BaT project

Chapter 14
Socio-economic assessment

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14. Socio-economic assessment

14.1 Introduction

The purpose of this chapter is to assess the expected social and economic impacts (positive and negative) of the Project. It provides an overview of existing socio-economic conditions and values for local and regional communities and assesses the potential impacts of the Project on these values. Strategies to manage potential impacts are also recommended, where required.

This chapter addresses sections 10.30 and 10.31 of the Terms of Reference (ToR).

14.1.1 Methodology

The study corridor for the socio-economic assessment is displayed in **Figure 14-1**. It includes the Australian Bureau of Statistics (ABS) Statistical Areas Level 2 (SA2) locations of:

- Fairfield-Dutton Park; Annerley; Woolloongabba; and Kangaroo Point, south of the Brisbane River
- Brisbane City (i.e. Brisbane Central Business District (CBD)); and Spring Hill, north of the Brisbane River.

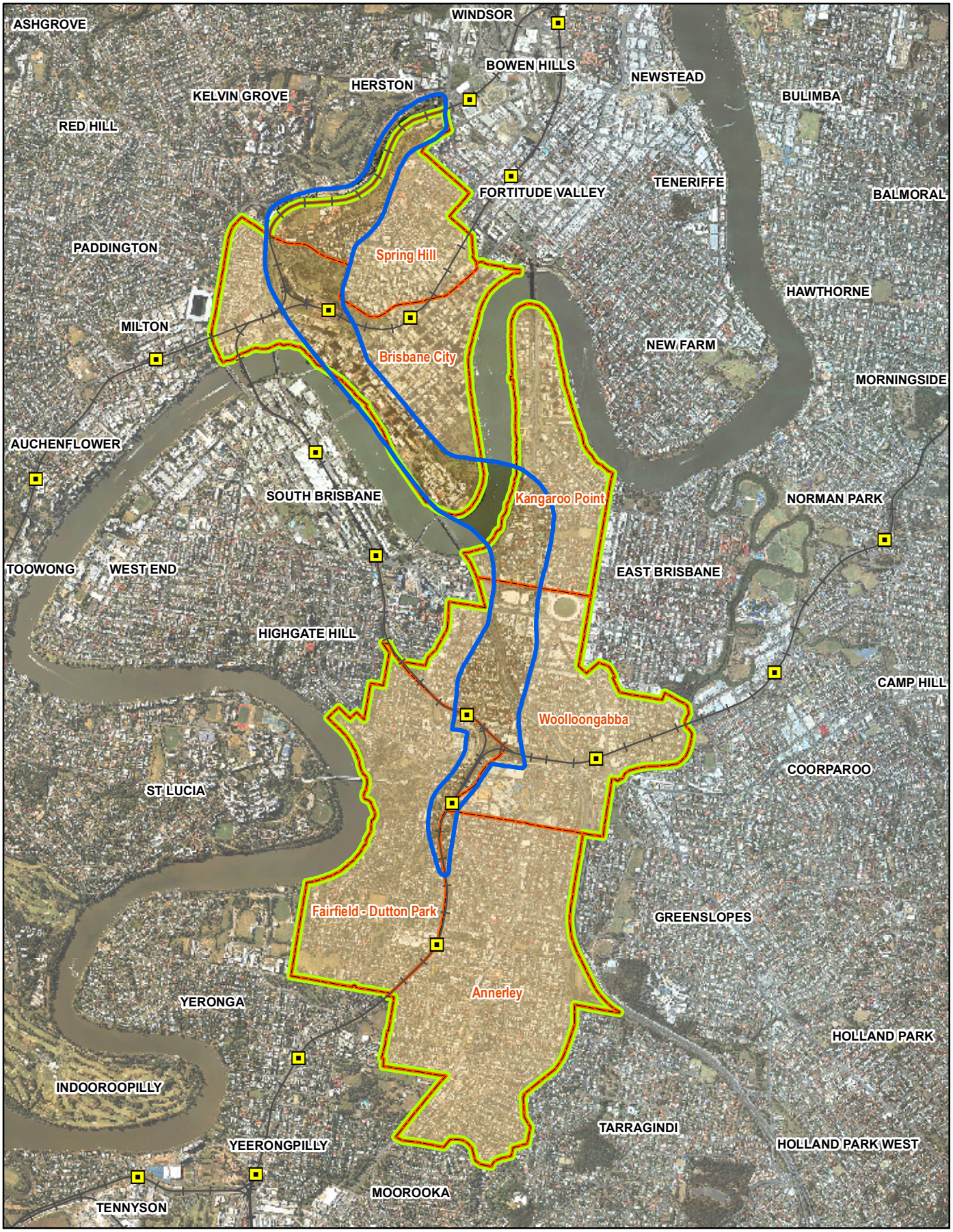
The Herston-Kelvin Grove SA2 is also intersected by the Project. Works in this SA2 are mainly located in Victoria Park, adjacent to the northern side of the Inner City Bypass (ICB), and are not expected to directly impact residential areas in Herston-Kelvin Grove. Population and demographic statistics for Herston-Kelvin Grove have not been included in this assessment, although impacts on local businesses, social infrastructure and community values in this area have been considered, where relevant.

Benefits and impacts from the Project's construction and operation may also be experienced in other areas of Brisbane and South East Queensland, such as through improved public transport access during operation or temporary disruptions from the haulage of spoil, materials and equipment during construction. These impacts are also considered in this assessment.

Socio-economic assessment involves the process of analysing, monitoring and managing the intended and unintended social and economic impacts, both positive and negative, of a development. It involves identifying and evaluating changes to or impacts on, communities, business and industry that are likely to occur as a result of a proposed development, in order to mitigate or manage impacts and maximise benefits.

This socio-economic assessment was developed in accordance with the Queensland Government's Social Impact Assessment Guideline (July 2013). The guideline outlines those components to be considered and the matters to be addressed by social impact assessment. The initial step in the assessment process involved scoping the likely range of potential socio-economic impacts and identifying communities likely to be affected by the Project. This was informed by:

- the Environmental Impact Statement (EIS) ToR for the Project
- the Queensland Government's Social Impact Assessment Guidelines (June 2013)
- social and economic assessments undertaken for other rail and transport infrastructure projects, including those assessments for the Cross River Rail project (SKM Aurecon CRR JV, 2010)
- literature relating to the assessment of social and economic impacts, including the International Principles for Social Impact Assessment (IAIA, 2003)
- outcomes of consultation undertaken for the Project as well as consultation that has occurred in the study corridor for other similar projects.



LEGEND

- Existing rail station
- Existing rail line
- Study corridor
- Study area
- SA2 block (Census 2011)

BUS AND TRAIN PROJECT
ENVIRONMENTAL IMPACT STATEMENT

FIGURE 14-1

SIA study area - statistical areas level 2

N

0 0.5 1
Kilometres
1:40,000 (at A4)
Projection: GDA 1994 MGA56

Aerial Photo: Brisbane City Council 2012

E:\QENV2\Projects\QE06863\SpatialVArcGIS\Figures\Final_EIS_Figures\14_Social_Impact\Social_Figure14-1_SIA_StudyArea_SA2_Boundaries.mxd Date: 12/08/2014

The second step of the assessment involved describing the existing socio-economic conditions. This provides a baseline of the social and economic characteristics and values in the study corridor, from which potential benefits and impacts of the Project can be assessed. The description of the existing socio-economic conditions involved both qualitative and quantitative analysis, including:

- reviewing existing State and local government policies and strategies relevant to the socio-economic environment of the study corridor
- analysing population and demographic data for communities in the study corridor, such as population size and growth, diversity, socio-economic disadvantage and housing
- analysing economic information, including data on employment and income, workers and visitors to the study corridor, and business and industry near the Project
- reviewing existing social infrastructure in the study corridor such as education facilities, health and emergency services, recreation uses and transport facilities
- identifying existing community values relating to factors such as amenity and sense of place, access and connectivity, and community health and safety.

The description of the existing socio-economic conditions principally draws on information from the ABS Census of Population and Housing 2011, supplemented with information and data from:

- government agencies such as the ABS, Queensland Government Statistician and Brisbane City Council
- Queensland Government and Brisbane City Council publications, reports, guidelines and websites
- a visual survey of local businesses near to Project infrastructure and construction works
- observations made during a site visit to the study corridor
- community consultation undertaken for the Project, including on the draft ToR and draft reference design.

The next step for the socio-economic assessment involved identifying and evaluating changes to the existing social and economic conditions and values in the study corridor from the Project's construction and operation. This included the assessment of direct and indirect benefits and impacts as well as consideration of cumulative impacts due to the Project's interaction with impacts of other projects.

A framework was used to evaluate the significance of the Project's socio-economic effects, based on an assessment of the likely extent, duration and severity of each impact, and the consequence and probability of the impact occurring. Further information on the evaluation framework is provided in **Appendix I**.

The final step for the socio-economic assessment involved identifying measures to avoid, minimise or mitigate socio-economic impacts arising from the Project. These measures were informed by feedback from community consultation and consideration of measures used to manage socio-economic impacts of other major transport projects.

Community and stakeholder consultation

Community and stakeholder consultation has formed an integral part of the Project development and preparation of the EIS. This included engagement with affected property owners, local communities, business and industry organisations, State Government agencies and Brisbane City Council. A summary of community and stakeholder consultation undertaken for the Project is provided in **Chapter 1 – Introduction** while a detailed consultation report is provided in **Appendix D**.

This socio-economic assessment has been informed by feedback from community and stakeholder consultation. This included:

- identifying community features, values and issues that are important to communities in the study corridor
- understanding how people live, visit and work in the study corridor
- identifying potential benefits and impacts of the Project's construction and operation.

Consultation was also undertaken with the Office of the Coordinator-General regarding the socio-economic assessment.

A summary of the key issues raised during community and stakeholder consultation are provided in **section 14.4**.

14.2 Legislative and social policy context

This section provides an overview of the broader social and economic policies and strategies relevant to the Project and the study corridor.

14.2.1 Australian Government

Disability Discrimination Act 1992

The *Disability Discrimination Act 1992* (DDA) provides protection against discrimination based on disability. The DDA requires areas and facilities open to the public to be accessible to people with a disability. This includes areas and facilities such as public footpaths and walkways; public transport; public buildings (i.e. libraries, sporting venues, shops and government offices); and parks, public swimming pools and pedestrian malls. The DDA applies to both existing places as well as places under construction.

Project stations at Woolloongabba, George Street and Roma Street would be designed to comply with the DDA. During construction, temporary access changes required to public areas and facilities would need to consider the needs of people with a disability.

14.2.2 Queensland Government

State Development and Public Works Organisation Act 1971

The EIS has been prepared under the *State Development and Public Works Organisation Act 1971* (SDPWO Act). The SDPWO Act defines 'environment' as including:

a) 'ecosystems and their constituent parts, including people and communities; and

b) all natural and physical resources; and

c) the qualities and characteristics of locations, places and areas, however large or small, that contribute to their biological diversity and integrity, intrinsic or attributed scientific value or interest, amenity, harmony and sense of community; and

d) the social, economic, aesthetic and cultural conditions that affect, or are affected by, things mentioned in paragraphs (a) to (c)'.

The ToR for the Project requires the assessment of the likely social and economic impacts (positive and negative) on affected communities and economies. In particular, the ToR identifies that the construction and operation of the Project should aim to avoid or mitigate adverse social and economic impacts arising from the Project and to capitalise on opportunities potentially available to affected communities.

Social impact assessment guideline

The Social Impact Assessment Guideline (July 2013) provides guidance on the assessment of social aspects of projects and provides direction on the roles and responsibilities of project stakeholders in the development and implementation of social impact assessments.

The guideline identifies five components to be considered in preparing a social impact assessment. These are outlined in **Table 14-1** along with a description on each component's relevant to the Project. Reference is also provided to where the component is addressed in the EIS.

Table 14-1 Components considered in social impact assessment

Component	Relevance to the Project	Section(s) addressed in the EIS
Community and stakeholder engagement	Community and stakeholder engagement undertaken for the Project informed the development of the reference design and EIS, including the socio-economic assessment. Community and stakeholder engagement would be ongoing during the construction and operation of the Project and would be important in managing the Project's socio-economic impacts.	**Chapter 1 – Introduction** **Section 14.1.1** **Section 14.4** **Appendix D**
Workforce management	Construction would not result in an influx of workers at a scale that would impact on population size, demography or housing in the study corridor. The presence of a construction workforce may impact on community values and amenity for some residents closest to construction worksites.	**Section 14.5.4** **Section 14.5.7**
Housing and accommodation	Construction would not result in an influx of workers at a scale that would impact on housing in the study corridor. Impacts on housing and accommodation would mainly result from volumetric acquisition or changes in residential amenity.	**Section 14.5.2**
Local business and industry content	Construction and operation of the Project may have effects for some local businesses closest to the Project.	**Section 14.5.4**
Health and community well-being	Changes to health and community well-being would generally result from temporary changes to amenity during construction.	**Section 14.5.7**

14.2.3 Brisbane City Council

Brisbane Vision 2031 is Brisbane City Council's long-term community plan. It details the aspirations for the city's future and outlines ideas for achieving this vision. The main priorities for Brisbane Vision 2031 are to maintain or improve quality of life for the Brisbane community and ensure that Brisbane has the services and infrastructure to meet the liveability and sustainability challenges of the future.

Land use and development within the Brisbane Local Government Area (LGA) is guided by the Brisbane City Plan 2014 (City Plan). The City Plan outlines several strategic outcomes for the City. Those relating to the socio-economic environment for the Project include:

- Brisbane is served by appropriate infrastructure – the land, facilities and services that support economic growth and meet environmental and social needs
- Brisbane's healthy and safe communities are ensured through development which is designed to minimise environmental risks, contribute to crime prevention and promote active travel and recreation.

The City Plan includes neighbourhood plans which provide detailed guidance on planning and land use in specific localities. The City Centre Neighbourhood Plan encourages development of high density commercial and residential areas, complemented by a vibrant retail core and high level recreational and entertainment uses.

The intention of the Woolloongabba Centre Neighbourhood Plan is to encourage development to create an urban community with easy access to opportunities for living, working and playing, providing affordable accommodation for workers. The West End-Woolloongabba District Neighbourhood Plan encourages the continued co-existence of the area's diverse mix of residential, industrial, commercial, retail and community uses to provide social and built form diversity. The major institutions located in or adjoining the neighbourhood plan area will remain focal points and are to be enhanced by better access by all transport modes.

Further information on land use and development planning in the study corridor is provided in **Chapter 5 – Land use and tenure**.

14.3 Existing environment

This section describes the existing social and economic conditions and values in the study corridor, including population and housing, employment, local business and industry, and social infrastructure.

14.3.1 Socio-economic context

The Project is located in Brisbane's inner city suburbs, extending from Dutton Park in the south to Spring Hill in the north. The study corridor comprises a mix of land uses including residential, major commercial developments, small scale industrial uses and local and regional level community facilities.

The study corridor has a residential population of 44,532 people (Queensland Treasury and Trade, 2014). Residential development within the study corridor offers a range of housing choice including medium to high density apartments in the Brisbane CBD, Spring Hill and Kangaroo Point and lower density character housing at Annerley, Dutton Park, and Woolloongabba.

The study corridor also has a worker population of about 150,400 people, of which about 75 per cent work in Brisbane City (i.e. the Brisbane CBD) (Queensland Treasury and Trade, 2014).

There were about 16,709 registered businesses in the study corridor in 2012, of which about 95 per cent were small businesses with less than 20 employees (Queensland Treasury and Trade, 2014). Commercial development within the study corridor is mainly focussed in the Brisbane CBD and includes office accommodation, shopping and entertainment uses. Smaller scale commercial centres are also located at Stanley Street and Ipswich Road in Woolloongabba and Boundary Street in Spring Hill with these mainly comprising a mix of retail, shopping and café/ restaurant uses.

The study corridor is well serviced by a broad range of community services and facilities, including education, medical, community support services, shopping, entertainment, recreation and open space areas. These include services and facilities that cater for communities in the study corridor as well as communities across greater Brisbane and South East Queensland. Major community facilities near the Project include:

- the Princess Alexandra Hospital (PA Hospital) at Woolloongabba and Royal Brisbane and Women's Hospital (RBWH) at Herston
- Queensland University of Technology (QUT) in Brisbane City and Brisbane Girls Grammar School, Brisbane Grammar School and St Joseph's College at Spring Hill
- open space, parkland and sporting facilities, including the Gabba Stadium at Woolloongabba, City Botanic Gardens and Roma Street Parkland in Brisbane City, and Victoria Park at Spring Hill.

The study corridor is also serviced by a range of transport services and facilities, including passenger and freight rail services, busways and surface bus routes, major roads and freeways, and pedestrian and cycle networks. These provide a high level of access for residents in the study corridor as well as access for communities across South East Queensland to major community facilities and employment opportunities located in the study corridor.

14.3.2 Community profile

This section provides an overview of the population, demography and housing characteristics of communities in the study corridor. Information is presented for the study corridor as well as for the Brisbane LGA and Queensland. Further information on population and demographic characteristics is provided in **Appendix I**.

Population size and growth

In 2012, the study corridor had a residential population of 44,532 people (refer to **Table 14-2**). Annerley had the largest residential population, reflecting the predominantly residential nature of this area. This was followed by Brisbane City, which comprised about 21 per cent of the study corridor's population. Fairfield-Dutton Park had the smallest residential population, with about 10 per cent of the study corridor population living in this area.

Over the 10 years to 2012, the study corridor experienced relatively high population growth, with population growing at a faster rate than both the Brisbane LGA and Queensland. This was driven by relatively high growth in Brisbane City, reflecting the development of high density residential apartments in the city centre in the early 2000s.

Table 14-2 Population growth 2002-2012

Location	Population (number)		Average annual growth rate (%)
	2002	2012	2002-2012
Study corridor	29,627	44,532	4.2
Brisbane LGA	908,289	1,110,473	2.0
Queensland	3,653,123	4,565,529	2.3

Source: Queensland Treasury and Trade, 2014

The population of the study corridor is expected to grow to about 64,831 people by 2036, or about 1.6 per cent annually from 2011 (refer to **Table 14-3**). This is below the rate of growth for Queensland, although above the predicted rate of growth for the Brisbane LGA.

Woolloongabba is projected to have the highest rate of population growth in the study corridor, at an average of 4.9 per cent annually. This would give Woolloongabba a population of about 16,930 people in 2036, making it the largest residential population in the study corridor. Woolloongabba includes a priority development area and is proposed to be developed as a mixed use precinct, with high density residential development.

Table 14-3 Projected population growth, 2011-2036

Location	2011	2016	2026	2036	Average annual growth rate (2011-2036) (%)
Study corridor	43,512	49,356	57,911	64,831	1.6
Brisbane LGA	1,089,879	1,176,418	1,310,033	1,440,223	1.1
Queensland	4,476,778	4,946,319	6,007,578	7,095,177	1.9

Source: Queensland Government population projections, 2013 edition; ABS, Population by Age and Sex, Regions of Australia, 2012 (Cat no. 3235.0)

Age profile

The study corridor has a relatively young population. In 2012, the study corridor had a median age of 31.3 years, compared to 34.6 years in the Brisbane LGA and 36.6 years in Queensland. Kangaroo Point had the highest median age in the study corridor at 34.6 years.

The study corridor has a high proportion of working aged people and relatively low proportions of older people and children. In 2012, over 82 per cent of people in the study corridor were aged 15-64 years. This is compared to about 71 per cent and 67 per cent of people in the Brisbane LGA and Queensland respectively (refer to **Table 14-4**). This reflects the study corridor's proximity to the Brisbane CBD and the major hospitals and universities, which are typically attractors for young professionals and students.

Within the study corridor, Fairfield-Dutton Park and Annerley had high proportions of children aged 14 years or younger, although these were below the average for the Brisbane LGA and Queensland. Kangaroo Point had the highest proportion of older people (at 13.1 per cent), which was above the Brisbane LGA. This is likely to reflect uses such as St Vincent's Care Services in this area.

Table 14-4 Age profile, 2012

Location	0-14 years (%)	15-64 years (%)	65 years or over (%)	Total population	Median age (years)
Study corridor	9.2	82.7	8.1	44,532	31.3
Brisbane LGA	17.5	70.9	11.6	1,111,217	34.6
Queensland	19.9	66.8	13.3	4,565,529	36.6

Source: Queensland Treasury and Trade, 2014

Cultural diversity

Communities in the study corridor are culturally diverse with high proportions of people born overseas, people who speak a language other than English and who do not speak English well, or at all (refer to **Table 14-5**). At the 2011 Census, each of the study corridor SA2s had proportions above the Brisbane LGA and Queensland averages of people born overseas and who spoke a language other than English at home.

Brisbane City and Spring Hill particularly had more than double the Queensland average proportions of overseas born people. The top five countries of birth for residents in the study corridor were the United Kingdom, New Zealand, South Korea, China and India. The most common non-English languages were Chinese, Indo Aryan, Korean, Spanish and Greek.

The study corridor had relatively high proportions of people with low levels of English proficiency, with about 9.3 per cent of people not speaking English well or at all. This is compared to 8.1 per cent in the Brisbane LGA and 5.2 per cent in Queensland. Woolloongabba had the highest levels of people who did not speak English well or at all, followed by Brisbane City and Spring Hill. People with lower levels of English proficiency represent a stakeholder group with particular communication needs and a group who may be more vulnerable to changes from the Project.

At the 2011 Census, about 0.9 per cent of the study corridor's population identified as Indigenous, which was below the proportion of Indigenous people in both the Brisbane LGA and Queensland. However, the levels of Indigenous people varied across the study corridor with Woolloongabba and Fairfield-Dutton Park recording levels of Indigenous people similar to Brisbane as a whole.

Table 14-5 Cultural diversity, 2011

Location	Indigenous persons (%)	Overseas born (%)	Speaks language other than English at home (%)	Speaks English not well or not at all (%)	Total population
Study corridor	0.9	36.7	21.7	9.3	40,809
Brisbane LGA	1.4	28.3	14.6	8.1	1,041,841
Queensland	3.6	20.5	7.4	5.2	4,332,738

Source: Queensland Treasury and Trade, 2014 and ABS, Census of Population and Housing, 2011

Population mobility

Communities in the study corridor are relatively mobile, with proportions of people who lived at a different address both 12 months and five years prior to the 2011 Census, above the averages for both the Brisbane LGA and Queensland.

Spring Hill had the highest levels of population mobility in the study corridor, over both 12 months and five years. This was followed by Brisbane City and Kangaroo Point. The higher levels of population mobility in these areas may reflect the relatively high levels of rental accommodation as well as residential development that has occurred in Spring Hill and Brisbane City in recent years.

Annerley, Fairfield-Dutton Park and Woolloongabba had the lowest levels of population mobility, although the levels of population mobility in these areas were above the averages for both the Brisbane LGA and Queensland. This lower level of mobility is consistent with the more established, residential nature of these areas.

Households and families

There were about 16,231 households in the study corridor at the 2011 Census, of which more than one quarter were in Annerley, reflecting the more residential nature of this area.

In 2011, the study corridor had high proportions of lone person and group households and low proportions of family households compared to both the Brisbane LGA and Queensland (refer to **Table 14-6**).

This household composition generally reflects the high levels of rental accommodation within the study corridor and proximity to the Brisbane CBD and major hospitals and universities, which make the study corridor attractive to students and young professionals who are more likely to live in share households.

The higher proportion of lone person households is also likely to reflect the housing types (i.e. high density apartments and units) in areas such as Brisbane City and Kangaroo Point. Spring Hill and Woolloongabba had the highest proportion of group households, while Fairfield-Dutton Park and Annerley had the highest proportions of family households, which is likely to reflect the lower density and more residential nature of these two areas.

Table 14-6 Household composition, 2011

Location	Family households (%)	Lone person households (%)	Group households (%)	Total households (number)
Study corridor	51.3	33.8	14.9	16,231
Brisbane LGA	68.8	24.0	7.2	380,777
Queensland	72.4	22.8	4.7	1,547,304

Source: ABS, Census of Population and Housing, 2011

The study corridor generally had lower proportions of families with children and higher proportions of couple only families compared to the Brisbane LGA and Queensland. In 2011, couple only families were the predominant family type in all SA2s apart from Fairfield-Dutton Park.

The study corridor also had a lower proportion of one-parent families compared to the Brisbane LGA and Queensland. However, levels of one parent families in Fairfield-Dutton Park were above or comparable to the Brisbane LGA and Queensland averages.

Housing

The study corridor had 16,233 occupied private dwellings at the 2011 Census. Overall, dwelling types were typical of the study corridor's inner city location, with higher proportions of apartments and lower proportions of separate houses (refer to **Table 14-7**).

However, dwelling types varied across the study corridor with:

- Fairfield-Dutton Park, comprising predominantly low density detached dwellings
- Annerley and Woolloongabba, comprising a mix of separate houses and apartments
- Kangaroo Point, Brisbane City and Spring Hill characterised by high density residential apartments.

Table 14-7 Dwelling type, 2011

Location	Separate house (%)	Semi-detached (%)	Apartment (%)	Total dwellings
Study corridor	31.4	8.1	60.0	16,233
Brisbane LGA	70.9	9.7	18.8	380,774
Queensland	78.5	8.4	11.7	1,547,303

Source: Queensland Treasury and Trade, 2014 and ABS, Census of Population and Housing, 2011

The study corridor generally had lower proportions of owner occupiers and higher proportions of rental housing compared to the Brisbane LGA and Queensland (refer to **Table 14-8**).

In 2011, more than half of dwellings in the study corridor were rented. In particular, Spring Hill had very high levels of rental housing with almost 70 per cent of dwellings being rented. Kangaroo Point and Woolloongabba also had high levels of rental housing.

The high level of rental households reflects the higher levels of population mobility and group households and the availability of short term accommodation within the study corridor. Fairfield-Dutton Park and Annerley had the highest proportion of owner occupied houses, with about 46.9 per cent and 44.6 per cent of houses respectively, that were either fully owned or being purchased. This reflects the more established, residential nature of these areas.

Table 14-8 Housing ownership, 2011

Location	Fully owned (%)	Being purchased (%)	Rented (%)	Total
Study corridor	17.0	21.3	58.1	16,231
Brisbane LGA	27.7	33.8	35.7	380,774
Queensland	29.0	34.5	33.2	1,547,304

Source: Queensland Treasury and Trade, 2014 and, Census of Population and Housing, 2011

There were approximately 840 households renting public housing in the study corridor at the 2011 Census. This represented about five per cent of dwellings in the study corridor, which was above both the average for the Brisbane LGA (at around 3.9 per cent) and Queensland (at 3.5 per cent). Fairfield-Dutton Park and Annerley had the highest proportion of public rental dwellings, including flats, apartments and units. In addition, about 165 households, or about one per cent of households in the study corridor, lived in housing delivered by community organisations.

Education

People in the study corridor had higher levels of education attainment and qualifications compared to the Brisbane LGA and Queensland. In 2011, about 73 per cent of people in the study corridor had completed Year 11 or 12, compared to about 69.4 per cent in the Brisbane LGA and 55.3 per cent in Queensland. The study corridor also had a lower proportion of people who did not go to school or who had only completed Year 8 or below.

However, this varied across the study corridor, with Woolloongabba, Fairfield-Dutton Park and Annerley having proportions of people in this group above the study corridor average.

The study corridor had higher proportions of people who had achieved a bachelor degree or higher and lower proportions of people with a certificate qualification compared to the Brisbane LGA and Queensland. Spring Hill had the highest proportion of people who had completed a bachelor degree or higher, with 38.2 per cent of the population achieving this qualification level.

Levels of disadvantage

The ABS produces a range of indices that provide a summary measure of socio-economic conditions (Socio-economic Indexes for Areas (SEIFA)) based on information from the ABS Census. The SEIFA index of relative socio-economic disadvantage is derived from Census variables such as income, education attainment, unemployment and motor vehicle access. Low index values represent areas of most disadvantage and high values represent areas of least disadvantage.

A community's level of disadvantage may influence the ability of that community to cope with or respond to changes from a project. In particular, communities that display levels of relative disadvantage may be more vulnerable to the impacts of large infrastructure projects than those that display levels of relative advantage. However, improved access to employment opportunities would also provide benefits for those communities that display levels of relative disadvantage.

In 2011, communities in the study corridor generally displayed relatively low levels of disadvantage compared to Queensland, with lower proportions of people in the bottom quintiles and higher proportions of the population in the highest quintile (which demonstrate low levels of relative disadvantage). However, compared to the Brisbane LGA, the study corridor had a lower proportion of the population in the bottom quintile (displaying the highest levels of disadvantage), but also lower proportions of people in the highest quintile (displaying the lowest level of disadvantage) (refer to **Table 14-9**).

Table 14-9 Level of disadvantage, 2011

Location	Quintile 1 (most disadvantaged)	Quintile 2	Quintile 3	Quintile 4	Quintile 5 (least disadvantaged)
Study corridor	5.3	14.3	26.5	27.0	26.9
Brisbane LGA	6.6	9.7	19.1	24.2	40.4
Queensland	20.0	20.0	20.0	20.0	20.0

Source: Queensland Treasury and Trade, 2014

Levels of disadvantage varied across the study corridor, with residents in Kangaroo Point and Brisbane City generally displaying relatively low levels of disadvantage, with about 50 per cent of the population in these areas in the least disadvantaged quintile. At the same time, communities in Woolloongabba and Spring Hill had proportions of people displaying the highest levels of disadvantage above the Brisbane LGA, although below Queensland as a whole.

Need for assistance

At the 2011 Census, the study corridor had relatively low levels of people in need of assistance in one or more of the three core activity areas of self-care, mobility or communication because of a long-term disability, health condition or old age. This was largely driven by a very low proportion of people needing assistance in Brisbane City (i.e. less than one per cent), with many of the study corridor SA2s recording need for assistance comparable to, or slightly above, the Brisbane LGA. Each SA2 in the study corridor had lower levels of people who needed assistance compared to Queensland.

Travel to work

Travel patterns of residents in the study corridor generally reflect the study corridor's high level of access to public transport, pedestrian and cycle networks and proximity to the Brisbane CBD and other major employment and activity centres.

While private vehicle was the most predominant mode of travel, compared to the Brisbane LGA and Queensland, residents in the study corridor were more likely to use public transport, walk or cycle to work (refer to **Table 14-10**).

Travel by bus or train formed a part of travel to work for about 17 per cent of people in the study corridor. This was similar to the Brisbane LGA as a whole, but considerably higher than bus or train travel in Queensland (at 7.3 per cent). Fairfield-Dutton Park and Annerley had the highest proportion of people who caught the train to work, which reflects the proximity to train stations for these residents. Woolloongabba had the highest proportion of bus commuters, followed by Annerley and Fairfield-Dutton Park.

About 23.7 per cent of workers in the study corridor walked or cycled to work. Spring Hill and Brisbane City had particularly high proportions of people who walked or cycled, at about 45 per cent, which reflects the proximity of residents in these areas to employment in the Brisbane CBD.

Table 14-10 Journey to work, 2011 (per cent)

Location	Train	Bus	Car (as driver or passenger)	Walked or cycled	Train and bus	Train and one other method (excl bus)	Bus and one other method (excl train)	Train and two other methods	Bus and two other methods (excl train)	Worked at home
Study corridor	4.1	10.3	40.1	23.7	1.0	0.3	0.9	0.2	0.1	3.7
Brisbane LGA	5.0	8.1	58.7	5.9	0.9	1.3	1.0	0.3	0.1	4.1
Queensland	2.1	3.3	67.4	4.8	0.4	0.8	0.5	0.2	0.1	4.9

Source: ABS, Census of Population and Housing, 2011.

14.3.3 Economic profile

This section describes economic characteristics of residents and workers in the study corridor. It also includes an overview of economic conditions relating to such things as local business and industry.

Income

Residents in the study corridor generally had a higher median income compared to the Brisbane LGA and Queensland. Incomes varied across the study corridor with the high median income for the study corridor, largely driven by particularly high incomes in Kangaroo Point and Brisbane City (refer to **Table 14-11**).

In 2011, all SA2s in the study corridor had above average proportions of high income earners compared with Queensland. Brisbane City, Kangaroo Point and Spring Hill also had proportions of high income earners above the Brisbane LGA average. Fairfield-Dutton Park had relatively high proportions of low income earners (i.e. on less than $20,800 per year), with this above the averages for both the Brisbane LGA and Queensland.

Table 14-11 Annual personal income, 2011

Study corridor	Less than $20,800 per year (per cent)	$104,000 or more per year (per cent)	Median annual income ($)
Study corridor	28.3	10.3	38,985
Brisbane LGA	31.5	8.8	36,237
Queensland	34.6	5.5	30,524

Source: Queensland Treasury and Trade, 2014 and ABS, Census of Population and Housing, 2011

Employment

Labour force participation measures the number of people currently employed or actively looking for work. The unemployment rate measures the total unemployment relative to workforce participation.

There were 26,286 people in the study corridor who were either employed or looking for work in December 2013. The study corridor had a relatively high level of unemployment, at about 6.8 per cent in December 2013. This is compared to around 5.4 per cent in the Brisbane LGA.

Unemployment levels varied across the study corridor. Woolloongabba had the highest unemployment rate at 11.4 per cent, followed by Fairfield-Dutton Park at 8.7 per cent. Kangaroo Point had the lowest level of unemployment, with about 5.0 per cent of the labour force looking for work (Australian Government Department of Employment, Small Area Labour Markets 2013).

The main industries of employment for residents in the study corridor at the 2011 Census included:

- professional, scientific and technical services (14.7 per cent)
- health care and social assistance (12.3 per cent)
- accommodation and food services (9.8 per cent)
- education and training (8.4 per cent)
- retail trade (7.3 per cent).

In 2011, there were about 36,310 people in the Brisbane LGA employed in the construction industry, representing about 6.7 per cent of workers. This was below the proportion of people employed in construction in Queensland as a whole, at about 9.0 per cent.

In 2011, the main occupation groups of employment in the study corridor were professionals, clerical and administrative workers and managers. This was consistent with the main occupation groups in the Brisbane LGA. The study corridor had lower than average proportions of technicians and trade workers, labourers and machinery operators and drivers compared to Queensland.

Business and industry

The study corridor includes a wide range of business and commercial uses that serve communities across South East Queensland as well as communities in the study corridor.

In 2012, there were 16,709 registered businesses in the study corridor, of which 11,412 businesses, or about 68 per cent, are located in Brisbane City. Spring Hill had the next largest concentration of businesses (at 2,150 businesses), followed by Woolloongabba (at 1,114 businesses). About 95 per cent of businesses in the study corridor are small businesses, employing less than 20 employees. This is consistent with the proportion of small businesses in Brisbane and Queensland as a whole (Queensland Treasury and Trade, 2014).

The largest industry sector in the study corridor was financial and insurance services, followed by professional, scientific and technical services; and rental, hiring and real estate services. Combined, these three sectors account for about 53 per cent of registered businesses in the study corridor. Retail trade accounted for about four per cent each of businesses in the study corridor, which was below the Brisbane and Queensland averages. (Queensland Treasury and Trade, 2014).

Tourism is an important industry for the study corridor. Accommodation and food services accounted for about four per cent of registered businesses in the study corridor (Queensland Treasury and Trade, 2014) and employed about 7,979 workers, or about 5.3 per cent of people working in the study corridor (ABS Census, 2011).

In 2013, there were about 70 short-term accommodation providers in the study corridor with 15 or more rooms. These included hotels, motels, guest houses and serviced apartments. About half of the short-term accommodation providers were located in Brisbane City, with these providing more than 70 per cent of hotel, motel and serviced apartment rooms within the study corridor.

The average room occupancy in the study corridor for the June quarter 2013 was 72.4 per cent, although this was driven by higher occupancy rates in Brisbane City, which were at about 80 per cent. This is compared to about 60 per cent for Queensland as a whole. Visitors to the study corridor generally stayed an average of about 2.4 nights, which was slightly below the Queensland average (at 2.6 nights).

Further information on hotels, motels and serviced apartments near to the Project are described in the following sections.

Local context

A wide range of business and commercial uses are located near to the proposed surface works that serve communities in the study corridor as well as communities across the South East Queensland region. These include such things as:

- government administration and office uses, including high rise office accommodation in Brisbane City
- retail uses ranging from smaller scale specialty retail uses to larger scale supermarkets and car yards, including at George Street and Roma Street in Brisbane City, Woolloongabba and Dutton Park

- accommodation, food and entertainment uses, including at Dutton Park, Woolloongabba, and George Street and Roma Street in Brisbane City
- health and medical support services, particularly at Dutton Park and Spring Hill/ Herston
- community and educational uses, including at Dutton Park, George Street and Roma Street in Brisbane City, and Spring Hill.

The following provides an overview of business and commercial uses near the Project surface works.

Dutton Park

Business and commercial at Dutton Park comprise a mix of uses, ranging from tertiary level health and medical support services associated with the PA Hospital, office and scientific research services at Boggo Road Urban Village, and smaller scale retail uses catering for the needs of local residents at Annerley Road. Business and commercial uses near the Project include:

- office uses including architectural and advertising services at Railway Terrace, engineering services at Pound Street, and government administration and scientific research uses within the Ecosciences Precinct at Boggo Road Urban Village
- allied health and medical support services associated with the PA Hospital, including at Cornwall Street, Ipswich Road and Kent Street
- education facilities, including the Aboriginal and Torres Strait Islander Corporation for Health and Education and Training at Railway Terrace and the University of Queensland (UQ) Pharmacy Australia Centre of Excellence (PACE) at Cornwall Street
- café, restaurant and takeaway services, including cafés at the UQ PACE and Ecosciences Precinct, and fresh fish shop at Annerley Road
- accommodation uses at Cornwall Street and Tottenham Court
- a service station at Annerley Road and automotive repair workshop at Pound Street.

Weekly fresh produce and craft markets are also held at the Boggo Road Urban Village on Sunday mornings. The Buranda Village and PA Central are located at Ipswich Road. These comprise a mix of retail uses with about 15-30 individual businesses in each. Apart from the major uses such as the PA Hospital, Ecosciences Precinct and UQ PACE, the majority of businesses in Dutton Park are small businesses, employing less than about 20 people.

Most businesses near the Project have access to off-street parking for staff and customers. These parking areas also provide access for service vehicles. On-street parking is also available. However, consultation for the Project identified that on-street parking in the study corridor was subject to a high level of demand from major uses such as the PA Hospital, Ecosciences Precinct, rail stations and UQ.

Woolloongabba

Business and commercial uses at Woolloongabba comprise a mix of offices, cafés, restaurants and takeaway services, retail uses and short-term visitor accommodation. These are mainly small businesses, employing less than 20 people. Most businesses near the Project cater for local and district communities, including passing pedestrian traffic from the local area.

Business and commercial uses near the Project include:

- offices that provide for a range of services such as accounting and legal, rental and real estate, digital media, and government administration and support services, including the Land Centre
- cafés, restaurants and takeaway uses at Stanley Street and Logan Road, including cafés and restaurants with outdoor dining areas
- car yards and retail showrooms at Ipswich Road
- supermarket at the intersection of Main Street and Stanley Street, and small scale retail uses at Stanley Street, Vulture Street and Ipswich Road, offering a range of goods and services such as recreation, food and convenience goods, clothing, footwear and personal accessories, that cater for local and wider district communities
- short-term visitor accommodation such as motels and rental apartments (e.g. intersection of Main Street and Vulture Street, Allen Street), that provide accommodation for staff and patients visiting the Mater Hospital, visitors to major sporting events and tourists.

Businesses at Woolloongabba generally have access to off-street parking, mainly accessed from local roads at the rear or side of properties. On-street parking is provided within the service lane on Stanley Road and on local roads. Limited on-street parking is also provided on the eastern side of Ipswich Road, south of Stanley Street. Access for service vehicles is generally provided from local roads at the rear or side of properties. On street loading zones are also located at Stanley Street. Pedestrian access to businesses is at the street frontage.

George Street

Businesses near the Project at George Street mainly include medium to large scale mixed-use developments, comprising commercial offices or residential uses on upper floors with, cafés/ restaurants and/ or small scale retail uses at street level. A number of allied health services are also located in the area.

In particular, business and commercial uses include:

- office uses that provide for government administration and private sector services, including at George Street and Alice Street, Margaret Street, Mary Street, Charlotte Street and Elizabeth Street
- short-term accommodation uses, such as the Rendezvous Hotel, Casino Towers and Treasury Hotel at George Street, and the Queensland Club at the corner of George Street and Alice Street
- cafés, restaurants and takeaway uses within larger mixed-use developments at George and Mary streets, that generally cater for workers and residents of nearby buildings as well as passing pedestrians
- retail and service uses such as newsagencies, convenience stores and banking services, within larger mixed-use developments, mainly located at George Street, which generally serve office workers, residents of nearby buildings and passing pedestrians.

The main government and administrative functions near the Project at George Street include:

- Mineral House at 41 George Street, which accommodates staff from the Department of Natural Resources and Mines and Department of Local Government, Community Recovery and Resilience
- Department of State Development, Infrastructure and Planning at 63 George Street
- Department of Housing and Public Works, at 80 George Street

- Capital Hill Building, at 85 George Street, which accommodates Department of Transport and Main Roads staff
- Executive Building, at 100 George Street, which accommodates the Department of the Premier and Cabinet, Queensland Treasury and Trade, Department of State Development and Infrastructure Planning and Department of Science, Information Technology, Innovation and the Arts
- Department of Communities, Child Safety and Disability Services, and Department of Tourism, Major Events, Small Business and the Commonwealth Games, at 111 George Street.

Some cafés/ restaurants provide outdoor seating and dining areas, with these mainly providing less than about four tables, although some provide up to about 10 tables.

Pedestrian access to businesses is generally provided directly from the street frontage, although some buildings, particularly on the southern side of George Street, provide access from a courtyard or plaza area.

Vehicle access to buildings fronting George Street is generally provided from designated vehicle accesses at the side or rear of businesses. This includes access for both private vehicles and service delivery vehicles. Direct vehicle access to the Rendezvous Hotel, located on George Street near the corner of Mary Street, and the Queensland Club at the corner of George and Alice streets, is provided from George Street, although both properties also have a second access from a side street.

Smaller business such as cafés and newsagencies, are generally supported by on-street loading zones at George Street and other surrounding streets. While limited on-street parking is provided on streets near the Project, including George and Mary streets, these generally cater for the wider area, rather than just the adjoining businesses. Bus and taxi zones are also located on George Street and surrounding streets.

Roma Street Precinct

Business and commercial uses at Roma Street comprise a mix of medium to large office buildings, many of which support public administration and safety services, short-term visitor accommodation, and small retail uses and eateries, including cafés, restaurants and takeaways, convenience stores and hotels.

Many businesses near the Project at Roma Street are small businesses with less than 20 employees, although some office based businesses are likely to have up to 200 employees.

Business and commercial uses near the Project at Roma Street include:

- office developments that support a range of government and private sector businesses, such as East Tower next to the Brisbane Transit Centre, and the Queensland Police Headquarters and Brisbane Magistrates Court at Roma Street
- the Brisbane Transit Centre, which comprises about 25 individual businesses, including small cafés, restaurants and takeaways, retailers, travel agents and transport operators
- short-term visitor accommodation uses, including a hotel at Roma Street next to the Brisbane Transit Centre, and service apartments and backpackers hostels at Herschel Street
- cafés, restaurants, hotels and bars located at George Street and Herschel Street, and a restaurant and cafés at Parkland Boulevard and within the Roma Street Parkland
- an English Language College at Herschel Street.

A number of the cafés and restaurants near the Project provide outdoor dining areas. This includes the cafés and restaurants at Parkland Boulevard and Roma Street Parkland.

Retail, café and restaurant businesses near the Project generally cater for users of the Roma Street Transit Centre, workers and residents from nearby buildings, visitors to Roma Street Parkland as well as passing pedestrians. Other businesses such as the language college and accommodation provide for people from a wider area.

Many businesses near the Project at Roma Street have service vehicle access to the rear or side of the property. On-street loading zones are also provided in some locations, including for businesses at Herschel Street. The Brisbane Transit Centre has a number of access points along Roma Street for off-street parking, service vehicles, loading zones, public and private buses and taxis. Commercial uses at the eastern end of the Transit Centre, rely also on access for service vehicles from Roma Street.

Spring Hill/ Herston

Business and commercial uses at Spring Hill and Herston include a mix of community based businesses, including health, education and recreation related businesses. Apart from major uses such as the RBWH, the majority of businesses near the Project comprise small businesses with less than 20 employees.

Businesses near the Project cater for local residents as well as broader district and regional communities. Business and commercial uses near the Project at Spring Hill and Herston include:

- medical, education and research uses within the RBWH campus at Herston, including the Clive Berghofer Medical Research Institute, the UQ Centre for Clinical Research and the UQ Health Sciences Precinct
- educational facilities including tutoring and childcare uses at Gregory Terrace
- cafés/ restaurants including within the RBWH campus and at Gregory Terrace
- recreation uses and health related services within the Centenary Aquatic Centre at Gregory Terrace, and the Victoria Park Golf Course
- utilities and government facilities north of Victoria Park, including the Energex substation, Biomedical Technology Services facility and Brisbane City Council Field Services Group temporary staging facility.

The RBWH campus also includes a number of retail uses such as cafés that cater for staff, patients and visitors to the hospital.

Service access for commercial and other uses within the RBWH campus, is from Herston Road and Bowen Bridge Road. A commercial car park for hospital staff and visitors is also located at Herston Road and Gilchrist Avenue. Pedestrian access to these facilities is available from the street, as well as from within the hospital campus.

The Centenary Pool complex, within Victoria Park, at Gregory Terrace comprises a number of small businesses, including swimming pool and gym and health related services (physiotherapy, rehabilitation services, orthodontist, etc.). An off-street car park is located next to the pool complex, which is accessed from Gregory Terrace. Pedestrian access is provided from Victoria Park or Gregory Terrace.

Worker population profile

There were approximately 150,377 people working in the study corridor in 2011, of which about three quarters worked in Brisbane City. Spring Hill and Woolloongabba had the next largest worker populations, at 14,549 people (9.7 per cent) and 12,974 people (8.6 per cent) respectively.

The majority of people working in the study corridor were employed full-time, working more than 35 hours per week. The study corridor had a greater proportion of part-time workers compared to the Brisbane LGA.

Public administration and safety (government legislative, executive and judicial activities, police, fire protection and emergency services, etc.) was the largest industry of employment for people working in the study corridor, employing about 21.7 per cent of the study corridor's worker population in 2011. This reflects the role of Brisbane City as the primary centre for government administration in Queensland. Other main industries of employment for people working in the study corridor included:

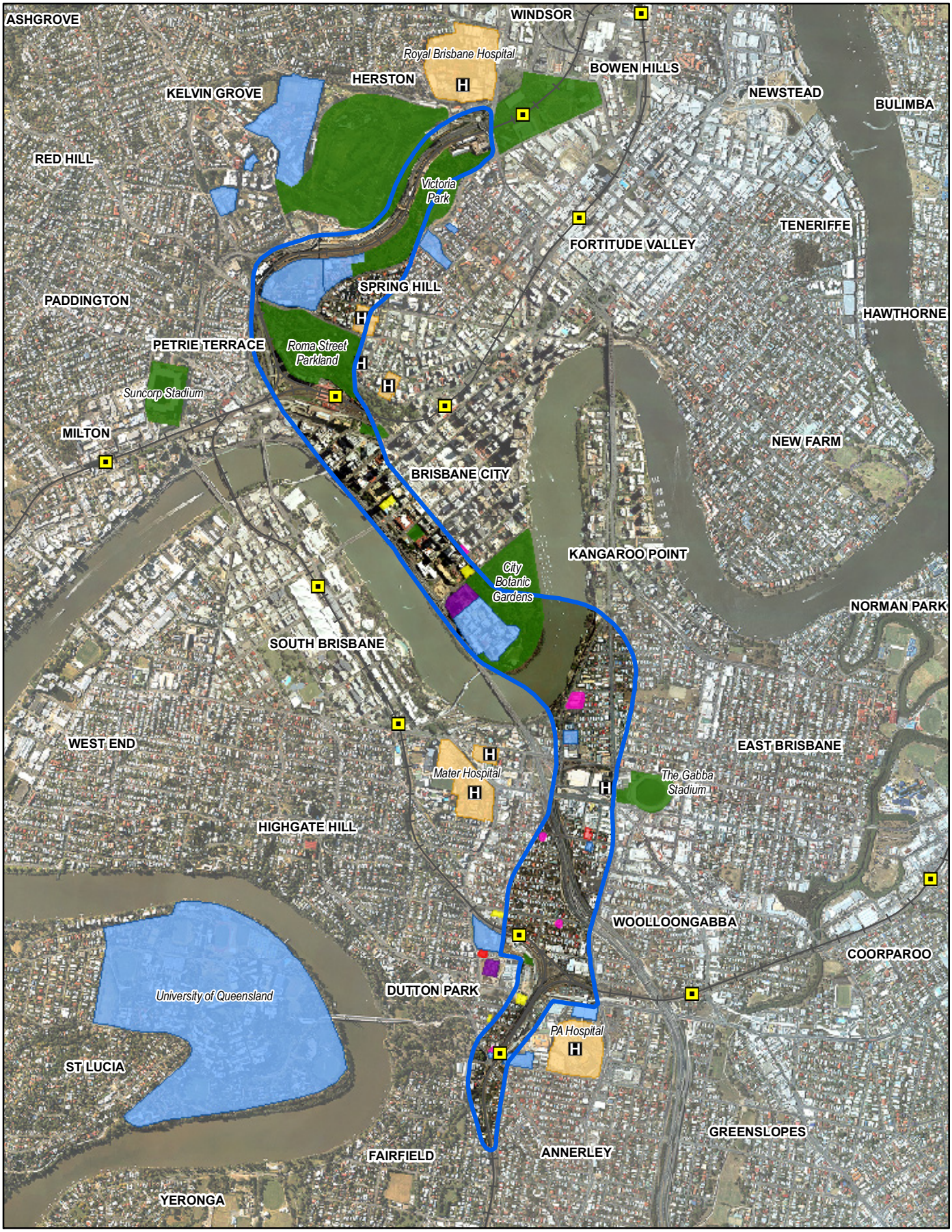
- professional, scientific and technical services (19.8 per cent)
- financial and insurance services (10.9 per cent)
- health care and social assistance (9.5 per cent)
- accommodation and food services (5.3 per cent).

The majority of people working in the study corridor used public transport to travel to work in the study corridor, which reflects the high level of public transport access to the inner city. In 2011, 46.2 per cent of people working in the study corridor used either train or bus for all or part of their journey to work. This is compared to about 17.2 per cent in the Brisbane LGA. In 2011, about 94 per cent of workers in the study corridor commuted into the study corridor, of which about 31 per cent lived in the inner suburbs. The main places of residence outside of the study corridor from which workers in the study corridor travelled from included Coorparoo, New Farm and the Hills District (i.e. Everton Hills, Arana Hills and Ferny Hills).

Further information on the socio-economic characteristics of workers in the study corridor is provided in **Appendix I**.

14.3.4 Social infrastructure

The study corridor accommodates a wide range of social infrastructure that cater for the needs of local and regional communities, including education facilities; medical and emergency services; sport, recreation and leisure facilities; and community support and cultural facilities. Social infrastructure in the study corridor is shown in **Figure 14-2**.



LEGEND

- Existing rail station
- Existing rail line
- Study corridor

Social Infrastructure

- Aged care
- Community
- Cultural
- Education
- Emergency services
- Health
- Place of worship
- Recreation

BUS AND TRAIN PROJECT
ENVIRONMENTAL IMPACT STATEMENT

FIGURE 14-2

Existing social infrastructure - study corridor

N

0 0.5 1
Kilometres
1:30,000 (at A4)
Projection: GDA 1994 MGA56

Aerial Photo: Brisbane City Council 2012

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Education facilities

The study corridor includes a range of education facilities including early childhood, primary, secondary and tertiary level facilities. A number of major education facilities are located in the study corridor that cater for communities across Brisbane and South East Queensland. These include:

- UQ PACE, located at Cornwall Street adjacent to the PA Hospital. UQ PACE opened in 2010 and accommodates about 2,000 researchers, clinicians and biopharmaceutical businesses (UQ PACE fact sheet)
- Translational Research Institute (TRI), located at Kent Street, Woolloongabba adjacent to the PA Hospital
- QUT Gardens Point, located at the southern end of George Street in the Brisbane CBD, adjacent to the City Botanic Gardens and Parliament House. In 2012, the campus had 24,992 students and 1,724 full-time equivalent staff members (QUT annual report, 2013)
- UQ School of Dentistry at Turbot Street in Brisbane CBD, which is a major oral health care facility in Brisbane
- Brisbane Girls Grammar School, Brisbane Grammar School and St Joseph's College Gregory Terrace, Spring Hill. In 2013, Brisbane Girls Grammar School had 1,172 students, while Brisbane Grammar School and St Joseph's College had 1,436 students and 1,389 students respectively (www.myschool.edu.au, accessed June 2014). Brisbane Girls Grammar School and St Joseph's College access playing fields and tennis courts within Victoria Park.

Major education facilities are also located at St Lucia, Kelvin Grove and Herston that are accessed by public transport facilities within the study corridor. These include:

- UQ at St Lucia, which is accessed via the Eleanor Schonell Bridge at Dutton Park. In 2013, the UQ St Lucia campus had 41,737 students
- QUT Kelvin Grove campus, which is accessed by the Inner Northern Busway. In 2013, the campus had 13,997 students and 1,750 full-time equivalent staff
- UQ at Herston, which is located next to the Royal Children's Hospital and RBWH. In 2013, the campus had 3,248 students.

These facilities cater for the local communities in and around the study corridor, as well as those from the South East Queensland region.

The study corridor includes about 14 child care facilities, four state primary schools and eight primary and secondary non-government schools that cater mainly for local communities. Dutton Park State School is located at Annerley Road, adjacent to Boggo Road Urban Village. In 2013, the school had about 300 students ranging from years prep to seven as well as 26 teaching staff (www.myschool.edu.au, accessed June 2014). The school provides a special education program as well as out of school hours programs managed by the YMCA. The school mainly services students from the suburbs of Dutton Park, Woolloongabba, Highgate Hill, South Brisbane and Fairfield. The school includes students from more than 35 different ethnic backgrounds, with about 23 per cent of students from non-English speaking families or families where English is the second language (www.duttparkss.eq.edu.au).

Access to the Dutton Park State School is provided from Annerley Road and Boggo Road. The main drop-off and pick-up area for students is at Boggo Road. Pedestrian access to the school is also provided by a pedestrian overbridge at Merton Road. The school is also used by a range of other community groups, such as the Sojourn Bible Church, which holds weekly Sunday afternoon services.

Additional education facilities located closest to the Project are listed in **Table 14-12**.

Health and emergency services

The study corridor includes major hospitals and health facilities that provide services to local and regional communities as well as the wider Queensland population.

The PA Hospital is located at Cornwall Street and Ipswich Road, Woolloongabba, immediately east of the Project. In 2012-2013, the Hospital had more than 6,000 staff, admitted more than 84,500 patients and catered for about 495,935 outpatient appointments. The Hospital provides a wide range of health services and is an integral component as a health research facility in association with UQ and QUT. The Hospital has a large accident and emergency department, which is accessed from Cornwall Street. In 2012-2013, about 58,169 patients were admitted through the emergency department.

The RBWH is located at Herston Road and Bowen Bridge Road, Herston, near to the Project works at Gilchrist Avenue. The RBWH is the largest tertiary referral hospital in Queensland, providing services to patients throughout Queensland, Northern New South Wales and the Pacific Rim. The Hospital has more than 7,450 staff and admits more than 90,000 patients each year. It also caters for about 515,000 outpatient appointments. The Hospital's emergency department, which is accessed from Bowen Bridge Road, caters for about 72,000 patients annually.

Other major health services near to the Project include:

- Mater Hospital and Mater Private Hospital at Stanley Street, South Brisbane
- Queensland Children's Hospital, at Stanley Street, South Brisbane, which is currently under construction and due to be opened in late 2014
- Aboriginal and Torres Strait Islander Community Health Service at Annerley Road, Woolloongabba
- Brisbane Private Hospital and St Andrews War Memorial Hospital, both at Wickham Terrace, Spring Hill.

A range of community health centres and services are located across the study corridor that provide a range of health and community services such as mental health, Aboriginal health, and drug and alcohol assistance.

Police stations are located in the study corridor at Dutton Park and Charlotte Street in Brisbane City. The Queensland Police Services Headquarters is also located at Roma Street in Brisbane City.

The Dutton Park police station is located at the corner of Annerley Road and Boggo Road, at Dutton Park. The station services the surrounding suburbs of Dutton Park, Woolloongabba, East Brisbane and Kangaroo Point. Neighbourhood Police Beats are also located at PA Hospital and Logan Road at Woolloongabba. The Brisbane City Station is located at Charlotte Street, Brisbane City. The station services the surrounding suburbs of Brisbane City, Spring Hill, Red Hill and Kelvin Grove. The station also includes police beat shopfronts at Adelaide Street.

Ambulance stations in the study are located at South Brisbane, Roma Street in Brisbane City, and Spring Hill. Fire stations in the study corridor are located at Annerley and Roma Street in Brisbane City.

Sport, recreation, leisure and cultural facilities

The study corridor includes a diverse range of sport, recreation, leisure and cultural facilities that cater for both local and regional communities. These include facilities catering for organised sporting activities as well as informal recreation and leisure pursuits.

Regional and district level sport, recreation, leisure and cultural facilities located within the study corridor include:

- gardens, parkland and recreation areas such as Kangaroo Point Cliffs, City Botanic Gardens, Roma Street Parkland, and Victoria Park
- major sporting venues such as the Gabba Stadium at Woolloongabba
- entertainment facilities such as Brisbane Riverstage, located within the City Botanic Gardens
- public meeting places, such as Emma Miller Place and Gallipoli Place at Roma Street
- cultural facilities such as Boggo Road Gaol museum at Dutton Park, St Nicholas Russian Orthodox Cathedral at Woolloongabba, Brisbane Synagogue at Margaret Street and York's Hollow in Victoria Park.

The City Botanic Gardens are located at Alice Street and George Street, and are bordered by the Brisbane River, Parliament House and QUT Gardens Point campus. The Gardens are an attraction for visitors and provides informal recreation facilities for residents and workers in the Brisbane CBD. The City Botanic Gardens also hosts community events, including at the Riverstage. Access to the Gardens is provided from George Street, near Parliament House, as well as from Alice Street, at the intersections of Edward Street and Albert Street.

Roma Street Parkland is located at Wickham Terrace and Parkland Boulevard within the Brisbane CBD. The Parkland comprises areas of formal gardens, amphitheatre, and informal recreation facilities, including picnic and play areas. The Parkland attracts between 500,000 and 900,000 visitors each year, of which about one third of visitors are from intrastate, interstate or overseas. This includes people attending community events, with the largest events attracting up to 60,000 people (at one time). The Parkland is also a popular location for private events and weddings, with these events attracting about 12,000 people each year. It is estimated that about 350,000 people cycle through the Parkland each year, while 500,000 cars drive through the Parkland. Access to the parkland is also available through the Brisbane Transit Centre and Roma Street Station, with about 70,000 people accessing the Roma Street Parkland from the station (Brisbane City Council, 2014). Further information on community values related to Roma Street Parkland is provided in **section 14.5.7**.

Victoria Park is located south of the ICB at Spring Hill and north of the ICB at Herston. The park is an important parkland and open space area for local residents and the wider community. The park provides a number of formal sporting facilities including Centenary Aquatic Centre, Victoria Park Golf Course, playing fields, and tennis and netball courts. The playing fields and tennis and netball courts are used by nearby schools. In addition, the park also provides a range of informal sport, recreation and leisure facilities including walking and cycling paths, children's playground, picnic areas and dog off-leash area. Further information on Victoria Park's community values is provided in **section 14.5.7**.

Outlook Park at Boggo Road Urban Village includes seating and picnic facilities, as well as a playground facilities opened in June 2014. The park mainly caters for workers of the Ecosciences Precinct as well as local residents from surrounding residential areas.

The Gabba Stadium is located at Main Street, Woolloongabba, between Vulture Street and Stanley Street. The stadium hosts regular state, national and international football and cricket matches, with seating capacity for about 42,000 people.

Emma Miller Place is located at Roma Street and Albert Street in the Brisbane CBD. The park includes several cultural memorials and public art items including Roma Street Police Station Memorial and the Gavin Fenelon Statue (child with case). The park is also used for a number of annual events such as the Queensland Council of Unions 2010 Memorial Day, and forms part of the Brisbane City Council Cultural Heritage Public Art Trail. The Gallipoli Monument is located in Gallipoli Place, which is located at Roma Street west of Emma Miller Place.

Boggo Road Gaol is located at Annerley Road, within the Boggo Road Urban Village. The Gaol comprises a museum, which offers daily tours, as well as facilities for private functions. Weekly farmers markets are also held outside of the Gaol every Sunday.

St Nicholas Russian Orthodox Cathedral is located at Vulture Street, Woolloongabba. The Brisbane Synagogue at Margaret Street holds Shabbat Services on Friday evenings and Saturday mornings and weekday services on Sunday, Monday and Thursday mornings.

Additional sport, recreation, leisure and cultural facilities located nearest to the Project are in **Table 14-12**.

Community support services

The study corridor offers a wide range of community support services that cater for local and regional communities. Some of the facilities include:

- Aid for the Blind accommodation facility at Cameron Street and Wilkins Street West, Fairfield, which comprises 40 independent living units for people who are blind or have low vision. Public transport access for residents is provided at Fairfield and Dutton Park stations
- Leukaemia Foundation ESA Village (ESA Village) at Peter Doherty Street, Boggo Road Urban Village
- Mercy Family Services Romero Centre at Dutton Street, Dutton Park, which provides refugee support and assistance to asylum seekers
- Sunshine Welfare and Remedial Association (SWARA) at Park Road, Woolloongabba
- Hazara Ethnic Society in Australia Inc, at Woolloongabba
- emergency and crisis housing services for men, women and young people, at Spring Hill.

The ESA Village is located on the southern side of Peter Doherty Street, adjacent to Railway Terrace, next to the proposed excavation works at Boggo Road Urban Village. The village comprises 30 accommodation units for patients who are undergoing medical treatment for leukaemia and their families, mainly at the PA Hospital or Mater Hospital. The centre is built around a large grassed courtyard and comprises a range of facilities including children's playground, recreation facilities, and auditorium (http://www.lfq.org.au/our-services/accommodation-services/patient-family-accommodation/esa-village). Consultation with representatives of the ESA Village undertaken for the Project indicated that the average length of stay for patients is about three to six months.

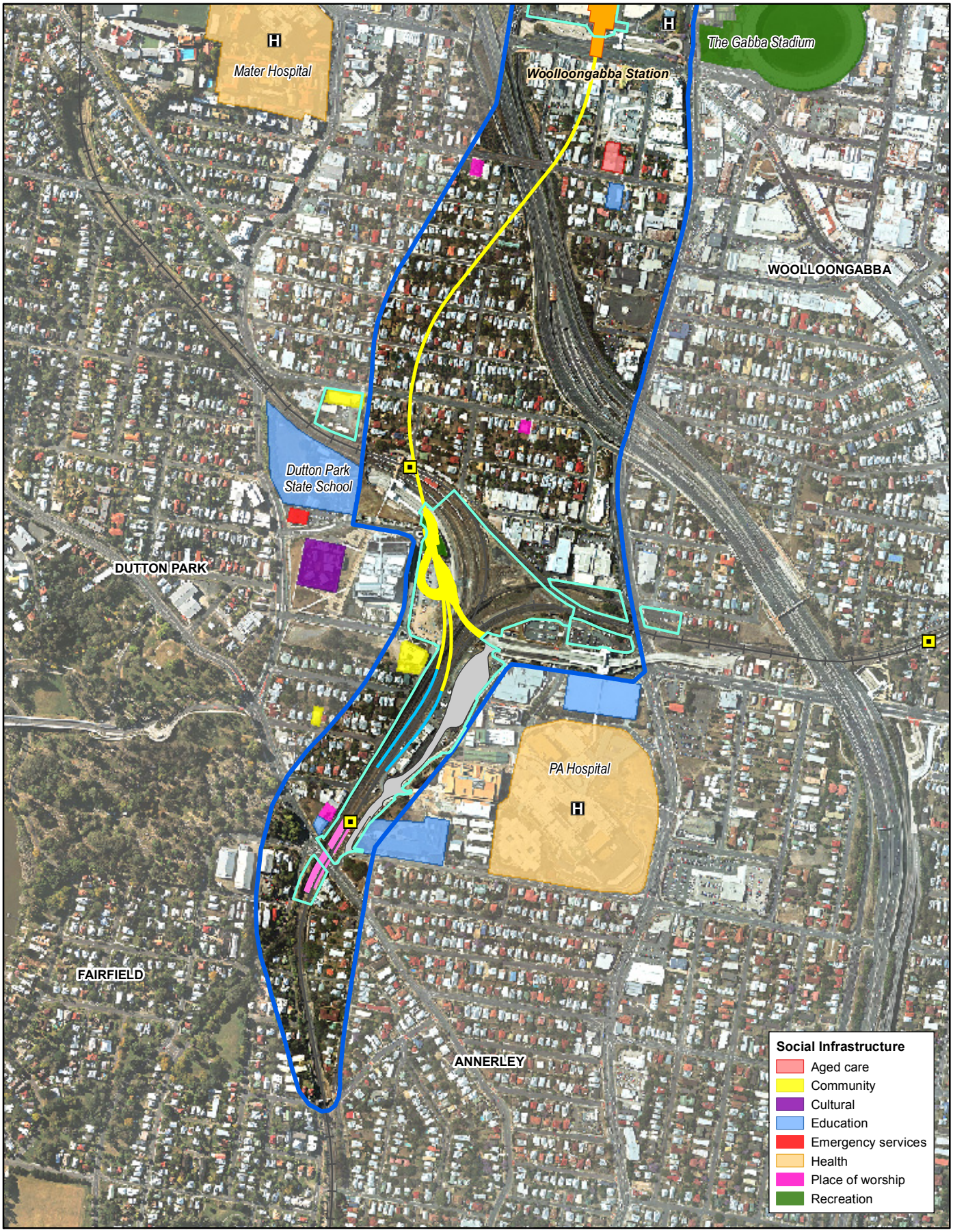
SWARA is located next to the proposed construction worksite at Park Road. The centre provides a learning environment for people with disabilities to improve their life skills and independent living skills. The centre currently caters for about 100 people per week, with about 60-70 people attending on a daily basis (http://www.swara.com.au/about-swara.html).

Other community support services near the Project are listed in **Table 14-12**.

Social infrastructure near the Project

A number of community facilities are located near the Project that may experience benefits or impacts, either directly or indirectly, from the construction and/ or operation of the Project.

These are shown on **Figure 14-3** to **Figure 14-5** and listed in **Table 14-12**.



LEGEND

- Existing rail station
- Existing rail line
- Study corridor

Project Infrastructure

- Construction worksite
- Underground station
- Bus layover
- Dutton Park Station (upgraded)

Alignment

- Underground

Aerial Photo: Brisbane City Council 2012

BUS AND TRAIN PROJECT
ENVIRONMENTAL IMPACT STATEMENT

FIGURE 14-3

Existing social infrastructure - south

N

0 0.1 0.2
Kilometres
1:10,000 (at A4)
Projection: GDA 1994 MGA56

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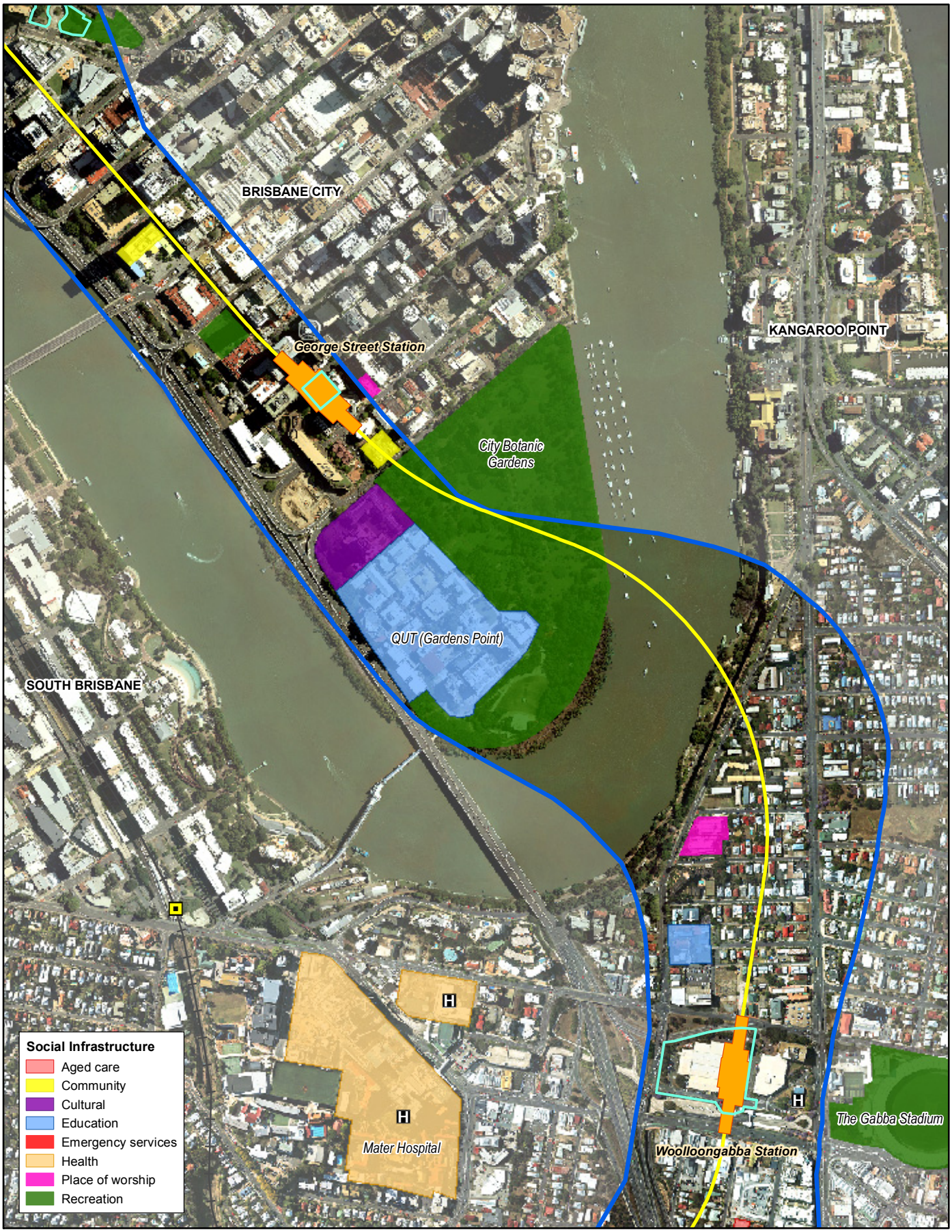

LEGEND

- Existing rail station
- Existing rail line
- Study corridor

Project Infrastructure

- Construction worksite
- Underground station

Alignment

- Underground

Aerial Photo: Brisbane City Council 2012

BUS AND TRAIN PROJECT
ENVIRONMENTAL IMPACT STATEMENT

FIGURE 14-4

Existing social infrastructure - central

N

0 0.1 0.2
Kilometres
1:10,000 (at A4)
Projection: GDA 1994 MGA56

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LEGEND

- Existing rail station
- Existing rail line
- Study corridor

Project Infrastructure

- Construction worksite
- Underground station
- Bus layover

Alignment

- Above ground
- Underground

Aerial Photo: Brisbane City Council 2012

BUS AND TRAIN PROJECT
ENVIRONMENTAL IMPACT STATEMENT

FIGURE 14-5

Existing social infrastructure - north

N

0 0.1 0.2
Kilometres
1:10,000 (at A4)
Projection: GDA 1994 MGA56

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Table 14-12 Social infrastructure near the Project

Location	Facility	Address	Type
Southern Connection (Dutton Park/ Woolloongabba)	Harvest House International Church	Railway Terrace	Church
	Queensland Aboriginal and Torres Strait Islander College of Health Education	Annerley Road	Education
	Mercy Family Services Romero Centre	Dutton Street	Community support
	UQ PACE (UQ School of Pharmacy)	Cornwall Street	Education
	PA Hospital	Ipswich Road	Health
	PA Hospital Early Education Centre	Alexandra Place, PA Hospital	Education
	ESA Village	Peter Doherty Street	Community support
	Dutton Park State School	Annerley Road	Education
	Dutton Park Police Station	Annerley Road	Emergency services
	Outlook Park	Boggo Road	Recreation
	Boggo Road Gaol Museum	Annerley Road	Cultural
	SWARA	Park Road	Community support
	Holy Annunciation Orthodox Church	Park Road	Church
Woolloongabba Station (Woolloongabba/ Kangaroo Point)	Russian Orthodox Church of St Seraphim	Hawthorne Street	Church
	Nazareth residential aged care	Hawthorne Street	Aged care
	Nazareth Community Kindergarten and Preschool	Hawthorne Street	Education
	South Brisbane Dental Hospital	Main Street	Health
	Woolloongabba Place Park	Main Street	Recreation
	Gabba Stadium	Vulture Street	Recreation
	St Nicholas Russian Orthodox Cathedral	Vulture Street	Church
	St Joseph's Primary School	Leopard Street	Education
	The Church of Jesus Christ of Latter-day Saints	River Terrace	Church
George Street Station (Brisbane CBD)	City Botanic Gardens	Alice Street	Recreation
	QUT Gardens Point	George Street	Education
	Queensland Parliament	George Street	Point of interest
	The Queensland Club	George Street	Community
	The Brisbane Synagogue	Margaret Street	Church
	Queens Park	Elizabeth Street	Recreation
	Brisbane Square Library	George Street	Community
Roma Street Station (Brisbane CBD)	Emma Miller Place and Gallipoli Place	Roma Street	Recreation
	Lutheran Church of St Andrew the Apostle	Wickham Terrace	Church
	Roma Street Parkland	Parkland Boulevard	Recreation

Location	Facility	Address	Type
Northern Connection (Spring Hill/ Herston)	St Andrew's War Memorial Hospital	Wickham Terrace	Health
	Brisbane Girls Grammar School	Gregory Terrace	Education
	Brisbane Grammar School	Gregory Terrace	Education
	Holy Family Childcare Centre	Gregory Terrace	Education
	Centenary Aquatic Centre	Gregory Terrace	Recreation
	St Joseph's College Gregory Terrace	Gregory Terrace	Education
	Victoria Park	Gregory Terrace	Recreation
	RBWH and Royal Children's Hospital	Bowen Bridge Road	Health
	UQ Centre for Clinical Research	Bowen Bridge Road	Education

14.3.5 Access and connectivity

The study corridor is well serviced by transport services and facilities, including major roads, bus and rail services, and pedestrian and cycle networks. In particular, the study corridor includes several major transport corridors. These provide access for local communities to other areas of Brisbane and South East Queensland as well as access for regional communities to destinations in the study corridor, such as the Brisbane CBD and major education, medical and recreation uses.

The following provides an overview of transport services and facilities in the study corridor. More detailed information is provided in **Chapter 4 – Traffic and transport**.

Railway services

The Queensland Rail City network provides passenger services to communities across South East Queensland. The network extends from Brisbane City, south to Beenleigh and the Gold Coast, north to Ferny Grove, Shorncliffe, Caboolture and Gympie, east to Cleveland and west to Richlands, Springfield, Ipswich and Rosewood. Communities in the study corridor are mainly serviced by rail stations at Fairfield, Dutton Park and Park Road in the south and Roma Street and Central in Brisbane City.

Fairfield Station is located at Mildmay Street, Fairfield adjacent to the Fairfield Gardens Shopping Centre. The station is serviced by the Beenleigh Line. Fairfield Station has relatively low levels of passenger use and mainly provides access for local residents.

Dutton Park Station is located between Railway Terrace and Kent Street at Dutton Park. The station forms part of the Beenleigh Line. The station provides access to nearby employment, education and medical facilities, such as the PA Hospital, Ecosciences Precinct at Boggo Road Urban Village, and UQ PACE at Woolloongabba. During consultation for the Project, local communities identified Dutton Park Station as an important public transport facility for local residents as well as for staff and patients at PA Hospital, and students at Dutton Park State School and UQ. Community feedback received during consultation for the Project indicated that Dutton Park Station is the preferred station for people from the local area with vision impairment. This includes people from the Aid for the Blind accommodation facility at Fairfield, which comprises 40 independent living units (http://www.aidfortheblind.org/default.html).

Park Road Station is located at Quarry Street, Dutton Park, next to the Boggo Road Busway Station. The station is serviced by the Beenleigh, Gold Coast and Cleveland lines. The station provides access for local residents as well as to local employment and education destinations. The station also provides opportunities for interchange between busway services and rail services (i.e. bus-rail and rail-rail).

Roma Street Station is located in the Brisbane CBD. The station is part of the Brisbane Transit Centre, which provides a multi-modal transport hub including commuter and long-distance passenger rail, bus and inter-city coach services. The station is serviced by all suburban and inter-urban railway services. Access to intrastate services (i.e. Tilt Train, Cairns, Longreach and Roma services) are provided from Platform 10, which is located adjacent to the construction worksite for the Project's Roma Street Station. Roma Street Station provides important access to employment, education, shopping and community uses in the Brisbane CBD, including the Roma Street Parkland.

Central Station is located at the corner of Edward Street and Ann Street in the Brisbane CBD. The station is serviced by all suburban and inter-urban railway lines and is a major interchange for rail services. The station is the busiest station on the network, providing important access to employment, education, shopping and community uses in the Brisbane CBD.

Bus services

The study corridor is well serviced by the Translink busway network, including:

- South East Busway, which extends from Eight Mile Plains to Brisbane CBD
- Eastern Busway, which connects Coorparoo to UQ at St Lucia, via the Eastern Busway and Eleanor Schonell Bridge
- Inner Northern Busway, which extends from the RBWH at Herston to Brisbane CBD
- Northern Busway, which connects from the RBWH to Kedron.

Communities in or adjacent to the study corridor are serviced by busway stations at PA Hospital, Boggo Road, Woolloongabba, Mater Hill, South Bank and Cultural Centre to the south; Queen Street, King George Square and Roma Street in the Brisbane CBD; and Royal Children's Hospital Herston and RBWH to the north. Busway stations at Boggo Road, South Bank, Cultural Centre and Roma Street provide opportunities for interchange with the passenger rail network.

Communities in the study corridor are also well serviced by on-road bus routes, many of which connect into the inner city busway network. In the south of the study corridor, Ipswich Road, Cornwall Street, Fairfield Road, and Annerley Road are bus routes, providing both regular and high frequency services to the Brisbane CBD and other destinations within or near to the study corridor. Gladstone Road also provides a number of services connecting to the Brisbane CBD, via West End.

Within the Brisbane CBD, Adelaide Street and Elizabeth Street are major bus corridors, while other important corridors include Margaret Street, Edward Street, Herschel Street and Roma Street.

Pedestrian and cycle access

The study corridor includes a range of off-road and on-road bikeways and pedestrian connections. Off-road cycle routes in the study corridor include:

- Eleanor Schonell Bridge connecting Annerley Road and Gladstone Road at Dutton Park to UQ at St Lucia
- PA Hospital cycleway, which extends from O'Keefe Street at Buranda to Cornwall Street at Woolloongabba, via Kent Street

- South East Freeway Bikeway, which in the study corridor connects from O'Keefe Street at Buranda to Kangaroo Point, with connections to Park Road and Stanley Street at Woolloongabba
- Bicentennial Bikeway, which extends along the Brisbane River from the City Botanic Gardens to Toowong
- Northern Bikeway, which connects Brisbane's inner northern suburbs to the Brisbane CBD via Gilchrist Avenue at Herston, the Land Bridge across the ICB, Victoria Park and Roma Street Parkland
- bridge crossings of the Brisbane River, including Goodwill Bridge, which connects South Bank to the City Botanic Gardens; and Kurilpa Bridge which extends from West End to the Brisbane CBD via Tank Street.

The study corridor also includes a number of on-road cycle routes. On-road cycle routes located near to Project works include:

- Cornwall Street at Woolloongabba, Annerley Road at Dutton Park and Fairfield Road at Fairfield
- Ipswich Road and Stanley Street at Woolloongabba
- Adelaide Street, George Street, Roma Street, Tank Street and Herschel Street in the Brisbane CBD
- Gregory Terrace at Spring Hill.

Parkland Boulevard at Roma Street Parkland is an important cycle route, although this does not comprise a dedicated cycleway. As indicated in **section 14.3.4**, it is estimated that about 350,000 people cycle through the Parkland each year.

A number of streets within the Brisbane CBD also provide important pedestrian access including:

- George Street, which provides access to the Government Precinct, QUT Gardens Point and the City Botanic Gardens
- Roma Street, which provides access to the Roma Street Station
- Albert Street, which connects Roma Street Parkland and Roma Street Station to the Queen Street Mall via King George Square.

Victoria Bridge is also an important pedestrian route, connecting South Bank to the Queen Street Mall in the Brisbane CBD.

The need to improve pedestrian access and connectivity near the stations was identified as important by residents and other stakeholders during consultation for the Project. In particular, community feedback identified the need for improved access between Woolloongabba and surrounding facilities such as the Gabba Stadium and Mater Hospital.

Roads

The study corridor includes several main arterial roads, such as:

- South East Freeway and Pacific Motorway, Clem Jones Tunnel (CLEM7), Annerley Road, Ipswich Road, and Ipswich Motorway, which connects the Brisbane CBD to the south
- Riverside Expressway, which connections to and from the Brisbane CBD at Alice Street, Margaret Street, Elizabeth Street, Ann Street, Turbot Street and Herschel Street
- ICB, which connects Brisbane's northern suburbs to Kelvin Grove Road/ Countess Street at Kelvin Grove, as well as to Coronation Drive at Milton, via Hale Street.

The Legacy Way road tunnel is currently under construction and due to commence operation in mid-2015. The tunnel will connect the ICB at Herston to Brisbane's western suburbs.

14.3.6 Community values and lifestyles

Community values include those things held as important to communities for quality of life and well-being. Community values can relate to physical elements such as parks, natural features, built form, places of value, and access and connectivity, as well as intangible qualities such as sense of place, community cohesion, and environmental amenity (i.e. air quality and noise levels).

This section describes those values important to local and regional communities in the study corridor. They have been informed by community consultation undertaken for the Project as well as the review of existing information and observations of the study corridor.

Local amenity and character

Community values relating to local amenity and character refer to natural and physical qualities and characteristics that contribute to a person's appreciation of their surroundings. They relate to such things as built form and landscape, environmental conditions (ie existing air quality and noise levels) and heritage and cultural features.

Local amenity and character in the study corridor is characterised by a diversity of land uses, including suburban and inner city residential neighbourhoods, major institutional uses and community facilities, including parks and open space areas, commercial precincts, and major transport corridors.

Overall, the study corridor displays high levels of amenity with good access to:

- community facilities and services of State and regional significance, including major hospitals, primary, secondary and tertiary education facilities, and sport and recreation uses
- the full range of transport services and facilities, including rail, busway, State roads, and major cycle networks
- parks and open space areas of regional importance, including the Brisbane River, City Botanic Gardens, Roma Street Parkland and Victoria Park
- residential neighbourhoods within easy reach of local services, employment and the Brisbane CBD, including areas of low density 'tin and timber' character housing at Fairfield, Dutton Park and Woolloongabba, and medium to high density housing at Kangaroo Point, Brisbane City and Spring Hill.

The heritage and history associated with the Indigenous culture and early European settlement of Brisbane is also important to the character and identify of the study corridor. The Project passes through a number of areas of great significance to Aboriginal people and incorporates a number of important Aboriginal living, resource extraction and ceremonial sites. It contains physical or tangible cultural heritage values as well as intangible heritage values such as cultural practices or oral traditions, relating to places or landscapes across the study corridor. A number of natural and built heritage places of State and local significance are also located across the study corridor, particularly in the Brisbane CBD. These include buildings and structures such as the old Woolloongabba Post Office and St Nicholas Russian Orthodox Church at Woolloongabba, The Mansions and Harris Terraces near George Street Station and the original Roma Street Station building; as well as parks and open space areas such as the City Botanic Gardens and Victoria Park. Further information on Indigenous and non-Indigenous heritage values is provided in **Chapter 12 – Cultural heritage**.

The study corridor includes a number of open space areas that are highly valued by local and regional communities due to their landscape, scenic amenity, heritage and recreational values. These include the Brisbane River, City Botanic Gardens, Roma Street Parkland and Victoria Park, including Victoria Park Golf Course. Major open space areas located near to Project surface works include Roma Street Parkland and Victoria Park.

Roma Street Parkland covers an area of about 16 hectares. As indicated in **section 14.3.4**, the Parkland provides a range of formal and information recreation and leisure opportunities, and is an important location for major community events as well as smaller private events. The Parkland comprises a range of landscaped spaces, gardens and recreational features, and is valued for its "*peaceful atmosphere and pleasant surroundings*" (www.romastreetparkland.com). Roma Street Parkland is also valued for its cultural heritage. Prior to European settlement and throughout the early colonial period, local Aboriginal people used the area for gatherings. The area includes a recorded Indigenous cultural heritage place, being a resource extraction site, formerly a string of waterholes and the source of Wheat Creek (DATSIMA LB:N74) and remains important to the Turrbal People today (Turrbal Association, 2014). The area occupied by the Parkland also incorporates an early Brisbane park and land previously used for an orphanage and a rail yard (www.romastreetparkland.com).

A map of Roma Street Parkland, including the main gardens and landscape spaces is shown in **Figure 14-6**.

Victoria Park covers an area of about 27 hectares and includes that land bordered by Bowen Bridge Road, Gregory Terrace and Herston Road, and the QUT Kelvin Grove campus. The Park is highly valued by residents in Spring Hill and Brisbane's inner northern suburbs for its landscape, aesthetic, recreational and heritage values. The Park was gazetted in 1875 and initially spanned an area of 130 hectares, although land set aside for the Park was encroached upon over the succeeding years by community facilities and urban development (Queensland Heritage Register, ID 602493). In more recent years, further encroachment has occurred with the development of transport infrastructure such as the ICB, Inner Northern Busway and Legacy Way project.

Victoria Park provides formal sport and recreation facilities including golf course, playing fields, tennis courts, bikeway and aquatic centre, as well as informal recreational and leisure facilities such as the dog off-leash area, playground, areas of open space, and picnic areas. These facilities are used by students of nearby schools and local residents.

The Park is listed on the State heritage register, for both its Indigenous and non-Indigenous heritage values. The area is an important gathering place and ceremonial area for Aboriginal people, which is recognised by the lake area known as York's Hollow, located north of the ICB. Victoria Park has also provided the setting for many major events in Brisbane's history, from the industries and immigrant camps of early settlement, to the Depression era housing of the unemployed, the expansion of the city's electricity grid, and the encampment of Allied forces during the Second World War (https://heritage-register.ehp.qld.gov.au/basicSearch.html, QHR 602493). Victoria Park includes landscape spaces and trees of community importance, including some areas recognised on the State heritage listing. These include:

- the Gundoo Memorial Grove of eucalypts, which were planted by students of Brisbane Girls Grammar School as part of Queensland's centenary celebrations in 1959
- plantings from the original landscape design by Harry Oakman for the rehabilitation of the Park following its military use during the Second World War
- Poinciana and Silky Oak trees located at Gilchrist Avenue.

The Park also includes trees planted in 2012 near Gregory Terrace as part of the Queen's Diamond Jubilee celebrations. **Figure 14-7** shows the main landscape and recreational features of the Park.

Local amenity in the study corridor is currently affected by increased travel times and congestion on major transport routes, including roads, rail lines and busways, as well as increased noise from road traffic and rail operations, particularly freight rail. Major transport corridors also act as a barrier to movement within and between communities in the study corridor. Air quality in the study corridor is also affected by motor vehicle emissions from major roads and local construction activities.

Community cohesion

Community cohesion refers to the 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.

Residents in the study corridor have good access to a diverse range of community facilities, such as education, sport and recreation, open space and community services, as well as local centres, restaurants and cafés, which provide local meeting places and support local social cohesion. The study corridor also has a number of important community networks related to local schools, churches, recreation and cultural facilities that help to foster relationships and trust. This is particularly evident in the more established residential areas of Annerley, Fairfield, Dutton Park and Woolloongabba in the south, and Spring Hill in the north.

Communities in the study corridor are relatively mobile (refer to **section 14.3.2**). This is likely to reflect the proximity to major tertiary education facilities and the Brisbane CBD, which makes the study corridor attractive to students and young professionals, who are often highly transient. However, consultation for the Project indicated that some residents have lived in the local area for many years and that amongst longer term residents, there is a strong sense of belonging, connections and shared networks, which enhance community cohesion.

Communities in the study corridor are culturally diverse, with high proportions of people born overseas, people who speak a language other than English and who do not speak English well or at all (refer to **section 14.3.2**). Some locations in the study corridor also display relative levels of socio-economic disadvantage and include levels of people in need of assistance slightly above the Brisbane LGA. These groups are likely to be more dependent on personal and social networks.

Pedestrian, commuter, and motorist connectivity is also important to community cohesion and liveability. Connectivity between neighbourhoods is important to ensure social networks are maintained in the study corridor. In addition, access to public transport infrastructure is important to allow community members to participate in social life, access places of work, study and recreation and access community services.

BUS AND TRAIN PROJECT
ENVIRONMENTAL IMPACT STATEMENT

FIGURE 14-6

Roma Street Parkland

BUS AND TRAIN PROJECT
ENVIRONMENTAL IMPACT STATEMENT

FIGURE 14-7

Victoria Park features

Community health and safety

Preserving a sense of community safety and ensuring Brisbane is a place where people feel safe is important for many residents. The need to maximise the safety of residents and visitors and ensuring Brisbane remains an attractive, vibrant and safe place is an important element of Brisbane City Council's vision for the city. Safety and security is also important to communities in the study corridor. Comments made by community members during consultation for the Project about safety related to:

- need for safe access for pedestrians and cyclists near the Project during construction, including for:
  - students at Dutton Park State School, via the Merton Road pedestrian bridge and at Boggo Road
  - staff, patients and visitors to PA Hospital, particularly at night
  - people with mobility difficulties, including for people with vision impairment at Fairfield and Annerley
  - pedestrians along George Street to QUT and the Government Precinct
  - residents and visitors near to Roma Street Parkland
  - users of the Land Bridge and cyclepaths at Victoria Park
- safety for students during construction, due to the presence of a large construction workforce at Dutton Park
- importance of safe access to the Project stations for people with mobility difficulties and vision impairment
- safety and security for properties near the Project stations, and potential for stations to encourage loitering and vandalism
- existing conflicts between pedestrian and cycle access at Annerley Road, Dutton Park
- need to improve safety at the existing and new Roma Street stations, including provision of lighting, security cameras and security staff
- the consideration of crime prevention through environmental design (CPTED) principles in the design of stations.

Comments by residents during consultation on the Project about community health mainly related to the possible health impacts of ventilation outlets. Particular concern was raised in relation to the ventilation outlet at Roma Street Station and perceived impacts for residents of nearby residential apartments, which were reported to have a large number of aged residents.

The need to maintain access during construction for emergency vehicles, particularly at PA Hospital, was also identified during consultation for the Project.

14.4 Summary of issues raised during consultation

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 and stakeholder consultation identified a range of views in response to the Project, including both positive and negative impacts of construction and operation. Many people concerned about the adverse impacts of construction also acknowledged the long-term benefits to flow from the Project's operation.

Some people living close to the Project were concerned that while the benefits would be widespread, the impacts during construction would be localised. This is a notable outcome when considering that consultation activities (i.e. community information sessions, community liaison group meetings) mainly involved people from within or near to the study corridor. Many of these people would experience both the long-term benefits of the Project's operation and the impacts of the construction phase.

People living beyond the study corridor who are also likely to benefit from the Project's operation typically did not engage directly in the consultation activities such as community information sessions, making their acceptance of the Project, or otherwise, less easy to quantify.

The following provides a summary of the key issues raised during community and stakeholder consultation for the Project. A detailed description is provided in **Appendix D**.

14.4.1 Project need and operation

Consultation for the Project identified broad community support for the Project and recognition of the need to improve bus and rail services, including increased frequency of services, and integration between public transport modes.

Comments made during consultation about project need and operation generally related to:

- interchange opportunities between transport modes and services at Project stations
- consideration of additional Project stations, including at Boggo Road and Spring Hill
- the need to allow for future extension and expansion, such as the inclusion of an Exhibition Station, and a future north-west connection to Alderley and Strathpine
- importance of integration of the Project with the wider South East Queensland public transport network
- Project cost and funding, including the suggestion that a more economical approach to addressing the capacity constraints would be to upgrade existing rail tracks and stations to accommodate nine-car trains
- potential impacts on freight operations.

Comments were also raised by community members in relation to the location and potential impacts of ventilation outlets required for the Project. In particular, issues related to potential health impacts of emissions, particularly for children and elderly people; visual impacts of ventilation outlets; and potential impacts on property values for properties near to ventilation outlets. The need for ventilation outlets to be located away from residential areas was identified by residents as important.

Operational issues relating to safety and emergency management were also identified during consultation, including the potential for the Project to be vulnerable to incident, attack or natural disaster.

14.4.2 Southern Connection

The overarching issue for residents, workers and stakeholders in the southern part of the study corridor were potential impacts of the southern tunnel connection, particularly the decommissioning of Dutton Park Station initially proposed for the Project.

Concerns relating to the decommissioning of Dutton Park Station proposed by the draft reference design generally related to the loss of train services for local residents, resulting in reduced access to the Brisbane CBD, as well as loss of services for workers and users of nearby major facilities such as the PA Hospital and UQ.

Following feedback from consultation on the draft reference design and further investigations, the reference design was refined to retain Dutton Park Station and remove the proposed underground pedestrian link.

Other comments made during consultation related to:

- potential impacts on existing bus services and routes during construction
- construction impacts, including location of the construction worksite, noise impacts, impact on trees at Railway Terrace, dust impacts and worker parking
- impacts associated with the presence of a large construction workforce
- the need to ensure the adequate reinstatement of Outlook Park and loss of further greenspace in the area
- consultation with affected stakeholders during construction.

The need to maintain safe and convenient pedestrian and cycle access during construction was also identified, particularly for the Merton Road pedestrian bridge and Joe Baker Street.

14.4.3 Northern Connection

A number of issues raised about the Project related to the location and impacts of the Northern Connection, particularly on Victoria Park at Spring Hill. Community concerns related to both the temporary construction impacts and permanent impacts of surface infrastructure on the visual, recreational, heritage and social values of the park.

In particular, concerns related to:

- importance of Victoria Park's heritage values, including both Indigenous and non-Indigenous heritage values
- loss of valuable recreational space, impacts on park amenity and pedestrian and cycle access, particularly the Land Bridge, and the need for green space and large trees in the inner city to be protected
- visual impacts from the elevated busway connection
- cumulative impacts on Victoria Park and incremental loss of park land, due to previous infrastructure projects (i.e. ICB, Inner Northern Busway and Legacy Way).

Following feedback on the draft reference design, the Northern Connection was refined to minimise the permanent footprint on Victoria Park from the Project's surface infrastructure. In particular, changes to the bus alignment means that the majority of surface infrastructure would be contained within the existing railway corridor.

14.4.4 Construction impacts

Community and stakeholder comments made in relation to potential impacts of construction activities related to:

- impacts on local amenity and lifestyle for communities near to surface construction works, particularly at George Street and Roma Street, and potential impact on residents' use of balconies
- construction noise, including regenerated noise, and impacts to residents, businesses and community facilities from prolonged noise impacts, particularly at George Street Station and Roma Street Station

- duration of construction and potential disturbance due to night works
- vibration and noise from tunnel construction and potential impacts for properties above the tunnel alignment
- potential vibration impacts on the transmission electron microscope located at the Ecosciences Precinct
- dust from construction works, particularly excavation at stations and tunnel portals
- cumulative impacts of noise, dust and traffic disruptions with other developments proposed to be constructed within a similar timeframe or near to the Project, such as at Queen's Wharf Brisbane and Boggo Road Urban Village
- potential impacts of spoil removal, including dust, noise and transport, and the need to consider haulage by rail or barge, and the use of major roads rather than local streets
- loss of parkland for the construction worksite at Victoria Park, including loss of trees, impact on dog off-leash area, and pedestrian and cycle pathways, particularly the Land Bridge, and impact on the Park's heritage and cultural values
- impacts on local businesses, including loss of office worker custom during lunch hours due to closure of the office building at 63 George Street.

Community and stakeholder comments also related to construction impacts on local access and connectivity, including:

- impact on local streets from worker parking, and loss of public car parking at Roma Street Parkland and Boggo Road Urban Village
- impacts of construction traffic access to construction worksites
- changes to traffic and access, particularly associated with the possible closing of streets in the Brisbane CBD and the need to maintain access to George Street and Roma Street Parkland for residents, businesses and visitors
- importance of maintaining safe pedestrian and cycle access near construction worksites, particularly the Land Bridge at Victoria Park.

The need for appropriate management of construction impacts, including a thorough complaints management process, was also identified as being important to community members.

14.4.5 Local access and connectivity

Overall, feedback from consultation recognised that the Project would improve access and connectivity to areas within Brisbane's inner city, such as the Brisbane Cricket Ground (Gabba Stadium), QUT Gardens Point and the future Queen's Wharf Brisbane development.

Comments made during consultation about local access and connectivity related to:

- the need for improved pedestrian connections across Ipswich Road, Stanley Street and Vulture Street at Woolloongabba, particularly pedestrian access and connection between the station and Gabba Stadium on game days
- need for planning to allow adequate public space at the station entries and for integrated pedestrian walkways to improve passenger movement
- potential to enhance pedestrian and cycle access from Roma Street Station to George Street and Albert Street
- need to minimise disruptions to rail and bus services during construction and to ensure that services are replaced or improved following construction

- need to ensure that stations are accessible and functional for all bus and rail users, particularly people with vision impairment or mobility challenges
- concerns about capacity of, or impact on, existing car parking at stations such as Park Road Station, particularly with the decommissioning of Dutton Park Station initially proposed for the Project.

14.4.6 Property impacts

Potential impacts on property were a concern for property owners. Particular comments related to:

- volumetric property impacts from the tunnel and station caverns and uncertainty about the volumetric acquisition process, including compensation, particularly for buildings under a body corporate arrangement
- potential for adverse impacts on property values, particularly at Dutton Park and Annerley from the closure of Dutton Park Station initially proposed for the Project
- potential impacts on amenity causing prospective buyers to reconsider buying properties near to the Project, specifically at Roma Street Parkland
- effects of vibration and underground works on the structural integrity of buildings, such as residential and heritage buildings near the George Street Station, and need for property condition surveys to be conducted prior to and after construction, to ensure any damage from construction is measurable and can be repaired, if required
- potential implications on future development of properties near to the tunnel alignment (i.e. basement car parking and underground structures/ foundations)
- potential impacts on major development areas such as Boggo Road Urban Village and Queen's Wharf Brisbane, and the need to work with stakeholders to ensure coordination between various developments.

14.5 Impact assessment

This section describes the potential benefits and impacts of the Project's construction and operation on existing communities and social values within the study corridor.

The Project would provide long-term benefits for communities within the study corridor as well as across South East Queensland, through improved public transport access and connections to services, community facilities and employment within Brisbane's inner city and elsewhere.

Once constructed, much of the Project infrastructure would be located underground with surface infrastructure generally limited to connections to the existing surface rail and busway networks at Dutton Park and Spring Hill, station buildings at Woolloongabba, George Street and Roma Street and associated infrastructure such as feeder stations and ventilation outlets.

During construction, surface construction activities would be limited to those areas near the southern and northern connections as well as at each of the station locations. The main activities undertaken during construction would include:

- establishment of the construction worksites, requiring activities such as demolition of existing buildings and structures, relocation of services and utilities, realignment of existing rail tracks, and vegetation clearing
- excavation works including for the station shafts, tunnel boring machine (TBM) launch and retrieval shafts, and cut and cover tunnels at Dutton Park and Spring Hill
- underground excavation of the station caverns

- construction of the tunnel using TBM
- track laying, and tunnel and station fit-out.

Loading and handling of spoil from TBM tunnel construction and station excavation would occur within ventilated, acoustic sheds, with removal of spoil by road. Spoil from the TBM construction would be from Dutton Park.

Construction of the Project as a whole would take up to five years, with the duration and intensity of construction activities varying across construction worksites and throughout the construction phase. Much of the major construction activities at each worksite (i.e. site establishment and excavation) would occur for about two years.

The TBM is expected to progress on average at a rate of about 100m per week and take about 18 months to complete tunnel construction. As such, properties above the tunnel may experience noise and vibration from the TBM over a period of about 5-7 days.

14.5.1 Property impacts

Directly affected properties

The Project would directly impact on a total of 297 properties, either in total or in part. This includes about 21 properties impacted by surface works and about 276 properties impacted by volumetric acquisition, where the Project passes beneath the property (refer to **Table 14-13**).

Surface works would not require the acquisition of private property, with all properties directly impacted by surface works either owned by the State or a Government Owned Corporation. All but one property, being the site of the George Street Station at 63 George Street, comprise transport infrastructure or community uses such as park.

Properties impacted by volumetric acquisition include about 208 private properties, 88 properties owned by the State, and one property owned by Brisbane City Council. Volumetric acquisition requires the resumption of a portion of land below the surface of the property (i.e. volumetric lot). The balance of the land would not require change of ownership or relocation of occupiers.

Table 14-13 Property requirements

Land use/ tenure	Surface impact	Volumetric impact
Ownership		
Private	Nil	208
State (including Government Owned Corporation)	21	67
Council	Nil	1
Total	21	276
Land use		
Residential, including mixed use	Nil	148
Commercial/ business	1	65
Community (parks, education, etc.)	9	9
Transport	11	53
Total	21	276

The majority of properties impacted by volumetric acquisition (148 properties) comprise residential uses, including separate houses, flats or apartments or mixed-use developments comprising a mix of both residential and commercial uses. As indicated in **section 14.3.2**, the study corridor has a relatively high proportion of rental households. Therefore, it is expected that many of the residential properties impacted by volumetric tenure would be investment properties. Six residential properties impacted by volumetric acquisition comprise State owned housing. These include flat or multi-unit developments, located at Woolloongabba, Kangaroo Point and Spring Hill.

Sixty-five properties impacted by volumetric acquisition are being used for commercial purposes. The majority of commercial properties affected by volumetric acquisition are located in the Brisbane CBD, although about seven are located at Woolloongabba south of Stanley Street, two are located at Kangaroo Point and four are located at Spring Hill. Nine properties affected by volumetric acquisition are being used for community purposes, the majority of which are owned by the State. Two properties used for community purposes are privately owned. Community uses affected by volumetric acquisition include parks, law courts, education uses and church.

Impacts on property

During consultation for the Project, comments made by community members about property impacts mainly related to:

- uncertainty about the volumetric acquisition process, including compensation process
- potential impact on future development of properties above the tunnel or stations, including constraints on basement car parking
- changes to amenity during construction, and the potential for this to impact property values in areas near to construction works, decisions by prospective property buyers and rental potential of investment and commercial properties
- uncertainty around property decisions, including decisions to buy or sell properties near to the Project
- potential risk of damage to and impacts on buildings from construction of the tunnel and stations, and the need for property condition surveys to be conducted to ensure any damage from construction can be measured and repaired, if necessary.

The acquisition of volumetric lots would be undertaken in accordance with the *Acquisition of Land Act 1967*. Under the Act, property owners who have a volumetric resumption under their property are entitled to claim compensation. The Queensland Government has notified affected property owners regarding potential acquisition requirements and would continue to liaise with these property owners as the Project progresses about the resumption process.

Acquisition of a volumetric lot for the Project would generally not impact on the current use of land and occupants of these properties would not need to relocate for the Project. Further information on property impacts is provided in **Chapter 5 – Land use and tenure**.

Based on experience from other public transport projects in Brisbane and elsewhere, the improved accessibility provided by the Project is likely to positively influence property values in the longer term, particularly near to the new stations. Ongoing communication and consultation about proposed changes prior to and during construction would help to reduce uncertainty and raise awareness of the Project's operational benefits. Environmental management measures have been identified to address potential impacts on amenity during construction. These are described in **Chapter 18 – Draft Outline EMP**.

During construction, some occupants of buildings above the tunnel alignment may experience perceptible vibrations for short periods as the TBM passes or works occur beneath the property,

although vibration levels would generally be below the compliance goals relating to structural risks for buildings or structures. Measures would be implemented to mitigate potential impacts of vibration on people and minimise potential risk to properties. These would include early and ongoing notification of owners and occupants of buildings above the tunnel alignment about the timing and duration of underground works and building condition surveys prior to and following construction for buildings above the tunnel alignment, where required.

During operation, vibration from train and bus movements is predicted to be within compliance goals for all sensitive receiver locations. Potential vibration impacts of the Project's construction and operation are discussed further in **Chapter 11 – Noise and vibration**.

Uncertainty around property decisions, volumetric acquisition or impact on property from construction vibration may cause stress and anxiety for some people, potentially affecting health and well-being for these people. This is discussed in **section 14.5.7**.

14.5.2 Housing and accommodation

The Project would not directly impact on the supply or demand for housing and accommodation in the study corridor. It is expected that the construction workforce would generally be sourced from across Brisbane and South East Queensland. While some technical specialists are likely to be sourced from interstate or overseas to work on the Project from time to time, this would not result in an influx of workers at a scale that would impact on demand for housing and accommodation. In addition, surface works would not require the acquisition of any residential properties.

Without mitigation, some occupants of residential and accommodation uses closest to the construction worksites or above the tunnel alignment may experience temporary, short-term changes to local amenity during construction due to such things as:

- noise and dust from surface and excavation works
- vibration and regenerated noise from tunnelling, for a period of about 5-7 days
- light spill from night-time construction works
- changes to visual amenity, due to the presence of construction infrastructure and activities, and clearing for construction worksites
- increased construction traffic and temporary changes to local access and connectivity.

The implementation of mitigation measures such as screening, use of ventilated acoustic sheds and limiting of work hours for particularly noisy activities would assist in managing potential impacts on residential amenity and minimising disruptions for local residents. Early and ongoing consultation and communication with local residents and managers of accommodation facilities close to the construction works would also assist in minimising disruptions to residential amenity. This would be particularly important where night-time works are proposed or where activities are likely to generate particularly high levels of noise and vibration. As indicated in **section 14.3.2**, the study corridor has a relatively high proportion of rental households and communities that are relatively mobile, particularly in Spring Hill and Brisbane City. This would need to be considered in consultation and communication about construction works.

Further discussion about possible changes to amenity for communities near to the Project are described in **section 14.5.7**, while amenity impacts for specific project locations are described in **section 14.5.8**.

During operation, vibration from train and bus movement are predicted to be within compliance goals for all sensitive receiver locations

14.5.3 Equity

Equity refers to a fair distribution and sharing of resources. The Project would improve public transport access and connections to where people live, work and play, and support improved economic and social opportunities. These benefits would be long-term and would be shared by communities at both local and regional levels.

Many of the construction impacts such as changes to amenity and perceived liveability would be experienced by those communities closest to construction works or occupants of properties above the tunnel alignment. These impacts would be localised and relatively short-term and temporary (i.e. less than five years) compared to the design life of the Project (i.e. 100 years). Following construction, most of these communities would experience long-term benefits from the operation of the Project through improved bus and train access from new or existing stations to destinations within the inner city and across South East Queensland.

During consultation for the Project, some community members at Spring Hill raised concerns that there would be visual, recreational and social impacts on Victoria Park impacting on communities at Spring Hill, with “little or no perceived benefits for this area”. The Roma Street Station would provide enhanced public transport access to residential, commercial and community uses at Spring Hill through provision of a northern entrance to Roma Street Parkland. Following construction, areas of Victoria Park temporarily disturbed by construction activities would be rehabilitated and reinstated through a master planning process undertaken by Brisbane City Council in consultation with the local community and the Turrbal Association. This would provide the opportunity to enhance the functionality of the Park and landscape and recreational values for local residents.

Locally, the Project may encourage regeneration around stations, stimulating new development and business activity. This may create improved social and economic opportunities for local communities.

The Project would operate under the Translink integrated ticketing system, which currently comprises 23 zones across South East Queensland. Fares are calculated at either an adult or concession rate and based on the number of zones travelled. Concessional fares for students, pensioners and elderly rail users would maintain equitable access to transport.

New Project stations and access would be designed to comply with the DDA, ensuring that the stations are fully accessible to people with mobility difficulties. Dutton Park Station would be upgraded as part of the Project to include lifts, improving disability access to the station.

14.5.4 Economic impacts

This section describes impacts on local and regional economies from the Project’s construction and operation as well as impacts on local business and employment. Information presented on the cost benefit analysis (CBA), the economic impact assessment and review of wider economic impacts, is based on the outcomes of the economic assessment undertaken for the Project by Deloitte Access Economics (Deloitte, June 2014).

Cost benefit analysis

The CBA has been used to estimate the economic viability of the Project. CBA is often applied to public sector projects to assess public expenditure in terms of the relative benefits and costs that would accrue to society. It compares the costs to the community of delivering and operating a project with its monetised benefits to the community. If overall benefits are demonstrated to exceed the expected costs, a project is considered economically viable. The CBA undertaken for the Project involved:

- defining the base case or ‘without Project’ scenario, against which the Project is compared

- identifying the costs and benefits that might be expected in moving from the base case to the 'with Project' scenario
- identifying the core parameters of the evaluation (e.g. time scale, base year for prices to calculate present dollar values, discount rate)
- development of transport modelling for the base and project case
- quantifying the costs and benefits over the evaluation period
- estimating the Net Present Value (NPV), Benefit Cost Ratio (BCR) and Internal Rate of Return using discounted cash flow techniques
- testing the sensitivity of the CBA results to changes in the underlying assumptions.

The economic benefits for the Project have been calculated in incremental terms (i.e. the 'with Project' scenario minus the 'without Project' scenario).

Modelling inputs and assumptions

The economic evaluation was based on a number of assumptions. These are summarised in **Table 14-14**.

Table 14-14 Economic evaluation inputs and assumptions

Item	Input/ assumption
Base price year	The base price year adopted for the evaluation is 2013-14 (30 June 2014). Costs and benefits included in the evaluation are presented in 2014 values.
Period and dates	Construction planning is expected to commence in 2014, with Project commissioning in 2021. The evaluation period adopted for the Project is 30 years from Project commissioning, consistent with Infrastructure Australia guidelines. As such, the evaluation period ends in 2050 (i.e. 2021 to 2050 inclusive).
Discount rate	A real discount rate of 7 per cent has been adopted for the CBA, in accordance with Infrastructure Australia guidelines. Sensitivity testing has also applied real discount rates of 4 per cent and 10 per cent.
Costs	Project costs include capital construction costs, annual operating costs and all ongoing maintenance costs on a whole-of-life basis. Construction and operation costs included in the economic evaluation for the Project include: • fixed infrastructure costs, including early and enabling works, tunnel, stations, rail track and other surface infrastructure • systems infrastructure, including busway systems, rail signalling and rail power • construction and operational risk • Principal's costs (including additional rollingstock requirements) and property acquisition costs • recurrent costs, such as bus and train running costs and station operation costs. The total whole of life cost for the Project is estimated to be $4.09 billion (in 2014 values), including allowance for Project risk.
Benefits	Benefit streams have been calculated using outputs from the patronage model developed for the Project for the years 2021 and 2031. Benefits between these years were calculated through interpolation calculated using a straight line growth calculation.

Item	Input/ assumption
	Benefits are assumed to be realised immediately in year one of operation as new infrastructure is used, and benefits are capped at 2038 due to network capacity constraints. Modelling was used to identify changes to both public transport and private transport trips. Benefits considered in the economic evaluation included: • public transport benefits, which comprise the generalised cost savings commuters would receive once the Project increases the public transport capacity of the network (including fares and journey quality issues) • private vehicle travel time savings, due to mode shift to public transport once the Project becomes operational and congestion is relieved on the existing network • private vehicle operating cost savings, due to reduced congestion on the road network • road freight savings, such as reduced travel times and vehicle operating costs for road freight resulting from reduced congestion on the road network.
Residual value	This relates to the components of the capital investment that have economic lives beyond the 30 year evaluation period. The residual values reflect the unused portion of those assets based on their economic lives.

Source: Deloitte Access Economics (2014)

CBA results

Table 14-15 presents the results of the CBA for the Project. The Project would return a positive NPV ($641 million) and a BCR of 1.16. This indicates that the Project would provide societal benefits in excess of the Project costs.

Consistent with other public transport projects, the Project costs are dominated by capital expenditures while the Project benefits are more broadly distributed across different benefit categories. Improvements in public and private transport travel times and private vehicle operating costs are the largest contributing factors. Some benefit to freight movements by road are also expected due to the shift in public transport mode share freeing up of road infrastructure.

Table 14-15 Cost benefit analysis results*

Item	NPV ($2014) ($ million)
Project costs**	4,090
Project benefits	4,731
Net present value	641
Benefit cost ratio	1.16
Internal rate of return	8 per cent

Note:

** Based on 7 per cent discount rate*

*** Cost estimates have been adjusted for real increases in labour costs (i.e. income grown of 1.5 per cent per annum)*

Source: Deloitte Access Economics (2014)

Sensitivity testing was undertaken to test the assumptions used in the CBA. In accordance with Infrastructure Australia guidelines, the CBA considered variations in the discount rate, construction and operating costs, and Project benefits.

The results of the sensitivity testing are presented in **Table 14-16**.

Table 14-16 Summary of sensitivity testing

Scenario	NPV ($2014) ($ million)	BCR
Project base case	641	1.16
P50 costs	870	1.23
Discount rate 4 per cent	4,114	1.83
Discount rate 10 per cent	(844)	0.76
Capital costs +20 per cent	(65)	0.99
Capital costs -20 per cent	1,346	1.40
Operating costs +20 per cent	528	1.13
Operating costs -20 per cent	753	1.19
Benefits +20 per cent	1,587	1.39
Benefits -20 per cent	(306)	0.93
Capital costs +30 per cent, benefits -20 per cent	(1,364)	0.74
Capital costs -30 per cent, benefits +20 per cent	2,645	1.87

Source: Deloitte Access Economics (2014)

Economic impact assessment

An assessment was undertaken of the broader flow-on impacts from Project investment on the wider economies of South East Queensland and Queensland, using Computable General Equilibrium (CGE) modelling (Deloitte, 2014).

The CGE model allows changes in macroeconomic aggregates, such as gross domestic product (GDP) and employment, to be projected. CGE modelling for the Project was undertaken for the period 2014 to 2031. The CGE modelling estimates that between 2014 and 2031, the Project would increase the output of South East Queensland by $2.2 billion (in net present value terms (2014)) and the Gross State Product for Queensland by $2.094 billion (refer to **Table 14-17**). This is largely driven by increases in the construction, manufacturing and service industries.

The increase in economic activity would have a positive impact on job creation, particularly for South East Queensland. This would result in an average of nearly 580 full-time equivalent (FTE) positions created as a result of the Project between 2014 and 2031. This represents the net amount of employment that would be supported in the South East Queensland region due to the Project, assuming that Queensland is nearing full employment.

Table 14-17 Outcomes of computable general equilibrium modelling

Area	2014-2021 (construction)	2022-2031 (operations)	2014-2031 (total)
Gross Regional Product (NPV, $ million)			
South East Queensland	609	1,611	2,220
Queensland	492	1,602	2,094
Employment deviation (average FTE)			
South East Queensland	425	698	577
Queensland	351	698	544

Source: Deloitte Access Economics (2014)

Wider economic impacts

Changes to the features of an urban economy may result in wider economic impacts, with direct gains attributable to the Project magnified as they pass through the broader economy. These include such things as agglomeration effects, imperfect competition effects and labour market tax benefits.

While wider economic impacts have been estimated for some infrastructure projects in Australia, accurate calculation has largely been limited by the lack of available domestic data and the subsequent reliance on UK inputs to measure agglomeration benefits. As such, a qualitative assessment was undertaken of the Project's potential wider economic benefits, based on a review of national and international projects.

Table 14-18 provides an overview of each of these wider economic impacts as they relate to the Project.

Table 14-18 Summary of wider economic impacts

Item	Relevance to the Project
Agglomeration effects	Transport infrastructure projects bring activities and people closer together, effectively raising the density of economic activity. This provides opportunities for labour markets to operate more efficiently, interactions in the economy to be made easier or less costly, and the overall scale of activity accessible to large economies to increase. The Project would have the effect of reducing worker transport costs to employment centres along the route. This would contribute to increased productivity by increasing the pool of workers from which firms can choose, enabling firms to find workers more suitable to their requirements more efficiently.
Imperfect competition effects	Firms that benefit from transport improvements will experience lower costs, which in turn can be converted to increased turnover. These effects tend to be more important for improvements that deliver significant time and cost savings to travellers in the course of work. The Project would allow only a very small proportion of journey savings to accrue to businesses. As such, the wider economic impacts resulting from these effects are considered insignificant.
Labour market tax benefits	Improving accessibility may increase labour market participation, subject to overall labour market conditions. Increasing labour supply would increase economic output and provide increased taxation on additional income earned (albeit the magnitude of this gain is usually small). The Project would allow costs of accessing jobs to be reduced as well as provide improved accessibility to employment. This may encourage people who are currently not participating in the labour market, such as second income earners or family members with child care responsibilities, to take up employment. This would provide gains to society in the form of increased taxation on additional income earned. While changes in behaviour caused by improving accessibility are likely to be observed by a few individuals only, the societal effect could be significant.

Source: Deloitte Access Economics (2014)

Local business impacts

This section provides an assessment of potential impacts on local businesses from the construction and operation of the Project.

Surface works for the Project would directly impact on one commercial property located on the site of George Street Station, at 63 George Street. This mainly comprises government administration as well

as a retail use (financial and insurance services). These uses would be required to relocate prior to construction. It is expected that alternative accommodation would be available locally for these uses.

A further 65 commercial properties would be impacted by volumetric acquisition. The majority of these are located in the Brisbane CBD, although about seven are located at Woolloongabba south of Stanley Street, two are located at Kangaroo Point and four are located at Spring Hill.

It is expected that the volumetric acquisition would not impact on the operation of these businesses or require these businesses to relocate.

During operation, the Project would improve public transport access for workers and customers to commercial and employment centres, which would benefit businesses in the study corridor. The Project would also support local business development through:

- opportunities for commercial development within the stations, such as small scale retail, cafés or eateries
- stimulating development and revitalisation of those areas around stations, creating opportunities for new businesses
- increasing pedestrian traffic near to stations, providing benefits for those businesses that rely on passing trade, such as cafés, eateries and retail services.

Construction of the Project would have temporary impacts, both beneficial and adverse, on some local businesses closest to construction activities.

The main benefit would result from increased demand for local goods and services. Businesses supplying goods and services to construction are likely to experience benefits from increased construction activity. This would benefit businesses in industry sectors such as manufacturing, construction, extractive resources, trade, transport and financial and business services. Local shops and food outlets near construction works are also likely to benefit from increased business in response to the day-to-day needs of construction workers.

Temporary changes to local roads and increases in construction vehicles accessing construction worksites could potentially disrupt access to some local businesses for workers, customers and service vehicles. This includes:

- temporary loss or disruption to loading zones or on-street parking areas, particularly for businesses near to construction worksites in the Brisbane CBD
- temporary changes or disruptions to off-street parking areas, including near construction worksites at George Street and Roma Street
- increased demand for parking by construction workers near to construction worksites, potentially impacting on the availability of on-street parking for workers and customers of nearby businesses.

Temporary changes would also be required to pedestrian access near to construction worksites. This may impact on customer access to some businesses, particularly near construction worksites at George Street and Roma Street. This would have the greatest effect on those businesses that rely on passing pedestrian trade such as small scale retail uses (newsagents, convenience stores, etc.), cafés, restaurants and takeaway outlets.

Changes to amenity may be experienced by users of some businesses near to construction worksites due to increased noise, dust and construction traffic. The effect of this impact would depend on such things as the nature and type of business, but could affect employee productivity, ability to interact with customers, or changes to general ambience. This would have the greatest impact on businesses that include outdoor areas, such as cafés and restaurants with outdoor dining.

Further discussion about impacts on local businesses near to the Project due to changes in such things as local access, pedestrian access and amenity is provided in **section 14.1.8**.

Employment and training

The Project would impact positively on employment through the creation of direct employment opportunities in the Project's construction and operation and indirect employment in businesses and industries that support construction and operation activities.

During its construction, the Project would generate employment for approximately 1,600 FTE positions, mostly in construction, professional and administration services, technical and trades including plant and machinery, transport and skilled labour. Indirectly, the construction phase would generate about 425 FTE positions in South East Queensland, particularly in the construction, manufacturing and service industries (Deloitte, 2014). This is discussed further in **section 14.5.4**.

It is expected that construction workers would generally be sourced from across Brisbane and South East Queensland, although some specialist technical services or consultants may also be sourced from interstate or internationally as and when required. This would not result in an influx of workers at a scale that would impact on population size, demography or housing in the study corridor.

In 2011, there were about 36,310 people in the Brisbane LGA working in the construction industry, while about 131,300 people were employed in construction in South East Queensland. As such, it is anticipated that there would be sufficient capacity within the region for the Project. In particular, a labour pool of construction workers with experience in tunnelling is likely to be available to resource the Project due to other tunnel projects recently undertaken in Brisbane. This includes Legacy Way, which is due to be completed in 2015. As indicated in **section 14.3.3**, the study corridor had areas of relatively high levels of unemployment. As such, the Project has the potential to impact positively on employment in the study corridor.

During operation, it is estimated that the Project would directly generate employment for about 135 workers. These workers would be required to operate new train and bus services and staff new stations. In addition maintenance workers would also be required to maintain project infrastructure.

Indirectly, the Project is expected to create about 698 FTE positions in South East Queensland during the initial operations phase (i.e. 2022-2031) (Deloitte, 2014).

Strategies for local participation

The Queensland Government has developed a number of policies relating to the procurement, employment and training for major public construction projects, aimed at stimulating the local economy and job growth opportunities. These include the Queensland Government Building and Construction Training Policy (Training Policy) and the Charter for Local Content.

Queensland Government Building and Construction Training Policy

The Training Policy replaces the Queensland Government Building and Construction Contracts Structured Training Policy (10 per cent Training Policy) and the Indigenous Employment Policy for Queensland Government Building and Civil Construction Projects (IEP 20 per cent Policy).

The Training Policy requires a minimum of 10 per cent of the total labour hours on eligible projects to be undertaken by apprentices and/ or trainees and through other workforce training. Eligible projects include civil construction projects with a contract sum of $3 million or greater. As such, the Training Policy would apply to the Project (www.training.qld.gov.au/industry/queensland-government-building-and-construction-training-policy.html#).

Potential training opportunities associated with the Project, would allow groups such as young people and Indigenous people, to gain skills in the construction industry. This would create improved social and economic opportunities for these groups. Consideration would be given to identifying training and employment opportunities for young people and local Indigenous people as part of the construction phase, in consultation with relevant stakeholder groups.

Charter for Local Content

The Charter for Local Content replaces the former Local Industry Policy. The charter aims to provide businesses with opportunities to tender for Queensland Government procurements and has the core objective of maximising local content through greater participation of capable local industry in major government procurement activities.

The charter does not mandate government agencies to use local suppliers, but rather provides a mechanism to enable government agencies to give consideration to a wide range of potential suppliers. Procurement categories captured under the charter include among other things:

- Queensland Government procurements with a total Queensland Government contribution of more than $5 million
- public private partnerships for projects and capital asset acquisitions greater than a capital value of $5 million
- large infrastructure projects where funding of over $20 million is provided by the Commonwealth Government through the Queensland Government (www.dsdip.qld.gov.au/resources/charter-for-local-content.html).

Workforce management

The Project would require on average, a construction workforce of about 850 people across each of the worksites, increasing to about 1,200 people during the peak construction period. In summary it is estimated that an average of about 200 workers would be required for construction at each connection, while an average construction workforce of about 150 workers would be required at each of the stations (refer to **Table 14-19**). Construction workers would generally be sourced from across Brisbane and the South East Queensland region.

Table 14-19 Construction workforce per worksite

Precinct	Workforce (average)	Workforce (peak)	Workforce (peak – single shift)
Southern Connection	200	300	200
Woolloongabba Station	150	200	150
George Street Station	150	200	150
Roma Street Station	150	200	150
Northern Connection	200	300	150
Total	850	1,200	800

Concerns were raised during consultation for the Project about the presence of a large construction workforce in residential areas and near community facilities, and potential impacts of worker behaviour on perceptions of community safety and amenity. A range of worker management measures would be implemented to manage potential impacts. This would include worker education and induction processes about community and Proponent expectations of worker behaviour. A 24 hour community grievance mechanism would also be established, which would assist in identifying any potential impacts or issues about worker behaviour.

14.5.5 Social infrastructure

The Project would improve public transport access to regional level social infrastructure within or near to the study corridor. This includes:

- major medical and health care facilities such as the PA Hospital, Mater Hospital, new Children's Hospital, and the RBWH
- sport and entertainment facilities such as the Gabba Stadium and Suncorp Stadium
- education facilities such as QUT Gardens Point and UQ campuses at PA Hospital, St Lucia and Herston
- major open spaces such as the City Botanic Gardens and Roma Street Parkland
- community service organisations located within the Brisbane CBD and inner Brisbane.

This would have long-term beneficial impacts for local communities in the study corridor as well as communities across South East Queensland.

Some community services and facilities located closest to the Project may experience short-term and temporary impacts from the construction and operation due to such things as direct property impact, or changes to amenity or local access.

Victoria Park is the only social infrastructure that would be directly impacted by permanent surface works for the Project. This would be from the busway connection to the Northern Busway and would impact on land used for playing fields located at Gilchrist Avenue, north of the ICB. This area is currently being temporarily used as workforce parking for the Legacy Way project. This would result in the permanent loss of a small area of the playing fields only and would not impact on the overall use of the playing fields in this area. During the detailed design phase, consideration would be given to the design of the busway connection to minimise the area of playing fields permanently impacted. The area of playing fields not required for permanent infrastructure would be reinstated to the original use or similar alternative use (i.e. open space) following construction.

As indicated in **section 14.5.1**, the Project would also require the volumetric acquisition of about nine properties comprising community uses. This would not impact on the use of these properties.

Construction activities would directly impact on some social infrastructure facilities, including:

- Outlook Park at Boggo Road Urban Village
- Emma Miller Place and Gallipoli Place at Roma Street
- the boardwalk and car park areas at Roma Street Parkland
- Victoria Park, south of the ICB at Spring Hill, including areas of open space and pedestrian and cycle paths.

This would result in the temporary disruption to the use of all or part of these facilities. This impact would be relatively short-term (i.e. up to, but likely to be less than five years) in the context of the life of the Project. Following construction, areas disturbed by construction activities, and not required for Project surface infrastructure, would be rehabilitated and reinstated.

The Project would also temporarily disrupt some public transport facilities during the construction phase, including Dutton Park Station, Platform 10 at Roma Street Station and possibly bus stops at George Street. The provision of alternative bus services at Dutton Park Station and the temporary relocation of facilities at Platform 10 and bus stops at George Street, would minimise potential impacts on bus and rail users. Potential impacts of construction on bus and rail users are discussed further in **Chapter 4 – Transport**.

Without mitigation, indirect impacts on social infrastructure near the Project could result from:

- increased noise, vibration, dust and construction traffic, impacting on the amenity of some community services and facilities
- demand for construction worker parking near to construction worksites.

Temporary changes to local access, including for pedestrians, cyclists and motorists, as well as increased construction traffic may also cause temporary delays and disruptions for users of some community facilities located closest to construction worksites as well as impact on community perceptions about safety.

These impacts would be reduced through the implementation of environmental and traffic management measures at construction worksites as well as early and ongoing consultation with managers of social infrastructure near to construction works. The development of local access strategies near construction works, in consultation with local communities, managers of social infrastructure and relevant stakeholder groups, would also reduce potential impacts on access to community facilities.

The implementation of traffic management measures would assist in avoiding or minimising possible impacts on access for emergency services vehicles, particularly for works near to the PA Hospital, Mater Hospital and RBWH.

Additional strategies to manage potential impacts on local amenity and access are outlined in **Chapter 18 – Draft Outline EMP**.

Further discussion about impacts on amenity is provided in **section 14.5.7**, while information on impacts from construction on specific social infrastructure facilities is provided in **section 14.5.8**.

14.5.6 Access and connectivity

At a regional level, the Project would greatly enhance public transport services and accessibility to facilities, services and employment in Brisbane's inner city. In particular, the Project would provide inner city rail and bus network capacity improvements to accommodate future public transport patronage to and from the Brisbane CBD, allowing increased public transport accessibility to the CBD from new or improved railway stations and from the busway network. This would improve transport accessibility and provide more effective and efficient transport services, benefiting workers, visitors and public transport users to and from the Brisbane CBD and inner city.

The Project would also provide the opportunity for the removal of some bus services from the Captain Cook Bridge and other major roads in the inner city. In addition, enhanced access provided by the Project is expected to result in a shift to public transport for commuters and increase in the proportion of public transport trips. This would have long-term benefits for road users, including both private and commercial vehicles, by reducing congestion on the road network and improving travel times.

At a local level, the Project would improve access and connectivity, through:

- provision of new integrated bus and train stations at Woolloongabba, George Street and Roma Street
- increased train services at Dutton Park Station, providing greater public transport access for residents and workers
- improved pedestrian connections, including at Dutton Park and between stations and surrounding areas, such as between Roma Street Station and Spring Hill

- connections to the existing busway network at Woolloongabba and Dutton Park, improving bus access for residents, workers and users or community facilities such as the PA Hospital
- connection to the existing busway network at Herston, improving bus access between the Brisbane CBD and the inner northern suburbs, including the RBWH.

New Project stations would be designed to comply with the DDA, ensuring that these are accessible to people with mobility difficulties. Dutton Park Station would also be upgraded as part of the Project to include lifts, improving disability access to this station.

During construction, short-term impacts on local access and connectivity may be experienced by motorists, public transport users, pedestrians and cyclists due to:

- temporary closure of some traffic lanes near to construction worksites and changes to speed limits, particularly at Dutton Park, George Street, and Roma Street, resulting in possible delays and disruptions for motorists and other road users, including buses
- increased construction traffic on local roads, including heavy vehicles used for spoil haulage and delivery of materials and equipment, and construction worker vehicles, resulting in possible delays and impacts on road safety for motorists, pedestrians and cyclists
- temporary changes to rail and bus services such as possible relocation of bus stops, short-term closure of some stations and temporary track possessions, resulting in possible delays and disruptions for public transport users and rail freight services
- changes to pedestrian and cycle paths near to construction works, including temporary closure or realignment of some pathways, particularly near works at George Street, Roma Street and Spring Hill, resulting in possible disruptions or impacts on safety for users.

The implementation of traffic management measures during construction would assist in managing potential impacts on local access and connectivity. This would include such things as limiting spoil haulage during peak periods, use of traffic controllers where possible interaction between construction traffic and pedestrians occur (e.g. at construction worksite access points), and where possible, planning works involving possession of rail lines around existing rail maintenance and closure programs to minimise impacts on rail users. Where public transport services are disrupted, alternative services may be provided to minimise impacts on local residents and commuters.

Early and ongoing consultation and communication with local residents, motorists, public transport users and other relevant stakeholders about potential changes or disruptions to local roads, public transport services and pedestrian and cycle networks would be important in managing potential impacts. As indicated in **section 14.3.2**, the study corridor has high proportions of people who speak a language other than English or with lower levels of English proficiency. Communications about changes should consider the needs of these groups.

If not managed, increased demand for worker parking in local streets near to construction worksites, also has the potential to impact on the availability of on-street parking for local residents and workers. This was raised by community members during consultation for the Project, particularly at Dutton Park given the existing issues experienced in this area due to its proximity to major uses such as the PA Hospital and UQ at Woolloongabba and St Lucia. Workforce parking would be provided at the construction worksites outside of the CBD, which would assist in managing impacts of worker parking on local areas.

Pedestrian and cycle access would be maintained near to construction works, including to community services and facilities, although temporary changes may be required to some pedestrian and cycle accesses. Application of CPTED principles and consideration of the particular needs of children, elderly people and people with mobility disabilities would be important in the design of these temporary accesses.

The development of local access strategies, in consultation with local communities, managers of community facilities and relevant stakeholder groups, would also be important to reduce potential impacts on pedestrian and cycle access.

Further discussion about potential impacts of changes to local access and connectivity at Dutton Park, Woolloongabba, George Street, Roma Street and Spring Hill is provided in **section 14.5.8**.

More detailed information about impacts on access and connectivity from the construction and operation of the Project is also provided in **Chapter 4 – Traffic and transport**.

14.5.7 Community values

This section assesses potential impacts on community values in the study corridor, including those relating to amenity and character, community cohesion and community health and safety.

Local amenity and character

Local amenity refers to the suitability or desirability of an area for a particular purpose. It is influenced by factors such as changes to noise, air quality, visual amenity, traffic and local access.

Operational impacts

During operation, the Project would have beneficial impacts on the local amenity of those areas near to the new stations through enhanced public transport access and improvements to the urban environments and streetscapes.

Localised impacts on amenity may occur for those areas closest to new stations and the southern and northern connections.

Surface infrastructure for the Project would be located at the southern and northern connections and each of the station locations. Communities near to the surface infrastructure may experience changes to visual amenity.

At the Northern Connection, the elevated busway structure above the railway corridor and across the ICB would have long-term, adverse impacts on existing views and visual amenity from some surrounding locations. The location of the feeder station and ventilation outlet within the railway corridor adjacent to the Park may also impact on visual amenity, although this impact is likely to diminish over time as landscaping implemented during the rehabilitation phase matures. As indicated in **section 14.5.7**, Victoria Park is highly valued by residents in Spring Hill and Brisbane's inner northern suburbs for its landscape, aesthetic, recreational and heritage values. Changes to the landscape and visual amenity of the Park would be a concern for some community members, particularly in the context of cumulative impacts with other recent infrastructure projects such as the ICB, Inner Northern Busway and Legacy Way project. At the Southern Connection, surface infrastructure such as the bus layover, feeder station and ventilation outlet may also change existing views and visual amenity from some locations. Careful design of surface infrastructure and implementation of landscaping (i.e. screening trees) would assist in managing potential impacts on visual amenity in these locations. Further discussion about the Project's impacts on visual amenity is in **Chapter 13 – Landscape and visual amenity**.

During consultation for the Project, issues were raised by residents in Dutton Park about existing impacts on parking and amenity in residential streets due to parking demand associated with the PA Hospital, UQ and the Ecosciences Precinct. This area is currently covered by a parking control area, which would assist in managing potential effects of increased demand for commuter parking on this area. Where required, the implementation of local traffic management measures within local

streets near other stations would also assist in mitigating potential impacts on local parking. Further discussion about impacts of the Project on access is provided in **Chapter 4 – Traffic and transport**.

Construction impacts

During construction, impacts on amenity may occur for communities close to construction worksites due to increased noise, dust and traffic from construction activities and changes in visual amenity from the presence of construction infrastructure and removal of established vegetation.

Noise from construction activities may impact on amenity for residents, occupants of commercial properties and users or commercial facilities and open space area near the Project. This would include impacts from night-time construction works, such as works within the rail corridor or spoil haulage. These works would be required to be undertaken at night or on weekends to minimise disruption on rail and busway services and local and regional road networks. Careful mitigation would be required to ensure noise and lighting from these works minimise potential impacts on night-time amenity or sleep disturbance for residents closest to construction activities, particularly at Dutton Park, George Street Station and Roma Street Station. This would include consultation and communication with potentially affected residents. Impacts on amenity at specific locations is discussed in **section 14.1.8**.

Without mitigation, dust from construction activities may also impact on local amenity at properties near to construction worksites and spoil haulage routes. This would include increased dust from activities associated with excavation of the transition structures, cut and cover tunnel and TBM launch and retrieval shafts at the southern and northern connections, excavation of the station shafts, and the loading, handling and removal of spoil.

Changes to amenity during construction from construction noise, vibration, dust, traffic and changes to visual values, may temporarily impact on the potential use and enjoyment of some residential properties closest to construction worksites, particularly of outdoor areas such as balconies. These impacts would be managed through the implementation of environmental management measures at construction worksites. This would include the use of ventilated, acoustic sheds at Dutton Park, Woolloongabba Station, George Street Station and Roma Street Station for the loading, handing and removal of spoil from tunnel and station excavation. Further discussion about construction air quality impacts is provided in **Chapter 10 – Air quality**.

Short-term impacts on amenity may be experienced at some properties above the tunnel alignment due to regenerated noise and vibration from tunnel construction. Some occupants of residential properties above the tunnel alignment may experience perceptible levels of noise and vibration as the TBM passes. Occupants on the lower levels of some hotels near to the tunnel alignment may also experience perceptible levels of noise and vibration at night. These impacts would be for a relatively short period (i.e. 5-7 days) as the TBM passes. In particular, impacts on night-time amenity may occur where noise and vibration from driven tunnelling approach or exceed sleep disturbance levels. Further discussion about potential impacts of noise and vibration for residential uses near the Project is in **Chapter 11 – Noise and vibration**.

Ongoing consultation and communication with communities near to construction works and above the tunnel alignment would be undertaken during construction, which would help to maximise the success of the mitigation measures. This would be particularly important for residents of properties where works are proposed to be undertaken during night-time hours.

As indicated in **section 14.3.2**, the study corridor has a high proportion of rental households and communities that are relatively mobile, with high proportions of residents who do not live at the same address for more than 12 months. This would need to be considered in consultation and communication about construction works.

A community complaints mechanism, including a 24 hour, seven days a week community information line, would also be established and implemented during the construction phase. This would include procedures for receiving, registering and responding to community complaints about construction activities. Further information on ongoing consultation and communication during construction is detailed in **Chapter 18 – Draft Outline EMP**.

The removal of established vegetation with the construction worksites and the presence of construction infrastructure, may change visual amenity for users of properties near to construction works. In particular, mature trees and vegetation within Victoria Park would be required to be cleared to allow construction of the Northern Connection. Where possible, layout of construction worksites would be designed to minimise potential clearing of vegetation. Following construction, land within Victoria Park disturbed by construction activities, would be rehabilitated and reinstated in accordance with a master planning process to be undertaken by Brisbane City Council in consultation with the Turrbal People and local residents. This would provide the opportunity to provide beneficial impacts on local amenity, by enhancing the functionality of the Park and landscape and recreational amenity. Further discussion about potential impacts on Victoria Park is provided in **section 14.1.8**, while discussion on the Project's cultural heritage, landscape and visual impacts is provided in **Chapter 12 – Cultural heritage** and **Chapter 13 – Landscape and visual amenity**.

Further information about impacts on amenity due to changes in local access and connectivity is described in **section 14.5.6**, while impacts on amenity at specific locations near construction works is discussed in **section 14.1.8**.

Community cohesion

During operation, the Project would have beneficial impacts on public transport travel for work, business and leisure, by reducing travel times and improving travel reliability. Improved public transport access to services, facilities and employment in Brisbane's inner city would help to facilitate social interaction and economic transactions across the wider region, providing benefits for community cohesion. Reduced travel times and improved connectivity between public transport services and modes of travel would also make some trips more attractive, facilitating community interaction.

Improved access to social infrastructure, services and employment would have a positive impact on community well-being by providing improved access to economic and social opportunities.

Community health and safety

New Project stations would be designed to comply with the DDA, ensuring that the stations are accessible to people with mobility difficulties and vision impairment. The upgrade of Dutton Park Station as part of the Project would improve disability access to the station. As indicated in **section 14.3.5**, Dutton Park Station is the preferred station for people in this area with vision impairment. Improved station access would improve public transport access, safety and travel opportunities for people with mobility difficulties and may encourage some people, who may otherwise avoid making trips, to access public transport. This is likely to have beneficial impacts on the health and well-being for this group.

During consultation for the Project, concerns were raised by some residents near to the stations about potential impact on safety and security. In particular, comments related to the potential for stations to encourage loitering and vandalism. Safe and functional access for passengers would be delivered through features such as closed circuit television (CCTV) monitoring of platforms and stations. Security measures implemented at stations would assist in alleviating concerns about possible security issues for adjoining areas.

Increased activity and changes to urban environments around stations is also likely to impact positively on people's perceptions around personal safety and property security. The design of stations and public spaces has considered CPTED principles to ensure safety for passengers. CPTED principles take into account the relationship between the physical environment and the users of that environment, promoting maximum useability and safety. The activation of streets and public spaces around Project stations would assist in improving community safety.

Community concerns were also raised during consultation for the Project about the location of ventilation outlets and potential health effects, particularly by residents near Roma Street Station. The ventilation outlets for the Project are required for emergency use, the removal of excess heat from the tunnels and the ventilation of bus emissions. Emissions from the day-to-day operation of the ventilation outlet are predicted to below the health based air quality objectives and would not impact on the health of local communities. Further information on the Project's air quality impacts is provided in **Chapter 10 – Air quality**.

If not managed, noise, dust and vibration from construction activities may impact on community health for residents or occupants of properties closest to construction activities. This was identified as a concern for local residents during community consultation for the Project. This potential impact is most likely to occur where night-works result in sleep disturbance over extended periods, or where construction activities create extended periods of high noise and dust levels. The implementation of environmental management measures, in conjunction with ongoing consultation and communication with local residents would assist in managing potential impacts on community health. Minimising the number of consecutive nights that night-time surface construction activities are required would also assist in managing any potential impacts on community health.

Increased construction traffic may also impact on community perceptions of road safety near to construction worksites. Pedestrian and cycle access would be maintained near construction works, including to community facilities, such as schools, open spaces, sport and recreation, public transport and shopping facilities. Temporary changes would be required to some pedestrian and cycle paths to accommodate construction of Project infrastructure. In particular, this would include changes to pedestrian and cycle access near to construction worksites at George Street, Roma Street Parkland and Victoria Park. These changes would be required to ensure safety of pedestrians and cyclists.

Changes to public places near construction worksites may also impact on people's perceptions of safety by reducing sight lines, opportunities for casual surveillance and levels of activity in public spaces. This impact would be managed through the application of CPTED principles. The needs of children, elderly people and people with mobility disabilities would also be considered in the design of temporary pedestrian and cycle access. This would be particularly important near community facilities such as the PA Hospital, Dutton Park State School, Roma Street Parkland and Victoria Park. Where possible interaction between construction traffic and pedestrians occur (e.g. near construction worksite access points), traffic controllers would be used to ensure safety for pedestrians and cyclists. Temporary changes to pedestrian and cycle access would need to be clearly communicated and marked to ensure safety for pedestrians and cyclists.

Uncertainty about local changes may also cause stress and anxiety for some property owners, potentially impacting on community health. In particular, concerns were raised by some community members during consultation for the Project about potential impacts on amenity causing prospective buyers to reconsider buying properties near to the Project, and the lack of compensation available to property owners who would experience disruption due to their proximity to construction works.

On balance, it is unlikely that such anxiety would affect community health given that the Project would not require any surface acquisitions of private property and that there are a range of social support services in the study corridor that can provide assistance to the community as needed. Communities in the study corridor also displayed low levels of relative disadvantage and above average proportions

of high income earners compared with Queensland. This suggests that communities would generally have a high level of resilience and are more likely to have the resources to respond to or cope with impacts or changes from the Project.

Ongoing consultation and timely communication with affected property owners and communities about the Project's property requirements and construction activities, including timing, likely impacts and mitigation measures, would help reduce uncertainty about the Project and minimise the potential for stress and anxiety amongst local communities.

14.5.8 Local area impacts

This section provides an overview of potential socio-economic impacts in areas closest to the surface works, including southern and northern portal connections and stations.

Dutton Park

Works at Dutton Park would include connections to the existing bus and rail networks, upgrade of Dutton Park Station including a new platform face to the west and lifts. Associated infrastructure such as a ventilation outlet and feeder station would also be established along with a bus layover area.

During construction, a construction worksite would be located within the existing railway corridor and on land at Kent Street, adjacent to the PA Hospital. A construction worksite would also be established on Lot 2 within Boggo Road Urban Village, while site offices would be established at Park Road. The TBM would launch from the worksite at Lot 2 within Boggo Road Urban Village. A spoil handling facility would be established on the eastern side of the railway corridor, with spoil to be transported to Ipswich Road, via O'Keefe Street. Boggo Road and Peter Doherty Street would be used to transport spoil from the excavation of the TBM launch site.

Construction works at Dutton Park are expected to require an average of about 200 workers, increasing to about 300 workers during the peak construction period.

Operation

The Project would have beneficial impacts on public transport access for communities at Dutton Park, Fairfield and Annerley, due to:

- improved train services, including more frequent services and shorter travel times to destinations in the Brisbane CBD
- enhanced bus access due to connectivity to the Project from the PA Hospital and Boggo Road busway stations
- upgrade of the pedestrian access at Annerley Road.

This would allow improved access and connectivity for local residents to facilities, services and employment in the inner city and would also provide improved access for workers and patients of the PA Hospital, workers at the Ecosciences Precinct and students to tertiary education facilities within the PA Hospital campus.

Dutton Park Station would be upgraded to improve disability access, which would improve accessibility for all rail users, but particularly people with mobility difficulties. In particular, consultation for the Project identified Dutton Park as an important station for people from the local area with vision impairment. The upgrade of the station would enhance safety and public transport access for this group.

The Project would also have a positive impact on local amenity of areas near to the station, including the residential area west of the railway corridor. Operational impacts may be experienced for some residents and users of community facilities near to the station and surface connections due to increased noise from the station and rail operations and potential increased traffic and parking in local streets.

Consultation for the Project identified existing issues around parking in local streets due to the area's proximity to major institutional and employment uses such as the PA Hospital, UQ PACE and Ecosciences Precinct. Dutton Park is currently covered by a parking control area, which includes restrictions on parking during weekdays. These controls would be maintained.

Further discussion about impacts of the Project on local access and connectivity is provided in **Chapter 4 – Traffic and transport**, while impacts on operational noise are described in **Chapter 11 – Noise and vibration**.

Construction

Local business impacts

Increased demand by the construction workforce for goods and services is expected to benefit some businesses in this area. In Dutton Park, these include shops and food outlets such cafés at the Ecosciences Precinct and UQ PACE, and eateries and convenience stores at Annerley Road and Ipswich Road.

Without mitigation, adverse impacts on some local business in this area may result from increased noise, dust and traffic from construction activities. If not managed, this may cause temporary impacts such as:

- disruption to employee productivity for workers in professional offices and education and training uses located at Railway Terrace and Annerley Road, west of the railway corridor
- impacts on amenity for customers and the use of outdoor dining areas at cafés within the Ecosciences Precinct and UQ PACE.

These impacts would be managed through the implementation of environmental management measures.

As indicated in **section 14.3.3**, weekly fresh produce and craft markets are also held at the Boggo Road Urban Village on Sunday mornings. Surface works would not occur on Sunday, except in exceptional circumstances. As such, construction activities are not expected to impact on the markets.

Parking for construction workers would be provided within the worksite at Dutton Park. This would be sufficient to accommodate the expected peak workforce in this area, which would assist in avoiding impacts on local businesses associated with on-street parking by workers. This is further discussed in **Chapter 4 – Traffic and transport**.

Social infrastructure

Construction of the TBM launch site would directly impact on Outlook Park, located within Boggo Road Urban Village. This park is mainly used by workers of the Ecosciences Precinct and residents of surrounding areas. This would result in the temporary loss of this park during the construction phase, including the playground and picnic facilities. The park would be reinstated following construction works in this area.

Indirectly, potential impacts on social infrastructure from construction activities in this location would generally relate to noise and dust from surface works, regeneration noise and vibration from excavation and tunnelling works, and spoil haulage.

During construction, residents of the ESA Village at Boggo Road Urban Village may experience short-term noise and vibration impacts from construction of the transition structure. Without management, these works are predicted to result in exceedances of the night-time noise and vibration goals, potentially causing sleep disturbance for some residents. Dust from excavation activities may also impact on residents of the ESA Village. As indicated in **section 14.3.4**, the ESA Village provides short-term accommodation for Leukaemia patients receiving treatment at nearby hospitals. As such, these residents are likely to be more sensitive to impacts of noise, dust and vibration, particularly where these impact on sleep disturbance. Ongoing consultation with the Leukaemia Foundation about potential works in this area would be important in managing impacts on this facility.

Further information on noise and vibration impacts, including possible management measures, is provided in **Chapter 11 – Noise and vibration**, while dust impacts and management measures are described in **Chapter 10 – Air quality**.

Potential impacts on Dutton Park State School would generally relate to the use of Boggo Road for haulage vehicles at Boggo Road Urban Village. Access to the construction site would be via Peter Doherty Street, while egress would be via Boggo Road. About 60 trucks per day would be required for the removal of spoil during the three month peak spoil haulage period, while a further 12 trucks per day would be required during peak construction for delivery of materials and equipment. As indicated in **section 14.3.4**, the main drop-off and pick-up area for students is at Boggo Road. An increase in construction traffic particularly heavy vehicles, may impact on community perceptions about safety for children. The implementation of traffic management measures, including limiting heavy vehicle access on Boggo Road during school drop-off and pick-up times, would assist in managing potential safety impacts. Concerns were also raised during consultation for the Project about potential impacts on safety for students using the pedestrian overbridge at Merton Road, from construction traffic accessing the worksite at Park Road. Construction traffic accessing this site would generally involve light commercial or worker vehicles and is not expected to cause any safety issues additional to those from general road use.

Ongoing consultation and communication with the school community, including students, about haulage activities and potential safety risks would also assist in managing potential impacts. The implementation of education and awareness programs for workers and transport operators about potential road safety impacts would also help to ensure safety for students. Further information on construction traffic is provided in **Chapter 4 – Traffic and transport**.

Comments were raised during consultation for the Project about the presence of a large construction workforce in proximity to the school and potential impacts of worker behaviour. Worker induction processes would be implemented during construction, which would include information about community and Proponent expectations around worker behaviour. This would assist in effectively managing concerns of the school community. Ongoing consultation and communication with the school would also be important to ensure potential impacts and issues are identified early and appropriately addressed.

The use of O'Keefe Street to access the construction worksite west of the railway corridor, has the potential to impact on users of the PA Early Education Centre located at O'Keefe Street, within the PA Hospital. In particular, O'Keefe Street would be used by spoil haulage vehicles to remove spoil from TBM construction. Increased traffic noise and volumes of heavy vehicles impact on amenity and perceptions of safety, particularly for children. This is expected to involve more than 96 trucks per day

(over 24 hours) for a period of about 18 months. Additional trucks would also be required for the delivery of materials and equipment. The implementation of measures such as covering of loads and traffic management would assist in managing potential impacts for users of the childcare centre. Further information on construction traffic is provided in **Chapter 4 – Traffic and transport**.

Potential impacts on the PA Hospital, including the PACE and TRI, would generally relate to noise and dust associated with the construction of the Kent Street bus layover and transition structures as well as loading, handing and removal of spoil from the TBM construction. These impacts would be managed through the implementation of mitigation measures. The upgrade of Dutton Park Station would also have temporary disruptions on public transport, pedestrian and cycle access to these facilities for workers, students, patients and visitors. Alternative access would be provided, where required, minimising potential impacts of these disruptions.

Ongoing consultation with managers of these facilities would be undertaken during construction. This would include information about construction activities, including timing, duration and potential impacts. Consultation would also be undertaken to identify any specific mitigation measures, where required.

Residential amenity

During construction, temporary changes to residential amenity may be experienced at some properties closest to construction works. In particular, residential properties at Railway Terrace may experience:

- noise impacts from daytime works associated with site clearing and piling
- noise impacts associated with the night-time works and transport of spoil for the TBM construction
- ground-borne noise impacts from daytime and night-time roadheader works.

The implementation of mitigation measures would assist in managing potential noise impacts for local residents. This would be particularly important where night-time construction activities are predicted to exceed sleep disturbance levels. Further information on noise and vibration impacts is provided in **Chapter 11 – Noise and vibration**.

The construction worksite at Dutton Park east of the railway corridor, would be used for the loading, handling and removal of spoil from TBM tunnelling. Without management, dust from spoil removal as well as surface excavations has to potential to impact on local amenity at properties near to the construction worksite. Measures would be implemented to manage potential dust impacts of spoil removal and excavation. This includes the loading and handling of spoil within a ventilated acoustic shed located east of the railway corridor, covering of loads prior to transport and use of dust suppression measures.

Construction works in the railway corridor would be required in this area to connect to the existing rail network. These works would need to be undertaken at night-time and on weekends to minimise disruption to existing passenger and freight rail services. Light spill from these works may impact on the night-time amenity at some residential properties located closest to the works. However, the effects of this are not expected to be significant given the influence of the PA Hospital on the existing night-time environment in this area.

As indicated in **section 14.5.7**, the implementation of environmental management measures would also assist in mitigating potential impacts on local amenity.

Access and connectivity

During construction, spoil from the excavation of the TBM launch site in Boggo Road Urban Village would be hauled to Ipswich Road via Boggo Road, Annerley Road and Cornwall Street. Peter Doherty Street would also be used to access the construction works at this site. O'Keefe Street would be used to access the construction worksite west of the railway corridor, including spoil haulage of spoil from TBM construction. Without management, an increase in heavy vehicles on these roads may impact on access, particularly through possible changes in road safety.

Minor delays at intersections to Ipswich Road and Annerley Road may also be experienced, particularly during peak times. Traffic management measures would be implemented to manage potential traffic impacts.

Disruptions to train services would be experienced by users of Dutton Park Station, for works requiring the temporary closure of the station such as the upgrade of the station, and construction of the transition structures and connections to the existing rail network. Public transport access for users of the station would be maintained through the provision of a rail-bus service during the closure periods. As indicated in **section 14.3.5**, Dutton Park is an important station for people with vision impairment. Temporary changes to services at Dutton Park would need to consider any specific needs of this group and should be undertaken in consultation with relevant stakeholder groups.

Temporary disruptions may be experienced by some bus routes during construction. This includes services using the Eastern Busway, during construction of the connection from the Project to the existing busway network. These services would be maintained, although temporary changes may be required to the routes, causing possible short delays for some commuters. Disruptions due to the Project are not expected to services on roads such as Ipswich Road or Annerley Road.

Pedestrian and cycle access would be maintained near to construction works in this area. This includes access to uses within the Boggo Road Urban Village, the PA Hospital and education uses. Temporary detours may be required in some locations to allow for construction works and to maintain safety. In particular, temporary changes would be required to the PA Hospital cycleway at O'Keefe Street and Kent Street, to avoid construction works and haulage activities in these locations. This may cause disruptions for pedestrians and cyclists and users of these facilities. Changes to pedestrian and cycle networks in this area would need to consider the needs of children, elderly and people with mobility difficulties, particularly given the proximity to the hospital. Temporary pedestrian and cycle networks should also consider any specific needs of shift workers at the PA Hospital, particularly in relation to safety at night.

The development of local access strategies, in consultation with local communities, local stakeholders such as the PA Hospital, Ecosciences Precinct, Dutton Park Police Station and Dutton Park State School and relevant stakeholder groups, would be important in reducing potential impacts on pedestrian and cycle access. Communication with local residents, workers and commuters about temporary changes to public transport services and pedestrian and cycle access would also assist in managing the effects of these changes.

Further information on potential impacts for local access and connectivity is provided in **Chapter 4 – Traffic and transport**.

Woolloongabba

Works at Woolloongabba would involve construction of a new underground station at the site of the former Government printer GoPrint. Construction works at this site are expected to require an average of about 150 workers, increasing to about 200 workers during the peak construction period.

Operation

The Project would provide improved public transport access for communities in Woolloongabba and Kangaroo Point to the Brisbane CBD as well as to services, facilities and employment areas adjacent to the existing rail network. The Project would also improve bus and train access for communities across South East Queensland to major facilities such as the Gabba Stadium, Mater Hospital and new Children's Hospital.

The establishment of the station would support future development planned for Woolloongabba, particularly within the Woolloongabba Priority Development Area, as well as support local business development and ongoing revitalisation commercial and entertainment areas, such as at Stanley Street and Logan Road.

Construction

Local business impacts

Increased demand for goods and services by construction workers may have benefits for some businesses such as shops and food outlets, particularly at Stanley Street and Main Street closest to the construction works.

Without mitigation, noise, dust and traffic from construction activities may have temporary impacts on some local businesses nearest to the works, including:

- temporary changes in amenity for occupants of professional offices and accommodation uses at Stanley Street
- possible changes in amenity for customers and the use of outdoor dining areas of cafés and eateries at Stanley Street, due to increases in noise, dust and construction traffic
- temporary impacts on accommodation uses at Vulture Street and Allen Street, resulting from the use of these roads for the haulage of spoil, materials and equipment.

Temporary disturbances may also be experienced by occupants of some hotel accommodation uses at Woolloongabba above the tunnel alignment due to vibration and regenerated noise from tunnelling activities. However, this impact is likely to be short-term as the TBM passes (i.e. 5-7 days).

The Land Centre is located adjacent to the construction worksite. The Land Centre comprises government offices and provides public access to government services relating to property and land. Potential impacts for workers and visitors to the Land Centre include:

- temporary changes to amenity due to increased noise, dust and construction traffic, potentially impacting on worker productivity
- potential impacts on safety for workers and visitors accessing the Land Centre, particularly pedestrians and cyclists, due to an increase in construction traffic and haulage vehicles.

A number of car dealerships are located at Ipswich Road, south of Stanley Street. It is not expected that these businesses would experience impacts from the Project.

Environmental and traffic management measures would be implemented at the construction worksite, which would assist in managing potential amenity and road safety impacts for nearby businesses. Ongoing consultation and communication with business owners and business representatives such as the Gabba. Traders would also be important in managing potential impacts on local businesses in this area.

Social infrastructure

During construction, potential impacts on social infrastructure at Woolloongabba may result from:

- noise from daytime surface construction works, temporarily impacting amenity for users of the St Nicholas Russian Orthodox Cathedral
- noise and dust from construction activities impacting on amenity for workers and patients of the South Brisbane Dental Hospital
- potential safety impacts for workers and patients of the South Brisbane Dental Hospital, particularly pedestrians and cyclists, due to increase in construction traffic.

Construction activities are not expected to impact on the Gabba Stadium. Construction planning would need to ensure that construction activities involving disruptions to local access (i.e. transport of large equipment or machinery) do not occur during major events at the Gabba Stadium.

Regular consultation and communication would be undertaken with managers of these facilities during construction, to ensure impacts and appropriate mitigation strategies are identified. This would assist in managing potential impacts on users of these facilities.

Further information on noise and vibration is in **Chapter 11 – Noise and vibration**, dust impacts are discussed in **Chapter 10 – Air quality**, while impacts on construction traffic are discussed in **Chapter 4 – Traffic and transport**.

Residential amenity

Without mitigation, potential impacts on residential amenity may be experienced during construction by some residents nearest to the Project due to increased noise, dust and construction traffic. In particular, some residential uses at Vulture Street may experience noise impacts from daytime works associated with site establishment and initial shaft excavation works. Impacts on night-time amenity may also be experienced from night-time spoil removal, which may impact on sleeping patterns for some residents.

Temporary disturbances may also be experienced for some users of visitor accommodation above the tunnel alignment due to vibration and regenerated noise from tunnelling activities. This impact is likely to be short-term (i.e. 5-7 days) as the TBM passes. Further information on noise and vibration impacts and the management of potential impacts is in **Chapter 11 – Noise and vibration**.

Access and connectivity

Construction access to the construction worksite at Woolloongabba would be from Main Street and Leopard Street. Ipswich Road, Stanley Street, Allen Street, and Vulture Street would also be used for the haulage of materials, equipment and spoil. This is not expected to impact significantly on local access and connectivity for motorists.

Impacts on pedestrian and cycle access are likely to be minimal, given the location of the construction worksite. Although temporary changes may be required to pedestrian and cycle access to the Land Centre and South Brisbane Dental Hospital, to ensure safety for workers and visitors to these facilities.

Construction activities are not expected to impact on access to the Woolloongabba Busway Station.

Parking for construction workers would be provided within the construction worksite for Woolloongabba Station. This would accommodate most workers at this site, although there may be some demand for on-street parking in this area. The Woolloongabba area is located within an existing parking control area, which would assist in managing impacts on residents, workers and visitors.

Further information on construction traffic impacts is provided in **Chapter 4 – Traffic and transport**. This includes traffic management measures to manage potential impacts on motorists, pedestrians, cyclists and public transport users in this area.

George Street

Works at George Street would involve construction of a new underground station at 63 George Street, on the corner of George Street and Mary Street. Construction works at this site are expected to require an average of about 150 workers, increasing to about 200 workers during the peak construction period.

Operation

The George Street Station would provide improved public transport access for communities across South East Queensland to employment, commercial uses and major facilities such as QUT Gardens Point and the southern part of the Brisbane CBD. The station would also connect visitors and residents to community uses such as the City Botanic Gardens.

The Project would also have a positive impact on local business development through opportunities for commercial development within the station, such as small scale retail, cafés and eateries, and increased pedestrian traffic, providing benefits for those businesses that rely on passing trade. This includes small scale retail uses, cafés and convenience uses at George Street and Mary Street.

The George Street Station would support future development of commercial, residential and leisure uses at Queen's Wharf Brisbane.

As indicated in **section 14.5.4**, the Project would directly impact on one commercial property located on the site of George Street Station, comprising government administration and a retail use (financial and insurance services).

Community concerns were raised during consultation for the Project about the location of ventilation outlets and potential impacts for nearby communities. The ventilation outlet at the George Street Station is required for emergency use, the removal of excess heat from the tunnel and the ventilation of bus emissions. It is likely that the ventilation outlet would be integrated within a building development above the George Street Station. Emissions from the day-to-day operation of the ventilation outlet are predicted to be below the health based air quality goals and would not impact on health of local communities. Impacts of the ventilation outlet on visual amenity are described in **Chapter 13 – Landscape and visual amenity**.

Construction

Local business impacts

The presence of the construction workforce may have benefits for businesses in this area, through increased business activity in response to the day-to-day needs of construction workers. This would particularly benefit businesses such as cafés, takeaway and convenience stores closest to the Project such as at George Street, Mary Street and Margaret Street.

Without mitigation, local business may experience some temporary impacts on amenity due to effects of increased noise, dust, vibration and increased construction traffic, impacting on:

- the use of outdoor dining areas for cafés and restaurants fronting George Street and Mary Street
- offices and commercial uses, nearest to the construction worksite, including:
    - Capital Hill Building at the corner of George Street and Mary Street

  - Minerals House at the corner of Margaret Street and George Street
  - office uses within The Mansions and Harris Terraces at George Street
- occupants of tourist and visitor accommodation at George Street, Mary Street and Margaret Street, due to temporary disturbances from vibration and noise from tunnelling activities and noise from surface construction works.

Changes to local road access, including the temporary closure of traffic lanes on George Street and Mary Street, and increased construction traffic may also impact on vehicle access to some business in this area. This includes:

- changes in access to off-street parking areas for offices at Mary Street due to restrictions on access into Mary Street from George Street
- disruption to service vehicle access for commercial, retail and café businesses at George Street due to the temporary loss of loading zones and on-street parking areas at George Street.

Alternate loading zones would be provided at Charlotte Street, Mary Street and Margaret Street, which would assist in minimising potential impacts from the loss of loading zones on George Street.

Access to off-street parking to the Rendezvous Studio Hotel would be maintained during construction, although use of the eastbound traffic lane on George Street for construction vehicle access may make access to this off-street car park more difficult. Traffic control measures would be implemented at this location to minimise potential impacts on this access.

Access to the Queensland Club car park from George Street would be maintained.

Changes to pedestrian access would be required near to the construction works. In particular, pedestrians would need to cross to the southern side of George Street between Mary Street and Margaret Street. This may impact on passing trade for some businesses at George Street, particularly if pedestrians choose to cross George Street earlier (i.e. at Charlotte Street or Alice Street) to avoid construction activities at George Street and Mary Street. This is likely to have the greatest effect on businesses such as cafés, eateries and convenience stores.

Environmental and traffic management measures would be implemented at the construction worksite, which would assist in managing potential amenity and traffic impacts for nearby businesses. Ongoing consultation and communication with business owners would also be important in managing potential impacts on local businesses in this area.

Social infrastructure

Construction activities are not expected to impact on social infrastructure near George Street. While George Street is a primary pedestrian access to QUT Gardens Point and the City Botanic Gardens, changes to pedestrian access near the construction works can be managed to achieve an acceptable outcome in terms of safety and function.

Residential amenity

During construction, some occupants of residential apartments and tourist accommodation uses near to the George Street worksite may experience changes to residential amenity due to noise and dust from surface works and spoil haulage and regenerated noise and vibration from excavation for the station construction and TBM passby. Increased construction traffic on George Street may also impact on residential amenity for some residents.

In particular, residential apartments at Mary Street, next to the construction worksite for George Street Station are predicted to experience noise impacts from daytime works associated with site establishment and initial shaft excavation works. Airborne noise impacts on these apartments are predicted to reduce once an acoustic shed has been established over the station shaft. These apartments are also expected to experience impacts from regenerated noise and vibration associated with excavation of the station shaft, particularly rock breaking activities. Some occupants of residential properties at George Street nearest to the Project may also experience adverse changes to residential amenity due to regenerated noise from night-time works associated with surface excavation of the station shaft as well as works associated with excavation of the station cavern.

Potential disturbance to sleeping patterns may be experienced by some residents in these apartments, particularly where there are exceedances to night-time noise and vibration goals. Further information on these impacts and the management of potential impacts is described in **Chapter 11 – Noise and vibration**.

Access and connectivity

During construction, impacts on local access and connectivity would generally result from:

- changes to local road access, including the temporary closure of traffic lanes on George Street and Mary Street, restrictions in some vehicle movements near the construction worksite and changes to traffic flows on George Street for construction traffic
- changes to pedestrian access near to the construction works, impacting on safety and pedestrian amenity
- temporary disruption and relocation of bus stops at George Street, and changes to bus routes at George Street, Mary Street and Margaret Street.

These changes would result in possible delays and disruptions for motorists, pedestrians, cyclists and public transport commuters, as well as potential impacts on safety for road users.

Traffic management measures would be implemented, which would assist in managing potential impacts on local access and connectivity. This would include advanced notification of potential changes and consultation with stakeholders about possible management measures. Further discussion about potential impacts of access and connectivity from construction is provided in **Chapter 4 – Traffic and transport**.

Roma Street

Works at Roma Street would involve construction of a new underground station adjacent to the existing Roma Street Station. The Project would also include pedestrian access to Parkland Boulevard.

During construction, a construction worksite would be established within land adjacent to Platform 10. Two ancillary worksites would also be established, including one within land currently comprising Gallipoli Place and part of Emma Miller Place and the other currently used as car parking at Parkland Crescent. Construction works at this site are expected to require an average of about 150 workers, increasing to about 200 people during the peak construction period.

Operation

The Roma Street Station would provide improved public transport access for communities across South East Queensland to employment, services and facilities in this part of the Brisbane CBD and consolidate Roma Street Station's role as a hub for public transport services and passenger interchange.

The station would connect visitors and residents to community uses such as the Roma Street Parkland. The Project would also provide an improved pedestrian access to Parkland Boulevard as well as the Brisbane CBD via upper Albert Street.

Locally, the station would provide improved bus and train access for residents in the northern part of the Brisbane CBD and Spring Hill to services, facilities and employment areas in Brisbane's inner city and wider South East Queensland.

The Project would also have a positive impact on local amenity near to the station through the development of a civic plaza and urban design enhancements at the station entry. Noise from the operation of the station is not expected to impact on local amenity given it is underground and the proximity to the existing station.

The need to improve safety during operation for users of the new station and existing Roma Street Station was identified by community members during consultation for the Project. The stations would include security and safety measures such as lighting, emergency access buttons and security cameras, which would assist in improving safety for station users and local residents.

Community concerns were also raised during consultation for the Project about potential impacts on the location and emissions from the ventilation outlet, particularly for elderly residents in the Parkland apartments. The ventilation outlet is required for emergency use, the removal of excess heat from the tunnels and the ventilation of bus emissions. The ventilation outlet would be located within the railway corridor, away from residential uses. Emissions from the day-to-day operation of the ventilation outlet are predicted to be below the health based air quality goals and would not impact health of local communities. Impacts of the ventilation outlet on visual amenity are described in **Chapter 13 – Landscape and visual amenity**.

Construction

Local business impacts

Increased demand by the construction workforce for goods and services is expected to benefit some businesses in this area. These include businesses such as shops, cafés and eateries within the Brisbane Transit Centre and the Roma Street Parkland, and at Roma Street and George Street.

Local businesses near to the main construction worksite may experience temporary changes to amenity due to increased dust from surface works, noise and vibration. These would include:

- businesses at Parkland Boulevard and within the Carriage Building at Roma Street Parkland, including restaurant, café, convenience retail and real estate agents
- cafés, small eateries and convenience retail at Roma Street and George Street
- Traders Hotel and East Tower at the eastern end of the Transit Centre.

In particular, commercial uses at Parkland Boulevard are predicted to experience noise impacts from daytime works associated with construction of the station shaft. This would potentially impact on the use of outdoor dining areas for the café and restaurant. Further information on noise and vibration impacts is provided in **Chapter 11 – Noise and vibration**, while dust impacts are described in **Chapter 10 – Air quality**.

Access for haulage vehicles would be from Roma Street via Parkland Boulevard. Herschel Street would also be used to provide access to the Pacific Motorway. Increased construction traffic has the potential to cause temporary impacts on amenity for local businesses at Herschel Street, such as cafés, offices, visitor accommodation and education uses, although this is expected to be minor.

Construction activities would not require changes to loading zones or service vehicle access areas in this location. Use of car parking areas for construction works, may impact on customer and worker parking for some businesses at Roma Street Parkland, although alternate on-street parking is provided at Parkland Boulevard.

Social infrastructure

The construction activities would not directly impact on any of the open space areas of Roma Street Parkland, but would impact on a part of the boardwalk and car park areas. Platform 10 of the Roma Street Station would also be temporarily impacted (refer to *access and connectivity* section as follows).

The boardwalk area would be impacted by the pedestrian access and lift from the station to the boardwalk level. During construction, use of the boardwalk and access to the Parkland from this direction may be temporarily disrupted for short periods. The boardwalk would be reinstated following construction.

The car park area would be used to support construction works for the station and would accommodate site offices, storage and worker parking. This would result in the temporary loss of car park spaces in the main car park area as well as adjacent to Platform 10. This would impact the amount of parking available for visitors to the Parkland and may make access to the Parkland more difficult for some users. Ongoing consultation and communication, including signage to advise alternative visitor car parking, would be provided to minimise potential impacts on park users. Following construction, the car park areas would be reinstated.

Without management, indirect impacts on the Roma Street Parkland may occur from:

- temporary changes to amenity for park users, due to noise and dust from construction activities
- potential impacts on safety for road users, including pedestrians and cyclists, from the use of Parkland Boulevard by construction traffic, including haulage vehicles, to access the construction worksites.

As indicated in **section 14.3.4**, the Parkland attracts a large number of visitors each year for both community and private events. The park is also an important route for commuter and recreational cyclists. As such, these impacts would affect both local residents, and visitors and residents from across the wider Brisbane area. The implementation of environmental management measures such as noise barriers, acoustic enclosures and dust suppression would assist in managing potential impacts on amenity for park users. Traffic management measures would also be implemented to ensure safe access is maintained for all road users in the vicinity of construction works. Further information on possible mitigation measures is provided in **Chapter 18 – Draft Outline EMP**.

Ongoing consultation and communication would also be undertaken with managers of the parkland to ensure that the planning of major haulage activities or construction activities that are likely to cause excessive noise or dust, considers the timing of major events held within the parkland.

The use of Gallipoli Place and the western portion of Emma Miller Place as ancillary worksites would result in the temporary disruption to the use of these areas. Public access to the eastern portion of Emma Miller Place would be maintained. As indicated in **section 14.3.4**, Emma Miller Place is used for a number of annual events and has important community values. Annual events held at Emma Miller Park may need to temporarily relocate during construction. Ongoing consultation with the organisers of these events would be required to ensure that impacts can be appropriately managed. This would include considering the timing of events held at the park in the planning of construction

activities that are likely to generate excessive noise and dust. Following construction, these parks would be reinstated for park uses.

Without mitigation, noise and dust from construction activities and increased construction traffic may impact on amenity for some users of that part of Emma Miller Place not required for construction. Environmental management measures would be implemented, which would assist in reducing impacts on amenity for park users.

Residential amenity

Construction activities for Roma Street Station would occur close to residential properties at Roma Street Parkland, namely the Central Parklands Apartments. Site establishment and excavation activities would occur for about 30 months.

During construction, some occupants of residential apartments near to the construction worksite would likely experience temporary changes to residential amenity due to noise and dust from surface works and spoil haulage, and regenerated noise and vibration from excavation of the station shaft and TBM passby. The presence of the construction worksite may also impact on some residents due to changes in visual amenity.

In particular, some residents of the residential apartments at Parkland Boulevard, next to the construction worksite for Roma Street Station, are predicted to experience noise impacts from daytime activities associated with site establishment, piling and initial shaft excavation works. Without mitigation, dust from these works would also impact on amenity for some residents near to the Project. Dust and airborne noise impacts are expected to reduce once an acoustic shed has been established over the station shaft, although noise impacts may be experienced from the night-time loading and removal of spoil. Locating vehicle access to the acoustic shed away from these apartments would assist in managing potential noise impacts for residents. Occupants of apartments closest to the construction worksite may also experience impacts on amenity due to vibration and regenerated noise from rock breaking works for the shaft excavation.

Changes in amenity may impact on the use and enjoyment of residential properties for some residents, particularly of outdoor balcony areas. Potential disturbance to sleeping patterns may also be experience for residents of some apartments, particularly where there are exceedances to night-time noise and vibration goals. Further information on these impacts and proposed management measures is described in **Chapter 10 – Air quality** and **Chapter 11 – Noise and vibration**.

The implementation of environmental management measures would assist in managing potential impacts on amenity for residents near to construction activities. This would include ongoing consultation and communication with local residents about construction activities, including the timing, duration, potential impacts and management measures. This would be particularly important where surface works are proposed to be undertaken during night time hours. Further information on possible mitigation measures is provided in **Chapter 18 – Draft Outline EMP**.

Access and connectivity

During construction, impacts on local access and connectivity would relate to:

- changes to Parkland Boulevard and Parkland Crescent, impacting on access for residents of the Central Parkland apartments, businesses and Parkland users
- temporary loss of car parking and passenger drop-off area next to Platform 10 at Roma Street Station

- loss of car parking for Roma Street Parkland
- changes to pedestrian access near to the construction works, particularly to Roma Street Station and Roma Street Parkland, impacting on safety and pedestrian amenity.

These changes would result in possible delays and disruptions for motorists, pedestrians, cyclists and bus and rail passengers, as well as potential impacts on safety for road users.

Construction traffic access to the construction worksite would be via Herschel Street, Roma Street and Parkland Boulevard. During the six month peak spoil haulage period, this would involve up to 44 trucks per day for the removal of spoil. A further 14 trucks per day would be required for the delivery of materials and equipment during the peak construction. The establishment of the construction worksite at the car park for Platform 10 would also require the temporary closure of Parkland Crescent, west of the Central Parkland apartments, while construction of the lift and pedestrian access to Roma Street Parkland may also require the short-term closure of Parkland Boulevard. These changes may result in temporary delays and disruptions for road users, including motorists, pedestrians and cyclists, impacting on local residents, businesses and visitors to Roma Street Parkland. Access would be maintained to the Central Parkland apartments from Parkland Boulevard and the eastern end of Parkland Crescent. Alternate access to Roma Street Parkland is also provided from College Road, which would assist in minimising impacts on these groups.

The location of the construction worksite for Roma Street Station would require temporary access changes to Platform 10, which provides passenger access to long distance rail services. In particular, the existing facilities, including drop-off area and station building would be relocated along the platform, west of the existing facilities. This change is not expected to impact on passengers who would be dropped off by vehicle, although may require some passengers who are transferring from suburban rail services or accessing these services from the Brisbane Transit Centre to walk further to these facilities.

Construction activities for Roma Street Station would require changes to pedestrian access near to construction works, including along Parkland Boulevard from Roma Street and between the existing Roma Street Station and the Parkland.

Pedestrian access would be provided by an extension at the eastern end of Platform 10. This would allow access between the station and Roma Street Parkland. As indicated in **section 14.3.4**, about 70,000 people access the Parkland from the existing Roma Street Station annually. These visitors would be required to walk further to access the Parkland. This access would need to consider the needs of people with mobility difficulties, such as elderly and people with disability. The extension of Platform 10 would also provide access for residents of the Parkland Central Apartments during the station's operating hours. Pedestrian access would be maintained for residents from Albert Street via the boardwalk. Construction activities would not impact on pedestrian access to the Brisbane Transit Centre from Roma Street.

Traffic management measures would be implemented, which would assist in managing potential impacts on local access and connectivity. This would include early and ongoing consultation with residents, business and other stakeholders about potential changes and management measures. Notification of traffic changes would also be important to minimise impacts on visitors to the Parkland. Further discussion about potential impacts of access and connectivity from construction is provided in **Chapter 4 – Traffic and transport**.

Spring Hill

Works at Spring Hill would include connections to the existing bus and rail networks, including connection over the ICB. Associated infrastructure such as a ventilation outlet and feeder station

would also be established within the railway corridor adjacent to Victoria Park, while a bus layover area would be provided at Gilchrist Avenue.

During construction, a construction worksite would be located within Victoria Park adjacent to the railway corridor south of the ICB, as well as on land used for playing fields north of the ICB, which is currently being temporarily used for workforce parking for the Legacy Way project. Construction works at Spring Hill are expected to require an average of about 200 workers, increasing to about 300 workers during the peak construction period.

Operation

The Project would improve public transport bus access for workers, patients and visitors to the RBWH as well as for students of tertiary education facilities within the RBWH campus. The Project would also improve bus access for communities in Brisbane's inner northern suburbs, to services, facilities and employment in the Brisbane CBD and inner southern suburbs.

During operation, surface connections and associated infrastructure south of the ICB would be primarily located within the railway corridors. North of the ICB, the busway connection to the Northern Busway would directly impact on an area of Victoria Park used for playing fields at Gilchrist Avenue. Part of this connection would be located in structure, with the area of park beneath the structure likely to be rehabilitated to park following construction.

Concerns were raised during consultation for the Project about potential visual impacts of the busway connection. The busway connection over the ICB would result in long-term, adverse changes to visual amenity from locations within Victoria Park and the surrounding area. These impacts are described in **Chapter 13 – Landscape and visual amenity**.

Community concerns were also raised during consultation for the Project about the location of ventilation outlets and potential health impacts. The ventilation outlet at Spring Hill is required for emergency use, the removal of excess heat from the tunnels and the ventilation of bus emissions. The ventilation outlet would be located within the railway corridor, away from residential areas and other sensitive uses.

Emissions from the day-to-day operation of the ventilation outlet are predicted to be below the health based air quality goals and would not impact on health of local communities. Impacts of the ventilation outlet on visual amenity are described in **Chapter 13 – Landscape and visual amenity**.

Construction

Business impacts

Increased demand by the construction workforce for goods and services may benefit some businesses in this area. These include shops and food outlets at Herston Road as well as at Spring Hill.

Without mitigation, adverse impacts on local businesses in this area would generally result from increased noise, dust and traffic from construction activities, potentially resulting in:

- temporary impacts on customer amenity at recreation and health related businesses at the Centenary Aquatic Complex in Victoria Park
- temporary impacts on amenity for occupants and customers of short-term accommodation uses, offices, cafés and education uses at Gregory Terrace.

The implementation of environmental management measures at the construction worksites would assist in managing impacts of the Project on these businesses. This would include ongoing consultation and communication with businesses near to construction activities about the timing, duration and likely impacts of construction activities and potential management measures.

Parking for construction workers would be provided within the worksite at Spring Hill. This would be sufficient to accommodate the expected peak workforce in this area, and would assist in avoiding impacts on local businesses associated with on-street parking by workers. This is further discussed in **Chapter 4 – Traffic and transport**.

Social infrastructure

Construction worksites at Spring Hill would be established within Victoria Park south of the ICB as well as north of the ICB. The construction worksite south of the ICB would cover an area of about 6,380m^2 south of the Land Bridge and about 17,940m^2 north of the Land Bridge, adjacent to the railway corridor. The main construction worksite north of the ICB would cover an area of about 14,300m^2.

As indicated in **section 14.3.4** and **section 14.5.7**, Victoria Park is a major open space area, which is highly valued by residents in Spring Hill and Brisbane's inner northern suburbs for its landscape, aesthetic, recreational and heritage values. Community concerns about potential impacts on Victoria Park raised during consultation for the Project related to the loss of recreational space, as well as impacts on park amenity and facilities such as pedestrian and cycle paths, playground and dog off-leash area.

Construction works would not directly impact on any formal sport and recreation uses within Victoria Park, apart from an area of playing fields at Gilchrist Avenue north of the ICB currently being temporarily used as workforce parking for the Legacy Way project. Following construction, the area of playing fields not required for permanent infrastructure would be reinstated for playing fields or other similar open space use. The loss of this park land area would be a concern for some community members, particularly in the context of cumulative impacts and the incremental loss of park land due to other recent infrastructure projects such as the ICB, Inner Northern Busway and Legacy Way project.

The use of open space areas within Victoria Park for construction worksites would result in the temporary disruption to the use of these areas. This would include temporary changes to pedestrian and cycle paths as discussed in the *access and connectivity* section as follows. Public access to other areas of Victoria Park would be maintained. This includes the Land Bridge, dog off-leash area, playground and Centenary Aquatic Complex.

The establishment of the construction worksites would require the clearing of some trees and vegetation within the construction worksites. The Gundoo Memorial Grove of eucalypts and the established figs located north of the Land Bridge would be retained. The establishment of the bus layover at Gilchrist Avenue would not require the removal of trees in this location or impacts on the retaining wall. Some trees located adjacent to the railway corridor south of the ICB would need to be cleared for construction of the cut and cover tunnel and TBM retrieval shaft. This includes trees identified as part of the original Harry Oakman landscape design as well as trees planted for the Queen's Diamond Jubilee celebrations. The loss of these trees would be a concern for some community members and would impact on community values associated with the Park's landscape and aesthetic values.

Following construction, areas of Victoria Park disturbed by construction activities would be rehabilitated in accordance with a master planning process to be undertaken by Brisbane City Council in consultation with the Turrbal People and the local community. This would include new planting and landscaping works. This would assist in reducing potential impacts on community values, particularly

as trees planted for the Project would be mature. This would also provide opportunities to enhance the functionality of the Park and landscape and recreational values for local residents.

Further discussion about potential impacts on Victoria Park's ecology, heritage and landscape values is provided in **Chapter 8 – Ecology**, **Chapter 12 – Cultural heritage** and **Chapter 13 – Landscape and visual amenity**.

Other impacts of construction activities on Victoria Park would relate to:

- temporary changes to amenity for park users, due to noise and dust from construction activities
- potential impacts on safety for pedestrians and cyclists, due to increased construction traffic, including haulage vehicles, access the construction worksites.

Without management, noise and dust from construction activities have potential to impact on amenity of park users, including users of the Centenary Aquatic Centre, tennis courts, dog off-leash area, and playground. The implementation of environmental management measures such as noise barriers, acoustic enclosures and dust suppression would assist in managing potential impacts on amenity for park users. Traffic management measures would also be implemented to ensure safe access is maintained for pedestrians and cyclists in the vicinity of construction works. Further discussion about impacts of dust, noise and vibration are discussed in **Chapter 10 – Air quality** and **Chapter 11 – Noise and vibration**.

Residential amenity

Concerns about potential impacts of construction on the amenity of nearby residential uses was identified during consultation for the Project.

Without management, residential areas nearest to the Project may experience temporary impacts on amenity due to noise and dust from construction activities. In particular, minor noise impacts may be experienced for some residents closest to the Project during the construction of the cut and cover tunnel and transition structures. The implementation of environmental management measures such as noise barriers and dust suppression measures would assist in managing potential impacts on residential amenity.

Ongoing consultation and communication with local communities about potential construction activities, including timing, duration, impacts and possible mitigation measures would also assist in managing potential impacts of construction.

Further discussion about impacts of dust, noise and vibration are discussed in **Chapter 10 – Air quality** and **Chapter 11 – Noise and vibration**.

Access and connectivity

Safe access for pedestrians and cyclists would be maintained near to construction works, including to the Land Bridge, although temporary detours may be required. This includes sections of the northern bikeway, which connects Brisbane's inner northern suburbs to the Brisbane CBD via Gilchrist Avenue at Herston, the Land Bridge across the ICB, Victoria Park and Roma Street Parkland. This may result in temporary disruptions for recreational and commuter cyclists and pedestrians. Changes to pedestrian and cycle access may also impact on access and connectivity for school students to sport and recreation facilities located within the park.

Temporary detours to pedestrian and cycle access would need to consider the needs of students as well as people with mobility difficulties, including elderly and young children. The development of local

access strategies near construction works, in consultation with local communities and key stakeholders such as local schools, would reduce potential impacts on pedestrian and cycle access.

14.6 Impact management

A range of mitigation measures are identified in **Chapter 18 – Draft Outline EMP** to manage possible socio-economic impacts associated with the construction and operation impacts of the Project on local and regional communities.

Monitoring and reporting of socio-economic impacts would be undertaken as part of the construction environmental management plan. This section provides an overview of the impact management, monitoring and reporting framework relevant to the Project's socio-economic impacts. Further information on the management and monitoring of socio-economic impacts is provided in **Chapter 18 – Draft Outline EMP**.

14.6.1 Management of socio-economic impacts

The environmental outcome for the management of socio-economic impacts during construction is to avoid, or minimise and mitigate impacts from construction activities on local businesses and the social environment. The identified performance criteria include:

- impacts on local amenity and community life are avoided or minimised
- impacts on the use and functioning of social infrastructure and local businesses near the Project are avoided or minimised, mitigated or managed
- safe access is maintained near to construction worksites and construction works, including to social infrastructure and businesses
- to optimise positive interaction of the workforce with local communities
- communities and local businesses likely to be directly affected by construction works are aware of the works in advance of their commencement and are aware of the procedures for making complaints about construction works.

Mitigation measures identified to manage potential socio-economic impacts are described in **Chapter 18 – Draft Outline EMP**. They generally relate to:

- provision of timely and clear information on the Project works, including information on construction activities such as timing, duration, likely impacts and mitigation measures
- implementation of a comprehensive suite of integrated mitigation measures relating to such matters as noise, vibration, dust and traffic management, as specified in the Draft Outline EMP, for both construction and operation of the Project
- involvement of the Traditional Owners, local communities and other relevant stakeholders, in rehabilitation of open space areas affected by construction activities.

Monitoring and reporting of socio-economic impacts would be undertaken as part of the monitoring program identified in the Draft Outline EMP. This would include monitoring of and reporting on such things as:

- consultation with and feedback from local business owners
- community complaints system for number and types of complaints
- employment records for employment diversity

- procurement spend reports for Project spending on goods and services with local and regional providers
- environmental monitoring reports for results on dust, noise and air quality changes to evaluate potential impacts on amenity
- Project safety reporting to monitor safety incidents and near misses that may impact on workforce health and well-being as well as the general community.

Further detail on the monitoring and reporting process is also provided in **Chapter 18 – Draft Outline EMP**.

14.6.2 Community engagement

The Proponent is to implement engagement procedures through which stakeholders and the community can obtain information, discuss and provide feedback on the Project, construction activities and environmental management measures.

Community and stakeholder engagement on the Project is to achieve the following outcomes:

- local communities, residents and businesses likely to be directly affected by construction works for the Project are aware of the nature, timing and predicted effects of the works in advance of their commencement, and are aware of the procedures for making complaints about the construction works related to the Project
- public transport and road users, including pedestrians and cyclists are aware of construction works and the predicted effects on road and rail network operations in advance of their commencement, and are aware of the procedures for making complaints about construction works related to the Project
- opportunities for ongoing consultation with local communities likely to be directly affected by construction works, as well as the wider community such as public transport users and road users, including pedestrians and cyclists, are provided throughout the construction phase
- communities have access to an effective and responsive communication and complaints process to address and respond to community issues
- consultation with the community and stakeholders is commenced well in advance of the commencement of construction works and, in some circumstances, commences with the design of mitigation measures during detailed design. Such consultation is to be conducted in detail sufficient to address specific construction impacts and mitigation requirements
- consultation with affected parties about possible mitigation measures is conducted in confidence.

To support this initiative, the Proponent would appoint an independent, suitably-skilled person to fulfil the role of Community Relations Monitor. This role would facilitate and chair community advisory groups, oversee the timely dissemination of information to the community, and oversee the complaints handling procedure. Monthly reports would inform both the Environmental Monitor and the Chief Executive, Department of Transport and Main Roads as to the effectiveness of the community engagement program and the implementation of the mitigation measures agreed with particular affected parties or neighbourhoods.

Further information on community and stakeholder consultation for construction is provided in **Chapter 18 – Draft Outline EMP**.

14.7 Evaluation of impact significance

This section summarises the socio-economic benefits and impacts of the Project's construction and operation and evaluates their likely significance based on the consequences and likelihood of the impact occurring.

A risk framework was used to assess and prioritise each of the Project's construction and operation impacts. The framework considered the nature of the impact as well as the level of significance. The significance of the impact was determined by consideration of the:

- consequence of the impact, based on the extent, duration and severity of the impact
- likelihood, or probability of the impact occurring.

The nature of the impacts may be:

- positive – impacts have a beneficial or uplifting effect on the project-affected communities or stakeholders and/ or quality of life of affected communities is improved
- negative – impacts have a negative or oppressive effect on project-affected communities or stakeholders and/ or quality of life of affected communities is diminished
- neutral – impacts are neither positive nor negative in nature.

Further information on the evaluation framework is provided in **Appendix A**.

Table 14-20 provides a summary of the Project's impacts and opportunities and includes an assessment of the likely extent, duration, severity, probability and significance of the impact or opportunity.

An overview of possible mitigation measures are also identified. Further information on possible mitigation measures is provided in **Chapter 18 – Draft Outline EMP**. This includes mitigation measures relating to management of such things as general construction, transport, landscape and visual amenity, ecology, air quality, noise and vibration and cultural heritage, in addition to measures specific to socio-economic impacts.

Table 14-20 Evaluation of impacts

Impact/ benefit	Description	Project phase	Nature	Level of significance (without mitigation)	Typical mitigation measures	Level of significance (with mitigation)
Property impact	Volumetric acquisition of private properties	Operation	Negative	High	Compensation to property owners in accordance with Acquisition of Land Act	Medium
	Impact on property values	Construction	Neutral	Low	Early and ongoing consultation and communication about construction activities, implementation of environmental management measures to address amenity impacts (i.e. noise, dust, vibration, traffic)	Low
	Uncertainty about property decisions, uncertainty about volumetric acquisition process	Construction	Negative	Medium	Early and ongoing consultation and communication with affected property owners	Low
	Potential impact on future development above tunnel	Operation	Negative	Medium	Compensation to property owners in accordance with Acquisition of Land Act; design of tunnel to allow for future development	Low
	Damage to properties above the tunnel alignment	Construction	Negative	Low	Building condition surveys for buildings potentially affected by vibration or settlement	Low
Housing and accommodation	Amenity impacts at residential and accommodation uses near surface works	Construction	Negative	High	Implement appropriate environmental management measures as per the draft outline EMP (i.e. noise, dust, vibration, traffic), early and ongoing consultation and communication with affected communities	Medium
	Amenity impacts at residential and accommodation uses above the tunnel	Construction	Negative	Low	Early and ongoing consultation and communication with affected property	Low

Impact/ benefit	Description	Project phase	Nature	Level of significance (without mitigation)	Typical mitigation measures	Level of significance (with mitigation)
	alignment				owners, relocation (if required and agreed with residents)	
Equity	Provision of more equitable public transport access	Operation	Positive	High	n/a	High
	Improved social and economic opportunities by improving access to social infrastructure such as education, employment, health and social facilities	Operation	Positive	High	n/a	High
	Changes to amenity and perceived liveability	Construction	Negative	High	Implement appropriate environmental management measures as per the Draft Outline EMP, early and ongoing consultation and communication	Medium
Local business impacts	Surface acquisition of commercial properties, requiring relocation	Construction	Negative	High	Compensation in accordance with Acquisition of Land Act, early and ongoing consultation with affected business Consultation with local business owners.	High
	Opportunities for commercial development within stations	Operation	Positive	Low	Provide for small scale retail uses within the station design	Medium
	Stimulation of development and revitalisation around stations	Operation	Positive	Low	Collaboration with Queensland Government agencies responsible for area planning and Brisbane City Council to implement planning, urban design, and other measures aimed at improving amenity and encouraging private development	High
	Increased pedestrian traffic (passing trade)	Operation	Positive	High	Creation of civic plazas at station entrances and improvements to	High

Impact/ benefit	Description	Project phase	Nature	Level of significance (without mitigation)	Typical mitigation measures	Level of significance (with mitigation)
					pedestrian access on station routes	
	Loss or disruption of loading zones, on-street parking areas	Construction	Negative	High	Provision of alternate loading zones and parking areas nearby. Consultation with affected business owners.	High
	Increased demand for construction worker parking	Construction	Negative	Medium	Provide worker parking within the construction worksites	Low
	Increased demand by construction workers of goods and services	Construction	Positive	Medium	n/a	Medium
Employment and training	Creation of direct employment opportunities	Construction	Positive	High	Consideration of employment and training opportunities for young people and local Indigenous people in consultation with relevant stakeholders	High
	Creation of indirect employment opportunities	Operation/ construction	Positive	Medium	Implementation of local procurement policies in accordance with the Queensland Government Charter for Local Content	High
Workforce management	Impacts associated with presence of large construction workforce	Construction	Negative	Medium	Develop and implement an employee code of conduct, employee induction and training about appropriate worker behaviours	Low
Social infrastructure	Improved public transport access to regional social infrastructure	Operation	Positive	High	n/a	High
	Permanent surface impact on playing fields at Victoria Park	Operation	Negative	High	Minimise permanent impact on playing fields through design, where possible	High
	Direct impacts on social infrastructure facilities (temporary disruption to use) (i.e. Victoria Park, Outlook Park,	Construction	Negative	High	Minimise area of open space impacted by construction activities, reinstate open space area as soon as	High

Impact/ benefit	Description	Project phase	Nature	Level of significance (without mitigation)	Typical mitigation measures	Level of significance (with mitigation)
	Emma Miller Park)				practicable; implement a master plan process for Victoria Park in consultation with Traditional owners and the local community	
	Amenity changes for social infrastructure users	Construction	Negative	High	Implementation of environmental management measures, early and ongoing consultation and communication with managers of social infrastructure	Medium
	Changes in local access to social infrastructure	Construction	Negative	Medium	Early and ongoing consultation and communication with managers and users of social infrastructure Consideration of the timing of major events at venues such as Gabba Stadium and Roma Street Parkland in the planning of construction works and major haulage activities	Low
Access and connectivity	Improved public transport access to services, facilities and employment	Operation	Positive	High	n/a	High
	Improved local public transport services	Operation	Positive	High	n/a	High
	Road changes near construction	Construction	Negative	High	Implementation of traffic management	High

Impact/ benefit	Description	Project phase	Nature	Level of significance (without mitigation)	Typical mitigation measures	Level of significance (with mitigation)
	worksites, resulting in delays and disruptions for motorists				measures, advance notification of road changes and possible disruptions	
	Increased construction traffic on local roads	Construction	Negative	High	Implementation of traffic management measures, limiting spoil haulage activities during peak traffic periods	Medium
	Temporary changes to rail and bus services	Construction	Negative	Medium	Timing to avoid key travel periods, advance notification of changes and disruptions to commuters	Medium
	Changes to pedestrian and cycle paths near construction worksites	Construction	Negative	High	Provide safe alternate access in consultation with local communities and key stakeholders, advanced notification about potential changes	Medium
	Increased demand for construction worker parking	Construction	Negative	Medium	Provide worker parking within the construction worksites, implementation of parking control measures near construction worksites	Low
Community values (amenity and character)	Changes to local amenity of areas near new stations	Operation	Positive	Low	Creation of civic plazas at station entrances and improvements to pedestrian access on station routes	Medium
	Increased noise from station operations and at surface connections	Operation	Negative	Medium	Establishment of noise barriers (where required), design passenger communication systems to minimise noise breakout	Medium
	Changes to visual amenity due to surface infrastructure	Operation	Negative	High	Implementation of urban design measures, establish plantings or other barriers to screen infrastructure. Reinstate open space areas disturbed by construction activities progressively and as soon as practicable following	Medium

Impact/ benefit	Description	Project phase	Nature	Level of significance (without mitigation)	Typical mitigation measures	Level of significance (with mitigation)
					construction.	
	Increased demand for commuter parking near stations	Operation	Negative	Medium	Implementation of parking control measures near stations	Low
	Noise, dust, traffic from daytime surface works impacting on local amenity	Construction	Negative	High	Implement appropriate environmental management measures as per the draft outline EMP, early and ongoing consultation and communication with affected communities	Medium
	Construction noise and vibration from night-time surface works	Construction	Negative	Medium	Implement appropriate environmental management measures as per the draft outline EMP, early and ongoing consultation and communication with affected communities, minimise night-time construction works, avoid extended durations of night-time construction works	Medium
	Regenerated noise and vibration from tunnel construction	Construction	Negative	Medium	Early and ongoing consultation with residents	Medium
	Regenerated noise and vibration from station construction	Construction	Negative	High	Early and ongoing consultation with residents, implementation of measures outlined in **Chapter 11 – Noise and vibration**	Medium
	Removal of mature trees and vegetation	Construction	Negative	High	Minimise size of construction worksites and number of trees to be cleared, replace lost trees with new plantings	Medium

Impact/ benefit	Description	Project phase	Nature	Level of significance (without mitigation)	Typical mitigation measures	Level of significance (with mitigation)
Community values (community health and safety)	Upgrade of Dutton Park Station to comply with DDA	Operation	Positive	High	n/a	High
	Safety and security impacts near stations	Operation	Neutral	Medium	Creation of civic plazas at station entrances and improvements to pedestrian access on station routes	Medium
	Potential health impacts of ventilation outlets	Operation	Negative	Low	Undertake air quality monitoring, as described in **Chapter 10 – Air Quality**	Low
	Increased noise, dust and vibration from construction activities impacting community health	Construction	Negative	Medium	Implement appropriate environmental management measures as per the draft outline EMP, early and ongoing consultation and communication	Low
	Increased safety risk associated with changes to pedestrian and cycle paths near construction worksites	Construction	Negative	Medium	Provide alternate access, notification	Low

14.8 Summary

The Project is located in Brisbane's inner city suburbs, extending from Dutton Park in the south to Victoria Park at Spring Hill in the north. The study corridor comprises a mix of land uses including residential, major commercial developments, small scale industrial uses and local and regional level community facilities.

The study corridor contains diverse social environments and communities, and covers a range of housing choice including medium to high density apartments in the Brisbane CBD, Spring Hill and Kangaroo Point and lower density character housing at Annerley, Dutton Park, and Woolloongabba. The study corridor has a residential population of about 44,500 people, of which about 25 per cent live in Annerley. The study corridor also has a worker population of about 150,400 people, of which about 75 per cent work in Brisbane City (Queensland Treasury and Trade, 2014).

The Project would provide long-term benefits for communities for local and regional communities by providing more frequent and reliable bus and train services to services, facilities and employment in the Brisbane CBD and inner city areas. The Project would also support growing populations and changing social environments, such as at Woolloongabba and Queen's Wharf Brisbane redevelopment.

Permanent changes to the social environment would include the loss of playing fields at Gilchrist Avenue, within Victoria Park north of the ICB, and changes to streetscapes and urban environments around the Project stations.

In the short-term, the Project would impact on socio-economic values for communities near to construction works at the southern and northern connections and each of the stations. These would generally relate to changes in local amenity associated with noise, dust and vibration from construction activities, increased construction traffic, changes in local access and disruption to open space, including at Victoria Park. These impacts would be temporary and able to be managed with the implementation of management measures, minimising disruptions to local communities and businesses. This would include early and ongoing consultation with affected communities.

Overall, while the scale and intensity of construction is a significant undertaking, the Project's socio-economic impacts would be of limited duration compared to the operational benefits for local and regional communities.