1 Introduction

The *South East Queensland Regional Plan 2009–2031* (SEQ Regional Plan) sets out a vision for South East Queensland as ‘a region of interconnected communities, with excellent accessibility and an extensive and efficient public transport system that contributes to reducing greenhouse gas emissions’ (Department of Infrastructure and Planning 2009a).

The timely provision of accessible public transport infrastructure is critical to achieving this vision and ensuring that emerging communities have access to employment and services.

Through the Mt Lindesay / Beaudesert Strategic Transport Network Investigation (MLBSTNI), which was released for public comment in mid-2009, state infrastructure planning has identified the need for extensions to existing public transport networks to service future growth areas in the South Western Corridor. In the medium-to-long term, stronger public transport links would also be required to service planned future growth in the Scenic Rim Regional Council area.

The need to identify and preserve a corridor suitable for a future passenger rail service between Salisbury and Beaudesert is specifically identified in the *South East Queensland Infrastructure Plan and Program 2009–2026* (DIP 2009b). It is expected that this passenger rail line would generally follow the alignment of the existing Brisbane–Sydney rail line; however, a new corridor would be required to connect future passenger services from Kagaru to Beaudesert.

The Department of Transport and Main Roads (DTMR) has engaged Kellogg Brown & Root Pty Ltd (KBR) to prepare a review of environmental factors (REF) which identifies a preferred alignment between Kagaru and Beaudesert township and potential station locations for the passenger rail line from Salisbury to Beaudesert based on the findings of the MLBSTNI.

The primary aim of the REF is to identify potential constraints to the Salisbury to Beaudesert passenger rail line for future investigation and assessment. It summarises the work undertaken to date, the outcomes of the corridor and station selection process, and sets out the actions required for future delivery of a passenger rail line between Salisbury and Beaudesert.

1.1 Future passenger rail line

If constructed in the future, the Salisbury to Beaudesert passenger rail line would be operated as an extension of the existing Citytrain network to service future development in the South Western Corridor (in Logan City) and Scenic Rim Regional
Council area. It would also provide passenger rail services for established areas and future development in Brisbane City.

This would involve the construction of a 53 km double-track, narrow gauge, electrified passenger rail line connecting to the existing Citytrain network near Salisbury Junction and terminating at Beaudesert.

Construction of the passenger rail line would likely be implemented in stages and would only commence after 2026 subject to:

- realisation of projected demand in future growth areas identified under the SEQ Regional Plan
- future infrastructure delivery priorities and funding decisions of the Queensland Government.

Prior to delivery of a passenger rail line, interim public transport solutions would be implemented to service emerging communities in the study area. Potential interim solutions would also be investigated as part of subsequent phases of this study.

1.2 Background

1.2.1 Need for the project

South East Queensland is one of the fastest growing regions in Australia. The SEQ Regional Plan identifies a number of local and regional development areas that are anticipated to accommodate future urban development in the SEQ region to 2031. The plan also nominates ‘identified growth areas’ which are capable of supporting growth and development beyond 2031, subject to further investigation.

A significant number of these future growth areas are located in the South Western Corridor (Logan City) and the Scenic Rim Regional Council area, which are anticipated to accommodate a significant proportion of the forecast population growth in SEQ to 2031 and beyond (see Figure 1.1).

Regional and local development areas are fundamental to the delivery of dwelling and employment targets in the SEQ Regional Plan. The successful development of these areas as regionally significant centres for growth is dependent on the timely delivery of public transport infrastructure and other services (DIP 2009a).

Development of the Salisbury to Beaudesert passenger rail project would provide essential public transport infrastructure to service future development areas in the South Western Corridor and Scenic Rim Regional Council area. The project would also improve services for established and proposed urban development areas to the south of Brisbane.

A key aim of the project is to ensure the integration of transport and land use to assist in achieving social, economic and environmental sustainability in the SEQ region.

Draft Mt Lindesay / Beaudesert Strategic Transport Network Investigation

Long-term transport needs (to 2056) in the study area have been investigated by the Department of Transport and Main Roads as part of the Mt Lindesay / Beaudesert Strategic Transport Network Investigation.
The study found that future public transport demands are likely to warrant a dedicated passenger rail service to the Bromelton/Beaudesert region 2056 as shown in Figure 1.2, assuming that public transport patronage levels are above the ‘low’ scenario modelled for the study. While demand was higher at Bromelton, the study concluded that it was unlikely that a rail service is the best solution to service the large-scale industrial development within the Bromelton state development area and that it was likely that the rail line was better targeted to Beaudesert township.
Figure 1.1
Overview of passenger rail corridor
Further, the study found that while estimated 2056 demands to Beaudesert were lower than achieved on other components of the rail line, investigation of a rail service was warranted due to the proposed nature of the town as a principal rural activity centre.

The draft report (Cardno Eppell Olsen 2009) released in May 2009 recommended that a detailed corridor planning study was needed to assess the requirements for achieving passenger rail services along the Sydney to Brisbane interstate rail corridor with a view to future corridor preservation needs. The report also recommended that the passenger rail tracks be additional to the existing freight track on this corridor.

**1.2.2 Alternatives to the project**

The primary objective of a future Salisbury to Beaudesert rail project would be to provide rail transport infrastructure and services for existing communities and future urban communities under the SEQ Regional Plan. This section considers two possible alternatives to the rail project identified in this REF:

- a ‘do nothing’ option which assumes that urban development would proceed in accordance with the SEQ Regional Plan without the provision of additional public transport infrastructure in the study area.
• operating bus services on existing and future road networks as the sole means of public transport within the communities that would otherwise be serviced by the Salisbury to Beaudesert passenger rail service.

‘Do nothing’ option

In future, the population of the study area is expected to grow from approximately 200,000 people in 2006 to around 350,000 in 2031 (PIFU 2009). The majority of this growth would be accommodated within the existing boundary of the urban footprint at Park Ridge, Flagstone and Beaudesert, with further growth anticipated beyond 2031.

A key outcome of the SEQ Regional Plan is the integration of transport and land use planning to encourage a greater proportion of trips by walking, cycling and public transport. Without the provision of additional public transport infrastructure, these communities would be forced to rely on private cars as the primary means of transport to places of work, study and recreation. Therefore, the ‘do nothing’ option is not consistent with the desired outcomes of the SEQ Regional Plan and has not been considered further.

Bus services only

During the initial stages of development in the South Western Corridor and Scenic Rim Regional Council area improved bus infrastructure and services would be used to provide high quality connections to the Brisbane CBD and other major regional destinations such as Logan Central, Browns Plains, Park Ridge and Flagstone. However, once projected passenger demand reaches levels that warrant a train service, it would require very large numbers of buses to carry the same number of passengers. Furthermore, as general traffic levels increase commensurate with the growth in total population, higher levels of bus priority would need to be included on road networks for buses to bypass congestion.

As such, buses are seen as a suitable short–to–medium term solution however, there will be a time when passenger rail would provide higher capacity, high speed public transport and buses would revert to providing local coverage and connectivity, including feeder services to and from rail stations.

1.2.3 Relationship to other projects

There are currently a number of other infrastructure projects (including rail and other services) in varying stages of delivery across SEQ. The following projects in the study area have been deemed relevant due to their proximity to the rail corridor or their potential to influence the project in the future.

Cross River Rail Project

Future capacity on the inner city rail network is a key consideration in determining the nature of the service provided on the Salisbury to Beaudesert passenger rail line. Effective integration of the proposed passenger rail service with the existing Citytrain network also requires consideration of longer-term service requirements for the Gold Coast–Beenleigh rail line and network capacity through the inner city.
Network capacity in the inner city is being addressed by the Cross River Rail Project, which is currently in the early planning phase. This includes the identification of a north–south study corridor, nominally defined by Salisbury at its southern limit. Network integration of the proposed passenger rail line in the vicinity of Salisbury Junction will also be addressed as part of ongoing investigations into the inner city rail network.

**Southern Freight Rail Corridor Study**

The Southern Freight Rail Corridor Study has identified a future route for a freight rail corridor connecting the western rail line near Rosewood to the existing interstate rail line at Kagaru. This would be operated as a freight-only railway and form a key link from the proposed Melbourne to Brisbane Inland Railway to the existing interstate rail corridor, providing an alternative route to existing freight centres at Acacia Ridge and the Brisbane Multimodal Terminal (Port of Brisbane) (Maunsell 2008).

To avoid potential future conflict between freight and passenger rail services, the proposed passenger rail line diverts from the existing interstate line to the north of this connection and follows a route to Beaudesert across the Logan River floodplain.

**Mt Lindesay Highway upgrades**

Future upgrades to the Mt Lindesay Highway between Brisbane and Beaudesert are planned over the long term. Early concept planning is being undertaken for the Beaudesert bypass and has been considered as part of this study; however, these upgrades would need to be considered further as part of future detailed design.

### 1.3 Review of Environmental Factors

**1.3.1 Purpose**

The primary aim of the REF is to summarise the results of a desktop review of the existing natural, social and economic values of the study area, and to identify where potential impacts on these values would require investigation and assessment should the project proceed in future.

**1.3.2 Scope**

Based on the statement of work provided by DTMR, the aims of the REF were to:

- provide a review of the environmental issues associated with the implementation of a passenger rail line which generally follows the alignment of the existing interstate rail line between Salisbury to Kagaru
- develop and assess potential alignment options to establish a preferred corridor linking the existing interstate rail line near Kagaru and Beaudesert township
- identify preferred station locations for the future passenger rail line between Salisbury and Beaudesert
- identify existing roads or public utilities potentially affected by the future passenger rail line between Kagaru and Beaudesert
• identify environmental, social or economic features or issues requiring consideration as part of any future engineering design, including ‘showstopper’ issues that could significantly constrain the development of the future passenger rail line between Kagaru and Beaudesert

• provide advice with respect to the impact of town planning and legislative requirements on the future development of the passenger rail line

• undertake a preliminary assessment of potential impacts on matters of national environmental significance protected under the Environment Protection and Biodiversity Conservation Act 1999 (Cwlth).

1.3.3 Study area sections

Three distinct geographic sections of the project area are recognised for the purposes of the REF, as shown on Figure 1.1. The northern, central and southern sections are defined largely by the nature and intensity of land use in each section as follows:

• northern section—largely urban land uses between Salisbury and Boronia Heights

• central section—medium-density housing and rural residential uses between Boronia Heights and Undullah

• southern section—generally rural land uses and townships between Undullah and Beaudesert.

Existing environmental values and potential impacts have generally been considered within the context of these sections which are described in detail in section 2–Project description.

1.3.4 Study team

KBR was commissioned by DTMR to undertake the REF supported by a technical working group consisting of key stakeholder groups who provided advisory inputs to the REF process. A list of those stakeholder groups is provided below.

Technical working group

The technical working group for this study comprised representatives from the following agencies:

• Department of Transport and Main Roads

• Department of Infrastructure and Planning

• Department of Environment and Resource Management

• Brisbane City Council

• Logan City Council

• Queensland Rail Network

• Scenic Rim Regional Council

• Translink Transit Authority
2 Project description

This chapter provides a description of the proposed passenger rail line, including the key design and functional requirements, design criteria and design constraints. Major design features such as bridges, structures and stations are also presented. This chapter also discusses construction matters such as staging and implementation, waste management and construction costs.

2.1 Scope

As stated in Chapter 1, the alignment of the proposed passenger rail line has been assumed to generally follow that of the existing interstate railway between Salisbury and Kagaru. Within these northern and central sections of the study area, this REF has considered engineering issues which will require further investigation in the future. Within the southern section between Kagaru and Beaudesert, the design of the rail alignment has been progressed to a conceptual level. During the detailed impact assessment stage, the design of the overall alignment will be refined to incorporate the findings of subsequent engineering, environmental and demand studies, together with the outcomes of the proposed community consultation program.

2.2 Overview

The following section presents a broad overview of the features of the study area and a summary of the design of the proposed passenger rail line. Further details regarding the design within the southern section are presented in subsequent sections.

2.2.1 General features of the study area

Landforms and topography

The landform of the northern section of the study area is relatively flat from Salisbury to the higher elevations (approximately 40 m Australian Height Datum [AHD]) at Acacia Ridge. From this point, the proposed passenger rail line drops down to and skirts the edge of the Oxley Creek floodplain. South of the Logan Motorway, the elevation of the proposed rail line ranges between 35 m AHD and 70 m AHD, and the surrounding topography consists of undulating hills that continue through the central section of the study area to the point where the proposed rail line intercepts the Logan River floodplain. From here, the topography remains generally flat through to Beaudesert. A series of ridges of up to approximately 250 m AHD run parallel to the west of the corridor from northern Flagstone southwards. More details on the topography of the study area can be found in Chapter 5, together with a description of the underlying geology and soil types.
Water resources

The northern section of the study area is located within the Oxley Creek sub-catchment of the Lower Brisbane River catchment. Oxley Creek runs roughly parallel to the proposed passenger rail line between Salisbury and Hillcrest and the corridor crosses a number of minor, east-to-west draining tributaries of this creek between Salisbury and the Logan River.

The proposed rail line intersects the Logan River catchment at Greenbank and crosses a series of west-to-east draining creeks within the Greater Flagstone area including Abrade, Flagstone and Sandy creeks. The majority of the southern section of the study area falls within the Logan River floodplain. Notable west-to-east draining tributaries of the Logan River within this section of the study area include Teviot Brook and Allan Creek.

Land uses

Notable existing land uses and areas of vegetation within the study area are shown in Figure 2.1 to Figure 2.4 and are summarised below. Detailed land use mapping is presented in Figure 5.27 to Figure 5.29 in Chapter 5.

The northern section of the study area is highly urbanised. The primary land uses from Salisbury to Algester consist of a mix of residential, industrial and commercial activities. Between Algester and the Logan Motorway, the proposed passenger rail line is abutted to the east by residential development and to the west by Paradise Road and areas of non-remnant vegetation associated with Oxley Creek. Between the Logan Motorway and Johnson Road the proposed passenger rail line passes through a large area of remnant vegetation consisting primarily of Eucalyptus species. South of Johnson Road the proposed rail line is bordered by residential development to the east and rural residential properties to the west.

The central section of the study area is dominated by rural and residential land uses. Large, rural residential properties abut the majority of the eastern border of the proposed passenger rail line from Greenbank to southern Flagstone and the western border of the corridor within Greenbank. The Greenbank Military Training Area consists of approximately 45 km² of intact remnant vegetation, formerly widespread throughout the region. The proposed passenger rail line passes through this property from chainage 961.5 km to 956 km between Hillcrest and Greenbank. From southern Greenbank southwards through Greater Flagstone, the proposed rail line is bordered to the west by large areas of relatively intact remnant vegetation in a mosaic of patches together with sections of regrowth vegetation. This mosaic is currently undergoing clearing for urban development.

The southern section of the study area is predominantly rural. This area is dominated by agricultural land uses, including cattle grazing and crop cultivation, with minor, isolated remnant areas of native vegetation scattered across the landscape. Small areas of rural residential properties are located in the eastern portion of the study area along the Mount Lindesay Highway. The town of Beaudesert itself is primarily residential and commercial in nature, and some areas of industrial development are located to the west of Beaudesert at Bromelton.
Figure 2.1
Land use—chainage 975 km to 964 km
Figure 2.2
Land use—chainage 963 km to 950 km
Figure 2.3
Land use—chainage 950 km to 935 km
Figure 2.4
Land use—chainage 935 km to 922 km
2.2.2 Summary of the proposal

As described in Chapter 1, the Salisbury to Beaudesert passenger rail line would consist of approximately 53 km of double-track, narrow gauge, electrified passenger rail line connecting to the existing Citytrain network near Salisbury Junction and terminating at Beaudesert. Both passenger tracks would be dedicated for commuter rail use and would be operated separately from the existing standard and narrow gauge freight lines.

In the northern and central sections of the study area, the Salisbury to Beaudesert passenger rail line is expected to generally follow the alignment of the existing interstate rail corridor. This existing corridor crosses a number of roads and waterways. These crossing points would need to be addressed during future stages of the rail design. Further consideration would also need to be given to the potential interface with the Acacia Ridge intermodal freight terminal.

Based on the assessment undertaken for this REF, new passenger rail stations would be located at Acacia Ridge, Algester, Hillcrest, Boronia Heights, Greenbank, New Beith, Flagstone and Undullah.

The southern section of the conceptual rail alignment would deviate in a south-easterly direction from the interstate rail line at Kagaru to connect with the disused Bethania to Beaudesert rail corridor at the intersection of Hopkins Lane and the Mount Lindesay Highway. From here the corridor would follow the general alignment of the Bethania to Beaudesert rail corridor southwards to Beaudesert. Deviations from this existing corridor would be necessary to accommodate the increased curve radii required to meet the proposed 140 km/h design speed of the alignment through this section. Stations would be located at Gleneagle North and Gleneagle. The terminal station would be situated within Beaudesert town centre.

Additional bridges would be required along the southern section of the alignment to facilitate the crossing of the Logan River and some minor creek systems. Where the proposed alignment traverses the Logan River floodplain, the tracks would be raised above the Q100 flood line by a combination of embankments and viaducts.

Chainages for the proposed alignment have been based on the chainages from Sydney to Brisbane, which run south to north along the existing interstate rail line. Chainages for the alignment commence at 976.825 km (Musgrave Road) and terminate at 922.100 km (Beaudesert town centre).

2.3 Existing transport corridors and service operations

2.3.1 Interstate rail corridor

The existing interstate standard gauge rail line extends 975.8 km between Sydney and Salisbury Junction and was built in the 1920s to connect New South Wales and Queensland. The existing alignment is a non-electrified dual gauge railway from the New South Wales – Queensland border to the northern end of the Acacia Ridge intermodal terminal. From Acacia Ridge to Roma Street the interstate rail line becomes an electrified dual gauge railway. This section of the line shares a ‘two track’ corridor with the Acacia Ridge to Salisbury narrow gauge rail for just over 1 km.
The Queensland section of the interstate rail corridor is currently owned by the Queensland Government, who lease it to DTMR, who sublease it to the Australian Rail Track Corporation (ARTC). ARTC currently manages contracts for infrastructure maintenance and planning. Since 2008 ARTC has been undertaking route improvement works including the installation of signalling systems, lengthening of existing sidings and the installation of dual gauge concrete sleepers and track.

The existing interstate line would remain on its current alignment, and is expected to be minimally impacted by construction of the new commuter tracks.

2.3.2 Bethania to Beaudesert rail corridor

This rail line was constructed in 1888 for the purpose of transporting agricultural products and passengers between Bethania and Beaudesert. Due to the low horizontal curve radii, the alignment has very low line speeds (less than 60 km/h). Queensland Rail services ceased in 1996 and the corridor was not used for rail traffic until a six month period in 2002–2003 when the alignment was used by Beaudesert Rail to run a heritage/tourist railway operation. The railway line has not been used since the failure of this operation in 2003. The corridor is therefore mostly unfenced and the remaining rail infrastructure is overgrown and in a state of disrepair.

2.3.3 Existing service operations

A single daily passenger train travels each way between Brisbane and Sydney. This Countrylink XPT train travels north from Sydney overnight, arriving at Roma Street station in Brisbane at 6.30 am. The return trip south to Sydney commences an hour later. An additional passenger train travels from Sydney to as far north as Casino in New South Wales before returning to Sydney. Passengers for destinations north of Casino use a bus link between Casino and Brisbane.

Currently an average of five freight trains travel daily each way along the interstate rail line. This number is forecast to almost triple by 2026. The proposed Southern Freight Rail Corridor link from Ipswich will tie into the interstate line near Kagaru, potentially generating additional freight traffic between Kagaru and Acacia Ridge.

2.4 Design criteria

Key design parameters are as follows:

- a stand-alone passenger rail line from the interstate rail line to Beaudesert
- the alignment to diverge from the existing interstate line between Kagaru and northern Bromelton, and connect with the disused Bethania to Beaudesert rail corridor before terminating at Beaudesert
- the proposal to consist of a double-track, narrow gauge, electrified rail system
- the alignment to be designed for a desirable minimum speed of 140 km/h
- no new or major at-grade road crossings of the alignment.
2.4.1 Rail formation and corridor width

The corridor within the southern section has been designed for a double-track railway, an access road and an adjacent cycle path. The majority of the design was undertaken using minimum track centres of 6.0 m between the two proposed passenger tracks.

Corridor width is also influenced by the depths of cuts and the heights of embankments. These parameters, coupled with those described above, would result in a proposed corridor width of 45–70 m between Kagaru and Beaudesert.

Overhead clearances have been set at 5.9 m for the proposed passenger rail line in conformance with Queensland Rail standards. Due to the electrified nature of the proposed railway system, the majority of the corridor would be fenced.

The engineering drawings are included within Appendix F for the new corridor between Kagaru and Beaudesert.

Horizontal alignment

South of Kagaru, the alignment traverses relatively flat, predominantly rural land, and the alignment has been generally designed for a speed of 140 km/h. As a consequence, where the existing Bethania to Beaudesert rail corridor is being followed, the proposed alignment would deviate off railway property and onto adjacent land to achieve the design speed. The exception to this is in the vicinity of Beaudesert where the proposed alignment would follow the existing corridor due to constraints such as the location of stations and an adjacent sewerage works. A design speed of 100 km/h was used for this section.

Vertical alignment

The maximum vertical gradient for the future passenger tracks is limited to 1 in 50 (2.00%) on straight track, with allowance for curve compensation on horizontally curved tracks. The maximum grade in stations is 1 in 200 (0.50%), with the majority of stations designed with flatter grades.

Grade separation of any existing road that would cross the finished railway within the southern section has been allowed for. There are several new roads proposed in the Scenic Rim area, and grade separations have been allowed for where the locations of crossings are known. Crossings for these locations, however, are still in the planning phase and could be moved in the future.

2.5 Bridges and structures

It is expected that existing road overbridges within the northern and central sections of the interstate rail corridor between Salisbury and Kagaru would need to be modified to accommodate the additional tracks. It is also expected that existing rail bridges over roads and waterways would require modification or duplication. This would need to be addressed during future stages of the design. Existing road and rail bridges along this section of the alignment are presented in Tables 2.1 and 2.2 below.

The alignment between Kagaru and Beaudesert passes through a floodplain and would require large openings to accommodate surface water flow. These openings would consist of culverts, bridges and viaducts including a 1.1 km long bridge which would
be required to cross the Logan River and Undullah Road. The locations of bridges and viaducts within this southern section are shown on Drawings BET903-C-DWG-101 to 124 in Appendix F and listed in Tables 2.1 and 2.2.

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Table 2.2  Road bridges

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2.6  Roads impacted by rail

2.6.1  Northern and central sections

Roads which are crossed by the existing interstate corridor are listed according to their state or local government designation below. Potential impacts on these roads would need to be considered during future stages of the design.

State controlled roads:

- Mount Lindesay Highway
- Brisbane Urban Corridor (Griffith Arterial Road)
- Logan Motorway (adjacent to Paradise Road Interchange).

Brisbane City Council (BCC) arterial roads:

- Beaudesert Road
- Boundary Road
- Learoyd Road.

BCC local roads:

- Musgrave Road
- Johnson Road (on the border of BCC and LCC).

Logan City Council (LCC) arterial roads:

- Middle Road
- Pub Lane
2.6.2 Southern section

The alignment would be crossed by three future arterial roads which are likely to become state controlled:

- Brookland Road (future north–south arterial connecting Flagstone to Bromelton)
- future inner bypass of Beaudesert
- proposed heavy vehicle bypass to Beaudesert business area.

Other local Scenic Rim Regional Council roads which would be affected by the rail alignment within the southern section include Kilmoylar Road, Undullah Road, Hall Road, Hiscock Road, Hopkins Lane, Walker Road, Allan Creek Road and Helen Street.

2.7 Rail systems

2.7.1 Electrification

To enable the running of electric traction rolling stock from Salisbury to Beaudesert, the entire route would be required to be electrified. The proposed electric traction system is a 25 kV overhead wire catenary installation. This would necessitate the installation of vertical steel structures at approximately 60 m intervals along the entire route.

Future design would need to consider the issues associated with the supply of power for this system, potential impacts on surrounding communications networks and the safety considerations surrounding the interface between high voltage electrification and the general public.

2.8 Stations

Following the constraints mapping and options analysis process, which is presented in Chapter 4, the following preferred station locations were identified.

Northern section
- Acacia Ridge
- Algester
- Hillcrest
- Boronia Heights

Central section
- Greenbank
- New Beith (proposed park and ride)
• Flagstone Central
• Undullah

**Southern section**

• Gleneagle North (proposed park and ride)
• Gleneagle
• Beaudesert

2.9 **Public utilities**

Major public utility interfaces with the existing interstate corridor which were identified during the course of this study include:

• high voltage transmission line crossings near Learoyd Road, Logan Motorway, and Pub Lane
• a large diameter water main crossing north of Learoyd Road (see Figure 2.5)
• a transmission pressure gas main along Paradise Road south of Learoyd Road.

![LARGE WATER MAIN CROSSING NORTH OF LEAROYD ROAD](image)

More detailed investigations into public utility locations and interfaces should be undertaken during subsequent phases of this proposal.

2.9.1 **Powerlink**

There are four locations where Powerlink high voltage alignments presently cross the existing interstate corridor. Powerlink is planning additional overhead and underground transmission installations between the Algester and Larapinta substations and thus would be an important future stakeholder.
2.9.2 Telecommunications
Telstra and other telecommunications carriers would have a number of installations across and possibly within the existing interstate corridor, particularly within the more urban parts of the study area. These would need to be identified during subsequent stages of the design.

2.9.3 Electricity reticulation
As in the case of telecommunications, underground and overhead reticulation plant would be identified by the relevant authority during subsequent stages of the design.

2.9.4 Local authority services
Local authority services include water and sewerage reticulation lines. Some of these utilities cross the existing corridor, frequently on overhead structures. The extent of local authority service installations and the managing of any protection or relocation of these services would also form part of the future design process.

2.10 Construction staging
A staged implementation strategy for the construction of the future passenger railway would be developed during subsequent phases of design. Additional construction staging strategies would also need to be developed to address issues such as:

- traffic management
- alternative dry and wet construction programs
- existing rail network access
- temporary works
- accommodation works and access requirements
- construction of rail and road bridges
- construction of new road alignments
- construction of earthworks
- construction of stations and services.

The full implications of any staging options would require careful consideration given the potential construction impacts on local communities resulting from issues such as noise, dust and traffic diversions. Early local consultation would form an integral part of the development of any construction staging strategies.

2.11 Construction activities
Significant levels of construction activity would be required to construct the proposed passenger rail line, stations and associated infrastructure. Currently the construction of the rail line is expected to commence after 2026 (Draft Mt Lindesay/Beaudesert Strategic Transport Network Investigation: Post-2026 Public Transport Connections, DTMR 2009). These timescales will be subject to funding and expected patronage demand.
Given the limitations of the current level of design and the considerable amount of time before construction commences, the likely nature of proposed construction activities is not yet defined in any detail. The following section therefore provides an outline of the construction activities which would potentially be associated with the proposed passenger rail line.

2.11.1 Plant and equipment

Typical plant and equipment types for a rail construction project such as the proposed Salisbury to Beaudesert rail line would include:

- light transport vehicles
- excavators
- bulldozers
- wheel loaders
- graders
- scrapers
- backhoes
- heavy trucks
- tip trucks (fill/ballast)
- water trucks
- rollers
- concrete cutting saws
- cranes
- concrete pumps
- concrete trucks
- pile drivers
- wood chippers/mulchers
- track laying machinery
- generators
- compressors
- assorted small items of equipment.

The requirement for the machinery listed would depend on the stage of construction, and not all plant listed would be on site at any given time.

2.11.2 Workforce

The construction is likely to be undertaken by private contractors. The number of personnel in the workforce during the peak of construction activities is currently unknown, but is likely to be in the order of hundreds of people. A large proportion of
the workforce is expected to be from the South East Queensland region. Although parts of the proposed rail line are located in an essentially rural area, the entire alignment is within easy travelling distance of major towns such as Beaudesert or the urban areas of Brisbane and Logan. These localities are likely to have ample housing and facilities to support those workers who do not already live locally.

2.11.3 Associated temporary facilities

A number of construction compounds would be required along the length of the alignment to secure plant outside hours, to store construction materials, and to house workforce day facilities such as offices, the mess huts and ablutions facilities. It is also likely that a number of self-contained portable toilets would be located elsewhere along the site. Consideration should be given to constraints such as watercourses and significant vegetation when siting temporary facilities.

2.11.4 Major construction activities

Construction activities would occur in two phases: firstly, the construction of the earthworks up to the top of formation; and secondly, the construction of the rail infrastructure.

Formation works

- vegetation clearing and top soil stripping
- preliminary drainage works, including the construction of ‘cutoff’ drains and some sedimentation basins
- earthworks
- major drainage works, including the construction of cross-drainage culverts and formation of table drains, and construction of remaining sedimentation basins
- installation of drainage and culverts
- trimming and compacting of subgrade
- scour protection works and landscaping

Associated infrastructure works

- realignment of roads and road furniture
- construction of rail/road bridges
- construction of stations and station car parks
- diversion and protection of utilities

Overhead electrification work

- installation of mast foundation, dressing and erection of masts
- installation of balance weights, mid-point anchors and ties
- running of ancillary wires and catenary wires
Track work
- relocating existing tracks where required
- initial ballast laying
- laying of mainline sleepers
- placing continuously welded rail strings on sleepers
- clipping rail to sleepers
- ballast laying and track tamping
- de-stressing of rail strings and final welding
- installation of turnouts and crossovers
- installation of insulated rail joints and other signal system requirements
- final alignment of track

Signalling work
- installation of signal, huts, equipment rooms and automatic warning systems
- installation of mechanical points
- installation of main and local cables

Telecommunication work
- installation of transmission and data networks
- installation of main and local cables
- installation of station services (closed circuit television, public address system, ticket machines and passenger information)

Power distribution work
- installation of track section cabins
- installation of feeder station
- installation of auxiliary and booster transformers
- installation of main and local power cables

2.11.5 Existing rail activities
Approximately 36 km of the construction work would be adjacent to the existing interstate rail line and many activities are likely to be undertaken in close proximity to the operational interstate railway. Construction activities therefore have the potential to impact on the operation of the existing interstate railway. Consultation and careful planning would be required to avoid major disruptions to this service. Furthermore, clear responsibilities would need to be agreed and implemented between the existing interstate rail operators and the principal contractor, to ensure that the necessary safety protocols were followed.
Construction of the line through the existing Acacia Ridge intermodal terminal would require consultation with terminal stakeholders, as this element of works may disrupt terminal operations.

### 2.12 Demand on resources

The construction of the proposed railway system would require a range of construction material supplies from local and wider regional resources. These resources are likely to include:

- fill
- ballast
- concrete (sleepers and structures such as bridge decks)
- steel
- water
- fuels and oils
- labour resources.

Initial estimates indicate that construction of the rail formation within the southern section would require a volume of excess fill in the order of 75,000 m³. The total cut to fill balance produced by construction of the overall passenger rail line is currently unknown and would need to be investigated in future. This would enable an assessment into the potential impacts on local and regional supplies of fill.

Further studies would need to be undertaken during future design stages to quantify other resource requirements such as the volumes of ballast, concrete and steel required to construct the railway. The impacts of potential resource requirements on local and regional supplies would then need to be assessed following identification of the necessary supply sources.

### 2.13 Waste management

Waste management issues associated with construction of the proposed passenger line would primarily be linked to the construction phase, and would include:

- handling and disposal of cleared vegetation
- handling and disposal of excess or unsuitable fill and road building materials
- collection and disposal of construction debris and domestic rubbish
- handling and storage of dangerous goods including fuels, oils, greases or other chemicals
- the provision of toilet/washroom facilities, and the collection and disposal of wastewater.

The overriding principles applied to waste management would be to minimise the amount of waste generated, reuse and/or recycle wastes wherever possible, and dispose of the remainder in a responsible manner.
2.14 Cost estimate

The estimated total project development cost of the proposed passenger rail line described in this REF is $1.2–1.8 billion based on today’s values. This has been estimated based on similar constructed projects.
3 Planning background

3.1 Protecting the corridor

The coordination of transport and land use planning is a core principle of the South East Queensland Regional Plan 2009–2031 (SEQ Regional Plan) and a key function of the Department of Transport and Main Roads (DTMR) under the Transport Planning and Coordination Act 1994 (TPC Act). Early identification of the preferred corridor between Kagaru and Beaudesert will minimise the potential for conflict with surrounding land uses in the future. There are two main processes available to DTMR for protecting the preferred corridor. These are:

- using powers under the Sustainable Planning Act 2009 (SPA) and the TPC Act to identify the corridor in statutory land use planning documents
- designating land required for the preferred corridor for community infrastructure under Chapter 5 of the SPA.

DTMR’s preferred approach is to use its powers under the SPA and the TPC Act to identify the preferred corridor in the local planning scheme for the Scenic Rim Regional Council area (which is currently under review) and other land use planning documents, such as the SEQ Regional Plan. The department would then act as a referral agency for development applications under the SPA which may impact the preferred corridor.

Where DTMR is a referral agency or assessment manager for development applications affecting a future public transport corridor or future public passenger transport facility, it must assess the extent to which it meets the land use and transport coordination criteria set out by Part A of the TPC Act.

DTMR proposes to undertake early concept design and a non-statutory assessment of potential impacts associated with the future passenger rail line to ensure that the corridor protected is feasible with respect to engineering and environmental constraints.

3.2 Legislative framework

3.2.1 Environment Protection and Biodiversity Conservation Act 1999

The Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act) provides protection for matters of national environmental significance (NES). Matters of NES potentially relevant to the proposal include:

- the threatened ecological community of the Swamp Tea-tree (*Melaleuca irbyana*) forests of South East Queensland
• threatened species
• migratory species (see Section 5.6).

An action that has, will have, or is likely to have a significant impact on the environment on Commonwealth land also requires approval from the Australian Government under the EPBC Act. The existing interstate rail corridor bisects the Greenbank Military Training Area, which is a Commonwealth Heritage Place on Commonwealth land.

Referral decision

Under the EPBC Act, anyone undertaking an action that may have a significant impact on matters of NES or actions affecting Commonwealth land must submit a referral to the Australian Government Minister for the Environment to determine whether the project requires assessment and approval by the Commonwealth. The Minister may determine that a project is:

• ‘not a controlled action’, where an action is not expected to have a significant impact, and no formal assessment is required for the development to proceed. The minister may also specify that the action is to be undertaken in a ‘particular manner’ to avoid significant impact
• a ‘controlled action’, where potential impacts on matters of NES or Commonwealth land are considered to be significant, and formal assessment and approval under the EPBC Act is required.

3.2.2 Native Title Act 1993

The Native Title Act 1993 (NT Act) provides recognition for the rights and interests over land and water possessed by Australian indigenous people under traditional laws and customs. Native title is generally held to be extinguished on freehold land, but may still exist on lands held in leasehold or other unallocated state land affected by the proposed rail corridor.

The NT Act provides for native title parties to be notified of ‘future acts’ which may affect native rights. Section 24KA of the NT Act contains specific provisions for dealing with future acts involving construction, operation, use, maintenance and repair of public infrastructure and services. These provisions allow public infrastructure projects to proceed insofar as they do not prevent the enjoyment of native title rights under the Act. Figure 3.1 indicates native title claims current for the study area at April 2010.
Figure 3.1
Current native title claims
As shown on Figure 3.1, the Jagera people have a native title claim application over parts of the study area and, in future, would need to be notified of any ‘future acts’ which may affect their native title rights.

### 3.2.3 State legislation

This section discusses Queensland legislation which needs to be considered as part of the REF. It should be noted that, due to the long time horizons associated with the development of the passenger rail line, these requirements would need to be reviewed in future, should the project proceed.

**Sustainable Planning Act 2009**

All aspects of development for the maintenance, repair, upgrading, augmentation or duplication of rail transport infrastructure are exempt from assessment against a planning scheme pursuant to Schedule 4, Table 5, Item 8 of the Sustainable Planning Regulation 2009 (SP Regulation). Additional passenger tracks, railway stations and associated facilities may be considered to constitute the ‘augmentation’ of rail transport infrastructure associated with Queensland Rail’s existing Citytrain network; however, this would need to be resolved in consultation with the Department of Infrastructure and Planning or any other relevant authority at the time of application.

Railway lines, stations and associated facilities are also prescribed as community infrastructure under Schedule 2 of the SP Regulation. Under Chapter 5 of the SPA, a minister or local government may designate land for community infrastructure; however, DTMR’s preferred approach is to protect the corridor using powers under the TPC Act as outlined in Section 3.1.

It should be noted that no development approvals would be sought for the passenger rail line at this stage of the study. Development approvals would need to be sought as part of the detailed design process, should the project proceed in future.

**Environmental Protection Act 1994**

The *Environmental Protection Act 1994* aims to protect the environment while still allowing for development that is ecologically sustainable. This Act also regulates environmentally relevant activities (ERAs) prescribed in the *Environmental Protection Regulation 2008*. ERAs are activities that are considered to have the potential to cause environmental harm. The following ERAs could apply to the project; however, these would need to be reviewed in future:

- ERA 8  – Chemical storage (which includes chemicals used in herbicides and pesticides)
- ERA 16 – Extraction
- ERA 43 – Concrete batching
- ERA 57 – Regulated waste transport (for removing and disposing of industrial waste from construction sites).
Vegetation Management Act 1999

The Vegetation Management Act 1999 protects native vegetation by regulating vegetation clearing in terms of the types and areas of vegetation that can be cleared, and how the clearing may be undertaken. A certification is required under Section 22A of this Act to confirm that any clearing undertaken is for a ‘relevant purpose’. This certification must be obtained before an integrated development assessment system (IDAS) application can be lodged.

Fisheries Act 1994

The Fisheries Act 1994 protects Queensland’s fishery resources by setting out requirements for the use, conservation and enhancement of fishery resources and fish habitat. The proposed railway crosses a number of waterways and so approval may be required under the Fisheries Act for those development activities that would pose a temporary or permanent barrier to fish movement.

Water Act 2000

The Water Act 2000 protects Queensland’s water resources by setting out requirements for development or use of the state’s water resources. Where the railway crosses a waterway, approval may be required under this Act to take or interfere with water, or destroy or remove vegetation within the watercourse.

Nature Conservation Act 1992

The Nature Conservation Act 1992 aims to conserve nature through a comprehensive statewide conservation strategy that includes education and communication, designating and protecting certain areas, and protecting native wildlife and habitat. Recent amendments to this Act mean that permits are now required from the Department of Environment and Resource Management where a proposed activity involves the taking of any native fauna or flora (including vegetation clearing).

In some cases a general permit for the taking of certain species in the wild may be issued to a government agency or government owned corporation. This permit should cover any clearing of such species for this proposal. A separate permit would then be required for taking endangered, rare and vulnerable species if these are present.

Aboriginal Cultural Heritage Act 2003

The Aboriginal Cultural Heritage Act 2003 protects indigenous cultural heritage through duty of care provisions and by setting out requirements for cultural heritage management plans. Section 5.9 of this report discusses the potential cultural heritage impacts of this proposal in detail.

3.2.4 Queensland Government Environmental Offsets Policy

The Queensland Government Environmental Offsets Policy outlines the basic principles and guidelines for applying environmental offsets in Queensland. An environmental offset is defined as an action taken to counterbalance unavoidable negative impacts on the environment resulting from an activity or development.

There are two specific-issue policies that are relevant to this proposal:
• Policy for Vegetation Management Offsets—which sets out specific guidance for offsetting impacts on native vegetation

• Offsets for Net Benefit to Koalas and Koala Habitat—which sets out specific guidance for offsetting impacts on koalas or koala habitat.

The draft Biodiversity Offsets Policy may also need to be considered in future.

3.2.5 State planning policies

In accordance with the SPA, the following state planning policies (SPPs) may be in effect at the time when development applications are assessed.

SPP 1/03 Mitigating the adverse impacts of flood, bushfire and landslide

SPP 1/03 aims to ensure that development in areas at risk from flood, bushfire and landslide take appropriate account of these risks to protect property and human life. Planning scheme overlay maps for Brisbane, Logan and Scenic Rim local government areas identify a number of locations at risk of natural hazards resulting from flood or bushfire. While this policy does not impose requirements for any additional approvals, safety and environmental management plans for the construction and operation of the railway may need to consider risk from bushfire, flooding or landslide.

SPP 1/92 Development and the conservation of agricultural land

SPP 1/92 aims to protect good quality agricultural land (GQAL) from development encroachment. This is relevant in the southern section of the study area which traverses land classified as Class A—arable land, Class B—limited arable land and, in some cases, Class C1 land that is considered to be GQAL. The government’s policy position as described in this SPP is that GQAL should not be built on unless there is an overriding need for the development. Potential impacts on GQAL are discussed in further detail in Section 5.1.

SPP 2/02 Planning and managing development involving acid sulphate soils

In coastal local government areas (including Brisbane and Logan), SPP 2/02 applies where disturbance may occur to land, soils and sediment at or below 5 m Australian Height Datum (AHD) where the natural ground level is less than 20 m AHD. Preliminary reviews identified that there is no potential for acid sulphate soils to be affected by the corridor construction (see Section 5.1).

SPP 2/07 Protection of extractive resources

SPP 2/07 identifies extractive resources of state or regional significance (key resource areas or KRAs) where extractive industry development is appropriate in principle, and aims to protect these resources from development that might prevent or constrain extraction when the need for the resource arises. There are no KRAs potentially affected by the proposed rail corridor.
South East Queensland Koala State Planning Regulatory Provisions

The South East Queensland Koala State Planning Regulatory Provisions place restrictions on the kinds of development occurring in areas of protected koala bushland habitat or the interim koala habitat protection area. These provisions are currently under review and will be superseded by the forthcoming SEQ Koala Conservation State Planning Policy (currently at draft stage) and state planning regulatory provisions in the near future. In the interim, current areas of mapped koala habitat have been noted as part of this study.

3.2.6 Local government

The study area traverses three local government areas: Brisbane City, Logan City and the Scenic Rim Region. Local laws are laws set out by a local government in order to manage locally specific issues. These laws achieve that aim by regulating actions or activities through permitting and licensing requirements. The local laws that are relevant to this proposal are discussed in Chapter 8–Approvals and licensing.