

13. Social Environment



Northern Link

Phase 2: Detailed Feasibility Study

CHAPTER 13

SOCIAL ENVIRONMENT

- September 2008

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13. Social Environment

This chapter addresses Part B, Section 5.9, Social Environment of the Terms of Reference (ToR), which require the EIS to describe the existing social values and amenity that may be affected by the Project. This is to be achieved through development and mapping of a social and community profile of the suburbs potentially affected by the Project, including social indicators, social conditions and social infrastructure in the study corridor.

The ToR also require that the EIS define and describe the potential benefits and impacts of the Project on the social environment, and propose measures to optimise the benefits and to avoid or mitigate any negative impacts.

13.1 Introduction

Social impact assessment (SIA) “includes the process of analysing, monitoring and managing the intended and unintended social consequences, both positive and negative, of planned interventions [i.e. the Project] and any social change processes invoked by those interventions. The primary purpose of SIA is to bring about a more sustainable and equitable biophysical and human environment”¹.

13.1.1 Methodology

The methodology for the SIA is summarised below. Key stages included:

- scoping the range of potential social impacts in relation to communities within the study corridor, including for those neighbourhoods closest to the construction worksites and construction works, surface infrastructure and the tunnel alignment;
- describing the existing social environment of the study corridor, including population and demography, social infrastructure and community values;
- identifying and assessing potential benefits and impacts on the social environment of the study corridor, including on quality of life, community values, population size and characteristics, access and connectivity, and social infrastructure; and
- identifying measures to enhance the Project’s benefits and avoid or reduce its impacts were identified. Mitigation includes measures relating to design development, urban regeneration, environmental management and monitoring.

Information on community values and community concerns and issues gathered from consultation with community members was considered in the preparation of the SIA. This included information gathered from community information sessions, community reference group meetings, 1800 project information line, meetings with government agencies, and consultation with directly affected property owners (see **Appendix B**).

The SIA also considered the magnitude, duration, and extent of potential impacts (i.e. local or regional) of the Project’s potential impacts and benefits. This assumed the implementation of mitigation measures, including urban renewal strategies, identified as part of the SIA.

¹ International Association for Impact Assessment (2003), Social Impact Assessment International Principles, Special Publication Series No. 2, May 2003.

The effects of the Project may be experienced by individuals and communities as positive, neutral or negative, depending on individual circumstances, vulnerabilities and attitudes in relation to particular changes. Information from community consultation identified a range of views in response to the Project, including potential benefits and impacts of the design, construction and operation.

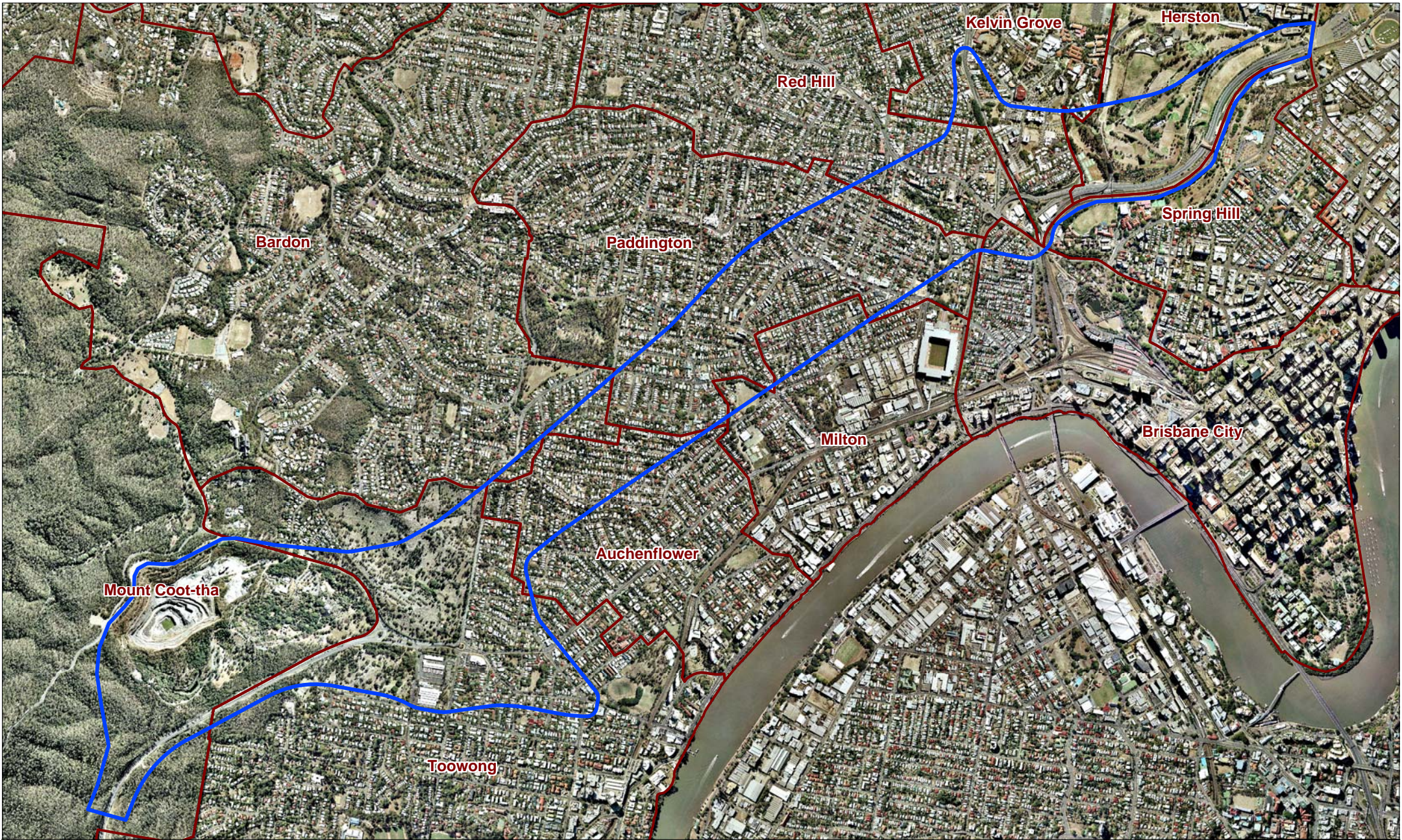
13.1.2 Study Corridor

For the purposes of the SIA, this chapter focuses upon the study area as defined in the EIS ToR, but also deals with those areas outside of the ToR Study Corridor in which daily living conditions or community well-being may be affected by construction or operation of the Project. **Figure 13-1** shows the study corridor for the Northern Link SIA. It incorporates each of the suburbs in the Northern Link ToR Study Corridor including:

- Toowong and Bardon, in the vicinity of the proposed western connection;
- Brisbane City, Herston, Spring Hill and Kelvin Grove in the vicinity of the proposed northern connection; and
- Paddington, Red Hill, Milton, and Auchenflower, in the vicinity of the proposed tunnel alignment.

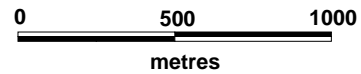
The suburb of Mt Coot-tha (located at the western end of the study corridor) has a very low population count and Australian Bureau of Statistics (ABS) demographic data is therefore not available. However, the Mt Coot-tha Forest Park and Mt Coot-tha Botanic Gardens, which fall within the Mt Coot-tha suburb boundary and the SIA study corridor, have important values for both local and regional communities and have been considered in this SIA.

Changes may also be experienced in other areas of Brisbane, such as reduced congestion or potential changes to conditions along spoil haulage routes. These changes have also been considered in the SIA.



LEGEND

- Study Area Corridor
- Social Environment Study Corridor Suburbs



Scale 1: 25,000 (A4)



NORTHERN LINK
ENVIRONMENTAL IMPACT STATEMENT

Figure 13 - 1
Suburb Boundaries



13.2 Description of Existing Environment

This section provides a description of the existing social environment and conditions in the study corridor suburbs, providing the basis for predicting and managing potential changes which may affect the social environment as a result of the Project.

Northern Link would traverse Brisbane's inner western suburbs, which are home to nearly 60,000 people. The study corridor suburbs are typical inner city suburbs comprising a mosaic of old and new land uses encompassing "tin and timber" character housing, areas of medium and high density unit development, health and education facilities, open space and recreation and commercial and entertainment precincts.

Social Policy Framework

The description of the existing social environment has been informed by a review of existing social policies articulated by different levels of government. At the local government level Council's vision for Brisbane is outlined in *Living in Brisbane 2026*. *Living in Brisbane 2026* identifies eight themes, of which the following are relevant to Brisbane's social character, amenity and equity:

- Friendly, safe city;
- Clean, green city;
- Accessible, connected city;
- Active, healthy city; and
- Vibrant, creative city.

Council's Strategic Plan identified in the *Brisbane City Plan 2000* also includes a desired outcome relating to 'community life, health and safety', which identifies Brisbane as a "safe, healthy and vibrant place to live, offering a wide range of local and regional services, facilities and activities and diverse housing, community, cultural and recreational choices". The citywide strategies relevant to the social environment include:

- 3.2.2.1 enhance social diversity, choice and accessibility;
- 3.2.2.2 cater for a balanced range of recreational and sporting opportunities, natural environments and attractive landscapes to meet community needs;
- 3.2.2.3 promote cultural diversity; and
- 3.2.2.8 achieve a safe, secure, equitable and comfortable City.

At the State government level, social policy goals are expressed in the *South East Queensland Regional Plan* (SEQRP), which includes a Desired Regional Outcome for Strong Communities of: *Cohesive, inclusive, and healthy communities with a strong sense of identity and place, and access to a full range of services and facilities that meet diverse community needs*. Principles which support achievement of this outcome include:

- maximise access to appropriate social infrastructure for all residents in the region;
- ensure the social effects of growth and change on the local community are planned for, monitored, and evaluated;
- address issues of disadvantage in communities;
- create well-designed, safe, and healthy local environments, encourage active community participation, promote healthy lifestyles, and prevent crime;

- support community engagement and community capacity building in the planning and development of future communities;
- manage urban growth and development to create, maintain, and enhance a sense of community, place, and local identity throughout the region;
- protect the region's unique cultural heritage, including historic places; and
- support the arts and cultural development through the planning and provision of cultural infrastructure and spaces.

13.2.1 Demographic Profile

This section provides a summary of the study corridor's key population, housing and demographic characteristics. A detailed analysis, including for each suburb in the study corridor, is provided in the SIA Technical Report.

Population

The study corridor had an estimated residential population (ERP) of 57,291 people in 2006, and this is expected to grow to about 68,000 people by 2026. Between 2001 and 2006, the study corridor's ERP population grew at an annual average rate of 4.4%, more than double the overall growth rate for the City of Brisbane. This high population growth was driven in part by the growth of medium and high density residential development in the City and Spring Hill. Between 1996 and 2006, Spring Hill's population nearly doubled, while the City's population quadrupled. This growth in the inner city resident population is expected to continue.

Age Profile

The study corridor had a relatively homogeneous age profile, which differed from the Brisbane LGA. At the 2006 Census, relative to Brisbane, the study corridor had a lower proportion of children (i.e. aged 0-14 years), higher proportions of people aged 15-24 years and 25-44 years, and a lower proportion of people aged over 45 years. The exception to this was Bardon, which generally aligned more closely with the age profile for the Brisbane LGA.

The median age for the study corridor at the 2006 Census was 30 years, compared to 34 years for Brisbane and 36 years for Queensland (**Table 13-1**).

■ Table 13-1 Age Profile 2006

Location	0-14 yrs (%)	15-24 yrs (%)	25-44 yrs (%)	45-64 yrs (%)	65 + yrs (%)	Total	Median age
Study Corridor	11.6	24.0	37.3	19.3	7.7	57,296	30
Brisbane LGA	18.1	15.8	31.3	23.1	11.8	956,128	34
Queensland	20.7	13.8	28.2	25.0	12.4	3,904,531	36

Source - ABS Census 2006

Household and Family Type

The study corridor generally had a lower proportion of family households and higher proportions of lone person and group households compared to the Brisbane LGA at the 2006 Census. At the 2006 Census, 53.3% of households in the study corridor comprised family households, compared to 68.2% and 25.1% in Brisbane and Queensland respectively. The suburbs of the City (44.8%), Spring Hill (45.3%) and Milton (45.4%) displayed low rates of family households, while Bardon (71.6%) was the only suburb with a higher proportion of family households than the Brisbane LGA. Over 30% of households in the study corridor had only one occupant,

compared to the Brisbane and Queensland averages of 25.1% and 22.8% respectively. The City had the highest proportion of single occupant dwellings (38.6%), while Bardon had the lowest (21.9%).

At the 2006 Census, couple only families comprised 47.8% of families in the study corridor, compared to 37.8% in the Brisbane LGA. The City had the highest proportion of couple only families followed by Spring Hill and Auchenflower. Couple families with children comprised 34.7% of families in the study corridor, with highest proportions in Bardon (49.7%) and Red Hill (39.9%). One parent families comprised 11.0% of the study corridor's families, compared to 15.3% in the Brisbane LGA. Those suburbs with proportions of one parent families lower than the study corridor included the City (7.3%), Auchenflower (9.2%) and Toowong (10.8%). "Other families" comprised 6.4% of the study corridor's families. Herston had the highest proportion of "other families" with this family type nearly double the proportion for the study corridor (12.4%). Toowong and the City also had high proportions of "other families".

Population Mobility

The study corridor had a relatively high degree of population mobility, with lower proportions of people who lived at the same address either 12 months or five years previously than for Brisbane LGA and Queensland. At the 2006 Census, 63.1% of the study corridor's population lived at the same address 12 months previously (compared to 77.1% in the Brisbane LGA), while 29.4% lived at the same address five years previously, compared to 46.9% in the Brisbane LGA. The suburbs of Brisbane City and Spring Hill had the most 'mobile' populations, which partly reflects the proportions of young professionals and number of couple only households, which tend to move house more often. Bardon was the only suburb in the study corridor that experienced a lower rate of population mobility than the Brisbane LGA and Queensland.

Cultural Diversity

Compared to the Brisbane average, the study corridor had a lower proportion of people who spoke a language other than English at home and who spoke English not well or not at all. However, the City and Spring Hill had proportions considerably higher than the study corridor and the Brisbane average. These people represent a stakeholder group with particular communication needs and which may be more vulnerable to changes in the social environment than some other members of the community. Approximately 25% of the study corridor's population was born overseas, which was similar to the Brisbane average. The City had the highest proportion of overseas born people (41.4%), followed by Spring Hill and Toowong (both with approximately 27%).

Education

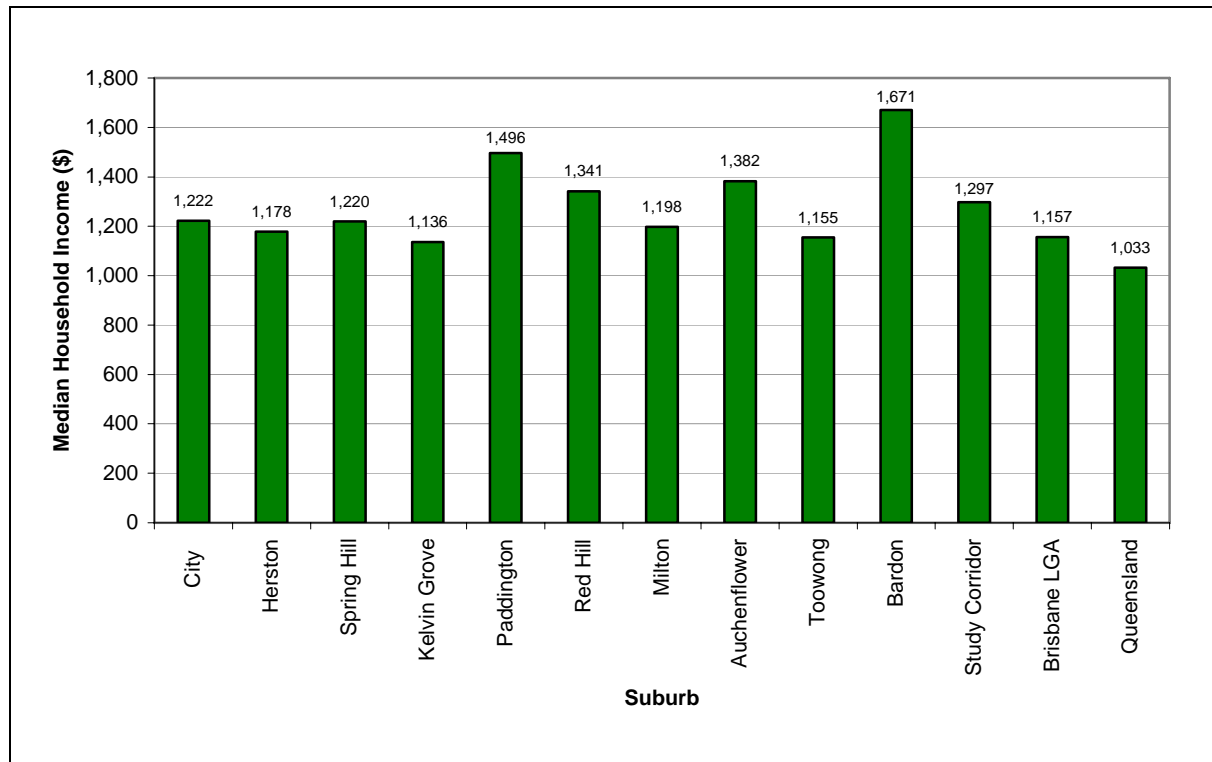
The 2006 Census counted 22,212 students in the study corridor. Overall, the study corridor had lower proportions of school students and higher proportion of university students compared to the Brisbane LGA. Secondary students comprised 10.9% of students in the study corridor, compared to the Brisbane average of 17.2%. The proportion of students attending university or other tertiary institution (37.4%) was higher than the Brisbane average (21.8%). Toowong had the highest proportion of university students, with half of the suburb's students attending a university or other tertiary institution. These figures reflect the proximity of major universities such as the University of Queensland (St Lucia), QUT (City and Kelvin Grove campuses), and Griffith University (Southbank Campus) to the suburbs in the study corridor.

Overall, the study corridor had higher proportions of people with either a post-graduate degree or degree and lower proportions of people with either a diploma or certificate, compared to the Brisbane LGA and Queensland. At the 2006 Census, 14.8% of people with a qualification in the study corridor had post-graduate degrees. Spring Hill was the only suburb in the study corridor to have lower proportions of people with a Bachelor Degree or post-graduate degree than the Brisbane LGA.

Income and Employment

Figure 13-2 shows median weekly household income for the study corridor at the 2006 Census. The median weekly household income for the study corridor was \$1,297, which was higher than both Brisbane (\$1,157) and Queensland, (\$1,033). Bardon recorded the highest median weekly household income, at \$1,671, followed by Paddington at \$1,496, and Auchenflower at \$1,382. Each of the study corridor suburbs other than Kelvin Grove (\$1,136) and Toowong (\$1,155) had a median weekly household income higher than for Brisbane overall.

■ Figure 13-2 Median Weekly Household Income 2006



Source: ABS Census 2006.

Labour force participation in the study corridor (66.6%) was similar to the Brisbane average (65%), with two-thirds of workers engaged in full-time work. At the 2006 Census unemployment in the study corridor, at 4.2%, was slightly above Brisbane at 4.0%. Unemployment rates varied across the study corridor, with the highest unemployment rate (Spring Hill, 6.0%) being more than double that of the lowest (Bardon, 2.8%).

Occupations and Industries

Table 13-2 shows the occupation by category of workers in the study corridor. Overall, the study corridor had higher proportions of people employed in professional and management positions, and lower proportions of people employed in machinery, labourers, technical/ trades, and clerical positions than for Brisbane and Queensland.

■ Table 13-2 Occupation 2006

Suburb	Professionals (%)	Managers (%)	Clerical (%)	Sales (%)	Community (%)	Tech/ Trades (%)	Labourers (%)	Machinery (%)
City	34.2	17.6	13.2	10.1	8.5	7.6	5.9	1.3
Herston	39.6	8.5	12.9	12.6	9.7	9.3	5.5	1.4
Spring Hill	36.1	13.4	15.3	7.9	7.7	7.8	8.3	2.0
Kelvin Grove	35.1	10.3	14.5	10.6	11.2	8.4	5.5	3.4
Paddington	37.3	13.8	14.0	9.3	9.9	8.5	4.3	1.6
Red Hill	37.8	14.1	13.8	9.1	8.9	8.9	4.5	1.9
Milton	33.4	13.1	15.5	8.5	9.7	11.3	3.9	2.7
Auchenflower	39.2	12.4	15.6	8.9	8.8	7.8	4.5	1.9
Toowong	40.1	10.1	13.9	10.1	9.7	7.9	5.2	1.8
Bardon	40.1	15.0	13.4	8.7	7.7	8.0	4.2	1.7
Study Corridor	37.3	12.8	14.2	9.6	9.2	8.6	5.2	2.0
Brisbane LGA	26.4	12.3	16.7	9.9	8.5	11.8	7.9	4.7
Queensland	17.1	12.4	15.4	10.4	9.1	15.4	11.9	7.2

Source: ABS Census 2006

Socio-Economic Disadvantage

The ABS produces four Socio Economic Indices for Areas (SEIFA) based on Census data for local areas. These indices identify areas of relative advantage and disadvantage.

Each of the study corridor SLAs rank highly on the Index of Relative Socio-Economic Advantage/Disadvantage, indicating higher proportions of people on high incomes, qualified people, and professionals. The average Advantage/Disadvantage value for the study corridor (1,125) was higher than the Brisbane LGA average (1,063) with value ranges for each SLA above those for Brisbane LGA, and amongst the highest in Queensland. Census Collector Districts (CCDs) with lower scores on the Index were concentrated in Milton and the eastern area of Paddington and near the Project's connection at Kelvin Grove, Red Hill and Spring Hill. CCDs with higher Index scores were distributed across the study corridor, including in Bardon, Toowong, Auchenflower and the western portion of Paddington.

The study corridor SLAs also ranked highly on the Index of Economic Resources indicating higher proportions of high-income families, a lower proportion of low-income families and more households living in large houses. CCDs with lower values were located in Milton near the northern connection at Kelvin Grove and Red Hill. Those areas with higher values were located in Bardon, Toowong and Auchenflower.

Need for Assistance

At the 2006 Census, the study corridor had a lower rate of people needing assistance in one or more of the three core activity areas of self-help, mobility or communication due to disability, a long term health condition or old age (2.1%), compared to the Brisbane LGA and Queensland (3.5%). Consultation for the Project indicated that the neighbourhoods affected by surface works at Toowong and Kelvin Grove include a number of elderly residents and long-term residents, with some houses owned by the one family for a number of generations. The

area also includes a number of people who need help or assistance in self-care, mobility or communication because of disability, long-term health condition or old age.

Transport Use

Census data from 2006 show lower rates of private vehicle ownership in the study corridor than for Brisbane and Queensland generally. Over 16% of households in the study corridor did not own a private vehicle, compared with Brisbane (10.4%) and Queensland (7.9%). While almost 43% of households in the study corridor had one private vehicle (compared with 38.8% and 36.5% for Brisbane and Queensland respectively), rates of multiple vehicle ownership were substantially lower. Less than one-third of households in the study corridor owned two vehicles (Brisbane 34.9%, Queensland 36.5%), and only 8.8% of households owned three or more private vehicles (Brisbane 12.6%, Queensland 15.6%). Access to a motor vehicle is typically an indicator of potential social isolation. However, in relation to the study corridor, the higher proportions of households without a vehicle is likely to reflect a reduced need and personal choice, given the study corridor's access to public transport and proximity to the CBD, employment opportunities and major universities.

The travel patterns of residents in the study corridor generally reflect the proximity of the study corridor to the CBD and major employment centres as well as the high level of access to public transport and pedestrian and cycle networks. Journey to work by private vehicle was the most prevalent form of transport for people in the study corridor, with 46.2% of people travelling to work in a private vehicle as either driver or passenger. However, this is lower than for both the Brisbane LGA and Queensland (60.0% and 66.5% respectively). Compared to Brisbane as a whole, commuters in the study corridor were more likely to use public transport, or to walk or ride a bicycle to work, particularly in those suburbs close to the CBD or with good access to bus routes or railway stations (i.e. Auchenflower, Toowong and Milton).

Housing and Home Ownership

The study corridor had 22,101 occupied private dwellings at the 2006 Census. Overall, the study corridor had higher than average percentages of higher density dwellings such as flats, units and apartments, and lower percentages of separate houses. However, housing type varies across the study corridor, with higher density dwellings generally located in those suburbs close to the CBD (i.e. City, Spring Hill and Milton).

The study corridor had a relatively low rate of owner occupiers and high proportions of renters compared to the Brisbane and Queensland averages, reflecting the study corridor's relatively young and mobile population, and the high student population. Bardon had the highest level of owner occupants (72.8%), followed by Paddington and Red Hill, both at approximately 50%. Spring Hill (62.3%) and the City (61.2%) had high proportions of rental dwellings as did Milton (59.4%).

Housing costs across the study corridor are generally high, with the study corridor experiencing higher rental costs and housing loan repayments compared to the Brisbane LGA and Queensland. At the 2006 Census, the study corridor had an average median rent of \$274 per week compared to \$240 in the Brisbane LGA. The study corridor also had higher median housing loan repayments, with each suburb showing median loan repayments above the Brisbane LGA.

Between 2002 and 2007, the overall supply of affordable rental stock in the study corridor declined by 15.1% compared to approximately 30% in the Brisbane LGA. The study corridor also saw a decrease in affordable rental stock as a proportion of total dwellings. In particular, the proportion of one bedroom units experienced the greatest reduction, with considerable decreases in all suburbs, with the exception of Spring Hill. Two bedroom and four bedroom dwellings also experienced reasonable decreases in the proportion of total dwellings, while the proportion of three bedroom dwellings remained relatively constant over the five years.

In 2007, more than half of very low or low income households in the study corridor that were renting, were in housing stress, higher than the Brisbane LGA (41%) and Queensland (35%). Each of the study corridor SLAs, with the exception of Spring Hill, experienced a higher level of housing stress than the Brisbane LGA. Red Hill had the highest proportion of very low and low income households considered to be in housing stress (61%) followed by Herston (60%) and Toowong (56%). Spring Hill had the lowest proportion of households in housing stress (34%).

Property Prices

At June 2006, median house prices across the study corridor were higher than the Brisbane LGA, ranging from \$450,000 in Kelvin Grove to \$695,000 in Spring Hill. The average median house price for the study corridor is approximately \$509,000. This is compared to the median house price for the Brisbane LGA of approximately \$400,000. The study corridor had an average median unit price of \$331,425 in June 2006, which was higher than the median price for the Brisbane LGA (\$292,500). Bardon had the highest median unit price, at \$435,000 followed by the City at \$414,000. Herston, Spring Hill and Kelvin Grove had the lowest median unit prices, with these suburbs having unit prices below the Brisbane LGA median².

Health Status

The health status of the general community in the study corridor is likely to be good given the status of socio-economic risk factors, the disease profile and access to services. In particular:

- the study corridor population appears to have a low risk of general poor health than communities with a higher prevalence of risk factors;
- disease prevalence rates per 1,000 population for the Brisbane North Division were generally consistent with the national averages. However, the division had slightly higher than the national average of respiratory system diseases (including asthma) and osteoporosis (in women); and
- residents in the study corridor have good access to services which also support the general health of the community, including GP provision, accident and emergency services, public transport and open space and recreation facilities which encourage physical activity.

However, individual health outcomes will vary in line with socio-economic factors and personal risk factors, with poorer health experienced by people with lowest incomes or greater ages.

13.2.2 Social Infrastructure

The study corridor includes a wide range of community services and facilities to service the needs of local communities, including community support, education and training, sport and recreation, cultural, health, and emergency facilities and services. In addition there is a range of social infrastructure servicing the needs of the broader community at a regional, interstate and international level, including health and medical, open space, sport and recreation, and education facilities. The study corridor also includes a range of commercial and retail centres that cater for local and regional communities.

Below is a brief description of the main social infrastructure and facilities in the study corridor, which are shown on the maps in **Figure 13-3(a-c)**. A detailed list of community services and facilities in the study corridor is provided in the SIA Technical Report.

² www.reiq.com.au, viewed on 19 November 2007

Health, Medical and Emergency Services

The study corridor has access to a comprehensive range of international standard health and medical services, within the immediate study corridor suburbs and nearby. Some of Brisbane's major hospitals, such as the Royal Brisbane and Women's Hospital (RB&WH) and Royal Children's Hospital (RCH) (Herston), the Wesley Private Hospital (Auchenflower), the Toowong Private Hospital, St Andrew's Hospital (Spring Hill), the Brisbane Private Hospital (Spring Hill), Brisbane Eye Hospital (Spring Hill) and the Dental Hospital (City and Woolloongabba) are located in the suburbs that make up the study corridor.

The Royal Brisbane Hospital (RBH) complex at Herston, which includes the RB&WH and the RCH, as well as the University of Queensland Medical School and the Queensland Institute of Medical Research, is one of the largest hospitals in the southern hemisphere. The RBH is Queensland's major tertiary referral and paediatric teaching hospital, providing medical and health services to patients throughout Queensland, Northern New South Wales, and the Northern Territory. The RCH also provides health care services to children and young people in the Pacific Islands, New Zealand and Japan.

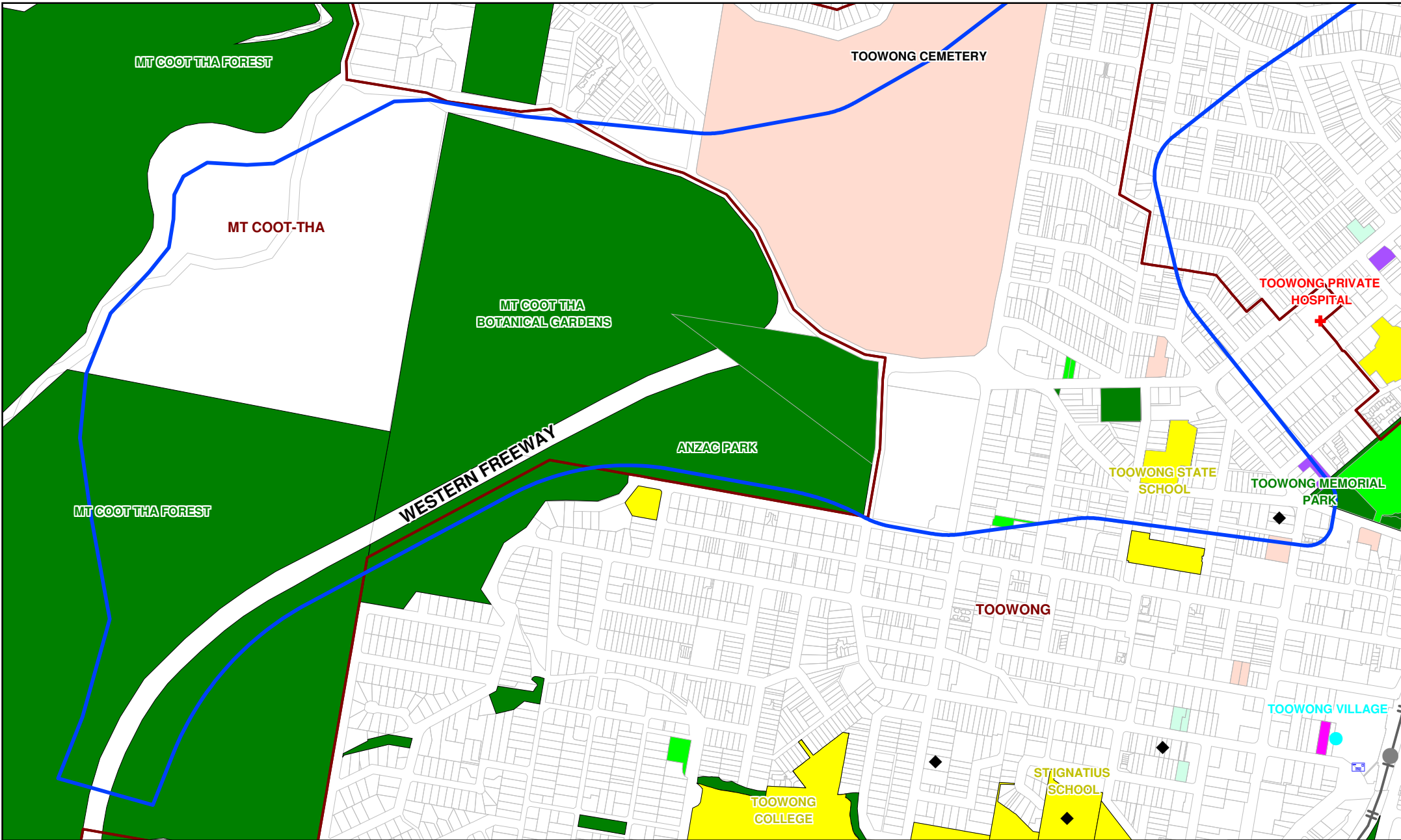
Wesley Private Hospital is one of the largest private hospitals in Queensland, with approximately 430 in patient beds, employing 1900 staff and serving more than 75,000 people annually. Construction is currently under way for a \$102 million expansion of the hospital and its car park, with the works due for completion by June 2009.

The study corridor is well served by emergency services, with one or more police, ambulance and fire station being located in the study corridor suburbs, and more in surrounding suburbs.



Sport, Recreation, Leisure and Cultural Facilities


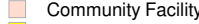


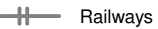
The study corridor suburbs provide a diverse range of sport, recreation, leisure and cultural facilities and clubs that cater for organised sporting activities as well as informal recreation and leisure pursuits. These facilities include larger, regional facilities such as Suncorp Stadium, Victoria Park Golf Course and Mt Coot-tha Botanic Gardens. At the local level, facilities include parks such as Toowong Memorial Park and Anzac Park at Toowong, Centenary Pool at Spring Hill, playing fields and numerous neighbourhood parks, some of which incorporate play equipment and barbecue and picnic facilities.


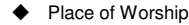

There are also a number of cultural and religious centres located in the study corridor, most serving local needs including pastoral and community care.

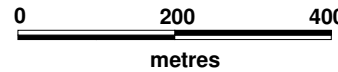


LEGEND

-  Study Area Corridor
-  Social Environment Study Corridor Suburbs

-  Accommodation
-  Child Care Centre
-  Education
-  Sport and Recreation
-  Park
-  Retirement Village
-  Railways

-  Emergency Services
-  Centres
-  Medical Facility
-  Place of Worship
-  Post office
-  Railway Station



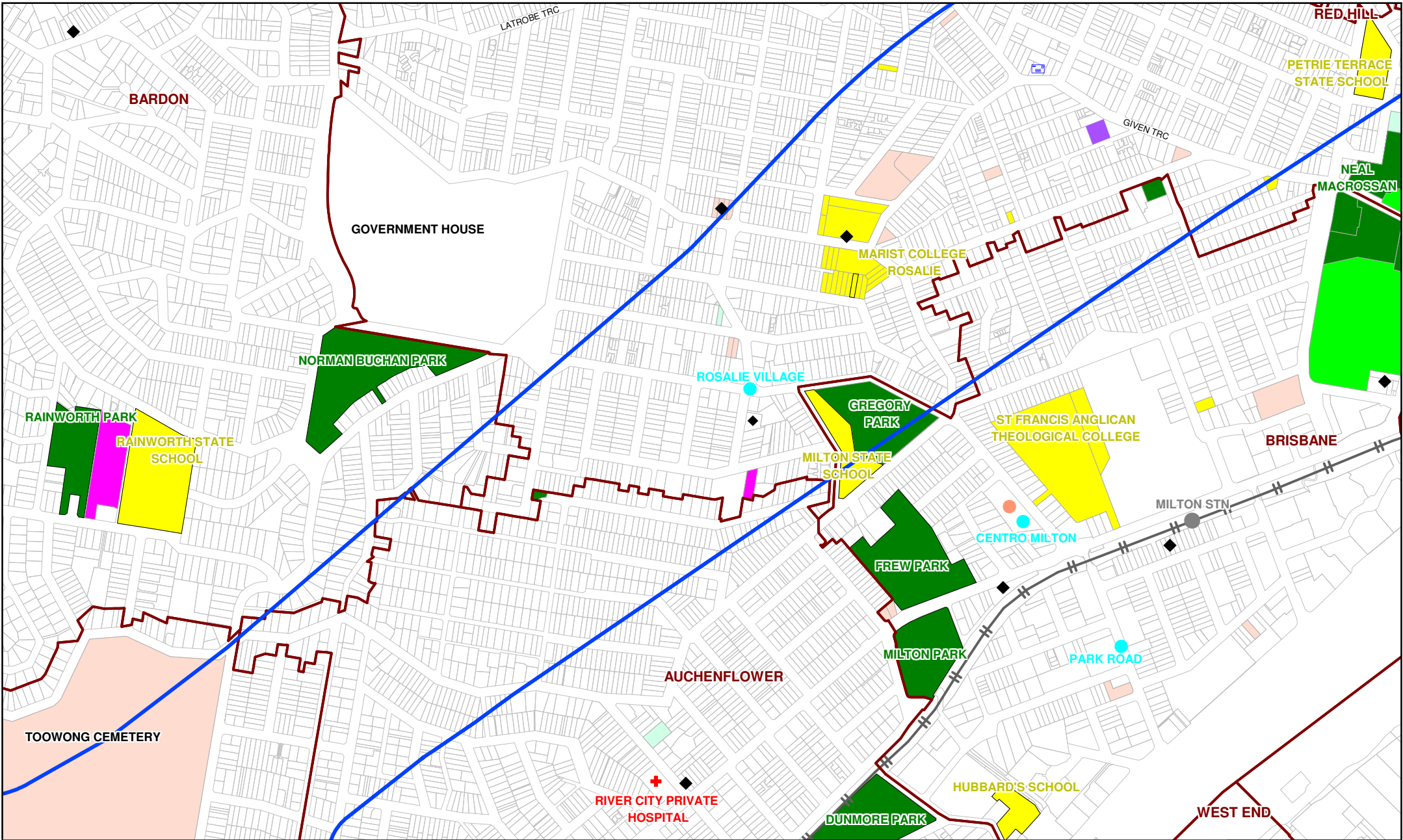
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NORTHERN LINK
ENVIRONMENTAL IMPACT STATEMENT








Figure 13 - 3A
Social Infrastructure







LEGEND

-  Study Area Corridor
-  Social Environment Study Corridor Suburbs

-  Accommodation
-  Child Care Centre
-  Community Facility
-  Education
-  Sport and Recreation
-  Park
-  Retirement Village
-  Railways

-  Emergency Services
-  Centres
-  Medical Facility
-  Place of Worship
-  Post office
-  Railway Station

0 200 400 metres

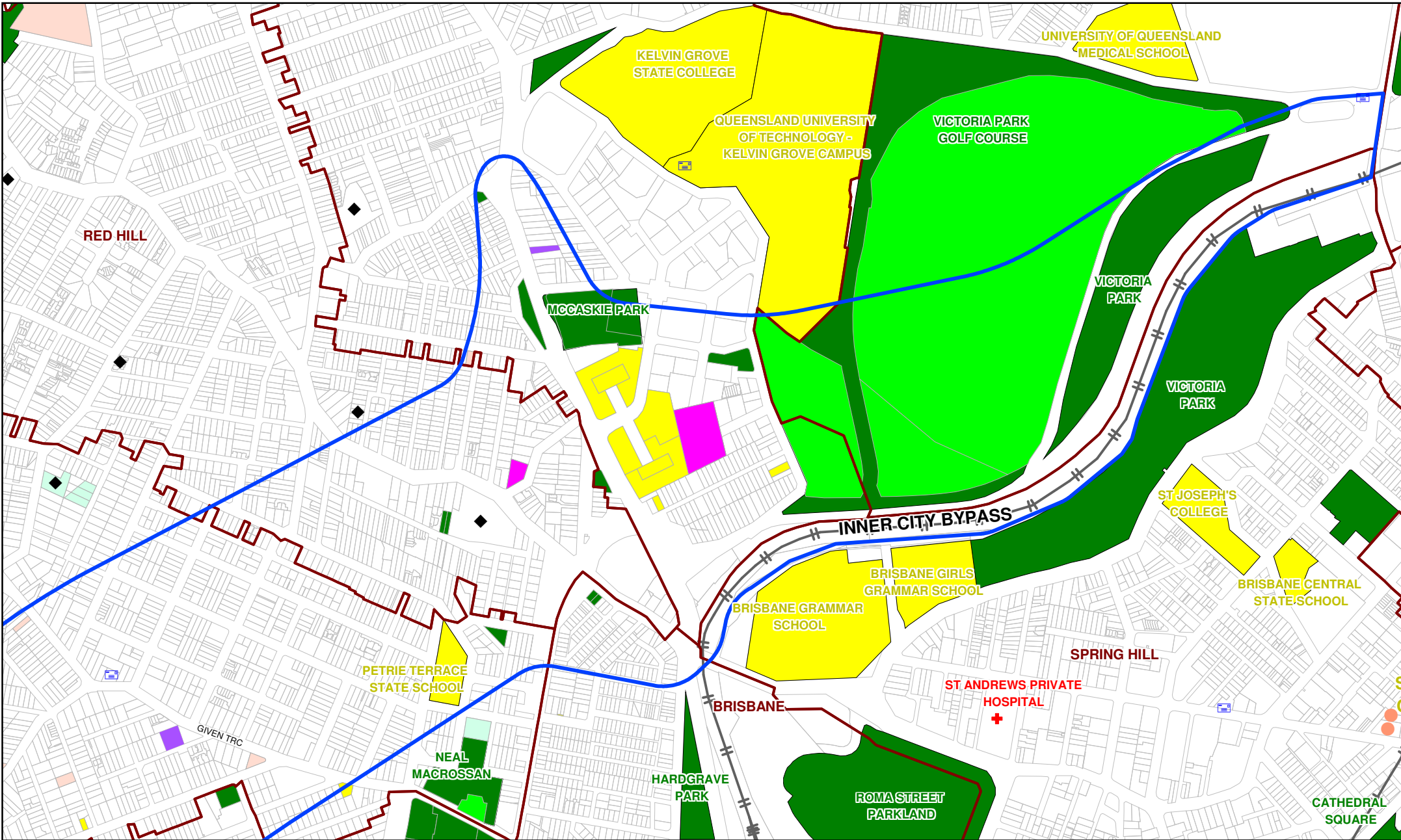
Scale 1: 10,000 (A4)



NORTHERN LINK ENVIRONMENTAL IMPACT STATEMENT

Figure 13 - 3B
Social Infrastructure



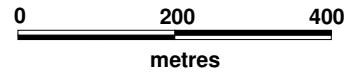


LEGEND

- Study Area Corridor
- Social Environment Study Corridor Suburbs

- Accommodation
- Child Care Centre
- Community Facility
- Education
- Sport and Recreation
- Park
- Retirement Village
- Railways

- + Emergency Services
- Centres
- + Medical Facility
- ◆ Place of Worship
- ✉ Post office
- Railway Station



Scale 1: 10,000 (A4)



NORTHERN LINK
ENVIRONMENTAL IMPACT STATEMENT

Figure 13 - 3C
Social Infrastructure



Education

Suburbs in the study corridor have access to a wide range of educational facilities and institutions, either within the study corridor suburbs or nearby. These include:

- seven State primary schools, including Toowong State School, Milton State School and Petrie Terrace State School;
- two private primary schools;
- five private secondary schools, including Brisbane Girls Grammar School at Spring Hill;
- four private combined primary/secondary schools, including Brisbane Grammar School at Spring Hill;
- three senior State secondary schools;
- one special needs school (Red Hill Special School); and
- four tertiary institutions, being QUT, the Queensland Institute of Medical Research, and two theological colleges as well as the University of Queensland at nearby St Lucia.

In addition, there are numerous kindergartens and child care centres throughout the study corridor and adjoining suburbs, which could also be classified as educational facilities.

Aged Care

The study corridor suburbs contain a number of aged care facilities including:

- Rosalie Nursing Care Centre at Rosalie, a residential facility for patients with high care needs;
- Aldersgate Court Wesley Mission at Red Hill, which includes independent living units;
- Pinjarra Lodge at Red Hill;
- Hilltop Gardens at Kelvin Grove, which currently offers independent living units, nursing places and hostel beds; and
- Magdalene Court Retirement Community at Bardon, which provides independent living units.

These aged care centres are supported by the study corridor's high level of medical and public transport services. There are also a number of local service providers (including community and church organisations) assisting seniors to ensure that where possible, their social, health and other community needs are met through local networks, facilities and services.

Affordable Housing

Affordable housing may include public housing; community owned or leased housing, and private rental housing (detached dwellings, units and boarding houses). There are approximately 318 public housing properties within the study corridor suburbs, ranging from a small number of attached and detached dwellings to larger numbers of apartments and seniors' units, as shown in **Table 13-3**. In addition, there are 90 beds provided in boarding house properties in Spring Hill.

Of the study corridor suburbs, Spring Hill has the largest number of public housing properties, the majority of which comprise apartments. Paddington and Red Hill also have higher numbers of public housing properties, mostly comprising apartments and seniors' units.

■ **Table 13-3 Public Housing Stock, 2007**

Suburb	Apartment	Attached Housing	Detached House (properties)	Dual Occupancy (properties)	Senior Unit (properties)	Studio Apartment (Properties)	Total
Auchenflower	2						2
Bardon	1		8				9
Herston	24		3				27
Kelvin Grove	6		4				10
Milton					6		6
Paddington	4	6	5		36	13	64
Red Hill	42	3	1		20		66
Spring Hill	74	9	2	2		24	111
Toowong	15	6	2				23
TOTAL	168	24	25	2	62	37	318

Table Note: Source - Queensland Department of Housing, 2007

Other forms of affordable housing in the study corridor include private boarding houses and hostels, and community rental housing that is owned or leased by community organisations. These forms of housing are coming under increasing pressure from rising costs and a regulatory environment that is becoming increasingly tight in terms of building compliance standards, insurance obligations and the opportunity costs of (for example) alternative land use or development scenarios.

Community Facilities and Services

The study corridor suburbs offer a wide range of community support services and community facilities. The services provided are varied and include emotional and health support services, employment support services, disability services, youth support and emergency accommodation support services. Some of the key community service facilities in the study corridor suburbs include:

- Centacare Employment Group, Royal Queensland Bush Children's Health Scheme, Blue Care, and Veterans Support and Advocacy Service Australia Inc, at Toowong;
- Community (formerly Red Hill Paddington Community Centre), at Bardon, which offers a range of community support services;
- Gardens Motel, Lang Parade Lodge and Wesley Rotary Lodge at Auchenflower, which provide accommodation for hospital patients and their families;
- Centre for Multicultural Pastoral Care, Child Adolescent and Family Welfare Association of Queensland, and Queensland Parents for People with a Disability, at Paddington;
- Boystown, AMPARO Advocacy Inc, and Kids Helpline at Milton;
- Youth Christian Workers, Salvation Army – Moonyah and Blue Care – Unicare, at Red Hill; and
- Queensland Council of Social Service Inc and Teen Challenge, Hebron House, at Kelvin Grove.

Other facilities available in the study corridor suburbs include function venues, libraries and community centres, Scouts and Guides, Senior Citizens' – Brisbane West and Lang Park PCYC, Paddington.

Community Networks

The following facilities and services, which contribute to the building of strong community networks, are located within the study corridor.

- School Parent and Citizens' Associations for each of the state and private schools;
- Historical societies, including the Toowong History Group, and Toowong and District Historical Society;
- Friends of Toowong Cemetery;
- Silk Shed Studio Group at Quinn Park;
- Resident and community groups, including West Toowong Community Association, Auchenflower Residents Alliance Inc, Herston Kelvin Grove Residents Group, Normanby Action Group, and Community Vegetable Garden Group (Toowong);
- Business and local service groups, including the Brisbane Inner West Chamber of Commerce and Rotary Club of Toowong;
- Environmental groups, including Save Our Waterways Now (SOWN); and
- Neighbourhood Watch, Brisbane Central.

In addition, the study corridor suburbs include a range of sporting clubs and associations, including:

- Western Leagues Club, Bardon;
- Queensland Rogaine Association, Bardon;
- Bardon Latrobe Junior Soccer Club, Bardon;
- Bardon Bowls Club, Bardon;
- Indoor Netball Federation of Queensland Inc, Milton;
- McIlwraith Croquet Club, Auchenflower;
- Brisbane Basketball Inc, Auchenflower;
- Toowong Soccer Club, Auchenflower;
- West Toowong Bowls Club, Toowong; and
- Western Districts Rugby Football Club, Toowong.

Commercial Centres

The study corridor suburbs offer a diverse range of commercial and business, retail and entertainment facilities, serving both a local and regional function. Key commercial, business and retail centres in the study corridor suburbs include:

- the Toowong Village, which provides regionally significant commercial and community based services, comparison retail, convenience retail, entertainment and secondary administrative functions;
- Given Terrace-LaTrobe Terrace, Paddington;
- Bardon Village (local convenience), Rosalie Village, Auchenflower (local convenience/ entertainment), and Cat and Fiddle (Toowong).

The Study Corridor suburbs also include a number of cafe, restaurant and entertainment precincts such as Park Road Milton, High Street Toowong, Caxton Street Paddington, Given Terrace – Latrobe Terrace Paddington, and parts of Spring Hill.

13.2.3 Community Values

This section provides an overview of the community values important to local residents in the study corridor. Community values are those tangible (physical) and intangible (social) elements held as being important to quality of life and wellbeing. They include parks, buildings, and landscape; a sense of belonging and community diversity. Social infrastructure (Section 13.2.2) is a major contributor to the development of community values, as are demographic characteristics (Section 13.2.1) and the natural and built features of the landscape.

Interactions between social and physical values contribute to qualities such as accessibility, amenity, sense of place and safety, and also to social capital. The tangible and intangible elements that make up a community, and which communities identify with, could be affected as result of changes to the physical and social environment. Some of these elements that contribute to community values in the study corridor include:

- connectivity, provided by major transport corridors and good connection to other areas of Brisbane by road, bus, rail and bicycle;
- diverse housing options;
- access to residential neighbourhoods within easy reach of the city's services and amenity;
- contribution of heritage places and 'tin and timber' character housing to the study corridor's local character and sense of place;
- district and local open space areas (including mature urban landscape plantings in private yards) which offer a range of landscape, ecological, scenic amenity, and recreational values, including the Brisbane River, Mt Coot-tha Botanic Gardens and Brisbane Forest Park;
- social, cultural, historical, recreational and landscape values of heritage listed facilities such as Toowong Cemetery and Government House (Fernberg);
- good access to community facilities of state and regional significance, including public transport, community facilities and employment opportunities; and
- strong community networks and levels of volunteering.

Accessibility and Connectivity

The study corridor includes several major transport corridors, including roads, bus and rail corridors, and pedestrian and bicycle networks which provide good connections to other areas of Brisbane. The study corridor is well serviced by public transport, including rail, bus and City Cat. Three major off-road bikeways (i.e. Bicentennial Bikeway, Western Freeway-Centenary Highway Bikeway and Victoria Park Bikeway) are located in the study corridor as well a number of on-road bicycle lanes, including along Sylvan Road, Sherwood Road and Miskin Road at Toowong and Caxton Street-Given Terrace-Latrobe Terrace at Paddington. The pedestrian environment in local streets is generally good with most streets having footpaths connecting to main roads and shared off-road pedestrian paths.

Community consultation identified that accessibility and connectivity in the study corridor was generally good. However, access and connectivity are becoming compromised by increasing traffic volumes and traffic congestion, with travel times increasing and inefficiencies in the transport system growing. In particular, increased traffic congestion on Milton Road and Coronation Drive has resulted in delays to peak period bus travel and commuter traffic. Main roads in the study corridor also provide existing barriers to local movement and connectivity within the study corridor, and form boundaries to local neighbourhoods, to pedestrian and cycle movements and to some of the local centres in the study corridor. The pedestrian and cycle environment along main roads is compromised by high traffic volumes and the hardening of the environment.

Amenity and Sense of Place

Amenity in the study corridor is high and sense of place is strong. Local communities have good access to public transport, community facilities of state and regional significance and employment opportunities, as well as a diverse range of local, district and regional shopping and entertainment precincts.

Local communities also have good access to parks, open space and recreation areas which offer a range of landscape, ecological, scenic amenity and recreational values. These include open space areas of district and regional importance such as Mt Coot-tha Forest and Lookout, Mt Coot-tha Botanic Gardens, Toowong Cemetery, Anzac Park, Toowong Memorial Park, Roma Street Parklands and the Brisbane River as well as local parks (i.e. Quinn Park, McCaskie Park, Marshall Park), that provide visual amenity, sense of place and recreation opportunities for local residents. School grounds also provide important green spaces, and sport and recreation opportunities.

The study corridor includes a mix of high density residential areas combined with low density character housing, with areas of 'tin and timber' character housing contributing to the amenity and sense of place of the study corridor.

Community cohesion

Community cohesion refers to connections and relationships between individuals, groups, and neighbourhoods and is encouraged by the existence of local community facilities, a sense of local identity and belonging, population stability, and opportunities for community participation. Levels of community cohesion in the study corridor are generally likely to be healthy, but are expected to vary across the study corridor.

Residents in the study corridor have good access to a diverse range of community facilities, including education, sport and recreation, open space, and community services, as well as good access to cafes, hotels and entertainment venues which support local social cohesion. The study corridor has a number of important community networks and relatively high proportions of people who engage in volunteer work. The study corridor has a mobile residential population, with higher proportions of people having lived elsewhere in the previous 12 months or the previous five years. However, community feedback during consultation gave a clear sense of strong community cohesion and shared social networks that mostly revolve around hubs such as schools, sporting clubs, neighbourhood centres, churches and other community-based organisations.

Community Safety

Preserving the City's sense of community safety is important for Brisbane residents, as identified in Council's *Living in Brisbane 2026*. This includes ensuring Brisbane is a place where everyone feels safe, without fear for their personal safety or property security, either in their homes, streets, parks and travelling through the city (Brisbane City Council, 2007). Values which contribute to community safety include freedom from threats to personal well being, protection of personal and public property, and road safety. Crime prevention requires that opportunities for crime are reduced by providing safe environments in streets, parks and other public places, providing visual surveillance over public spaces, and encouraging community participation in reducing crime and its effects.

13.3 Social Impacts

This section provides an assessment of the potential changes to the social environment of the study corridor as a result of the Project. Overall, the Project has potential for both city-wide and local benefits in the medium to longer term. However, Northern Link would be placed in a highly urbanised, inner city environment, which would bring immediate and longer term changes to the physical and social fabric of local neighbourhoods and communities in the inner western suburbs.

The discussion of social impacts and benefits focuses upon each of the four locations directly affected by the surface works associated with the Project, being the connections at the Western Freeway, Toowong, Kelvin Grove, and the Inner City Bypass (ICB). The likely social impacts and benefits for each of these locations are described, with particular reference to the communities affected. Where appropriate, the discussion also examines the impacts on the wider study corridor and its surrounds, and the city as a whole.

The Project's social impacts have been evaluated in the context of the construction and operation phases. Where potential impacts have been identified they are discussed in the context of the proposed mitigations, which in some cases would result in a net social benefit, or an overall improvement in the amenity or functionality of the affected location.

Detailed discussion of the Project's benefits and impacts on the social environment is provided in the SIA Technical Report.

13.3.1 Overall Social Impacts of the Project

Overall Construction Impacts

The planned duration of construction for Northern Link would be approximately four years. During this time, construction work sites would be established at the Western Freeway, at Frederick Street/Milton Road Toowong, and at Kelvin Grove. Some works would also take place at the northern connection (Inner City Bypass), but this would not be a substantial construction site.

It is proposed that tunnelling works would be undertaken 24 hours per day, seven days per week with works occurring underground or within the acoustic worksheds. The majority of surface works would occur during day light hours (i.e. 6.30am to 6.30pm), Monday to Saturday. However, some surface works may be required to be undertaken outside of these hours to minimise traffic disruption on the regional road network.

During construction, communities nearest to construction work sites and surface works would experience impacts on local amenity, access and connectivity and quality of life due to:

- construction noise and dust;
- impacts on sleeping patterns, where night-time construction works are required;
- changes to local character due to the location of the worksites;
- noise and dust associated with the loading, handling and removal of spoil from construction worksites; and
- temporary changes to local access and connectivity for pedestrians, cyclists and motorists near construction worksites and in the vicinity of surface works.

The social impacts of construction at each location are discussed in detail below.

Following completion of construction activities at each location, construction work sites and surplus land would be rehabilitated and returned to the community either as open space (e.g. proposed Western Freeway worksite),

or made available for development in accordance with the land use planning controls and requirements of the Brisbane City Plan.

More broadly, the construction phase would impact on some localities that are distant or remote from the construction work sites and surface works. Residents, businesses and commuters in and around the study corridor are likely to experience some disruption from construction traffic and construction activities, including changes to traffic conditions and local access and connectivity. Construction traffic would bring materials, equipment and personnel to and from the construction sites on a daily basis, and transport spoil away from the work sites at Toowong and Kelvin Grove. Construction traffic (Chapter 5, Traffic and Transport) has a social dimension because of issues relating to noise, dust and traffic congestion. Additional volumes of heavy vehicles on roads, including some that are already congested, may also impact on the amenity and quality of life for communities along haulage routes.

Some properties situated above the proposed tunnel alignment may be exposed to regenerated noise and vibration from driven tunnel construction. Sensitivity to regenerated noise and vibration would depend on the depth of the tunnel, and a number of other factors that are explained in Chapter 9, Noise and Vibration. This is relevant mainly for those locations where the tunnel is close to the surface, and where vibration levels approach or exceed sleep disturbance limits (see Noise and Vibration Chapter).

During construction, environmental management measures, as outlined in the technical chapters of this EIS (ie: noise, vibration, air quality etc), would be put in place to ensure that negative impacts are minimised to the fullest extent possible. In addition, ongoing consultation and communication with local residents close to construction works would also be undertaken. This will be particularly important for residents of properties that may experience regenerated noise or vibration levels from driven tunnelling approaching or exceeding sleep disturbance levels and where surface works are proposed to be undertaken during night time hours. A 24-hour project information line and formal process for receiving, handling and responding to community complaints would also be established. This would include a requirement for contractor's to communicate responses to community issues and complaints received to the wider community on a regular basis.

Overall Operational Impacts

During operation, the character of some communities near surface connections are likely to be altered, with potential adverse outcomes for residents in close proximity to the new infrastructure. Some communities near surface connections may experience impacts on local amenity, access and connectivity and quality of life due to:

- increases in traffic noise from traffic entering and exiting the tunnel, particularly where the removal of buildings results in properties becoming exposed or moving closer to main roads;
- disruptions to views or visual amenity as a result of the location of surface infrastructure (i.e. transition structures, elevated ramps and ventilation outlets); and
- the closure of some local streets.

The social impacts of operation at each location are discussed in detail below.

A number of measures have been incorporated in the Project design to mitigate impacts on communities in the immediate vicinity of the surface connections. These include improvements to the urban environment such as pedestrian and cycle facilities, provision of open space, and landscaping and urban design treatments. The aim of these measures is to offset some of the detrimental impacts on those communities, and provide additional social benefits that may not otherwise have arisen without the Project.

The construction of noise barriers at the transition structures and connection ramps and the redevelopment of surplus land following construction of the Project will assist in mitigating traffic noise impacts on local amenity. The design and placement of noise barriers would need to consider pedestrian routes, safety for local communities, visual amenity for neighbouring properties and climatic conditions (i.e. breezes).

During operation, the Project would not impact on communities or property above the tunnel alignment, other than through the acquisition of a volumetric lot beneath those properties located directly above the tunnels (Chapter 11, Land Use and Planning). Volumetric resumptions would be noted on the affected properties' titles, but would not affect the use of land at the surface in any manner that complies with Brisbane City Council's planning codes and policies.

In the longer term, while the Project would deliver a range of benefits for local and regional communities (Section 13.2.2), locally there is likely to be a negative social effect caused by displacement of residents, changes to local movement patterns, and a changed visual environment in the immediate vicinity of the surface connections, particularly at Toowong and Kelvin Grove.

13.3.2 Overall Social Benefits of the Project

The Project represents the closure of a significant missing link in Brisbane's arterial road network, and would result in a net social benefit to the city. Without the Project, traffic congestion in the study corridor would continue to increase, with further loss of local amenity, increased travel times, and increased rat-running in local streets. With Northern Link, substantial volumes of traffic, including heavy vehicle freight traffic, would be removed from surface roads between Toowong and the ICB, including Milton Road, Coronation Drive and other routes through the study corridor, providing benefits for local and regional communities.

Locally, reducing traffic and rat running in the study corridor would assist in improving amenity for some local streets and neighbourhoods, including through reduced traffic noise, improved air quality, a safer road network, and improved local access and connectivity for motorists, pedestrians, cyclists, and public transport. Reduced traffic on some local streets would be achieved by up to 30-50%, including in Toowong, Milton, Red Hill and Rosalie. These are outlined in the *Traffic and Transport Report* and include streets such as Haig Road, Stuartholme Road, Rainworth Road and Birdwood Terrace. Concerns were raised during community consultation about existing levels of 'rat running', including in Paddington (i.e. Ellena Street) and in Auchenflower. The potential to reduce this was identified as a benefit by some community members.

The Project would also reduce traffic congestion compared to the without Project scenario on some regional radial roads, such as Milton Road, Coronation Drive, Moggill Road and High Street and some city distributor roads such as Sylvan Road, Caxton Street and Latrobe Terrace. This would improve amenity in the Caxton Street and Latrobe Terrace shopping and entertainment precincts and enable improved access within the study corridor, through freer movement of traffic, travel time savings and improved connection to the regional road network. A detailed assessment of predicted changes to traffic in the study corridor is provided in the *Traffic and Transport Report*.

The project would also help to improve access for local and regional residents to community facilities, such as local and regional health and medical services and education facilities, by reducing traffic congestion in Brisbane's inner western suburbs, providing an alternative route to some facilities and reducing travel times. At a city level, access to better cross-city travel options and travel time savings is also likely to facilitate community interaction and provide benefits for community cohesion.

At a regional level, the Project would support future employment growth areas in Brisbane and SEQ by providing more direct access between key areas of economic and employment activity such as the Western

Corridor, ATC (which comprises Brisbane Airport and the Port of Brisbane), and Brisbane CBD. It is also expected that the Project would:

- improve commuting times for cross-city workers and for public transport users;
- improve local amenity and access between the tunnel connections, providing benefits for local businesses particularly along Milton Road;
- provide a catalyst effect for the location of businesses near the surface connections; and
- assist in reducing transport and freight costs for businesses.

A recent study by Ernst and Young³ of the socio-economic benefits of Sydney's toll road network found that indirect socio-economic benefits of toll road projects, such as "better access to jobs, enhanced industry competitiveness, and the opening up of outer suburban areas for housing development" had been underestimated. Other results of the study included employment growth along toll road routes, and movement in residential and commercial property prices that were greater than the metropolitan averages. The study also noted that in inner-city areas, property values had risen and shopfronts had re-appeared, as toll roads take traffic off suburban streets. Although the study quoted applies to Sydney, the findings support and are consistent with many of Northern Link's key aims and objectives, and also support the findings of the economic assessment documented in Chapter 15, Economics.

Project benefits at each location are discussed in detail below.

13.3.3 Impacts by Location – Western Connection

Western Connection – Construction Impacts

During construction, land adjacent to the Western Freeway would be used as the primary construction site for the Project, and would be the preferred launch site for the two TBMs. This land currently is open space belonging to Brisbane City Council, and includes both the Brisbane Forest Park and Mt Coot-tha Botanic Gardens. The work site would become a hub for construction activity and would accommodate a large workforce, with large numbers of truck movements into and out of the site. While all traffic movements would be maintained on the freeway and through the Mt Coot-tha Roundabout, this area would be subject to change during construction, including the temporary erection of a number of large sheds, site offices and facilities, internal site haul roads and infrastructure for the proposed spoil conveyor (Chapter 4, Project Description). Land along either side of the freeway would be excavated to construct the tunnel entry and exit ramps, and on the freeway's southern side this would encroach (by approximately 25 m) into Anzac Park.

The proposed works at the Western Connection would not directly impact on the local community, in that no private properties would be acquired, and construction activities would not take place in a residential environment. However, establishment of the worksite would comprise an area of open space within the Mt Coot-tha Botanic Gardens, and a smaller area of open space within Anzac Park. Following construction, the area of the Mt Coot-tha Botanic Gardens used for the Western work site would be rehabilitated consistent with the Mt Coot-tha Botanic Gardens master plan. This would provide enhanced facilities (i.e. BBQs, shelters, drinking fountains, park furniture and lighting) and amenity for users of the Botanic Gardens. Land in Anzac Park that would be used for construction of the westbound cut-and-cover tunnel would also be returned to parkland.

³Ernst and Young (2008). *The economic contribution of Sydney's toll roads to NSW and Australia*. Independent study commissioned by Transurban Limited, Sydney, July 2008.

The Western Connection construction site would include a conveyor system, to remove and transport spoil from the mainline tunnels directly to the Mt Coot-tha Quarry (Chapter 4, Project Description). The proposed alignment for the conveyor would be through a section of land occupied by the Mt Coot-tha Botanic Gardens, and would have an impact on the use of a small portion of the Gardens while tunnel excavation works proceed. Following completion of tunnel excavation works, the conveyor would no longer be required and would be dismantled, and the affected land rehabilitated. The spoil conveyor is proposed to be covered, which will help to minimise potential noise and dust impacts on the amenity of nearby residents and for users of Mt Coot-tha Botanic Gardens. However, issues were identified during community consultation for the Project about impacts on neighbouring residents from the existing Mt Coot-tha quarry operations such as noise, dust, vibration and the use of local roads by heavy vehicles, and the potential for these impacts to increase with the use of the quarry for the collection and recycling of tunnel spoil. It is not expected that the existing levels of heavy vehicles entering or exiting the quarry will be increased as a result of the Project. The use of spoil from the tunnel may reduce some impacts of the quarry's operations associated with blasting, including noise, dust and vibration.

During construction, there would be temporary disruption to the bikeway adjacent to the Western Freeway in Anzac Park. However, access along the bikeway would be maintained, minimising impacts for pedestrians and cyclists in this area. Ongoing communication, including signage and advertisements, about potential changes to the bikeway would also reduce potential impacts for bikeway users during construction.

Overall, the impacts of construction works at the Western Connection including on local amenity, access and connectivity, and sense of place would not be significant.

Western Connection – Operational Impacts

During Northern Link's operations phase, the Western Connection would continue to function as a Freeway interchange, although with the addition of the tunnel entry and exit ramps. The new road infrastructure would be at or below the existing road level and therefore would have a low visual impact. This area currently does not hold good amenity, given its predominant transport function, although the dense vegetation on either side of the freeway provides a distinct experience for motorists, pedestrians and cyclists approaching from the west. For motorists, the 'entry' to Brisbane's inner western suburbs via the freeway would remain largely unchanged.

The existing pedestrian and cycleway along the southern side of the Western Freeway would be realigned to make way for the tunnel and ramp adjoining Anzac Park. There would allow direct connectivity to the new pedestrian/cycle overbridge, currently under construction (by the Department of Main Roads) from Anzac Park across the Western Freeway to Mt Coot-tha Road.

The transition structures for the tunnel entry and exit ramps would be a permanent encroachment into the edge of the Botanic Gardens and Anzac Park (up to approximately 30 m in width). However, this is not expected to impact significantly on amenity for park users, given the close location of the surface works adjacent to the Western Freeway.

The area of land used as the major construction site, on the northern side of the freeway, would include use for tunnel infrastructure, including the ventilation station and possible tunnel control centre. Community concerns have been expressed about the tunnel ventilation outlets, for their potential visual and health impacts, and these issues are addressed in Chapter 14, Urban Design and Visual Environment and Chapter 8, Air Quality and Greenhouse Gases. However, a key consideration in the proposed location of the western ventilation outlet has been its visibility from and proximity to residential areas.

The location of the ventilation outlet, may impact on the visual outlook for residents in neighbourhoods north of the Mt Coot-tha Botanic Gardens and in some streets south and east of Anzac Park. However, overall the

proposed location achieves good separation from residents and a low visual impact, while satisfying all of the relevant functional technical requirements.

Overall, the social impact of the Project in the vicinity of the Western Connection during operation would not be significant.

13.3.4 Impacts by Location – Toowong Connection

Toowong – Construction Impacts

Construction of the Toowong connection is likely to cause temporary disruption to amenity, local access and connectivity and quality of life for communities in close proximity to construction works. The proposed construction work site at Valentine Street / Milton Road directly adjoins an established ‘timber and tin’ residential neighbourhood, while the surface works in Milton Road, Croydon Street and Sylvan Road would affect those residents living along those streets, and to a lesser extent in adjoining streets.

Potential construction impacts of the Project for communities near the Toowong connection include:

- Impacts on local amenity in those streets nearest to the construction work site and surface works, as a result of construction noise and dust and increase in construction traffic, particularly heavy vehicles;
- acquisition of private properties, both residential and commercial, for the establishment of the construction work site and surface works and consequent displacement of residents and businesses;
- Changes to local access and connectivity resulting from the closure of local streets (Valentine Street, Gregory Street, Quinn Street) and traffic changes (banning of right turn from Milton Road into Sylvan Road);
- Temporary disruption to pedestrian and cycle access near the construction work site and surface works, although access would be maintained in these locations;
- Potential changes to the location of bus stops on Milton Road near the construction work site and surface works;
- Temporary changes to access to some local community facilities, such as the Toowong Baptist Church (corner of Sylvan Road and Jephson Street), Toowong Private Hospital (Milton Road east of Croydon Street) and Silk Shed Studio Group (Quinn Park) due to partial land acquisition;
- Impact on amenity of Quinn Park, including for the Silk Shed Studio Group, through the reduction in open space area, and noise and dust from construction works.

While some of these impacts individually may be managed through the implementation of environmental management measures, the cumulative effect of these changes would affect the amenity and quality of life of local residents near the Toowong connection during construction and particular for those residents directly adjoining the construction work site and surface works.

The technical aspects of recommended mitigation measures at Toowong (ie: noise, vibration, air quality, traffic and transport, urban design/visual etc.) are detailed in the relevant chapters of this EIS. In combination, these measures would contribute to the mitigation of some of the social impacts outlined above, with the overall aim of achieving construction methods, processes, sequences and schedules that allow for the maintenance of acceptable living conditions near the Toowong connection work site. Early and ongoing consultation and communication with local residents about construction activities (i.e. timing, duration and likely impacts) and potential disruptions would also be required to maximise the success of the mitigation measures. A 24-hour project information line and formal process for receiving, handling and responding to community complaints

would also be established. This would include a requirement for the contractor to communicate responses to community issues and complaints to the wider community on a regular basis.

The social impacts of construction would also be mitigated by the enclosure of the work site with solid hoardings at the residential interface, to create a physical separation between residents and the construction activities. This would largely be achieved through the use of acoustic barriers, noise- and dust-proof enclosures around the tunnel portal construction and spoil loading area, restrictions on access points for construction traffic, a prohibition on construction workers parking in local streets, and limits on the hours during which certain activities can be carried out.

Long term impact mitigation is discussed in relation to operational impacts, below.

Toowong – Operational Impacts

During operation of the Project, significant long-term changes would be introduced to the local community in the vicinity of the Toowong connection. The changed visual environment, the scale of the infrastructure relative to other (primarily residential) land uses, the changes to traffic flows and volumes, changes to local access, changes to pedestrian and cycle networks, and associated noise and air quality issues, would be perceived by the local community as detrimental impacts on their quality of life and amenity. Each of these issues has been addressed individually through the technical investigations undertaken for this EIS, and mitigation measures have been recommended.

A key issue for community members is the widening of Milton Road from four traffic lanes to 10 traffic lanes, with the added scale and bulk of the tunnel connection ramps. In the context of the prevailing urban environment that currently exists, with low density housing on both sides of the road and a short commercial strip on the approach to the Toowong Roundabout, this represents major change. Concerns have been raised during consultation for the Project relating to the potential for increased traffic through Toowong, and the effects of road widening on local connectivity and community cohesion between neighbourhoods and to community facilities such as the Toowong State School, local shops (i.e. Cat and Fiddle Shopping Centre) and public transport facilities. The Project design makes allowance for traffic noise mitigation, pedestrian, cycle and local traffic connections, and urban design and landscaping improvements along the corridor. However, regardless of the measures implemented to soften the impact, the new road infrastructure in Milton Road would change the character of this location significantly and permanently.

Connection across Milton Road is currently provided by signals at the intersection of Milton Road, Croydon Street and Morley Street and this intersection would be maintained as the primary pedestrian connection. It will be important to redress potential impacts on community cohesion by ensuring that the local environment around affected areas is restored and enhanced in a way that promotes connections and interaction within and between neighbourhoods, for example through the provision of attractive and usable public space, enhancement of existing open spaces (i.e. Toowong Memorial Park), and enhanced pedestrian and cycle connections, including to community facilities. Proposed enhancements are described in detail in Chapter 20 – Urban Regeneration.

To a lesser extent, the proposed widening of Croydon Street from four traffic lanes to seven traffic lanes also represents major change, bringing increased traffic along this route and necessitating the acquisition and demolition of a number of private properties on its western side. When viewed in the context of the overall permanent works at Toowong, the proposed widening of Croydon Street would compound the effect of the Milton Road works in altering the character of the local area.

The neighbourhood affected by property acquisition for the Toowong connection is a pocket of the suburb where narrow streets, older residents and the closeness of houses are likely to encourage social relationships

within the neighbourhood. Relocation of households due to property acquisition would disrupt bonds between neighbours and social networks. These impacts would be localised, but significant to the quality of life of residents who relocate and other members of their local networks. Support would be provided to people who are required to relocate due to property acquisition, particularly elderly and people with disability or long-term health conditions, in finding new housing and establishing new support networks. Brisbane City Council currently provides this service in relation to its major infrastructure projects, and would continue to do so for any residents who require assistance with relocation as a result of Northern Link.

During operation, impacts on amenity for users of Quinn Park would result from the loss of approximately half of the park, increased traffic noise, and impact on visual amenity due to the loss of trees adjacent to Milton Road. Quinn Park provides informal recreational opportunities for local residents, and is highly valued particularly given the limited number of local parks in the area. As such, the impact on the park is likely to be significant in the context of the local community. Rehabilitation and enhancement of the park following construction would mitigate some of the Project's construction and operation impacts. Mitigations would include new tree planting and landscaping (see Chapter 14), and noise mitigation (see Chapter 9).

During operation, there would be some improvements at Toowong. For example, local road closures and turn bans would remove through traffic from Valentine Street, Quinn Street and the southern end of Gregory Street, and reduce eastbound traffic flow in Sylvan Road, improving local amenity and pedestrian and cycle access in these streets. However, during consultation for the Project, some residents identified concerns that the Project would increase through traffic in some streets near the Toowong connection, because southbound traffic in Frederick Street wishing to access the tunnel would use local streets to reach Milton Road and the tunnel ramps, thus reducing local amenity. Traffic modelling found that compared to the without Project scenario, traffic reductions would occur in residential streets north of Milton Road. However, the implementation of local area traffic management measures, such as narrow entry 'thresholds' from Frederick Street, speed humps and chicanes in these streets would assist in mitigating impacts on local amenity resulting from potential increases in through traffic. Changes to local traffic with and without the Project and possible mitigation measures are discussed in Chapter.

13.3.5 Impacts by Location – Kelvin Grove Connection

Kelvin Grove – Construction Impacts

Construction of the Kelvin Grove connection would impact directly on the resident community in Lower Clifton Terrace, Upper Clifton Terrace, Westbury Street and Victoria Street. All of the five existing residential properties on the eastern side of Lower Clifton Terrace would be acquired for construction works, in addition to a number of single dwellings and multi-dwelling units at the location of the proposed tunnel portal construction site.

The Kelvin Grove work site would extend along the west side of Kelvin Grove Road from the Hale Street off-ramp to Victoria Street. The site will include an acoustic shed located over the proposed portal at the eastern or lower end of Upper Clifton Terrace. During construction, the main vehicular access into the Kelvin Grove work site would be from the Hale Street off-ramp below Lower Clifton Terrace, while the vehicular exit from the work site would be either at the existing signalised intersection opposite Musk Avenue, or at Victoria Street.

Pedestrian access along the west side of Kelvin Grove Road would be disrupted during construction in the vicinity of construction works, although alternative access would be provided. Provision of alternative pedestrian access would need to consider the needs of all pedestrians, including children, elderly and people with disability.

Low cost housing

Twenty-eight residential properties would be acquired at Kelvin Grove and residents would be required to relocate impacting on community cohesion at a local level. Five properties in Upper Clifton Terrace (including one multi-unit residential building) would be situated directly adjacent to the proposed acoustic shed at the portal. Approximately 11 properties in Lower Clifton Terrace, Westbury Street and Victoria Street would also be exposed to construction activities through their proximity to the work site at these locations.

The Project would directly impact on three properties comprising 16 student accommodation units at Lower Clifton Terrace and Kelvin Grove Road in Kelvin Grove. The loss of any student accommodation or affordable housing in the Study Corridor is undesirable. However, rather than prescribing the uses for which surplus land from the Project should be developed, it is considered more appropriate to identify those parcels of land that might have potential for housing development. Chapter 20 of this EIS (**Section 20.4.2**) identifies parcels of land that would become available for re-use after the Project's construction is complete, at Toowong and Kelvin Grove. As discussed in Chapter 20, the worksites at Toowong and Kelvin Grove have potential for a range of uses, subject to Council planning controls and suitable development proposals. For example, the residual land at Kelvin Grove may be suitable for a range of uses including landscape buffers, community recreation, or mixed commercial and residential development.

While the end use would be determined through a planning and development assessment process, the preferred option would be a combination of uses which enlivened Lower Clifton Terrace, making it an effective and attractive pedestrian link between the Kelvin Grove Urban Village and the Caxton Street/Given Terrace precinct, including Suncorp Stadium, in Paddington. Upper Clifton Terrace and the northern parcel of residual land would be suitable for student accommodation, or some form of affordable housing or other medium to high-density housing sympathetic with the scale and character of housing in those streets (see Chapter 20 for more detail).

Brisbane City Council, through City Plan 2000 and local area plans, already provides incentives for the development of affordable housing in accordance with *State Planning Policy 1/07 – Housing and Residential Development*. The desired policy outcome of SPP 1/07 is:

“That local governments identify the housing needs of their community and analyse, and modify if necessary, their planning scheme to remove barriers to and provide opportunities for a range of housing options that respond to the housing needs of the community.”

Amenity

Establishment of the work site at Kelvin Grove and construction works in this location would impact on the character and amenity of this area, but this effect would be partially mitigated by the prevailing topography. The land rises steeply above the western edge of Kelvin Grove Road, providing some natural separation between the main focal point of construction activity, and the adjoining residents. However, the nature of works required at Kelvin Grove Road, particularly for construction of the tunnel entry ramp portals within the roadway, may require some works to be carried out at night in order to minimise traffic disruptions. Night-time works may result in some local disturbance, including to sleeping patterns, depending on the nature of works and the potential for noise.

Other potential impacts during construction at Kelvin Grove include:

- regenerated noise and vibration from tunnelling excavation for the ramps and portals (Chapter 9, Noise and Vibration);

- noise and dust impacts from the loading and handling of spoil (Chapter 8, Air Quality and Greenhouse Gases and Chapter 9, Noise and Vibration);
- increase in spoil haulage vehicles on the road network, resulting in increases in traffic noise (Chapter 5, Traffic and Transport);
- potential changes to the location of bus stops on Kelvin Grove Road near construction work sites and surface works;
- changes to local access for residents in Westbury Street and for residential properties at the northern end of Upper Clifton Terrace, with connection to Victoria Street; and
- the proximity of the acoustic enclosure to local residents in Upper Clifton Terrace, and its potential for disturbance of adjacent residents through noise and dust.

The local community has raised concerns regarding the potential use of local streets in Red Hill for parking by construction workers, noting that students from QUT's Kelvin Grove campus already adopt this practice. To prevent this occurring during construction, the contractor's Environmental Management Plan would require that a single, remote parking facility be provided for the construction workforce, and that workers be transported by bus from this facility to the work sites.

The proposed construction methodology and environmental management measures would help to mitigate some of the potential impacts on the amenity of local streets and neighbourhoods in Kelvin Grove and Red Hill. This includes measures such as the erection of screening and noise barriers near construction works, the handling of spoil with an acoustic and dust controlled shed, and the implementation of dust mitigation measures (ie: wheel wash, covering of loads, etc). Ongoing consultation and communication with surrounding residents would be required during construction. This is particularly important for residents of properties where predictive modelling, undertaken as part of the environmental management requirements for the Project, or through actual construction experience, report that noise and vibration levels from driven tunnelling or other works are causing disturbed sleep, or established levels for sleep disturbance would be exceeded.

Kelvin Grove – Operational Impacts

When complete, the Kelvin Grove connection would not have a significant impact on the character or amenity of the community surrounding the tunnel interchange. Road traffic noise would be attenuated by noise barriers along Kelvin Grove Road around the tunnel portal. The portal itself would be set into the side of the embankment opposite Musk Avenue, and the embankment itself would be treated with a dedicated landscape design incorporating the noise barriers, tree planting, and pedestrian/cycle pathway. Pedestrian and cycle connectivity would be improved through integration into the design of dedicated pedestrian/cycle connections, that would ultimately facilitate improved connectivity between Kelvin Grove Urban Village, Red Hill, Victoria Park, the Normanby Bus Station, the Grammar Schools and the city.

Concerns with existing levels of 'rat running' in some local streets have been raised during community consultation, including by residents in Victoria Street. The operation of the Project may assist in improving amenity of some local streets by providing an alternate route for through-traffic, reducing rat-running in some residential streets. However, the closure of Victoria Street and reconfiguration of Westbury Street at Kelvin Grove Road would change local traffic access in this area. This may impact on local amenity in some streets connecting to Musgrave Road, if appropriate local area traffic management measures are not implemented.

The proposed works at Kelvin Grove would also impact on Marshall and McCaskie Parks, which are situated on opposite sides of Kelvin Grove Road adjoining Blamey Street. A narrow strip (approximately 4 m in width) of

McCaskie Park would be resumed on the eastern side for the widening of Kelvin Grove Road and provision of an indented bus stop.

The Project works would also result in the loss of two fig trees from McCaskie Park and two fig trees from Marshall Park on the western side of Kelvin Grove Road, which contribute to the amenity of these parks and streetscape of Kelvin Grove Road. The figs in Marshall Park are heritage items (Queensland Heritage Register; Chapter 12), while those in McCaskie Park are not. However, the loss of these fig trees would be important to the community and consideration should be given to their replacement in the local area. This is further discussed in Chapter 14, Urban Design and Visual Environment.

13.3.6 Impacts by Location – Inner City Bypass Connection

ICB connection – Construction Impacts

Construction of the ICB connection would not have a major social impact due to the separation between this connection and surrounding communities. However, construction of the eastbound tunnel exit portal would take place immediately adjacent to residents in Normanby Terrace. Properties along the south side of Normanby Terrace adjoin the ICB, and a noise barrier has been erected along these properties' rear boundaries to attenuate road traffic noise. During construction of the cut and cover portal, there would be some additional disturbance in this area, including noise and dust. There may also be some vibration and regenerated noise from tunnelling beneath properties in Normanby Terrace, which may impact on amenity for local residents, particularly where vibration levels approach or exceed sleep disturbance levels (Chapter 9, Noise and Vibration).

Construction would also encroach on the southwest corner of the Brisbane Grammar School playing fields, to the extent that the corner would be cut off one of the existing tennis courts, resulting in its loss. The existing vehicular access to the playing fields may also be interrupted during construction. However, it would be reinstated at completion of works and the playing field space itself would remain intact both during and after construction.

Local roads (ie: Victoria Park Road) would not be used by construction traffic, and residents in Normanby Terrace would not come into direct contact with the work site. However, there may be some requirement for night time works within the ICB corridor, to avoid traffic disruptions, which may impact on local amenity and sleeping patterns for local residents. In addition, traffic changes would be implemented on the ICB at key stages of construction to allow construction to proceed without interrupting traffic flows.

Further east, the ICB roadway would be widened to allow the addition of merge lanes from the tunnel (Chapter 4, Project Description), which would necessitate some resumption of land along the edge of Victoria Park. This would have an impact on the amenity of the open space and on connectivity, requiring the diversion of the existing pedestrian/cycle path along this edge. The diverted pathway would be moved only enough to allow the widening of the ICB corridor, and would follow approximately the same alignment as existing. No changes are proposed to the existing pedestrian access across the ICB corridor, during construction or operation.

In addition, the Project would encroach into the parkland for construction of the tunnel vent outlet, the ventilation fan station and the ducts connecting the tunnel to the vent outlet. However, while functionally part of the park, the land on which the ventilation structures are proposed to be built is owned by QDMR and is not within the cadastral boundary of Victoria Park. The fan station is proposed to be situated in the embankment adjacent to the Inner Northern Busway viaduct, while the vent outlet is proposed to be located further to the north, approximately 180 m from the edge of the ICB, and adjacent to the busway tunnel. In order to construct these facilities, some excavation would be required within the parkland, which would impact on the golf course.

The impacts described above would be temporary in nature and mitigation strategies would help to minimise or eliminate their social impacts. The pedestrian/cycle path along the ICB would be temporarily diverted during construction works until a new, permanent path is completed as part of the overall Project, in a similar location as the existing. Temporary modifications would be required for two holes of the Victoria Park golf course, but there would be no permanent impact on the golf course apart from the small area that would be occupied by the proposed vent outlet (see below).

For the residents of Normanby Terrace, construction impacts of noise, vibration and dust are addressed in the relevant chapters (ie. Chapter 9, Noise and Vibration and Chapter 8, Air Quality and Greenhouse Gases) and mitigation measures are identified to reduce potential impacts. In addition, early and ongoing consultation and communication with local residents about construction activities (i.e. timing, duration and likely impacts) and potential disruptions would also be required to maximise the success of the mitigation measures. A 24-hour project information line and formal process for receiving, handling and responding to community complaints would also be established. This would include a requirement for contractor's to communicate responses to community issues and complaints received to the wider community on a regular basis.

Inner City Bypass/Northern Connection – Operational Impacts

Following construction, the ICB and the Northern Link ICB connection would function in a similar way to the existing ICB, allowing for additional traffic volumes (Chapter 5, Traffic and Transport). Social impacts of operation at this location would be minimal.

During consultations with the community, concerns were raised in regard to the potential health and visual impacts of the proposed ventilation outlet in Victoria Park, on nearby residents and on the Brisbane Grammar and Girls Grammar Schools. The air quality and health risk assessment in Chapter 8, Air Quality and Greenhouse Gases has found that, for the predicted traffic volumes using the Northern Link tunnel, the concentration of airborne pollutants would be within the EPA's goals for fine particles, oxides of Nitrogen and Carbon monoxide. The assessment also found that there is little or no health risk posed to nearby residents or school populations as a result of the proposed vent outlet location. The nearest residences, at Normanby Terrace, would be approximately 200m from the vent outlet, while the Brisbane Girls Grammar School would be approximately 300m from it.

The Project when complete would result in minor changes to the appearance and character of the ICB connection and its surrounds. The configuration of the ICB/Victoria Park Road intersection would be modified to accommodate the tunnel exit portal, but the functionality of the intersection would not change. Access to the Grammar Playing Fields would remain in its present position, but would be realigned to allow for the reconfiguration of the ICB / Victoria Park Road intersection. The finished design of the tunnel exit portal incorporates an integrated landscaping plan, which would help to further screen the roadway from residents of Normanby Terrace, and improve amenity for pedestrians and cyclists.

Adjoining Victoria Park, the widening of the ICB would require further (permanent) encroachment into the parkland, which would be cumulative when taken in context of the ICB's original encroachment into this space. The community's association with Victoria Park is based on its recreational and social values, and further incremental encroachment would compromise these values. However, given that the park is primarily a golf course, albeit a public course, there are connotations of some exclusivity of use. The edge of the park adjoining the ICB, where the pedestrian/cycle path is located, has a more inclusive public focus, and includes York's Hollow and access to the Land Bridge across the ICB and rail yards. The Project would have no long term impact on public access to, or the functionality of this public space.

13.3.7 Impacts on Private Property

The Northern Link Project will require the whole or partial acquisition of properties for surface works (e.g. connections, road widening, construction worksites, and tunnel infrastructure) as well as volumetric acquisition of properties above the tunnel alignment.

A total of 116 properties would be acquired, either wholly or in part, in the vicinity of surface connections at Toowong and Kelvin Grove. This would include approximately 94 properties that would need to be wholly acquired and 22 properties that would be impacted by partial acquisition.

Of this number, a total of 85 residential properties would be affected by surface works, of which 74 properties would be fully acquired. Fifty seven residential properties would be affected by the Toowong connection, in Frederick Street, Valentine Street, Milton Road and Croydon Street. Twenty-eight residential properties would be affected by the Kelvin Grove connection, mainly in Lower Clifton Terrace, Upper Clifton Terrace and Kelvin Grove Road. A breakdown of the ownership and current use of these properties, by location, is given in **Table 13-4**.

■ Table 13-4 Property Requirements – Surface Works

Ownership and Use	Toowong	Kelvin Grove	Total
State	1	4	5
Council	7	8	15
Private	66	30	96
TOTAL	74	42	116
Commercial	8	3	11
Residential	57	28	85
Public land	5	4	9
Road	4	6	10
Vacant	0	1	1
TOTAL	74	42	116

The Project would directly affect 11 commercial properties. These commercial properties comprise 24 individual businesses including restaurants, car yards, real estate agents and service stations.

The Project would require the partial acquisition of the Toowong Baptist Church car park and the Toowong Private Hospital due to widening of Milton Road. These facilities would continue to operate as usual during and after construction. However, careful management of construction works would be required to minimise impacts on these facilities such as disruption to access, noise, dust and impacts of construction traffic.

Property impacts would include 20 parcels of land owned by the Brisbane City Council or Queensland Government. This includes open space partially occupied by the Mt Coot-tha Botanic Gardens and Council parks such as, Anzac Park, Quinn Park, Memorial Park on Sylvan Road and Victoria Park.

Brisbane City Council is currently consulting with property owners whose properties may be directly affected by the Project. Compensation would be provided to property owners who are directly impacted by the Project in accordance with the relevant legislation.

The Project would not impact on any State or Council-owned public housing. However, some student housing at Kelvin Grove would be impacted on as discussed above in **Section 13.3.5**.

In addition to those properties affected by surface works, approximately 614 properties titles, which are located along the tunnel alignment, would require reconfiguration to subdivide from the title a volumetric lot of land, below ground, which would be acquired to provide tenure for the tunnels. Volumetric acquisition would not impact on the use of land at the surface. Compensation for the acquisition of the volumetric lot would be provided to affected property owners, based on a 'before and after' valuation method in accordance with the *Acquisition of Land Act 1967*.

A number of issues were raised by community members during consultation about potential property impacts. These include:

- potential impacts on property values in the study corridor, particularly for those properties near to surface works or along the tunnel alignment;
- potential for volumetric acquisition to reduce the amenity and therefore value of properties along the tunnel alignment;
- potential impacts from tunnelling construction, including noise, vibration and structural damage to properties caused by vibration; and
- potential vibration impacts from tunnelling on community uses, including the Toowong Cemetery and Marist College Rosalie.

Vibration impacts of tunnelling are discussed in Chapter 9, Noise and Vibration, which includes recommended measures to mitigate potential impacts of vibration on people and properties, such as early and ongoing notification of residents and businesses above the tunnel alignment about the timing, and duration of tunnelling works. Predictive modelling would be required by the contractor, prior to the commencement of construction, of the potential construction noise and vibration impacts on properties. This modelling would be based on the proposed construction methods to be used and the proximity of sensitive places, and identification of surface locations where the duration of underground works exceeds two weeks. Building condition surveys would be undertaken prior to construction, where it is considered there may be potential for cosmetic (superficial) building damage from TBM and drill-and-blast methods (see Chapter 9). This would provide a basis for determining the extent of any damage caused that is attributable to tunnelling works, and hence the scope of any necessary repairs, for which the contractor would be responsible.

Property Values

Uncertainty about proposed changes and effects of the Project may impact on property values near surface works in the short-term. However, based on experience from recent urban tunnel projects in Brisbane and other Australian capital cities, improvements to local amenity and accessibility within the study corridor are likely to support property values in the longer term.

Improved access to a cross-city connection such as Northern Link is likely to support property values, particularly in those suburbs close to the tunnel connections (ie: Toowong and Kelvin Grove). This is evident in other areas of Brisbane directly affected by the Clem Jones Tunnel (CLEM7)⁴ and Airport Link and Northern Busway Projects, such as Woolloongabba and Windsor, which have experienced higher rates of growth in house prices over the 12 months to December 2007 compared to the Brisbane LGA (REIQ, Autumn 2008).

⁴ Formerly known as the North-South Bypass Tunnel (NSBT).

Consultation and communication about the Project and potential effects would help to reduce uncertainty and raise awareness of potential longer term benefits of the Project. Potential impacts on local property values are discussed further in Chapter 15, Economics.

13.3.8 Community Health and Safety

The Northern Link is likely to improve access to health and medical services, including accident and emergency services, public hospital care and community services supporting health for specific target groups (e.g. aged people) by providing an alternative route to facilities such as the RBH, reducing travel times and improving traffic congestion in the inner western suburbs.

Residents, business owners and employees facing changes such as relocation from acquisition of properties may experience anxiety and stress about these changes. The neighbourhoods affected by surface works at Toowong and Kelvin Grove include a number of elderly residents and long-term residents, with some houses owned by the one family for a number of generations. The area also includes a number of people who need help or assistance in self-care, mobility or communication because of disability, long-term health conditions or old age. Relocation of some residents away from the local area and from existing social and support networks may impact on their well-being if they are not appropriately supported to do so.

There is potential for impacts on quality of life due to the effects of uncertainty about property acquisitions or other impacts such as noise and vibration. Concerns were raised during consultation about uncertainty relating to:

- decisions on buying or selling properties, future renovations and impacts on property values near construction works at Toowong and Kelvin Grove and above the tunnel alignment, which may cause stress and anxiety;
- vibration and noise impacts for residents above the tunnel alignment or near worksites, including the perception that property may be damaged by vibration; and
- potential impacts for businesses near surface works, resulting from changes to access, vibration and amenity.

On balance it is unlikely that such anxiety would affect community health given the range of support facilities and socio-economic resilience which is generally evident in the study corridor. However, further stages of the project planning and delivery will need to be sensitive to the potential for anxiety and stress and ensure that ongoing consultation and communication with residents and local businesses reduces uncertainty.

Operational air quality was raised as a primary concern by many local residents, specifically in relation to potential health impacts for sensitive groups such as elderly people and young children. Other issues raised in relation to air quality included impact of emissions for tunnel portals and elevated ramps, proximity of ventilation outlets to sensitive uses (i.e. schools, playing fields, aged care) and the need for the best possible ventilation system. People also identified a concern to ensure air quality is maintained at safe levels, and enhanced where possible. Air quality modelling undertaken for the Project found that air quality would not change substantially as a result of the Northern Link Project and that local air quality improvements will be achieved in some areas of the study corridor, particularly where traffic volumes are reduced (Air Quality Chapter). Communication about air quality will be valuable in assuring most community members that potential effects on health have been comprehensively assessed and precluded.

During construction, potential impacts (including perceptions or concerns) about community safety may result from changes to pedestrian and cycle paths near construction works, reducing the legibility of the pedestrian environment and perceived potential for the creation of unsafe public places, by reducing sight lines, opportunities for casual surveillance and levels of activity in public spaces. Application of Crime Prevention Through Environmental Design (CPTED) principles will be important in ensuring pedestrian safety during construction and operation. Ongoing consultation and communication with local communities about potential changes to pedestrian and cycle facilities will help to improve community safety by improving legibility of the environment.

During operation of the Project, a reduction in traffic congestion and rat running in some local streets within the study corridor would help to improve safety and access for pedestrian and cyclists and may encourage an increase in walking and cycling. This would also have health benefits for local communities. However, changes to pedestrian and cycle connections and traffic flows in the vicinity of surface connections at Toowong and Kelvin Grove Road may discourage walking and cycling in these local communities, reducing potential gains in health benefits resulting from increased walking and cycling across the study corridor. Improvements to pedestrian and cycle connections in the vicinity of surface connections would help to mitigate these impacts.

13.3.9 Impacts on Employment

The Northern Link Project would impact positively on employment, both directly through the creation of construction-related jobs and indirectly through improved access to employment centres within the study corridor and the wider Brisbane region including the Brisbane CBD and Australia TradeCoast (ATC).

A total of 24 businesses would be directly affected by the acquisition of commercial properties for surface works. These include businesses that serve the needs of local residents (i.e. restaurants, real estate agents, and take-away shops). Publicly available information⁵ suggests that there is an ample supply of vacant commercial property, for sale or lease in the Study Corridor and surrounding suburbs. It is therefore expected that most if not all of these businesses would be able to find alternative premises in the local area. However, a number of properties affected by acquisition include businesses with broader catchments such as car yards and service stations. These businesses generally have more specific location requirements, which may make finding alternative premises locally more difficult.

It is not proposed to offer direct support to businesses caused to relocate by the Project other than through a legal or statutory right to compensation. Under the *Acquisition of Land Act 1967*, business owners occupying leasehold properties may be entitled to fair compensation depending on the conditions and duration of their existing lease, subject to negotiation but potentially including relocation costs and loss of goodwill. Beyond this however, no additional support or relocation services would be offered to businesses, as the overall loss of commercial property is not considered to be significant, and this is not considered to be a social need.

The acquisition of commercial properties may cause a loss of local employment in Toowong and Kelvin Grove, particularly if alternative premises are not able to be found locally. However, this is not expected to be significant in the context of the diversity of employment options available in this area.

⁵ A search for vacant commercial properties (for sale or lease) was carried out (September 9, 2008) on <http://www.commercialrealestate.com.au/>, with the search criteria including a mixture of types of premises such as factory/warehouse, offices/consulting rooms, showrooms, retail/shops, service stations, for the suburbs of Toowong and Milton, and 'surrounding suburbs'. Search results revealed approximately 30 properties/premises fitting the search criteria. Google search for 'commercial real estate' indicates there are a number of other similar on-line services available, in addition to the above.

During the construction phase, the Project will generate a range of direct and indirect employment opportunities as discussed in the Economic Chapter. It will be important for the Project to include support for relevant industry and skills training, particularly for population groups who may experience disadvantage in accessing employment.

Some businesses close to construction works may experience impacts such as noise, dust, vibration and temporary changes to access and parking. This may impact on local employment opportunities if business turnover is affected. Early and ongoing consultation and communication will be required during the construction phase to identify potential impacts on local businesses and appropriate management strategies to ensure that local businesses can continue to operate. Potential mitigation strategies may include measures such as additional signage, provision of alternative access including for delivery vehicles, and communication with local communities about changes to business access.

In the longer term, the Project would support future employment growth areas in Brisbane and SEQ by providing more direct access to key areas of economic and employment activity such as the ATC, and Brisbane CBD as well as improving commuting times, providing a catalyst effect for businesses near surface connections and reducing transport and freight costs. Further discussion about potential benefits and impacts for businesses is provided in the Economic Chapter.

13.3.10 Population Growth and Diversity

Population growth in the study corridor is being driven by a range of factors such as amenity, affordability, proximity to the CBD, and increases in residential densities. By 2026, the population in the study corridor is expected to increase to approximately 68,000 people, driven largely by growth in the City and Spring Hill. Construction and operation of the Project is not expected to be an influence on population growth in the study corridor.

During operation, the Project may contribute to acceleration of redevelopment for higher density housing particularly in locations near to the surface connections, and this would contribute to an increased local population, consistent with the strategic objectives of Brisbane City Council and the SEQ Regional Plan.

The existing population characteristics documented at the beginning of this chapter suggested that the study corridor exhibits lower than average overall population diversity when compared with the surrounding region, using indicators such as age, household income, household size, language spoken at home, country of birth, level of education, and employment status. While the full socio-economic spectrum is represented across the study corridor, in overall terms the dominant indicators show a relatively affluent, well-educated, English-speaking, ageing community with high levels of home ownership and stability, when compared with the rest of Brisbane or the SEQ Region.

The Project is not expected to influence cultural diversity within the study corridor given, although effects may be felt at local neighbourhood levels as a result of property acquisition.

13.3.11 Equity in Distribution of Impacts/Benefits

Social equity is a key element of Council's Strategic Plan as identified in the *Brisbane City Plan 2000*. *City Plan 2000* promotes enhanced social diversity, choice and accessibility through, among other things, equitable access to centres, services, facilities, electronic service information, transport and green space.

The Project's primary objectives include reduced traffic congestion and an improved strategic traffic and transport network in Brisbane. Traffic congestion has a range of flow-on effects, including increased travel

costs, increased time constraints, and reduced employment opportunities within easy and convenient commuting times.

Reducing the costs of congestion would provide a benefit for the wider community, and may provide particular benefits for people living in or near to the study area, through travel time savings, improved regional access and improved connectivity to the broader community and employment opportunities. Other potential equity benefits of the Project include improved public transport service reliability, due to reduced traffic congestion on surface roads and implementation of bus priority measures.

The Project would also help to reduce traffic on major roads in the study corridor, including Milton Road and Coronation Drive, as well as ‘rat running’ in some local streets in Toowong, Milton, Red Hill and Rosalie, providing improvements to local environments and amenity, and access and connectivity for residents. The Project would provide improved access and reduced travel times for residents and businesses in Brisbane’s western suburbs, to key areas of economic employment such as the ATC and CBD, to Brisbane’s northern suburbs and key regional facilities such as the Brisbane Airport, RBH and QUT. Residents in Brisbane’s inner northern suburbs would also benefit, with improved access to the western suburbs and regional facilities such as the University of Queensland.

The Project’s benefits would be shared between local and regional communities. However, many of the Project’s construction and operation impacts, including property acquisition and impacts on amenity, would be experienced by those residents closest to the Project works. As discussed previously in this chapter, construction activities and the ‘residual’ effects of new, permanent infrastructure changes are likely to impact on the amenity of residents around the connections at Toowong and Kelvin Grove. For some of these residents the impacts of the Project would be realised, but few of the benefits.

Potential impacts in these locations include construction noise, dust, changes to local access and connectivity, and reduction in visual amenity. Regenerated noise and vibration from driven tunnelling construction may also impact on local amenity for some neighbourhoods above or close to the tunnel alignment, particularly where regenerated noise and vibration approaches sleep disturbance levels. On their own, each of these issues would be managed within acceptable standards. However, the cumulative or incremental effect of each construction impact is likely to result in diminished amenity in areas nearest to worksites. To compensate, improvements to pedestrian and cycle connections and enhancement of local open space areas near surface connections would help to improve amenity, access and connectivity for local residents.

13.4 Mitigations and Monitoring

This section outlines strategies to optimise the community benefits and minimise social impacts of the Project. These relate to design development, crime prevention, public transport and active transport strategies as required by the ToR, and include consideration of mitigation strategies implemented for previous similar projects. Consultation strategies are also identified for inclusion in the draft Environmental Management Plan.

13.4.1 Design Development

The design of the Project should respect, and where possible, enhance community values in the study corridor. Specifically, the project design should protect or enhance the amenity of local neighbourhoods, community facilities and residents adjacent to the Project’s surface infrastructure. Objectives should include:

- minimising the footprint of surface connections on open space and park areas, including Mt Coot-tha Botanic Gardens and Anzac Park at the Western connections, and Brisbane Grammar School playing fields, McCaskie Park and Victoria Park at the Northern connections;

- minimising the footprint of surface connections at Quinn Park and ensuring that the useable open space within the park is maximised;
- locating the spoil conveyor in the Mt Coot-tha Botanic Gardens away from areas highly frequented by park users;
- limiting the working hours for surface construction activities to ‘industry standard’ Monday to Saturday daylight hours (see Chapter 3 for more detail);
- re-instating parks and open space disturbed by construction activities (ie: Mt Coot-tha Botanic Gardens, Anzac Park, Quinn Park, Brisbane Grammar School playing fields, McCaskie Park and Victoria Park) to the full extent possible and as soon as practicable, providing enhanced amenity and protecting community values associated with parks and open space areas;
- ensuring that the design and placement of permanent noise barriers adjacent to residential neighbourhoods at Toowong and Kelvin Grove incorporate design and landscape treatments that respond to the scale and values of the local neighbourhood, and consider pedestrian access, safety for community members and visual amenity of neighbouring properties;
- ensuring that construction noise barriers are designed and located in consideration of pedestrian access, safety for community members and visual amenity of neighbouring properties;
- providing design treatments for portals and structures to respond to the character of local neighbourhoods and key features of local communities;
- ensuring access to the Brisbane Grammar School playing fields is maintained during construction and that any changes to access are made in consultation with the school administration;
- ensuring that access to public places near the project works is maintained during construction and operation for people with disability, as required by the Disability Discrimination Act 1992;
- ensuring that public spaces created near worksites and construction works (including pedestrian and cycle connections) consider CPTED principles, including maintaining visual sightlines and pedestrian legibility, providing opportunities for casual surveillance, and allowing levels of activity in public spaces;
- ensuring the design of public spaces adjacent to the Project’s surface infrastructure create safe and attractive urban spaces, that consider CPTED principles and that provide high levels of pedestrian connectivity between neighbourhoods and to community facilities;
- ensure design development of ventilation outlets respects the open space values and character of their locations; and
- ensuring the design and layout of construction worksites maintains visual sightlines and pedestrian legibility around worksites boundaries.

The implementation of design development objectives should be qualitatively assessed through the construction program and prior to operation in respect of the Project’s long term contributions to connectivity and sense of place, through consultation with community reference groups.

13.4.2 Public and Active Transport

During construction, measures would be implemented to manage potential impacts on public transport and walking and cycle connections near construction worksites and surface works. These include:

- maintaining safe and convenient pedestrian and cycle access in the vicinity of construction worksites and surface works at Toowong and Kelvin Grove, including for children, elderly people and people with disability, which consider CPTED principles, including maintaining visual sightlines and pedestrian legibility and providing opportunities for casual surveillance;

- maintaining public transport facilities in the vicinity of construction worksites and surface works, including at Milton Road at Toowong and Kelvin Grove Road at Kelvin Grove, where possible, or ensuring that changes to facilities (ie location of bus stops) allows safe and easy access, particularly for elderly people and people with disability;
- ensuring early and ongoing communication and notification with local communities and public transport users about changes to public transport facilities near construction worksites and surface works;
- ensuring early and ongoing communication and notification with local communities and bikeway users (including signage and advertisements) about changes to pedestrian and cycle connections near construction worksites and surface works at the Western Freeway, Toowong, Kelvin Grove and the ICB, to improve community safety and legibility of the pedestrian environment;
- reinstating and where possible, enhancing, pedestrian and cycle connections disturbed by construction activities as soon as practicable;
- undertaking consultation with local communities and pedestrian and cycle groups in the design of pedestrian and cycle connections to be implemented following construction; and
- developing and implementing a pedestrian and cycle management strategy during construction, that ensures safe access is maintained in the vicinity of constructions works.

In the longer term, reduced traffic congestion provided by the Project would provide opportunities to enhance public transport and active transport (ie walking and cycling) in the study corridor. Opportunities should be considered to maximise the benefits for public and active transport of reduced traffic congestion, including:

- possible bus priority measures on major roads approaching or within the study corridor to further enhance public transport services; and
- enhanced pedestrian and cycle connections in the vicinity of the surface connections and within the study corridor generally, including links between neighbourhoods at Toowong (ie: across Milton Road and Croydon Street) and Kelvin Grove (ie: along and across Kelvin Grove Road) and to public transport facilities, regional pedestrian and cycle networks, and community facilities.

13.4.3 Urban renewal strategies

The EIS includes a proposed framework for urban regeneration (see Chapter 20), which seeks to capture the potential benefits of the Northern Link Project and to manage the on-going change occurring in the study corridor. Urban regeneration initiatives generally relate to program initiatives, redevelopment initiatives and urban mitigations. These are outlined in the Urban Regeneration Chapter.

For long-term operation, management of environmental impacts would include:

- Consultation about the design and placement of noise barriers located adjacent to residential neighbourhoods or community facilities with local residents and managers of community facilities;
- Monitoring and if necessary remediating design and structural factors affecting the safety and use of public spaces, open spaces and pathway networks created or changed as a result of the Project;
- Communication about air quality at Kelvin Grove, particular in relation to the combined effect of ventilation outlets for Northern Link, Airport Link and CLEM7; and
- Ongoing monitoring of in-tunnel and ambient air quality, with results made available to the public.

13.4.4 Environmental Management and Monitoring

Environmental Managements Plans (EMPs) will be prepared by the Contractor for the construction and operation phases of the Project, to identify measures to ensure that environmental objectives and performance criteria are addressed, that potential impacts of the Project are minimised, and environmental values of the study corridor are protected and where possible, enhanced. A draft outline EMP for construction and operation of the Project is provided in Chapter 19 of this EIS.

Community participation in ongoing planning and environmental management monitoring will assist in avoiding or minimising potential social impacts of the Project. The following outlines environmental objectives, performance criteria, and mitigation measures for managing potential construction impacts on local communities. The following outlines social environment objectives, mitigation measures and monitoring and reporting requirements for construction.

Objective	Avoid or mitigate and manage construction impacts on the social environment ⁶ in the study corridor and other areas affected by the Project works.
Performance Criteria	<ul style="list-style-type: none"> ■ Construction techniques and procedures minimise, mitigate and manage impacts on community life throughout the construction phase. ■ Local and broader communities are notified in advance of construction activities, including any special construction activities of short duration, or about changes to local access and connectivity. ■ Affected residents are generally satisfied with the efficacy of mitigation measures ■ Communities have access to an effective and efficient communication and complaints process to identify and respond to impacts.
Mitigation Measures	<p>Amenity</p> <ul style="list-style-type: none"> ■ Undertake early and ongoing consultation and communication with residents nearest to the construction worksites and project works, about construction activities, including timing and duration, and potential impacts on local amenity. This should include potential impacts for communities adjacent to spoil haulage routes. ■ Implement management measures to minimise impacts of construction noise and dust on amenity for park users, including at Mt Coot-tha Botanic Gardens, Anzac Park, and Victoria Park. ■ Maintain safe access for pedestrians and cyclists near construction worksites and construction works, including consideration of pedestrian access needs of elderly people and people with disability; ■ Enforce the prohibition on construction workers parking in residential streets close to work sites; ■ Reinstate as soon as practicable, open space areas and pedestrian and cycle connections disturbed by construction activities, including: <ul style="list-style-type: none"> ■ the Western Freeway bikeway in Toowong, and the ICB bikeway at Kelvin Grove; ■ pedestrian and cycle connections along Frederick Street, south of Morley Street, across and along Milton Road between Croydon Street and Frederick Street, along Croydon Street between Milton Road and Jephson Street, and along Kelvin Grove Road, between the ICB and Victoria Street; and ■ areas of Mt Coot-tha Botanic Gardens, Anzac Park, Quinn Park, Victoria Park, the Brisbane Grammar School playing fields and McCaskie Park.
	<p>Social infrastructure</p> <ul style="list-style-type: none"> ■ Undertake early and ongoing consultation with the Toowong Baptist Church and Toowong Private Hospital to identify potential impacts (i.e. changes to access, noise and dust) and effective mitigation strategies of

⁶ Social environment includes residential and neighbourhood amenity, access and connectivity, community health, community diversity, social infrastructure and community safety.

	<p>construction works on use of these facilities.</p> <ul style="list-style-type: none"> ■ Undertake early and ongoing consultation with users and managers of the Silk Shed Studio Group at Quinn Park to identify potential construction impacts (i.e. access, noise and dust) on the use of the facility and effective mitigation strategies. ■ Where possible, consider the peak use times (i.e. weekends and public holidays) in the planning of construction activities affecting Mt Coot-tha Botanic Gardens and Anzac Park. ■ Undertake early consultation with the Brisbane Grammar School about potential changes to access to the playing fields.
	<p>Consultation and Communication</p> <ul style="list-style-type: none"> ■ Initiate consultation with owners and occupiers of directly affected properties, including those affected by volumetric acquisition, as soon as practicable after a decision to proceed with the project is taken, about the process and timing of property acquisition. ■ Undertake and maintain a comprehensive community consultation and community information program to inform the community of project activities, including timing and duration, and potential impacts. At a minimum, this should include: <ul style="list-style-type: none"> ■ maintenance of a 24 hour project information line, operated by a person with authority to halt construction works if goals and agreements with the community are not met; ■ a range of communication and consultation strategies, including (but not limited to) public advertisements, signage, electronic media, newsletters, direct mail notifications, one-on-one meetings, stakeholder briefings and Community Reference Groups (CRGs; as already established); ■ access to information about possible construction impacts and mitigation for residents in the study corridor with poor English or communication disabilities; ■ continuation of existing CRGs to represent residents, businesses, community facilities and organisations closest to construction works; ■ direct consultation and communication with residents, local businesses and community facilities closest to construction works, including surface and driven tunnelling construction; ■ direct communication and consultation with residents, local businesses and community facilities where surface works are proposed to be undertaken outside of normal daylight construction hours; ■ notification and communication with motorists about changes to regional and local road networks, including time, duration and likely disruptions; ■ consultation and communication with local communities and relevant community organisations about changes to pedestrian and cycle connections near construction works; and ■ consultation and communication with local schools, child care centres, aged care, and medical and health facilities near to construction works or the tunnel alignment.
	<p>Complaints Management and Corrective Actions</p> <ul style="list-style-type: none"> ■ Develop an effective system for receiving, handling and responding to complaints from community members and key stakeholders during the construction phase. ■ Ensure a response is provided to the complainant within 24 hours of the complaint being received. ■ Provide a publicly available report on complaints received, responses provided, timeliness of responses, and corrective actions taken on a monthly basis. ■ Raise community awareness of the complaints system and procedures, through communication and consultation strategies.
<p>Monitoring</p>	<ul style="list-style-type: none"> ■ Monitor and evaluate the effectiveness of community consultation and communication processes, through surveying and direct sampling of local residents' views on effectiveness and responsiveness ■ Monitor and evaluate the effectiveness of mitigation outcomes, using

	qualitative and quantitative standards to measure achievement of social objectives and mitigation criteria <ul style="list-style-type: none"> ■ Monitor and report on the safety, provision and maintenance of temporary pedestrian and cycle access near construction activities.
Reporting	<ul style="list-style-type: none"> ■ Notes of CRG meetings to be made publicly available via Project website. ■ Monthly report on complaints received, responses provided, timeliness of responses and corrective actions taken, to be made publicly available. ■ Immediately in the case of a safety incident or written complaint from a neighbour or community group ■ Six monthly for other reports.
Responsibility	Contractor

13.5 Conclusions

Brisbane's aspirations as outlined in *Living in Brisbane 2026* include:

- Friendly, safe city;
- Clean, green city;
- Accessible, connected city;
- Active, healthy city; and
- Vibrant, creative city.

These are further supported by strategies outlined in the Brisbane City Plan relating to 'community life, health and safety', which include (among other things):

- enhance social diversity, choice and accessibility;
- cater for a balanced range of recreational and sporting opportunities, natural environments and attractive landscapes to meet community needs;
- promote cultural diversity; and
- achieve a safe, secure, equitable and comfortable City.

The Project would help to improve city-wide accessibility and travel times to employment centres (ie: CBD and ATC), regional community facilities (ie: universities, health facilities, and open space), by providing an alternate cross-city route between Brisbane's western and northern suburbs. Reducing traffic congestion on main roads within the study corridor would also enhance local access and connectivity, including for pedestrians and cyclists, and provide opportunities for public transport improvements. This would also result in reduced rat-running in some residential streets within the study corridor, improving local amenity, safety and access and connectivity, including to some local community facilities.

In those neighbourhoods close to construction works, some existing values may be diminished during the construction phase. This includes construction works associated with connections at Toowong, Kelvin Grove and the ICB given their proximity to residential neighbourhoods. Construction works in some areas may extend over a number of years. Careful management of construction impacts would be required to help minimise construction impacts and protect quality of life and community values for local communities.