilation station, giving rise to the indicative building envelope described in the EIS as being approximately 45metres long, 25 metres wide and 15 metres high. In making an allowance for possible subsequent installation of a filtration facility in a linear arrangement, a site area of approximately 80m long and 25m wide would be required.

The Airport Link reference design has cut and cover tunnel that is rising from Kalinga Park towards Sandgate Road, with less than 3 metres of ground cover between the top of the tunnel and the surface. Also there are ramps, being at surface or in trough, to the proposed connection at Sandgate Road. The ventilation tunnels would have a cross-sectional area of 40m² and would be limited by an aspect ratio of 4:1. This geometrical configuration constrains the potential locations for the ventilation station but more importantly the alignments that the ventilation tunnels can follow.

Ventilation – Construction Issues

The construction of the ventilation structures would be constrained by the following issues:

- The ventilation station and the possible filtration facility need to be located near the extraction point in each tunnel;
- The ventilation station and the possible future filtration facility require a significant area of land;
- Burying the ventilation station and/or filtration facility would at risk of possible flotation of the structure during flood events;
- Flooding risk constrains siting opportunities for the ventilation station north of the Sandgate Road off-ramps, with no feasible potential for mitigation;
- Geometrical constraints of the Sandgate Road intersection and mainline tunnels impact on the land required for the ventilation station;
- The geometrical design requirements at Sandgate Road constrain the alignment of the ventilation tunnel from the extraction point to the ventilation station;
- The ventilation tunnel would have a minimum structure depth of 4m although this is likely to be closer to 6m and sitting proud of the surface affecting pedestrian egress between Stuckey Road and Toombul;
- The crossing of Schulz Canal would require a series of coffer dams, leading to increased hazards, environmental impacts and increased construction cost.

Hydraulics (Flooding)

With regards flooding in Kedron Brook and Schulz Canal, the 100-year ARI boundaries in the Clayfield connection area are particularly sensitive to flooding. Investigations into the flooding for the EIS identified the flooding issues in the area and the need for mitigation works if new Airport Link works impacted these areas.

The ventilation works for Airport Link would require any structure that was located within the flood plain north of the proposed alignment, to be completely buried or have adequate flood mitigation measures. This constrains further construction of each of the three ventilation site options north of Schulz Canal as well as constraining opportunities to site the ventilation station north of the Sandgate Road off-ramp.

Preferred Site at Clayfield

The EIS referred to a number of possible locations for the Clayfield ventilation station and outlet. While the impact on ambient air quality for each of the possible locations would be within the project goals for ambient air quality, the proposed location provided slightly better outcomes than some others³. Consequently, the more influential factors in site selection related to:

- Risk of inundation by flood waters from Schulz Canal, Kedron Brook and Melrose Creek;
- Environmental impacts of construction, particularly in and around Schulz Canal;
- Likely construction, operations and property costs;
- The potential to reduce the visual impact of the structure through careful design and siting was considered to be greater on its present site; and
- The likelihood that with a vent station situated north of Schulz Canal, a fan station would still be required close to the location shown in the reference design for the proposed ventilation station.

³ The differences in air quality outcomes between each of the possible vent sites were very small.

The preferred site for the Clayfield ventilation station and outlet described in the EIS, is immediately to the south of the Clayfield on-ramp from Sandgate Road. This site provides the following advantages to the Project::

- There is sufficient space to accommodate the ventilation tunnel and the fan station;
- There is a sufficient space for the allowance for future filtration facility;
- The geometrical constraints can be accommodated;
- There are few if any flooding constraints;
- Pedestrian movements from Alma and Stuckey Road to Toombul and Kalinga Park can be maintained;
- Access is better than other sites; and
- It is an economical solution.

Submissions received during the public notification period indicate a number of concerns for people living in the vicinity of the preferred Clayfield ventilation station site. These concerns include:

- Impacts on ambient air quality in the locality;
- The scale and bulk of the facility and its related impacts on the residential character of the area;
- The visual impact of the facility on the residential character;
- The potential impact the facility would have on property values in the locality;
- Perception that the preferred location is a significant change from the options presented in Newsletter #4 and should have been the subject of preliminary consultation; and
- Availability of other sites (i.e. Toombul shopping centre) removed from residential areas.

These concerns are held genuinely by people in the area. The preferred site is a matter of great concern for people living in Alma Road and Stuckey Road, Clayfield. If the Coordinator-General recommends that the Project proceed, a number of actions would be required to address such concerns, including:

- Establishment of baseline monitoring for ambient air quality in the vicinity of the each of the ventilation outlets;
- Implement measures to reduce visual impacts for adjacent properties;
- Adherence to the urban design guidelines presented in the EIS to mitigate the visual impacts of the ventilation building and outlet; and
- Adherence to the environmental reporting processes presented in the draft Outline EMPs in the EIS, assuming they are adopted generally for inclusion in the conditions issued by the Coordinator-General.

2.2.4 Kedron - Lutwyche Worksite

The Reference Project responds to the project objective for reducing congestion on key routes in the northern suburbs. To meet the objective, there is a network benefit in connecting Stafford Road, via the Airport Link, with the East-West Arterial. This requires a complex intersection arrangement for Stafford Road, Gympie Road, Lutwyche Road and Kedron Park Road. The intersection arrangement for the Reference Project entails a combination of surface road works and tunnelling works which, over the construction period, needs to be supported by construction worksites in the locations indicated in the EIS, i.e. in the Lutwyche Road corridor and on land presently occupied by the Department of Emergency Services. A further worksite would be located on

Gympie Road, Kedron, north of the intersection with Leckie Road. These worksites are referred to collectively in the EIS as the north-western worksites⁴.

The scale and duration of construction works are off-set somewhat by staging and the distribution between above-ground and below-ground works. However, the above-ground or surface works for the Reference Project would require the construction of transition structures connecting the tunnel lanes with the surface road network, elevated roadways and bridge structures, and the ventilation station. A comprehensive approach to environmental management is required to avoid where possible and otherwise mitigate and manage potential impacts such as construction noise, dust, night lighting and changes to property and street access.

In particular, a comprehensive construction EMP would be required to be finalised prior to the commencement of construction works, to manage impacts on the community facilities and residential communities situated nearby the Kedron and Lutwyche worksites. Such community facilities include the Woolloowin State School, St Andrew's Anglican Church, the Department of Emergency Services and the Kedron High School.

2.2.5 Gympie Road – Stafford Road Intersection

The Reference Project presented one option for the connections between Airport Link, Gympie Road and Stafford Road. The option entailed a combination of surface roads and roads in elevated structures crossing Kedron Brook and Gympie Road. Analyses of intersection performance indicated the proposed arrangements as being functional, without a reduction in the level of service likely to be experienced in this key location without the project⁵.

Further refinement of the Reference Project design at this stage is not warranted, pending the design response to the procurement and design development phases.

2.3 East West Arterial Gateway Motorway Intersection

In addition to these designated major projects, the Queensland Government, through the Department of Main Roads, is investigating the feasibility and the concept options for further upgrading the intersection of the Gateway Motorway, the East-West Arterial and Airport Drive.

In the interim, the Department of Main Roads has committed to enhancing capacity and safety for the Gateway Motorway – East West Arterial intersection by installing traffic signals to manage traffic flows through the roundabout system. This commitment was foreshadowed in the Airport Link EIS⁶ as being desirable and required to resolve existing traffic congestion at the intersection, regardless of whether Airport Link proceeds.

2.4 Northern Busway

The terms of reference for the Airport Link EIS require investigation of the opportunities for integration of the Northern Busway project with Airport Link.

⁴ Refer to EIS Chapter 4 - Project Description

⁵ Refer EIS Chapter 5, section 5.6.3 – Network Performance Effects

⁶ Refer to Airport Link EIS, Chapter 21 section 21.2.3 and Chapter 22, section 22.1.6

The Reference Project for Airport Link was developed, in a conceptual form, to coordinate to the extent practicable the planning, design, delivery and operation with the proposed Northern Busway. The Concept Design and Impact Management Plan (CDIMP) for the Northern Busway was made available for public comment at the same time as the Airport Link EIS. Further refinements to the concept design for the Northern Busway are now being developed, in response to submissions received during the consultation process.

While the ultimate concept design for the Northern Busway remains unchanged, a proposed interim arrangement to permit parts of the project to be constructed at the same time as Airport Link, is being investigated as an effective means of reducing construction impacts in the common corridor for the two projects. The actual extent of the concurrent works will be determined through the tendering and evaluation phase of each project, having regard for opportunities to avoid or minimise and mitigate project construction impacts and to optimise construction efficiencies.

While the extent of works for the Northern Busway which will be constructed concurrently with Airport Link will not be finalised for some time, an assessment of cumulative impacts of the two projects was presented in the EIS⁷.

2.5 Construction with Other Major Projects

If it proceeds, the Airport Link Project could be constructed concurrently with several major projects in the northern suburbs of Brisbane, including:

- North-South Bypass Tunnel;
- Northern Busway;
- Gateway Upgrade Project; and possibly
- Parallel Runway for Brisbane Airport, should it be approved and proceed within the timeframes provided in the Parallel Runway EIS⁸

There is a need for a coordinated approach to managing the potential impacts of construction of each of these major projects on the City fabric. Coordination is best undertaken by the Queensland Government, in consultation with key stakeholders including the Brisbane City Council, Brisbane Airport Corporation and the Australia TradeCoast.

With regards construction spoil, the EIS describes the spoil haulage task in terms of quantities and truck loads in Chapter 4 (refer to section 4.3.19). Spoil quantities and truck movements for the Northern Busway are described in the CDIMP⁹ which was displayed for public comment at the same time as the Airport Link EIS. In summary, the indicative quantities of spoil from related worksites for the Northern Busway are presented in **Table 2-2**.

⁷ Refer EIS Chapter 21, section 21.1

⁸ Draft Environmental Impact Statement and Major Development Plan, New Parallel Runway Project, Brisbane Airport Corporation, 2006

⁹ Refer to Northern Busway CDIMP, Chapter 20, section 20.4.7

■ **Table 2-2: Indicative Spoil Haulage – Northern Busway**

Worksite	Estimated Spoil to be Removed (m ³)	Average Daily Truck Loads	Av Hourly Truck Loads	Airport Link (Av Daily Loads)
Windsor (Federation St)*	60,000 – 70,000	30 - 40	3 – 5	50
Lutwyche	100,000 – 120,000	50 - 60	4 – 6	115
Kedron	110,000 – 130,000	40 - 50	3 – 5	

Note 1: Federation Street worksite quantities for interim Northern Busway

As with Airport Link, the preferred haul route for spoil from each of the sites is via Lutwyche Road, to Kingsford Smith Drive. The traffic analyses conducted for the EIS indicate that traffic flows on Lutwyche Road, south of Kedron Park Road¹⁰, will increase from about 60,000vpd in 2004 to about 68,200vpd in 2012, without the Project, being the estimated period for construction works. The additional cumulative traffic load for spoil haulage, in the context of the daily traffic flows on Lutwyche Road, is considered insignificant. If spoil haulage is conducted generally outside peak traffic periods, including periods at night, the cumulative impact of spoil haulage also would be insignificant.

¹⁰ Refer to EIS, Chapter 5, section 5.6.2, Table 5-32 – Volumes on Surface Roads, With and Without the Project

3 Submission Analysis

This chapter presents responses to the full range of issues raised in submissions from both government agencies and the community. The issues are presented in the order in which they are raised in the terms of reference and consequently, in the EIS. Some issues are discussed in relation to certain key issues of interest to particular communities as well as in relation to their general topics.

3.1 Overview of Key Issues

3.1.1 The Mews Apartments

Issue 1

The construction of Airport Link adjacent to The Mews apartment block (Campbell St) would destroy the outlook/ views from living areas and no mitigation measures for visual impacts are apparent. Without appropriate and significant urban design measures the visual amenity for residents of the complex will suffer tremendously.

Response

The EIS found that the cumulative impacts of road infrastructure for the North South Bypass Tunnel and the reference design for Airport Link, in close proximity to The Mews apartments, would be adverse, with limited opportunity for effective mitigation. The range of mitigation measures in the reference design included the use of transparent noise barriers and screen landscaping both at ground level and on the structures proposed.

While there is no proposal to change the reference project, there may be a less intrusive design solution for these connections which should be investigated further during the concept design phase. To reduce impacts on The Mews apartments as well as O'Connell Terrace, concept design investigations should address the design criteria recommended in section 2.2.1 of this Supplementary Report.

Should different connection designs be developed, further consultation with the community, and residents of The Mews apartment in particular, should occur and should inform the design development process.

The detailed designs for the Project will need to address and satisfy the urban design principles recommended in this Supplementary Report, assuming they are adopted by the Coordinator-General's conditions. Such principles seek to minimise and then mitigate the impacts of the Project, and in particular the elevated road infrastructure adjacent to The Mews apartments.

Issue 2

The proposed Airport Link will unreasonably impact on the use and enjoyment of the units and common property at the Mews. Request the following measures to mitigate impacts of Airport Link construction:

- *Additional cover on 50m² of outdoor courtyard to minimise dust, construction noise and ongoing traffic noise. This area is now unusable during NSBT construction hours;*
- *Acoustic treatment to one bedroom window and two sliding glass doors (to bedrooms)*
- *Upgrading of individual ducted air conditioning system to compensate for the increased use and excessive dust;*
- *Compensation for personal hardship; and*
- *That a coordinated approach be instigated for The Mews residents for all three major infrastructure projects.*

Response

Should the Coordinator-General recommend that Airport Link proceed, further development of the Project design will be required and will need to address, among many other things, the environmental objectives and criteria, as well as the urban design and environmental management requirements, established through the EIS process.

It is understood that the development permit issued for The Mews apartments required the installation of measures in the buildings to mitigate the existing road traffic noise from the Inner City Bypass. Such measures would assist in mitigating the impacts of both construction and operations of the Project, being additional to those proposed in the EIS.

Possible alternative design solutions could mitigate some of the impacts for The Mews residents, including impacts on views and aspects which would be caused by the proposed elevated roadways in the reference design, and road traffic noise impacts, particularly for apartments in the upper levels of the Mews. Visual impacts could be mitigated through implementation of a comprehensive approach to project urban design and landscaping. However, the present views along Enoggera Creek will change, initially as a consequence of the NSBT road infrastructure, with further visual impacts on views of Enoggera Creek likely as a consequence of Airport Link road infrastructure.

Issue 3

The proposed Airport Link will have significant impacts on The Mews during construction, including noise, dust and vibration. The EIS acknowledges some of these impacts but does not do justice to the detriment this complex will suffer if the project proceeds without significant measures to protect amenity. If the project proceeds, conditions of approval must specifically restrict the potential impacts of Airport Link on The Mews.

Response

The proximity of the proposed construction works to The Mews would require specific mitigation measures to manage construction impacts such as noise, dust and vibration. The onus would be on the Proponent to satisfy the environmental objectives and performance criteria set out in the draft Outline Construction EMP. The Proponent may need to adopt special construction techniques to achieve the environmental objectives and the performance criteria regarding construction impacts at The Mews.

For guidance, recommended management measures are outlined in the draft Outline Environmental Management Plan (EMP) (Construction) included in Chapter 19 of the EIS. The purpose of the draft Outline EMP is to set out the Project commitments to avoid or minimise potential impacts of the Project as identified in the EIS, including the identification of environmental aspects to be managed and how environmental values may be protected and enhanced.

Detailed EMP sub-plans will be prepared by the Proponent for construction for review by the Coordinator-General or an entity with delegated responsibility, and either EPA or a State agency exercising its powers under legislation. Such EMP sub-plans will need to include, but not be limited to, mitigation measures which address the Environmental Objectives and Performance Criteria of the draft Outline EMP included in the EIS and any conditions imposed by either the Coordinator-General's evaluation report or other agencies under other approvals. Mitigation measures set out in the draft Outline EMP (Construction) include but are not limited:

- Measures for managing dust and odour (i.e. enclosed worksheds, dust controls on vehicles, monitoring performance against stringent dustfall criteria);

- Measures for managing motor vehicle emissions from construction vehicles (i.e. construction vehicle fleet management, limitations on idling time, measures for stationary plant and equipment);
- Monitoring ambient air quality, vibration and noise levels, and local traffic conditions;
- Measures for managing vibration and noise levels (i.e. limitations on hours of above-ground work, temporary noise barriers, use of enclosures for tunnelling works, establishment of goals for a range of living and working conditions);
- Measures for on-going community consultation and complaints handling, in association with a comprehensive system of monitoring, reporting and corrective actions in the event of non-compliance.

Issue 4

The proposed Airport Link will have serious negative impacts on The Mews during operation including traffic noise. There are concerns with the lack of viable visual and acoustic solutions to road traffic noise from the elevated bridges and surface roads. The EIS refers to an attempt to maintain 'status quo' for acceptable traffic noise rather than planning criteria. Concerned that no serious effort will be made to provide the best possible outcomes for residents who have already lost the right to quiet enjoyment of the amenities of The Mews due to NSBT.

Consideration should be given to appropriate conditions to minimise noise impacts on The Mews, including:

- *Installation of permanent noise monitoring equipment and regular monitoring of noise levels, reporting and penalties for exceeding agreed noise levels;*
- *Construction and operation noise levels at The Mews should not exceed reasonable noise levels as per accepted guidelines;*
- *Use of noise barriers, sound absorption material, planting and other urban design solutions;*
- *Acoustic treatment of balcony areas in all units in The Mews; and*
- *Use of superior road surfaces to minimise traffic noise.*

Daytime noise during the construction and operation of the Airport Link is likely to disrupt the ability of hospital workers and patients to sleep, and will disturb the quiet enjoyment of other residents of the complex. Unless properly mitigated, construction and traffic noise will force residence permanently inside their units, losing the ability to use their spacious balcony areas.

The area immediately east of The Mews is becoming one of the biggest road and tunnel connections in Brisbane. The Mews is proximate to, and affected by, traffic on Bowen Bridge Road and the ICB. Noise levels in numerous units [from the ICB] are already beyond acceptable levels. To add significant traffic flows with the NSBT and the Airport Link will push noise levels in the complex to completely unacceptable levels. Residents also currently have intermittent 'peaking' noise impacts from take-off and landing of helicopters at the RBWH.

Response

Potential construction and operation noise impacts were investigated for the Airport Link EIS.

In relation to construction, the EIS found that without mitigation being implemented, daytime construction of elevated structures adjacent to The Mews apartments is predicted to result in significant exceedances of the design goal by 12dBA to 17dBA, and is likely to be intrusive to building occupants. Mitigation measures would be required to manage construction impacts including advanced notification of the time and duration of

construction, selection of appropriate construction techniques and low-noise plant and equipment, location of plant to maximise distance to residences, the use of temporary noise barriers and other measures.

The EIS recommends that, in response to a program of predictive construction noise modelling, a noise monitoring procedure be developed and implemented to ensure compliance with the Coordinator-General's conditions. On-going monitoring will indicate compliance or the need for corrective action to ensure compliance with the conditions.

Such monitoring data also can support responses to noise complaints received during the construction phase. This includes investigating and measuring noise levels from activities as soon as practicable, after a complaint has been received. A response would be provided to the complainant as soon as practicable upon completion of the investigation outlining the corrective action taken.

In relation to operation, noise monitoring at The Mews apartments found existing noise levels associated with traffic on the Inner City Bypass and surrounding streets were 67 dBA ($LA_{10\ 18hr}$), compared with the planning level for non-State controlled roads¹¹ of 63dBA ($LA_{10\ 18hr}$). To achieve the planning level, road traffic noise barriers would be required without further mitigation for Airport Link impacts. While the planning levels are set as desirable benchmarks for new residential development, the adoption of a status quo noise level is considered to be a reasonable response (i.e. it represents a 'no worsening' of the predicted environmental conditions without the Airport Link project)

The EIS investigations then identified a need for road traffic noise barriers to mitigate noise to achieve the status quo levels in this location. The EIS recommends that during the detailed design phase, consideration should be given to other traffic noise mitigation options, including road surface treatments.

The urban design principles recommended in the EIS were provided, in part, to address the physical and visual impact of road traffic noise barriers and the elevated road infrastructure on adjacent properties, and on The Mews apartments in particular.

Issue 5

Concerns about the impact of construction and additional traffic on air quality for residents of The Mews - particularly those with respiratory problems. Also concerned about potential damage to the mechanical ventilation systems, dirt particles in the air, exhaust fumes and the 'blanketing' of the complex with dust during construction. Consideration should be given to appropriate conditions to minimise air quality impacts on The Mews, including monitoring of air quality during construction and operation and penalties. Concerned about long term impacts generated as a result of increased traffic flows past The Mews, including increased air pollution and emission of 'black' particulate matter.

Response

Performance criteria relating to construction and operation air quality for the Project are outlined in the draft Outline EMP in Chapter 19 of the EIS.

Detailed EMP sub-plans will be prepared by the Proponent and reviewed by the Coordinator-General, or either EPA or a State agency exercising its powers under legislation. These will need to include, but not be limited to, mitigation measures which address the Environmental Objectives and Performance Criteria of the draft Outline

¹¹ EPP (Noise)

EMP included in the EIS and any conditions imposed by either the Coordinator-General's evaluation report or other approvals.

During construction, the environmental objectives and performance criteria require that potential air quality impacts such as dust, odour and vehicle emissions should be avoided or managed and mitigated. The onus is on the Proponent to ensure that the works are undertaken in a way that satisfies the environmental objective and the performance criteria. Goals for monitoring construction impacts on ambient air quality are required to address total suspended particulates, particulates (PM₁₀), and dust deposition. The Proponent may need to adopt particular construction techniques to meet the construction air quality requirements and address potential impacts on nearby, sensitive receptors, such as The Mews apartments.

Regular monitoring would be undertaken to ensure that construction activities achieve the performance criteria relating to ambient air quality, dust and vehicle emissions. The recommendations in this Supplementary Report indicate locations for monitoring stations for construction air quality.

The air quality modelling undertaken for the EIS indicated that impacts on the existing and likely future ambient air quality would be well within the rigorous, health-based goals adopted for the assessment. This assessment took into account the potential cumulative impacts of the NSBT ventilation station to be constructed in Sneyd Street, Bowen Hills with the Airport Link ventilation station in Earle Street, Windsor. The draft Outline EMP also includes ambient air quality goals to be achieved during the operation of the Airport Link Project. Real-time ambient air quality monitoring would be undertaken at monitoring sites established near each of the ventilation stations and performance reviewed against the air quality goals.

Issue 6

Monthly meetings should be held between The Mews Body Corporate, BCC and the selected contractor during construction and a committee should be established comprising representatives from BCC, the State Government, the successful contractor for Airport Link and the NSBT contractor to monitor the community impact and provide a single point of consultation. A community liaison group should also be formed for Bowen Hills.

Response

The EIS recommends ongoing consultation and communication with communities near the project works. This includes the establishment of Community Consultative Committees to represent nearest neighbours and community facilities to worksites as well as consultation with near neighbours to construction activities as soon as practicable after a decision to proceed with the project is taken.

Issue 7

Concerned about vibration from the operation of heavy machinery and blasting during construction. Effects of vibration are particularly potent for residents with health problems who choose to live close to the RBWH.

Response

Construction of the surface connection in the vicinity of The Mews would require the use of vibration generating equipment such as vibratory rollers. However, vibration is not expected to be significant due to the separation distances of works from The Mews and the construction techniques likely to be engaged for works adjacent to The Mews (i.e. bridge works, elevated road works, no blasting). Blasting is envisaged for the construction of the tunnels only and would not be required for the construction of the elevated structures adjacent to The Mews. As such, vibration from blasting is not expected to impact on The Mews apartments.

The recommendations of this Supplementary Report are that the Proponent undertake predictive modelling of the likely levels of construction vibration. Where such levels are predicted to lead to human disturbance, impact on sensitive building contents or cosmetic damage to buildings, the Proponent would need to take appropriate action, including building condition surveys, building contents investigations, construction planning and works scheduling, and proactive consultation and engagement with potentially affected residents and building occupants.

Issue 8

Construction of the NSBT is currently affecting The Mews and is expected to run until around 2011. With construction of the Airport Link, The Mews will be adjacent to construction sites for the next 10 years.

Response

NSBT is expected to commence operation in 2010. Airport Link is expected to take approximately 4 years in total to complete, however the duration of works at each connection will be the subject detailed construction planning, including timing and duration of construction. Should Airport Link be delivered according to present expectations¹², construction works could be completed in 2011-12, with Project operations commencing in 2012. The combined construction period with NSBT, which commenced in 2006, would be approximately 6 years in that scenario.

While the duration of construction for Airport Link is considerable, it is finite. Careful and committed environmental management of construction is required to minimise the impacts and the potential for disruption for residents, including those of The Mews. Furthermore, it is recommended in the EIS and in this Supplementary Report that the Coordinator-General set in place measures to coordinate and manage the construction of a number of major projects in northern Brisbane, including the North-South Bypass Tunnel and Airport Link.

3.1.2 Wooloowin State School

The portals for the connection to Lutwyche Road are located north of the school grounds in the existing central median (for southbound traffic) and on the western side of Lutwyche Road (for northbound traffic). The Lutwyche Road southbound traffic lanes will remain in their present position, with widening of Lutwyche Road occurring on the western side of Lutwyche Road. The Lutwyche Road northbound lanes would be moved west, further from the school grounds, with an additional lane added to allow northbound traffic to access the east-west section of the tunnel.

A worksite is proposed to be located in the middle of Lutwyche Road. Cut and cover tunnelling is also proposed for the section of tunnel between Colton Avenue and Isedale Street. In front of the school, the cut and cover section of tunnel would be located in the median and western side of Lutwyche Road.

Issue 1

Proximity of the construction worksite to the school and potential construction impacts including safety, access, parking, noise and dust.

¹² Airport Link EIS, Chapter 4 - Project Description, section 4.3 - Project Delivery Mode

Response

The proximity of the proposed worksite to Woolloowin State School will require careful construction planning and management, and specific mitigation measures to ensure the ongoing functioning and operation of the school. Recommended management measures are outlined in EIS and established in the draft Outline Environmental Management Plan (EMP) (Construction) included in Chapter 19 of the EIS. Mitigation measures to manage a broad range of construction impacts, including traffic management, noise and dust, vibration, pedestrian and cyclist safety, vehicular and pedestrian access to the school, and potential impacts on heritage buildings are set out in the draft Outline EMP (Construction).

It is noted that access to Woolloowin State School at present is from Lutwyche Road, with a student set-down occurring ad hoc on nearby properties. The existing situation is not desirable and has been the subject of a number of discussions with the school and Education Queensland. Should Airport Link proceed on the basis of the Reference Project, further consultation with Education Queensland will be required to avoid worsening the situation during construction of Airport Link, and to determine what assistance might be provided to improve vehicular and pedestrian access to the school during the construction phase.

In addition to the environmental management measures, on-going consultation and communication with the school and school community is recommended to ensure that students, staff and parents are aware of construction activities and changes in access arising from these activities so that potential impacts can be identified and managed.

EMP sub-plans addressing the potential impacts on the areas around the worksites, including the Woolloowin State School, are required to be prepared and finalised prior to the commencement of works associated with Airport Link in the locality of the school.

Issue 2

Concerned about the noise impacts from the long duration of the construction program and from the increased traffic flows after construction.

Response

Potential construction noise impacts were investigated for site preparation, tunnelling and surface works (EIS, Volume 3, Technical Report No 6 — Construction Noise & Vibration, pp. 62-70).

These investigations found that site preparation works and daytime tunnelling in Lutwyche Road are unlikely to cause acoustic impact on the school, given the separation distance to the noise sources (i.e. approximately 50 m from the school buildings to the work site boundary). However, daytime surface construction of the tunnel connections, including the elevated structures and cut and cover tunnelling works are likely to be found intrusive at residences directly adjacent to Lutwyche Road without appropriate noise mitigation measures, such as noise barriers.

Mitigation measures identified to manage construction noise impacts in the vicinity of the Woolloowin State School include construction of noise screens along the worksite boundaries and construction of an acoustic enclosure over the portal and spoil handling areas. On-going noise monitoring is also proposed to ensure that construction activities meet the relevant noise goals so that normal operations at Woolloowin State School can be maintained. Detailed construction planning is also recommended in consultation with the Woolloowin State School administration, taking into account the school's needs and activities, and the need for acoustic screening from construction activities.

Post-construction, the EIS findings indicate that existing (2005) traffic noise from Lutwyche Road is already affecting the school and will increase in 2022 with increases in daily traffic flows¹³. Noise mitigation measure will need to achieve 'status quo' traffic noise criteria for this location.

Issue 3

Potential air quality impacts from construction, relating to the operation of heavy machinery, construction vehicles entering and exiting worksites, and surface and tunnelling works.

Response

Investigations for construction air quality impacts included an assessment of construction vehicles and plant, site establishment and demolition activities, driven and cut and cover tunnelling works, spoil management and transport and surface road and bridge works.

The EIS found that dust control and management measures would be required to minimise potential air quality impacts from construction activities. These include such measures as avoiding queuing of construction vehicles at worksites, ensuring plant and equipment is fitted with appropriate emission control equipment and implementing dust control measures such as water sprays, wheel wash stations, and covering loads. The excavation, loading and stockpiling of spoil at the Lutwyche Road worksite would be carried out within the workshed. The underground works would also be ventilated during tunnelling, with ventilated air being treated prior to exit from the workshed. Regular monitoring would also be carried out during construction to ensure that the relevant construction air quality criteria are met.

Construction works would be required to comply with the Coordinator-General's conditions and the requirements of the Construction EMP and construction air quality EMPsub-plan.

Issue 4

Proximity of the ventilation outlet to the school and potential health effects for children for tunnel operations.

Response

Air quality investigations undertaken for the EIS described ambient and roadside concentration levels for various pollutants. These investigations found that predicted pollutant concentrations with and without Airport Link were very similar and that for each of the modelled years (2012, 2016 and 2026), all pollutant concentrations are below stringent, health-based air quality goals at each of the monitoring locations, including the monitoring site at the Department of Emergency Services Kedron complex. The air quality modelling also found that the highest ground-level concentrations due to all ventilation outlet emissions are well below the air quality goals.

The EIS also modelled predicted roadside pollutant concentrations along selected surface roads, including Lutwyche Road, in the vicinity of Lutwyche and Gympie Roads. Modelling considered predicted concentrations with and without Airport Link at the kerbside and distances of 10m, 30m and 50m from the kerb. Generally, the modelling found that improvements in local air quality are observed where reductions in surface traffic occur as a result of diverting traffic to the tunnel. In relation to Wooloowin State School, air quality modelling predicted that the pollutant concentration levels along Lutwyche Road will be lower with Airport Link compared to without Airport Link, and well below the air quality goals identified for the Airport Link Project.

¹³ Noise measurements, Windsor Ave near Wooloowin State School

Potential health risk for impacts on regional (ambient) and roadside air quality was assessed for the EIS. These investigations considered the location of sensitive receptors such as child care centres and schools, as well as those groups within the community who appear to be most at risk from the health effects of air pollutants, such as children. The health risk assessment concluded that there would be no appreciable change in community health as a consequence of the Airport Link Project, either due to the operation of the ventilation outlet or changes in roadside concentrations.

Issue 5

Disruption to drop-off/ pick-up areas, including parking for parents. Pedestrian access and safety for students, particularly across/ along Lutwyche Road.

Response

As indicated in the response to Issue 1 above, access for dropping-off and picking-up of students is acknowledged as an existing concern for Woolloowin State School. The Airport Link Project would not change existing access to the school during construction and operation.

A matter of concern to parents of children at Woolloowin State School is safety for students in the vicinity of construction areas, particularly crossing of Lutwyche Road. Traffic control measures would be implemented during construction to allow safe access for vehicles, pedestrians and cyclists in the vicinity of work areas. The existing controlled crossing of Lutwyche Road at the intersection with Norman Avenue would need to be retained during construction to allow safe crossing for pedestrians across Lutwyche Road. The EIS also recommends on-going communication and consultation with the school and school community during the construction phase to ensure that students, staff and parents are aware of changes to pedestrian access.

Discussions between the school administration, Education Queensland and the Proponent on how the school can be assisted in addressing this issue are on-going. Having regard to the concerns raised in submissions, alternative access arrangements for the Woolloowin State School need to be in place prior to the commencement of construction in this locality.

Should Airport Link proceed on the basis of the Reference Project, further consultation with Education Queensland will be required to maintain safe traffic conditions in Lutwyche Road to determine what assistance might be necessary to provide safe vehicular access and maintain safe pedestrian access to the school during the construction phase.

It is anticipated that operational conditions along Lutwyche Road and through the Norman Avenue intersection with commencement of tunnel operations will provide for the controlled crossing of Lutwyche Road in this location.

3.1.3 St Andrew's Anglican Church

The portals for the connection to Lutwyche Road are located adjacent to St Andrew's Anglican Church, in the existing central median (for southbound traffic) and on the western side of Lutwyche Road (for northbound traffic). The Lutwyche Road southbound traffic lanes will remain in their present position, with widening of Lutwyche Road occurring on the western side of Lutwyche Road. The Lutwyche Road northbound lanes would be moved west, further from the church grounds, while an additional single lane would be included to allow northbound traffic to access the east-west section of the tunnel.

A worksite is proposed to be located in the middle of Lutwyche Road. Cut and cover tunnelling is also proposed for the section of tunnel between Colton Avenue and Isedale Street. Adjacent to the church, the cut and cover section of tunnel would be located in the median and western side of Lutwyche Road.

The following includes responses on issues specific to St Andrew's Anglican Church. Further information on general issues is provided in other sections of the Supplementary Report.

Issue 1

Financial viability of the Parish – during and after construction. The Airport Link Project will significantly reduce the income at the parish (i.e. through lost weddings, funerals and other special events) and could result in closure of the Parish. The EIS appears to offer no mechanism for recovery against any economic loss suffered by this parish.

Response

The measures set out in the draft Outline Environmental Management Plan (Chapter 19, EIS) will address potential construction and operation impacts of Airport Link on the continued functioning and operation of nearby businesses and community facilities, including St Andrew's Anglican Church. Following construction, urban design and landscaping measures would be implemented to mitigate the visual impact of the surface infrastructure in the vicinity of the church.

In addition to the environmental management measures, the EIS recommends on-going consultation and communication with St Andrew's Anglican Church during the detailed planning and construction phases to ensure that potential impacts on the church activities are identified and addressed through appropriate mitigation measures.

Issue 2

The proposal to undertake construction works 24 hours, 6 days a week appears to conflict with the genuine requirements of St Andrew's Anglican Church to undertake Saturday weddings, funerals on most days and special events using the front yard. Airport Link will need to come up with a management plan to design out noise and construction disruption.

Response

The construction worksite for the north-west connections (Lutwyche Road worksite) does not require any land from the St Andrew's Church site. The existing traffic lanes in Lutwyche Road would be maintained in their present location. The construction works would be preceded by the erection of a worksite enclosure and an acoustically-lined and ventilated workshed, within which tunnelling and spoil handling would occur. Site management and construction management practices and requirements would address a range of potential impacts such as noise, dust and traffic movements.

The impacts on the church land would be limited to changes in views and aspect as a consequence of the worksite enclosure and workshed, and the movement of construction vehicles accessing and departing the worksite. Church activities could continue on the church land uninterrupted.

Twenty-four hour construction activities would generally be confined to underground tunnelling works and removal of spoil from tunnelling. The excavation, loading and stockpiling of spoil at the Lutwyche Road worksite would be carried out within the enclosed, acoustically-lined workshed, reducing noise and dust impacts of these activities. The movement of spoil haulage vehicles would be controlled and monitored in accordance with a construction traffic EMP sub-plan and a construction vehicle EMP sub-plan to ensure the environmental objectives and performance criteria were met. These plans would establish measures to ensure traffic safety, avoidance of noise and air quality impacts due to trucks queuing at worksites, dust from material being spilled onto roadways and the like.

Surface works generally would be undertaken between 6.30am and 6.30pm Monday to Saturday, with no work on Sundays or public holidays. However, some after hours activities may be required to avoid undue traffic disruptions. The proximity of proposed construction works to St Andrew's Anglican Church may require mitigation measures to address construction traffic movements. Recommended management measures are outlined in the draft Outline Environmental Management Plan (EMP) (Construction) included in Chapter 19 of the EIS.

In addition to the environmental management measures, the EIS recommends detailed construction planning in consultation with St Andrew's Anglican Church to take into account the activities and needs of the church and the need for acoustic screening from construction activities.

Issue 3

Implications of uncontrolled fill under the church building and potential for vibration from tunnelling to cause cracking to the church building as the building is more sensitive to vibration. Current cracks will need to be monitored before and during the construction phase to ensure that zero harm is made to the facilities.

Response

Potential vibration impacts for buildings near construction works were considered for the EIS. This included potential vibration impacts of drill and blast and driven tunnelling. Anticipated vibration levels from driven tunnelling would generally not be noticeable in buildings along the tunnel path. In relation to drill and blast construction, the EIS recommends careful blast design to mitigate against building impacts, and if necessary, using gradually increasing trial blasts to establish safe design parameters.

The EIS also recommends that pre and post blasting Building Condition Surveys be undertaken in the areas of construction influence and in accordance with Brisbane City Council requirements where potential exists for cosmetic (superficial) building damage from drill and blast methods. This Supplementary Report recommends that predictive modelling of vibration from all forms of tunnel construction be undertaken in advance of works. Where such modelling indicates a potential for impacts on human comfort, sensitive building contents¹⁴ or building damage, then a range of mitigation measures, monitoring and consultation would be required.

Furthermore, the local cultural heritage significance of the premises warrants particular care with regards the boundary wall and fence to Lutwyche Road. This aspect will be addressed in the construction management plans for the north-western worksites.

Issue 4

The rectory is located at the rear of the church building and it is not clear that the proximity of this building to the proposed works has been allowed for in noise planning.

Response

Investigation of potential construction noise impacts (EIS, Volume 3, Technical Report No 6 — Construction Noise & Vibration, pp. 62-70) found that site works in Lutwyche Road are unlikely to cause acoustic impact on the church, given the separation distance to the noise sources (i.e. approximately 65 m from the church building to the work site boundary). With the location of the rectory behind the church buildings any change to noise

¹⁴ Sensitive building contents are outlined in the EIS, Chapter 10, section 10.2.3 and in Technical Paper 6 - Noise and Vibration, Chapter 2, section 2.3.2

levels at that location will be virtually negligible. The EIS recommends that construction planning in consultation with St Andrew's Anglican Church should take into account the activities and needs of the church, particularly with regards acoustic screening from construction activities.

Issue 5

The proposed tunnel portal location needs to be moved down the hill, away from the church grounds. The negative impacts of having the portal in front of the church are visual, noise, air quality and the presence of at speed traffic that will diminish urban amenity.

Sensitive urban design is necessary in both the construction and operational phases to ensure no loss of visual amenity and the visual values of the church and its surroundings. Preference of the church that the final design of the green space in the median outside of the church is: 1) Sympathetic with the form and visual symbols of the church and its precinct; 2) Capable of some noise attenuation; and 3) Supportive of a road user speed environment matching the land uses in the vicinity of the church and school.

Response

The location of the transition from the tunnel roads to the surface road network at the north-western connection is principally defined by the need for the main tunnel connection to Gympie Road to be on elevated structure above the Gympie Road, Lutwyche Road and Kedron Park Road intersection. Shifting the tunnel portal and transition further north would interfere with this intersection in its design, function and capacity. Locating the tunnel portal and transition south of the church would require the extension of the embankment structure in front of the church and school.

The tunnel portals and elevated structures would incorporate noise attenuation measures to minimise traffic noise impacts for the church. Urban design treatments are also recommended for the tunnel portals and elevated structures to reduce the visual impacts of the tunnel infrastructure and to maintain an appropriate urban character in this location. The setting and cultural values of the church premises are well appreciated and need to be respected in the design of the project. Some urban design concepts are presented in Chapter 15 of the EIS. However, further detail on the urban design treatments would be prepared during the detailed design phase of the project.

Issue 6

The long term health effects of ultra fine particles ($PM_{0.1}$) are a major air quality issue and the lack of well-published Queensland state standards around $PM_{0.1}$ emissions needs to be addressed. Given the current level of public controversy about air quality standards an independent expert to review this area of concern is requested, and a publicly displayed report should be submitted.

Response

Ultrafine particles were considered in the air quality investigations undertaken for the EIS (Volume 3, Technical Report No 5A — Air Quality Impact Assessment, page 49). The matter of an independent review of air quality outcomes is addressed under Issue 3.9.1.

Issue 7

The project's apparent aversion for tall chimneys to the ventilation station will limit dispersion. If the chimneys are limited to 30 metres, having the church on a nearby rise would effectively decrease the height of the structure in relative terms. Appears to be little if any, coordination of the chimney height with maximum building heights under the town plan.

Response

Air quality modelling undertaken for the Airport Link EIS found that a ventilation outlet height of 30metres achieves air quality outcomes well below the associated air quality goals. The air quality modelling assessed pollutant concentrations at both 30m and 50m above ground level. The modelling also took into account a range of local conditions, including terrain, height of nearby buildings, weather patterns and predicted traffic flows, to name some.

The height of the ventilation outlets recommended in the EIS sought to balance the requirement for maintaining good ambient air quality and reducing other impacts, such as visual impact and shadowing, associated with the provision of a ventilation outlet. Ambient air quality would not be compromised as a consequence of adopting an outlet height of 30 metres. Application of the urban design principles recommended in the EIS and in this Supplementary Report during the detailed design phase of the project would assist in mitigating the visual impact of the ventilation station and ventilation outlet.

Issue 8

Cumulative effect of the operation of the Northern Busway and Airport Link north-west ventilation station is of concern in relation to attracting and retaining present and future rectors to staff the parish.

Response

The cumulative air quality impacts of the Northern Busway and the Airport Link Project were assessed for the EIS. The results showed that air quality for Airport Link are expected to be similar with and without the Northern Busway and well within the relevant goals. There would be no project-related reasons for staffing difficulties for the parish.

Issue 9

A development application from the EPA to handle and discharge combustion emissions to the environment should be sought.

Response

No development application for a material change of use that is an environmentally relevant activity is required for the ventilation outlet. The environmental effects of the project, including the ventilation system and impacts on ambient air quality, are being assessed by the Coordinator-General under the SDPWO Act. The operation of the ventilation system is recommended in the EIS and this Supplementary Report to be subject to on-going monitoring for in-tunnel air quality and to ascertain the contribution of the ventilation system to ambient air quality.

Issue 10

A review of Brisbane City Council's local neighbourhood plans should be undertaken for the length of the Corridor, on the understanding that a calmer surface road would allow for greatly enhanced urban amenity.

Response

The EIS recommends that neighbourhood planning studies should be undertaken to address land use changes, redevelopment potential, circulation, access and connectivity and built form and infrastructure requirements in the study corridor. The Brisbane City Council has recently commenced preparation of a neighbourhood plan for the Lutwyche Road corridor.

Issue 11

Consideration should be given to lowered speed limits for segments of Lutwyche Road at locations of urban enhancements.

Response

No change is proposed in the EIS to speed limits on Lutwyche Road.

Issue 12

A local integrated transport plan needs to be formulated that addresses issues including:

- *Safe turn movements into kerbside properties at the church, hotel and Woolloowin State School;*
- *Walking and pedestrian access; and*
- *Cycling and interconnection of the fragmented cycle network.*

Response

The EIS considered potential impacts on existing pedestrian and cycle access and investigated opportunities to enhance pedestrian and cycle connections within the study corridor. The detailed design phase of the project would be required to ensure traffic safety and pedestrian and cyclist safety and connectivity are maintained around locations such as St Andrew's Church.

The EIS and this Supplementary Report recommend, for the construction phase, the preparation and implementation of a construction traffic EMP sub-plan, as part of an overarching Construction Environmental Management Plan, to address traffic, pedestrian and cyclist safety during construction. Similarly, traffic management plans are recommended requirements for the operational phase.

The EIS recommends improvements to pedestrian and cycle facilities as part of the urban mitigation works for Airport Link. This includes provision of a north-south pedestrian and cycle corridor connecting Lutwyche and Windsor, and enhanced pedestrian and cycle links in the vicinity of surface connections.

Issue 14

The kerbside lane inbound along Lutwyche Road should be converted to a high-occupancy vehicle (HOV) lane (i.e. to allow safer turn into the church).

Response

No change is proposed in the EIS to speed limits or traffic lane operations on Lutwyche Road. The existing access arrangements will be maintained for the church. Reductions in traffic flows on Lutwyche Road as a consequence of both Airport Link and the Northern Busway, would contribute to easier access to church land.

Issue 15

Care should be exercised to preserve if practical the gravitational flow of the sewer in the area of Lutwyche and Kedron Park Roads to avoid the installation of a sewer pumping station and an overflow structure.

Response

Existing utilities in the vicinity of proposed works were considered in the development of the project design. The requirement for any modifications to these utilities would be considered in the detailed design phase of the project. While the variety and extent of existing services that may potentially be affected by the project works (i.e. the sewer in the vicinity of Lutwyche and Kedron Park Roads) have been identified in the EIS process, only the feasibility of these modifications has been addressed to date. In principle, gravitational flow is the preferred

means of transport in sewers. Alternatives, such as pumping, would be available and considered if gravitational flows proved not to be feasible in the process of detailed design.

3.1.4 Kedron State High School

Issue 1

It is important to note that the air quality standards or goals established as part of the NEPM are designed to be measured to give an 'average' representation of air quality. That is the NEPM monitoring protocol was not designed to apply to monitoring peak concentrations from major emission sources.

Response

It is correct that the NEPM air quality standards were developed to provide protection to the majority of the Australian population to be measured at sites which were generally representative of air quality in the area in question. The levels of air pollution could be higher at other locations, for example near a busy road. It is not correct that the standards do not relate necessarily to long-term averages. The averaging period that is used for the NEPM standards is appropriate for the time over which the health effects occur.

The air quality goals relevant to the Airport Link Project are based on Environment Protection (Air) Policy air quality goals as well as the NEPM air quality goals. Some of the NEPM standards are more stringent than the EPA standards/goals. For example there is a nitrogen dioxide NEPM 1-hour standard of 120 ppb, compared with the EPP goals of 160 ppb. The NEPM 24-hour PM₁₀ goal is 50 µg/m³ compared to the EPP goals of 150 µg/m³.

The more stringent of the NEPM and EPP goals were used for this assessment.

Issue 2

The health risk assessment concludes that there will be no appreciable change in community health as a consequence of Airport Link. This assumption will require testing over time as little is currently known about the impact of ultra fine particulate matter on humans, and in particular, in their formative years.

Response

The EIS and this Supplementary Report recommend on-going monitoring to determine the contribution of the project ventilation system to ambient air quality. The air quality modelling undertaken for the EIS supported the analysis of potential changes in community health as a consequence of project ventilation. A number of relevant national and international studies on the effects of motor vehicle emissions on human health were relied upon in this analysis. With on-going monitoring of ambient air quality, refined estimates of changes to community health would be possible. No adverse, significant changes to community health are anticipated.

The air quality modelling also found that motor vehicle emissions from Brisbane's surface road network were widely distributed in Brisbane's airshed, such that the benefits of filtering the ventilated motor vehicle emissions from a motorway-standard road system such as Airport Link, are somewhat nullified by motor vehicle emissions from the congested surface roads.

As new standards are adopted, the monitoring and assessment method will reflect this. At present there is no nationally agreed method of measuring ultrafine particles and the adoption of a standard is not imminent. The World Health Organisation, in its 2005 global update, noted that, while there is evidence for health impacts of ultrafine particles, at this stage there is insufficient evidence to set any air quality goals for ultrafine particles in the ambient air.

Issue 3

The potential for air quality impacts from Airport Link construction raise concerns regarding the impact upon students and staff health due to the proximity of schools to many construction activities.

Discussion of the long term effects of ambient exposure to air pollution in the EIS (Volume 3, Technical Report 5b) have raised community concerns in respect of (1) location of a ventilation outlet in the vicinity of Wooloowin State School and Kedron State High School (This Department has indicated that ventilation towers should be no closer than 300 metres to a school site.); (2) location of ventilation outlet in relation to sensitive land uses including schools, child care, aged care, residential areas, open spaces and recreational areas; (3) Need for filtration of ventilation outlets employing world's best practice and at any cost; (4) Changes to air quality near ventilation outlets and potential health effects for residence and students; (5) Need for online real time monitoring and reporting of air quality during construction and operation; (6) Validation and certification of air quality models.

Response

Potential impacts on ambient air quality during construction could derive from dustfall from uncontrolled and exposed surfaces and soil, and from engine emissions from construction vehicles and powered plant and equipment. Monitoring potential construction impacts on ambient air quality is an important aspect of pro-active environmental management required by the draft Outline EMP (Construction) set out in Chapter 19 of the EIS.

Construction activities should be managed to minimise dust nuisance and engine emissions, consistent with the goals¹⁵ set out in Chapter 9 of the EIS.

Air quality investigations undertaken for the EIS for operational impacts, described ambient and roadside concentration levels for various pollutants in several traffic scenarios (i.e. without Airport Link, with Airport Link, with Airport Link and the Northern Busway) over a range of design years.

Both the Queensland EPA and Queensland Health have assessed the EIS (air quality and health risk assessment) and have concluded that the modelling for air quality and health risk adopted appropriate methods, assumptions and data sets, leading to appropriate and supportable conclusions.

These investigations found that predicted pollutant concentrations with and without Airport Link were very similar and that for each of the modelled years (2012, 2016 and 2026), all pollutant concentrations are below air quality goals at each of the monitoring locations, including the monitoring site at the Department of Emergency Services Kedron complex. The air quality modelling also found that the highest ground-level concentrations due to all ventilation outlet emissions are well below the associated air quality goals.

The 300 metre separation buffer referred to in the submission has not been supported by technical analysis or research. It appears to be an arbitrary buffer and bears no relationship to research, literature or factual evidence.

The locations for each of the ventilation outlets was assessed having regard to a range of criteria set out in the EIS and in Chapter 2 of this Supplementary Report. The analysis for the Kedron ventilation outlet took into account the location and proximity of a range of sensitive receptors, including schools, aged care facilities and residential areas. The preferred site is situated in the most advantageous location for this part of the project corridor and provides good separation from most sensitive receptors. The EIS went further to recommend a very

¹⁵ Refer to EIS, Chapter 9, section 9.2.1

conservative approach to ambient air quality, resulting in a recommended height for the Kedron ventilation outlet of 30 metres. The ground-level concentrations for pollutants of concern or interest from the Kedron ventilation outlet are well below the stringent, health-based air quality goals.

The EIS also modelled predicted roadside pollutant concentrations along selected surface roads, including Lutwyche Road, in the vicinity of Lutwyche and Gympie Roads. Modelling considered predicted concentrations with and without Airport Link at the kerbside and distances of 10m, 30m and 50m from the kerb. Generally, the modelling found that improvements in local air quality are observed where reductions in surface traffic occur as a result of the Project. In relation to Wooloowin State School, air quality modelling predicted that the pollutant concentration levels along Lutwyche Road are predicted to be lower with Airport Link compared to without Airport Link, and well below the air quality goals identified for the Airport Link Project.

The need for and benefit of filtration was examined in the EIS. In summary, these investigations found that, due to the low concentrations of pollutants in the ambient environment with Airport Link, the potential benefits of filtration would not be significant, and would be overtaken, or negated by motor vehicle emissions from traffic on other surface roads in northern Brisbane. In the circumstances, there was no warrant for the cost of installation or operation of filtration equipment. However, the reference design does make provision for the future installation of filtration should a demonstrable benefit be evident.

Potential health risk impacts on regional (ambient) and roadside air quality were assessed as part of the EIS. These investigations considered the location of sensitive receptors such as child care centres and schools, as well as those groups within the community who appear to be most at risk from the health effects of air pollutants, such as children. The health risk assessment concluded that there would be no appreciable change in community health as a consequence of the Airport Link Project, either to the operation of the ventilation outlet or changes in roadside concentrations.

Both the EIS and this Supplementary Report recommend that a program of baseline monitoring and on-going monitoring for in-tunnel air quality and ambient air quality be undertaken for Airport Link. With regards ambient air quality monitoring, it is recommended that quarterly reports be provided as one means of demonstrating the effectiveness, or otherwise, of the ventilation system, and associated impacts on the receiving environment, if any can be measured.

Issue 4

The provision of filtered air conditioning in schools and double glazing will provide reassurance to staff, students and current and prospective parents.

Response

The provision of filtered air conditioning would be ineffective for the removal of ultrafine particles in the ambient environment, due to the coarseness of the filters used in air-conditioning units, relative to the size of the ultrafine particles. The most effective means of dealing with ultrafine particles in this instance is that adopted by the Project i.e. wide-spread dispersion via high-level ventilation outlets.

Double glazing is not considered necessary to mitigate construction noise impacts, if the mitigation and management measures set out in the draft Outline Environmental Management Plan (EIS, Volume 1, Chapter 19) are implemented, or, the environmental objectives and performance criteria for construction air quality are satisfied. Similarly, the modelling undertaken for the EIS indicates there to be no need for double-glazing to mitigate road traffic noise in the operation of Airport Link. Monitoring of road traffic noise and of the

ventilation station and ventilation outlet is recommended in the EIS and in this Supplementary Report to ensure the environmental objectives for the project are met.

Issue 5

With respect to the note in Technical Report on Noise and Vibration to the effect that further examination of Kedron State High School should be undertaken to see whether the windows are normally open (as assumed) or whether they are air-conditioned and the windows kept shut the Department takes the position of the EPA's Noise Measurement Manual 3rd ed. 1 March 2000 which states "Measurements should be made in habitable rooms with doors and windows open or closed to represent typical 'worst case' conditions".

The assessment that prevailing levels of traffic noise will mask construction noise is unacceptable as any increase in noise has the potential to impact upon the learning environment.

The fan noise at the tunnel portal near schools raises concerns along with the dispersal of pollutants.

Response

As explained in the EIS and in Technical Paper No 6 – Noise and Vibration, noise monitoring for the investigations were conducted in accordance with Australian Standard AS1055 – 1997, *Acoustics – Description and Measurement of Environmental Noise*, and the Queensland Environmental Protection Agency's *Noise Measurement Manual 2000*. The Queensland EPA did not raise any concerns with regards the noise monitoring, nor with the methodology adopted for the investigations and impact assessment for the EIS.

The EIS, through the draft Outline EMPs set environmental objectives and performance criteria to address the avoidance, or mitigation and management of construction impacts on sensitive receptors, such as the schools in the project corridor.

The noise impact assessment has been based on the "windows open" scenario and therefore represents a worst case assessment. This comment has been included as many educational facilities have rooms which are permanently closed for air conditioning. In these instances it is common practice for noise assessments and corresponding mitigation design to take this fact into account.

Traffic noise does have the ability to "mask" other noise sources within our community however the degree of "masking" depends on many factors including the level of road traffic noise. In this case, factors such as the level of construction noise, when the noise is heard and where the noise is heard (i.e. case inside a classroom) will be considered in determining what noise mitigation measures will be employed to achieve a satisfactory noise environment at neighbouring noise sensitive locations such as places of education.

A preliminary assessment of fan/ventilation noise has been undertaken as part of this EIS and these investigations show that such noise can be controlled to within acceptable limits. The technology for the control of mechanical (i.e. ventilation fans) noise is very well developed, enabling very large reductions in noise emissions from such plant to be readily achievable.

Issue 6

Given schools operate five days per week for 40 weeks a year, the duration of the construction and the increased traffic post-construction is a significant issue. Long-term mitigation as opposed to temporary mitigation during construction is deemed appropriate to ensure student learning is not impacted.

Response

The EIS investigations took into account the location of a range of noise sensitive receptors in the project corridor, including the schools. The impact assessment also took into account the operation needs for internal noise levels for both the construction and operational phases of the project. While short-term or temporary mitigation measures are proposed to address the potential construction phase noise impacts, mitigation measures for operational noise impacts are required to be incorporated in project design (i.e. road traffic noise barriers) to ensure the normal operations of the schools is able to be maintained.

The assessment and control of adverse noise impacts during the construction and operational phases of the project have been dealt with separately. Where mitigation measures have synergies for both phases, construction planning and detailed design should seek to optimise such opportunities, but always on their acoustic merits for the noise sources under investigation. All appropriate mitigation measures will be employed throughout both the construction and operational phases of the project to achieve the environmental objectives and performance criteria, together with compliance with noise goals/guidelines applicable to the various sensitive locations neighbouring the project.

Issue 7

The expectation that the Department of Emergency Services relocate its internal access road along the Kedron State High School boundary has serious implications for the high school. In excess of 500 vehicles will utilise this road daily, mainly between 7.45am and 8.45am when students are accessing the footpath along Kedron Park Road. As the school's music block, hall, general learning areas and canteen facilities are located immediately adjacent to this proposed access, the issue of increased traffic noise, air quality concerns and implications for student safety will be paramount concerns to staff, students and parents.

Response

At present, the Park Road access to the Emergency Services site is an important one, accepting a range of vehicle types and functions. It is situated nearby the main administration access point in Park Road for the Kedron High School. At present, a significant proportion of the daily traffic accessing the Emergency Services complex does so from the Park Road access in close proximity to the sensitive receptors referred to in the submission. There is an existing traffic management issue for these facilities.

It is proposed in the reference design that all access to the Emergency Services facility will be from Park Road. In light of the existing situation, traffic management and consultation between the Department of Emergency Services and Education Queensland is required.

A consultation process with the Department of Emergency Services has commenced and is progressing with regards to gaining access to this (DES) land for construction. The impact of moving the primary DES access to Park Road and the potential for traffic conflicts arising from future development of the DES site, with school-related traffic and pedestrian movements, will be addressed in consultation with DES. A range of potential mitigation measures would be developed in that consultation process, and could include the provision of passenger set-down areas, designated pedestrian crossings and management of traffic flows to and from the DES site.

The potential environmental and social impacts associated with the Department of Emergency Services site's future development will need to be considered in the approval for its future use under relevant legislation. A consultative process involving key government stakeholders, such as the Department of Emergency Services and Kedron High School administration, is recommended to address the school's concerns regarding traffic

access, safety and environmental aspects. Consultation should be implemented during the detailed design phase and in accordance with the Construction EMP.

Issue 8

The EIS acknowledges the complexity of the Gympie Road, Lutwyche Road, Kedron Park Road intersection. The requirement to maintain safe pedestrian movements is crucial for the safety of students attending both Woolloowin State School and Kedron State High School. These concerns are held not only by current students and their parents but also by prospective parents that may consider alternative schools should student safety be compromised.

Response

From the community inputs received during preparation and formal notification of the EIS, the importance of maintaining safe and functional access to both the Woolloowin State School and the Kedron High School is appreciated and understood.

In the reference design the movement of pedestrians through this intersection is provided for over two traffic movement phases. The requirement to maintain safe pedestrian movements being crucial for the safety of students attending both Woolloowin State School and Kedron State High School is acknowledged and will be a specified requirement for the detailed design of this intersection.

Alternative access along the Kedron Brook corridor is intended to be maintained at all times during the construction phase and into the operation phase of the project. Such access will be designed to be safe and convenient.

Issue 9

Of the 950 students at Kedron State High School a recent survey showed 29% travel by motor vehicle, 27% travel by bus, 19% catch a train, 17% walk, 7% cycle and 1% catch taxis. A large number of the 70% who do not use motor vehicle will be subjected to the impact of construction and the resultant alternative bicycle and pedestrian routes that will need to be put in place during and after the construction phase.

Proximity of the work site to Woolloowin State School and Kedron State High School presents significant access issues, especially for those students who have to negotiate re-configured bikeways and footpaths as a result of the construction. Drop-off and pick-up zones for students transported by car also have the potential to be significantly impacted by Airport Link construction, including parking for parents.

There is a need to maintain safe pedestrian and cycle access (including for students with a disability) near construction worksites and surface works, particularly: 1) Avoiding confusion and uncertainty for pedestrians and cyclists; 2) Across and along Lutwyche Road/ Gympie Road to Kedron Brook and community facilities; and 3) Need for communication to parents and students of changes to pedestrian access during construction.

Response

Temporary access through and/or around construction sites would be maintained as required in the construction traffic EMP sub-plan required for construction required in the Draft Outline EMP in Chapter 19, Volume 1 of the EIS. The temporary accesses during construction would be of a standard sufficient to be easily and safely negotiated and would be developed in consultation with the schools administrations, consistent with the construction traffic EMP sub-plan.

The reference design does not propose any use of Kedron Park Road for construction access and therefore would not affect this key drop off zone. Access from Kedron Brook across the ovals into the school would be maintained throughout the construction and operation of the project. This is identified in the reference design and community consultation drawings.

The pedestrian paths and bikeways along Kedron Brook will be maintained throughout the construction process. Alterations to these bikeways may occur in isolated periods where temporary routes would be in place, i.e. when the bridge over Kedron Brook and its abutments are being constructed. These temporary routes will need to be managed to comply with safety requirements.

During construction, it will be important for the Proponent to consult with and seek input from the Kedron High School administration with regards the scheduling of construction events and school events to minimise the impact of changes to access arrangements from Kedron Brook.

Traffic on the major roads, such as Gympie Road, Lutwyche Road and Kedron Park Road would be managed during construction in accordance with the construction traffic EMP sub-plan.

Issue 10

Denial of access to the Kedron State High School oval during construction of the cut and cover tunnel section and re-instatement of the oval presents significant issues for the effective delivery of the school's Sport and Physical Education curriculum.

Response

Only one oval, that beside the Kedron Brook cycle/pedestrian path will be affected by Project works. The other two ovals adjacent to the High School buildings will not be affected during construction. Construction of the cut and cover tunnels will be carried out as quickly as possible to allow reinstatement of the sporting field.

Considering the nature of the Project works and the activities conducted on the school oval(s), construction noise goals for site preparation and for daytime tunnelling works have been developed to address the concerns in the submission. The investigations for this Supplementary Report have also taken into account the intermittent use of the ovals (i.e. not 24hours, 7 days) and the flexibility to move around on the ovals to increase the separation distance between the works and the school activities. The site preparation works would be of shorter duration than daytime tunnelling works adjacent to the ovals. The recommended goals for construction noise on the school ovals are set out in **Table 3-1**.

■ **Table 3-1: Recommended Goals for Construction Noise – Kedron High School Ovals**

Construction Activity	Construction Noise Goal
Site preparation works	65 dBA Leq (1hr)
Daytime tunneling works	60 dBA Leq (1hr)

Investigations for this Supplementary Report indicate that, with the installation of temporary noise walls approximately 4 metres high and the tunnelling enclosure or workshed, the goals can be achieved over most of the ovals, except for a zone approximately 40 metres in width immediately adjacent to the noise walls. Such measures should be adequate to enable a reasonable and practicable level of activity and utility of the school oval nearest the work site, during the construction phase of the Project.

Construction site planning, establishment and on-going management will be required to ensure public safety is maintained, as well as meeting the environmental objectives and performance criteria recommended in the EIS¹⁶ and this Supplementary Report.

Consultation with the school administration will be required to plan and deliver the works in low activity periods wherever possible (i.e. school holidays).

Issue 11

Impacts of tunnel construction, namely vibration and subsidence, are of concern with respect to the DES swimming pool to the continuation of the Sport and Physical Education curriculum.

Response

For the reference project, the construction works proposed adjacent to the swimming pool include surface roadworks and construction of the south-bound off-ramps connecting the project with Gympie Road and Lutwyche Road. Also, the ventilation station would be constructed partly above the transition structure from the tunnel to the surface roads.

Construction works at the closest point, are estimated to come within 20 metres of the swimming pool itself, while the construction site boundary would require part of the swimming pool complex. There may be periods when the swimming pool complex will be unable to function during construction. Detailed design may be able to resolve the future use of the swimming pool and associated facilities.

A number of mitigation measures will be employed to avoid building (i.e. swimming pool) damage throughout the construction period. These include building condition surveys before and after construction and vibration monitoring to alert the construction contractor when vibration levels are approaching the levels that may cause damage so that alternative construction techniques can be utilised.

Issue 12

Environmental value concerns include: 1) Need to manage construction to ensure that species are able to be maintained, such as the provision of vegetation areas prior to construction commencing; 2) Impact of construction on species in Kedron Brook (i.e. interruption of flows and barriers to fish movements).

Response

As indicated in the EIS¹⁷, these points will be addressed in developing the Environmental Management Plans as required of the Proponent before construction begins. Furthermore, approvals under the *Integrated Planning Act 1997* are required for operational works that are either tidal works or works that are waterway barrier works. Further assessment may be required to determine such applications, depending on the scope and effect of the detailed design for the Project.

Issue 13

The (Education) Department would expect that all costs associated with the implementation of mitigation measures would be met by the Proponent of the Airport Link Project.

¹⁶ Refer EIS Chapter 19, Draft Outline Construction EMP

¹⁷ Refer to EIS, Chapter 19, section 19.6 – Draft Outline EMP (construction)

Response

Should the Coordinator-General recommend the Project proceed, subject to conditions, the Proponent will be required to meet and satisfy the conditions imposed. Similarly, the Proponent will be required to meet and satisfy any conditions imposed by another agency exercising its powers under legislation relevant to the Project (i.e. Development Permit for Operational Works that are tidal works). The Proponent would be responsible for the costs associated with meeting the conditions imposed by the Coordinator-General and any other agency.

3.1.5 Department of Emergency Services Complex

Issue 1

As one of the proposed worksites is situated on land owned by DES, further consultation with regard to property matters is necessary.

Response

A program of consultation with the Department of Emergency Services is in progress and will be maintained through the detailed design phase, seeking to resolve any impacts of the project.

Issue 2

Park Road is noted as having secondary access to the DES complex but it is next to Kedron State High School and increased usage may present risk to school children. During school terms Park Road is very busy. Moreover, emergency vehicles (ambulances) use Kedron Park Road access to quickly exit the complex. Because the Gympie Road entry is the principal entry point to the complex for staff and commercial vehicles its loss to road construction will be a major detriment to the Complex's operation. Heavy vehicles will have difficulties with safety and turning circles. Access/egress to/from the proposed infrastructure for service delivery during construction should take into account the need for the delivery of all emergency services in view of the proposal that ten trucks per hour are expected to traverse the Kedron Project site. There is potential for impacts on pedestrian and vehicular movements to/from/around/across QAS Intensive Care Paramedic Station within the DES complex Kedron. These issues need to be adequately addressed in the detailed project design.

Response

It is proposed in the reference design that access to the remaining area of the emergency services facility will be from Park Road. On-going consultation with the Department is being undertaken regarding access to land required for construction and also for project operation, as well as for Departmental operations on the remaining land. Access to the Kedron High School site needs to be considered in this process.

Issue 3

There appear to be potential limitations of access/egress for emergency vehicles when looking at the project, including the Northern Busway, as a whole.

Response

The operational phase of the Airport Link Project would have facilities in Windsor and in Kedron that would provide parking, maintenance and marshalling areas for emergency vehicles. The Tunnel Control Centre in Windsor will manage the fire protection, traffic management and control, incident control, communications and emergency procedures.

Access to infrastructure belonging to the Northern Busway is addressed separately in the Northern Busway CDIMP.

Issue 4

Any review of Department of Emergency Services land should consider the potential requirement of Emergency Management Queensland to land a helicopter in emergency situations.

Response

This point is noted and will need to be reflected in the project brief for the redevelopment of this public facility.

Issue 5

The proposed alignment of the tunnels at the North-western Connection has a severe impact on the Emergency Services Complex, particularly the Gympie Road access, staff car parking and the Kedron Brook Building.

An off-ramp from the tunnel inbound will surface in close proximity to the DES swimming pool complex and there is an outbound ramp linking Gympie Road to the tunnel at the point where the Kedron Brook Building now stands. It is estimated 30,000 cars per day will use this link road.

The proposed alignment of the tunnel bisects the DES Complex decimating the potential for growth on the Kedron site. Loss of approximately 40% of the site, height of on and off ramps and the link road from Gympie Road to the outbound tunnel ramp will significantly affect the potential for development and future growth of the site. The Kedron Brook Building will need to be demolished with the functional technical units it now contains needing to be relocated. Alternative accommodation at other DES sites is not available. Moreover, the 2000 m² of functional office space from the Kedron Brook Building cannot be absorbed into the main complex building.

A number of DES staff cycle to work and others access the Complex on foot. Students at Kedron State High School use the green spaces behind their school for access to and from to avoid the heavy traffic load on Gympie Road and Kedron Park Road. The safety of these groups of users will need to be considered in developing alternative accessways during construction.

The Project impacts on the property will further seriously affect the amenity of the current site and will impact the regard with which it is currently held as a sought-after workplace. DES gave assurances to staff in developing the business case for the Kedron Complex that ample car parking would be provided for staff at the complex.

Response

The Department's concern regarding potential deterrence of employees from the DES site which provides state-wide programs and services is acknowledged. A process of consultation and negotiation with regards property-related matters between the Proponent and the Department commenced during preparation of the EIS and will continue through to detailed design and construction.

Negotiations between the Proponent and the Department of Emergency Services are on-going regarding car parking, access, site development impacts, construction and operational phase impacts (i.e. air quality, noise, vibration), and site amenity generally.

With regards impacts on the swimming pool complex, see the response in section 3.1.4, Issue 11, of this Supplementary Report.

With regards access concerns for cyclists and pedestrians, see the response in section 3.1.4, Issue 9 of this Supplementary Report.

The detailed EMP sub-plans managing construction impacts and operational impacts are required to address the suite of issues which have the potential to impact on the amenity of the DES site (i.e. traffic noise, air quality, accessibility, visual impact and landscaping). Environmental objectives and performance criteria responding to these issues have been presented in the EIS (Chapter 19, draft Outline EMPs) and should be captured in any conditions imposed by the Coordinator-General.

Issue 6

Location of the ventilation station and outlet is of concern. The potentially hazardous pollutants being exhausted within the Emergency Services Complex where approximately 800 staff are accommodated are of concern to DES. The ventilation shaft will pump out more than 2700 cubic metres of heated, exhaust-polluted air every minute and despite the height of the stack, there will be an impact on the surrounding area that will vary depending on the direction and strength of any wind.

The exhaust discharges of the large number of heavy vehicles and the generation of dust on site will further degrade the air quality around the DES Complex.

A third party assessment in regard to these emissions and their potential effects on DES staff is requested. The preferred position of DES is to request a third party analysis and evaluation of this potential impact and its possible health effects.

Response

See the response to section 3.1.4, Issue 3 of this Supplementary Report.

The EIS (Volume 1, Section 9.3.5 and Volume 3, Technical Report 5A – Air Quality, Section 8.2) presents the results of detailed modelling of air quality effects of the ventilation outlets. The modelling shows that dispersion of tunnel air at 30m above ground is predicted to have minimal impact on the ambient air quality in the area of the outlets including at Kedron. The assertion in the submission that the ventilation outlet will impact on the ambient air quality of surrounding area, is not supported by the EIS findings.

The modelled air quality parameters during operation of the Project at full capacity show that the predicted levels of pollutants are well below the rigorous health-based goals adopted for the Project. It is noted that a number of briefings on the implications of the proposed ventilation system, air quality and health risk, have been extended to DES staff and senior management during the preparation of the EIS and also during the notification period.

With regards a third party review, the EIS (including Volume 3, Technical Report 5A – Air Quality) has been reviewed by the Environmental Protection Agency and by Queensland Health. Both agencies have accepted the methodologies, the data sets used in analysis and the conclusions reached as presenting fair assessments of the likely impacts and risks associated with development of the Airport Link Project.

Issue 7

It is envisaged that there will be an increase in noise levels at the DES Kedron Complex during construction and operation of the project. Construction works, increased passing traffic from Gympie and Stafford Roads and the operation of the ventilation outlet station are seen as major potential contributors to increased noise levels. It is vital that acoustic design data and actual readings from similar tunnel projects are pursued to provide sound information on which to base future decision making.

Response

The EIS in Chapter 10 reported on existing background noise conditions and modelled likely future background conditions with and without Airport Link. The EIS also established the goals for construction and operational noise required to achieve environmental objectives which seek to maintain functionality and amenity on the Emergency Services site, to the extent possible having regard to land requirements.

The modelling undertaken for air quality, noise and vibration with regards the Airport Link Project is based on design data used for other similar projects (i.e. tunnels and roadways) around Australia and the world. The models used for construction and operational (traffic and ventilation) noise predictions are based on actual noise measurements. Considerable effort has been expended to undertake a credible assessment of noise impacts associated with the Airport Link Project.

The EIS recommends monitoring be undertaken during both construction and operation to determine whether the environmental objectives are being met. Should they not be met, then environmental reporting is required to document the corrective action taken and the outcome of such action.

Issue 8

The visual amenity afforded by the green space including the sports oval and other green belts between the main building and the Kedron Brook Building will be severely curtailed by the tunnel construction and the ventilation outlet station.

Response

The EIS, in Chapter 15 – Urban Design and Chapter 19 – Draft Outline EMPs, set out a range of mitigation measures for visual impacts at each of the connections, including the north-west connection at Kedron. Should the Project proceed according to the reference project, there will be significant changes in the urban character of the locality as a consequence of Project infrastructure, including elevated roadways, transition roadways connecting to tunnel segments, and the ventilation station and ventilation outlet.

During construction, the visual amenity of Kedron Brook will change due to the construction worksites and worksheds. At present, Kedron Brook adjacent to the planned worksites has been constructed into a major drainage channel, with little visual appeal. It retains open space and recreation values, particularly for walking and cycling.

Urban design treatments are recommended for the Project as part of a comprehensive approach to mitigating such visual impacts. Another important element will be effective landscaping, possibly requiring some mature plantings in key locations. The landscaping intention for the north-west connections at Kedron is to minimise and mitigate visual impacts by establishing some landmark settings with the use of theme plantings (i.e. hoop pine, weeping figs). However, it is recognised that the scale of the infrastructure will limit the extent to which it can be screened or mitigated.

The EIS also recommended the implementation of a range of urban mitigations, including a comprehensive landscaping treatment for Kedron Brook, between Gympie Road and Shaw Road. For Kedron Brook, the works included as part of the Project include reinstating a more natural waterway with low-flow channel modifications and appropriate plantings, as well as the provision of additional pedestrian and cycle facilities including seating and paths. Such mitigation works would enhance the Kedron Brook open space corridor in terms of its visual amenity and utility, and enhance its value to the Kedron and Lutwyche communities, as well as the wider Brisbane community.

3.1.6 Clayfield Ventilation Outlet

A number of submissions were received from residents in Clayfield concerning the design, siting, and potential operational impacts of the ventilation station and ventilation outlet proposed in the reference project to be situated in Kalinga Park fronting Sandgate Road, and occupying some allotments in Alma Road. The site selection has been described in the EIS and in this Supplementary Report (refer to section 2.2.3 – Supplementary Report).

Issue 1

Site for the ventilation outlet at Sandgate Road, Clayfield is considered too close to residential areas for a number of reasons, including polluted air, noise from the ventilation station, impact on property values and the need for resumptions, impact on visual amenity, and the potential for vandalism and other unlawful activities, and the adverse health effects of the above.

Response

The site selection process for each of the ventilation stations and ventilation outlets was based on a number of criteria, set out in section 2.2.3 of this Supplementary Report and included determinants such as functionality, air quality performance, proximity to sensitive receptors (residential, aged care, health care), topography and flooding, accessibility for maintenance, visual impact, and construction and operational costs.

As noted in section 2.2.3 above, the preferred site at Sandgate Road, Clayfield performed better in the comparison than other possible sites for the north-east ventilation station, in responding to the criteria.

From the consultation activities extended to the community, community groups and political representatives about the preferred location for the north-eastern ventilation outlet, the range of community concerns is well documented and understood.

From a technical standpoint, the preferred site for the ventilation outlet remains that identified in the EIS.

The detailed design phase is expected to provide more refined designs for the configuration of the ventilation station and ventilation outlet in response to the urban design principles recommended in the EIS and this Supplementary Report. The detailed design of the ventilation station and ventilation outlet should be supported by a consultation process.

Issue 2

The Clayfield vent site is not one of choices previously shown (consultation process).

Response

The preparation of the EIS and the development of the reference design were informed by an extensive program of community consultation including the distribution of newsletters and extending to a number of community information days to impart information about project design and potential impacts. This process was voluntary and preceded the formal consultation process of public notification which concluded on 8 December 2006.

The site options being considered for each ventilation outlet were provided for community comment via Newsletter #4 issued in June 2006. Four options were shown for the north-eastern connections, two for the north-western connections and three for the southern connections. The newsletter noted that the maps were "... indicative only and subject to change".

Community comments were received at the information days, as well as through emails, feedback forms and telephone calls.

With further refinement of the reference design, the preferred site for the Clayfield ventilation outlet and ventilation station was shown in the EIS, and the newsletters and display materials during public notification, as being situated in the same locality at Clayfield as option A in Newsletter #4. The preferred site was moved from a position directly above the west-bound tunnel and ramp from Sandgate Road, as shown in Newsletter #4, to the preferred position immediately to the south of the west-bound ramp from Sandgate Road. The preferred position is about 20 metres further south than shown in the preliminary consultation documents, and requires the acquisition of a number of residential properties, one of which fronts Alma Road, Clayfield. This refinement was highlighted and explained in Newsletter #5 issued in conjunction with the public notification of the EIS.

While this change is seen as significant by local residents, it would not result in different impacts in terms of air quality. It would require the ventilation station to be carefully designed and sited to minimise and mitigate impacts of the residential character and amenity of Alma Road – a matter of concern for local residents.

Issue 3

The Clayfield vent site choice should not be based on cost saving

Response

The site selection process leading to adoption of the preferred location for the reference project was based on a range of criteria, set out in Chapter 2, section 2.2.3. The locality of the preferred site was selected as being the most desirable against the criteria, noting that all sites were constrained to some degree by their proximity to sensitive receptors or by property considerations. The positioning of the preferred site to the location shown in the EIS occurred in response to anticipated construction and flooding challenges associated with the cross-section of the ventilation shaft connecting the extraction point to the fan station.

Considering that the preferred site best meets the selection criteria, then the costs of construction and operation, while important, are not and were not the primary determinants for the recommendation.

Issue 4

Should be underground and stack to be artistically designed. Engineering of a vent crossing the creek should be feasible and flooding reasons are a fallacy. Prefer it be located adjacent to Centro Toombul. Does not meet urban design principles. No amount of urban design will enable a complex 45 metres long, 20 metres wide and 15 metres high to be constructed in keeping with the low-medium density 'tin and timber' nature of Eagle Junction. The proposed location would make an absolute mockery of residents' efforts to maintain a charming streetscape.

Response

The reference design presents one realistic and effective way of providing ventilation of the tunnel system while meeting environmental and engineering objectives. The urban design treatments presented in the EIS sought to reduce the visual impact of the ventilation station and ventilation outlet through the use of different materials and design elements, integrated with a comprehensive landscaping approach. Submissions received from local residents have generally not supported the proposed treatment nor the preferred site.

The siting of a ventilation outlet in the Toombul shopping centre presents a number of property, commercial and engineering challenges without necessarily avoiding a requirement for the ventilation station (i.e. fan, plant and equipment) to remain in the location indicated in the reference project and assessed in the EIS. Factors which would constrain siting the ventilation station in the shopping centre include lack of control over the shopping centre land for this purpose, constraints on shopping centre operations and development potential, possible flooding impacts if the building were to extend to the south of the existing shopping centre façade.

The detailed design of the Clayfield ventilation station and ventilation outlet would need to satisfy the urban design principles recommended in the EIS, particularly with regards visual impacts, amelioration of building scale and bulk, landscaping and shadowing.

Issue 5

No baseline modelling has been included for Kalinga Park to reflect current ambient air quality and establish potential impacts of the North-East connection. The air monitoring data from monitoring sites at Brisbane Airport, Eagle Farm, Bowen Hills and Kedron does not reflect the whole Airport Link corridor and is a significant flaw in the modelling. Monitoring sites should be established at the North-East Connection as soon as the project is approved to provide baseline data. One of the monitoring sites should be located in green space to reflect impacts on the surrounding communities away from elevated emission points adjoining surface road connections.

Response

The air quality modelling for the Airport Link EIS used data collected at three air quality monitoring sites located around the proposed tunnel route at Eagle Farm, Bowen Hills and Kedron. These sites are considered to be representative of the existing air quality in the environment, providing a representation of air quality in suburban and residential areas of Brisbane, removed from busy streets, and provided a sound basis for the development of three-dimensional wind field models for subsequent air quality assessments.

The selection and use of data sets in the EIS was accepted as reasonable and representative in the appraisal of the air quality assessment by the Queensland Environmental Protection Agency.

Consideration will be given to establishing three extra monitoring locations, each at a sensitive location near a ventilation outlet, to assess whether any impacts can be demonstrated from the ventilation outlet dispersion. In response to community inputs during the preliminary consultation phase, the EIS and this Supplementary Report recommend that one monitoring station be established in Kalinga Park. The monitoring sites generally would be established to complement the EPA network and be operational for at least 12 months before the Project commences operation. It is recommended that monitoring be on-going for the concession period of the Project.

A full discussion on the potential impacts on ambient air quality of Project operations is presented in Chapter 9 of the EIS, Technical Study No 5a – *Air Quality*, and Chapter 3, section 3.8.3 of this Supplementary Report.

Issue 6

As a consequence of Airport Link, the BCC should hold approvals on childcare centre at Melton Rd and building in Parklands St until final decision is made.

Response

Considering the air quality outcomes identified in the modelling for the reference project (ref EIS Chapter 9), there is no need and no provision under the Integrated Planning Act for the Brisbane City Council to hold decisions on development applications in abeyance.

Detailed design development and predictive modelling supported by further background monitoring for the ventilation system proposed during the procurement process will need to demonstrate outcomes which satisfy the environmental objectives and the goals for ambient air quality recommended in the EIS and this Supplementary Report.

Issue 7

The ventilation system will employ large machinery which will have noise impacts which will not be outstripped by Sandgate Road traffic.

Response

The EIS considered the potential for noise impacts from ventilation station operations in Chapter 10, section 10.3.2 and established noise design criteria for the north-eastern ventilation station. The EIS concluded that in applying the criteria, some noise reduction would be required for the north-east ventilation station, particularly for the low and high frequencies (125Hz, 2KHz). This was noted as being manageable through mechanical and structural design.

Issue 8

Filtration must be fitted to the ventilation station, due to its proximity to residential areas and Kalinga Park. Health impacts of air quality in low-lying areas, particularly around Kalinga Park. Cost rather than the health and welfare of the community is the over-riding concern. Kalinga Park is a popular recreation venue which will be impacted by poor air quality from the Clayfield stack. What are the contingency plans if air quality goals are not met during construction or operation.

Response

Refer to the EIS, Chapter 9, section 9.5 – Air Filtration Technologies, and section 3.8.3 of this Supplementary Report for detailed discussion regarding the potential use of filtration in the ventilation system. In summary, the modelling of ambient air quality with Airport Link, with and without filtration, indicates little change in ground-level concentrations for the pollutants of concern in the assessment. Consequently, there is little benefit if any from fitting and operating filtration systems when considering beneficial changes to community health.

Modelling for the north-eastern ventilation station indicated changes to ambient air quality around Kalinga Park to be well below the stringent health-based goals adopted for the Project.

Despite the conservative redundancies in the ventilation system for the reference design, the integrated operation of the traffic management system with the real-time monitoring for the ventilation system allows traffic in-flow to the Project to be managed to ensure in-tunnel air quality and manage impacts on ambient air quality. Ultimately, the Proponent will be required to manage the Project, including the ventilation system, to ensure that impacts on ambient air quality do not exceed the stringent health-based goals.

Issue 9

The ventilation outlet will encourage vandals who will view the 10 storey industrial building as a challenge to decorate with graffiti. A 10 storey smoke stack that is not manned will promote unlawful activity in or around the building.

Response

Strict security measures would be required for the ventilation station and ventilation outlet for public safety, operational security and for the control of vandalism. The security of each of the ventilation stations will be monitored on a 24 hr / 7 days basis by the Proponent.

There will not be public access to the ventilation stations or ventilation outlets. Appropriate security measures, such as secure fencing and barriers will be required to maintain the security of each facility.

Issue 10

Loss of property values and potential to sell and move. Causing house values to plummet, making selling impossible. The proposed development will be directly responsible for residents substantial financial losses. The community has been ear-marked as sacrificial lambs for the 'good' of the wider community.

Response

Property values are influenced by a broad range of factors, including external factors. No evidence has been provided in the submission that financial loss has occurred or will occur as a consequence of the Airport Link Project. However, this issue was raised in a number of submissions from residents living adjacent to the proposed ventilation station at Clayfield.

Where land is acquired for Airport Link, a person with an interest in that land has a right to compensation in accordance with the *Acquisition of Land Act 1967*.

3.1.7 Kalinga Park

A number of submissions on the Airport Link EIS raised issues relating to potential impacts on Kalinga Park, from the design and construction of the north-eastern connection.

In relation to Kalinga Park, the Sandgate Road ramps are located west of Sandgate Road, with transition structures between the northern rail line and Sandgate Road. The cut and cover tunnel extends from Kalinga Park, west of the North Coast Railway, to Sandgate Road. A construction worksite is proposed to be located between the east-bound off-ramp and the AirTrain, and within Kalinga Park west of the rail line.

Issue 1

Construction of the tunnel and use of Kalinga Park for a construction worksite will significantly impact on the eastern entrance of Kalinga Park, requiring the clearance of trees, including a group of Eucalyptus and Hoop Pines and destroying habitat/ ecosystems of many wildlife species. Shocked that the parkland will be destroyed rather than using the unused car park at Toombul centre. The tunnel should not exit in Kalinga Park causing the creek to be relocated and beautiful historic old trees to be destroyed.

Response

Impacts on flora and fauna are assessed in Chapter 11 of the EIS. Existing habitat and vegetation in the southern end of Kalinga Park between the railway line and Sandgate Road will be cleared for construction of cut and cover tunnels and transition structures. Further impacts across Kalinga Park will arise from the clearing of trees and vegetation for construction worksites.

Mitigation measures are proposed in the EIS to manage potential impacts on flora and fauna in the study corridor. Marking areas of vegetation to be retained would also help to minimise the loss of habitat during construction activities. The implementation of site management procedures are also recommended to minimise the potential for harming of native fauna and prior to site clearing, tree hollows in Kalinga Park would be inspected to inform a relocation plan for any arboreal mammals or bats found living there. Following construction, revegetation of areas disturbed by construction works would be undertaken, using local native species and mature trees where practicable.

The car park on the southern side of Schulz Canal between Sandgate Road and Widdop Street is identified as a worksite for the construction phase. Following construction, the EIS recommends that this area be reconstructed as a natural wetland, incorporating pedestrian and cycle paths. Areas of Kalinga Park required for construction

worksites are proposed to be rehabilitated and landscaped suitable for on-going community use. Community consultation will support the development of landscaping concepts for Kalinga Park.

The location of the tunnel connections with Sandgate Road and the East West Arterial are required in the location identified in the Reference Project to achieve the project's transport objectives, including the relief of congestion on key routes in the northern suburbs.

Issue 2

Mitigation measures requested in relation to Kalinga Park include: 1) Retain trees at the end of Stuckey Road; 2) Employ experts to ensure survival of trees at end of Stuckey Road; 3) During rehabilitation of the construction area, plant large trees, shrubs and flowers, including water hardy natives; 4) Provide avenue of Jacaranda trees and avenue of Frangipani trees; and 5) Include shaded seating areas and children's play areas in grassed sections over top of tunnel.

Response

Vegetation in Kalinga Park east of the railway will need to be removed for the construction of Airport Link. Marking areas of vegetation to be retained will help to minimise the loss of habitat during construction activities. Proposed landscaping would help to mitigate impacts by revegetating areas, which are disturbed by construction works. The EIS recommends that landscaping plans for rehabilitation of the area include planting of mature trees, and provision of shaded seating and playground areas.

The EIS recommends a number of mitigation measures to manage potential impacts on vegetation in the area near the proposed north-eastern connection. These are outlined in the draft Outline Environmental Management Plan (EMP) included in Chapter 19 of the EIS.

Details of the landscaping and urban design treatments near surface connections, including landscaping and urban design themes, would be developed during the detailed design phase of the project.

Issue 3

The Airport Link will destroy our quality of living by removing the tree-lined path connecting to Toombul Shopping centre.

Response

The EIS recommends that safe pedestrian and cycle access be maintained near construction works, particularly between Stuckey Road and Kalinga Park, Toombul railway station and Toombul shopping centre. The existing pedestrian and cycle connections at the northern ends of Stuckey and Alma roads would be relocated to accommodate the transition structures, with new connections north across Schulz Canal to the Toombul rail station, shopping centre and bus station. These connections will be established within a landscaped setting, consistent with the landscape scheme to be developed for the rehabilitation of Kalinga Park.

Issue 4

Construction of the tunnel will destroy the war memorial Diggers Drive in Kalinga Park.

Response

Potential impact on Diggers Drive was considered in Chapter 13 of the EIS (Cultural Heritage). The EIS investigations found that physical evidence of the alignment of Diggers Drive between the North Coast Railway and Sandgate Road relies on a straight row of tallowwood trees that appear to have been planted in the 1950's when additional plantings were undertaken in Kalinga Park. There is no evidence of remaining memorial

plantings from the 1920's along the alignment of Diggers Drive east of the railway. The eastern extent of Diggers Drive between the railway and Sandgate Road has been covered and turfed, possibly during the latter years of the 1960's, with the final loss of the timber bridge across the tributary to Kedron Brook during the 1974 flood. A significant element of the original alignment is now occupied by the Airtrain, which provides access underneath.

No work is proposed in the section of Diggers Drive and associated memorial plantings west of the railway. The Airport Link Project does not directly impact on the original memorial plantings, all of which are west of the railway. On the eastern side of the railway, the area of Kalinga Park, including the obscured area of Diggers Drive and the majority of the remaining plantings and original native vegetation will be removed by the construction works or occupied by the construction area.

Further investigation is warranted to determine potential opportunities for appropriate recognition of Diggers Drive east of the railway as part of an improved pedestrian and cycle connection established following construction.

Issue 6

Recommend that noticeboards be installed close to the Kalinga Park main entrance and Bertha Street car parks and possibly near Shaw Park hockey fields to inform people of upcoming construction activities and proposed timelines. Advertising in local newspapers of upcoming construction activities in Kalinga Park should also occur. Direct consultation with Eagle Junction residents should be required as a condition of the project approval, on rehabilitation and mitigation measures for both Kalinga Park and the North East tunnel connections, including Sandgate Road tunnel ramps.

Response

The EIS recommends that a communication and community information program be implemented during the construction phase of the Airport Link Project to ensure local communities are informed about construction activities and potential impacts.

Details of the communication and community information program would be developed during the detailed design phase of the Project and implemented in accordance with the Construction EMP.

3.1.8 East West Arterial Road intersections with Nudgee Road and Gateway Arterial

Issue 1

The tunnel should extend beyond the Gateway Arterial and not be influenced by cost factors. The intersection of the Gateway Motorway and the East West Arterial should be included in the scope of works for Airport Link or the Gateway Upgrade Project. Nudgee Road intersection should be included as part of the Project as it is already congested. The tunnel does not go to the Airport, creating more congestion in Sandgate Road. The project should go directly to the airport.

Response

The need to upgrade the intersections on the East West Arterial with both Nudgee Road and the Gateway Motorway has been identified in a number of studies in recent years¹⁸ and is independent of any impact of the Airport Link Project. Traffic congestion is experienced at the intersection of the East West Arterial and Nudgee

¹⁸ Gateway Upgrade Project EIS, Airport Link EIS, Parallel Runway EIS, Airport Northern Access Study

Road, and at the intersection with the Gateway Motorway in both the morning and afternoon peak periods. Without improvements, conditions at both intersections would continue to degrade, worsening significantly with or without Airport Link in terms of queuing and delay. The DMR has undertaken to signalise the Gateway roundabout as an interim measure pending further investigations to provide a long term solution to traffic congestion at these critical intersections.

Signals will be installed by August 2007 at all four approaches to the roundabout. In conjunction with the existing East West Arterial/Nudgee Road signals, the new signals will provide a degree of management of the queues on the approaches. The signals are expected to provide a short term benefit until 2009, when the Gateway Motorway improvements begin to come on line and demand is predicted to decrease at the interchange. Notional upgrading of these intersections was analysed in the Airport Link EIS (e.g. Volume 1, Section 5.5.3 on page 5-58; Section 5.6.3 on page 5-86; Section 5.6.9 on page 5-101; Section 21.2.3 on page 21-21) indicating that a satisfactory situation with regard to queuing between Nudgee Road and the Airport Link tunnel portal at Sandgate Road could be achieved by the time of the tunnel opening in 2012. Queuing between the signalised Gateway Motorway ramps at the Gateway Roundabout and the East-West Arterial/Nudgee Road signals could also be satisfactorily managed by signal coordination.

The East West Arterial and these intersections are on a key approach route to the Australia TradeCoast (ATC) precinct, which is forecast to experience a substantial growth in forecast traffic demand due to increased employment and economic activity within the ATC notwithstanding Airport Link. The Federal Government has recently approved the Northern Access Road Project (NARP) for the Brisbane Airport Corporation. This project is designed to join with the sole major interchange from the new Gateway Upgrade Project and provide the primary airport access for north-south traffic movements from the new Gateway Motorway. Queensland Transport has also approved the Australia Trade Coast Transport Study to explore the whole issue of accessibility to and within the ATC. It is envisaged that this study will provide higher level strategic context to the long term need and provision of transport services to sustain the ATC well into the future.

3.2 Project Rationale

3.2.1 Background and Strategic Context

Issue 1

Recommended that as a result of the significant impacts within a heavily populated urban area, and the compromised role of the Coordinator-General in representing the proponent, the Coordinator-General appoint a panel of technical experts to assist in considering the EIS and submissions, pursuant to Section 16 of the SDPWO Act.

Response

It is not improper for the Coordinator-General to assess this Project. The Coordinator-General has a statutory role to evaluate the EIS for the project, including consideration of all properly made submissions, other submissions accepted by the Coordinator-General and other material the Coordinator-General considers is relevant, and the evaluation of the EIS must be done within this framework.

The EIS has been prepared by technical experts engaged by the proponent and has been publicly notified. That public notification resulted in comment and evaluation from State agencies in their areas of interest, including on key elements such as traffic, air quality, health and environmental management.

Issue 2

Clause 21.1 and 23.2 of the Project Deed for the NSBT Project indicate a serious problem with elected officials negotiating large projects with private companies. These clauses commit the ratepayers and taxpayers of Brisbane not only to compensation costs for impacts on traffic flows into the NSBT, but also ensures Brisbane's transport network will remain inferior and unable to truly be anything other than subservient to the NSBT. Roads internal to portals are to be constrained to ensure congestion remains, and new road works may only be those that are listed in the Deed, and implemented only at the times indicated. Roadworks or transit improvements not recorded in the Deed, or implemented either too early or too late will incur compensable payments, impacting on the cost benefit analysis of future projects. The ability of the proponents to enter into such agreements must be prevented.

Response

Clause 21.1 of the NSBT Project Deed operates to ensure that Council and the State will not be restricted from or required to exercise any power with respect to developing, managing or changing the transport network.

Clause 21.1 (b) expressly states that Council and the State may exercise any rights or powers they would have had in relation to the construction, extension and alteration of new and existing roads and public transport routes or services and the implementation of government transport policies.

It is incorrect to say that clause 23.2 provides that Council is to make compensation payments to RCM. Council is not obliged to make any compensation payments to RCM.

It is also incorrect to say that roadworks or transit improvements which are not recorded in the Project Deed, or implemented either too early or too late will incur compensable payments.

Issue 3

A study by the European Environment Agency [in relation to the precautionary principle] sets out 12 principles to adhere to ensure a transparent and accurate regulatory role such as that of the Coordinator-General. It is clear that the proposal has many uncertainties, risks and indeed, ignorance of potential impacts, such as air quality health for many local residence near the stacks.

Response

The Airport Link EIS has ensured that the environmental impact assessment has been carried out consistent with Australian and State Government environment and planning policy. The Intergovernmental Agreement on the Environment 1992 (IGAE) was agreed by all of the States and Commonwealth Government to provide a mechanism by which to facilitate:

- A cooperative national approach to the environment;
- A better definition of the roles of the respective governments;
- A reduction in the number of disputes between the Commonwealth and the States and Territories on environment issues;
- Greater certainty of Government and business decision making; and
- Better environment protection.

Section 3.1 of the IGAE established the principles of environmental policy, practices and procedures for ecologically sustainable development (ESD) and agreement that, a range of ESD principles should inform policy

making and program implementation. These principles included the precautionary principle which was defined as:

- Where there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation.

In the application of the precautionary principle, public and private decisions should be guided by:

- Careful evaluation to avoid, wherever practicable, serious or irreversible damage to the environment; and
- An assessment of the risk-weighted consequences of various options.

The Airport Link EIS, through detailed technical studies particularly focussing on health, air quality and traffic, has provided careful evaluation to avoid serious or irreversible damage to the environment and human health. The assessment has been based on risk weighted consequences of various options, leading to the development of mitigation and management measures to protect the environment and human health impacts associated with the Airport Link Project. There is considerable information provided in the EIS on the risk weighted consequences of air quality impacts on human health (refer to EIS Volume 3 Technical Paper 5b - Health Impact of the Proposed Airport Link, Dr Tim O'Meara). The technical studies found that, even under "worst case" conditions there is forecast to be either an improvement in air quality or no health effects resulting from ventilation outlet and surface road emissions associated with the proposed Airport Link. The worst case maximum forecast increases as a result of the proposed Airport Link are well below the maximum level currently recorded in these regions.

Issue 4

Ecological Sustainable Development is an overriding consideration to be adhered to by the Coordinator-General in considering the proposal. The proposal does not provide a balance that protects ecological processes nor does it maintain cultural, economic, physical and social well-being. Recent precedent in this matter is consideration of the Anvil Hill Coal Mine which found that the assessment by the Director General (NSW) was flawed in that it did not take into account the precautionary principle. It is argued that it is incumbent on the Coordinator-General to adhere to the precautionary approach and ESD principles. The proposal's contribution to local, regional and broader air pollution both as a stand alone project and as a component of TransApex and the more general transport network must be considered fully.

Response

The EIS has assessed the impacts and benefits, together with proposed mitigation measures for various aspects of the Airport Link Project, including flora and fauna, cultural, economic, physical and social well being. In addition to impacts assessed on a project specific level, cumulative impact assessments were carried out based on projects that were approved and known to be proceeding at the time of the EIS, including known network improvements for the wider transport network. "Ecologically sustainable development" is described in the National Strategy for Ecologically Sustainable Development 1992 as having the goal for "development that maintains the total quality of life, both now and in the future, in a way that maintains the ecological processes on which life depends." The assessment of impacts and benefits of the Airport Link Project, and the mitigation measures presented in the EIS, are aimed at ensuring that the Airport Link Project fulfils this objective.

The "precautionary principle" provides that if there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation. Many similar road projects have been constructed both within Australia and internationally, and the

expertise and learnings from those projects has been drawn upon the preparation of the Airport Link EIS. The proposal's contribution to local, regional and broader air pollution is addressed on a project basis and with approved TransApex projects at the time of the EIS including known network improvements to the wider transport network. The mitigation measures and the design of the Reference Project has been designed to avoid serious or irreversible environmental damage as a consequence of the Airport Link Project.

Issue 5

It is noted by the proponents that the proposed Airport Link is part of the broader TransApex network of roads, bridges and tunnels. Indeed, until recently, due to the inability of the private sector to fund such a large project, the North South Bypass Tunnel (NSBT) was termed stage 1 while the proposed Airport Link was stage 2.

If one was to consider the proposal in the absence of the NSBT, the mooted Northern Link and other elements of the TransApex network, it would simply not stack up, and indeed, the former "airport link" was not committed on that basis.

Under the Integrated Development Assessment System within the Integrated Planning Act 1997, where an application is for a part or component of a whole, it is considered at Case Law to be a piecemeal application. The intent is to ensure the full effect of a proposal is evaluated and that projects are not advanced which are knowingly incomplete.

It is clearly apparent that the proposed Airport Link is not a project that may be evaluated in isolation. Its impacts, and those contributed to it by other proposed elements of TransApex, cannot be understood without a full Environmental Impact Statement across all elements of TransApex, including other committed road works by the Proponents as part of the North South Bypass Tunnel contracts (Schedule 17 - Assumed Transport Network Enhancements).

Response

Population growth and the other factors contributing to travel demand dictate that ongoing adaptation and improvement of the transport infrastructure in the inner northern and outer northern suburbs of Brisbane is required. The Airport Link Project will relieve traffic congestion on key arterial roads in the northern suburbs, such as Lutwyche Road and Sandgate Road.

The EIS assessed the Airport Link Project for its effect on the existing road network and in conjunction with additional projects which were planned and known to be proceeding such as the North South Bypass Tunnel and the Gateway Upgrade Project. The EIS also explored opportunities for integration of construction with the proposed Northern Busway. As presented in the EIS, Airport Link would achieve the project objective of relieving traffic congestion on key routes in the northern suburbs.

Airport Link is not a piecemeal project. It is the second stage of the TransApex policy initiative which is aimed at resolving Brisbane's continuing growth in travel demand.

The North South Bypass Tunnel and Hale Street were subject to separate approvals and assessment processes, with cumulative impacts between the North South Bypass Tunnel and Airport Link assessed in the Airport Link EIS. Each TransApex project will be subject to a separate approval and assessment process. Airport Link is clearly a separate project to the other TransApex projects.

Suggestions that the EIS should have included such assessments do not recognise the practical, legal or the technical aspects and are not considered relevant as a consequence.

Issue 6

How has the project addressed each of the identified liveability objectives? Refer at least to green space and air quality.

Response

The EIS (Volume 1, section 2.1.4) outlines specific project objectives derived from State and Local Government strategies for regional planning, infrastructure provision, and integrated land use and transport planning for South East Queensland and the Greater Brisbane area.

The Project's response to liveability objectives is demonstrated in **Table 3-2**.

■ **Table 3-2: Response to Livability Objectives**

Liveability Objectives	Response
Minimise community impact of project footprint	This objective is fundamental to the development of project options such as the decision to proceed with a full tunnel option rather than expose the community to extensive areas of surface work and cut and cover. The objective is also one of the driving forces behind the environmental impact assessment and expression of environmental management or mitigation measures expressed in the Draft outline EMP.
Reduce through traffic and heavy vehicles through suburban streets	The EIS has identified in detail where it is expected that there will be a reduction of through traffic and heavy vehicles from suburban streets.
Facilitate planning and urban regeneration	There is an assessment of urban regeneration issues and options in Chapter 20 of the EIS, including a range of land use planning initiatives.
Seek to improve urban amenity and community safety	Urban amenity and community safety issues and the associated effect of the Airport Link Project are addressed in Chapter 14 of the EIS in relation to the Social Environment impacts of the project.

Specifically, with respect to "green space" the Reference Project

- Minimises the impact on greenspace to the extent possible by confining the majority of a major road development underground; and
- Minimises the use of existing greenspace to the extent possible and encourages revegetation and rehabilitation of green areas required for construction;

Specifically with respect to "air quality" the Reference Project:

- Relieves congestion on key surface roads or arterials, thus improving street level air quality relative to what it would have been if the tunnels were not built;
- Allows peak hour traffic along major arterial roads beyond the tunnel exits to flow more freely and thus reduce the length of time vehicles spend in stop/start conditions and idling at traffic lights.

3.2.2 Problem Definition and Project Justification

Issue 1

Airport Link road connection should remain in ground, without connection to Sandgate Road, to a north-eastern portal east of the Gateway Arterial Road.

Response

To meet the project objective of relieving traffic congestion on key routes in the northern suburbs, the Airport Link Project must connect with Sandgate Road and the East West Arterial. Consequently, traffic congestion on Sandgate Road, inbound from the Project connections through to Albion, is significantly reduced by 25 – 26% in the peak periods (refer to EIS Chapter 5, section 5.6.3, Table 5-32).

3.2.3 Need for the Project

Issue 1

If the Public Transport system is substantially upgraded the Airport Link Project will be unnecessary.

Response

The EIS (Volume 1, Section 2.2.2) demonstrates 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”. In addition these growth trends are similar for commercial vehicle movements, 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 more significant over time.

Travel by private vehicle will continue to provide the majority of modal share in the region. The South East Queensland Regional Plan 2005-2026 also acknowledges that private vehicles will continue to be used for the majority of trips in SEQ.

The EIS has considered the Airport Link Project as part of a balanced and integrated approach to relieve inner-city congestion. Other measures included in this balanced approach to transport planning for Brisbane include enhanced public transport services on important routes, and enhanced opportunities for cycle and pedestrian trips. As previously reported by the Coordinator-General in the report on the North South Tunnel Project, it is not the responsibility of the Coordinator-General, in the context of evaluating an EIS, to comment on the modal balance of investment in the transport sector.

Issue 2

The Northern Busway Project and the Airport Link Project should be considered as an integrated solution for reducing congestion and improving access in the corridor.

Response

The Northern Busway was proposed in the Brisbane Busway Plan of 1995. The Transport Plan for Brisbane 2002-2016 identifies the Northern Busway as a key initiative to achieve quality public transport. The Plan suggests that, if the busway is to be constructed at the same time as Airport Link Project, it would be possible to locate the busway within the existing Lutwyche Road corridor.

While the Northern Busway Project and the Airport Link Project are separate projects, with separate functions and infrastructure, as a result of the outcomes of the concept design phases for both Airport Link and the Northern Busway, there are potential efficiencies in constructing part of the Northern Busway with Airport Link. Such concurrent construction will also be beneficial in terms of reducing the duration of construction impacts from both projects in the Lutwyche Road – Gympie Road corridor.

The planning and possible construction of parts of the two projects concurrently is being investigated. This coordination will aim to ensure maximum benefit for the City by for reducing congestion and improving access

within the corridor, while minimising construction impacts compared to if the projects were constructed separately.

While no decision has been made on the extent of any concurrent construction works, should both projects proceed, it has been assumed for the purposes of the Supplementary Report that the interim Northern Busway (Windsor to Kedron) will be constructed concurrently with Airport Link. This is consistent with the cumulative impact assessment that was reported in the Airport Link EIS.

3.2.4 Justification for the Project

Issue 1

Not a valid argument that traffic will increase in a do nothing option. The existing road network would serve to temper increased car usage through maintaining a level of congestion generally undesirable to the average commuter. Several options which have previously been canvassed include: 1) Removal of regional road network tolls for freight and commercial vehicles; 2) Establishment of a competitive public transport system; and 3) Integration of land uses, particularly at nodes of transport to encourage less car reliant exchanges.

Response

The issues raised are matters of broad traffic and transport policy for South-East Queensland and the Brisbane metropolitan area in particular. There are a number of transport and land use plans and policies of both the State government and Brisbane City Council which address these options and associated investments. The Airport Link Project has been proposed as a major part of the investment in an orbital road network consistent with these plans and policies, not as an alternative to other options raised in the submission.

The Coordinator-General has previously reported in relation to suggestions asserting the need for alternative responses to traffic congestion that it is not the responsibility of the Coordinator-General, in evaluating an EIS, to comment on the modal balance of investment in the transport sector¹⁹. The Coordinator-General went on to say that he would be guided by the *South East Queensland Infrastructure Plan and Program* which has established an investment plan for greater Brisbane transport infrastructure.

Issue 2

The EIS does not establish what role it (the Project) plays in the wider solution nor how it responds or contributes to local imperatives for integrated transport. There is no evidence that a system of motorway-standard orbital roads will relieve congestion and enhance accessibility.

Response

The EIS (Volume 1, Chapter 2) describes the role of the Project within the wider context of local and regional transport and land use planning and policy. 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. In the Transport Plan, Airport Link is presented as part of a balanced and integrated approach to relieve inner-city congestion and address the City's transport challenges.

¹⁹ Coordinator-General's Report on the Environmental Impact Statement for the proposed North-South Bypass Tunnel Project, August 2005, Section 3.2 page 9.

The Project also supports the development of the Northern Busway by relieving traffic congestion on key surface routes such as Lutwyche Road and Sandgate Road, as well as supporting connectivity between urban centres with enhanced public transport and better walking and cycling facilities..

Other recognised measures include enhanced public transport services on important routes, and enhanced opportunities for cycle and pedestrian trips, providing greater flexibility in the transport system. The EIS however should not be required to assess the Government's response to the modal balance of investment in the transport sector. The balance of imperatives for integrated transport are provided broadly in the *South East Queensland Infrastructure Plan and Program* and the *Brisbane Transport Plan*, within which Airport Link plays a part.

The EIS (Volume 1, Section 5.6) specifically addresses the effects of the Project on the regional and local traffic network (volume effects, performance effects, intersection performance), travel times, local accessibility, bus travel effects, pedestrian and cycle effects, and road safety effects. There is clear evidence that Airport Link responds to the need for integrated transport, particularly through its relationship with the proposed Northern Busway, and relieves traffic congestion and enhance accessibility within both local and regional traffic and transport networks.

3.3 Project Development

3.3.1 Corridor and Alignment Assessment

Issue 1

Between Kedron and Clayfield the proposed road should be aligned through the public lands along the course of Kedron Brook, either on the surface or in tunnels beneath ground.

Response

A surface alignment through the open space along Kedron Brook was not pursued because of the significant impacts it would have on ecological, recreational, landscape, community and amenity values of the area. Furthermore, a surface road option would have unacceptable environmental impacts (i.e. road traffic noise), sever communities along Kedron Brook, would constrain access and would reduce the available open space in this regionally-significant open space corridor.

An alignment following Kedron Brook between the same surface connections would be approximately 600m longer than the alignment shown in the Reference Project design. A longer tunnel route would have additional long-term environmental, social and operational costs resulting from:

- Additional fuel consumption and vehicle emissions from increased kilometres travelled between the same surface connections;
- Increased energy required to operate tunnel infrastructure (such as the ventilation system);
- Increased road traffic noise, requiring noise barriers or other mitigations; and
- Increased operating costs.

A longer alignment would have increased construction costs for little additional benefit, if any, and is not warranted.

Issue 2

The proposed transport corridor identified in the 1970s (i.e. essentially following the North Coast Railway from Albion to Eagle Junction) has kept property values down adjacent to the corridor, whilst properties further away have increased significantly. The proposed tunnels under homes away from the transport corridor will devalue these homes. Why has this previously identified transport corridor not been used for Airport Link?

Response

The EIS (Chapter 3, section 3.2) explains that the Airport Link reference design was adopted, rather than the transport corridor of the 1970s referred to in this submission, for the following reasons:

- Greater opportunities to connect Airport Link to other road and public transport projects;
- Opportunities for integration with the Northern Busway in concept development and possibly in project delivery;
- The construction to be almost fully in tunnel, reducing impacts on the community during and after construction, avoiding extensive use of above-ground structures, visual impacts, disruptions to residential communities, and environmental impacts.

Issue 3

The importance of underground space in Brisbane has not been clearly identified. Brisbane lends itself to underground space development.

Response

The submission is noted, however it raises issues that are beyond the scope of the Terms of Reference for the EIS.

3.3.2 Project Connection Options

Issue 1

State Planning Policy 1/03 Outcome 3 requires community infrastructure to function effectively during and immediately after natural hazard events commensurate with a specified level of risk. It is required that the design of Airport Link effectively addresses the risk of flooding, particularly given the location of Gympie Road and Sandgate Road interchanges in the Kedron Brook floodplain.

Response

Flood protection measures in the reference design of Airport Link have been incorporated to protect the new construction and also protect existing infrastructure from afflux. The flood protection for the underground portions of the Project has been identified in the Reference Project as Q10,000 (1 in 10,000 year event).

Issue 2

The preferred option is to maintain current surface conditions at Kalinga Park, East-West Arterial and Sandgate Road intersection to maintain all the inherent value of Kalinga Park and maintain pedestrian connectivity between Clayfield, Nundah and Toombul. Alternatives should be considered for these transition structures and intersection, including:

- *No entry/exit to Sandgate Road south of the intersection. Removes the need for an entry transition structure through Kalinga Park.*

- *Surface level entry of southbound Sandgate Road traffic to Airport Link is via a bridge structure that exits at Sandgate Road north of the East-West Arterial Road and loops to join the East West arterial westbound lane east of Sandgate Road.*
- *Tunnel traffic heading north onto Sandgate Road would exit via a tunnel under Kedron Brook and emerge to join the northbound lane of Sandgate Road.*

Response

The EIS found that there was a strong demand from traffic south of the intersection of the East West Arterial and Sandgate Road to enter and exit the Project. If this demand was not met it would add to both the congestion on Sandgate Road and also major east-west connections such as Park Road and Junction Road. Removal of this connection alone also does not lead to the consequent removal of the transition structure which is required to meet Sandgate Road north connectivity.

The proposal for a bridge structure for southbound Sandgate Road traffic to access Airport Link west-bound has been examined and found to be unachievable, principally on the following design grounds:

- The radius of the curve to achieve the right turn entirely to the east of Sandgate Road would significantly interfere with the Centro Toombul Shopping Centre site;
- The elevations required for the proposed bridge would interfere with the Airtrain elevated structure; and
- Introduction of an extra west-bound lane east of Sandgate Road would require widening towards Kedron Brook with attendant worsening of the flooding effect.

The proposal for the north-bound Sandgate Road traffic to remain in tunnel beneath Kedron Brook to join Sandgate Road further north is not feasible due largely to the poor geotechnical conditions in this area. Cut and cover tunnelling would be required from Kalinga Park, across Kedron Brook and through Ross Park with potentially much greater environmental impacts than the proposed reference design.

3.3.3 Ventilation Systems and Outlets

Issue 1

The location of the ventilation outlet on Sandgate Road at Clayfield is close to the consultation map's 'Location A', but is not an accurate representation of the location presented to the community during the consultation period.

Response

See the response to this issue in section 2.2.3 and section 3.1.6 of this Supplementary Report.

There were four (4) location options for the north-eastern ventilation outlet presented to the community during the comprehensive and preliminary consultation period prior to the release of the EIS. The preferred location presented in the EIS is generally in the same location as but about 20 metres further south of option A, adjacent to the junction of Sandgate Road and the Project in Kalinga Park.

Prior to the release of the EIS, but after community consultation on indicative ventilation outlet locations, further design studies found that, because of technical constraints, the preferred site for the north-eastern ventilation station is as shown in figure 4-6 of the EIS. The selection of the preferred site was highlighted to the community in Newsletter No. 5 that coincided with the release of the EIS for formal public notification and on-going community consultation.

Issue 2

An option that was never considered for the location of the ventilation outlet was in Kalinga Park, either between the North Coast railway and the Airtrain or west of the main railway line.

Response

The initial investigations for suitable sites for each of the ventilation stations and ventilation outlets adopted the criteria set out in the EIS and presented in this Supplementary Report in Chapter 2, section 2.2.3. An extensive area around the north-eastern connections was investigated early in the development of the reference design.

Potential sites in Kalinga Park were considered but found to be unsuitable due to increased flooding risk upstream and also in the ventilation station itself by reducing the function of Kalinga Park as a flood storage basin. Also, the investigations sought to minimise impacts or provide opportunities for mitigating impacts on the community, recreational and landscape values of Kalinga Park where possible.

3.4 Project Description

3.4.1 Project Design

Issue 1

Early and on-going consultation with Department of Emergency Services and Queensland Fire and Rescue Service is required on the planning and design development process for the fire and life safety design of the structure.

Response

The Department of Emergency Services and QFRS have been engaged in discussions of design of services necessary for the tunnels. This process will continue into the detailed design and procurement phases of the Project.

Issue 2

Any underpass or tunnel structure (pedestrian, bike, buses or vehicle) should provide for ease of access for Queensland Ambulance Service equipment and/or vehicles, and should be adequately illuminated at all hours. Bikeways, ramps etc. will need to be underpinned wherever emergency vehicles are required to cross into public areas thereby limiting potential for infrastructure and QAS vehicle and equipment to be damaged.

Response

All tunnel, road connection, street lighting, including temporary works and modifications to existing street lighting and underpass lighting will be designed to comply with standards and guidelines for road lighting and the lighting of road tunnels and underpasses and any further requirements of relevant Authorities. Similarly, QAS access and service requirements will be incorporated into the detailed design of the Project in accordance with emergency service access requirements and standards. Emergency services access will be monitored and controlled from the Tunnel Control Centre. The use of public areas by emergency vehicles is also a matter for detailed design development in consultation with the specified requirements of emergency service authorities.

Issue 3

Emergency vehicle access and egress to all areas of the infrastructure is a specific requirement, including the potential recovery of patients from the public access areas and the Northern Busway terminals.

An assessment of concurrent infrastructure projects needs to be conducted, specifically addressing emergency services access and egress (i.e. to what extent will multiple projects impede the capacity of emergency vehicles

to travel freely from incident sites to health facilities. We need to understand whether response profiles will be affected).

Infrastructure should be named and signposted with any signage to include the physical location of that piece of infrastructure, including the street address of that location. This will provide a caller for emergency help with the ability to accurately describe the location of an emergency and allow emergency services to more quickly find the site so described.

Response

Emergency vehicle access to all areas of the infrastructure, including public areas and the nearby Northern Busway terminals is generally established in the reference design for Airport Link and has been addressed in the CDIMP for the Northern Busway. Specific details and requirements will be developed during the detailed design and development of both projects in consultation with relevant emergency service authorities including QAS and QFRS.

The detailed design development and construction planning will also involve management of the road network during concurrent construction of both projects. Construction traffic EMP sub-plans and associated arrangements will be developed with the relevant emergency services agencies to assess response profiles under construction arrangements to ensure the capacity of emergency vehicles to travel freely from incident sites to health facilities.

With regard to the underground infrastructure the cross passages would be numbered and labelled providing locational signposts for emergency vehicles. Furthermore the Proponent will liaise with emergency services agencies to develop an Incident Response Plan that would identify how incidents would be managed and attended.

Issue 4

Any review of Department of Emergency Services land should consider the potential requirement of Emergency Management Queensland to land a helicopter in emergency situations.

Response

This point is noted and would need to be reflected in the Project brief for the redevelopment of this facility. The Department of Emergency Services should ensure this design aspect is addressed in any future planning for the re-use and redevelopment of the Emergency Services site.

Issue 5

A risk assessment needs to be undertaken of all structural links as potential high risk environments (i.e. accident scenes and potential suicides).

Response

The detailed design of all “structural links” and infrastructure associated with the Project will involve specific design safety issues and standards including for such elements as traffic accidents and also the application of environmental design practices to help prevent various aspects of criminal and other behaviour.

Issue 6

A major impact of the tunnel alignment is the network of roads at the intersection of Gympie and Kedron Brook Roads and the links to surface roads from the tunnel. Three levels of road are proposed for the intersection - the tunnel, the surface and the elevated overpass.

An off-ramp from the tunnel inbound will surface in close proximity to the DES swimming pool complex and there is an outbound ramp linking Gympie Road to the tunnel at the point where the Kedron Brook Building now stands. It is estimated 30,000 cars per day will use this link road.

Response

The North-western Connection has been designed to provide all of the existing main road movements. Because of the high quality of road proposed and the elimination of several sets of traffic lights for tunnel users the flow of traffic through the area is expected to be much improved.

At present the construction site boundary requires part of the swimming pool complex and it is doubtful that the complex will be able to continue functioning in its current position during and/or after construction. See the response to this issue in section 3.1.5 of this Supplementary Report.

Issue 7

The proposed Project alignment bisects the DES Complex decimating the potential for growth on the Kedron site. Loss of approximately 40% of the site, height of on and off ramps and the link road from Gympie Road to the outbound tunnel ramp will significantly affect the DES's masterplan for development and future growth of the site.

Because the Gympie Road entry is the principal entry point to the complex for staff and commercial vehicles its loss to road construction will be a major detriment to the Complex's operation. Heavy vehicles, in particular, will have difficulties with the alternatives in terms of safety and turning circles.

The Kedron Brook Building will need to be demolished with the functional technical units it now contains needing to be relocated. Alternative accommodation at other DES sites is not available. Moreover, the 2000 m² of functional office space from the Kedron Brook Building cannot be absorbed into the main complex building. DES has submitted a compensation claim to the Airport Link Project Team for the loss of property that will result from the construction process and for the redevelopment necessary to continue the services here mentioned.

Response

See the response to this issue in section 3.1.5 of this Supplementary Report.

The Department of Emergency Services site is significantly impacted by the reference design and the proposed construction works. The existing and future use of the DES site will need to be reviewed.

On-going consultation with the Department is progressing in relation to access to this land, and potential use of the remaining area by Emergency Services.

Issue 8

The Department of Emergency Services gave assurances to staff in developing the business case for the Kedron Complex that ample car parking would be provided for staff at the complex. All car parking adjacent to the Kedron Brook Building is lost to the project. Development options for car parking are included in the business case and the compensation claim submitted to the Airport Link Project Team.

Response

The loss of land and infrastructure resulting from the reference design is being addressed in consultation with DES and in accordance with relevant legislation.

Issue 9

The EIS acknowledges the complexity of the Gympie Road, Lutwyche Road, Kedron Park Road intersection. The requirement to maintain safe pedestrian movements is crucial for the safety of students attending both Woolloowin State School and Kedron State High School. These concerns are held not only by current students and their parents but also by prospective parents that may consider alternative schools should student safety be compromised.

Response

See the response to this issue in section 3.1.4 of this Supplementary Report.

In the reference design the movement of pedestrians through this intersection is provided for over two traffic movement phases. The requirement to maintain safe pedestrian movements being crucial for the safety of students attending both Woolloowin State School and Kedron State High School is acknowledged and will be a specified requirement for the detailed design of this intersection.

Alternative access along the Kedron Brook corridor is intended to be maintained at all times during the construction phase and into the operation phase of the project. Such access would be safe and convenient.

Issue 10

It is noted that the schematic drawings of the Airport Link Feasibility Study have limited detail. The impact on QAS will remain unknown until accurate plans are available.

Response

The Detailed Feasibility Study is based on a reference design that identifies conceptually how the Project could be designed, constructed, delivered and operated. This reference design has provided a description of the project to a level of detail appropriate to identify how the community is affected with regard to social, economic and environmental factors. The reference design proposes necessary alterations to QAS operations with regard to surface routes, tunnel accesses and additional areas that require servicing. Available plans are sufficient for planning these operational changes at a strategic level. Final planning for QAS services will be completed in consultation with QAS and other stakeholders during the development of the detailed design and construction plans.

Issue 11

Due consideration should be given to the visual and noise impacts of elevated structures at Kedron.

Response

The visual impacts of proposed elevated structures at Kedron have been considered (EIS, Volume 1, Section 15.3.2, Figures 15-33 to 15-53) and mitigation measures proposed in the form of urban design and landscaping treatments. The EIS notes that some forms of road traffic mitigation (i.e. noise barriers) themselves may impose local impacts. The EIS proposes a range of urban design principles to minimise and mitigate the impacts of noise attenuation measures.

The noise impacts of proposed elevated structures at Kedron have been modelled (EIS, Volume 3, Technical Report No 6—Operational Noise and Vibration, Appendix K) and extensive mitigation measures, in the form of noise barriers, proposed. Road traffic noise can be mitigated to achieve the environmental objectives for sensitive receptors in the vicinity of the elevated road structures over Kedron Brook.

During the detailed design phase these concepts will be developed further to achieve an acceptable urban design and landscape outcome for the area.

Issue 12

Pedestrian lights are needed for the proposed crossing on the new section of Sandgate Road entering the tunnel from Clayfield.

Response

An unsignalised, zebra crossing of the left turn from Sandgate Road into Airport Link ramp west-bound is shown in the reference design. Safe pedestrian access between Clayfield, via Sandgate Road, and the commercial and community facilities in Nundah, such as the rail station and shopping centre, will be a key requirement for the detailed design. The ability for pedestrians to cross this intersection safely will be further assessed through a design safety audit conducted during the detailed design of this connection.

Issue 13

Concerned that the Gympie Road/Stafford Road lane drops from three lanes to one lane overall within approximately 200m will cause significant congestion issues during peak times. Large volumes of outbound traffic will already be on Gympie Road when it merges with Airport Link tunnel exit due to

- *The wide variety of origins and destinations of trips;*
- *Limited access to the tunnel for travellers intending to head northbound; and*
- *The tolling-off effect.*

Therefore it is important to widen the road corridor to accommodate four lanes outbound north to at least Broughton Road.

Response

The traffic performance of the reference design has been modelled, particularly in terms of the performance of the connections with the surface road network. All simulations show that, for the reference design, the level of service at Gympie Road and Stafford does not change and meets acceptable standards. The detailed design phase will need to achieve acceptable levels of intersection and network performance for each of the connections.

On-going consultation with stakeholders, including the Department of Main Roads and the Brisbane City Council, will be required to ensure intersection design and performance for the surface connections meet project objectives as well as strategic objectives. The Proponent will require the approval of the Chief Executive, Department of Main Roads, for Project connections with State roads including Gympie Road and Stafford Road.

Issue 14

The location of the ramps in Campbell Street will have significant impact on the Queensland Newspapers site on corner of Campbell Street and Mayne Road. The ramps need to be sympathetic to a significant Queensland business headquarters. Reorganisation of on-site parking and traffic flow directions are unacceptable. Refurbishment plans will need to be put on hold.

Response

The development of the reference design has sought to avoid where possible and otherwise minimise the impact of the infrastructure on the surface road network and on properties nearby. During design development, there

was and remains, a need to balance project objectives with project impacts on localities, communities, the environment, and individual properties.

The need for the ramps to be sympathetic to the use of key sites around each of the connections is recognised and will be considered further in the detailed design of the Project.

Section 2.2.1 of this Supplementary Report recommends criteria for the design and delivery of connections with the surface road network in Bowen Hills to address this submission, and provides an example of one way in which the criteria might be satisfied. This example reduces the direct impact on the Queensland Newspapers site in Campbell Street, while also reducing potential impacts on The Mews apartments and pedestrian movements along O'Connell Terrace.

With regards the Queensland Newspapers site at Bowen Hills, the example provided in section 2.2.1 of this Supplementary Report for the Campbell Street connection includes a 3 lane ramp rather than a 4 lane option as shown on the reference design, leading to reduced property and re-development or refurbishment impacts.

Issue 15

The expectation that the Department of Emergency Services relocate its access road to its car park along a road on the Kedron State High School boundary has serious implications for the high school. In excess of 500 vehicles will utilise this road daily, mainly between 7.45am and 8.45am when students are accessing the footpath along Kedron Park Road. As the school's music block, hall, general learning areas and canteen facilities are located immediately adjacent to this proposed road the issue of increased traffic noise, air quality concerns and implications for student safety will be paramount concerns to staff, students and parents.

Response

See the response to this issue in section 3.1.4 and section 3.1.5 of this Supplementary Report.

The Department of Emergency Services site would be significantly impacted by the reference design. On-going consultation with the Department is being undertaken regarding access to this land and potential use of the remaining area for Emergency Services.

There are no approved plans for the redevelopment of the Emergency Services site at present. On-going consultation and a strategic evaluation of site options are progressing to resolve the future use of the Emergency Services site. Issues such as access, car parking and its relationship with Kedron State High School will be important matters for consideration in that process. The potential environmental and social impacts associated with the site's future use will need to be accounted for in the approval for its future use under relevant legislation.

Issue 16

Concerns over the development of O'Connell Terrace include:

- *Potential loss of kerbside parking along O'Connell Terrace;*
- *Potential loss of access into the RNA site from O'Connell Terrace near the old alignment of Evans Street due to the off-ramp. Relocation of access further east may be required;*
- *Need to use Sneyd Street and Campbell Street to travel northbound along Bowen Bridge Road as the right turn from O'Connell Terrace would be removed;*
- *Elevated Campbell Street on-ramp may create adverse noise and visual impacts on the RNA site; and*

- *Presence of the motorway on and off-ramps connecting into O'Connell Terrace dramatically changes the functionality of the street. Closing O'Connell Street at Sneyd Street and relocating the RNA access may create more appropriate local road hierarchy for the area adjacent to the RNA site.*

Response

For Airport Link, O'Connell Terrace will need to be modified to a two way operation between Bowen Bridge Road and the on-access ramp west of the ICB portal under O'Connell Terrace. The impact of Airport Link on O'Connell Terrace will be a further modification to changes primarily brought about by the NSBT Project between Sneyd Street and Bowen Bridge Road. O'Connell Terrace will need to be one way (NSBT has it two way) between the Airport Link off-ramp (signalised) on the eastern side of the ICB Portal and Sneyd Street. There are no changes required by Airport Link to the east of Sneyd Street and O'Connell Terrace / Brookes Street and Hamilton Place.

These proposed arrangements will have the potential to affect kerbside parking. Access to the RNA site from O'Connell Terrace will remain east of Sneyd Street. Should the existing access to the RNA need to be relocated this will be considered during the detailed design process and in consultation with the landholder.

The effect of the elevated Campbell Street ramps on local amenity such as noise and visual impact will be mitigated to achieve the environmental objectives for both noise and visual impacts. The reference design proposes noise barriers along the elevated ramps east of the Exhibition Rail Loop. However, there is little likelihood, if any, of the Campbell Street ramps impacting on the RNA site south of O'Connell Terrace, where background noise levels are already elevated by traffic flows and other activities consistent with an inner-City location.

Issue 17

QFRC concerns include: accessibility to hydrants and properties through the positioning and height of barriers; communications on road closures and alterations during construction; and if blasting forms part of the construction method, timing and details will be required.

Response

These concerns are acknowledged and will be further resolved in the detailed design phase of the project.

3.4.2 Project Delivery

Issue 1

Four years construction work building the tunnel would bring about chaos in the Clayfield area. The Gateway Bridge and other proposed developments should be constructed first to alleviate traffic congestion.

Response

As stated in the EIS (Chapter 21 page 22) the need for a comprehensive approach to construction traffic management is required given the wide range and significance of major road and public transport projects within and surrounding the Airport Link corridor. A construction management strategy is recommended to include the establishment of an advisory coordination committee comprising representatives of the Department of Main Roads, Queensland Transport, the Coordinator-General, and the Brisbane City Council. The role of this coordination committee would be to manage effects on the transportation network arising from delivery of major projects in northern Brisbane (including Clayfield), including the NSBT Project, the Airport Link Project, the Northern Busway Project and the Gateway Upgrade Project.

Issue 2

As one of the proposed worksites is situated on land owned by DES, further consultation with regard to property matters is necessary.

Response

A program of consultation with the Department of Emergency Services is in progress and will be maintained through the detailed design phase.

Issue 3

The storage, movement, treatment and disposal of tunnel spoil, contaminated soils, acid sulphate soils and hazardous materials on site poses risks which must be addressed. It is noted that the EIS recognises the importance of these issues and indicates measures to be taken to reduce negative impacts.

Response

The handling of spoil, contaminated soils, acid sulphate soils and hazardous materials will be undertaken in accordance with the Coordinator-General's conditions and the measures established in the Construction EMP. The EIS and this Supplementary Report recommend the preparation of a number of Construction EMP sub-plans to respond to the particular issues arising with each aspect of construction, including those mentioned in the submission.

Issue 4

Queensland Rail is undertaking significant works on the Citytrain network. Ideally Airport Link works would be done in conjunction with the track closures to minimise the impacts for passengers.

Response

For the reference design, the Airport Link tunnel passes under the North Coast Railway at Clayfield and will require temporary closures for construction. Construction is expected to require spaced bored-piles, installed between tracks during overnight track closures. Precast headstocks and deck units could be installed during weekend track possessions, with the ballast sleepers and track then immediately reinstated on completion. Excavation and construction can proceed beneath deck level without interruption to rail services.

Approvals of closure for the proposed construction methodology will be required from Queensland Rail (QR). It is anticipated that the closures approved by QR would be co-ordinated to achieve both the upgrades for the Citytrain Network and the necessary construction works for Airport Link.

Issue 5

Any plantings of vegetation should be based on an appropriate risk assessment of that vegetation in regard to the possible consequence of ingestion/allergic reaction by pedestrians/commuters and surrounding road/busway networks. The possibility must also be highlighted that leaf litter may constitute a slip/trip hazard on roads, busways and pedestrian ways.

Response

Landscaping will be consistent with accepted practice and standard specifications for the landscaping of Main Roads.

Issue 6

Construction access needs to be planned to minimise disturbance to local residents. Worksites should be managed under a Transport Management Plan.

Response

The reference design requires the establishment of a number of construction worksites in proximity to sensitive neighbourhoods and community facilities, such as those in Windsor, Lutwyche and Kedron, and at Clayfield. Access to local streets, and access to pedestrian and cycle routes must be maintained safely and conveniently, so that normal community functions can continue, possibly in a changed manner.

The EIS, in the draft outline Environmental Management Plan, (Volume 1, Chapter 19, Section 19.6 on page 19-18) requires the Proponent to consult with Queensland Transport, Department of Main Roads, and Brisbane City Council to develop and implement a Construction Traffic EMP sub-plan to address a range of identified issues to do with construction traffic and worksite access. It goes on to identify requirements with respect to local traffic, public transport, cyclists and pedestrians. Compliance with the Construction Traffic EMP sub-plan will be included in the contractual obligations of the Proponent. The preparation of the EMP sub-plan should be supported by consultation with key stakeholders, including the school administrations for the Woolloowin State School and the Kedron High School, as well as the community consultative committees to be established for the construction phase.

Issue 7

The EIS does not mention delivery arrangements for precast components that may have the potential for significant impact on the Kedron worksite as they will need to be stored and managed. It is recommended that the delivery and management of the precast components be addressed in the EIS.

Response

The EIS in Chapter 4, Table 4-3 “Materials used for Site Construction” provides indicative quantities of key construction materials anticipated to be used during construction of the Airport Link Project according to the reference design. These materials and quantities include:

- Concrete – 380,000m³
- Precast concrete – 238,000 tonnes
- Reinforcement steel – 80,000 tonnes
- Bored piling – 190,000m³
- Controlled fill material - 130,000 tonnes

The Kedron worksite is likely to receive the majority of these materials, particularly the delivery of precast concrete segments used to line the east west tunnel. No precast piling is anticipated to be required at the Kedron worksite.

The general issue of deliveries is discussed in section 11.3.2 of Technical Paper No 1 – Traffic and Transport. A Construction Traffic EMP sub-plan will be required and should be prepared in consultation with the Department of Main Roads, Queensland Transport, Department of Emergency Services, Brisbane City Council, prior to the commencement of activities which warrant traffic management.

While delivery routes are likely to vary depending on the source of materials and equipment, the delivery routes would be confined to major roads, as is the case with spoil transport. Truck numbers required for deliveries are

expected to be lower than those required for spoil haulage. The nature of particular deliveries, including the delivery and management of precast components to worksites will be investigated in consultation with relevant stakeholders during the preparation of the Construction Traffic EMP sub-plans.

Some deliveries, such as Tunnel Boring Machine (TBM) main bearing, TBM cutting shield and TBM steel can will need to be made by oversized vehicles, usually outside peak traffic periods and possibly at night. These will be required to follow the guidelines set out by Queensland Transport, including loading, safety measures and time of transport. The number of deliveries and the routes required are not yet known and their planning will be examined in detail during preparation of the Construction Traffic EMP sub-plan.

In general, delivery times would be restricted to daytime hours Monday to Saturday, unless further investigations indicate restrictions should apply, such as limiting deliveries to off-peak periods. The storage and management of delivered components will be subject to detailed design and planning of the worksites within the environmental management framework specified to control off site impacts associated with the construction worksites. The EIS (Volume 1, Section 5.6.9 – Construction site access and Figure 4-13) presents the proposed access routes to the worksites.

Issue 8

Alternative means of transporting the spoil in a manner that does not increase the load on Kingsford Smith Drive should be investigated. Kingsford Smith Drive should only be used as a last resort and only if all loads are covered and no spoil transportation occurs between 10.00pm and 7.00am.

Careful consideration should be given to the number of haulage trips scheduled for peak traffic periods. Spoil haulage trips during AM and PM peak periods should be limited. The Schneider Road extension across the Pinkenba rail line should be the designated spoil haulage route to the spoil disposal site.

The TMP should require assessment of spoil haulage impacts at key intersections and road sections to allow changes to frequency of haulage trips if necessary. The TMP should also include monitoring of adverse impacts associated with spoil haulage throughout the construction period, taking into consideration NSBT.

Response

The EIS (Volume 1, Section 3.6.3) provides an overview of the options that have been considered for the transport of spoil to the potential placement sites within the Australia Trade Coast and Port of Brisbane.

This overview of options included road, rail, water-based (i.e. barge), slurry pipeline and conveyor. The transport of spoil to placement sites will be a major consideration for the construction tender of the approved project. Road transport is the preferred approach adopted for similar major road construction, including for the NSBT, due to a range of factors including scheduling flexibility, capacity, ease of site access and handling, land requirements, speed and cost. For the Airport Link Project, road transport has been the option addressed in detail in the EIS, to assess likely environmental impacts associated with this favoured method of haulage, including the use of Kingsford Smith Drive. Investigations for the EIS have found that haulage of spoil from worksites, along Kingsford Smith Drive, can be undertaken without impacting on the background acoustic environment and with much less disruption to traffic flows, particularly in peak periods, than would be the case if haulage was prohibited between the hours of 10.00pm and 7.00am as suggested in the submission. There is little potential for overlap in the spoil haulage tasks for Airport Link and the North South Bypass project presently under construction, due to current progress being made on NSBT.

As described in the EIS (Section 5.7.8), the Proponent will be required to prepare a Construction Traffic EMP sub-plan to avoid, or mitigate and manage the effects of spoil haulage on the road network and on communities

along the nominated haulage routes. The safety and convenience of all road users would need to be addressed by the plan. The Construction Traffic EMP sub-plan dealing with spoil haulage and deliveries would include measures to minimise the impacts of haulage along Kingsford Smith Drive and other nominated haulage routes.

Management of the impact on key intersections on Kingsford Smith Drive would also need to be addressed in the Construction Traffic EMP sub-plan. There are several intersections along Kingsford Smith Drive²⁰ operating at close to nominal capacity during peak periods. While it is a standard environmental requirement for spoil loads to be covered, transportation of spoil is likely to be required 6.30 am Monday to 6.30pm Saturday. No spoil haulage would take place on Sundays or public holidays.

The impact of the spoil haulage task on the regional traffic flow is outlined in the EIS (Volume 1, Section 5.7.3) and in the Cumulative Impacts chapter (EIS, Volume 1, Section 21.2.2) where assessment of the combined effects of Airport Link and NSBT are considered in terms of developing the Construction Traffic EMP sub-plan.

3.4.3 Project Operations Mode

Issue 1

It is recommended that the organisation responsible for Airport Link traffic operations be physically located in the Brisbane Metropolitan Traffic Management Centre to promote effectiveness in the management of traffic operations. It is proposed that the operator locate their traffic management and tunnel management systems off site and remotely access these systems from the BMTMC. To make the shift to network level operations, systems will need to be integrated to the STREAMS ITS platform as determined by the Portfolio ITS Strategy and centres should be co-located.

Response

The EIS (Volume 1, Section 4.4.1, page 4-38) identifies the need for an on-site Tunnel or tollroad Control Centre to coordinate a variety of major functions vital to safe and successful operation of the Project. The need for coordination between the traffic control centres is acknowledged. While this is not a requirement that can be imposed on the Project, these issues should be dealt with through a consultative process involving key stakeholders seeking to coordinate Project operations with overall network operations.

Issue 2

Airport Link must be interoperable with other Queensland toll roads.

Response

The Airport Link Project is designed to be interoperable with other Queensland toll roads.

Issue 3

For tunnel ventilation, the air quality modelling appears to have not considered portal emissions as a secondary point source emission. This has the effect of contributing to a wider tunnel pollutant effects, particularly for residents near to the portals. Ultimately, this issue will lead to the prospect of class action lawsuits based on deleterious health consequences as well as injurious affection on property values. The Coordinator-General has ignored previous submissions to the NSBT seeking to ban portal emissions. As such, there is no guarantee that any operator will not deliberately effect portal emissions. It is recommended that the Coordinator-General

²⁰ Refer to EIS, Chapter 21, section 21.22

impose a condition banning portal emissions with the installation of air quality and air flow monitoring equipment and daily public reporting of results by internet, with heavy fines for any noticeable portal emissions.

Response

The assertions in the submission are incorrect. The ventilation system described in the reference design is intended to achieve no portal emissions. A key feature of the ventilation system is the location of the extraction points for each tunnel being located several hundred metres back from the portal, with roof-mounted jet fans drawing air into the tunnels from the portals.

The EIS (Volume 1, Section 4.4.2 on page 4-39) notes that each of the mainline tunnels will be equipped with its own ventilation system, which draws air in at each of the portals (entry and exit portals) to achieve acceptable in-tunnel air quality as well as to minimise the potential for vitiated air escaping from the exit portals. The air in each tunnel is diluted with large quantities of fresh air drawn from the surface through each of the tunnel portals using jet fans installed along the roof of each tunnel.

As stated in the EIS, “no net discharge of air from the portals is being considered in the design of the ventilation system.” This was also a feature of the NSBT ventilation system, referred to incorrectly in the submission.

In the circumstances, the submitted request for the air quality modelling to consider portal emissions of vitiated air as a secondary point source of emission has not taken into account the proposed design and operation of the ventilation system.

Issue 4

There is no significant study of alternative ventilation systems to provide both the proponents and the community with alternative options for consideration, including potential removal of the ventilation complexes, which is demonstrated by limited information presented in the EIS.

Response

In developing the reference design for Airport Link, consideration was given to experiences gained both nationally and internationally in terms of design, construction and operation, including ventilation.

Early in the development of the concept design, it was determined that, for efficient tunnel ventilation and better managed environmental conditions, there should be no discharge of tunnel air at the portals. Dispersion into the atmosphere via elevated outlets is much more efficient, providing demonstrably better air quality outcomes and better community health outcomes.

Consequently, one or more ventilation outlet stations become necessary as large exhaust fans are required to draw the tunnel air out of the extraction point approximately 100-150m from the exit portal. The only options are to have a transverse system as in the M5 tunnel in Sydney or a longitudinal system as proposed in the reference design (refer to the EIS Volume 1, Section 4.4.2).

The longitudinal ventilation system was proposed because it does not involve re-circulating air from one tunnel into the adjacent tunnel travelling in the opposite direction and because it provides much better control over in-tunnel air in the event of a fire or other emergency. The smoke exhaust system can operate on a smaller volume of air.

To achieve the project objectives for air quality and in-tunnel ventilation, the most effect means is to adopt a ventilation system as proposed and adopt the requirement for ventilation stations adjacent to the exit portal of each tunnel. A similar approach has been adopted with a number of road tunnels in Australia, including the

Eastern Distributor in Sydney and the City Link Tunnel in Melbourne. The Lane Cove Tunnel, soon to be opened in Sydney, also has adopted this approach.

Issue 5

In regard to the complete failure of power supply, will the Uninterruptible Power Supply run the deluge system? It is recommended that essential services include "location markers" in the context of those to be maintained by a UPS.

Beneficial to include a discussion on the proposed measures for mitigating against the impact of failure of a ventilation fan, or monitoring/controlling equipment, on performance of tunnel ventilation system.

Response

The uninterruptible power supply (UPS) will support the fire deluge system. The fire alarm/control system that controls the deluge system is also covered by the Uninterruptible Power Supply systems. Additionally the water supply to the fire main can be obtainable through the use of "pumper" fire engines at the surface.

The EIS (Volume 1, Section 4.4.2) describes how, under normal operation, the tunnel ventilation system will rely on the unidirectional movement of traffic to induce air flow towards the extraction point over most of the length of the tunnel. In the event that air speed monitoring indicates an air flow below a threshold speed required for maintaining in-tunnel air quality, a series of jet fans independently operated so that failure of one would not affect the others, equally spaced along the roof of the tunnel, would be activated to induce air flow.

Between the ventilation system extraction point and the exit portal of the tunnel, a jet fan installation with more than one fan²¹, will operate continuously to draw air in from the exit portal to be extracted at the ventilation system extraction point with the air that entered the tunnel at the entry portal. Visibility, air speed and gas monitors for CO and NO/NO₂ would be installed in each of the tunnels. Automated control systems respond to data collected by these air quality monitors, switching individual jet fans and axial fans on and off to regulate the overall airflow. In the event of an emergency all traffic ingress to the tunnels would be halted from the Tunnel Control Centre.

3.4.4 Permits, Licences and Approvals

Issue 1

Some aspects of the Project, during the construction phase and urban mitigation works phase, are likely to constitute assessable development which may require assessment under City Plan.

Response

The EIS (Volume 1, Section 4.6.2, page 4-46) identifies a range of potential assessable developments associated with the Project. The Proponent is required to obtain all necessary approvals, including development permits for assessable development, prior to commencement of development for which approval is required.

Issue 2

Toll way project approval should be added to Table 2-1 Approvals in the EIS In Brief.

²¹ The additional fan provides a back-up system.

Response

To operate as a toll road, a declaration would need to be made that Airport Link is a toll road for the purposes of the *Transport Infrastructure Act 1994*.

3.5 Traffic and Transport

3.5.1 Approach and Methodology

Issue 1

Figure 5-2 would benefit by showing the rail lines.

Response

Agreed, the rail infrastructure could have been shown in Figure 5-2, however, such inclusion would not have enhanced the interpretation or meaning of the map. Railway facilities traversing the CBD and inner northern and north-eastern suburbs of Brisbane are shown on Figure 5-14 (EIS, Volume 1).

Issue 2

Insufficient detail on the traffic model outputs makes it difficult to determine if operational requirements can be met and/or maintained at current levels within the Gympie Road and Stafford Road corridors. More detail needs to be provided. In addition it is not clear if the operation of the Airport Link will result in additional delays or queuing on Gympie Road and Stafford Road. (Especially where 3 northbound lanes drop to one prior to Broughton Road).

Response

The modelling and analysis presented in the EIS demonstrate that traffic volumes within the Gympie Road and Stafford Road corridors will grow without the Project due to a general increase in traffic demand in the Brisbane Metropolitan area. Such demand is derived from sustained population and employment growth. Due to forecast background growth, the current levels of operational performance typically measured as level of service, will not be maintained over time regardless of whether Airport Link proceeds or not. This is demonstrated in the model output plots of operational performance (level of service) during the AM and PM peak periods for 2012 and 2026 provided in the EIS (Volume 3, Technical Paper 1 – Traffic and Transport, Figures 7-5, 7-6, 7-7 and 7-8).

Corresponding model output plots for operational performance (level of service) during the AM and PM peak periods for 2012 and 2026 with Airport Link are provided in the EIS (Volume 3, Technical Paper 1 – Traffic and Transport, Figures 9-9, 9-10, 9-11 and 9-12). Comparison of these model output plots with and without Airport Link for years 2012 and 2026 indicate that there will not be significant changes in operational performance in the approach corridors.

A Paramics microsimulation model of the Airport Link and its connections with the surface road system was prepared for use in the EIS Community Displays. This microsimulation model demonstrated that satisfactory traffic performance could be achieved for AM and PM peak operations with Airport Link operational in 2012 at the Stafford/Gympie Road intersection, including modelling the effects of queuing with the proposed lane configurations approaching Broughton Road.

Issue 3

A statement to clarify the origin of the residents in the user preference survey would be useful.

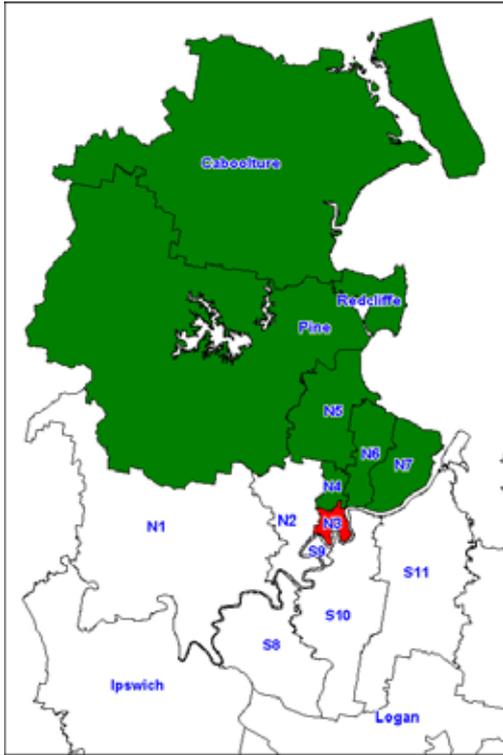
Response

The user preference survey was designed to survey a sample of Brisbane residents making the types of trips that could potentially be suited to toll road use. The survey quotas were divided into trip categories to target specific areas of interest including persons who had direct and recent experience of a journey through the corridor of interest.

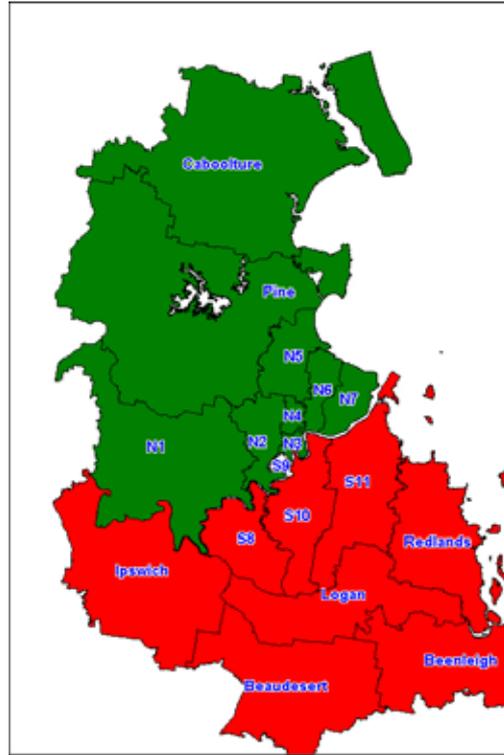
The key categories of residents (or markets) in the total sample of 791 persons and their associated trip origin and destination were:

- Origin Destination Market 1: North – City (Sample = 122)
- Origin Destination Market 2: North – South of River via Gateway Bridge (Sample = 126)
- Origin Destination Market 3: North – South of River via a City Bridge (Sample = 209)
- Origin Destination Market 4: Northeast – Northwest (Sample = 110)
- Origin Destination Market 5: Hale Street (Sample = 224)

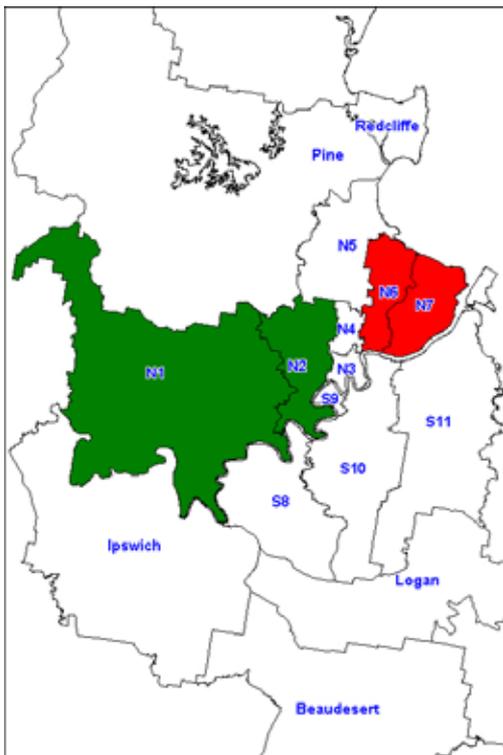
The figure below shows these key markets over a map of Brisbane.



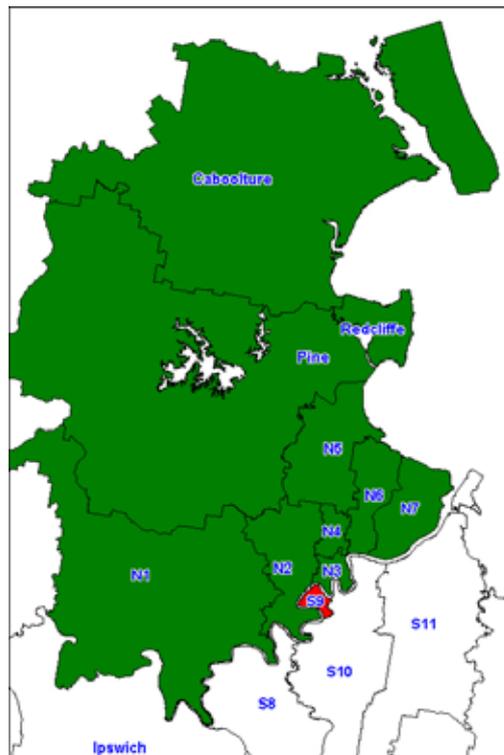
Market 1: North to CBD



Markets 2/3: NS (via Gateway/Other)



Market 4: Northeast to Northwest



Market 5: Hale Street

3.5.2 Description of Existing Transport Network

Issue 1

Only part of Kingsford-Smith Drive (KSD) is a B-double route, not all of it.

Response

The EIS (Volume 1, page 5-13 and Volume 3, Technical Report No. 1, page 3-23) identifies in two places that only the section of Kingsford Smith Drive east of its intersection with Nudgee Road is gazetted for B-Double usage.

Issue 2

The bus network on page 5-22, should include public transport as a proportion of total traffic in percentage terms

Response

The proportion of public transport vehicles (buses) within the total traffic stream on a range of roads is tabulated in the EIS (Volume 3, Technical Paper 1 –Traffic and Transport, Page 3-32, Table 3-4).

Issue 3

While the existing cycle network is detailed and discussion undertaken as to the conditions on Lutwyche Road not being conducive to shared lane travel there is little as to any proposed future plans and/or policies of BCC/QT and DMR as to pedestrian/cycle paths or shared lanes, in particular on Gympie and Stafford Roads. The provision or otherwise of pedestrian/cycle paths or shared lanes should be better related to any such future plans and/or polices.

Response

There has been no provision in the Airport Link Project of dedicated bikeways along Lutwyche Road, Gympie Road or Stafford Road due to the associated property impacts. The typical road cross section for these roads would be increased by a metre (2 metres in total) on either side so that the outside lanes are 4.5m as would be the minimum treatment to allow for cyclists. The additional 2m would result in increased property resumption, impacting on existing buildings in some locations (i.e. Lutwyche village).

The EIS (Volume 1, Section 20.6 and Figure 20.1) indicates, as part of the recommended urban mitigations, the potential for a pedestrian/bikeway corridor, parallel to and east of the Lutwyche Road corridor. The route runs north from Enoggera Creek, via Flynn Oval, Windsor Park, Lane Street, McLennan Street and Chalk Street to reach Centro Lutwyche. The EIS recommends that this path, or a similar route, with appropriate urban design treatments should be completed within 2 years of completion of Airport Link construction.

3.5.3 Existing Road Network Performance

Issue 1

In the second paragraph under Table 5-10 advise the numerical values of degree of saturation.

Response

The Degree of Saturation is a numerical value being the calculated ratio between the demand flow rate and the capacity for each movement. Table 4-9 on pages 4-56 and 4-57 of Technical Report No. 1 in Volume 3 of the EIS gives the DOS values for a large number of intersections (including those mentioned in the second paragraph below Figure 5-10) in the vicinity of the proposed Airport Link Project for both AM and PM peaks.

Issue 2

The proposal does not appear to reduce the number of signalised intersections on surface roads in the area of the Project. A reduction would be a comparatively cost effective measure in reducing travel times and the failure to include proposals for any such changes is a missed opportunity. Will the project seek to synchronise traffic lights along the route to minimise disruption as cars enter/exit the road?

Response

For the Project to operate as designed, no removal of traffic lights from any intersections in the vicinity is required.

If Airport Link creates a situation where some intersections no longer require to be controlled by traffic lights their removal would be a matter for the appropriate road authority (i.e. Department of Main Roads for State Roads and Brisbane City Council for other roads). The way in which Airport Link can help in this regard is in the avoidance of signalised intersections. For example, travelling between along Lutwyche Road between Gympie Road and O'Connell Terrace or along Sandgate Road between Centro Toombul and O'Connell Terrace, a motorist using Airport Link would avoid 18-20 sets of traffic lights. Within the Project there will be no traffic lights. Traffic lights will only be experienced at the connections to the existing road networks.

Issue 3

Existing turn lane vehicle storage capacities are to be maintained or increased at all intersections.

Response

The EIS has undertaken comprehensive modelling of forecast traffic demands in the network with Airport Link operational, including the demand for turning movements at intersections.

The forecast peak period traffic demands at each intersection have been used as the basis for the design of turn lane lengths and capacities at intersections that have been modified with the Project. This approach provides the most appropriate traffic engineering basis for identifying turn lane vehicle storage capacities as it takes into consideration the changes in travel patterns and routes used by all traffic in the network with the Project operational. It is not appropriate to simply maintain or increase existing provision as a design basis for modified intersections, as the project has a widespread effect in reducing surface traffic volumes in the inner north.

Issue 4

It is unclear if the traffic modelling has provided spare capacity for the growth of public transport volumes in the AM and PM peaks. This needs to be clearly explained. It is expected that additional buses will be generated in Gympie Road and Stafford Road to feed onto the Northern Busway. Final treatments need to be further investigated and are likely to be more extensive than 'indented bus bays'.

Response

The strategic transport model does not implicitly include a matrix of bus travel demand, however it incorporates the overall effects of use of road capacity within the network of forecast growth in volumes of medium and heavy commercial vehicles which correspond to Austroads vehicle classes 3 to 12 including buses.

The analysis of intersection performance using aaSIDRA model in the scenario with the Northern Busway as presented in the EIS (Volume 1, Chapter 21 – Cumulative Impact, Table 21-7) specifically incorporates bus volumes associated with the proposed Northern Busway service plans. Further investigations on strategies for managing forecast increased bus volumes due to the Northern Busway on Gympie Road north of Kedron are being undertaken by TransLink.

3.5.4 Transport and Traffic Demand Forecasting

Issue 1

Whilst the EIS concludes that the Gympie Road impacts reduce to 6-7% by Chermside, a closer inspection of the '2012 PM2 + Airport Link' plots reveals some local traffic increases that are presumably explainable as 'rat-running' to avoid congestion on Gympie Road.

Street	2012PM2 Do Min/2012PM2 + Airport Link
Clarence Road	320/630
Broughton Road	110/1020
Turner Road	140/1030
Moree Street	140/890

The EIS needs to clearly explain what measures will be applied to manage this rat-running including diverted traffic on Gympie Road that is likely to extend the impacts beyond Chermside. The management of potential rat-running needs to be detailed as does the process for managing traffic redirected (resulting from the management of rat-running) into the Gympie Road corridor.

Response

The EIS²² described the predicted local access effects of the Project on precincts such as Gordon Park, Kedron West, Lutwyche, Toombul, Emergency Services complex, and the southern connections. The EIS predicts that with increased traffic flows, north-bound, at the Stafford Road – Gympie Road intersection may lead to increased traffic in local streets in the Kedron West precinct (i.e. north of Stafford Road, between Webster Road and Gympie Road). Mitigation measures are recommended to address changes in traffic flows in local streets in this precinct as a consequence of the potential pressure of increased traffic on Gympie road and Stafford Road (EIS section 5.6.5, p5-91).

Measures to manage rat-running would include treatments described in Austroads (2004) Guide to Traffic Engineering Practice – Part 10: Local Area Traffic Management. Rat-running would need to be managed in a coordinated way by both the Brisbane City Council and the Department of Main Roads.

Local traffic volume increases would be undesirable in a suburban environment for the nominated local streets, and thus the EIS recommends management measures be implemented to deter such an increase from occurring. However, if these volumes were transferred to the adjacent arterial roads, i.e. Stafford Road and Gympie Road, the representative increase would be very minor and would not necessitate specific management initiatives.

3.5.5 Future Base Traffic Conditions

Issue 1

More up to date public transport patronage data should be used in Table 3-2 in the EIS In Brief (i.e. EIS, Volume 1, Table 5-23). There has been a significant increase in public transport patronage since 2004 (i.e. 11% between 2004-05 and 2005-06).

²² Refer to EIS, Chapter 5, section 5.6.2 and section 5.6.5, and Figure 5-31: 2026 Corridor Traffic Volume Changes with Airport Link

Response

The transport modelling undertaken for Airport Link was based on validation of the model for all travel modes, including road and public transport, to a 2004 base year. This base year was selected because a range of data sets were available covering the 2004/05 period to allow comparison of observed data to modelled estimates.

Data sources used included the Queensland Government's 2003/04 South East Queensland Travel Survey, traffic counts, journey travel time surveys and TransLink public transport ticketing data. The public transport data set used for the study was supplied by TransLink as the most recent available at the time and included bus patronage estimates derived from ticketing data for late 2005 and Queensland Rail 2005 load counts on the rail network. The data presented in Table 3-2 indicates that from the validated base year of 2004/05 for which data were supplied, and 2012 an increase in public transport trips of approximate 46% is forecast, consistent with strong growth in public transport patronage seen in recent years with the introduction of integrated ticketing, public transport service and network improvements.

Issue 2

How is it physically possible to achieve a predicted traffic volume of 5,700 vph in 2026, in the North South Tunnel? A volume of 2,200 vph per lane is at the limit of capacity of a single lane as defined in the Highway Capacity Manual of the United States Federal Highway Administration.

Response

The Airport Link Project has two parallel tunnels running north-south between Bowen Hills and Kedron each containing three (3) traffic lanes and not two as suggested in the submission. A north-bound peak hour traffic volume of 5,700 vph (EIS, Volume 1, Table 5-26) is within the operating capacity of three traffic lanes with this type of infrastructure provision.

3.5.6 Effects of the Proposal

Issue 1

Traffic congestion will increase on Sandgate Road north of the East West Arterial and at the intersection of Sandgate Road and the East West Arterial.

Response

Table 5-30 of the EIS provides data on the forecast traffic volumes on Sandgate Road north of the East West Arterial at Schulz Canal, with and without the Project. Traffic volumes on Sandgate Road with the Project at this location will be 9% less than the scenario if the Project were not implemented. These traffic reduction effects are also depicted graphically in Figure 5-30 and 5-31 for 2012 and 2026 respectively. The overall effect that this route will be less congested with the operation of the Project. The Level of Service plots provided in Technical Paper No 1 – Traffic and Transport demonstrate that a good mid-block level of service (i.e. uncongested traffic operations) is forecast for Sandgate Road north of the East-West Arterial.

The comparative Degree of Saturation and Level of Service of operation of the intersection of Sandgate Road and East-West Arterial is detailed in Table 9-13 of Technical Paper No 1 – Traffic and Transport. This shows that for the AM peak, in both 2012 and 2022, the intersection performance is less congested with the project than without. For the PM peak, in 2012 intersection performance is improved with the project, with slightly increased congestion in the 2022, although satisfactory operations prevail with respect to queuing.

Issue 2

Traffic congestion will increase in local streets in general.

Response

The EIS (Volume 1, Table 5-32) identifies a range of traffic reductions which could be expected on local streets such as roads termed suburban and district roads, with the Project. Similarly, the EIS (refer to Table 5-33) quantifies general reductions in surface traffic volumes with the Project across a series of local screenlines in the inner north suburbs. A graphic depiction of traffic reductions is provided Figure 5-30 and 5-31 for 2012 and 2026 respectively and the overall effect of these traffic reductions is that traffic congestion on local streets will be reduced with the project operational.

Issue 3

Traffic volumes will increase in Stafford Road further removing connectivity across this street and requiring upgrading of intersections along it e.g. with Webster Road.

Model plots for Stafford Road-Webster Road '2012 PM2 Do Min' - the low west bound count on Stafford Road west of Webster Road (2210) and the high north bound count on Webster Road north of Stafford Road (4530) seem inconsistent and need to be explained.

The EIS canvasses a number of treatments to investigate for Stafford Road, between Gympie Road and Webster Road (p 9-135). However, the EIS does not state whether land is required. The EIS needs to identify options to manage the future demand on Stafford Road. To ensure safety, traffic lights should be installed at the end of Waroon Street or an island traffic diversion system.

Response

The traffic volumes forecast by the transport model for 2012 in the Do Minimum case (i.e. without the Project) result from the predicted pattern of land-use, and the road and public transport networks provided to cater for travel demand. The transport model takes account of the effects of increasing congestion on travel times, and thus route choice for vehicle travel, between trip origins and destinations. The traffic volumes forecast by the model at Stafford Road and Webster Road within the Do Minimum case reflect these influences. It is likely that modelled low volume south-bound on Webster Road at the Stafford Road intersection occurs because some traffic will use a south-bound route via Minimine Street to Appleby Road to Stafford Road west due to the generally heavy south-bound demand on Webster Road further north. Forecast north-bound traffic volumes on Webster Road simply represent growth in out-bound demand in the PM peak compared to current levels.

With regards the predicted increases in daily traffic flows on Stafford Road, the EIS²³ concluded that "... while the resultant traffic volumes of 45,000 vpd in 2026 are within the mid-block traffic lane capacities of a well-managed four (4) lane arterial road, traffic management measures along the route between Gympie Road and Webster Road are recommended to safely and efficiently cater for the forecast increase." The EIS proposed a number of mitigation measures, including:

- Parking management measures;
- Formalisation of right-turn pockets;
- Construction of a raised median in key segments of Stafford Road;
- Possible implementation of additional signals at some side-streets;
- Providing facilities for pedestrians and cyclists; and

²³ Refer to EIS, Chapter 5, section 5.6.9 – Mitigation Measures for Operational Effects

- Providing facilities for public transport.

The options to manage increased traffic demand along Stafford Road are most appropriately developed by the Department of Main Roads, in consultation with the Brisbane City Council, as part of their normal course of network management and forward planning. It is noted that traffic demands on Stafford Road will increase both without and with the Project, although the quantum of demand with the Project will be greater.

The implementation of additional signalised intersections would require a detailed assessment of the role served by the connecting side-streets to Stafford Road in providing access to local land-uses (i.e. schools etc) and the best long-term strategy for balancing the needs of Stafford Road as a State-controlled arterial versus its use for local traffic movements and access. Signalised treatments could be implemented at various side-streets without additional land-take.

If however DMR could consider a longer term view, seeking to further increase the capacity of Stafford Road to allow future connection to further network enhancements to the west of the study area, such as those which remain under investigation within the Western Brisbane Transport Network Investigation.

North-south traffic volumes on Webster Road north of Stafford Road are forecast to decrease with Airport Link. Reduced traffic volumes will have the effect of improving traffic operations and reducing congestion at the Webster Road/Waroon Street signalised intersection. Traffic operations at the intersection of Waroon Street and Clifford Street within the local road network in Stafford are not affected by Airport Link. There is no need for traffic management improvements at this location arising from this project.

Issue 4

Gympie Road, Stafford Road and the East West Arterial will carry increased traffic as a result of the project. Thus the project is not in keeping with its objective to "ease traffic congestion on key routes". Model plots Stafford Road-Gympie Road '2012 AM2 Do Min' - The low south bound count on Gympie Road north of Stafford Road (6300) needs explanation.

The EIS forecasts significant increases in contra-peak demands on Gympie Road (north of Stafford Road):

- *AM - northbound - from 2953 (2004) to 4460 (2012 DoMin) to 5610 (2012+AL); and*
- *PM - southbound - from 3286 (2004) to 4900 (2012 DoMin) to 5910 (2012+AL).*

Although there is a natural increase in the amount of contra-peak demand to 2012, the Airport Link Project results in a significant increases in contra-peak demand: 2012+AL/2012 DoMin

- *AM NB +26% 5610/4460; and*
- *PM SB +21% 5910/4900.*

These increases are likely to lead to:

- *Reduced peak-direction capacity (as green time is allocated to the contra-peak direction turning movements);*
- *Construction of raised medians in segments where turn movements are currently prevented by a double centre-line;*
- *Increased pressure on signalised side street demands; and*

- *Difficulty in maintaining pedestrian and cyclist amenity.*

Response

The EIS has found that the Airport Link Project would reduce traffic volumes on a wide range of roads within Brisbane's inner north (as depicted graphically on Figures 5-30 and 5-31) and would reduce traffic congestion along the key arterial corridors such as Lutwyche Road and Sandgate Road. The nominated feeder roads Gympie Road, Stafford Road and East-West Arterial north and north-west are all high-order roads within Brisbane's road hierarchy and suitable to function as connections to the Project. Forecast traffic volume increases in these roads reduce progressively away from the Project connections.

A peak period travel time analysis without and with the Project is presented in the EIS (Volume 1, Table 5-38) using travel time comparison routes shown in Figure 5-34. These travel time routes include sections of Gympie Road, Stafford Road and East West Arterial where the highest increase in traffic volumes are forecast, in addition to route sections which experience traffic reductions with the Project. The analysis presented clearly demonstrates that with the Project operational, reduced travel times on the alternative surface road route to Airport Link are forecast in both the peak and contra-peak directions. The effects of increased traffic in both peak and contra-peak direction on the feeder road approaches clearly do not erode the benefits derived elsewhere along the route due to reduced congestion.

The Airport Link EIS recommends that a Traffic Management Plan (Operations) is utilised to ensure that signal co-ordination is implemented to ensure that traffic operations on key movement streams using the surface road routes in the vicinity of the connections are well-managed to avoid undue delays.

Issue 5

No reduction in general purpose lane space should be considered, even with a predicted lowering of traffic volumes on certain roads. Traffic growth and the vast expansion of the road freight task over the next few decades must be accommodated efficiently.

Response

With the Airport Link Project alone, no reductions in general purpose lane capacity are proposed on Lutwyche Road, Sandgate Road or other roads forecast to experience reductions in traffic.

The Northern Busway proposes some use of general purpose traffic lanes on certain sections of the Lutwyche Road corridor in an interim form.

The locations in which the number of general purpose lanes have been modified is detailed in Table 21-1 of the EIS. Even with these modifications, the overall travel environment on the alternative surface route to the Airport Link toll road continues to provide improved conditions to the situation if the Airport Link Project were not implemented. This is illustrated by the travel time comparisons in Table 21-8 of the EIS, which take into account forecast traffic growth including growth in commercial vehicle or freight travel.

Issue 6

It is necessary to reduce the number of single-occupant cars from the road as they occupy 67.5% of all mode-share for work trips to Brisbane and are the most inefficient users of the road space.

Response

As identified in Section 2.1.4 of the EIS, a specific project objective of Airport Link is to improve transport sustainability in Brisbane's inner northern suburbs for public transport, pedestrians and cyclists. The Project

improves opportunities and travel times for public transport and creates the opportunities for transit-oriented development near busway stations, and enhances pedestrian and cycle amenity by the reduction of traffic volumes on the surface road system. These types of measures contribute to wider transport planning strategies being implemented by the Council and State Government to encourage modal shift away from single-occupant cars to other sustainable forms of travel.

Issue 7

The increase in through volumes predicted in Gympie and Stafford Roads would indicate that right turn movements would need to be restricted at some intersections on Gympie Road north of Stafford Road. These restrictions, redirections and or U turn requirements and their impacts on the adjoining road networks need to be identified.

Response

The EIS (Volume 3, Technical Report 1 – Traffic & Transport, Table 9-7) shows that the peak directional (opposing flow) movements to right turns at intersections on Gympie Road north of Stafford Road²⁴ show very little increase (i.e. 1%) north of Rode Road. There remains suitable capacity in the contra-peak flows on Gympie Road to accommodate right turns, even with the project increase. Thus it is unlikely that the need for changes to right turn provisions in the future would be related to project impacts.

Analysis of the key intersections on Gympie Road immediately north of the Airport Link connection between Stafford Road and Castle Street on Gympie Road is documented in the EIS (Volume 3, Technical Paper No 1 – Traffic and Transport, Table 9-12). This indicates that satisfactory performance can be achieved with right turn movements incorporated at these locations.

Issue 8

There is doubt that the right turn traffic movement from Stafford Road / Gympie Road east bound towards Lutwyche can be satisfactorily accommodated without grade separation due to the number of movements be catered for at the intersection and its close proximity to diverges onto the Airport Link. The EIS needs to demonstrate the expected delays to the intersection in combination with the adjacent network with a microsimulation traffic model. Should the model demonstrate unacceptable delays then grade separation of additional movements must be considered.

Response

A paramics microsimulation model of Airport Link and its connections with the surface road system was prepared for use in the EIS consultation. This microsimulation model demonstrated that satisfactory traffic performance could be achieved for AM and PM peak operations with Airport Link operational in 2012 at the Stafford/Gympie Road intersection, and that the right turn traffic movements from Stafford Road eastbound towards Lutwyche can be satisfactorily accommodated without grade separation.

Issue 9

Need to explain in the EIS why the traffic volume on Sandgate Road north of East West Arterial is unloaded in 2026.

²⁴ South-bound in the AM peak, and north-bound in the morning peak

Response

The EIS (Volume 1, page 5-73) identifies that traffic volumes on Sandgate Road north of the East West Arterial are reduced by 9-10% with the Project, due to the re-distribution of travel movements from northern areas to the east-west toll road to access the East-West Arterial Road.

Issue 10

The EIS states a 35-40% reduction in traffic on Lutwyche Rd while the more specific traffic analysis indicates no reduction in traffic flows.

Response

The EIS (Volume 3, Technical Report 1 – Traffic and Transport, Table 9-10 on pages 9-144 and 9-145) shows the predicted traffic volumes on surface roads in the inner north are without and with Airport Link in operation. The reduction in traffic along Lutwyche Road, referred to in the submission, relates to the cumulative impacts of both Airport Link and the Northern Busway for the planning period of 2012 – 2026²⁵.

Issue 11

The Newmarket / Lutwyche Rd intersection will operate unsatisfactorily during the 2022 AM and PM peaks even with Airport Link. Bowen Bridge Rd / O'Connell St intersection is expected to continue to operate poorly during the AM peak even with Airport Link. Also, the Bowen Bridge Rd / Herston Rd intersection is expected to operate slightly worse in 2022 AM and PM peaks with AL (rather than without).

Airport Link is expected to have absolutely no effect on the poorly operating Bowen Bridge Rd / Gregory Tce / Brunswick St intersection during the 2022 AM and PM peaks.

Response

The EIS (Volume 3, Technical Report 1 – Traffic and Transport, Table 9-12 on page 7-148) shows that without Airport Link the Level of Service assessment of the Newmarket Road/Lutwyche Road intersection would deteriorate for the AM peak period from a D in 2004 to an E in 2012 and then to an F in 2022. However, the same table shows that with Airport Link the intersection will retain a Level of Service rated as D until at least 2022. In the PM peak without Airport Link the Level of service is predicted to go from C (2004) to F (2012 and 2022) with this F rating being unaffected by Airport Link. These modelled performance outcomes show clearly that although Airport Link may not significantly improve the operation of this intersection relative to today's performance they do show that it will significantly improve the intersection's performance relative to what could be expected if it were not operating in 2012 and beyond.

For the Bowen Bridge Road – O'Connell Terrace intersection, Airport Link will prevent deterioration of the Level of Service during the AM peak through to 2022 relative to the without Airport Link scenario. In the PM peak rather than see the predicted Level of Service deterioration from a B to an F by 2012 inception of Airport Link will see this intersection retain a C Level of Service rating through 2022.

The Bowen Bridge Road – Herston Road intersection is predicted to carry a considerable amount of traffic from the Airport Link tunnels accessing the CBD and other near CBD destinations. The spreading effect of traffic load, described in this Supplementary Report in Section 3.5.6., is directly applicable to the performance of this intersection. The intersection is assessed as capable of carrying these loads through the modelled period.

²⁵ Refer to EIS, Chapter 21, section 21.2.1, Table 21-5, Cumulative Impacts with Northern Busway

The EIS indicates that intersection performance for the Bowen Bridge Rd / Gregory Tce / Brunswick St intersection during the 2022 AM and PM peaks will not change as a consequence of the Project (refer to Table 9-12, EIS, volume 3, Technical Report 1 – Traffic and Transport).

Issue 12

There appear to be potential limitations of access/egress for emergency vehicles when looking at the Project, including the Northern Busway.

Response

See the response to this issue also in section 3.1.5 of this Supplementary Report.

The operational phase of the Airport Link Project would have a Tunnel Control Centre in Windsor and an additional site in Kedron that would provide parking, maintenance and marshalling areas for emergency vehicles. The Tunnel Control Centre will manage the fire protection, traffic management and control, incident control, communications and emergency procedures.

Access for emergency vehicles into the tunnels will be facilitated through these two sites in Windsor and Kedron, which would be used as marshalling yards. The location of these sites provides access to all project areas thereby allowing for quick response. The Project will also provide access that would allow emergency vehicles to enter the tunnels contrary to the direction of flow through measures such as emergency median and barrier crossings

Issue 13

Access/egress to/from the proposed infrastructure should take into account the need for the delivery of all emergency services in view of the proposal that ten trucks per hour are expected to traverse the Kedron Project site. In particular, access/egress for the QAS Intensive Care Station in the Emergency Services complex on Kedron Park Road. There is potential for impacts on pedestrian and vehicular movements to/from/around/across QAS Intensive Care Paramedic Station within the DES complex Kedron. Warning signs, restrictive crossing areas, barriers will need to be considered to prevent accidents between vehicles, pedestrians and emergency vehicles. Provision of access and egress for staff needs to be identified.

Ambulance access and egress is required to a standard that is supportive of QAS Units weight and size as well as all patient care equipment to all areas (or close proximity to), and areas of public access should have provision of:-ramps (not steps), lift access etc (where applicable). Heights of all new structures should not restrict QAS (or other emergency vehicles) access/egress to incidents during or after construction.

See also the response to this issue in section 3.1.4 of this Supplementary Report.

Response

Also see the response to this and related matters in section 3.1.5 of this Supplementary Report.

It is proposed in the reference design that access to the remaining area of the emergency services facility will be from Park Road. On-going consultation with the Department of Emergency Services is being undertaken regarding access to this facility by Emergency Services vehicles. Further consultation will be required to address concerns expressed by Kedron High School about potential pedestrian and vehicle conflicts in Park Road as a result of this change in access arrangements for the Department of Emergency Services.

Detailed design development during the procurement and delivery phases, informed by on-going consultation with key stakeholders, will take into account QAS needs for provision of service at any point on the new infrastructure in line with standard design principles for emergency services.

The vehicle clearance envelope for the Airport Link Project is 4.9m which allows clear passage for vehicles heights of 4.6m. Vehicle clearance envelopes for other parts of the road network that are affected by the new project works have been designed to have a minimum envelope 4.9m high that provides for vehicle heights of 4.6m.

Issue 14

Proximity of the work site to Woolloowin State School and Kedron State High School presents significant access issues, especially for those students who have to negotiate re-configured bikeways and footpaths as a result of the construction. Drop-off and pick-up zones for students transported by car also have the potential to be significantly impacted by AL construction.

Response

See also the responses to these matters in section 3.1.2 and section 3.1.4 of this Supplementary Report.

Temporary access or maintenance of existing access to both the Woolloowin State School and the Kedron High School has been identified as an important issue in the reference design and in consultation with both parties. The temporary accesses during construction would be of a standard sufficient to be easily and safely negotiated, particularly by students.

Traffic management during construction will need to be managed to minimise disruption to traffic conditions on Lutwyche Road and the access points for both schools. The reference design does not use Kedron Park Road for construction access and is therefore unlikely to affect this key drop off zone. However, the construction traffic EMP sub-plan will need to address traffic management issues arising from Project-related changes to access in Park Road for the Department of Emergency Services site.

Issue 15

Denial of access to the Kedron State High School oval during construction of the cut and cover tunnel section and re-instatement of the oval presents significant issues for the effective delivery of the school's Sport and Physical Education curriculum.

Response

See also the response to this issue in section 3.1.4 of this Supplementary Report.

Only the oval beside the Kedron Brook cycle/pedestrian path will be affected by Project works for a period of approximately 2.5 years while some cut and cover construction and the east-west tunnelling works are conducted²⁶. The other two ovals adjacent to the High School buildings will not be required for construction works or related activities. Construction of the cut and cover tunnels will be carried out as quickly as possible to allow reinstatement of the sporting field. Consultation with the school administration will be undertaken to see if the works can be timed to include holidays or periods when the usage may not be as great.

²⁶ Refer to EIS, Chapter 4, section 4.3.1, Figure 4-10

Issue 16

There is a need to maintain safe pedestrian and cycle access (including for students with a disability) near construction worksites and surface works, particularly.

Response

See also the response to this issue in section 3.1.2 and section 3.1.4 of this Supplementary Report.

Temporary access has been identified in the reference design and accessibility through and/or around construction sites would be maintained as specified in the traffic management plans required for construction (required in the Draft Outline EMP in Chapter 19, Volume 1 of the EIS). Specific measures will be required to be implemented to meet the needs of students with disabilities (i.e. hearing impaired, learning difficulties, vision impaired students attend Kedron High School)

Issue 17

The proposal for local access changes near Kedron Brook include the closing of Suez St to Gympie Rd. Suez St is the only exit from the north-east portion of Gordon Park that allows residents to travel north. There is no alternative route proposed for local residents to leave the area to travel north along Gympie Rd, without backtracking to Richmond St. Rose Lane would provide this option, however, this necessitates turning right across Stafford Road which already carries excessive traffic and is expected to carry 50% more at the completion of the Project. Under this proposal residents heading north will have to either travel from the northern end of Gordon Park to Lutwyche in the south, therefore increasing the amount of traffic on residential streets. Increasing trip times is not consistent with Main Road's stated policy of not causing an increase in the length of trips taken. One solution may be to open the intersection of Swan Rd and Stafford Rd to allow egress both north and south onto Gympie Rd and west onto Stafford Rd, and ingress from Gympie Rd, and from Stafford Rd from the west.

Response

The change described to Suez Street is a consequence of construction of the Northern Busway within the Airport Link corridor. Access arrangements to Suez Street are not specifically impacted by Airport Link.

The suggested provision of ingress from the north on Gympie Road to Swan Street would raise road safety concerns, as this type of movement was historically provided for but prevented in recent years at the Stafford Road/Gympie Road intersections via design modifications following a poor accident record. Access from Gympie Road south is provided for in the design with the Northern Busway. Ingress to Swan Street from the west on Stafford Road is not preferred for general traffic as it could encourage extraneous through traffic use (or rat-running) in the local street system.

Issue 18

The impacts of Airport Link on possible transport configurations should be further detailed specifically for:- Campbell St; intersection of O'Connell Tce, Brookes St, Hamilton Place; and intersection of Abbotsford Rd, Markwell St and Montpelier Rd. In addition, proposed timing for provision of public spaces and key connections should be provided as part of the EIS.

Response

This issue is also addressed in section 2.2.1 of this Supplementary Report.

The EIS (Volume 1, Figure 4-4 Southern Connection) illustrates the proposed traffic arrangements at the Campbell Street/Hamilton Place/Mayne Road intersection. No changes are proposed at the intersection of

Abbotsford Road/Markwell Street/Montpelier Road. Table 5-36 provides an assessment of the intersection performance (in terms of level of service) without and with Airport Link. Table 9-12 in Technical Paper No 1 – Traffic and Transport provides further details on intersection performance impacts in terms of degree of saturation without and with Airport Link.

Issue 19

The representation of information in the Traffic and Transport Technical paper has been somewhat distorted. Reference to Table 9.6 (Page 9-126) identifying the major roads which would reasonably be expected to be impacted by traffic flows exiting the proposed Airport Link. Airport Link would, in actuality, cause traffic leaving the tunnel to be forced into the CBD in much greater volumes than without Airport Link, the EIS is silent on mitigation measures for this matter.

Response

In addition to the summary data for particular locations identified in Table 9-6 (EIS, Volume 3, Technical Report 1 – Traffic and Transport) the traffic volume effects of the Project at the central city (or southern) end are illustrated on an overall network basis in Figures 9-7 and 9-8 (EIS, Volume 3, Technical Paper No 1 – Traffic and Transport) with the resultant Level of Service of operation of the network with the Project identified in Figures 9-9, 9-10, 9-11 and 9-12. Table 9-5 demonstrates that in 2026, only 37% of the traffic using Airport Link is related to use of the Campbell Street and O’Connell Terrace ramps.

The findings presented indicate that whilst a number of roads at the southern end of the Project will experience increased traffic demands, other roads approaching the CBD will benefit due to a reduction in traffic levels. These changes occur because some traffic, previously using the Sandgate Road, Lutwyche Road and Kingsford Smith Drive corridors to the central city, is predicted to redistribute to use a route via Airport Link.

As the southern end of the Project includes connections to both Campbell and O’Connell Terrace to cater for traffic to/from the City, Fortitude Valley, Bowen Hills, Newstead and New Farm areas, the effects of these traffic changes with Airport Link are anticipated to disperse, rather than concentrate. The increases, where they occur, are generally modest on individual road links and well within the network capacity with resultant levels of service acceptable. No specific mitigation measures are warranted to accommodate the redistribution of traffic flows that is forecast.

Issue 20

The Airport Link Project is to affect 4 existing bus stops once operational and a further three bus stops during construction. Pedestrian and cycle access to temporary and new bus stops must be maintained during construction and afterwards in conjunction with northern Busway. In particular the proposed bus stop between Lasseter Street and Park Terrace along Gympie Road should be constructed with improved footpath facilities.

Response

The mitigation measures in the Draft Outline EMP provide that bus stops impacted by the Project works will be relocated and users notified prior to relocation. Further, traffic management measures will be implemented near construction works to minimise construction disruption to bus routes and timing. Pedestrian and cycle access to temporary and new bus stops will be maintained during construction and operation of the Project. Provision will be made for new bus stops and associated footpath facilities impacted by the project.

Issue 21

There should be no detrimental effects to pedestrian or cycle ways caused by the Airport Link Project. Temporary re-routing or any other modifications during construction should be minimised and well advertised.

Response

Potential impacts of construction and operation on parkland areas and bikeways were considered in the EIS (Volume 1, Sections 5.6.7, 14.3.2, 15.3). Changes to local pedestrian and cycle access may alter during detailed design, particularly in areas adjacent to construction worksites and surface connections.

A number of mitigation measures are outlined in the EIS (Volume 1, Chapter 19, Draft Outline Environmental Management Plans (Construction) and (Operation)). These include the need to maintain safe pedestrian and cycle access near construction works, including to community facilities such as schools, child care facilities, churches, open space, transport and shopping facilities. Following construction, pedestrian and cycle paths and open space areas will be reinstated to the extent possible. A number of urban regeneration mitigation measures are also recommended, which mitigate longer-term changes to open space and pedestrian and cycle networks. These include waterway restoration works, landscape planning and works, reconstruction of a natural wetland at Schulz Canal, and relocation and enhancement of the Kedron Brook bikeway at Clayfield.

Temporary re-routing or any other modifications necessary during construction to existing active transport pathways will be provided and documented within construction traffic management plans including public notification of associated changes and consultation with relevant parties in the preparation of such management plans.

Issue 22

Connection to the East-West Arterial at Toombul will present a major pedestrian obstacle for the local community, particularly children and the elderly. The proposed transition structures would create an additional major barrier and removal of pedestrian access across Kedron Brook will effectively form a barrier to pedestrian movement along Sandgate Road from Clayfield to Nundah, and under the Sandgate Road Bridge to Toombul.

Response

The EIS (Volume 1, Section 5.7.6; Volume 3, Technical Paper No 1-Traffic and Transport, Section 9.6.3) identifies modifications to the existing pedestrian and cycle network required during construction to facilitate movements along and over Schulz Canal between Clayfield and Nundah.

Connectivity between the Toombul precinct and residential areas south of Schulz Canal would be maintained by a new pedestrian/cycle path linking Parkland Street, on the north of the canal, to Stuckey Road, south of the tunnel and associated transition structures. Pedestrian crossings would also be provided via the signals at the intersection of Sandgate Road/East West arterial and the Airport Link ramps to cater for safe and efficient movement of pedestrians across Sandgate Road and for north-south movement along Sandgate Road. There would be no effect on existing arrangements for pedestrians at the traffic signals at the Centro Toombul Shopping Centre access on Sandgate Road.

Issue 23

Of the 950 students at Kedron State High School a recent survey showed 29% travel by motor vehicle, 27% travel by bus, 19% catch a train, 17% walk, 7% cycle and 1% catch taxis. A large number of the 70% who do not use motor vehicle will be subjected to the impact of construction and the resultant alternative bicycle and pedestrian routes that will need to be put in place during and after the construction phase. Similar concerns are held for students of Woolloowin State School.

Response

See also the response to this issue in section 3.1.2 (Woolloowin State School) and section 3.1.4 (Kedron High School) of this Supplementary Report.

Access to and the functioning of the bikeway and pedestrian path along Kedron Brook would be maintained throughout the construction process for students of both Kedron High School and Woolloowin State School. Alterations to these paths may occur for short periods where temporary routes would be in place, i.e. when the bridge over Kedron and its abutments are being constructed. These temporary routes may have speed or other limitations to comply with safety requirements. Access from Kedron Brook across the ovals into the Kedron High School would be maintained throughout the construction and operation of the Project. Alternative access from Kedron Brook to the Woolloowin State School via Norman Avenue needs to be investigated and provided during the construction phase. This is identified in the reference design and community consultation drawings.

Issue 24

The Airport Link Project proposes modifications and realignment of some sections of the Schulz Canal pathway with the section between Jackson Street and Melton Road relocated to the northern bank. This is suitable post-construction but it is imperative that during construction access is provided to and along this corridor, from both ends of the construction worksite, and specifically from existing facilities at Jackson St, Melton Rd, Parklands St, Stuckey Rd, Alma Rd and Sandgate Road. It is important also that access is maintained between the Schulz Canal pathway and Toombul Railway Station, and that access is provided across/under the rail line which is a significant barrier to accessibility in the area.

Response

The Draft Outline EMP (Construction) includes maintaining safe pedestrian and cycle access near construction works particularly between Kedron State High School and Kedron Brook; across and along Lutwyche Road in the vicinity of Woolloowin State School and St Andrew's Anglican Church; between Stuckey Road and Kalinga Park, Toombul Railway Station and Toombul Shopping Centre; and along Kedron Brook.

In order to maintain these routes, new routes, such as along the northern side of Schulz Canal will need to be constructed prior to the closure of existing routes affected by construction.

Issue 25

For all construction staging, a traffic management plan that shows cycle detours and pedestrian accessibility must be shown to Active Transport. There is no real evidence to show that the Airport Link is actually improving the pedestrian/cycle environment along the Airport Link corridor.

Enoggera Creek pathway to be relocated as part of the NSBT should be provided as a high quality, high frequency shared pathway route, linking Albion (and future increased density development) with the RBH and Enoggera Creek.

Response

The Brisbane City Council will be a key stakeholder in the design, delivery and operation of Airport Link. The views of the Council, including those of Active Transport, along with other key stakeholders, will be sought in relation to a wide range of matters, including the staged re-routing of pedestrian and cycle paths in the inner northern suburbs during the construction phase of Airport Link.

The EIS (Volume 3, Technical Report No 1-Traffic and Transport), identified the need to improve the travel environment of pedestrians and cyclists on the surface network as a key transport planning factor underpinning

the need for the Project. The EIS also identifies a significant reduction in traffic demands on the local road system, particularly along Lutwyche Road and Sandgate Road and through their associated activity centres and public transport stations. Beside this general improvement to road and traffic congestion and its potential to improve the pedestrian and cycle environment along the surface of the Airport Link corridor, specific works are recommended (EIS, Volume 1, Chapter 20) to existing and for new active transport connections.

Airport Link does not affect the relocation or the design standards of the Enoggera Creek pathway as being developed within the NSBT project. The concept of this pathway being provided as a high quality, high frequency shared pathway is supported and the opportunity to extend the connection to the RBH and Albion Road is identified within the Airport Link framework for urban regeneration (EIS, Volume 1, Figures 20.1 and 20.10).

Issue 26

There seem to be little to no cyclist provisions mentioned – no mention of where cyclists will travel after departing the ICB and no mention of a parallel corridor along the Airport Link alignment. No off road north/south connection for cyclists or pedestrians between the Kedron Brook shared pathway and the CBD. There is a lack of on-road north/south cycle connections. No cyclist facilities are mentioned, especially in terms of addressing the existing corridor along Lutwyche Road, or connections to existing network along the ICB, and INB. The EIS generally disregards the route as a formal one for cyclists. Lutwyche Road is forecast to see an improvement, creating an opportunity for pedestrian improvements along the increased road capacity.

Dedicated cycle lanes and improved footpaths should be provided along Stafford road due to the forecast increase in traffic. Stafford Road is recognised as a Preliminary Bikeway in the Bicycle Brisbane Plan.

Response

Cycle facilities are broadly addressed in the EIS (Volume 1, section 5.2.5; Volume 1, figure 20.1 Volume 3, Technical Paper No 1- Traffic and Transport, section 3.7) where it is stated that there are no on-road cycle lane provisions along Lutwyche Road and conditions for on road cyclists are not conducive to shared lane travel. Pedestrian footpaths flank both sides of the road carriageway with signalised intersection providing for pedestrian crossing.

While Airport Link provides potential for a significant reduction in traffic and associated congestion along Lutwyche Road, lane widths adjacent to the kerb would require widening from 3m to 4m or 4.5m to meet recommended standards for a shared on road cycle facility. Such a widening would require additional property acquisitions that are not considered necessary for the delivery of the project and for facilitation of cycle and pedestrian accessibility along the corridor.

Through the urban mitigations measures²⁷ recommended in the EIS, Airport Link has proposed an alternative corridor to Lutwyche Road as part of the urban regeneration opportunities associated with the project. At the time of the EIS further work was also being undertaken by Queensland Transport to identify cycle network opportunities within the inner northern suburbs of Brisbane.

The EIS recognises that facilities for pedestrians and cyclists should be investigated for implementation along Stafford Road as part of a package of initiatives to manage traffic flows. This could be as part of the on-going Queensland Transport and Brisbane City Council investigations into pedestrian and cycle links in the inner

²⁷ Refer to EIS, Chapter 15, section 5.3, and Chapter 22, section 22.2

northern suburbs. Such measures will require scoping within an arterial corridor traffic management plan for the project. The preparation and implementation of local area traffic management measures to maintain the role and function of the surface road network is a specified measure in the Draft Outline EMP (Operation) (EIS, Volume 1, section 19.7). The local area traffic management plan will include the investigation of measures specified in the EIS as examples of arterial traffic measures for implementation along Stafford Road, particularly between Webster Road and Gympie Road to safely and efficiently cater for the forecast traffic increases.

3.6 Topography, Geology, Geomorphology and Soils

3.6.1 Description of Existing Environment

Issue 1

Would appreciate more information as to the likely impact of tunnelling above the shear zone beneath Park Avenue.

Response

Figure 4-2 (EIS, Volume 1, page 4-3) shows the narrow, near vertical shear zones in the Neranleigh-Fernvale Beds intersected by boreholes north and south of the Ferny Grove Rail Line. These shear zones have been completely re-cemented over time to resume their original strength and pose no threat to tunnelling in that area. On the same figure, the lensoidal rock unit illustrated beneath Park Avenue and extending to the west represents an andesitic, water-lain tuff bed which has been inadvertently omitted from the figure legend. In terms of its suitability for tunnelling this unit is of the same strength as the surrounding sedimentary units. The tunnelling methodology proposed in the EIS for the East-West tunnels has been specifically chosen on the basis of the tested strength of the sediments penetrated by boreholes as the most appropriate technology for the conditions.

Issue 2

Soil types indicated in the EIS (Volume 1, Figure 6-2) represent the dominant soils and the surveyed data is interpretive only. The Terms of Reference (TOR) require a description of the soil profiles likely to be affected by the surface works.

Response

The Terms of Reference refer only to soil profiles and not to soil types. The ToR are using the term in a broader sense and not in the strict hierarchy of terminology that might be employed by a specialist soil scientist.

Since the Airport Link Project is a road tunnel project, rather than a surface road project, the need for knowledge of soils is relevant only to those areas where the soils are to be disturbed, essentially at the worksites where connections are to be made to the surface roads. Since virtually all the road way will be supported in rock base below the soil zone the properties of the soils in terms of suitability for foundations is not relevant. Moreover, the legend to Figure 6.2 shows that the Logan and Chermside Soil types show little profile development and efforts to find meaningful profiles in the soil science sense would provide little information if at all possible

The level of information supplied in the EIS is considered sufficient as a basis for assessment of the Project and to satisfy the requirements of the terms of reference. A comparable level of information was used successfully in the NSBT Project which is a very similar type of project requiring similar geotechnical data.

3.6.2 Potential Impacts and Mitigation Measures

Issue 1

To adequately mitigate erosion risks, all areas where soil is to be disturbed and/or placed should be assessed for erosion risk, not just the major excavation areas. The reference to Logan and Clayfield soil types as being moderate to highly dispersive is considered too general and possibly a misinterpretation of the soil type characteristics. Mechanical versus chemical dispersion characteristics should be qualified.

Response

The EIS (Volume 1, Section 6.2.2 on page 6-14) identifies potential areas for soil erosion impacts as “tunnel portals, areas associated with cut and cover tunnel works, worksites, ventilation outlet locations and spoil placement sites.” which is considered to cover all areas where soil is to be disturbed.

The majority of Project works in the soil zone are at the three connections and will be almost entirely within the Logan soil type. Since this is an unconsolidated alluvial soil it has a reasonably high potential for wind-induced dust or water-induced mud development that may lead to local environmental impacts. The precautionary statement in the EIS (Volume 1, page 6-15) noted a “heightened potential for significant erosion impacts” though this is not extreme. Virtually all soils in the Brisbane area range from neutral to highly acidic as a result of their derivation from underlying acidic bedrock and thus have no potential for chemical impacts through dispersion.

Issue 2

Strong recommendation is made for detailed investigations and management plans for Acid Sulphate Soils to be undertaken as early as possible in the planning, design and approval stages, consistent with section 4.4 and 4.5 of State Planning Policy (SPP) 2/02. ASS investigations are requested in areas where there is the potential for disturbing ASS during construction and groundwater drawdown. Management strategies should be provided in the EMP detailing site specific prevention, minimisation, mitigation and monitoring strategies, consistent with Appendix 4 of the SPP 2/02 Guideline. If drawdown extends to alluvial areas containing ASS, ongoing monitoring and treatment may be required for the life of the Project.

Response

The EIS identified areas relevant to the Airport Link Project where even a remote possibility of intercepting potential acid sulphate soil (PASS) exists (EIS, Volume 1, Section 6.2.3).

The draft Outline Environmental Management Plan (EIS, Volume 1, Section 19.6) specifically requires development and implementation of an Acid Sulphate Soil (ASS) Management Plan. The draft Outline EMP further identifies a number of State Government Technical Manuals, Guidelines and Planning Policies (including SPP 02/02) with which the ASS EMP sub-plan must comply.

The areas to be excavated at the north-eastern connection are below the 5m AHD contour but are outside the area of Holocene marine sedimentation. For this reason alone the likelihood of encountering PASS is extremely low as shown on the ASS map of the area (EIS, Volume 1, Figure 6-3). This assessment is further confirmed by the sediments encountered in all the exploratory boreholes in the area lacking any indication of marine influence, with indications of being deposited in a braided stream environment at or above the head of an estuary, and the water chemistry analyses from samples taken in the boreholes (EIS, Volume 3, Technical Report 1 – Hydrogeological Environmental Impact Assessment, Appendix D) that show levels of sulphur (as SO₄), dissolved sulphide as S, and iron of the same order of magnitude as levels in samples from boreholes well above the 5m AHD (i.e. outside the possible ASS areas).

The part of the Enoggera Creek floodplain north of the Ferny Grove Railway line will not be excavated as the tunnels will be nearly 40m below surface in solid rock through this section. The Enoggera Creek flood plain identified in the EIS will only be excavated for Airport Link in the vicinity of Horace Street in an area that will necessarily be the subject of an ASS survey to be conducted for the NSBT Project. The draft outline EMP (EIS, Chapter 19, Section 19.6) requires the Proponent to undertake further investigations in these areas to determine the extent of ASS.

Mobilisation of contaminants through groundwater is identified in the Acid Sulphate Soils section of the EIS (Volume 1, Section 6.2.3) as a potential impact. Minimisation of changes to groundwater chemistry is identified as a particular aim of management measures. The Acid Sulphate Soil EMP sub-plan to be developed by the Proponent will necessarily address this matter including monitoring requirements²⁸.

Management strategies will form a central part of the Acid Sulphate Soil Management Plan required of the Proponent as an EMP sub-plan. The draft Outline EMP (Construction) (EIS, Volume 1, Section 19.6) requires the Proponent to develop these management strategies in consultation with the Department of Natural Resources and Water in line with the relevant State guidelines developed specifically for managing Acid Sulphate Soils.

3.6.3 Potential Impacts and Mitigation Measures

Issue 1

Has the existing stormwater system been checked for adequate capacity to accommodate flows from the untanked tunnels.

Response

Construction of the Airport Link Project will not change the volume of water entering the Enoggera Creek or Kedron Brook Catchments. Rainwater entering the tunnels and subsequently pumped to the stormwater drainage system will not increase the volume of runoff.

The only increase in volume of water to be removed from the untanked tunnels would be groundwater reporting to the tunnels. This would otherwise have remained in the ground and prevented surface water from entering voids or pore spaces in the ground. Therefore, removal of the groundwater to the tunnels lessens the volume of surface runoff from rain events because more water soaks into the ground. The nett effect is that the volume of water running through the stormwater drainage system remains fairly constant with or without the tunnels.

Moreover, the EIS (Volume 1, Section 7.4.2 Groundwater Depletion or Recharge) calculates from the modelling exercise that the groundwater inflow to the tunnels would be of the order of 8-8.5 litres per second. This inflow would be collected in a large sump near the lowest points of the tunnels and would then be pumped out to the stormwater drainage system at a time of choosing such as when no other water was entering the stormwater drains. The EIS also indicates that a steady state situation should be achieved by about 20 years after construction so that inflows ought to stabilise at a minimum level below the modelled figure. The stormwater drainage system does have adequate capacity to handle flows from the tunnels.

²⁸ Refer to the EIS draft Outline EMP (EIS, Chapter 19, Section 19.6)

3.7 Surface Water Quality

3.7.1 Description of the Existing Environment

Issue 1

It seems to be accepted that current water quality data collected by BCC and EPA will be sufficient for use as baseline data to monitor any impacts from the projects construction and operation. This may not be adequate, and further targeted monitoring by the proponent prior to construction may be necessary in order to get more useful baseline data.

Response

Monitoring of groundwater quality has been carried out through the boreholes of the geotechnical investigations for the detailed feasibility studies for the Airport Link Project and reported in the EIS (Volume 3, Technical Report No 2 – Hydrogeological Environment). Potential impacts of the Airport Link Project on groundwater quality are discussed in terms of different types of ground to be excavated and different potential agents that may alter the groundwater quality. Based on this investigation a number of recommendations and possible mitigation measures are outlined to deal with potential impacts on groundwater quality.

Monitoring of surface waters in the study corridor has been carried out by the Brisbane City Council and Environmental Protection Agency in the past and is reported in the EIS (Chapter 8) where Water Quality Objectives (WQOs) are clearly outlined and an assessment of the stream water quality is given against these WQOs. The on-going commitment and annual reporting of this monitoring program by BCC will provide an adequate monitoring regime for the long term operational phase of the Project.

Potential impacts on surface water quality of various construction activities are acknowledged in the EIS (Volume 1, Section 8.2.1). The range of mitigation measures recommended (refer to EIS, Volume 1, Section 8.2.2) includes but is not limited to the requirement to establish a water quality monitoring program during construction. Discussion of an appropriate monitoring program in the EIS (Volume 3, Technical Paper No. 4 – Surface Water Quality) recommends fortnightly sampling intervals with at least two sampling dates preceding the beginning of construction activities. This monitoring program is considered appropriate to establish baseline data for comparison with water quality monitored subsequently during construction.

3.7.2 Potential Impacts and Mitigation Measures

Issue 1

The Surface Water Technical Report does not show real evidence of how the Airport Link will impact on the current water quality and how the proposed mitigation may reduce the impact of existing levels.

Response

The EIS (Volume 3, Technical Report No 4 -, Surface Water, pp 18-21) outlines the potential impacts of the Airport Link Project on surface waters. It goes on (pp 22-23) to identify a range of mitigation measures that may be appropriate to the construction and operation of the Project. The report notes that these are typical strategic measures at this stage and the detailed design phase may see the requirement for other measures as well as or instead of those outlined in the Technical Report. The conclusion of the report is that impacts of Airport Link on water quality in Enoggera Creek and Kedron Brook, can be minimised by the appropriate application of well known devices and construction measures. The Draft Outline EMPs (Construction) and (Operation) (EIS, Volume 1, Chapter 19) each contain sections outlining responsibilities placed upon the contractor to ensure management of Surface Water Quality to minimise the impacts of the Airport Link Project.

3.8 Air Quality and Greenhouse Gases

3.8.1 Description of the Existing Environment

Issue 1

Data from Rocklea and Eagle Farm EPA monitoring stations has been used rather than monitoring and using data from local areas. Onsite measurements should be used to help model atmospheric transport and dispersion and may also aid in model selection. It is recommended that The Coordinator-General dismiss the air quality and health assessment reports and require local wind flows to be monitored for at least one year before resubmitting modelled air quality parameters.

A long-term wind rose would help justify that the 2004 wind rose data are representative.

Response

The meteorological data used in the modelling was discussed in some detail in the air quality technical report²⁹. Using data from Eagle Farm and Brisbane Airport, a windfield was constructed over the entire modelling grid for each hour of the year and at heights above ground level. Local land use and topography were also incorporated into the model. For localised impacts around ventilation stacks, local buildings were incorporated. These aspects have therefore been addressed in the EIS.

Comparisons of the annual average wind-roses at Brisbane Airport for the years 1998 to 2005 (below) with that provided in the EIS (Volume 3, Technical Report 5A – Air Quality, Figure 9) show good correspondence to justify the use of the data presented in the EIS. The Queensland Environmental Protection Agency assessed the air quality studies and concluded that the data and modelling based on the data was appropriate and resulted in a fair and accurate representation of the potential impacts of the Project.

²⁹ Refer to EIS Vol 3 Technical Reports No 5a – Air Quality

Wind-roses for Brisbane Airport for years 1998 to 2001

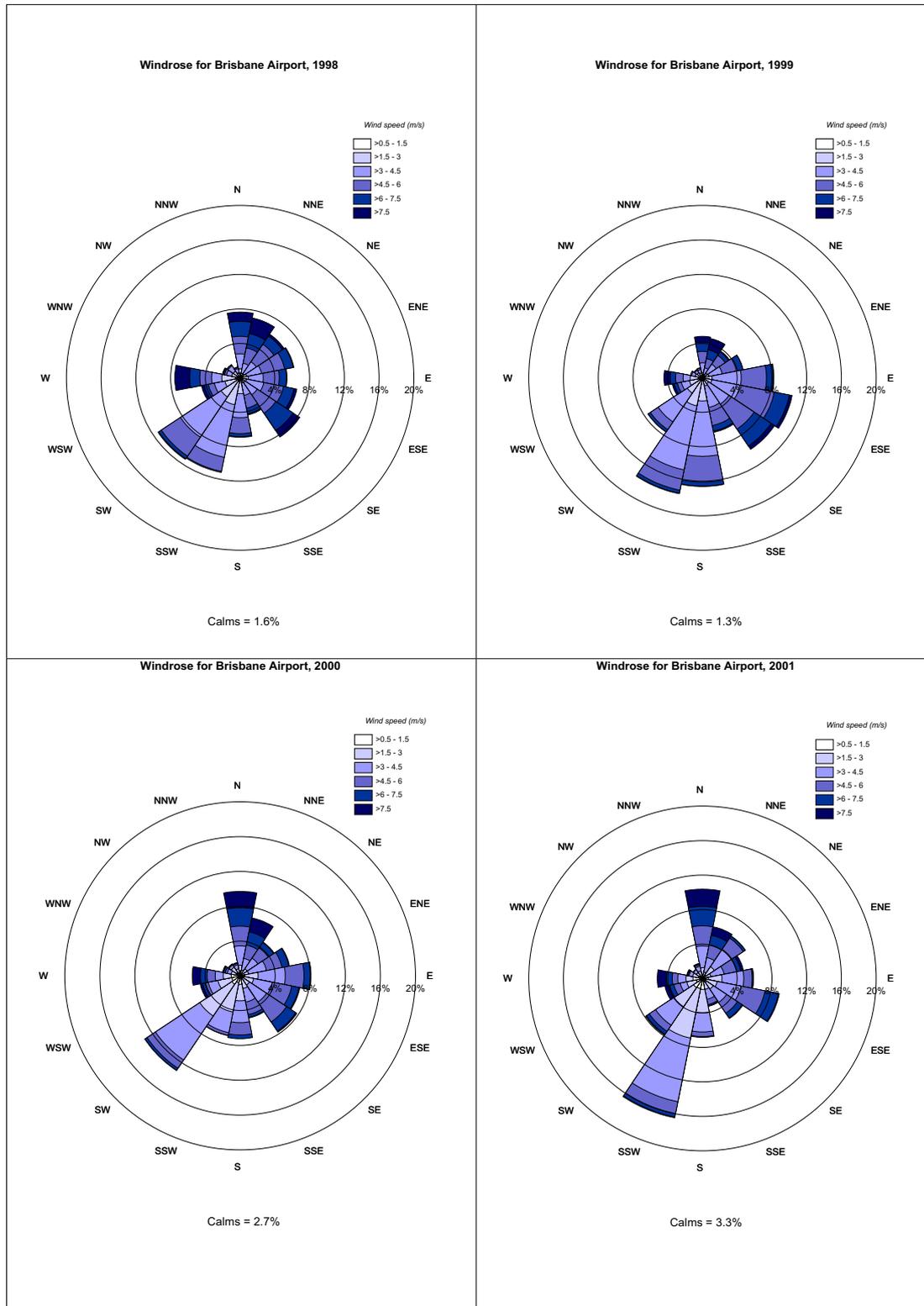
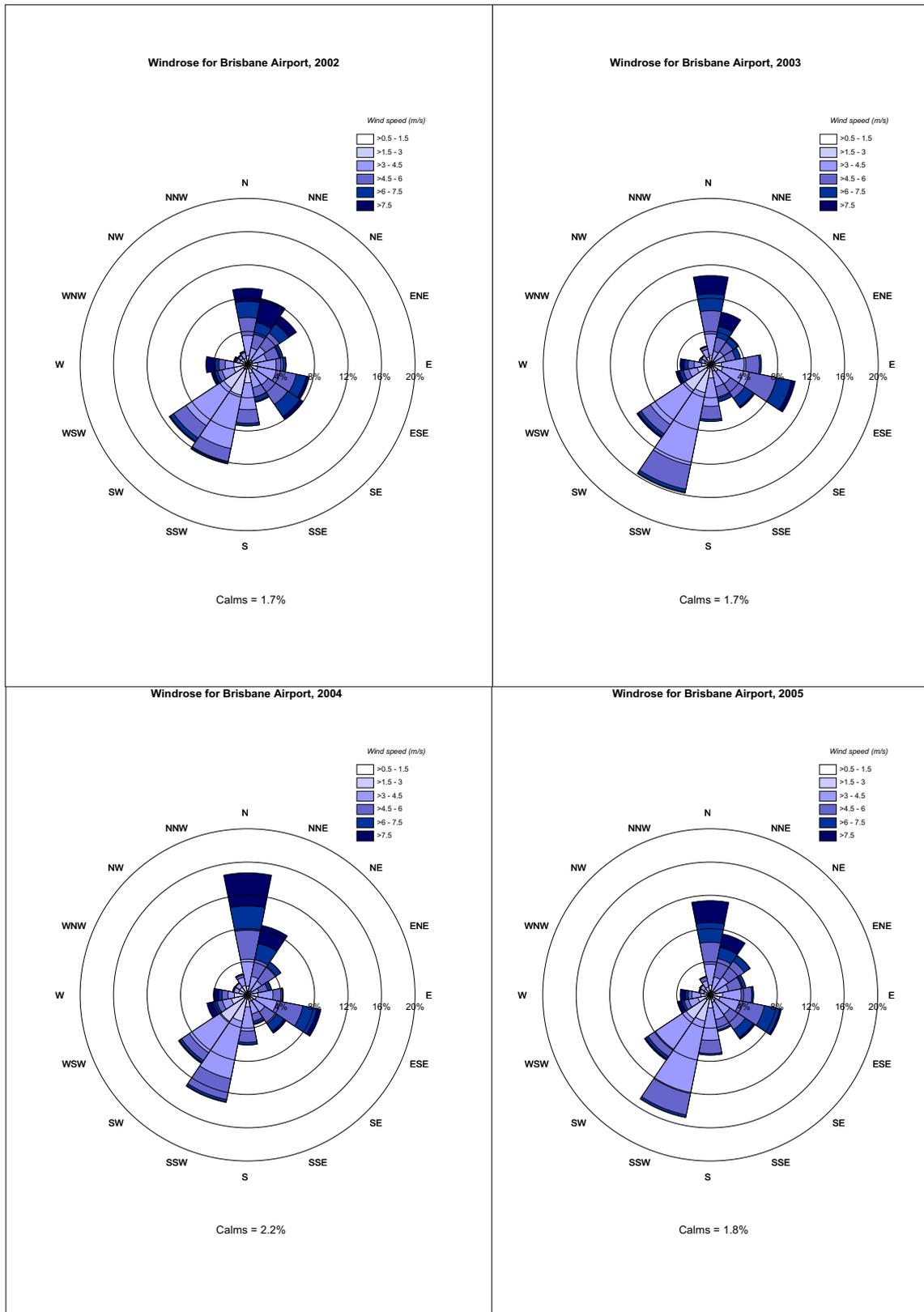


Table: Wind-roses for Eagle Farm for years 2002 to 2005



Issue 2

Particle concentrations, predicted by the modelling, appear to be unrealistically low. While the model predictions which related to carbon monoxide and nitrogen dioxide were accepted as reasonable, those which related to PM₁₀ appeared to be too low. The submission quoted a commissioned report that compared annual average PM₁₀ concentrations measured at Woolloongabba and at Rocklea, (21.7 and 16.9 µg/m³, respectively) indicating that there was a contribution of about 5 µg/m³ from local sources at Woolloongabba where the station is adjacent to a roadway. The conclusion drawn is that since the PM₁₀ annual average predictions at monitoring stations were of the order of 1 µg/m³, the assumed emission rates were too low.

Response

The modelling undertaken to predict the regional impacts was not able to reproduce the peak concentrations next to roadways. This has been discussed in some detail in the EIS (Volume 3, Technical Report 5A, Section 7.3) where it was stated that “although the CALPUFF model can simulate the dispersion of emissions from both line sources and point sources, it was not specifically designed for roadway emissions. In practice CALPUFF does not take account of the dispersion close to the road where vehicle induced turbulence is a significant influence. The Caline models simulate this turbulence better than CALPUFF. For this reason the Caline models were used to simulate near-road concentrations.”

The EIS (Volume 3, Technical Report 5A, Figures 51-61) presents predicted roadside concentrations using Caline models. The annual average levels of particulate matter close to the roadway in 2004 due to the roadway emissions alone, range from approximately 2 – 6 µg/m³ of PM₁₀. This is consistent with the 5 µg/m³ difference between the measured annual average concentrations between Rocklea and Woolloongabba indicating that the assumed PM₁₀ emissions rates for Airport Link vehicle sources are reasonable.

At the roadside locations modelled, the predicted 24-hour peak concentrations range from 5–15 µg/m³ in 2004. This higher relative prediction concurs with the expectation of the submission that a higher 24-hour average level would be expected compared to the annual average.

Issue 3

It is correct that there are no substantial difference between PM_{2.5} concentrations in clean and more polluted locations. However, higher PM concentrations are observed close to traffic sources. This implies that PM_{2.5} might not be the best metric to assess the contribution of vehicle generated particles. The same comparison for ultrafine particles shows that the background ultrafine particle concentration at Cape Grim is of the order of a few hundred particles cm⁻³. However, in the Brisbane urban background and Woolloongabba tunnel, average concentrations are of the order of 10,000 and up to 100,000, particles cm⁻³ respectively. These levels are approximately 10 to 100 times higher than in unpolluted environments. This indicates that ultrafine particles, for which the report did not conduct a comprehensive assessment, is an important particulate matter metric to consider in relation to health implications.

Based on a large body of data from measurements in Brisbane in various locations in the proximity of busy traffic, the difference between urban background and busy urban locations should be much larger than the maximum of 2500 particles cm⁻³ as indicated in the EIS (Volume 3, Technical Report 5A – Air Quality) in Figures 66 and 67.

The PM₁₀ emission factor used appears to be too low. Tunnel studies by Krristensson et al. (Real world traffic emission factors of gases and particles measured in a road tunnel in Stockholm, Sweden. Atmospheric Environment, Volume 38, pages 657-673, 2004.) have shown that average emission factors for a similar vehicle

mix under real world conditions are of the order of about 6 times higher than indicated. This could be partially responsible for the underestimation of PM₁₀ concentrations in this study.

Response

The same argument from the previous response holds for the predicted concentrations of ultrafines as discussed in the same submission. Figures 66 and 67 present modelling outputs for predicted maximum 24-hour average sub-micrometre particles in 2004 and 2012 in units of particles/cm³. The maximum 24-hour predicted concentrations were of the order of 3,000 particles/cm³. However, these are not near-road predictions. The assumption in the modelling for ultrafines was that 1 $\mu\text{g}/\text{m}^3$ of PM₁₀ equated to 711 particles /cm³. Close to the road, with a predicted concentration of 15 $\mu\text{g}/\text{m}^3$ of PM₁₀ this would be of the order of 10,000 particles/cm³ (15 x 711). The typical concentration of PM₁₀ in the tunnel using this calculation would be 500 $\mu\text{g}/\text{m}^3$. An in-tunnel concentration of 500 $\mu\text{g}/\text{m}^3$ would equate to a concentration of 350,000 particles/cm³ (500 x 711). This is similar to the levels referred to in Brisbane busway tunnels.

The submission notes that the maximum 24-hour PM₁₀ concentrations are predicted to be up to about 5 $\mu\text{g}/\text{m}^3$ close to the ventilation outlets, whereas at the Woolloongabba busway station PM_{2.5} concentrations increased by up to 160 $\mu\text{g}/\text{m}^3$. The two situations are not comparable. The first is the resulting ground level concentration from dispersion from a 30 m high outlet stack; the other is concentrations in the vicinity of a tunnel portal where there is no effective dispersion of pollutants.

The report by Kristensson et al., 2004 quoted in this submission has been reviewed for this response. At speeds of 45-70 km/h which are comparable to the speed on Brisbane network roads, the PM₁₀ mass emission rate was 0.091 g/km from data collected in 2003. The PM₁₀ emission factor of 0.0405 g/kg used in the EIS for network roads, was for 2012 where a reduction in emissions would be expected. Therefore the difference is not substantial. Note that in Kristensson et al., 2004, the proportion of PM_{2.5} to in-tunnel PM₁₀ is about 35% compared to the conservative 96% assumed in the EIS.

Issue 4

The number of sources included in the modelling appears to be small and thus the concentrations appear likely to be underestimated, especially in terms of PM, where no background contribution of the more minor local roads is assumed.

Response

The main reason why the PM₁₀ background concentrations were not taken into account was that the PM₁₀ predictions were carried forward into a health risk assessment where the change or increase in PM₁₀ was used to assess the likely health impact.

Issue 5

Methods of communicating the outputs of air quality modelling are scientifically flawed and disingenuous:

- *There is no quantitative presentation of model error. Presentation of absolute air quality values without a clear quantification of the likely errors is a disingenuous and poor attempt at communicating modelled results. From experience with similar models and constraints, the predicted values are likely to have potential error ranges of up to 2 orders of magnitude.*
- *There is no presentation of calibration or validation of results. There is no basis by which to independently assess the effectiveness of the model at predicting the current air quality.*

- *Presentation of absolute values is in error. If the model cannot predict the current air quality, it is clearly poor at predicting future scenarios. The only appropriate method of reporting is to present the relative change in air quality values under alternate scenarios.*

Response

It is not common practice in dispersion modelling exercises to include error bars in the modelling results. It is the generally held view in the industry, that dispersion models are generally accurate to within a factor of 2, not the 2 orders of magnitude suggested in this submission.

Experience from the CityLink Tunnel in Melbourne and the M5 East tunnel in Sydney with post operational monitoring indicates that the models are not under-predicting the impact and also that ventilation stacks are effective at dispersing emissions.

The EIS (Volume 3, Technical Report 5A, Section 8.1, Table 15) presents a comparison of modelled and measured concentrations at Bowen Hills and discusses the reliability of the model. In fact the model predictions are in reasonable agreement with the measured values. Presentation of absolute values is thus considered meaningful as in all other Air Quality of similar projects.

Issue 6

Goals in Table 9.1 should be referenced to which standard they are using - other than just saying criteria set by the Queensland Government and the NEPC.

Response

The goals in the right hand column of Table 9-1 are in $\mu\text{g}/\text{m}^3$ and have been taken directly from Table 9-3 on page 9-16 where the authority that established each of them is clearly identified. Section 9.3.1 Ambient Air Quality Criteria further explains that the goals are those set by the State Government EPA in the *Environmental Protection (Air) Policy 1997* or those set up by the National Environmental Protection Council where the latter are the more stringent or where the Environmental Protection (Air) Policy has not established a standard. Thus, the standards used in this study are the most stringent available in the Queensland jurisdiction. They are also consistent with those goals set by the Coordinator-General, on advice from the Queensland Environment Protection Agency and Queensland Health, for the North-South Bypass Tunnel, which is a comparable project.

Issue 7

On one hand, ambient air quality is 'considered to be good' and it then goes on to say that 'levels in the immediate vicinity (within a few metres) of busy roads may be close to or exceed relevant ambient guidelines'. Note: air quality monitoring undertaken by Main Roads and the EPA adjacent to the Riverside Expressway indicates that ambient air quality is well within EPA guidelines for carbon monoxide, nitrous oxides and PM_{10} .

Response

This terminology was used in the EIS In Brief summary statement. It was an attempt to present the findings of the air monitoring program undertaken to provide a background understanding of air quality in the study corridor before any Airport Link construction begins. The statement that ambient air quality is “generally good” is based on the monitoring results available, appropriately qualified by the very rare exceedances of goals being due to identifiable events (e.g. the bushfire of 3 February 2005) affecting the PM_{10} 24-hour average criterion. With respect to the vicinity of the proposed worksites the EIS In Brief notes that air quality in their vicinities is generally satisfactory but points out that because some proposed worksites are immediately adjacent to main arterial roads that are known to suffer from traffic congestion on occasions, elevated levels of one or more pollutants may occur. It simply says that if exceedances are likely anywhere they are more likely in such close

proximity to the busiest roads in the area. Moreover, the draft Outline EMP within the EIS (Volume 1, section 19.6) requires monitoring stations to be established adjacent to worksites for the duration of the construction phase so that roadside measurements will become available for these sites in due course.

3.8.2 Potential Construction Impacts and Mitigation Measures

Issue 1

With reference to Table 9-2 (EIS, Volume 1) measures of spoil truck loads (one way) is satisfactory if spoil haulage transport route is circuitous. Should a contractor adopt an "in-out" route then truck movements could double.

Response

Table 9-2 (EIS, Volume 1) provides forecasts for numbers of truckloads of spoil to be removed from each worksite. Each truckload mentioned in this table entails a trip from a worksite to a spoil placement site and the return trip to the worksite. Modelling of the effect of increased traffic on spoil haulage routes has taken these return trips into account.

Issue 2

Section 5.4.2 of the ToR states among tasks to be undertaken "Presentation of the findings of the modelling for the construction ...phase of the Project." This was apparently not done.

Response

The EIS (Volume 1, Section 9.2, pp 9-9 to9-15) presents the findings of the Construction Air Quality Impact Assessment. The methodology followed is outlined and shows the avenues of approach to this requirement.

Modelling of construction air quality impacts is difficult due to the potential range of construction techniques available for delivery of the Project. However, the EIS investigations pursued all the elements of a modelling process to determine and recommend a range of possible mitigation and monitoring measures for construction works. These various lines of investigation identified a variety of potential impacts and appropriate mitigation measures to cope with dust, odours and diesel exhaust emissions, being the principal construction threats to local air quality.

If these measures are employed properly the impact of the construction works on air quality are expected to be negligible. In the event that these mitigation measures are not properly applied and there is some impact on air quality the provisions of the Environmental Management Plan would apply to rectify the situation.

Issue 3

Important that mitigation strategies in relation to odour management are implemented. One critical element is a good complaint process, clearly defining responsibilities for investigating and responding to complaints.

Response

The EIS at Volume 1, Chapter 9, section 9.2.3 Mitigation Measures for Construction Impacts outlines mitigation measures to deal with Odour Impacts from a number of potential sources. The EIS (Volume 1, Chapter 19.6 Draft Outline EMP (Construction), Air Quality on p.19-23) spells out mitigation measures and a monitoring regime is defined to ensure that mitigation measures are employed efficiently if their implementation becomes necessary. The EIS (Volume 1, Chapter 19.2- Management Structure, Section 19.3.4 Complaints and Responses) places a clear responsibility upon the Proponent to carefully manage a prompt and effective process for the receipt and actioning of any complaints. This section outlines the minimum requirements of the

complaints process and identifies the requirement for its acceptance by the Proponent, the Coordinator-General and the EPA.

Issue 4

Comment (EIS page 9-15) in relation to monitoring of TSP, PM₁₀ and dust deposition levels during construction is too general and non-committal. A clear commitment to monitoring dust at specified locations, with the proposed frequency, timing and duration of monitoring clearly articulated, would significantly improve proposed mitigation measures. Commitment to making data publicly available via the internet is desirable.

Response

The EIS (Volume 1, Section 9.2.3) identifies a range of mitigation measures to be included in the Dust and Odour Environmental Management Plan. This range includes the requirement for monitoring particulate matter in the air around construction sites as a principle of managing the potential dust nuisance. This principle is elaborated upon in the draft outline Environmental Management Plan in Chapter 19 (Section 19.6, Air Quality – Construction) where daily monitoring for the duration of the surface works or in response to complaints is required.

The frequency of monitoring would be determined in the Construction EMP (air quality EMP sub-plan) and would need to relate to weather conditions (i.e. increased monitoring frequency in dry and/or high velocity winds) or if activities with high potential for dust generation are being undertaken.

A combination of mobile and stationary monitoring stations are recommended to monitor dust levels during construction. While it is not practicable to specify dust monitoring sites until the design is finalised and areas to be excavated precisely identified, there are a number of sensitive receptors in the vicinity of the worksites where monitoring might be conducted, including:

- The Woolloowin State School;
- Residential areas in Lutwyche, west of Lutwyche Road;
- The Kedron High School;
- Residential properties in Kedron, east of Gympie Road and adjacent to Kedron Brook;
- Nyamba aged care facility in Federation Street, Windsor;
- Residential properties in Kalinga Street, Clayfield; and
- Kalinga Park, adjacent to residential properties in Alma Road, Clayfield.

The monitoring sites may not be the same at all times owing to changing wind directions and weather conditions (i.e. monitoring dust fallout must be downwind of a construction site). The Proponent is to be responsible for carrying out the monitoring and for providing the results to the Coordinator-General and the Community Consultative Committees with the latter responsible for providing information to the wider community as required.

The Draft Outline EMP identifies the acceptable target levels for dust fallout. The objective of the dust fallout targets is to minimise dust nuisance to neighbours near project works. To avoid dust nuisance, Project dust emissions should not exceed the goals set out in **Table 3-3**.

■ **Table 3-3: Recommended Dust Monitoring Goals**

Dustfall goals		
Existing dust fallout level (g/m²mth)	Maximum acceptable increase over existing fallout levels (g/m²mth)	
2	2	2
3	1	2
4	0	1
Health-based goal for ambient air		
24 hr average (exceedances no more than 5 times / year)	50 µg/m ³	

The detail of how these measures are to be implemented will be included in the approved EMP (Construction). The manner of dissemination of the results of all monitoring associated with the construction phase and early operational phase of the project is outlined in the EIS (Volume 1, Section 19.2.1 Overall Responsibilities).

Issue 5

What are the contingency plans in the event of air quality falling below an acceptable standard during the building and/or operation of the tunnel?

Response

If air quality falls below stated acceptable standards during construction, there are a number of remedial measures available, ranging from site-specific responses to cessation of works. Since the Project worksites will be formally designated work places within the meaning of the *Workplace Health and Safety Act 1995*, throughout the construction phase, the provisions of the Act will apply. This is stated in Section 19.5.3 on page 19-12. Working conditions are determined under that Act and are not further explored in this EIS.

Once the Project becomes operational, a strict monitoring regime would be implemented in accordance with Draft Outline EMP (Operation). Should air quality in the tunnels fall below the stated standards the exhaust fan system in the roof of each tunnel may be used to extract air at a greater rate and thus draw in fresh air at the portals. Also, through the tunnel control centre, traffic in-flows may be constrained in order to achieve acceptable in-tunnel air quality. If for any reason these measures do not rectify the situation traffic levels in the tunnels can be lowered or even stopped completely until monitors indicate restitution of in-tunnel air quality.

Issue 6

An independent review of air quality impacts should be established to consider community concerns.

Response

The EIS (including Volume 3, Technical Report 5A —Air Quality) has been reviewed by the Environmental Protection Agency, by Queensland Transport and by the Department of Main Roads. The EIS was developed in step with a comprehensive and inclusive process of community consultation which was effective in identifying community concerns about air quality and the potential impacts the Airport Link Project might have on air quality.

These concerns have been addressed comprehensively in the EIS and in the recommendations presented in this Supplementary Report.

Ultimately, the standards for in-tunnel air quality for the Project have to be met during the operational phase. Where an exceedance of ambient goals can be attributed to Project operations, the Proponent will be required to report on the incident and take corrective actions to avoid a recurrence.

Issue 7

NEPM air quality standards which were used to compare emission predictions were designed to be measured over an averaging period. These standards were not designed to apply to peak concentrations of pollutants from significant point sources where human exposure is possible over critical shorter periods. Furthermore no consideration has been given to exposure of local residents to peak concentrations.

Response

The NEPM air quality goals were developed to provide protection to the majority of the Australian population to be measured at sites which were generally representative of air quality in the area in question. The levels of air pollution could be higher at other locations, for example near a busy road. It is not correct that the goals relate necessarily to long-term averages. The averaging period that is used for the NEPM goals is appropriate for the time over which health effects are likely to occur.

Furthermore, some of the NEPM goals, are more stringent than the EPA standards. The more stringent of the NEPM and EPP goals were used for this assessment.

Issue 8

The use of the term air quality "goals" is inappropriate, particularly when the "goals" are higher than the current pollution levels in the area.

Response

“Goal” is a reference to the upper acceptable concentration limit for various gases or particles in the air. The term came into common usage in the early days of air monitoring which started in the most polluted cities of the world. At that time the measured levels of certain pollutants were very high in certain places and research of public health effects induced health authorities to set standards below the measured levels. Thus the effort to reduce pollutant levels to these acceptable standards became the goal (or target or objective) for several stakeholder groups (i.e. motor vehicle manufacturers, road and tunnel designers, politicians etc.). Thus the terminology has become entrenched worldwide, extending to all cities, including those (such as Brisbane), where pollution levels have generally remained below established standards. To be strictly correct ‘goals’ may be referred to as ‘maximum acceptable levels’ but the meaning of ‘goals’ or ‘standards’ is well understood in this usage.

Issue 9

The adoption of the NEPM goals for particulates creates some minor potential perception issues, given the exceedance of the goals by existing background sources at times. It is stated in the EIS that the NEPM is designed to consider regional population exposure only and it might have been beneficial to compare to both EPP and NEPM guidelines throughout the text to emphasise this point.

Response

It was agreed with EPA and other stakeholders at the beginning of the assessment that the more stringent goal would be used to assess the project, either EPP or NEPM, both of which are designed in the same way.

Issue 10

Section 5.4.1 of the ToR states that the scope includes consistency with the South East Queensland Regional Air Quality Strategy (SEQRAQS). That document is apparently not mentioned in the EIS. Section 5.4.4 of the ToR states that reference should be made to the Brisbane Air Quality Strategy (2004). That document is apparently not mentioned in the EIS. It would be useful to quantify and discuss how much lower predictions based on the SEQ inventory data would be compared to the PIARC emissions data.

Response

Although these publications may not be directly referenced in the EIS they were taken into consideration in developing construction air quality management measures and in developing the air quality modelling study, respectively, as reported in the EIS. The EIS is consistent with strategies in these documents as required by the terms of reference and the findings soundly based.

A quantitative comparison of SEQ Air Emissions Inventory and PIARC is provided in the EIS Volume 3, Technical Report 5A –Air Quality, Appendix C).

Issue 11

The air quality modelling appears to have not considered road dust as a particulate contributor and it is recommended that The Coordinator-General require the modelling to consider road dust as a significant contributor to particulate matter in an urban road tunnel environment.

Response

The EIS (Volume 1, Section 9.2.1, Construction Impacts Methodology and Criteria on page 9-9) deals with dust (in Total Suspended Particles or TSP) management through the Construction Phase and notes that the provisions of the BCC Air Quality Planning Scheme Policy which deals with dust from soil spills on roadways, also apply as they do to any other construction development in the BCC area.

During the operation phase, the majority of particulate pollutants derived from motor vehicles in the tunnels are captured in the PM₁₀ monitoring. Dust from uncovered loads or from other spillages including litter disposed of in the tunnels will be cleaned up in regular maintenance programs. Regular maintenance will include wash down of the tunnel walls and roadways (with water conservation strategies such as using collected rainwater etc.— see EIS, volume 1, section 4.3.20 on page 4-37) as indicated in the EIS (Volume 1, section 4.4.1 on page 4-39) where provision is noted for this maintenance procedure.

Issue 12

The modelling approach implemented in this study is appropriate for the regional impact assessment, however the approach is not adequate for assessment of the roadways on a local scale. Some other concerns in relation to the modelling approach are:

- Since approximately 20% of the wind speeds are below 1 m/s the suitability of this model to the study could be questioned.
- The number of sources included in the modelling appears to be small and thus the concentrations appear likely to be underestimated.

Response

With respect to the use of the Cal3qhc model, all models have limitations, but the Caline series have been used extensively overseas and in Australia for roadway projects. As discussed above, these predictions appear to be

reasonable in terms of the near road impacts and the main approach to the assessment is to look at the change in predicted levels.

In terms of the sources included in the modelling, these have been selected to include the major roadways which would be affected by the project. It is agreed that the contributions from other sources of particulate matter will make a major contribution to the overall air quality but the focus of this study is the changes which will occur due to the project.

Issue 13

The section on Emission Estimates on p23 of Tech Report 5A notes that future emissions are likely to be lower as a result of new design rules. It would be useful to quantify the magnitude of potential improvement based on adoption of proposed design rules. It would be useful to have some indication of the sensitivity of emissions to a more realistic vehicle speed distribution, rather than the simple free-flowing/congested 80 kph/20 kph assumption.

The peak hour periods are nominated on p23 of Tech Rept No. 5A as hours ending 7, 8, 9, 16, 17, 18 and 19 consistent with congested hours for the Cross City Tunnel EIS in Sydney. It is recommended that hourly traffic and speed estimates be considered further – examination of Traffic Census data for several major Brisbane roads suggests that traffic flow for the hour ending 10 may be higher than for the hour ending 7 and that traffic flow for the hour ending 15 may be higher than for the hour ending 19. This may be of some significance, given the lower dispersion conditions expected in the early morning.

Response

Estimates of future emission rates are based on fleet turnover and on existing design rules. No account has been taken of potential future improvement in engine technology and fuel standards as these are as yet unknown. Emissions are sensitive to speed and are included in the PIARC tables. For the purposes of modelling, a limited number of scenarios has been considered to represent a realistic worst case.

There is no fixed method for selection of the peak traffic hours. For the purposes of the Air Quality Technical Report (EIS, Volume 3, Technical Report 5A, p.23) the choice of peak hours is based on data in Table C3 (EIS, Volume 3, Technical Report 5A, Appendix C).

The beginning of the peak hours is adjudged as the hour with the biggest jump in traffic volume – for both ‘all vehicles’ and for the ‘heavy vehicle’ component of traffic the biggest percentage increase leading to the morning peak hours is during the hour ending 7. In the afternoon peak where the question is whether the peak should start and finish an hour latter the only available criteria for comparison are the traffic volumes in the respective hours. On available data hour finishing 15 has marginally more ‘all vehicles’ traffic but with a significantly larger ‘heavy vehicles’ component.

The rationale for the choice of peak hours aside, inclusion of the hour ending 7 (rather than the hour ending 10) in the peak (and thus with a 20km/h average speed applied) means that the model is including a worse case scenario as mentioned in the submission because of the lower dispersion conditions in the earlier hour.

Issue 14

Ultrafine particles (i.e. less than 0.1 micron in maximum diameter) should be monitored to assess impact of the Airport Link tunnels on both ambient and in-tunnel air quality. Although there are no current EPA standards for this parameter they may come into place in the next 12-24 months and provision should be made to explore this further.

Response

As new standards are adopted, the monitoring and assessment method will reflect this. At present there is no nationally agreed method of measuring ultrafine particles and the adoption of a standard is not imminent. The World Health Organisation, in its 2005 global update, noted that, while there is evidence for health impacts of ultrafine particles, at this stage there is insufficient evidence to set any air quality goals for ultrafine particles in the ambient air. The matter of ultrafine particles is discussed in the EIS (Volume 3, Technical Report 5A – Air Quality, Section 9.5).

Issue 15

The fifth dot point on the first page of the Executive Summary of Technical Report No. 5A should be qualified to state that concentrations would be expected to decrease if congestion does not worsen significantly (by measures such as the proposed tunnel).

Response

The EIS (Volume 3, Technical Report 5A – Air Quality, Section 6-3, Emission Estimates, Table 11) provides the estimates of emissions on surface roads in 2012 with and without Airport Link. These figures, in comparison to emissions from ventilation outlets as they reach ground level provide the basis for the fifth dot point in the Executive Summary. Thus, it is based on modelled traffic numbers on these various roads and for some, emissions increase due to their position as an approach to the tunnels. For others, emissions decrease due to lessening of traffic numbers by courtesy of the tunnels. However, in all cases the modelled emission levels from the ventilation outlets are considerably less than that from surface roads even in the case where the project-induced decrease in road traffic brings the modelled emission levels closer together.

Issue 16

Figures 41 to 45 of Technical Report No. 5A compare the existing situation with the future (2012) with and without the tunnel, presented as a percentage change. It may be beneficial to present a comparison of the percentage change for 2012 for the situation with the tunnel compared to that without.

Response

The comparison of percentage change in pollutant levels between 2004 and 2012 (EIS, Volume 3, Technical Report 5A – Air Quality, Figures 41 to 45) is a more conservative plot because the differences are likely to be greater than between 2012 with and without Airport Link. However, the EIS (Volume 3, Technical Report 5A – Air Quality, Figures 51 to 61) does provide the 2012 with and without Airport Link comparison, suggested in the submission, for the spot locations shown on Figure 19 of the Air Quality report referenced above. These data are provided in relation to their proximity to the roadway and are subsequently employed in the Health Impact assessment (EIS, Volume 3, Technical Report 5B, Table 34).

Issue 17

It would be worthwhile to assess the likely impact of the occurrence of 'flagging' (due to winds above 5 m/s) and proposed control measures (Table 8).

Response

The full range of wind conditions is included in the modelling.

Issue 18

The headings of Tables C3 and C4 in Appendix C of Technical Report No. 5A are confusing.

Response

The captions to Tables C3 and C4 are typographic errors. The correct captions are to be found in the adjacent text where reference to these tables is made. Caption for Table C3 should read “Typical flow profile of traffic during day” and for Table C4 the caption should read “Tunnel grade details used for the ventilation outlet emission calculations”.

Issue 19

Do the emission factors in Table 21 of Technical Report No. 5A include the likely increases in congestion of the existing network without the tunnel?

Response

The emission factors in question (EIS, Volume 3, Technical Report 5A – Air Quality, Table 21) are explained on page 47 of that report where it is pointed out that they are relevant for the Greater Brisbane area and are given for an average travel speed of 50km/h. This average travel speed is chosen to acknowledge a level of congestion without the Project.

Issue 20

Locating two smoke stacks within 100m of each other at Bowen Hills is not only reckless, it will have acute and chronic effects on the residential population, health workers and hospitalised peoples.

Response

The EIS (Volume 3, Technical Report 5A – Air Quality, page 27 including Table 12) explains that the emissions from the adjacent NSBT ventilation outlet, based on the upgraded NSBT traffic numbers, have been taken into account in the CALPUFF modelling for ambient air quality in the study corridor. The results of this modelling are shown graphically in Figures 20 to 40 and tabulated for the Bowen Hills monitoring site in Table 14 of the same Technical Report. All predicted levels of roadway induced pollutants attributable to the ventilation outlets are a long way below air quality goals as set out by State and National agencies.

Issue 21

The emission model used by Katestone and Holmes is not adequate to the situation. A range of emission stack modelling guides state explicitly that the stack height needed to give adequate plume dispersion must be 2.5 times the height of the accompanying structure and 3 times the distance from the nearest equivalent building height. With this being the case, the proposed stacks should be at least 70 metres above ground level and at least 50 metres higher than a 20 metre high building. As the tunnel emissions are not heated to the extent of an industrial emission, but are drawn through a cool, underground tunnel system the emitted plumes will not behave as conducted models have proposed they will.

Response

The rules of thumb for building height and distance from the nearest equivalent building height are useful approximations in the absence of more detailed dispersion modelling. The modelling undertaken for this project used CALPUFF, a more sophisticated model than Ausplume and incorporated building wake algorithms (PRIME) which take account of the location and dimension of buildings in the vicinity of the stack. This aspect has therefore been adequately addressed by the modelling provided in the EIS. The emission model is adequate.

Issue 22

Air quality monitoring should be carried out in the immediate vicinity of the north-eastern connection, starting immediately, so that any changes during construction or operation of Airport Link can be identified.

Comment about establishing three monitoring locations is too general and non-committal. A definite commitment to confirming the modelling predictions by conducting ambient air quality monitoring, at specified locations and for specified parameters, would significantly improve the proposed mitigation measures. A commitment to making the data publicly available via the internet is desirable.

Response

The Airport Link Project is specifically committed to the requirement for establishment of an air quality monitoring station near each ventilation outlet for the tunnel ventilation system as soon as possible but at least 12 months before operation begins. The purpose of this monitoring is to establish baseline air quality data for the areas where the ventilation outlets will operate. At the commencement of operation of the tunnels two monitoring sites are to be established near to each ventilation outlet. Air quality will thus be monitored in real time for particular parameters against goals as outlined in the EIS (Volume 1, Table 9.3 on page 9-16 and repeated in the EMP as Table 2 on page 19-38) so that comparisons can be made with results of monitoring at established EPA stations that will operate through the same period. The need to continue air quality monitoring is to be reviewed after five years of operation. The Contractor is to be responsible for carrying out the monitoring and for providing the results to the Proponent. The EMP (EIS, Volume 1, page 19-38) requires the results of the monitoring to be made available via the project website.

The detailed modelling and analysis for this impact assessment indicates the contributions of the ventilation outlets to ambient air concentrations for particular pollutants is very low, and well below the stringent air quality goals adopted for the purpose of impact assessment. See Appendix C for detailed plots of present pollutant levels and predicted effect of Airport Link, in the immediate vicinity of ventilation outlets in particular.

Issue 23

Validation of air quality modelling results is critical - this can then confirm the modelling results and identify if any mitigation measures are needed.

Response

Monitoring will be carried out as recommended in the EIS to allow validation of modelled air quality.

3.8.3 Air Filtration Technologies

Issue 1

Air extracted from the tunnels should be passed through filtration equipment (i.e. ESP) before release to the atmosphere through elevated outlets.

Response

See also the response to matters raised in relation to the Clayfield ventilation station in section 3.1.6 of this Supplementary Report.

The existing ambient air quality across the study corridor is generally good, with all traces of motor vehicle-based pollutants well below the stringent ambient goals adopted in the EIS for ambient air quality. Regardless of whether the Airport Link Project proceeds or not, there is expected to be an improvement in air quality in the Brisbane air-shed due to the use of cleaner fuels and improved engine technologies in motor vehicles. This improvement is off-set somewhat by the predicted increase in travel demand deriving from forecast population growth.

The Airport Link Project would contribute to ambient air quality through the operation of the ventilation system and the release of vitiated air from the ventilation outlets at Windsor, Kedron and Clayfield. The proposed ventilation system is intended to minimise the impacts of vitiated tunnel air upon the ambient environment through high-level, high speed dispersion and subsequent dispersion. The detailed modelling and analysis for this impact assessment indicates the contributions of the ventilation outlets to ambient air concentrations for particular pollutants is very low, and well below the stringent air quality goals adopted for the purpose of impact assessment.

The health risk assessment has concluded that there will be no appreciable change in community health as a consequence of the Airport Link Project, either in relation to the operations of the ventilation outlets or the changes in roadside concentrations of vehicle emissions.

The impacts of filtration were assessed in the EIS (Volume 3, Technical Report 5A, Sections 4.3 and 9.4). The bases for the assessment were very conservative (i.e. seeking to exploit the potential benefits of filtration). However, the findings indicated there were no significant benefits evident from filtering ventilated air. Monitoring would be undertaken.

In summary, the modelling of ambient air quality with Airport Link, with and without filtration, indicates little change in ground-level concentrations for the pollutants of concern in the assessment. Consequently, there is little benefit if any from fitting and operating filtration systems when considering beneficial changes to community health.

Modelling for the north-eastern ventilation station indicated changes to ambient air quality around Kalinga Park to be well below the stringent health-based goals adopted for the Project.

Despite the conservative redundancies in the ventilation system for the reference design, the integrated operation of the traffic management system with the real-time monitoring for the ventilation system allows traffic in-flow to the Project to be managed to ensure in-tunnel air quality and manage impacts on ambient air quality. Ultimately, the Proponent will be required to manage the Project, including the ventilation system, to ensure that impacts on ambient air quality do not exceed the stringent health-based goals.

3.8.4 Effects on Public Health

Issue 1

Comment about in-tunnel air quality mitigation that advises motorists to close their vehicle windows does not provide a reasonable level of protection of the health and well-being of all tunnel users and workers, including motorcyclists and drivers of some sports cars. A much more universal plan is needed to provide a reasonable level of protection of all tunnel users who might be forced to stay in the tunnels for prolonged periods. This is also relevant to emergency and maintenance crews.

The EIS suggests that traffic management programs will be required to be implemented to ensure that prolonged exposure (>15 minutes) to nitrogen dioxide is not experienced by any motorist. No reference is given to where this traffic management program would be located or what it may contain.

In 2003, the South Eastern Sydney Public Health Unit and NSW Department of Health published "M5 East Tunnels Air Quality Monitoring Project Report July 2003". The report made a number of recommendations of precautions to be taken by tunnel users, identified groups of the community that may be at greater risk and indicated the need for more rigorous handling of certain pollutants. Based on the report, NSW Health

recommended that warning signs be erected and brochures distributed to ensure tunnel users are aware of health risks associated with usage of the tunnel. Has this been considered?

Response

Current Permanent International Association of Road Congresses (PIARC) guidelines have been used for particles and carbon monoxide assessment within road tunnels. Air quality within road tunnels is normally monitored and adjusted to ensure safe visibility (particle levels) and concentration of carbon monoxide.

The EIS (Volume 3, Technical Report 5b, Pages 41-56) considers the health impact of short term exposures to above ambient levels of pollutants, as may occur within a road tunnel. The impact of pollutants within the Airport Link tunnels on health of tunnel users was considered in preparing the health effects report, but was not modelled. At this stage there is insufficient evidence to establish clear guidelines on acceptable levels of pollutants within road traffic tunnels.

Based on studies that have been performed on at-risk groups, such as people with asthma, it appears that the levels of pollutants within road tunnels should not have an impact on health, since they are normally well below thresholds that have been found to have an impact. However, the impact on the health of a person who uses a tunnel several times each day for a number of years is not known and cannot be predicted from the available health effect data. This is an area which is currently under investigation by the National Health and Medical Research Council, who have recently called for tenders to explore this issue and develop guidelines for air quality in and around traffic tunnels. The M5 east carries around 100,000 cars per day and has only one ventilation outlet. The M5 design is vastly different to the proposed Airport Link tunnels.

The ventilation system must be designed to achieve in-tunnel air quality limits in the case of extreme congestion (i.e. traffic flow is less than 10kph). Satisfaction of this requirement will avoid the need for people to respond by closing car windows or operating air-condition on the recycled function. However, there may be some people who would prefer this course of action, whether they are in a congested road tunnel or in congested traffic in an inner city location.

In extra-ordinary circumstances where people are required to stay in the tunnels for a long period, a range of safety measures would be activated through the Tunnel Control Centre. Safety measures include increasing ventilation fan operations, limiting vehicular access to the tunnels, switching off vehicle engines, directing people to the cross-passages for evacuation and activating smoke extraction systems in case of an incident (e.g. fire).

Such measures would be communicated by a range of means including car radio over-rides, variable message signage mounted in the tunnels and by audible warnings and briefings on the circumstances and appropriate and safe behaviours.

The Proponent would be required to design, construct and operate the Project in a way which would achieve the stated performance criteria for both in-tunnel and ambient air quality as stated in the Coordinator-General's conditions and as established in the Operations EMP sub-plans for air quality and for traffic management.

Issue 2

Potential health risks associated with exposure to air toxics are well established and there is growing recognition of the need to minimise those risks. Consultant's report mentions that these pollutants, in minor amounts, may have significant long-term effects and be carcinogenic.

Response

This is addressed in the EIS (Volume 3, Technical Report 5B). The air toxics make up a very minor component of traffic related air pollutants. However, even at low concentrations they may be carcinogenic. The cancer risk factors were assessed for a number of air toxics in the EIS (Volume 3, Technical Report 5b). The air toxics considered in this report are benzene, formaldehyde, toluene and xylene. Benzene and formaldehyde have both short term and long term effects on health, while the effects of toluene and xylene are long term. These health effects are reviewed in Section B and the potential impact of the air toxics from Airport Link is provided in Section C1.

Overall, the health risk assessment, summarised in the EIS (refer to Chapter 9, section 9.6.2) concluded that the worst-case changes in benzene, formaldehyde, toluene, xylene and coarse and fine particulate matter in the ambient environment would have very small to negligible impacts on community health for both acute and chronic health impacts. For example, long-term health effects on cancer, mortality and lung function growth in children were forecast to be negligible.

Issue 3

There is inherent uncertainty in the determination of health risk for any air quality and health assessment. This uncertainty is important to acknowledge and becomes critical when predictions made are so small and hence potentially within the bounds of the uncertainty associated with the method.

Response

This is a valid point. The modelling and assessment provided in the EIS indicates that there would be no statistically significant increase in health events as a result of the Airport Link Project. There are two types of uncertainty in performing the calculations. The first uncertainty is the forecast level of pollutants and the second uncertainty is the models used to predict the health effects. These are accounted for in two ways:

- To protect public health and the environment an appropriate degree of conservatism must be adopted to guard against uncertainties in health risk assessments, hence the worse case scenario is always used. The EIS assessed the worst possible pollutant level and the worst possible health outcome.
- The models used to assess the health impact of the worst-case increase in pollutants, have considered the bounds of certainty in establishing the relationships between pollutants and health outcomes. Examples of these boundaries are given in the EIS (Volume 3, Technical Report 5b, Tables 14 and 15) where they are referred to as upper and lower estimates. This is expressed as a confidence interval such as a 3% increase, with a range from 2-4%. Provided the lower estimate is above zero a significant effect is predicted and is within the boundary of certainty.

Issue 4

Methodology used and assumptions used for assessing health risk would need to be scrutinised more carefully in circumstances where exposures or predicted ambient levels are large and predicted exposures are approaching standards.

Response

The models used have been highly scrutinized, by experts in the field and been published in peer reviewed scientific journals. They are considered to be the best predictors of any potential adverse health outcomes. The relatively small forecast changes in air pollutants, results in relatively small forecast increases in health effects.

Queensland Health has been consulted during preparation of the EIS with regards the health-risk methodology and has accepted both the methodology and the findings presented.

Issue 5

Technical Report 5A notes that worst case increases in pollutant levels were used for assessing health impact and that improvements in predicted air quality were not used as offsets. It would be beneficial to present some basic worked calculations to demonstrate how such offsets might work (i.e. estimated number of persons exposed to increased concentration and average increase compared to estimated number of persons exposed to decreased concentration and average decrease for the situation 'with tunnel' compared to 'without'). Some further qualification of the summarised health impacts may be required so that findings are not taken out of context i.e. p10 states that 'Epidemiological models of the acute health impacts of ambient NO2 predict that on the days where the maximum increase in NO2 occurs, there will be an increase in hospital admissions for cardiovascular, respiratory diseases in people aged 65 and over and asthma. An impact on mortality is also forecast'.

Response

To protect public health and the environment, an appropriate degree of conservatism must be adopted to guard against uncertainties in health risk assessments. Conservatism is essential in performing health risk assessments for air pollution, hence the worse case scenario is always used. This is the worst possible pollutant level and the worst possible health outcome. There are a number of locations where a net benefit is expected and this would provide a more balanced perspective on the likely impact on the wider community. The conservatism of using the worst case enables an assessment of how significant the most adverse outcome may be.

The purpose of Technical Report 5B (Volume 3 of the EIS) is to report on the forecast health impacts as a result of changes to air pollution associated with Airport Link. It is not the purpose of the health effects report to “soften” the language around the health effects forecast, as such softening could be misleading.

3.8.5 Greenhouse Gases

Issue 1

The estimate of greenhouse gas emissions is probably an underestimate. Figures given for the consumption for the Australian car fleet refer to a document that doesn't appear in the reference list and appear to overstate the fuel efficiency of the Australian car fleet by at least 10%. It is not expected that there will be any improvements in the efficiency of the national car fleet in the near future. The EIS has no examples of how high energy intensity building materials will be substituted for materials that have a lower energy intensity. The EIS fails to correctly contextualise the seriousness of the environmental impact of greenhouse gas emissions and climate change, and trivialises these emissions by stating that they are only a small proportion of Queensland's total emissions.

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The EIS fails to correctly contextualise the seriousness of the environmental impact of greenhouse gas emissions and climate change, and trivialises these emissions by stating that they are only a small proportion of Queensland's total emissions.

Response

The estimate of greenhouse gas emissions for the Project was based on the then current methodology outlined by the Australian Greenhouse Office (2005):

- *AGO Factors and Methods Workbook, December 2005*, Australian Greenhouse Office, Department of Environment and Heritage, Canberra.

The fuel consumption data for passenger cars, medium trucks and heavy trucks in Table 9-11 of the EIS was taken from Table 4 of this workbook. The AGO has recently updated this workbook (AGO, 2006a) and the fuel consumption figures have also been revised. A comparison of the fuel consumption rates is presented in **Table 1**.

Table 1 Comparison of Fuel Consumption rates by vehicle type

Source	Fuel	Fuel Consumption ¹	Fuel Consumption ²	% Change
Passenger Cars	Petrol	0.107 L/km	0.113 L/km	+5.6 %
Medium Trucks	Diesel	0.283 L/km	0.285 L/km	+0.7 %
Heavy Trucks	Diesel	0.542 L/km	0.546 L/km	+0.7 %

Sources: ¹ AGO, 2005; ² AGO, 2006a

The difference in greenhouse gas emissions as a result of changed network performance on the Brisbane road network due to the implementation of the Project is shown in **Table 2**.

Table 2 Difference in Greenhouse Gas Emissions from Network Performance

Year	Difference in VKT from Project implementation (km/yr)	EIS Predictions, based on 2005 Methodology	Difference in Greenhouse Gas Emissions (t CO ₂ -e/yr)
2012	+ 25,976,065	+7,775	+ 8,154
2016	+22,193,337	+6,643	+ 6,966
2022	+ 16,974,032	+5,081	+ 5,328
2026	+ 15,691,523	+4,697	+ 4,926

The overall fuel efficiency of the entire car fleet is expected to improve as a result of advances in technology for new vehicles and as new cars replace older vehicles. The Australian Greenhouse Office use this assumption when projecting greenhouse gas emissions from the transport sector (AGO, 2006b).

There are many examples in the construction industry of using materials with a lower energy intensity. The EIS is based on the reference design for the Project and prescribing the materials for construction is not practical until at least the detailed design stage. This is recommended as a mitigation measure to be considered during the detailed design and construction of the project. Simple examples are the general use of steel building materials instead of timber or plastic instead of paper to preserve trees that extract CO₂ from the atmosphere; use of bricks instead of glass in construction of the Tunnel Control Centre to reduce air conditioning requirements, etc. etc.

The EIS recognises that increasing concentrations of greenhouse gases have the potential to cause climate change. The potential impacts of climate change are outlined in several government and scientific studies. Providing the context of climate change is beyond the terms of reference of this EIS, but further information is available from the following sources:

- AGO, 2003, *Climate Change: An Australian Guide to the Science and Potential Impacts*, Australian Greenhouse Office, Department of Environment and Heritage, Canberra.
- AGO, 2005, *Climate Change Risk and Vulnerability: Promoting an efficient adaptation response in Australia*, Australian Greenhouse Office, Department of Environment and Heritage, Canberra.

Government policy at local, State and Federal levels has been developed in response to the potential impacts of climate change.

The EIS aims to provide some context to the greenhouse gas emissions resulting from the increase in VKT as a result of the project. The predicted change in greenhouse gas emissions (8,154 tonnes of CO₂-e in 2012; 4,926 tonnes of CO₂-e in 2026) represent a small proportion of Queensland's transport sector emissions (4,400,000 tonnes of CO₂-e in 2002). The construction of the project will ease congestion on surface roads and provide opportunities to improve the public transport network. Improving public transport is likely to result in improvements to Queensland's transport-related greenhouse gas emissions.

Issue 2

The contention that the Project would result in an improved energy efficiency compared to the NO Project case needs some quantitative estimate, based on the number of vehicles experiencing lower congestion.

Response

Data on removal of congestion resulting from the Project are available for a range of major roads as noted in the EIS, but not universally across the area and data on the degree of consequent changes to vehicle speeds are not available. Essentially the assessment was made that sufficient data are not available to make a quantitative estimate of this effect. Moreover, the predicted improvements to motor vehicle engines that are mentioned in this section of the EIS (Volume 1, Section 9.7.4) are unknown at present, being predicted on the basis of the trend in research and development in this area over the last few decades.

3.9 Noise and Vibration

3.9.1 Description of the Existing Environment

Issue 1

What was the purpose of measuring noise levels at the eastern end of Gallway Street? What is the modelled noise impact upon Gallway Street?

Response

Noise levels were measured at the eastern end of Gallway Street to establish existing noise levels in a representative "quiet" location in the vicinity of the southern portal and ventilation station. The EIS (Section 10.1 on page 10.1) explains that "Unattended continuous measurement of sound pressure levels at selected locations over a seven day period." were taken to deduce the existing noise environment. One of these sites was at 46 Gallway Street, Windsor (Location 9 on Table 10-1) for which existing noise sources are identified in Table 10-2 and for which measured noise levels are shown in Tables 10-5 and 10-6 where they are compared with Planning Levels for the Project. These measured levels are also used in Tables 10-12, 10-16 and 10-30 to compare with expected noise levels from construction activities and from the ventilation station. Where the levels measured are above the noise levels established for the project (which are based on Australian Standards and other applicable guidelines) the EIS proposes mitigation measures in the form of noise barriers and these proposals in proximity to Gallway Street are shown in Figure 10-1 on page 10-29. For specific noise level predictions in Gallway Street see the EIS (Volume 3, Technical Report 6 – Noise & Vibration, Appendix J).

Issue 2

Why have the three measurement locations been selected above other locations monitored. Presumably representative of different clusters or land use activity/traffic density but this should be stated.

Response

As stated in the EIS (Volume 3, Technical Report No.6 – Noise and Vibration, Section 4.6.1 on page 40) the short term operator attended surveys were conducted to assist in qualifying the prevailing noise environment at each location. These three sites was chosen as being representative of one of the three clusters of monitoring sites adjacent to the three portal areas where the future noise environment is likely to change the most due to the Project.

3.9.2 Construction Impacts and Mitigation Measures**Issue 1**

No analysis of noise impacts have been done using the $L_{A10}(15min)$ parameter.

Response

The EIS (Volume 3, Technical Report No. 6 – Noise and Vibration, Table 18 and Section 5.2) provides a detailed analysis of the existing L_{A10} 15 min noise levels at each logger location and the bases for parameters used for modelling.

Issue 2

External noise criteria seem to be set based on an ‘acceptable’ internal figure extrapolated to the outside via an adopted 10 or 20 dB(A) façade noise reduction.

Response

This is an appropriate method for assessing the potential impacts of construction noise, so that any noise monitoring required pre-, during and/or post-construction can be undertaken outside buildings which is far more practical for access reasons.

Issue 3

Preferable for the Proponent to consult all affected or potentially affected health care facilities in addition to Rosemount Hospital prior to finalisation of the management plan for the mitigation of vibration impacts from the construction activities.

Response

The EIS (Volume 1, Chapter 10.2.4) recommends in its Mitigation of Tunnelling Vibration giving “comprehensive advance notice of intended tunnelling activities in localities near the tunnel alignment”. The draft outline EMP (EIS, Volume 1, chapter 19.6, p. 19-27) under Construction Vibration Goals – Building Contents and Human Comfort requires the Proponent to address the special needs of “sensitive areas” which includes hospitals and to carry out predictive modelling of effects of tunnelling and blasting (if planned) to form the basis of a comprehensive set of appropriate mitigation measures agreed with residents in an early notification process progressively in advance of relevant construction works. Through this process all health-oriented establishments (i.e. residential, research, consultative etc.) in the zone of potential impact would be notified and advised of potential impacts and appropriate mitigation measures.

The Rosemount Hospital is specifically mentioned because it is situated in relation to the reference project where “building-specific vibration sensitivity investigations” might be appropriate. Should the predictive

modelling and advanced notification and consultation program reveal other buildings where this would be an appropriate mitigation measure, those investigations would be carried out in accordance with the Construction EMP. The Proponent would be required to receive and respond promptly to any complaints about vibration, or any other construction matters, received during construction.

Issue 4

Why is there a difference in sound power level for front-end loaders with identical power and mass rating tunnelling during the day and then at night? Are the maximum internal noise goals and external noise goals reported correctly in Table 10-12? Are the external noise goals in Table 10-17 correct?

Are the noise goals in Table 10-15 (Kalinga Street residences) correct? Should 'residence immediately south' have a night-time noise goal? No measured average $L_{A90, 15min}$ levels are incorporated in Table 10-15, which would allow determination of the ventilation external criterion.

Adjustments (Table 10-18) need to be made for external noise goals and external sleep disturbance goals

Response

The minor discrepancy of 1 dBA between the front end loaders is a copying error that occurred in the formulation of the Chapter in Volume 1 of the EIS. This Chapter is based on the Technical Report that is reproduced in Volume 3, Technical Report No. 6 – Noise and Vibration. The assessment is fully documented in the EIS (Volume 3, Technical Report No. 6 – Noise and Vibration) and reference to Tables 38 and 39 in that report shows that 92 dBA L_{max} has been used for both the daytime and night-time assessments. This transcription error does not affect the conclusions.

With regards internal and external noise levels, Tables 37, 38 and 39 in the Noise and Vibration Technical Report (EIS, Volume 3, Technical Report No. 6) provide the details requested in the submission. The L_{max} internal sleep disturbance goal of 50 dBA has been omitted from Table 10-12. This omission does not affect the conclusions.

With regards the Kalinga Street residences, the EIS (Volume 3, Technical Report No. 6 – Noise and Vibration, Tables 49, 50 and 51) provides amplification of Table 10-15. Goals for night-time tunnelling in the vicinity of residences are listed in Table 51 (EIS, Volume 3, Technical Report No. 6 – Noise and Vibration). Average L_{A90} levels are documented in Table 51 (EIS, Volume 3, Technical Report No. 6 – Noise and Vibration).

There is only one inconsistency in Table 10-17 which was again the result of a compilation mistake that occurred in the formulation of the chapter for Volume 1 of the EIS – see Table 58 (EIS, Volume 3, Technical Report No. 6 – Noise and Vibration) for the correct values. The external night-time L_{Aeq} level for residences North of Kedron Brook at Gympie Rd should read 50 dBA, not 60 dBA which is the L_{Amax} goal. Vice versa for the night-time L_{Amax} level (should read 60 dBA not 50 dBA). This does not affect the conclusions.

All the information contained in Table 10-18 (EIS, volume 1) is correct. However, as the question suggests, it does not contain all the information contained in Tables 60 and 61 of the Construction Noise and Vibration Technical Report (EIS, Volume 3, Technical Report No 6 – Noise and Vibration) where external noise goals are documented in full.

Issue 5

Previously stated steady state ventilation noise not to exceed background $L_{A90, 15min}$ when determined as $L_{Amax-adj}$. L_{Aeq} now $L_{Aeq}=L_{A90}+3$. Compare Page 10-25, Table 10-23. Where preference is given to the first criterion but in terms of component noise level. Note that $L_{Amax-adj}$ is not defined or used in the latest version of AS1055.1.

Response

The EIS (Volume 1, Section 10.2.4) defines reasonable construction noise as a basis for designing mitigation measures to maintain an environment within those noise levels. In this context the long term evening and night time reasonable steady noise level should be as advised in AS2107:2000 (i.e. $L_{Aeq-adj\ 15min}$) or not greater than the external background noise level (L_{A90}), whichever is the lower.

The submission confuses the operational noise goal for ventilation noise with construction noise goals. The EIS, in Chapter 10 (Table 10-23) sets out the operational noise goal for ventilation station noise. There are no stated goals specifically relating to ventilation plant and equipment for construction. Such noise is controlled by reference to the criteria set out in the EIS (section 10.2.4) and based on the requirements of AS2107:2000.

Issue 6

Are the noise goals correct in Table 10-16, Row 3, cells 2 and 3 considering both have the same description? Rows 6 and 7 should be interchanged. In Table 10-14 are the external noise goals reported correctly in row 6? 55 (night-time) external implies 45 (night-time) internal which does not correspond with any of the goals set in row 3, cell for 'Adjacent Residences'.

Response

The noise goals are different because one refers to daytime construction of the elevated structures or bridges whereas the other one refers to night time tunnelling activity. Rows 6 and 7 are correct as presented – they reproduce information from Technical Report 6 – Noise and Vibration (EIS, Volume 3) in Tables 38, 53 and 54.

Table 10-14 is an abstraction of Table 45 of the Construction Noise and Vibration Technical Report (EIS, Volume 3, Technical Report 6 – Noise and Vibration, page 67) where the External Noise Goal (L_{Aeq}) for residences adjacent to the site on the eastern side is correctly shown as 50. The quoted figure of 55 in Table 10-14 in Volume 1 of the EIS is a transcription error that does not affect the conclusions drawn from this Table.

Issue 7

It is envisaged that there will be an increase in noise levels at the DES Kedron Complex during construction and operation of the project. Construction works, increased passing traffic from Gympie and Stafford Roads and the operation of the ventilation outlet station are seen as major potential contributors to increased noise levels. It is vital that acoustic design data and actual readings from similar tunnel projects are pursued to provide sound information on which to base future decision making.

Response

The modelling undertaken for the Airport Link Project is based on design data used for other tunnels and roadways around Australia and the world. The models used for construction and operational (traffic and ventilation) noise predictions are based on actual noise measurements.

Issue 8

Impacts of tunnel construction, namely vibration and subsidence, are of concern with respect to the DES swimming pool and the Woolloowin State School swimming pool and in other areas as well (i.e. Gallway and Federation Streets).

Response

A number of mitigation measures will be employed to avoid building (e.g. swimming pool) damage throughout the construction period. These include building condition surveys before and after construction and vibration

monitoring to alert the Proponent when vibration levels are approaching the levels that may cause damage so that alternative construction techniques can be utilised.

Through the predictive modelling to be undertaken prior to construction, the Proponent will be able to identify properties where the level of vibration would present a potential risk of nuisance, disturbance or even cosmetic damage to buildings. Where the predictive modelling indicates that construction vibration would impact on a property, the Proponent would be required to mitigate and manage the impact to the extent possible, and to undertake a comprehensive consultation program with affected interests.

Issue 9

Given schools operate five days per week for 40 weeks a year, the duration of the construction and the increased traffic post-construction is a significant issue for the Department. Long term mitigation as opposed to temporary mitigation during construction is deemed appropriate to ensure student learning is not impacted.

Response

The assessment and control of adverse noise impacts during the construction and operational phases of the Project, in the EIS³⁰, have been dealt with separately and by locations adjacent to worksites or surface connections. Where predictive modelling identifies potential noise impacts on adjacent properties, mitigation measures for both the construction phase and the operational phase will be investigated in detailed design and construction planning.

3.9.3 Operational Phase – Impacts and Mitigation Measures

Issue 1

Given that noise levels are proposed to be increased it is only reasonable that the most noise-mitigating barrier options be implemented (status-quo should be pursued as a minimum rather than the lesser plan level option).

Response

The EIS (Volume 1, Section 10.3.2) identifies several areas where monitored noise levels already exceed standards set by EPP Noise. In this scenario it is unreasonable to expect the Airport Link Project to mitigate noise levels back to the planning criterion because the Project is unable to have an effect on existing noise sources. Therefore the proposed mitigation measures in these areas are designed to maintain existing noise levels albeit noise levels in excess of planning standards. It should also be noted that maintaining status quo noise levels, that may be below the applicable planning levels, is not a requirement of the EPP (Noise) or the Department of Main Roads Code of Practice. Measures other than noise barriers may be considered as a means of avoiding the consequential impacts of high noise barriers (e.g. road surface treatments, building modifications). Such measures as building modifications would be pursued in consultation with relevant building owners.

Issue 2

The visual implications of noise barriers are likely to be significant in the vicinity of the Southern Connection and thereby also negatively impact the visual amenity of the area. Barrier heights of 7 to 8m at the

³⁰ Refer to EIS, Chapter 10, section 10.2.4 – Construction Impacts and Mitigation Measures, and section 10.3.2 – Operational Impacts and Mitigation Measures

north-western connection along Lutwyche Road would not be acceptable. Alternative noise mitigation measures would be required.

Response

During the detailed design phase of the Project, further predictive modelling for traffic flows and road traffic noise will inform the design and performance requirements for mitigation measures for road traffic noise. Proposed mitigation measures would be considered in terms of their potential impacts (i.e. accessibility, CPTED considerations, aspect and breezes, amenity, aesthetic considerations, cost effectiveness etc) and feasibility (e.g. can barriers physically be constructed etc). The EIS (Volume 3, Technical Report No 6 - Noise and Vibration, Section 5.11) provides a range of alternative mitigation measures in circumstances where noise barriers are considered either unreasonable or not feasible.

Issue 3

The noise of cars exiting the tunnel appears not to be considered or modelled in the EIS. Jet fans may cause significant noise disturbances to surrounding residents. Airport Link EIS indicates that adequate noise minimising should be instigated, but guidelines are not apparent nor is specific mitigation. This appears to be an oversight and these issues need to be addressed in direct consultation with the community.

Response

The noise impact of motor vehicles exiting the tunnels is considered and modelled in the EIS. Traffic noise has been identified as a component of the existing noise background in most areas of the study corridor.

The measurements of the existing noise environment are used as the basis for modelling the noise environment with the tunnels operating. The modelling of the noise environment with the tunnels in operation (i.e. with the noise of traffic exiting the tunnels taken into consideration) is discussed in the EIS (Volume 1, Section 10.3.2 on page 10-26) and more fully in Volume 3, Technical Report No 6 – Noise and Vibration, section 5 –Traffic Noise Predictions and Impact Assessment where proposed mitigation measures are outlined with respect to each impact.

The EIS Technical Study (#6) presented a range of model plots indicating predicted road traffic noise levels, including from the portals, across a range of traffic scenarios. The Technical Study went further to present road traffic noise levels with alternative acoustic screening measures. The EIS, in Chapter 10 (section 10.3.1), presented goals for road traffic noise, drawn from Environment Protection Policy (Noise), DMR Code of Practice – Road Traffic Noise Management and, for the ventilation station, goals from the BCC Noise Impact Assessment Planning Scheme Policy.

During the detailed design phase of the Project, reasonable and practicable mitigation measures will be considered. Ventilation noise is also addressed in the EIS (Volume 1, Section 10.3.2 on pp 10-39 and 10-40 and Volume 3, Technical Report No 6 – Noise and Vibration, Section 7)

Issue 4

The EIS refers to the use of open graded asphalt (OGA) as a possible surface treatment and reduction in speed as potential mitigation strategies for traffic noise impacts. These would only be acceptable where other strategies (e.g. noise barriers) are not appropriate, or not required. Main Roads Road Traffic Noise Management Code of Practice sets the standards as to what level of treatment is required.

Response

Open graded asphalt (OGA) is commonly used as a mitigation measure, in many instances in combination with noise barriers. It is agreed that reductions in vehicle speeds would only be considered after other more reasonable and feasible mitigation options (e.g. noise barriers, quiet road surfaces and building treatments) have been exhausted. The Code of Practice provides guidelines/options for road traffic noise control for State-controlled roads and does not apply to local roads or other roads.

Issue 5

With respect to the note in Technical Report 6 - Noise and Vibration to the effect that further examination of Kedron State High School should be undertaken to see whether the windows are normally open (as assumed) or whether they are air-conditioned and the windows kept shut the Department takes the position of the EPA's Noise Measurement Manual 3rd ed. 1 March 2000 which states "Measurements should be made in habitable rooms with doors and windows open or closed to represent typical 'worst case' conditions".

Response

The assessment has been based on the "windows open" scenario and therefore presents the worst case scenario.

This comment has been included as many educational facilities have rooms which are permanently closed for air-conditioning. In these instances it is common practice for noise assessments and corresponding mitigation design to take this fact into account. If air-conditioning has not been installed at Kedron State High School and classrooms are used with either windows open or closed, then the assessment should be undertaken for "open" windows (e.g. worst case).

Issue 6

The assessment that prevailing levels of traffic noise will mask construction noise is unacceptable as any increase in noise has the potential to impact upon the learning environment.

Response

Traffic noise does have the ability to "mask" other noise sources within our community however the degree of "masking" depends on many factors including the level of road traffic noise, the level of construction noise, when the noise is heard and where the noise is heard (e.g. inside a classroom). All of these factors will be considered in determining what noise mitigation measures will be employed to achieve a satisfactory noise environment at neighbouring noise sensitive locations such as places of education. The design of the Project must take into account, and be able to demonstrate satisfaction of the environmental objectives and performance criteria for operational noise. The environment criteria set out in the draft Outline EMP (refer to EIS Chapter 19) are intended to maintain the normal operations and conditions for every-day life along the Project corridor during both construction and operations. The criteria presented in the EIS (Chapter 10, section 10.2.3) specifically refer to noise goals for internal settings, such as school music rooms and teaching areas, school libraries and gymnasias.

Issue 7

The fan noise at the tunnel portal near schools raises concerns along with the disposal of pollutants.

Response

A preliminary assessment of fan/ventilation noise undertaken as part of this EIS indicates that such noise can be controlled to within acceptable limits. The control of mechanical (e.g. ventilation fans) noise is very well developed and very large reductions in noise emissions from such plant are achievable. Some noise attenuation

measures would be required for tonal variations in plant and equipment operations in the ventilation station at Clayfield, due to its proximity to residential properties.

The operation of fans in the roof of each tunnel near the portal is intended to induce reverse air flow to combat portal emissions. Noise attenuation measures within the tunnels (ie treatments of walls and roofs) as well as the walls of the portal ramps, are effective in mitigating fan noise. The Project will need to be designed to achieve the road traffic noise and ventilation fan noise goals set out in the draft Outline EMP (Operations) in Chapter 19 of the EIS.

Issues relating to potential air quality impacts have been discussed in section 3.1.6 and section 3.8 of this Supplementary Report, as well as in the EIS (Chapter 10) and the Technical Reports (No. 5a – Air Quality, No. 5b – Air Quality Health).

3.10 Flora and Fauna

3.10.1 Description of Existing Environment

Issue 1

Only endangered species are considered in the Flora and Fauna chapter of the EIS. What about rest of flora and fauna?

The fauna survey is considered to be very limited in terms of length. It cannot be considered to be a proper and professional field investigation so as to permit an expert assessment of the scope of species present and number of individual species occurring or impacted. The length and the scope of the survey were insufficient to be able to draw any substantive conclusions.

*The EIS omits entirely the presence of a highly significant and unique tree, which is situated in Kalinga Park on the Western side of Sandgate Road. Unique as it is the only pink flowering *E. tereticornis* in Clayfield. Forest Red Gum also provides a wonderful food source for many nectar-feeding birds. The loss of this tree to the local residents and urban environment would be very significant due to its age, value as a habitat tree and as an asset to the local and wider community.*

Response

The entire flora and fauna biodiversity of the study corridor from the on site surveys carried out for this study and from the comprehensive collections and records held by the Queensland Museum and Herbarium have been listed in the Appendices to Technical Report No. 7: Fauna and Flora in Volume 3 of the EIS. The entire flora and fauna have been considered in assessing potential impacts of the project and necessary mitigation measures.

The flora and fauna surveys undertaken for this Project were augmented by specimen collections and records held in the Queensland Herbarium and in the Queensland Museum that represent more than 100 years of collecting in the Brisbane area. Further long-term investigations were not considered necessary in light of the existing and extensive records.

The EIS Chapter 11, Section 11.1.6 clearly identifies *Eucalyptus tereticornis* as a species dominant in Kedron Brook at Kalinga Park including the tributary. The particular tree referred to is almost certainly the one identified by species name and referred to in the EIS Section 11.1.4 as bearing a number of scratches being inferred as the result of common possum species.

E. tereticornis (pink-flowering blue gum) is known throughout the Kedron Brook flood plain and the EIS (Table 11.4, 3rd entry) identifies a mature specimen 200m upstream of Gympie Road. It is a relatively common species

through the Kedron Brook green spaces. Pink flowering blue gum (*E. tereticornis*) are neither rare nor unique through the Brisbane area.

The collective significance of all the vegetation in Kalinga Park is acknowledged in the EIS and several mitigation measures are outlined to minimise impacts on the vegetation and facilitate the reestablishment of vegetation after construction.

Issue 2

The EIS fails to indicate that there is a strong occurrence of the native species of mangrove fern in Melrose Creek. The fauna survey did not record any grey-headed flying foxes despite apparently conducting a nocturnal survey, as it would be obvious grey headed flying foxes were present due to their noise. The loss of the fig tree in the eastern section of the Kalinga Park would have a significant impact on the habitat of the flying foxes.

Challenge the assertion that habitat condition at Sandgate Road is poor noting that the area is tidal and at times hosts native flora and fauna. Habitat values of 3 or 4 out of 10 for the Kedron brook tributary in the Eagle Junction area are disputed.

Response

The EIS (Volume 3, Technical Report No. 7: Fauna and Flora, Appendix A) records the occurrence of the mangrove fern, *Acrostichum speciosum*, in Kalinga Park. The claim that this species occurs in the Eagle Junction tributary to Melrose Park is not disputed. However, the vegetation of the Eagle Junction tributary is not threatened by Airport Link.

The grey-headed flying-fox, *Pteropus poliocephalus*, was not identified from nocturnal surveys carried out for the preparation of the EIS but rather the closely related black-headed flying-fox, *Pteropus alecto*, was identified at all five sites surveyed. However, *Pteropus poliocephalus*, a species listed as vulnerable under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*, was identified from Queensland Museum records as having been recorded from the study corridor in the past and likely to overfly the area (EIS, Volume 1, Table 11.6, on page 11-9). Because of the highly mobile nature of this species and abundant food resources and nesting habitat in the broader region the Airport Link Project is considered to have no potential to affect this species.

The basis for the assessments of in-stream habitats, presented in Table 11.9 on page 11-14 is attached to the Table in the form of a note. As is explained on page 11-11 of the EIS the in-stream habitat at Sandgate Road is considered poor because the riparian vegetation has been removed, because of the large carpark with its attendant runoff of motor vehicle detritus adjacent to the stream, and because of the high levels of man-made rubbish finding its way into this section of stream. These factors are not evident a little further upstream where Kedron Brook traverses Kalinga Park leading to the assessment of the in-stream habitat as 'good'.

The EIS (page 11-14) describes the Eagle Junction tributary of Kedron Brook as having generally poor habitat value due to the fragmented nature of the riparian zone, abundance of weeds and weir structure limiting aquatic fauna movement. This was qualified with a note that a small section at the lower end, however, had good riparian cover and provided good condition aquatic habitat. Again these factors are absent in Kalinga Park where the aquatic habitat is considered good. Thus the factors prompting the assessment are evident.

3.10.2 Potential Impacts

Issue 1

There are several areas of remnant vegetation within the study corridor. The fact that this Project is in a highly urbanised area, with little native vegetation remaining, should be a good reason to retain all the native vegetation possible. Removal of mature tree in the eastern section of Kalinga Park must inevitably have a significant impact on the wildlife because mammals, bats and birds use hollows in dead trees in that environment.

Response.

The EIS states that there are no areas of remnant vegetation in the study corridor that will be affected by construction of the Project. The Project generally will be below ground level in areas of remnant vegetation in the study corridor. Areas of vegetation that will be affected do not represent original vegetation. Nevertheless, the development of the reference design, including the siting and planning of the worksites around tunnel portals has sought to limit the effect on existing vegetation. The EIS requires a relocation plan to be developed and implemented if any arboreal mammals or bats are found living in trees that may bear nesting hollows in the eastern end of Kalinga Park.

Issue 2

We assert that any proposed landscaping will not in any way mitigate the impacts of loss of wildlife, urban amenity and natural community assets. To equate the impact of construction activity to current traffic noise and light is totally ludicrous.

The conclusion that “Overall, the project will result in long-term impacts on terrestrial flora and fauna at Kalinga and Ross Parks. However, this is not expected to be significant as local species are common and widespread across Brisbane.” is contested and it is clear that there will be long term and catastrophic impacts on the habitat, the environment and on all of the local community.

Response

The EIS (Volume 3, Technical Report No 7 —Flora and Fauna) has demonstrated that the species found in the vicinity of proposed worksites are common across the urban areas of Brisbane indicating that they are species well adapted to the environment in terms of noise, light habitat etc.

The construction phase of the Project is to be managed to standards much higher than would normally be the case for an urban road project, due to the location of the Project and the scale and intensity of the works proposed. For example, worksites will include large Tunnel Portal Cover Sheds to enclose tunnelling activities, with stringent noise level restrictions on night and day tunnelling and other construction activities and with controls on night lighting. With such controls as those set out in the EIS (Chapter 19, Draft Outline EMPs), it is reasonable to expect the predicted environmental effects of construction activities to have similar effects on fauna as does the current traffic noise and light in terms of their respective effect.

Issue 3

Concerned that the proposal will impact on significant vegetation and valuable community open space. Particularly significant vegetation runs along Gorman Street edge of Brook Road Park. This is one of the few park areas that has not been modified by previous flood mitigation works. A large stand of 'Remnant Forest Red Gums', Figs and other local tree species create a pleasant outdoor grassed area, contributing greatly to the park's recreational value. During construction these areas will be invaluable to local residents.

Response

The EIS (Volume 2, Sketch No EIS-GA-009) shows the alignment of the road tunnels in the vicinity of Gorman Street and Brook Road, including the worksite within which the tunnels will transition from cut and cover construction to driven tunnel construction. Because this worksite is located in the cleared ground west of the main vegetation along Gorman Street and near the end of Brook Road there are no surface works planned in the vegetation community of concern.

Due to ground conditions and the presence of groundwater in the Woolloowin area, tunnel construction in this location would be by way of driven tunnelling. Surface disturbance including vegetation loss, would be minimal.

A few trees in the cleared ground approximately 200m west of Gorman Street and in the direct path of the cut and cover tunnel alignment on the above mentioned sketch will be removed and replaced in the post-construction landscaping works by native species in areas adjacent to the tunnel alignment.

3.10.3 Mitigation Measures

Issue 1

The successful transplanting and translocation of existing mature tree specimens impacted by Project Works (at Kedron Brook and Kalinga Park) should be prioritised where possible over replacement.

Response

This suggestion has merit and will be taken into consideration in the development of the Landscaping and Revegetation Plan as outlined in the EIS (Volume 1, Section 11.3.1). Aboreal studies into the feasibility of transplanting these mature trees should be undertaken by the Proponent prior to the commencement of works involving their removal, disturbance or damage. The use of mature plantings is recommended in a number of locations in the construction areas.

Issue 2

Approvals may be required for marine plant disturbance at Enoggera Creek and for construction of a waterway barrier on Eagle Junction tributary of Kedron Brook. Any disturbance of marine plants should be minimised and where unavoidable, appropriate mitigation should be considered. Mitigation of impacts to marine plants, tidal lands and other fisheries resources to offset any loss of and/or disturbance to fish habitat is appropriate and would be a condition of any approval issued by DPI&F.

Response

The EIS (section 4.6.2 on page 4-48) acknowledges the need to seek appropriate development approvals for works that may disturb or remove marine plants. This requirement is reiterated in Table 19-6 on page 19-14 of the EIS where approvals likely to be required are summarised and again in the Draft Outline EMP (Construction) where the requirement for site rehabilitation is necessary if disturbance of mangroves cannot be avoided.

The Coordinator-General may impose conditions on the Project relating to these development approvals, or alternatively, DPI&F may impose additional conditions on such approvals once the details of the Project have been refined through detailed design.

Issue 3

We assert that the measures proposed under this section (flora and fauna) are grossly inadequate and the commitments are unenforceable. We further assert that the EMPs can't be adequately designed to allow for remedial work to ensure that the environment is properly safeguarded.

Response

The EIS recommended a range of measures to mitigate and manage impacts during both the construction phase and the operational phase of the Project, through the draft Outline EMPs in Chapter 19. The Coordinator-General, having regard to these recommended measures, and the issues raised in the submissions, may impose conditions on the Project. Such conditions may include requirements for the mitigation and management of impacts on the flora and fauna of the Project corridor. The Coordinator-General's conditions are binding and enforceable.

Considering similar large projects in urban areas elsewhere in Australia, the measures proposed in the EIS are considered to be 'leading edge' in their approach to impact mitigation and restoration.

Issue 4

EIS should address how mosquito breeding sites will be managed (refer Guidelines to minimise mosquito and biting midge problems in new development areas, Queensland Health, March 2002).

Response

Consultation with the Brisbane City Council revealed that there are no confirmed mosquito breeding areas being actively managed in the study corridor at present. The potential exists with large construction projects for unintentional ponding of rain water producing mosquito breeding opportunities. The Environmental Management Plan (Construction) (EIS, Volume 1, Section 19.6) has specific requirements for dealing with surface waters and for preventing erosion by those surface waters. These provisions would prevent the establishment of suitable environments for mosquito breeding. In the remotely possible event of the project construction works leading to the breeding of mosquitoes in the area action would be taken in line with the *Guidelines to minimise mosquito and biting midge problems in new development areas*, (Queensland Health, March 2002).

3.11 Land Use and Planning

3.11.1 Description of Existing Environment

Issue 1

There is continual reference in EIS to integration of land use and transport infrastructure planning. However, Council's ability to integrate land use planning outcomes with the Airport Link structures is limited given the advanced stage of design of the Project. It is not within the scope of the Lutwyche Road Corridor Neighbourhood Plan to mitigate impacts of Airport Link. All mitigation actions are to be carried out by or on behalf of the Proponent and be clearly identified and costed in tender documents as the proponent's responsibility (to carry out and fund).

Response

The submission incorrectly asserts that Airport Link is in an advanced stage of design development. There remains an opportunity to refine the Project design in response to the Coordinator-General's conditions, particularly those relating to urban design.

The matters raised in the submission regarding urban design and urban renewal have been noted and carried forward in the recommendations of this Supplementary Report.

The submission incorrectly asserts that it is intended that the impacts of Airport Link be mitigated through the Lutwyche Road Corridor Neighbourhood Plan. The EIS recommended a range of mitigation measures to address identified Project impacts in the Lutwyche Road corridor.

However, it is desirable to manage anticipated land use changes which occur as a consequence of the Project. Having regard to experiences elsewhere in Brisbane and Australia, local planning is required to manage land use changes occurring as a consequence of changes in the City's road transport network.

The EIS endorses the position stated in the submission that appropriate future land uses is to be determined by the Brisbane City Council in the context of planning for the whole of the study area. It is accepted that Council's ability to integrate land use planning outcomes will be influenced by the proposed reference design. However the EIS does not see this as limiting Council's ability to plan. The EIS views the Airport Link Project as providing a catalyst for developing positive opportunities for integrated land use and transport planning that would not be so apparent without such extensive infrastructure and investment.

The submission correctly states that the physical impacts of the Project should be mitigated through Project detailed design studies. The EIS, and this Supplementary Report, recommend the adoption and implementation of urban design principles in the detailed design of the Project.

Equally, there is no intention in the EIS that such a local planning process is to take on board (physical) mitigation of potential impacts of the Airport Link. Potential physical mitigation measures have been identified throughout the EIS and listed where relevant within the Draft Outline EMP. These mitigation actions will be identified and costed as part of the Project.

3.11.2 Impact Assessment

Issue 1

The acquisition of volumetric title beneath the Homemaker site at the Lutwyche Road/Newmarket Road intersection is of particular concern given the potential restrictions to development of their site. The State may consider resuming land. The issue with this option is that the entire frontage of the site would need to be set back. This would be costly and reduce the available site space and existing on-site parking.

Response

The north-bound tunnel in the reference design would be constructed as driven tunnel at a depth of approximately 30 – 32.5 metres under part of the Homemaker site on Lutwyche Road. As a general rule of thumb, development should not encroach within 15 metres of the crown of the tunnel (i.e. a maximum basement depth of about 15 metres could be achieved in this location). There is little potential, if any, for the Project to restrict development on the surface, having regard for City Plan requirements.

Issue 2

Access to the site of the Emergency Services Complex under the Kedron Brook Bridge is a concern as the road would be below the designated flood level.

Response

See the response to this issue in section 3.1.5 of this Supplementary Report.

The EIS identified the alignment of the cycle/pedestrian path under the Lutwyche Road over Kedron Brook bridge as a possible access route to the proposed ventilation station to avoid access off Gympie Road. The final design layout for ventilation station and vehicular access to it will be subjected to careful scrutiny in the detailed design phase of the project. At that time and in view of the need to rebuild the Kedron Brook build the need for flood immunity to vehicular access to the ventilation station will certainly be given appropriate consideration.

3.11.3 Mitigation Measures

Issue 1

What are the proposed land use patterns for remaining land and what bits are "left over" and will require additional work to integrate them into a cohesive urban fabric?

Response

As stated above the EIS endorses the position of the BCC submission that appropriate future land uses on land directly impacted by or surrounding the proposal is to be determined by Council and other stakeholders (i.e. State Government) in the context of planning for the whole of the study area.

3.12 Cultural Heritage

3.12.1 Description of Existing Environment

Issue 1

Concerns over loss of Windsor Police Station (Lutwyche Road), which is a significant heritage structure. The building is an example of smaller scale Edwardian public architecture in Queensland. It forms part of a precinct including Wooloowin State School and St Andrews Anglican Church. Recommends that a complete record of the site be assembled and preserved.

Mitigation options regarding the loss of several community facilities (i.e. former Police Station/ PCYC Headquarters) have not been explicitly detailed.

Response

The EIS (Volume 3, Technical Report No. 10a-Cultural Heritage, Appendix 2) contains a specially commissioned "Heritage Assessment of the former Kedron Park Police Station (now Police Citizens Youth Welfare Association State Office)". This detailed report includes an account of the history of the site and the buildings thereupon, a list of the archives, plans, departmental files and other reports pertinent to the site, an assessment of the physical condition of the buildings and an assessment of the significance of the buildings from aesthetic, architectural, historic, scientific, social and technological points of view. It concludes with discussion of heritage values against criteria for the State Heritage Register and the BCC Heritage Register. The conclusion reached is that "...the former Kedron Park Police Station does not appear to retain sufficient integrity to meet any of the criteria for entry in the Queensland Heritage Register....it is of sufficient heritage value to meet a number of BCC Heritage Register heritage values...".

On the basis of this report the EIS (Volume 3, Technical Report No. 10a-Cultural Heritage, section 8.1.5 Recommendation Five) recognises that protection of the QPCYWA headquarters building is not possible and recommends:

- i) Archival documentation of the buildings and the site; and
- ii) Relocation of buildings from the site where possible and where an appropriate alternative site can be found.

The feasibility of such relocation is outside of Environmental Impact Statement reporting. The former Police Station/QPCYWA headquarters is the only community facility directly affected by acquisition for the Project. The location of the QPCYWA is not important to its functioning, in that it is an administrative centre for state-wide services. Negotiations with the Queensland Police Service are ongoing regarding relocation arrangements.

3.13 Social Environment

3.13.1 Potential Impacts

Issue 1

The proposed alignment of the tunnels at the North-western Connection has a severe impact on the Emergency Services Complex, particularly the Gympie Road access, staff car parking and the Kedron Brook Building. Any proposals to address the impact that the structure will have on the property will further seriously affect the amenity of the current site and will impact the regard with which it is currently held as a sought-after workplace.

Response

See also the response to this issue in section 3.1.5 of this Supplementary Report.

The issue raised in the submission regarding the potential deterrence of employees from the DES site, which provides state-wide programs and services, has been expressed during the preliminary and on-going consultation activities concerning this site.

Negotiations with the Department of Emergency Service regarding access to land, car parking, access and amenity are being undertaken by the Proponent. This should be extended to consultation with DES regarding access and urban design measures during construction and operation.

Issue 2

Consideration of the broad range of factors during construction and operation that have potential to positively or negatively change the health status of workers, individuals and communities (i.e. demographic, social, environmental, lifestyle and behaviours, access to services, natural and built environment) will minimise impacts on communities affected.

Response

The EIS (Volume 1, Chapter 14) identifies demographic and social factors which influence community health, and amenity and connectivity values which contribute to healthy lifestyles. Section 14.5 identifies a number of design, urban renewal and environmental management strategies related to determinants of individual and community health.

While the EIS recommended a range of urban regeneration activities to address potential project impacts and consequences, it is also important that, over the construction period and then through the operations of the Project, relevant agencies continue to monitor and manage community health and well-being as part of normal portfolio activities.

Issue 3

The EIS fails to address the social impact of the changes in the environment that the Project will cause. The impact can be measured and the involvement of the local community in an assessment of these impacts would give some description for consideration of the impact. The cumulative psychological impact of the project and

this process has not been acknowledged. We believe that an EIS should make some effort to address this impact and the proponent should be required to address these issues through ongoing support to individuals who identify that they have been affected.

Response

A social impact assessment was undertaken for the EIS in accordance with the Terms of Reference prepared by The Coordinator-General. The social impact assessment was informed by consultation undertaken with the local community and key stakeholders to identify potential impacts and mitigation measures.

The potential for stress and anxiety to affect residents facing change as a result of the project was acknowledged in the EIS (Volume 1, Section 14.3.1). The study area has a good level of social infrastructure supply with respect to services assisting people experiencing stress and anxiety. The EIS includes strategies to mitigate potential impacts of change for people who need specific support to relocate. Mitigation strategies also include consultation and communication with residents in close proximity to construction works, to ensure their day to day life is not unduly affected by construction activities, and with facilities which support community well being, to ensure their functioning is not impaired by the project's construction.

Issue 4

The implications of the Airport Link being a tolled road need to be considered as part of the social impacts.

Response

The Terms of Reference did not require an assessment of the social impacts of road tolling. Negative impacts of tolling were not identified in community consultation for the project. Existing free routes will be maintained and benefits may exist in that congestion on many existing routes will be lessened.

Issue 5

A number of DES staff cycle to work and others access the Complex on foot. Students at Kedron State High School use the green spaces behind their school for access to and from to avoid the heavy traffic load on Gympie Road and Kedron Park Road. The safety of these groups of users will need to be considered in developing alternative access ways during construction.

Response

See also the response to this issue in section 3.1.5 of this Supplementary Report.

The potential disruption to access to Kedron Brook and the need for safe access to be maintained are identified in the EIS (Volume 1, Section 14.3.4.1). The draft Outline Environmental Management Plan (EIS, Volume 1, Chapter 19, Element Ten) requires that the Proponent "liaise with key stakeholders to provide and maintain safe and usable pedestrian and cycle connections with existing networks, public open spaces, community facilities, schools and public transport stations during construction and recommends early consultation with local residents and school communities regarding safety, access and amenity near construction sites.

Issue 6

Open space is critical to the well-being of communities and innovative, creative opportunities to provide new spaces have not been demonstrated.

Response

The Project has been designed to minimise impacts on parks and access to schools in the vicinity of construction. A number of community enhancements regarding parks, reserves, and community use of open

space are recommended as urban mitigations in the EIS (Volume 1, Section 20.6) to be developed and agreed in consultation with relevant agencies, including the Brisbane City Council. Such mitigations include:

- (i) The rehabilitation of Kalinga Park according to an overall master plan;
- iii) The creation of a landscaped wetland in place of the car park on Schulz Canal adjacent to the East West Arterial;
- iv) Enhancement of Melrose Park according to an overall master plan; and
- v) Enhancement of the Kedron Brook open space corridor to increase visual appeal, utility and environmental function.

In addition, the urban regeneration initiatives will review land use within the context of the Local Neighbourhood planning process under Brisbane City Plan, to enhance existing open spaces and to promote increased usage.

Issue 7

Object to the plans to construct a “smoke stack” at the end of Alma Road (fronting onto Sandgate Road], Clayfield as the unmanned stack building will promote unlawful activity in and around the building, including encouraging graffiti.

Response

See also the response to this issue in section 3.1.6 of this Supplementary Report.

The implementation of site security measures and ongoing maintenance and management of the ventilation outlet will reduce the potential for unlawful activity at the site. Detailed design development will also need to address principles for Crime Prevention Through Environmental Design (CPTED) to promote maximum security and safety in public areas adjacent to Airport Link surface infrastructure.

Issue 8

The proposed location of the north-eastern ventilation outlet will have a detrimental effect on the quality of life of local residents due to the proximity of the ventilation building and outlet to homes. The quality of our lifestyle will be diminished as there will be no escape from the view of the stack. Not only is this taking away our basic right to enjoy the current liveability of our street, but it is a huge psychological impact on our family and will ruin our quality of life. We object to this intrusion into our home and object to the liveability of our street being diminished and the quality of life that we currently enjoy being taken away from us. We object to the psychological impact being placed on our family and the health concerns.

The residents of Alma Road will be disadvantaged and inconvenienced by noise, dust and general disruption to our community and life-style during construction. Concerned that the surrounding neighbours' quality of life will be severely impacted for many years due to increase in noise, re-routing of traffic, construction vehicles, etc.

Response

See also the response to this issue in section 3.1.6 of this Supplementary Report.

The potential impacts of the north-eastern ventilation outlet on the social setting of nearby residents have been documented in the EIS³¹ and raised comprehensively in submissions. Such impacts are expected to include:

- (ii) A change in the visual setting of Alma Road due to the scale and height of the ventilation station and the ventilation outlet;
- vi) A change in the residential character of Alma Road due to the overtly non-residential character and visual impact of the ventilation station and ventilation outlet;
- vii) Concerns about air quality and community health impacts as a consequence of the dispersion of vitiated air from the 1.5 km length of tunnel connecting Kedron to Clayfield; and
- viii) Concerns about impacts on property values and the potential resale for people who want to leave as a consequence of the Project.

Mitigation measures are recommended in the EIS, and in the draft Outline EMP (Operations) regarding air quality and visual impact. The EIS, in Chapter 15, recommends a range of urban design principles to be satisfied in the design of the ventilation station and ventilation outlet at Clayfield. However, the facility is large and for some properties in Alma Road, will appear large and atypical of the residential character of the street.

To address community concerns to the extent reasonable and practicable, on-going consultation during the design and delivery of the Project is required. On-going consultation also is required regarding potential impacts on property values and resale potential. This consultative process should proceed if the Coordinator-General recommends the Project can proceed.

Potential impacts for the quality of life of local residents near construction works and project infrastructure were assessed as part of the social impact assessment (EIS, volume 1, Section 14.3.1). The EIS (Volume 1, Section 19.6) in the draft Outline Environmental Management Plan, recommends mitigation measures to manage potential construction and operation impacts for local residents and includes strategies to manage such things as construction noise, changes to local access, and construction vehicle access.

Issue 9

EIS should more fully address the social impacts of a considerable increase in traffic on Stafford Road. Such a large increase in traffic volume is likely to result in significant negative social impacts including: 1) Community severance and loss of community cohesion; 2) Creation of local access and connectivity issues; 3) Loss of amenity and suburb character; 4) Health issues associated with increased vehicle emissions and incidence of accidents; and 5) the cumulative psychological impact. Stafford has a high proportion of older residents. Older residents typically have great difficulty negotiating major roads and predicted increases in the volume of traffic on Stafford Road is likely to create an acute access barrier for many of these residents. A possible mitigating strategy is the inclusion of Stafford in the Urban Regeneration Framework.

Response

Severance and cohesion: The EIS (Volume 3, Technical Report 11 – Social Impact Assessment, Sections 3.1.1 and 3.2.2) identifies the potential for surface works, change of physical character and traffic disruption to impact on amenity and connectivity in Stafford Road and notes that expansion of the road profile will reduce visual connections and potentially neighbourhood interactions. The EIS (In Brief, Section 6.13.1) notes that these

³¹ Refer to EIS, sections 14.3.1 and 14.3.2.

values are already affected by heavy traffic volumes in Stafford Road and that the functionality of the activity centres in this area being steadily reduced by the increasing traffic flows on Gympie Road and Stafford Road.

For all people, including aged people, Stafford Road and Gympie Road now should only be crossed at controlled pedestrian crossings due to present pedestrian hazards associated with present and predicted traffic volumes and speeds without Airport Link.

Access and connectivity: Local access effects have been assessed with moderate effects identified in this area, and with the Project design shaped to minimise adverse impact. The EIS (Volume 3, Technical Report 11 – Social Impact Assessment, Sections 5.2 and 5.3) requires that the design of urban spaces offset amenity and connectivity values diminished by construction, notes the requirement for access through public spaces to meet DDA 1992 standards during both construction and operation, and recommends consultation with local residents and school communities regarding safety, access and amenity near construction sites.

Amenity and character: Due to increased traffic volumes associated with its function as a feeder route for Airport Link, the need for mitigation works along Stafford Road has been identified (EIS, In Brief, Section 5.4.2). The EIS (Volume 1, Section 20.5.2) recommends neighbourhood planning studies and community consultation to address circulation, access, connectivity and built form for sites along Stafford Road and east of Webster Road.

Health: The EIS (In Brief, Section 6.6.4) concluded that the forecast increases in daily traffic flows are predicted to lead to increased roadside concentrations of vehicle emissions along Gympie Road, south of Rode Road and Stafford Road, east of Webster Road. In all cases, the forecast roadside concentrations are below the goals for ambient air quality, even though such goals are not intended to be applied to such specific locations.

Issue 10

Given schools operate five days per week for 40 weeks a year, the duration of the construction and the increased traffic post-construction is a significant issue for the Department. Long term mitigation as opposed to temporary mitigation during construction is deemed appropriate to ensure student learning is not impacted.

Response

See the response to this issue in section 3.1.2, section 3.1.4 and section 3.9.2 of this Supplementary Report..

Issue 11

Community severance should be included as a potential social impact of the project. Reduced street connectivity [through creation of cul-de-sacs] combined with noise mitigation structures and other elevated structures proposed may increase community severance and social isolation in the vicinity of portals if not appropriately managed.

Response

The EIS (Volume 3, Technical Report No 11 – Social Impact Assessment) outlines the potential impacts and benefits of street closures and cul-de-sacs in Section 3.1.2, of changes to pedestrian access and cycle connectivity in Section 3.2.1, and of impacts on community cohesion (including physical separation of neighbourhoods) in section 3.2.3.

Mitigation measures for impacts on the social and physical environment near portals are outlined in Sections 14.5.2, 14.5.4, 20.4 and 20.5 of Volume 1 of the EIS.

Issue 12

While loss of existing residential services (including a number of affordable private rental properties) is acknowledged as inevitable, the Department of Housing has lead responsibility for coordinating implementation of the Residential Services Closure Response: Queensland Government Interagency Protocol. The protocol sets out roles and responsibilities to respond to residents affected by the closure of private residential services and assist in finding alternative housing/ support options. Department expects continued consultation with the project team regarding the resumption of these properties so timely response can be implemented for residents.

Loss of private sector boarding houses and affordable private rental is likely to have a significant impact on the supply of low cost housing in the area. Any loss of affordable housing within the study area would run counter to the SEQRP principles and would affect the Department of Housing's ability to respond to high need clients who require affordable housing located near high end use facilities. The Department of Housing expects that innovative solutions will be implemented to ensure that there is no net loss of affordable housing as a result of the project. Departmental officers will continue to work collaboratively with the project team to identify strategies to ensure there is no net loss of affordable housing.

Response

Consistent with the concern expressed in the submission, the EIS (Volume 1, Section 14.3.4) identifies the potential for both direct impacts and the potential for indirect impacts on affordable housing supply and notes that early stages of project planning will need to include assistance to some people in affordable housing dwellings.

The EIS (Volume 1, Section 20.5.3) indicates the objectives of a proposed initiative with respect to Affordable Housing, a high (early) priority for re-use of housing stock and a medium term (2006-2011) priority for redevelopment options, including increased public housing.

On-going consultation between the key stakeholders and the Proponent is critical to successful program implementation, particularly with regards affordable housing opportunities in the study corridor. However, the provision of affordable housing is beyond the scope of the Project. It is recommended that the Coordinator-General establish arrangements to support the *Residential Services Closure Response: Queensland Government Interagency Protocol*.

Issue 13

No consideration has been given to the burden, which Clayfield residents have already made to bear for the city in the name of transport. Residents are experiencing severe financial loss, ill health, worry, and the destruction of the quiet enjoyment of their homes. Unreasonable to have additional burden of the Clayfield ventilation outlet imposed in our midst when Alma Road residents are already "paying a huge price" for the benefit of road users throughout Brisbane.

Response

Equity in the distribution of the community benefits and social impacts is discussed in the EIS (Volume 1, Sections 14.3.4 and 14.4.4).

While benefits of Airport Link such as reduced congestion, facilitation of urban regeneration and better public transport are likely to be shared at both local and regional levels, activities giving potential rise to impacts such as removal of properties and changes in access arrangements would be experienced at the local level in neighbourhoods closest to construction activity. The focus of the recommended urban mitigations and the urban regeneration initiatives is on areas closest to the Project connections rather than along benefitted routes.

3.13.2 Mitigation of Social Impacts

Issue 1

Although the EIS raises a number of social values and key impacts with respect to the community, the mitigation measures proposed are extremely limited, are not costed over the life of the infrastructure and have not been resourced through any social infrastructure arrangement.

Response

The EIS (Volume 1, section 14.5) recommends investigation of a range of mitigation measures for identified social impacts including:

- ix) Design modifications
- x) Urban regeneration, renewal and capacity-building initiatives;
- xi) A place-making approach to local planning;
- xii) Community consultation from early stages; and
- xiii) Measures to minimise impacts with regard to amenity, community health and safety, sense of place, community cohesion, equity, accessibility, and affordable housing.

The EIS (Volume 1, section 20.3.2) identifies the need for links to land use planning, transport planning, neighbourhood planning and growth management strategies and specifies a number of program initiatives to be undertaken by both State and local government agencies, supported by certain works to be undertaken by the Proponent.

In particular the EIS (Volume 1, sections 20.5.2 to 20.5.5) recommends an urban regeneration process, which includes neighbourhood planning studies and consultation to address neighbourhood issues, affordable housing initiatives including potential for a development incentive scheme for community facilities and affordable housing, and employment and training initiatives. Redevelopment initiatives outlined include planning for open space enhancement, restoration of ecological value and urban design responses to enhance the public realm.

The Terms of Reference did not require costing of or funding arrangements for recommended mitigation measures pertaining to social infrastructure. While the urban mitigations recommended in the EIS have been costed, the recommended program measures have not. The intention is that relevant agencies note the potential impacts of Airport Link during both construction and operations, and commence program development, planning and budgeting to capture potential flow-on benefits.

3.14 Urban Design, Landscape and Visual Environment

3.14.1 Urban Design Principles, Goals and Objectives

Issue 1

Areas of significant cultural heritage and architectural value should also be included as elements for consideration under Landscape Values as opposed to only natural areas.

Response

Landscape and amenity values for the study corridor are described in Section 15.1.5 of the EIS. Landscape amenity also incorporates the values of cultural heritage and environmental and recreational opportunities, which are addressed in other chapters of the EIS.

The EIS includes an assessment of landscape elements and visual values within the study corridor and at key locations, including the Windsor heritage precinct incorporating the Windsor Memorial Park, Windsor Town Quarry Park, War Memorial and old Windsor Council Chambers. Other places of cultural heritage and architectural value that have been identified in the EIS (Volume 3, Technical Report 10 – Cultural Heritage) are not referred to in the context of Urban Design because they are unaffected by Airport Link construction.

Issue 2

While the stated design objectives are appropriate, several key MR objectives for road landscape and urban design should also be addressed by the EIS, including:

- *Provide a safe road environment for all road users (not only pedestrians and cyclists); and*
- *Provide sustainable landscape and urban design treatment that minimises ongoing maintenance requirements.*

Response

The urban design and landscape strategies address issues in a framework of criteria consistent with Australian best practice urban design and landscape standards, codes and practices for all mitigation measures.

Road safety is an important consideration for all aspects of detailed design development. The Main Roads guidelines should be considered in developing the landscape and urban design aspects of the Project. However, it should be remembered that such guidelines were established for ‘main roads’ often situated in transport corridors or rural areas. Some sensitivity to the long-established urban fabric and the proximity of sensitive receptors is required in urban design

With regards maintenance, the choice of plant species should be determined in detailed design to achieve safe traffic conditions, low cost maintenance and a pleasant urban setting. A maintenance regime which takes into account access requirements, cost over time, plant health and vigor etc. would need to be employed throughout the life of the project.

Issue 3

A lighting plan is required that is consistent for the entire precinct. The issue of lighting impacts, particularly associated with the construction phase, should be identified and mitigated.

Response

Lighting within the tunnels is discussed in the EIS on page 4-42 of Volume 1. These elements are to be included into the detailed designs to be developed in the next phase of the project. Similarly, lighting of the surface roads, bridges and adjacent areas will be further developed in the Detailed Design phase in line with appropriate standards for motorway and/or highway lighting.

The Draft Outline EMP (Construction) on page 19-17 of Volume 1 of the EIS includes an outline of the general requirements for construction. Included therein, with reference to worksites is the need to install and position night lighting, including security lighting, to avoid light spill onto adjoining premises, at intensities not exceeding 8 lux measured at the common boundary.

For some elements of the urban mitigation measures, distinctive lighting may be employed, without eroding the overall urban design outcome. The preferred approach is that lighting throughout the Project be consistent with an overall lighting plan, rather than be consistent for the entire project.

Issue 4

What is the scope of work beyond the transport infrastructure (including specific works by Brisbane City Council) to mitigate identified impacts and or further enhance the Project?

Response

The EIS recommends a range of mitigation measures to manage potential impacts of the construction and operation of the Airport Link Project. These relate to design modifications, physical infrastructure, urban design and landscaping treatments and environmental management measures.

The EIS also includes a framework for urban regeneration which seek to capture project benefits and manage the on-going change occurring in the study corridor, within a framework based in infrastructure planning and provision, and in a planning process founded on agency, stakeholder and community consultation. These include both program and redevelopment initiatives focusing on land use planning, employment and training, affordable housing and urban mitigation measures.

Issue 5

The EIS indicates planting to the perimeter of the Windsor ventilation site but no indication of the use or treatment within the site apart from the ventilation outlet.

Response

The EIS (Chapter 20, Figure 20-10) indicates that the rehabilitated worksite on the corner of Lutwyche Road and Federation Street, Windsor, will accommodate the ventilation outlet close to the tunnel portal.

The residual area of the Windsor worksite may be of sufficient size and of suitable geometry to permit its redevelopment for some active land use. Should the residual area not permit feasible redevelopment, then possible concepts for landscape treatment of the worksite should be identified, including planting groves of large trees and creation of new recreation open space to the northern side of Enoggera Creek. Detailed concepts for this site would be developed during the detailed planning phase of the Project.

Issue 6

The red structures in the median in each section shown on Figure 15-13 on page 15-29 of the EIS is unidentified – unable to comment on urban design intent. Proposed tree plantings do not comply with MR clearzone requirements. Boulevard treatments may need to be revised to ensure compliance. Little detailing on proposed roadside landscape planting is provided at this stage. However, there seems to be intent within the EIS landscape and urban design to provide highly structured subtropical landscapes with a predominance of Bougainvillea. Similar concerns regarding vine planting over structures generally. Much care will be required at design development to ensure the success of this approach under current water restriction conditions and to ensure that self sustaining vegetation and maintenance minimisation objectives are met. Maintenance access to planters in some areas would appear to require the complete closure of a lane to permit vehicle access.

Response

The red structures shown on the median in Figure 15-13 (EIS, Volume 1, Chapter 15) are 'art elements' intended to open the view north along Lutwyche Road as part of the development of that thoroughfare into a more inviting environment with central and lateral vegetation planting to soften the broad expanse of road surface and adjacent concrete.

The urban design and landscape strategies provide illustrations of how the corridor and the surface works might be treated if the reference design was to proceed. As alternative urban design responses may emerge from the

detailed design phase, the EIS and this Supplementary Report have recommended a number of urban design principles to be satisfied through detailed design.

The landscape design solutions seek to create water wise subtropical landscapes. The term water wise is used to cover all types of water sensitive urban design (WSUD) issues of subtropical landscapes from plant selection to on site water harvesting. Maintenance of these living structures will be necessary. The technical aspects are achievable and are commensurate with such an important piece of urban infrastructure. WSUD issues can be addressed through water harvesting off hard stand into water tanks located within the structure itself; water is reticulated to planters with solar powered pumps.

Similarly, the proposed vine coverage of surface infrastructure is one design option which could be implemented if the reference design was to proceed. Appropriate landscape design responses to the surface infrastructure will be developed and selected for their suitability to hostile conditions, attractive qualities and drought tolerance.

Issue 7

O'Connell Terrace will become a major pedestrian thoroughfare so (1) Setbacks to create wider pedestrian spaces should be considered, particularly near entrances to the RNA Showgrounds; (2) Awning cover should be provided where possible to allow for shaded all-weather connection between key public facilities; (3) Finishes should be of a high quality commensurate with its inner urban location.

Response

The concept of setbacks to create wider pedestrian spaces, particularly near entrances to the RNA Showgrounds is endorsed, however this is a planning and development control matter that will need to be addressed between Council and the RNA. As stated above, the EIS endorses the position of the BCC submission that appropriate future land uses, and associated development control provisions, codes etc, on land directly impacted by or surrounding the proposal is to be determined by Council in the context of planning for the study area.

Much of the design of O'Connell Terrace, including the provision or otherwise of all weather connections and high quality finishes is being provided under the NSBT works. Council is fully involved with the design and development of these proposed works. Airport Link will integrate design themes with the NSBT works for O'Connell Terrace in line with agreed urban design principles and objectives for the project as outlined in the EIS and further developed through the detailed design process.

Issue 8

Transparent noise barriers may not adequately mitigate headlight glare from raised structures into adjacent residential areas. Panelling may be more prone to vandal attack and increased replacement/maintenance costs. Road pollution may quickly diminish visual impact mitigation benefits provided by transparent panelling and regular cleaning of panels may be required. Maintenance to both sides will be difficult and ultimately costly due to elevation, requirements to close outside lanes and impediment created by proposed bougainvillea planting.

Response

The noise barriers, or some equally effective measure, are required to mitigate road traffic noise. Transparency has been suggested to reduce the visual impact of the motorway structures, in response to the height of the required sound barriers. If there is determined to be a need to reduce headlight glare then frosting, tinting or texturing of the transparent sheeting will need to be investigated. The potential conflict between the need for noise barriers and the potential for vandalism and graffiti to damage the barriers assumes that community expectations would lean towards a reduction in noise as being of greater importance. As a consequence

maintenance of these structures will be an on-going issue should vandalism occur, as is the case with other motorways in South East Queensland. Testing for appropriate transparent materials and coatings would be needed in the detailed design stage to ensure the intent is maintained. It is noted that should vandalism take place it would be taking place regardless of the choice of materials and finishes, whether opaque or translucent.

Issue 9

The rear of the tunnel portals indicated in Figure 15-53 on page 15-71 of the EIS appears to be devoid of any urban design treatment. Given the visual prominence of these features in the road environment, it is considered that these elements require more detailed design resolution for inclusion within the overall EIS landscape and urban design.

Response

This sketch of a possible Tunnel Portal treatment supports the Urban Design, Landscape and Visual Strategies for design intervention in response to engineering proposals, by creating themed urban design and visual treatments and integrating them with the existing environment of each key location. The treatments presented in the sketches depict surface textures which are local theme based and are not visually imposing or distracting as to make the rear of the portals a highlight in the drivers' visual field and also exacerbate its visual presence on the streetscape. Themes in textures are derived from local flora and fauna species and are subject to further detail at an appropriate stage of development. Also soft landscape treatment such as vegetation planting is proposed to visually soften the portal structure.

Issue 10

Mitigation works around the Southern Connection (including Bowen Hills) should: -1) Provide a high quality urban design outcome by promoting connectivity, legibility and safety; 2) Design overbridges, public art, noise barriers and transport infrastructure as visual contributions to the public realm; 3) Have strong commitment to sustainability and tropical design; 4) Have activate pedestrian interfaces with commercial and retail uses, 5) Create an active, friendly, well-lit and safe pedestrian environment; and 6) incorporate public art at key locations.

Response

The Airport Link Project endorses these design principles and objectives as clearly identified in the EIS (Volume 1, Section 15.2-Urban Design Principles, Goals and Objectives) and reiterated specifically in relation to the Southern (Bowen Hills) Connection in Section 15.3.1.

Issue 11

Landscaping requirements should include: (1) Large trees at key points (preferably Ficus), to reinforce Brisbane's subtropical character and provide a foil to the size of the transport infrastructure; (2) Water Sensitive Urban Design (WSUD) and on-site stormwater retention; (3) Widened footpaths and building setbacks; (4) Clumped informal street tree plantings consistent with a subtropical boulevard; (5) inviting, no glare hardstand areas. A detailed landscape and revegetation plan needs to be included in a final proposal to achieve the following:

- *Improved value of the waterway as an acknowledged wildlife corridor;*
- *Detailed revegetation plan;*
- *Link between revegetation plan and improved habitat available for native animals;*
- *Plan for continued water quality; and*

- *No net reduction in green space.*

Response

The EIS outlines a number of urban design principles for the study corridor as a whole and for key locations. These principles guided the development of urban design treatments and mitigation measures for the tunnel portals and surface infrastructure, and are consistent with the elements identified above. A detailed landscape and revegetation plan will be developed and provided during the detailed design stages of the project consistent with the approved urban and landscape design principles and objectives for the project. These principles are identified in the EIS (Volume 1, Section 15.2) and include provisions for most if not all of the elements identified in the submission.

Issue 12

Pedestrian and cycle connectivity require:- 1) Signage and wayfinding elements consistent with wider city signage; 2) Design and lighting in line with CPTED principles reviewed by Council and Qld Police Safety audits; 3) Limited driveway cross-overs to reduce pedestrian/cycle and vehicle conflicts along O'Connell Terrace.

Response

The principles for pedestrian and cycle connectivity are recommended in the EIS. Detailed design studies responding to the issues raised in the submission will be required prior to the commencement of construction. The matters raised in items (1) and (2) above are straightforward design matters, whereas the matter raised in item (3) needs to be balanced against the access requirements for properties along O'Connell Terrace. It is recommended in this Supplementary Report that O'Connell Terrace be investigated as part of an overall urban design master plan for Bowen Hills relating to the integration of Airport Link infrastructure with the local area. The Proponent should prepare this master plan, in consultation with the Brisbane City Council and key stakeholders, such as the Office of Urban Management, Queensland Rail, Queensland health, TransLink, Queensland Newspapers Limited and the Royal National Association.

It is noted that a similar master plan is required to be prepared in respect of NSBT infrastructure for the same location.

Issue 13

EIS does not adequately address the legibility of and access to Bowen Hills Station. There is a need to ensure that infrastructure does not compromise opportunities for improved station access, land use planning opportunities, integrated open space and access to pedestrian and cyclist paths.

Response

The EIS outlines a number of urban design principles, goals and objectives for the study corridor as a whole and for key locations, including Bowen Hills and Windsor. This includes the need to achieve a high functional amenity integrating pedestrian, cycle and movement networks and provide good connectivity and access to transport along and across Bowen Hills,

Connectivity options for east-west movements through Bowen Hills will be more constrained for pedestrians and cyclists where all proposed roads and ramps impact on existing road and open space networks. This will be relevant to the eastern end of Campbell Street, the western end of O'Connell Terrace and the northern reach of Enoggera Creek.

The position of Bowen Hills Station and the importance of retaining and enhancing connectivity between the station and the Royal Brisbane Hospital complex is recognised in Figure 15.11 (Bowen Hills Key Location Mitigation Measures), including recognition of the opportunity to provide pedestrian links from Bowen Hills Station to Royal Brisbane Hospital and other broad opportunities for integrated open space treatments and connectivity.

Pedestrian and cycle connection between the Bowen Hills Station and the Royal Brisbane Hospital, provided by the NSBT, would be maintained along O'Connell Terrace. The implementation of urban design measures for O'Connell Terrace, both through the NSBT works and subsequent Airport Link works will serve to make this a more attractive and function pedestrian connection.

Issue 14

A consistent lighting plan for the Bowen Hills/Lutwyche corridor precinct needs to be considered to tie the pedestrian connectors together and provide a discernible character.

Response

The need for a consistent lighting plan for the Southern Connection precinct is agreed. This will be developed for Project works, during the detailed design of the project in consultation with responsible authorities. The extent of lighting works is to be determined also during detailed design.

3.15 Economic Environment

3.15.1 Economic Property Impacts

Issue 1

Residents and local business owners adjacent to the new infrastructure should be provided with more liberal compensation and a Property Value Guarantee to protect against decreased property values shown to be due to the emplacement of Airport Link.

Response

Where land is acquired for the Airport Link Project, a person with an interest in the land is entitled to compensation in accordance with the *Acquisition of Land Act 1967*.

Issue 2

Listed property market values are primarily in industrial areas.

Response

The EIS (Volume 1, Section 16.3.3 – Property Market Trends) describes average valuations to demonstrate movements in the property market over the last 5 years. Data are provided separately for residential properties and for commercial properties in three geographic sectors of the study corridor. In the sector from Lutwyche Road at Kedron to Centro, Toombul there are so few commercial properties that an average valuation would be meaningless because there have been too few transactions in the last 5 years.

A comparative analysis of the associated property economic impacts of the project before and after construction was undertaken for the EIS, including for residential properties within the study corridor. This assessment concluded that different property types in the study corridor will attract different scales of impact depending upon current land use, with a reduction in traffic impacting positively on residential uses.

Overall, the assessment indicates a positive future benefit to the study corridor, due to the alleviation of traffic problems in the study corridor, and natural market forces and assistance from government to improve the on-ground streetscape of the study corridor. In the medium to longer-term, the assessment found that there would be an uplift in property values above the base line through this period.

Issue 3

Impact of Airport Link and Northern Busway Projects on business property, including adverse impacts on:

- Property value and ability to lease the premises;
- Visibility of the property from Gympie Road;
- Professional presentation of the property;
- Access to the property
- The conduct of business from dust, noise, vibration; and
- Future development

Recommendations include: 1) establishment of local business liaison officer; 2) compensation; 3) identification of practical measures to support local business operations particularly during construction.

Response

The issues raised in this submission relate to compensation matters rather than the economic analysis of the EIS. For Airport Link, compensation is paid in circumstances determined by the *Acquisition of Land Act 1967*.

With regards maintaining property access, detailed access plans will be required to be developed, in consultation with property owners and occupants, during the development of construction management plans and Project detailed designs. It is recommended that all reasonable and practicable measures be taken to maintain practicable access to properties during construction.

The approach to managing construction impacts, such as dust, noise and vibration, has been discussed extensively in the EIS (refer to Chapter 19 – Draft Outline EMPs) and throughout this Supplementary Report (refer to section 3.8 and section 3.9 in particular).

3.15.2 Economic Analysis

Issue 1

The economics of the Project has been severely handicapped by the intention to toll it. To the extent that the toll is cut, aggregate travel time savings, vehicle operating cost savings and air pollution benefits would rise. The result would be a higher nett present value and benefit cost ratio. This scenario would require consideration of alternative financing mechanisms for the project.

Response

The decision to proceed or not, with Airport Link, will be made once the Coordinator-General has completed his evaluation and advised of conditions that might be imposed, should the recommendation be that the Project can proceed. The decision to proceed or not will also be informed by tender arrangements relating to construction, operation and financing.

If the premise of the submission is correct, then the economic assessment presented in the EIS represents a 'worst case' scenario. This assessment found that the Project was economically feasible, despite the concerns raised in the submission.

In considering alternative financing mechanisms for the Project the impacts of taxes, charges and expenditure reallocations could have varying impacts on the economics of the Project. The CBA for the Project is a road user benefit based analysis rather than a financial analysis and hence did not cover financing, depreciation and taxation. These issues are not in the scope of the EIS.

Issue 2

Economic analysis model of the Project should include consideration of fuel prices. Fuel pricing and availability may be affected by the peak oil concept (i.e. that at some time in the future global demand for oil products including petrol and diesel fuels will outstrip known reserves) which may drive down the usage of motor vehicles using these fuels.

Response

The technology already exists for motor vehicle propulsion without fossil fuels but rather fuels from renewable sources. In the event of traditional fuels becoming scarce or unavailable the drive would be towards improvements in and much higher usage of motor vehicles driven by renewable fuels rather than the wholesale abandonment of personal transport and freight vehicles. The need for a road network in the urban environment is highly unlikely to disappear as has been recognised by numerous studies and the need to upgrade the network is equally unlikely to disappear.

Issue 3

There are ways of financing the project that would have positive effects on economic efficiency, including:

- *axing the Northern Busway and reallocating the proceeds to Airport Link to cut tolls would substantially increase the Airport Link's benefits and benefit/cost ratio;*
- *Proceeds of sale of the government's electricity and gas distribution business could be transferred to urban road projects like Airport Link; and*
- *Network-wide congestion pricing regime could be implemented in Brisbane to reduce congestion costs directly.*

Response

The economic assessment in the EIS was undertaken in accordance with the terms of reference for Airport Link. The scenario presented in the submission was not part of the Terms of Reference.

Issue 4

A note as to the implications of the negative figures for motorways in Table 16-18 would improve clarity. Review of the EIS could not find analysis to substantiate the estimated environmental benefit in the order of \$11M referred to in the In Brief. Clarification would be beneficial regarding road traffic noise being improved by easing congestion as with reduced congestion, and increased average vehicle speeds, traffic noise may increase.

Response

Tables 16-18 and 16-20 (EIS, Volume 1) presenting findings on present values of savings of Vehicle Operating Costs and Road Safety benefits on various classes of roads due to the introduction of the Airport Link Project.

As a new motorway is being introduced to the road network where none existed before all vehicle operating and road safety costs on the motorway will be new costs (i.e. the opposite of savings) and are thus shown as negative values. However, the EIS (Volume 3, Technical Paper 13 – Economic Impact Analysis, Figure 4.4) shows how the extra VOC due to introduction of the motorway (below the line) is more than offset by the savings (above the line) effected on other classes of roads.

The EIS (Volume 1, Section 16.4.3 Results – Environmental and Externality Benefits on page 16-32) provides a full explanation of the process and the thinking involved in arriving at a figure for the Environmental Benefit of the Airport Link Project. The dollar value of Environmental Benefits thus arrived at, \$84, 650, 045, is included in the Present Value Benefits which is used in Table 16-13 (EIS, Volume 1) to calculate the Net present value and Benefit Cost Ratio.

All noise modelling presented in the Airport Link EIS has been undertaken at the "posted" traffic speeds (worst case) not actual average speeds. This is common practice in the acoustic industry. Moreover, the EIS (Volume 3, Technical Paper 13-Economic Impact Analysis, Table 4.13) clarifies the point made in the In Brief that the removal of a large number of motor vehicle trips from the surface roads to tunnels will significantly reduce surface road noise generation except in the vicinity of the portals for connections to the surface road network.

Issue 5

The economic sensitivity analysis should include higher and lower discount rates than the base rate of 6.8%. A higher rate (i.e. 8%) would have resulted in a negative nett present value and a benefit/cost ratio below one. A case could be argued for a higher rate because it would be closer to the social opportunity cost of capital. What is the rationale behind the use of a social discount rate of 5.5% in Table 16-12?

Response

Queensland Treasury advised the real base discount rate of 6.8% was to be used for the Airport Link Project to reflect the private benefit infrastructure that is entirely or substantially funded by users of the infrastructure. Queensland Treasury's previous Project Evaluation Guidelines (released in February 1997) prescribed a real rate of 6% for the economic analysis of all projects. In the advice, a lower discount rate of 5.5% real reflecting the social rate was to be used in modelling the lower sensitivity of the Airport Link Project. This discount rate of 5.5% is only used as the lower end of the discount rate range in accord with a social infrastructure project that was intended to be paid for by the general taxpayer as opposed to the immediate user.

Under the modelling assumptions, the setting of a higher discount rate of 8% for the upper sensitivity would return a marginally positive NPV of \$56m and BCR of 1.0 (or 1.03 to the second decimal point) compared to the project discount rate of 6.8% returns a NPV of \$131m and a BCR of 1.1. The differences in the results are very marginal. Notwithstanding, the CBA results should be considered as a guide to the decision making only since a number of other major costs and benefit areas including property impacts, social impacts, externalities and alignment to regional planning cannot be fully measured (i.e. given a dollar value) in the CBA process.

The social rate was calculated by Queensland Treasury by taking the long term GDP growth rate, and adding a factor of 1.5%. The 1.5% is aimed to capture catastrophe risk and individuals' preference for consumption now rather than later, on the assumption that no change in per capita consumption is expected. The Office of Economic Statistical Research (OESR) advised that the long term gross state product growth rate for Queensland over the next 30 years could reasonably be estimated at 3.5 to 4%. This results in a social growth rate of approximately 5.5%.

3.16 Hazard and Risk

3.16.1 Flooding and Drainage

Issue 1

The flooding investigation does not clearly state if ultimate flows have been modelled. The studies mentioned (i.e. the Kedron Brook Flood Study 1995) are outdated due to change in upstream land use. Further information on how local flooding will be mitigated needs to be addressed as the Kedron State High School has been subjected to local flooding in the past. The report does not include information regarding the Gympie Road crossing over Kedron Brook.

Response

The Kedron Brook Flood Study, whilst prepared in 1995 assumed ultimate catchment development in accordance with Council's land use plan.

The effects of increased urbanisation are reflected in the design event discharges used for the Airport Link Project. A key design criterion applied to Airport Link is that the works must have no adverse flood impacts on any other property arising out of rainfall events up to and including a 100 year ARI design rainfall event. Therefore, the Gympie Road crossings have been designed such that peak flood levels upstream and downstream of Gympie Road will not be worsened as a result of their construction.

At the detailed design stage, local drainage infrastructure will be included in the design of the surface works to meet the requirements of the Queensland Urban Drainage Manual and Brisbane City Council's Subdivision and Development Guidelines for major and minor storms. A further key design criterion being applied to design of the project is that it must not adversely affect the hydraulic performance of any existing drainage infrastructure.

3.17 Draft Outline Environmental Management Plans

3.17.1 Monitoring, Auditing and Reporting Strategies

Issue 1

Proponent should monitor $PM_{2.5}$ in addition to PM_{10} particles on a daily basis in the vicinity of construction sites for the duration of surface works or in response to complaints.

Response

See also the responses to this issue in section 3.9.2 of this Supplementary Report.

Air quality guidelines for construction of Airport Link are specified by the Queensland EPA in EPP(Air) 1997. The current goals for construction air quality, outlined in Schedule 1 of EPP (Air) relate to PM_{10} and to total suspended particulates (TSP). Schedule 1 of the EPP (Air) refers to airborne particulate material under PM_{10} , of which the $PM_{2.5}$ particulates are a component.

Issue 2

Will there be noise pollution monitoring?

Response

The EIS recommends that a noise monitoring procedure be developed and implemented to support the achievement of the environmental objectives and performance criteria, and to demonstrate compliance, or otherwise, with the relevant construction noise goals established in the Construction EMP.

The EIS and this Supplementary Report recommend monitoring of construction noise be undertaken adjacent to a number of noise-sensitive receptors around the surface worksites.

3.17.2 Outline EMP

Issue 1

The EMPs and any subplans (i.e. Cultural Heritage, Traffic, Odour etc) need to be supplied by the Proponent to the EPA or appropriate Government agency to provide a realistic opportunity for assessment and consultation should any impact be anticipated.

Response

Detailed EMP sub-plans will be prepared by the Proponent for construction and will be provided to the EPA prior to their finalisation. The Proponent should consult with the EPA and any other relevant agency or stakeholder in the preparation of such EMP sub-plans. Agencies should participate in the consultation process in a timely manner to enable their reasonable portfolio views and requirements to be reflected.

3.17.3 Draft Outline EMP (Construction)

Issue 1

The EMP (construction) needs to allow for measures to avoid or mitigate and manage impacts on the amenity and environmental conditions in the vicinity of work sites (including large trees, bird life, open public spaces and adjacent waterways), including night time activities.

Response

Recommended management measures are outlined in the draft Outline Environmental Management Plan (EMP) (Construction) included in Chapter 19 of the EIS. The purpose of the draft Outline EMP is to set out the project commitments to avoid or minimise potential impacts of the project as identified in the EIS, including the identification of environmental aspects to be managed and how environmental values may be protected and enhanced.

Detailed EMPs will be prepared by the Proponent for construction and review by the either the EPA or another agency acting within its portfolio interests. The EMPs will need to include, but not be limited to,

- Mitigation measures which address the environmental objectives and performance criteria of the draft Outline EMP included in the EIS; and
- Any conditions imposed by either the Coordinator-General's evaluation report or other agencies under other approvals.

Mitigation measures outlined in the draft Outline EMP seek to manage a broad range of construction impacts in the vicinity of worksites, including hours of work, traffic management, noise and dust, vibration, and potential impacts on open space, flora and fauna and waterways. The draft Outline EMP also includes requirements on the Proponent for monitoring, auditing and reporting to ensure that the mitigation measures are implemented or adhered to.

Issue 2

What obligations are in place to ensure that the Proponent adheres to the noise mitigation (and air quality) measures during construction (i.e. bonds)?

Many of the Performance criteria in the Draft Outline EMPs should be more measurable.

Response

The Coordinator-General may impose conditions on construction of the Project relating to a wide range of impacts, such as noise and air quality. The Coordinator-General may also impose conditions requiring the preparation of comprehensive EMPs and EMP sub-plans for the construction phase. Such conditions are binding and enforceable under the *State Development and Public Works Organisation Act 1971*.

The environmental objectives and performance criteria for the Airport Link Project establish the expectations for construction performance necessary to meet community expectations and environmental obligations. The 'measurable' elements of the environmental management framework are the mitigation measures set out in the draft Outline EMPs in Chapter 19 of the EIS. These would provide the nexus between the environmental management framework recommended in the EIS and the conditions imposed on the Project by the Coordinator-General.

Issue 3

The Traffic Management Plan for construction will need to ensure that the spoil haulage route does not impact on the annual Ekka or other events which may require closure of Gregory Terrace.

Response

The EIS (Chapter 19.6, page 19.18) outlines the requirements of the EMP in respect of traffic and transport during construction. Among several identified mitigation measures, one specifically required in the Traffic Management Plan is the control of heavy vehicle movements to avoid interference with major events, such as the annual show at the RNA Exhibition Ground. The Proponent will be bound to consult with the RNA and other relevant stakeholders to develop plans to cope with RNA requirements during the construction phase.

3.17.4 Draft Outline EMP (Operation)

Issue 1

The height limits for development in proximity to the ventilation stack contradict the SEQ Regional Plan targets for population growth.

Response

Any restrictions placed on building heights to ensure efficient dispersion from the ventilation outlets are unlikely to have a measurable effect on population growth because they impact a very small area. Furthermore, the SEQ Regional Plan does not specify either building heights or population targets for small areas (i.e. areas within local government areas). That task is performed by local growth management strategies and local planning.

Issue 2

It is recommended that Incident Management Plans be developed for the full range of potential emergencies.

Response

The Draft Outline EMP (Operation) on page 19-40 of the EIS requires that the Airport Link Operator develop emergency incident management response procedures in consultation with Emergency Services (Police, Fire, Ambulance).

3.18 Urban Regeneration

Issue 1

Framework for urban regeneration not in the EIS TOR as compared with the requirement for urban design (section 15). Section 20.6 recommends that works be included but they have not been costed.

Response

The urban mitigation works recommended in Section 20.6 of the EIS have been costed within the Project. On-going program initiatives were developed from a consultative process involving relevant agencies and will be to be factored into agency budgets and plans over the next 5 year period.

Issue 2

What is the scope of work beyond the transport infrastructure (including specific works by BCC) to mitigate identified impacts and or further enhance the project? Expectations of additional Council works to further enhance connectivity, in order that these works may be considered in future budget allocations.

Response

The EIS includes a framework for urban regeneration which seeks to capture project benefits and manage the on-going change occurring in the study corridor, within a framework based in infrastructure planning and provision, and in a planning process founded on agency, stakeholder and community consultation. These include both program and redevelopment initiatives focusing on land use planning, employment and training, affordable housing and urban mitigation measures.

Program initiatives would be delivered through existing policy-based programs of the Commonwealth, State and local governments. These relate to the delivery of tangible program outcomes and would need to be:

- Consistent with program objectives and performance measures;
- Appropriately ‘queued’ in the budgeting process for timely implementation and agency support;
- Relevant to the Airport Link Project for agency support and possible sharing of project resources; and
- Delivered equitably to avoid criticism of public resources being re-directed for project benefit.

Redevelopment initiatives would seek to capture the benefits of potential real estate windfalls resulting from implementation of the Airport Link Project. Redevelopment initiatives could be delivered through amendments to City Plan that offer incentives to the private sector to provide community enhancements.

The EIS (Volume 1, Chapter 20) identifies potential opportunities for synergy between the Airport Link Project and State and Council work programs, however there is no implied compulsion for further budget allocations.

3.19 Cumulative Impacts

Issue 1

Chapter devoted to cumulative impacts is very much orientated towards cumulative economic impacts which are wholly positive. To provide greater balance to the cumulative impacts section, it would be appropriate to also include statements relating to the potential negative social impacts of Airport Link, including Airport Link could contribute towards social exclusion by accelerating loss of affordable housing, displacing existing residents, and negative impacts on community cohesion and social infrastructure over time.

Response

The social impacts listed in this submission have been dealt with in the EIS (Volume 1, chapter 14-Social Environment) and relate to Airport Link only. The Cumulative Impacts Chapter (EIS, Volume 1, chapter 21) deals with the relationships of Airport Link to other projects and how the impact of Airport Link may be altered by virtue of its scope, timing, location etc. relative to other projects.

Issue 2

Consideration should be given to the cumulative impacts from haulage transport on the road network for the transport of construction spoil, waste and contaminated material as well as construction haulage traffic from other major projects (i.e. NSBT). Construction traffic management plans should provide mitigation strategies to address the cumulative impacts of all road construction and major development projects (i.e. Northern Busway, NSBT, Gateway Upgrade/Deviation Project, Hamilton Northshore urban renewal project, planned development for Brisbane Airport (including the parallel runway) and surrounding land (including matters addressed in Chapter 21 - Cumulative Impacts).

Response

The potential cumulative impacts on the road network due to construction haulage traffic were considered in the EIS and are discussed in Chapter 21 of the EIS (page 21-22).

The EIS identifies the need for a comprehensive approach to construction traffic management given the wide range and significance of major projects in northern Brisbane, including Airport Link and the Northern Busway. The EIS recommends that a co-ordination committee be established by the Coordinator-General, comprising the Department of Main Roads, Queensland Transport, and the Brisbane City Council to address the coordination and management of construction traffic and transport network performance during the construction phase.

3.20 Conclusions and Recommendations

Issue 1

Four construction work sites are identified but there is no further discussion of the Clayfield site.

Response

The five worksites for the project are identified in Chapter 4 of the EIS (Figures 4-11 to 4-15).

Issue 2

Coordinating committee for urban regeneration for coordinated delivery of programs indicates that urban regeneration is separate to the project yet Chapter 20 recommends that urban regeneration be undertaken as a part of the Project. It seems that better delineation between what is urban design and what is urban regeneration needs to be made so the scope of works is made very clear as what is in a potential contract and what is not.

Response

The Project includes a range of urban design and landscaping treatments to mitigate potential impacts of project works on urban centres, connections, urban character, visual values and landscape elements. These include such things as urban design treatments to minimise the visual impact of surface infrastructure, landscaping of open space areas impacted by project works, and reinstatement of pedestrian and cycle connections. These measures would be delivered as part of the Project works.

Urban regeneration initiatives seek to capture the potential Project benefits and manage the on-going change occurring in the study corridor within a framework based in infrastructure planning and provision, and in a planning process founded on agency, stakeholder and community consultation. These include both program and redevelopment initiatives focusing on land use planning, employment and training, affordable housing and urban mitigation measures.

Program initiatives would be delivered through existing policy-based programs of the Commonwealth, State and local governments. Land use and redevelopment initiatives capturing the benefits of the Airport Link Project could be delivered through amendments to City Plan.

The urban regeneration framework includes a number of urban mitigation measures that are recommended to be provided as part of the Project works that are required to address the project impacts during both the construction and operational phases. These are outlined in Section 20.6 of the EIS.

3.21 Community Consultation

Issue 1

Consultation process was flawed and not in line with Queensland Government's guidelines for community engagement. Important information (i.e. height and air quality impacts of vent outlets, height of ramps at Kedron, noise impacts) were omitted from the project newsletter. Only people who read the EIS would discover the height of vent outlets and air quality in Kedron would worsen.

Response

The submission correctly identifies the EIS as the principal source of information about the Airport Link Project and highlights the role of the consultation process as one of information-sharing. However, the submission incorrectly states that the consultation process was flawed as a consequence of not placing all Project details in a newsletter.

The submission also over-states the impact of the Project on air quality in Kedron. The predictive modelling undertaken for the EIS indicates that for most of the parameters, the changes in air quality in Kedron are very small, and would have very small to negligible impacts on community health.

Written information provided through the community consultation process included EIS In Brief and the EIS, as well as project newsletters, display posters, and website information. These documents were aimed at different audiences and provided varying levels of information about the project. The aim of the Project newsletters was to provide an update on the progress of the EIS and Project design investigations, and notify ways in which people could find out more about the Project.

In addition to the publication and distribution of written material, a range of consultation activities were undertaken as part of the EIS investigations to allow people to learn more about the project and provide input to the preparation of the EIS and the development of the project reference design. These included:

- Public displays at ward offices, Council libraries, electoral offices, and Council offices within or near the study corridor;
- Community information sessions and staffed library displays, which provided opportunities for community members to find out more about the project and speak one-on-one with members of the project team
- Staffing of a 1800 freecall project information line and email address, to enable members to provide input and obtain information on the project;

- Establishment of two community liaison groups and one local business liaison group comprising representatives of community organisations in the study corridor;
- Briefings to local neighbourhoods near to proposed surface infrastructure and construction works to discuss issues relating to Airport Link that were relevant to their local neighbourhood;
- Establishment of a project website to provide information on the EIS, project design, traffic and transport studies and community consultation activities; and
- Briefings to a range of community, industry and government stakeholders to provide information on the project and to identify any specific issues or concerns for consideration in the EIS investigations and development of the project reference design.

The consultation process was never intended to replace the EIS with its presentation of the Project design and impacts as the primary source of Project information. The consultation process was highly successful in bringing a wide range of information about the Project to a large segment of the Brisbane community, and most importantly, to people living in and near the study corridor.

Issue 2

The Queensland EPA appears to be an omission from the list of state agencies consulted (referring to page 3 of the EIS In Brief), particularly for such a significant project.

Response

The Environmental Protection Agency (EPA) is listed on page 1-9 of Volume 1 of the EIS as among the stakeholders and agencies who were consulted on various appropriate aspects of the EIS and made significant contributions. All identifiable stakeholders and relevant agencies were offered project briefings at different stages of the EIS process and the list in the EIS In Brief (page 3) is of those stakeholders and agencies that accepted invitations for briefings.

Issue 3

There appears to be limited discussion during community consultation of air quality. Exploring negligible impacts of the Project on human health as part of community consultation may be an effective strategy rather than weighting the focus towards physical mitigation treatments.

Response

Air quality was and remains an important community issue during the preliminary and formal consultation processes conducted in support of EIS preparation.

Information on the air quality investigations undertaken for the EIS, including on public health, was provided through a range of community consultation activities, including project newsletters, display material, stakeholder briefings and in discussions with the project team at community information sessions and staffed library displays.

The technical reports for both air quality assessment and the health risk assessment were made available for inspection at the display locations, as well as being freely available on the internet and through the freely available compact disc (CD) which contained all information comprising the EIS.

3.22 Issues Relevant to Volume 2 of the EIS

Issue 1

While there are typical cross sections for tunnels and transition structures, a typical road cross section is not apparent. A typical cross section drawing should be provided for Gympie Road and Stafford Road to depict accommodation of predicted traffic volumes to 2026 and pedestrian/cycle facilities (where provided) rather than rely on the Urban Design treatments.

Response

Typical cross-sections have been provided for infrastructure throughout the Project where the cross-sections provided are representative of an appreciable portion of the proposed road system.

Where cross-sections are rapidly changing along the roadway, principally near tunnel portals and on surface feeder roads it is not feasible to provide all the diagrams necessary for a clear picture of all the different cross-sections that will be involved. Cross-sections for specific areas, including Stafford Road and Gympie Road, would be developed during the detailed design phase of the Project, in order to gain approval to connect with a State road. The planning layouts included in Volume 2 of the EIS indicate the lane-widths, shoulders, centre barriers, verge, and clearance to property boundaries with other dimensions and clearances being developed in the detailed design phase of the Project.

Issue 2

An allowance for on road cyclists is to be made within the Gympie Road, Stafford Road and Sandgate Road corridors. It is not clear if these provisions have been made. The works must allow for bicycle movements through all intersections and high quality connectivity between existing and future bicycle facilities.

Response

Provision for movements through intersections would be made as per AUSTRROADS 14, including setting kerbs back at islands. No other cyclist provisions have been allowed for in the reference design due to the significant property implications that would be associated with these works. Furthermore, this is a matter more appropriately resolved during the detailed design phase of the Project, assuming the issue of land requirements is resolved beforehand.

Issue 3

Pedestrian movements at Sandgate Road and Airport Link (East-West Arterial) have not been fully detailed. It is unclear if the phasing and green times of traffic signals at Gympie and Stafford roads would provide appropriate provisions for pedestrian movements. The works must allow for pedestrian movements through all intersections and provide connections to the existing footpaths.

Response

All pedestrian movements have been provided for with adequate safe refuge for instances where they cannot cross the road in a single movement or phase. The SIDRA analyses of intersections has considered pedestrians with adequate green time to cross intersections. The level of detail required is not necessary at this stage in Project development. Detailed design will need to meet appropriate standards in terms of pedestrian and cycle links in these locations.

Issue 4

Access to private properties and businesses need to be maintained. Loss of directional access needs to be identified along with alternative routes.

Response

All accesses to properties that are not being acquired as part of the Project have been maintained. Effects of the Airport Link Project on local access routes are discussed in the EIS (Volume 1, section 4.2.5 Surface Roads on pages 4-6 to 4-14) where any changes to local access are identified along with proposed alternative routes.

Issue 5

The EIS needs to address the potential for an undesirable weave from the outbound traffic from Airport Link attempting to cross Gympie Road lanes to Broughton Road. Broughton Road has been identified in the traffic modelling as having a high rat-running potential impacting on three local school precincts.

Response

Line-marking in the detailed design phase would extend the unbroken line through to Broughton Street which would prevent the undesirable weaving conditions. Access to Broughton Road can be achieved via a number of local streets. If during operation this measure does not prevent the undesirable weave access from Gympie Road to Broughton Road may need to be closed.

Issue 6

The diverge point onto Airport Link (East-West) from Gympie Road is close to the intersection with Stafford Road. The EIS needs to address the potential for late weaves entering into the Airport Link (EW) access due to its close proximity to the intersection.

Response

The detailed design would develop road geometry so that traffic from Stafford Road would enter the middle of Gympie Road thus reducing the need to weave across multiple lanes. Late weavers would be controlled with appropriate line designation signage along Stafford and Gympie Roads.

Issue 7

The current proposal to lane drop the right lane on Stafford Road heading west bound against an overpass wall with no option for run out is not acceptable. Also two lanes west bound are needed between Swan Street and Rose Lane to match the ultimate five lane configuration on Stafford Road.

Response

The line marking would be adjusted in development of the concept design to have a left hand merge as opposed to the proposed right hand merge. The concept design will need to be approved by Queensland Department of Main Roads for connections with a State-controlled road.

Issue 8

Left turn slots at intersections need to be provided and should be of a length to be clear of the 95 percentile of back of queue for the through movements.

Response

This has been considered over the entirety of the Project. The majority of left hand turn slots within the Project are of sufficient length. An improved queue length for left hand turn lanes is required at Sandgate Road turning onto the East-West Arterial, as this location is constrained by the AirTrain pier locations.

Issue 9

The speed environment on the straight alignment of control NSBTF1 between CH 150 and CH 450 is inconsistent with the speed capacity of the curve commencing at CH 450. The vertical alignment accentuates the potential for accidents in this location. The EIS needs to address this road geometry.

Response

Road Geometry in this area was designed to conform with the NSBT design. On the advice of this submission further consideration will be given to this matter in the detailed design development.

Issue 10

The vertical crest curve on NSBTE1 at CH 306 hides the common tangent point for the reverse curves heading towards Mayne Road. In addition, the change requirements for super elevation cross over between reverse curves over the crest will require the super to be rolling out as traffic is midway through the tight horizontal and vertical curves. The EIS needs to address this road geometry.

Response

The road geometry has been modelled and designed to facilitate the development of a reference design. This crest curve will be further examined and considered in the detailed design development.

Issue 11

Sight distances to diverge points need to be checked for compliance with standards.

Response

Sight distance calculations have been performed for all parts of the Project and discussed and agreed with QDMR (Engineering and Technology Group). Furthermore QDMR tools, including VEHSIM, were used to model and assess sight distances for compliance with QDMR requirements. It is noted that the approval of the chief executive, Main Roads, is required where the Project connects with a State-controlled road.

Issue 12

Horizontal and vertical curve combination fails to meet Road Planning and Design Manual standards (Chapter 11 Horizontal Alignment). The EIS needs to address this road geometry.

Response

The design of this traffic movement is controlled by a number of factors including a design requirement for Q10,000 flood immunity, the mainline road geometry, and the proposed Lutwyche Road and Gympie Road levels and the driven portal. The currently 3-centred vertical and horizontal curve will be reviewed in detailed design as a single radius horizontal curve.

Issue 13

Operational legibility and safety at interchanges with short distances between merges and diverges will rely heavily on comprehensive signage. No information is available in the EIS to demonstrate how this can be achieved through a signing program. The EIS needs to address legibility of decision points and signage to assist the legibility.

Response

Signage and decision points have not been addressed in the reference design and would be considered within the detailed design development.

Issue 14

The EIS layouts indicate that the clearance for traffic would be reduced to between 3.8m to 4.0m. The existing bridge underpass clearance for Melton Road under East West Arterial should be maintained.

Response

The clearances associated with existing routes will be maintained throughout the Project.

Issue 15

There will be a strong east to west pedestrian movement across Gympie Road to access the Kedron Brook Busway Station. The pedestrian facilities at the interchange are circuitous and poorly accommodated with five crossing points to access the station. The EIS needs to provide a separate pedestrian facility or greatly improve the at-grade crossing.

Response

Crossings of Gympie Road/Lutwyche Road are provided at the two new intersections and the existing bikeway/pedestrian way on the south side of the brook is to be matched by a new path proposed for the north side of Kedron Brook.

Issue 16

It would appear that the existing signalised pedestrian crossing on Gympie Road at the bowling alley opposite Somerset Road (and proposed new outbound bus stop) has been removed. A pedestrian facility in this vicinity needs to be reinstated or alternative access for pedestrians detailed.

Response

The removal of pedestrian access across Gympie Road at Somerset Road and relocation to the new intersection at Sadlier Street has already occurred as a result of QDMR works associated with Gympie Road. This new pedestrian access at Sadlier Street would remain unaffected by the Airport Link project.

Issue 17

It is unclear how the signal phasing and geometric layouts accommodate for bus movements from the Busway to Kedron Park Road and Airport Link. If the movement is intended then the EIS needs to address this in the intersection layouts.

Response

A connection between the busway and the new intersection is indicated in the EIS (Volume 2, EIS-SO-008). This connection for busway movements is an issue to be resolved through the Concept Design and Impact Management Plan for the Northern Busway Project. It will be further developed in the detailed design of the projects.

Issue 18

An additional lane outbound in Gympie Road (between Stafford Road and Sadlier Road) needs to be provided to accommodate the two-lane flow outbound from Lutwyche Road. Currently this two lane flow is reduced to a single lane near Broughton Road.

Response

The reference design for Airport Link is constrained in this location by the Northern Busway on the western side and by the implications that widening the road corridor would have on the additional properties that would have

to be acquired. The treatment of the proposed lane drops and merging of Gympie Road and Airport Link traffic would be considered further during the detailed design phase.

Issue 19

There are a number of design elements that at preliminary design have not been fully resolved, as is usual, and these have been documented in the Reference Design Report for future detailed design development and resolution. The Reference Design Report has not been included in the EIS to provide an explanation of the issue and a proposed resolution methodology. Justification needs to be given to a number of aspects, for example Gympie Road reduced to one lane after Homebush Road until merging with the two lanes from AL. The traffic numbers that support this provision need to be related to the response.

Response

The submission incorrectly states that all the design elements need to be resolved at preliminary design stage and that the EIS has failed to present sufficiently developed material to meet this requirement. The EIS has been prepared in accordance with the terms of reference and in doing so, has fully described the reference project in terms of its conceptual design.

While there may be matters to be resolved through the detailed design phase across all aspects of the Project, the EIS has presented sufficient information to enable a person or entity to gain a clear understanding of the Project in terms of its scope and its potential impacts. It would be inappropriate and unreasonably inflexible to resolve detailed design issues at this stage in the process. Such an approach would also remove the opportunity for the detailed design stage to capture potential benefits of innovative design responses and innovative construction methods, for example.

With regards the impacts on Gympie Road, the peak traffic volumes for Gympie Road north of Stafford Road are provided in the EIS (Volume 3, Technical Report 1 – Traffic & Transport, Tables 9-5, 9-6, 9-7, 10-3 and 10-4). Using these predicted volumes a Paramics microsimulation model of the Airport Link and its connections with the surface road system was prepared for use in the EIS Consultation and demonstrated for interested agencies. This microsimulation model demonstrated that satisfactory traffic performance could be achieved for AM and PM peak operations with Airport Link operational in 2012 through the Gympie /Stafford Road intersection and north along Gympie Road as configured in the reference design.

4 Recommendations

The public notification of the EIS led to a number of submissions being made to the Coordinator-General in relation to a range of issues. Many of the matters raised in the submissions were presented during the preliminary consultation process which supported the preparation of the EIS, and consequently, were attended to in the refinement of the reference design for Airport Link and in the recommended measures in the draft Outline Environmental Management Plans contained in Chapter 19 of the EIS.

4.1 Recommendations

From a review of the submissions from both agencies and the community, this Supplementary Report provides a number of recommendations about the Airport Link Project. These recommendations are that:

- i) The Airport Link Project should proceed, subject to a range of conditions which seek to avoid, or mitigate and manage the potential impacts of the Project during both its construction and operational phases;
- ii) The Coordinator-General's conditions should:
 - State conditions for later IDAS approvals required for the Project;
 - Make recommendations for other approvals required for the Project; and
 - Impose conditions for the undertaking of the Project, where there is no other mechanism for conditions to be imposed (“imposed conditions”). In setting imposed conditions, the Coordinator-General may state when the imposed conditions take effect; and nominate an entity that is to have jurisdiction for the condition (“the nominated entity”).
- iii) The Coordinator-General's conditions should address the issues and the measures set out in Section 4.3, 4.4 and 4.5 below; and
- iv) The submitters be advised of the findings of the Coordinator-General's evaluation of the EIS.

4.2 Performance-Based Approach to Project Implementation

In consideration of the issues identified during preparation of the EIS and in response to the matters raised in submissions, a number of measures are recommended to avoid, or manage and mitigate the impacts of Project implementation.

Due to the scale and complexity of Airport Link, and the nature and the relationships between some potential impacts, there is a need for a performance-based approach to impact management. This is particularly relevant for managing the physical, environmental and social impacts to ensure community concerns are addressed and environmental values are retained during both construction and operation.

Environmental objectives and performance criteria set out in the draft Outline EMPs in Chapter 19 of the EIS are recommended for the construction phase and the operational phase of the Project. The environmental objectives are intended to address community and environmental concerns about potential impacts of the Project. The performance criteria are intended to provide direction and confidence in terms of how the environmental performance of project delivery and implementation will be assessed and how the environmental objectives are met. While mitigation measures that are means of achieving the environmental objectives and performance criteria are provided in the draft Outline EMPs, there may be other solutions to effective impact avoidance, minimisation, mitigation or management.

This performance-based approach to environmental management provides the necessary flexibility for the detailed design development, construction and operation of the Airport Link Project while setting criteria against which the environmental effects can be controlled and assessed.

4.3 Recommended Measures for Project Implementation

The measures for Project implementation should address the following issues:

- The need to coordinate with major projects to minimise the cumulative effects of construction and operation in the inner northern suburbs;
- The need to manage the land use and transport effects of Project implementation, particularly in the Lutwyche Road, Gympie Road, Stafford Road and Sandgate Road corridors, and in the vicinity of the activity centres and transport nodes;
- The need to address agency requirements for works requiring subsequent IDAS approvals and other agency consents and agreements (i.e. connections to State-controlled roads, works involving interfering with railways, tidal works, development of heritage places, working with contaminated land, and the removal destruction or damage of marine a plant);
- The establishment of an open and effective consultation and community engagement process, including a system for receiving and addressing complaints about construction and operational issues;
- The delivery of a program of urban mitigations generally consistent with the scope and intent of those set out in Chapter 22 of the EIS to address changes and potential impacts on the communities living in and near the Project works and the surface infrastructure;
- The need for Project infrastructure to be designed and delivered, to the extent reasonable and practicable, to minimise impacts on nearby sensitive receptors (i.e. residential, community facilities, sensitive commercial buildings, heritage places), or where impacts are unavoidable, the need for the Project to incorporate adequate mitigation measures into the design, and the construction and operational management plans;
- The achievement of high-quality urban design outcomes for Project infrastructure, particularly in the vicinity of the surface connections at Bowen Hills, Windsor, Lutwyche, Kedron and Clayfield, and for enhancement of selected locations within the Project corridor;
- The establishment of a comprehensive system of environmental management for both the construction and operational phases of the Project, to achieve the environmental objectives for the Airport Link Project set out in Chapter 19 of the EIS;
- The development of a comprehensive approach to training for the Project workforce, in addition to required technical training with regards workplace health and safety, environmental responsibilities, cultural heritage, community sensitivities and cultural awareness, and customer service;
- The establishment of construction management measures addressing spoil handling, haulage and placement controls, construction traffic management including construction vehicle management, air quality, noise and vibration management, vegetation management, surface and groundwater quality management, management of acid sulphate soils and contaminated land, soil erosion and sedimentation control, pedestrian and cyclist safety and access arrangements, access arrangements for properties near the worksites including the Kedron High School and the Wooloowin State School, and other matters identified in the draft Outline EMP set out in Chapter 19 of the EIS;
- The establishment of measures to manage impacts at locations where the Northern Busway Project is proposed to be constructed at the same time and in the same corridor as the Airport Link Project;

- The establishment of operational management measures addressing traffic management including the transport of dangerous goods, air quality for both in-tunnel and ambient air, road traffic noise and plant and equipment noise, and hazards and risk; and
- The establishment and implementation of an environmental reporting protocol to address compliance with the Coordinator-General's conditions and requirements.

4.3.1 Coordination with other Major Projects

A coordinated approach should be taken to delivery of major transport projects in the inner northern suburbs including the Airport Link Project. It is recommended that the Proponent establish an advisory committee comprising representatives from the Proponent (including Queensland Transport and the Department of Main Roads) and the Brisbane City Council to provide information about the concurrent major transport projects to allow the cumulative construction effects from all projects to be managed.

Recommended means for achieving this coordinated approach include exploring opportunities for the shared use of construction worksites in Bowen Hills, Windsor and Kedron. Such opportunities should aim to establish measures for:

- i) Managing and monitoring construction traffic to avoid congestion, especially during periods of peak traffic flows;
- ii) Managing and monitoring construction car parking in localities surrounding construction worksites;
- iii) Managing the impacts of overlapping work programs for surface works in close proximity to sensitive receptors such as residential properties and community facilities, where such surface works have the potential to cause nuisance or disturbance due to excessive noise or diminished air quality.

4.3.2 Integration with Regional & Local Planning Process

Given the potential for changes to the regional and local planning frameworks brought about by the Airport Link Project, it is recommended that the Proponent liaise with the Office of Urban Management and the Brisbane City Council to assist in identifying urban regeneration opportunities which arise because of Airport Link. Opportunities for integrated land use and transport planning should be identified through this process.

4.3.3 Measures for Approvals, Permissions, Consents etc

Marine Plants & Tidal Works

For operational work that is the removal, destruction or damage of a marine plant, appropriate mitigation of Project related impacts to marine plants, tidal lands or other fisheries resources must be provided.

Where required, it is recommended that a development application for operational work that is the removal, destruction or damage of a marine plant, must include information identifying:

- i) The areas likely to be disturbed by that work;
- ii) Any species of marine plants likely to be affected by that work;
- iii) Any potential changes to tidal flows likely to affect a marine plant and resulting from that work.

Where mangrove removal cannot be avoided, site conditions are to be suitable for the recolonisation of mangroves once construction is completed, in accordance with Fish Habitat Guideline 002 – Restoration of Fish Habitats, Guidelines for Marine Areas, DPI, 1998. Marine plants authorised for removal and/or other material

used in the works are to be removed from the intertidal zone, unless the material is to be used in a restoration project accepted by the Chief Executive of the Department of Primary Industries and Fisheries.

Prior to undertaking any waterway barrier works that is assessable development under the *Integrated Planning Act 1997*, approval for operational works to construct or raise waterway barriers must be held.

Any development application for operational work that is tidal work under the *Integrated Planning Act 1997* or operational work within a coastal management district, must include detailed information describing, among other things, the scale and nature of the proposed work, and the predicted impacts on tidal flows and hydrology, stability of the streambed and banks, erosion and deposition regimes, and navigation and other uses of the tidal waters.

Contaminated Land

Appropriate mitigation of Project related impacts involving contaminated land must be provided where a development approval is required for material change of use of premises if all or part of the premises is on the Environmental Management Register or Contaminated Land Register. In such circumstances, it is recommended that measures include:

- i) Undertake site history investigations of the tunnel alignment to identify areas of potential soil contamination. Soil suspected of being contaminated must be adequately appraised by a suitably qualified person in accordance with section 381 of the *Environmental Protection Act 1994* (EP Act).
- ii) Undertake investigations in locations where earthworks may potentially encounter contaminated soils (i.e. land that is listed on the Environmental Management Register or identified areas from a site history and observations analysis). The Draft Guidelines for the Assessment and Management of Contaminated Land in Queensland 1998 must be adhered to in these investigations. Any land identified as having contaminated soil must be notified to the EPA Contaminated Land Unit.
- iii) Contaminated soil can only be removed from land listed on the Environmental Management Register or Contaminated Land Register with prior EPA Contaminated Land Unit approval and under a disposal permit in accordance with s424 of the EP Act.
- iv) Prepare and implement a Site Management Plan for contaminated land on the tunnel alignment where that land is not being removed from the Environmental Management Register or Contaminated Land Register prior to any surface disturbance of the soil on that land, in accordance with the *Australian and New Zealand Environment and Conservation Council/National Health and Medical Research Council - Guidelines for Assessment and Management of Contaminated Sites* and the EP Act;
- v) If spills occur during the transportation of contaminated soil, the area affected will be remediated and the relevant authorities advised; and
- vi) For both managed sites and sites without a Site Management Plan that are listed on the EMR or CLR, validation sampling and appropriate analysis will need to be conducted following remediation or covering. Analysis must be undertaken by a suitably qualified person in accordance with section 381 of the EP Act.

Cultural Heritage

Appropriate mitigation of Project related impacts to some places listed on the Queensland Heritage Register is recommended. The following measures should attach to any relevant approval for development on a heritage registered place. The Environmental Protection Agency and the Queensland Heritage Council are the agencies with jurisdiction.

- i) Building condition surveys be conducted for each place on the Queensland Heritage Register which is the subject of a development application (“place of State significance”) prior to any works commencing to record present conditions. The building condition surveys to include detailed structural inspections of timber framing, stonework, brickwork, and sealing of all timber in the stone/brickwork.
- ii) Cultural Heritage Management Plans be developed for each place of State significance, including the following elements:
 - (a) Monitoring programs for places of State significance to assess building movement and condition;
 - (b) Vibration goals and their monitoring and recommended actions if the goals may be exceeded;
 - (c) Archival recording of all elements of cultural heritage significance that will be removed or demolished;
 - (d) Monitoring the construction works for archaeologically significant records; and
 - (e) Consultation with the Environmental Protection Agency in an effective and timely manner, particularly where the potential exists for the construction works to impact on a place of State significance.
- iii) Archival recording of cultural heritage significance of the following sites prior to carrying out relevant construction works including any demolition:
 - (a) Kalinga Park between Kalinga Street and Sandgate Road, Clayfield;
 - (b) Police Citizens Youth Welfare Association Headquarters at Lutwyche; and
 - (c) Former Swan Hill residential estate at Windsor in the vicinity of Earle Street, prior to demolition.

Aboriginal Cultural Heritage

Because an EIS has been prepared for the Airport Link Project, the Proponent must develop and have approved under the *Aboriginal Cultural Heritage Act 2003*, a Cultural Heritage Management Plan (CHMP) prior to any excavation, construction or other activity that may cause harm to Aboriginal cultural heritage.

Connection to a State Controlled Road

Approval must be obtained from the chief executive of the Department of Main Roads under the Transport Infrastructure Act 1994 for carrying out works for connections to any State controlled road. The Proponent should consult with the Department to ascertain requirements for the connections to State roads, such as Gympie Road and Stafford Road

Interference with a Railway

Approval must be obtained from the railway manager prior to any interference with a railway under the *Transport Infrastructure Act 1994*.

If any Project works are likely to interfere with the operation of rail services, it will be necessary for the Proponent to consult with the railway manager to identify actions which will minimise disruption to rail services.

Road Closures

Any road closures required must follow the procedure set out in the relevant legislation.

4.4 Recommended Measures for Construction

4.4.1 Community Engagement – Construction Phase

To keep the community informed during the construction phase of the Project, it is recommended that a community engagement process be developed and implemented. The process should include a range of measures, such as:

- i) Prior to the commencement of construction works in a locality, formation of a Community Consultative Committee (CCC) for each locality in which a work site is to be situated (i.e. Windsor, Lutwyche/Kedron and Clayfield), to provide timely advice to the Proponent about construction issues;
- ii) Early establishment of community information services which must include but is not limited to toll-free telephone service with 24 hour, 7 day servicing, project website and email service, regular newsletters, scheduled information sessions or open days;
- iii) Availability of information through the Project website and generally and in response to specific inquiries about environmental performance;
- iv) Early and on-going engagement with owners and occupants of premises adjacent to the proposed works or proposed mitigation measures;
- v) Early notification of owners and administration of critical premises such as hospitals, likely to be affected by proposed construction works in terms of their scale, duration, location and potential effects;
- vi) A complaints process, which delivers a prompt response to community concerns with relevant information, action where required, and reporting of incidents, integrated within a wider environmental reporting framework established in the environmental management plans (EMPs); and
- vii) Where required, special procedures to respond to complaints, issues or incidents, such as face-to-face meetings and on-going communications with affected parties and a documented process for issues resolution.

4.4.2 Urban Mitigation

It is recommended that a program of urban mitigations that form part of the Project be produced and provided to the Coordinator-General within 6 months of the commencement of construction. The program should be developed in consultation with relevant affected agencies, including Brisbane City Council and relevant State agencies to:

- i) Describe the urban mitigations proposed, generally consistent with those urban mitigations described in Chapter 20, Section 20.6 of the EIS (as agreed with relevant affected agencies);
- ii) Identify the location of urban mitigations;
- iii) Identify the entity responsible for delivering the urban mitigations; and
- iv) Describe the timeframe within which urban mitigations are proposed to be undertaken.

4.4.3 Environmental Management – Construction Phase

It is recommended that comprehensive environmental management plans for construction (“Construction EMP”) be prepared prior to the commencement of relevant stages of construction works. The Construction EMP be developed generally in accordance with the Draft Outline EMP (Construction) in Chapter 19 of the EIS, unless otherwise addressed by these recommendations. Mitigation measures may be those contained in the draft Outline EMPs set out in Chapter 19, or may include other measures to achieve the environmental objectives and performance criteria, as well as any relevant statutory requirements.

To address community concerns and to demonstrate compliance with the Coordinator-General's conditions and other statutory requirements, it is recommended that the Construction EMP establish a mechanism for reporting on compliance, generally consistent with the following hierarchy of reporting:

- i) Compliance reports on construction works – provided by the Proponent on a quarterly basis;
- ii) Management overview reports on construction works – provided by the Proponent on a half-yearly basis;
- iii) Environmental report – provided by the Proponent on an annual basis.

The framework for the Construction EMP is described in Chapter 19 of the EIS. It is recommended that EMPs be provided to the EPA.

The Construction EMP could allow for progressive assessment of predicted impacts and design of mitigation measures prior to the relevant stages of construction works and if so, with updates of the EMP being provided to the EPA. The matters to be addressed in the Construction EMP include, but are not limited to:

- i) Traffic and transport;
- ii) Geology and soils;
- iii) Hydrogeology and groundwater quality;
- iv) Hydrology, including surface water quality, and stormwater management;
- v) Air quality;
- vi) Noise and vibration;
- vii) Flora and fauna;
- viii) Cultural heritage except where covered by a cultural heritage management plan under the *Aboriginal Cultural Heritage Act 2003*;
- ix) Social environment;
- x) Hazard and risk, including flooding; and
- xi) Waste management.

General Construction

To avoid, or mitigate and manage construction impacts, the following recommendations are made with regards construction works generally:

- i) Construct the Project to achieve the environmental objectives and performance criteria set out in the EIS Chapter 19 Draft Outline EMP (Construction);
- ii) Construction activities for works on or above the surface (except for spoil haulage which is addressed below) which generate excessive levels of noise, vibration, dust or construction traffic movements, should be restricted to between 6.30am to 6.30pm Mondays to Saturdays and at no time on Sundays or public holidays, except for special circumstances where the above-the-surface works should be conducted outside these days and hours. Examples of such special circumstances include:
 - (a) Works on arterial roads to avoid disruption to peak traffic flows (i.e. Inner City Bypass, Lutwyche Road, Gympie Road, East West Arterial);
 - (b) Works in rail corridors; and
 - (c) Works involving and transport of large pre-fabricated components (i.e. bridge works).

- iii) Construction worksites along the tunnel alignment to be designed and constructed for the management and mitigation of construction impacts by incorporating acoustic screening, ventilation and dust filtration equipment.

Traffic Management

It is recommended that the construction traffic EMP sub-plan be provided to Queensland Transport, Department of Main Roads and Brisbane City Council prior to finalisation.

In addition to the matters addressed in the draft Outline EMP (Construction) regarding construction traffic, there are a range of matters raised in submission needing to be addressed in the construction traffic EMP sub-plan. Such matters include:

- i) Measures to allow for safe and functional access to community facilities, such as Emergency Services, Kedron High School, Woolloowin State School, Kalinga Park, and pedestrian and cyclist safety and movements on routes adjacent to construction worksites, particularly at Windsor, Lutwyche/Kedron and Clayfield³²;
- ii) Measures for avoiding disruption of scheduled major events (i.e. Brisbane Exhibition at Bowen Hills) and to coordinate with scheduled major construction works on other major projects (i.e. Northern Busway, Brisbane Airport Parallel Runway, North South Bypass Tunnel, Gateway Upgrade Project).

Spoil Haulage, Handling and Placement

In addition to the matters addressed in the draft Outline EMP (Construction) regarding spoil haulage, handling and placement, there are a range of matters raised in submissions needing to be addressed. Recommended measures to address these issues include:

- i) Nominated spoil haulage routes which, as far as is reasonable and practicable, rely upon arterial roads and minimise the use of minor roads, with no spoil being hauled along Junction Road, Clayfield or Albion Road, Lutwyche or Albion Road, Albion;
- ii) Nominated hours for collection, unloading and haulage of spoil from construction sites to be at any time from 6.30am Mondays to 6:30pm Saturdays but with no haulage on Sundays or public holidays;
- iii) Spoil-handling facilities and areas, and tunnel shafts servicing tunnel machines to be enclosed with ventilated, acoustically-lined sheds in which spoil handling (being stockpiling, loading into haulage trucks) is conducted at all times; and
- iv) Placement of spoil to comply with the performance criteria of the *Filling and Excavation Code* in City Plan.

Air Quality

In addition to the matters addressed in the draft Outline EMP (Construction) regarding air quality, there are a range of matters raised in submissions that need to be addressed. Recommended measures to address these issues include:

- i) Avoid or mitigate, manage and monitor dust at sensitive receptors adjacent to construction worksites, including residential areas, Kedron High School including the playing fields, Woolloowin State School,

³² Refer to Supplementary Report, section 3.1.2, section 3.1.4 and section 3.1.5

- aged care facilities in Windsor, health care facilities and child care facilities. The recommended dustfall objectives include:
- (a) Minimise dust nuisance to neighbours;
 - (b) Project dust emissions are not to exceed dustfall goals, and health-based goals at off site sensitive receptors more than five time per year; and
 - (c) No valid dust complaints, notices or prosecutions in relation to the construction works.
- ii) Monitoring of air quality for dust, total suspended particulates (TSP) and particles (PM₁₀) to determine whether environmental objectives and performance criteria of the Construction EMP are being met. The monitoring program, including the frequency of monitoring and the locations of monitoring stations, are to be established in the Construction EMP. The recommended monitoring stations include the following locations:
- (a) In or immediately adjacent to the Woolloowin State School;
 - (b) Adjacent to residential properties in Lutwyche, west of Lutwyche Road;
 - (c) In or immediately adjacent to the Kedron High School;
 - (d) Adjacent to residential properties in Kedron;
 - (e) In proximity to Nyamba aged care facility in Federation Street, Windsor;
 - (f) Adjacent to residential properties in Kalinga Street, Clayfield; and
 - (g) In Kalinga Park, adjacent to residential properties in Alma Road, Clayfield.
- iii) Monitoring for construction impacts on ambient air quality should include a representative sampling of baseline air quality.

Noise and Vibration

In addition to the matters addressed in the draft Outline EMP (Construction) regarding noise and vibration, there are a range of matters raised in submissions that need to be addressed. Recommended measures for addressing these issues include:

- i) Mitigate, manage and monitoring the construction levels for noise and vibration at sensitive receptors including nearby residential areas, the schools and their playing fields, aged care, child care, health care facilities (i.e. Rosemount Hospital and Amarina Nursing Home);
- ii) Implement effective consultative and mitigation measures (i.e. early, on-going and effective consultation, including advanced notification to owners and occupants of potentially affected properties, and generally measures in the draft Outline EMP) along the construction corridor, and particularly in areas where predictive modelling indicates the goals for construction noise or vibration could be exceeded.

Urban Design

So that the Project achieves a high quality urban design outcome for the surface areas including the connections to the surface road network, residual space in land on the surface, buildings, plant and equipment, an overall urban design master plan should be prepared by the Proponent in consultation with key stakeholders³³, and implemented in the design of the tunnel works, construction and rehabilitation of surface areas affected by construction works. The urban design master plan needs to include:

³³ Key stakeholders could include the Office of Urban Management, Brisbane City Council, Queensland Rail Queensland Health, TransLink, Queensland Newspapers Limited and the Royal National Association.

- i) Measures to address the urban design principles relating to the urban, environmental and visual character of the construction corridor generally consistent with Chapter 15, section 15.2 of the EIS;
- ii) An indicative program for the delivery of urban design enhancements associated with the Project, as well as other known works or activities pertaining to the improvement of the urban setting in the study corridor;
- iii) An indicative schedule of works associated with the Project together with allocated responsibilities for performing such works.

Cultural Heritage

To address cultural heritage issues in the construction corridor, there are a number of measures recommended, in addition to those set out in the EIS Chapter 19, Draft Outline EMP (Construction). These measures include conduct archival recording of cultural heritage significance of the following sites prior to carrying out relevant construction works:

- i) Kalinga Park between Kalinga Street and Sandgate Road, Clayfield;
- ii) Police Citizens Youth Welfare Association Headquarters at Lutwyche; and
- iii) Former Swan Hill residential estate at Windsor in the vicinity of Earle Street, prior to demolition.

4.5 Recommended Measures for Operations

4.5.1 Community Engagement - Operation

To respond to community concerns during the operational phase of the Project, it is recommended that there be a mechanism for receiving and dealing with complaints about the operational aspects of the Project, including achievement of the environmental objectives for the Project. The complaints mechanism should:

- i) Be similar to that established for the construction phase;
- ii) Provide an avenue to resolve operational impacts where the environmental performance criteria have not been met;
- iii) Provide for prompt responses to complaints made, with information, corrective action where required, and reporting back to the complainant and Proponent; and
- iv) Be incorporated within the wider environmental reporting framework for the Project.

4.5.2 Environmental Management – Operational Phase

To address community concerns and to achieve the environmental objectives and performance criteria for the operational phase of the Project, it is recommended that comprehensive environmental management plans for operation be prepared and implemented generally in accordance with the Draft Outline EMP (Operation) in Chapter 19 of the EIS, unless otherwise addressed by these recommendations. The framework for the Operational EMP is described in Chapter 19 of the EIS. It is recommended that the Operational EMP and associated sub-plans be provided to the EPA.

The matters to be addressed in the Operational EMP include, but are not limited to:

- i) Traffic and transport;
- ii) Hydrogeology and groundwater quality;
- iii) Surface water quality, including stormwater management;
- iv) Air quality;
- v) Noise; and

- vi) Hazard and risk, including flooding.

Monitoring – Operational Phase

It is recommended on-going monitoring for operational impacts be undertaken for aspects of the Project that are of concern or interest to the community, including air quality (in-tunnel and ambient air), noise from ventilation plant and other plant and equipment, road traffic noise (limited period), and surface water quality. The form of monitoring must be appropriate to the issue and should adopt the parameters established in the Operation EMP.

Complaints – Operational Phase

To address community concerns about Project operations, it is recommended that there be a formal process for receiving and dealing with complaints in relation to the environmental objectives. This process should be the same as that established during the construction phase.

Traffic Management

Prior to the commencement of operations, it is recommended that the following measures be established in an operational traffic EMP sub-plan:

- i) To manage in-tunnel air quality where an incident in the tunnel system or adjacent road network requires traffic to cease flowing or slow below design speeds for the ventilation system;
- ii) To manage traffic flows into and out of the tunnel system, having regard for conditions in each tunnel and on the surface road network;
- iii) To enable emergency services and other relevant entities to attend to incidents in the tunnel system, evacuations if necessary, maintenance requirements and other tunnel operating requirements; and
- iv) To assist with efficient transport network operations, through consultation with key stakeholders.

Air Quality

Prior to the commencement of operations, it is recommended that measures be established to mitigate and manage the potential impacts of diminished air quality arising from the operation of the tunnel ventilation system and traffic flowing into and from the tunnel system at the portals. Such measures could include the following:

- i) To address community concerns, the ventilation system be designed so that it does not prevent the possible future installation of filtration equipment for vitiated air before it is released to the ambient environment during tunnel operation;
- ii) The design and siting of the ventilation stations and the ventilation outlets to mitigate where practicable the potential visual impacts while seeking to achieve the environmental objectives for ambient air quality;
- iii) For in-tunnel air quality, it is recommended that continuous monitoring be undertaken, linked to a system of traffic management to maintain appropriate traffic flows and consequent emission levels within nominated air quality goals;
- iv) To address community concerns, on-going monitoring of ambient air quality be conducted at two monitoring stations for each ventilation outlet, with each monitoring station being located within 500 metres of each ventilation outlet³⁴;

³⁴ For the north-eastern ventilation outlet, the preferred location for one monitoring station is in Kalinga Park. For the north-western ventilation outlet, the preferred location for one monitoring station is in the campus of

- v) Monitoring results, based on validated data, regarding ambient air quality be included in a quarterly operations and maintenance report, and in the annual environmental report to be issued by the Proponent.

Noise

It is recommended that, prior to the commencement of operations, measures be established to mitigate and manage, if necessary, the potential for noise from Project operations, including:

- i) Ventilation system operating noise at each portal, ventilation station and ventilation outlet; and
- ii) Road traffic noise in specified locations identified in predictive modelling and including the following:
 - (a) East West Arterial near Sandgate Road;
 - (b) Project entry ramp adjacent to Alma Road Clayfield;
 - (c) Project entry and exit ramps adjacent to Kedron Brook and in Lutwyche Road Lutwyche;
 - (d) Gympie Road crossing of Kedron Brook;
 - (e) Gympie Road at the intersection with Leckie Road and at the intersection with Stafford Road;
 - (f) Federation Street adjacent to Nyamba aged care facility; and
 - (g) Project roadways adjacent to The Mews apartments in Campbell Street Bowen Hills.

Where the road traffic planning noise levels are already exceeded at sensitive locations it may not be reasonable and practicable to achieve compliance with the planning noise levels set out in the EIS, Chapter 19, Draft Outline Operational EMP. In these instances, either the “status-quo” noise levels should be maintained (i.e. maintain noise levels at levels anticipated in Y2022, the design year, without the Project), or specific measures to address localised impacts should be established in consultation with potentially-affected property owners and occupants.

Hazard and Risk

Prior to the commencement of operations of the Project, it is recommended that the Proponent prepare an incident response plan and consult with the Queensland Police Service, Queensland Fire Service and Queensland Ambulance Service on the content of that plan. In addition to incidents relating to Project operations, the incident response plan should address potential external factors which may affect Project operations (i.e. flooding, traffic incidents on the surface road network, incidents threatening Project security).

Kedron High School. For the southern ventilation outlet, the preferred location for one monitoring station is Eildon Hill reservoir, Constitution Road, Windsor.