

CHAPTER SIX

PROJECT BENEFITS



CHAPTER 6

PROJECT BENEFITS

CHAPTER SUMMARY AND CONCLUSIONS:

- The CRR Project offers significant city-building, transport and economic benefits. It will help create vibrant, connected and liveable communities, provide a frame around which Brisbane can grow and improve public transport between homes, workplaces and social infrastructure across the region.
- The CRR Project will enable the growth of SEQ to be more sustainably managed by providing additional transport capacity into key employment growth areas, improving intercity connectivity and promoting urban renewal around new station precincts.
- It will allow rail network expansion projects to commence into emerging residential areas, connecting new residents with jobs, services and community facilities.
- The CRR Project will unlock more than 300 kilometres of highly accessible rail network by removing inner-city capacity constraints, significantly increasing the transport capacity of the existing SEQ rail network.
- The CRR Project will influence land-use patterns and increase infill development, acting as a catalyst for urban renewal around the new stations. By providing well-designed urban spaces within each station precinct, the CRR Project will enrich Brisbane's network of public spaces.
- The CRR Project will:
 - double public transport capacity across the river into Brisbane CBD from the south, providing ultimate capacity for 24 rail services per hour in each direction
 - increase daily public transport patronage in 2026 by 9,000 passengers and 23,000 passengers in 2036
 - reduce private vehicle kilometres travelled by 526,000km per day
 - provide significant relief in public transport crowding (a 24 per cent decrease in daily crowded hours in 2026 and 29 per cent in 2036)
 - provide accessibility and interchange opportunities, with a new CBD station and further interchange opportunities at Roma Street and the new southern stations at Woolloongabba and Boggo Road.



6.1 Purpose and Overview of this Chapter

The purpose of this chapter is to present the benefits expected from delivering the Reference Project. The projected benefits are based on analysis of the key problems identified in Chapter 3: Problem. This chapter demonstrates how the CRR Project will address identified problems.

This chapter outlines:

- Strategic benefits – those provided by the CRR Project at the strategic level, with a focus on enhancing economic growth and productivity by improving accessibility and connectivity between population and employment centres.
- Transport network benefits – including the CRR Project’s impact on road congestion, future public transport demand and the freight task.
- Rail benefits – that will enable the rail network to more effectively perform its desired role including improved service frequency, journey times and costs, network reliability, resilience and reduced overcrowding.

The benefits of the CRR Project have been derived through detailed rail and transport modelling. This is supported by detailed operational modelling, which has been used to determine the optimal allocation of rail services on the network. The results of the transport modelling for the Reference Project, including any sensitivity testing, are presented in this chapter.

Table 6.1 summarises the relationship between the benefits sought by the CRR Project and those that can be expected. The CRR Project Benefits have been aligned with the objectives of the State Infrastructure Plan (SIP). Chapter 14: Implementation Plan outlines how these benefits will be maximised and monitored through the development of a benefits management plan.



PROJECT BENEFITS

BENEFITS SOUGHT

Note: SIP objectives:

1. improving prosperity and liveability
2. infrastructure that leads and supports growth and productivity
3. infrastructure that connects our communities and markets
4. improving sustainability and resilience.

CRR BENEFITS EXPECTED

MAINTAIN DESIRED LEVELS OF ECONOMIC GROWTH AND PRODUCTIVITY

- Connect people, places and businesses to the Brisbane CBD, the economic heart of the region.
- Provide new and improved opportunities to connect to markets and improve productivity.
- Provides new stations in the inner city's key employment hubs and urban growth areas, namely the southern CBD, Woolloongabba, Bowen Hills, Roma Street and Boggo Road. The southern CBD and Woolloongabba currently do not have passenger rail access.
- Allows rail network expansion projects to commence with adequate service levels e.g. rail connection to the new population centre at Flagstone.
Links to SIP objectives 2 and 3 (see table note)

IMPROVE ACCESSIBILITY AND CONNECTIVITY BETWEEN POPULATION AND EMPLOYMENT CENTRES

- Increase accessibility to more areas of the CBD and inner city.
- Maximise agglomeration benefits at key growth locations in the CBD and inner city.
- Allow the rail network to expand to connect new communities e.g. Flagstone.
- Improve accessibility at local and regional levels.
- Improve access for people who are transport disadvantaged.
- Increases the proportion of the population in metropolitan Brisbane within 30 minutes of employment to 20 per cent in 2026 with the CRR Project from 15.2 per cent in 2015 without the CRR Project.
- Doubles the rail capacity across the Brisbane River and through CBD from the south.
- Increases peak period public transport capacity through the CBD from 86 to ultimately 134 trains per hour.
Links to SIP objectives 1, 2 and 3



PROJECT BENEFITS

BENEFITS SOUGHT

OPPORTUNITY FOR CITY-BUILDING AND URBAN GROWTH

- Provide the frame around which the city grows.
- Facilitate and catalyse urban renewal opportunities at station precincts.
- Improve the level of transport service, triggering further urban consolidation around rail corridors.
- Provide new stations in key inner-city growth areas.
- Avoid externalities such as emissions and congestion costs.

CRR BENEFITS EXPECTED

- Provides new stations in the inner city's key employment hubs and urban growth areas, namely the southern CBD, Woolloongabba, Bowen Hills, Roma Street and Boggo Road. The southern CBD and Woolloongabba currently do not have passenger rail access.
- Reduces private vehicle kilometres travelled by 526,000km per day by 2036, considerably reducing greenhouse gas emissions (carbon dioxide) compared to 'without' the CRR Project.

Links to SIP objectives 1, 2, 3 and 4

REDUCE CAR DEPENDENCY AND ROAD CONGESTION

- Reduce road congestion and associated costs.
- Enable more efficient use of scarce road space, allowing for greater business travel and good access for road-based public transport and freight.
- Improve access to the inner city, the location of high-productivity jobs, for more community members.
- Reduce reliance on private vehicle access to the CBD.
- Reduce journey times and improve accessibility for a larger portion of the resident population.

- Reduces the number of private vehicles entering the CBD in the morning peak by 1,300.
- Increases the mode share of public transport in the region from 6.8 per cent currently to 11.2 per cent in 2036.
- Avoids costs to the economy of \$240 million annually in 2036 due to road congestion, compared to 'without' the CRR Project.

Links to SIP objectives 1 and 3



PROJECT BENEFITS

BENEFITS SOUGHT

CATER FOR PUBLIC TRANSPORT DEMAND

- Provide a 'step change' in public transport capacity.
- Meet forecast demand.
- Enable connections to growth areas.
- Increase service frequency.
- Reduce crowding.
- Increase incremental fare revenue.
- Achieve a mode shift to rail.
- Provide better interchanges with bus network.
- Allow bus network operational changes (feed to rail) and more efficient use of the bus network.

IMPROVE SUPPLY CHAINS

- Improve connectivity to markets by both road and rail freight.
- Improve leverage of rail freight opportunities.

ENSURE RAIL PERFORMS DESIRED ROLE

- Ensure capacity to meet long-term demand forecasts.
- Unlock SEQ rail network capacity, enabling the network to expand and meet demand.
- Increase service frequency.
- Improve accessibility.
- Reduce journey times.
- Increase service reliability.

CRR BENEFITS EXPECTED

- Doubles the rail capacity across the Brisbane River and through CBD, from the south.
- Allows for a doubling of rail demand by 2026 and almost a tripling of demand by 2036 to be carried on the rail network.
- Results in higher public transport use across the region with an increase of 23,000 trips per day in 2036 compared to 'without' the CRR Project.
- Reduces overcrowded conditions by 14,000 hours per day in 2036 on the rail network or 29 per cent.

Links to SIP objectives 1, 3 and 4

- Maintains sufficient rail freight paths across the network.

- Enables faster travel speeds and trip times for commercial vehicles on the road network.

Links to SIP objective 3

- Increases the share of journeys (as a proportion of all trips, including those made by car) made by rail to the CBD from 46.6 per cent without the CRR Project to 50.5 per cent with the CRR Project in 2036.

- Enables up to 24 trains per hour to move through the inner city, in each direction.
- Enables a train to depart Boggo Road/Park Road every minute by 2036.

Links to SIP objectives 2, 3 and 4



PROJECT BENEFITS

BENEFITS SOUGHT	CRR BENEFITS EXPECTED
INCREASE SERVICE FREQUENCY <ul style="list-style-type: none">▪ Increase the frequency of services.▪ Enable a mode shift to rail.	<ul style="list-style-type: none">▪ Enables 102 services accessing the CBD in the morning peak hour in 2026 with an ultimate capacity of 134 services. <i>Links to SIP objectives 2, 3 and 4</i>
COMPETITIVE JOURNEY TIMES AND COST <ul style="list-style-type: none">▪ Reduce travel time, across all transport modes.▪ Reduce wait times.▪ Enable a mode shift to rail.▪ Provide better interchange opportunities with the bus network.	<ul style="list-style-type: none">▪ Reduces journey times across the network to the southern CBD.▪ Reduces wait times through more frequent services. <i>Links to SIP objectives 3 and 4</i>
IMPROVE NETWORK RELIABILITY AND RESILIENCE <ul style="list-style-type: none">▪ Provide an alternative route and improved resilience in the core rail network.▪ Reduce downtime due to incidents.▪ Increase customer confidence in the rail system.	<ul style="list-style-type: none">▪ Improves on-time running of trains.▪ Provides a second corridor through the inner city, minimising disruption during incidents. <i>Links to SIP objective 4</i>
REDUCE OVERCROWDING <ul style="list-style-type: none">▪ Reduce crowding.▪ Make the customer experience more comfortable.▪ Increase service reliability.	<ul style="list-style-type: none">▪ Reduces the percentage of commuters standing on scheduled Gold Coast services to less than 25 per cent and those standing longer than 20 minutes to less than five per cent in 2036. <i>Links to SIP objectives 1 and 2</i>

Table 6.1: Summary of CRR Benefits Expected



6.2 Strategic Benefits

The Australian Government, in the State of Australian Cities 2014–15 report, recognises that Australia’s cities are important gateways to the global economy. Major cities generate much of Australia’s gross domestic product and contain most of the nation’s key economic infrastructure, which supports industries across the country. Importantly, the report highlights that cities also host most of Australia’s jobs. In this way, a city’s transport system has an important role to play in supporting productivity improvements and enabling the city to deliver economic benefits to the national economy.

The CRR Project will position Brisbane and SEQ for a more productive and competitive future. Specifically, the CRR Project will unlock more than 300 kilometres of highly accessible rail network by removing inner-city capacity constraints and significantly increase the transport capacity of the existing SEQ rail network. The CRR Project will also enable the rail network to expand into emerging residential areas by increasing the capacity of the inner-city network, connecting new residents with jobs, services and community facilities.

Investment in the CRR Project will also facilitate city-shaping outcomes consistent with SEQ’s strategic planning policies. These are outlined in the State Infrastructure Plan (SIP), which identifies the need for public transport solutions to support SEQ’s strong growth. Shaping SEQ also articulates a vision for more compact communities. It supports higher residential densities and clustering of employment and other activities along existing and planned public transport corridors.

Supporting this, Connecting SEQ 2031 specifically recognises the importance of public transport in facilitating urban infill targets within regional activity centres and along priority transit corridors. The CRR Project offers a unique opportunity to realise the collective policy vision of compact communities in close proximity to employment, education and recreational opportunities.

6.2.1 Economic Growth and Productivity

At a strategic level, the CRR Project will support economic growth and productivity through improved accessibility and connectivity and Brisbane’s city-building ambitions by enabling infill development and urban renewal. These outcomes will facilitate inner-city employment growth, as well as improved health, education and lifestyle opportunities across the region.

Transport infrastructure shapes cities. Infrastructure investments have the power to influence a city’s size, shape and employment patterns and determine its attractiveness as a place to live, work, visit and do business.

6.2.1.1 Improved Accessibility

Shaping SEQ identifies a network of regional activity centres suitable for concentrated businesses, services and facilities for employment, research and education, as well as higher density residential development serving a regional population. The presence of well-functioning centres will assist in achieving a high level of self-containment of each subregion, reducing the need to travel across the region for work, education, shopping and entertainment.

The CRR Project will support the development of regional areas by enabling the rail network to connect principal regional activity centres to Brisbane’s CBD. This will allow these centres to become vital nodes in the city’s economic network.



The CRR Project will significantly improve:

- access to high-growth employment areas
- linkages to major planned renewal areas and education precincts
- public transport capacity to the city's premier sporting and events facilities
- direct access to each of the major public and private health facilities in the inner city.

Without the CRR Project, the ability to connect principal regional activity centres to Brisbane's CBD via high-quality transit links will be compromised. Inevitably, this will reduce the activity centre's ability to reach a critical mass and lead to more dispersed regional activities and a more car-dependent region.

Accessibility modelling indicates that the proportion of the population in metropolitan Brisbane within 30 minutes of employment would increase to 20 per cent in 2026 with the CRR Project compared to 15.2 per cent in 2015 without the CRR Project.

6.2.1.2 Inner-City Connectivity

Transport and accessibility are consistently identified as key factors determining the economic performance, attractiveness and liveability of a city or region. A critical opportunity exists to boost the competitiveness of Brisbane and SEQ through targeted investment in core infrastructure, particularly public transport, to improve the city's connectivity. The State of Australian Cities 2014–15 report (DIRD) outlines how large-scale investments in Melbourne's transport have impacted long-term economic and land-use outcomes. For example, Melbourne's City Loop rail project (completed in 1985) added an estimated \$10.4 billion to the Melbourne economy in 2011, largely through clustering an estimated additional 74,000 jobs in central Melbourne. The project also facilitated significant development at Southbank and in Docklands.

The CRR Project will establish rapid, high-frequency connections between some of Brisbane's primary inner-city destinations and activity areas. A new Albert Street station will support the ongoing development of the CBD and the emergence of a vibrant mixed-use residential, employment and retail precinct adjoining the City Botanic Gardens. It also provides direct access to the financial district, the new Queen's Wharf Brisbane integrated resort development, the government precinct and Queensland University of Technology (QUT) at Gardens Point.

New CRR platforms at Roma Street will support continued development of commercial and mixed-use activities in the city's north quarter and preserve long-term city expansion opportunities associated with this precinct.

A new station at Woolloongabba will support the planned renewal of Woolloongabba Central, particularly the Woolloongabba priority development area (PDA) and Kangaroo Point South.

The new station at Boggo Road will support the continued development of the Boggo Road Urban Village, planned growth at Buranda, and improved access to The University of Queensland (UQ) campus and the Princess Alexandra Hospital and associated health, medical and eco-science activities.

6.2.1.3 Agglomeration Benefits

The emerging global economy will rely more heavily on a talented workforce involved in diverse industries. The quality of people that a city, region, state or nation can attract is fundamental to its economic performance. Evidence indicates that while job opportunities remain an important driver, more people are choosing to live and work based on lifestyle and quality-of-life factors.



The State of Australian Cities 2014–15 report states that labour mobility and voluntary migration for economic gain are a part of agglomeration, where educated workers gain from being in close proximity to others, so human capital flows to where it is abundant, not where it is scarce. This agglomeration process contributes to the boosting of the productivity of cities. The report also identifies that city centres are increasingly becoming the single largest location of employment.

The CRR Project will directly support inner-city growth projections by providing additional transport capacity into key employment growth areas.

6.2.1.4 Connecting New Communities

The relationship between mass transit and land use is well documented. A number of studies have concluded that the existence or introduction of rail is a significant driver of development activity and opportunities to manage population growth.

The increased transit amenity provided by heavy rail results in a number of outcomes including:

- the probability that access to mass transit is likely to encourage individuals and families to relocate to areas where accessibility to mass transit is improved
- the increased likelihood that workers will commute to work via rail where they reside in close proximity to railway stations
- high-density developments located in or around business districts, or close to mass transit stations, that can support a higher population of workers located closer to their workplaces.

International research has found that access to mass transit can lead or follow land use; however, in all cases, improving land-use outcomes must follow some form of mass transit network. If the existing mass transit network is insufficient to support higher density land uses, then higher density outcomes are unlikely to be achieved.

The CRR Project will enhance the existing rail network to the point where it can influence land-use patterns and development activity in an efficient and sustainable manner. The cycle of transport supply and accessibility will encourage individuals and families to reside near railway stations, necessitating development activity that supports higher density living.

Without the CRR Project, the transit capacity provided by the rail network will be constrained. This, in turn, will limit the ability for the passenger rail network to support the urban development densities envisaged in Shaping SEQ. Pressure to expand the urban footprint will increase, leading to greater levels of urban sprawl and related negative social, environmental and economic impacts.

Achieving the outcomes outlined in Shaping SEQ will be supported by targeted investment in the transport network, which will lead the pattern and pace of development to achieve the best land-use outcomes. The CRR Project will help realise SEQ's growth management aims by encouraging infill development in areas close to transport corridors, facilitating sustainable, compact settlement patterns and planned residential growth in key locations.

The planned development of a number of strategic regional development areas, in particular, Caloundra South, Flagstone, Fitzgibbon, Coomera and Yarrabilba relies on good transport accessibility. Each of these locations lies within the northern and southern catchments of the rail network, which will be directly supported by the CRR Project.



Without the CRR Project, the ability to connect new towns and principal activity centres by high-quality transit will be compromised. The result will be car-dependent communities, more congestion and greater growth for road space.

6.3 Opportunities for City Building and Urban Growth

The CRR Project is a once-in-a-generation, city-changing project. It will position Brisbane and the broader region for a more sustainable and competitive future through support of a more compact urban form, a vibrant inner-city centre and a connected region.

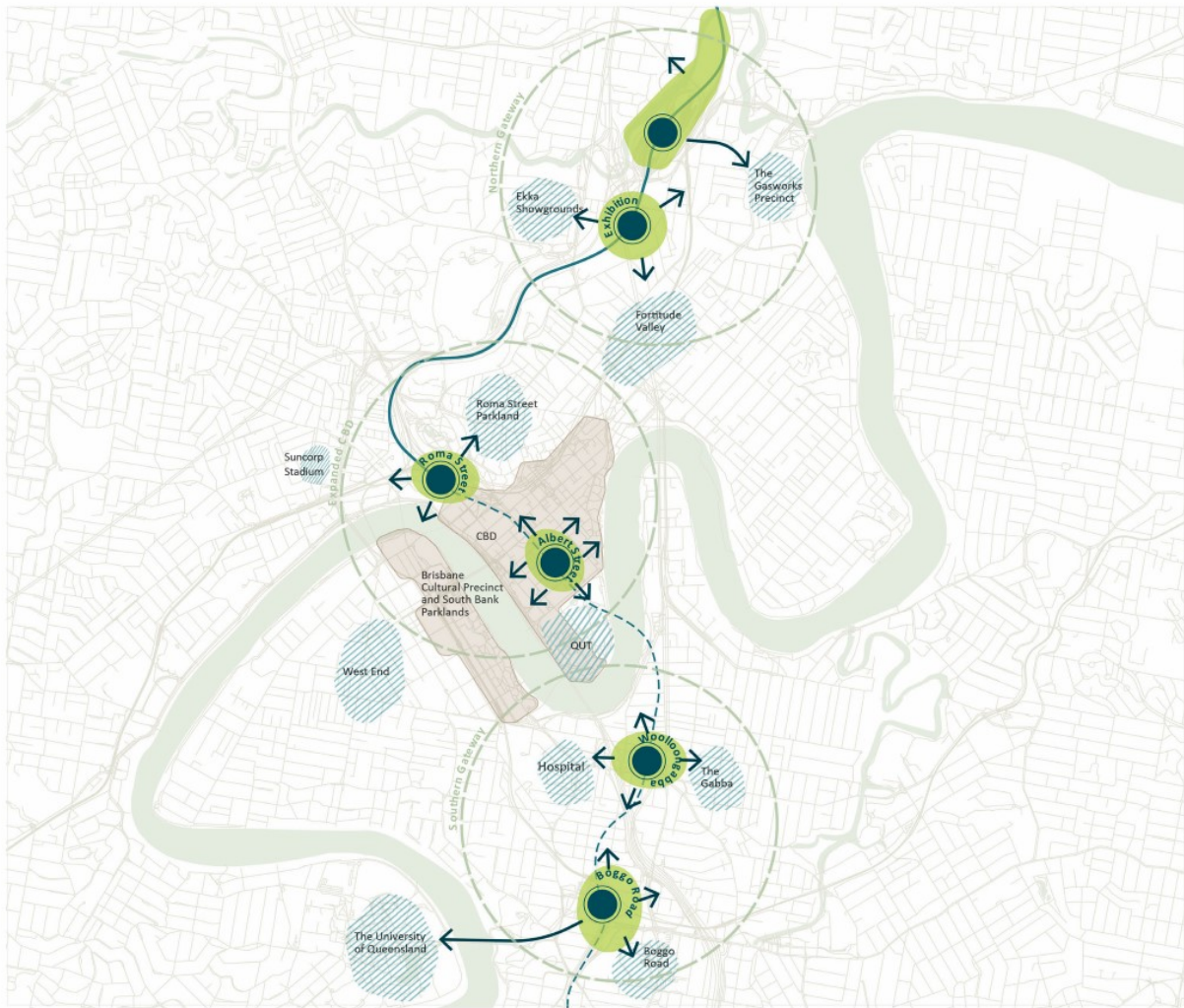
The CRR Project will influence land-use patterns and increase infill development, enable inner-city employment expansion, connect regional centres, better link inner-city areas and be a catalyst for urban renewal around the new stations. CRR will become the framework around which the city can grow.

Each CRR station sits at the centre of a precinct that is undergoing or will undergo significant redevelopment over the next 20 years. Redevelopment of station precincts, combined with improved local public transport, will also revitalise surrounding local neighbourhoods, generating new opportunities for redevelopment and renewal.

Station and precinct-specific redevelopment opportunities identified include the following:

- Exhibition station – catalysing the next redevelopment phase of the 108-hectare, high-density commercial and residential Bowen Hills PDA, including the \$2.9 billion Brisbane Showgrounds Regeneration Project.
- Roma Street station – enabling high-density commercial and residential development.
- Albert Street station – enabling high-density commercial and residential development with supporting retail on land acquired for the station construction.
- Woolloongabba station – enabling high-density commercial and residential development on land used for the construction of the tunnel and underground station, and supporting broader redevelopment of the Woolloongabba PDA.
- Boggo Road station – supporting development of the Boggo Road Urban Village and the broader precinct to achieve outcomes consistent with BCC’s Draft Dutton Park–Fairfield Neighbourhood Plan Strategy and government’s Brisbane Knowledge Corridor vision.





Cross River Rail Hubs and Hearts

Legend

- Inner city villages
- Metropolitan hub
- Brisbane CBD

- Station hearts
- Rail corridor

Figure 6.1: CRR Connectivity Through the Inner City



Each station precinct is discussed in the following sections, with detail provided on the vision for its future development, city-building outcomes anticipated, the broader planning context and likely development opportunities.

CRR station precincts will become subtropical urban places, with station structures set in green and public spaces activated by a range of uses and programs. Featuring a small footprint, stations will be made of robust, repeatable elements to create legible branding and wayfinding for the network. Station buildings will contribute shade while allowing natural daylight into the concourse level.

By providing well-designed urban spaces within each station precinct, the CRR Project will enrich Brisbane's network of public spaces. Cool and shaded, these will become places for people to interact, play, eat and relax within the city environment. Public spaces can be supported by active street frontages, outdoor dining, markets, performance space and multi-functional green spaces.

Guiding design principles for stations include:

- **Magnetic people places:** Stations will contribute to value uplift and precinct regeneration while improving connections for people. Uses around station edges, and movement into and out of the station, will activate and enliven stations and the surrounding precinct.
- **Subtropical and green:** Stations will contribute to the city's subtropical identity through the creation of green, vegetated urban spaces and station entries framed by nature.
- **Embedded within the place:** Stations will be embedded in the public space with legible branding and wayfinding for the network.



6.3.1 Northern Gateway Station Precincts

6.3.1.1 Exhibition Station

Local Context

Exhibition station is located in the heart of a major redevelopment area, the Bowen Hills PDA. Just three kilometres from the CBD, this 108-hectare parcel of land has been identified for specific accelerated development with a focus on economic growth. The station is located close to major health services and sporting and entertainment venues, with direct rail access to the Brisbane Airport. The Royal Brisbane and Women’s Hospital (RBWH) lies west of the Bowen Hills PDA, while landmark places within the PDA include the Brisbane Showgrounds, Old Museum and Perry Park.

The existing Exhibition station primarily serves the Royal Queensland Show (Ekka), Queensland's largest event, held annually at the Brisbane Showgrounds.

A fully operational station would promote more rapid market absorption of planned development and support greater commercial yields, particularly within the Brisbane Showgrounds Regeneration Project area. New high-density developments, in various stages of completion, are already taking advantage of this potential.

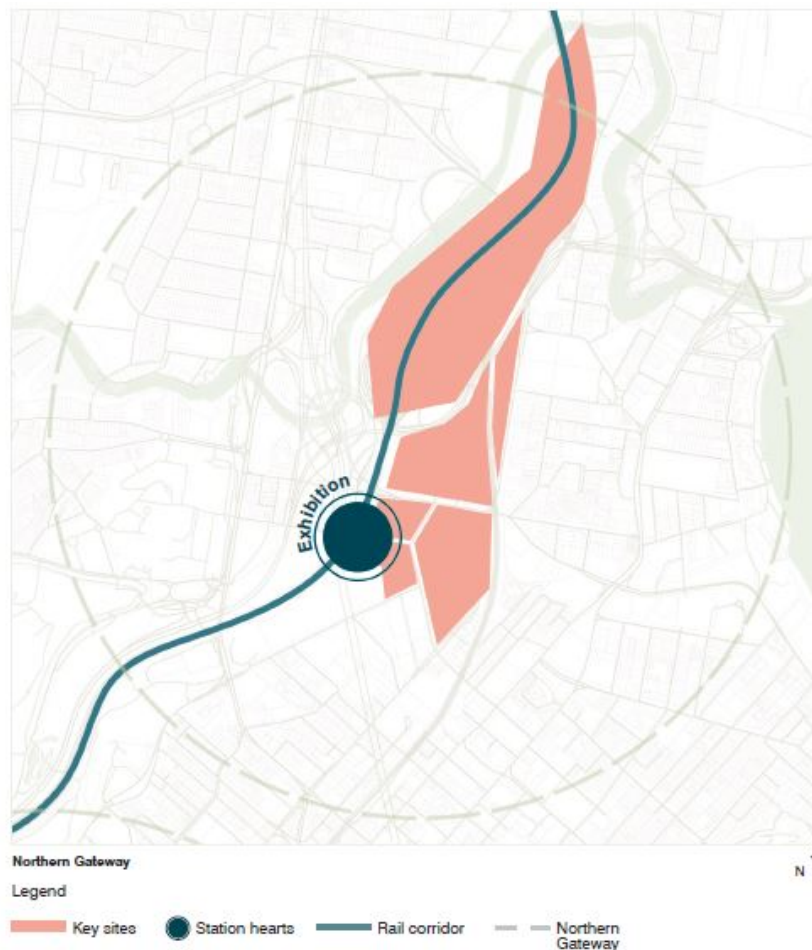


Figure 6.2: Location of Exhibition Station



Planning Context

The Bowen Hills PDA Development Scheme outlines zoning for the Exhibition station precinct. Identified zoning and land uses surrounding the precinct include mixed-use development comprising a range of commercial, retail and residential uses complementary to the RBWH and Brisbane Showgrounds precincts.

The Bowen Hills PDA Development Scheme’s vision is to rejuvenate and activate the Bowen Hills area, establishing it as the northern gateway to the Brisbane CBD. Surrounded by all northern train lines and numerous roads connecting to the city centre, the Bowen Hills PDA has potential to see significant acceleration in both development volume and density.

The CRR Project will complement this vision by improving the area’s accessibility and amenity. The development scheme notes that significant demand exists for high-density residential development and commercial office floor space outside the city centre. The CRR Project would accelerate the provision of both, leading to significant increase in density across the area. The development scheme supports this through a number of ‘residential very high intensity’ and ‘residential high intensity’ zones located near the proposed CRR station location.

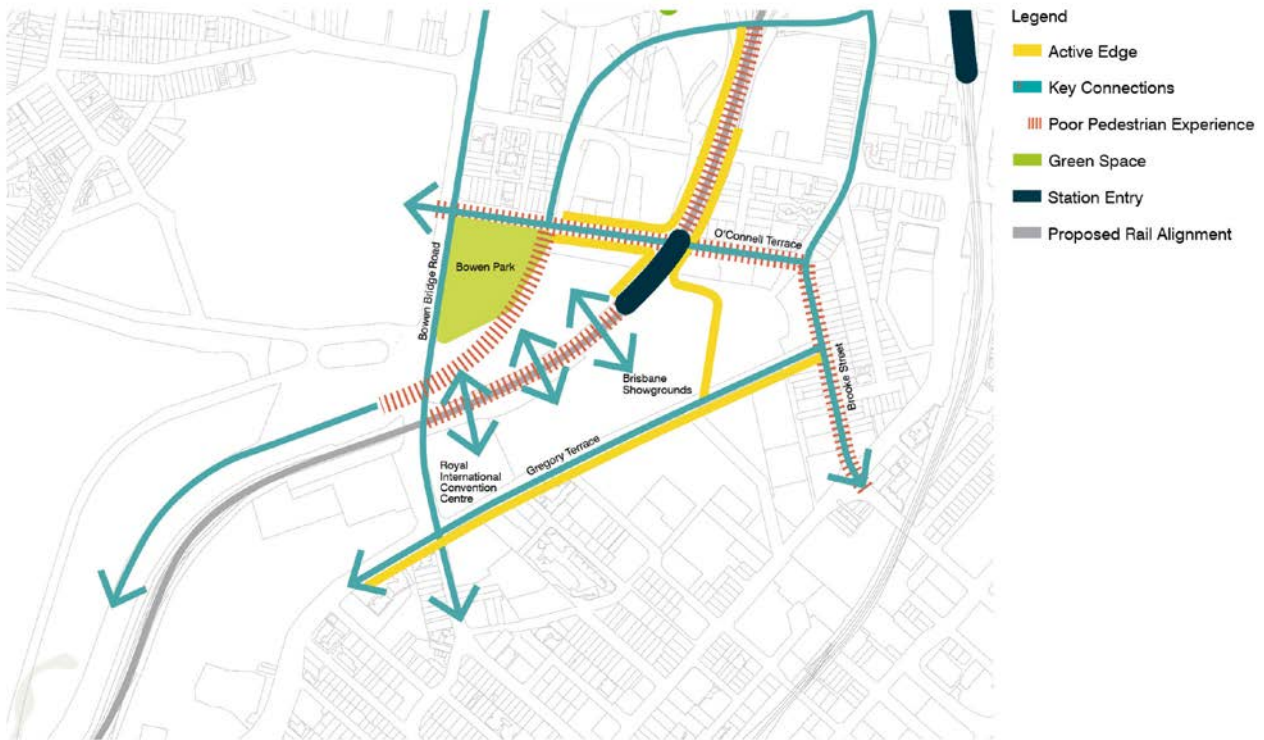


Figure 6.3: Exhibition Station Precinct Context



Precinct Vision

Exhibition station will become a busy transit hub and a core element of Bowen Hills' revitalised urban fabric.

Activated street frontages, convenient links to station entrances and new urban spaces around the station will support the safe movement of people to the precinct. Precinct design incorporating wide circulation spaces will provide seamless transition to and from stations to enhance pedestrian flows and improve commuter convenience.

The new station, with its high-quality public realm and fast, frequent rail services, will set the foundation for the emergence of a true transit-oriented, mixed-use 'urban village', catalysing planned development for the suburb.

City-Building Outcomes

Development of Exhibition station will:

- support the redevelopment of the Brisbane Showgrounds and broader Bowen Hills PDA
- preserve the planned intent for all passenger lines to pass through the Bowen Hills area
- facilitate the ongoing growth and development of a major health and knowledge precinct focused on the RBWH
- reinforce the role and function of O'Connell Terrace as an important people street and inner-city east–west connection
- provide a critical missing link in the northern cycle network
- reinforce the major public pedestrian route through the Brisbane Showgrounds from Fortitude Valley.

Station Development Opportunities

The Exhibition station will support, facilitate and catalyse a range of development including:

- mixed-use development
- commercial development (employment, small business and service industry)
- high-density residential development (long and short-term accommodation)
- entertainment (supporting the existing Brisbane Showground and Ballymore Stadium events)
- medium-density residential development.



6.3.2 CBD Expansion Area Precincts

The CRR Project facilitates the expansion of the CBD by supporting the redevelopment of both Roma and Albert Street station precincts.

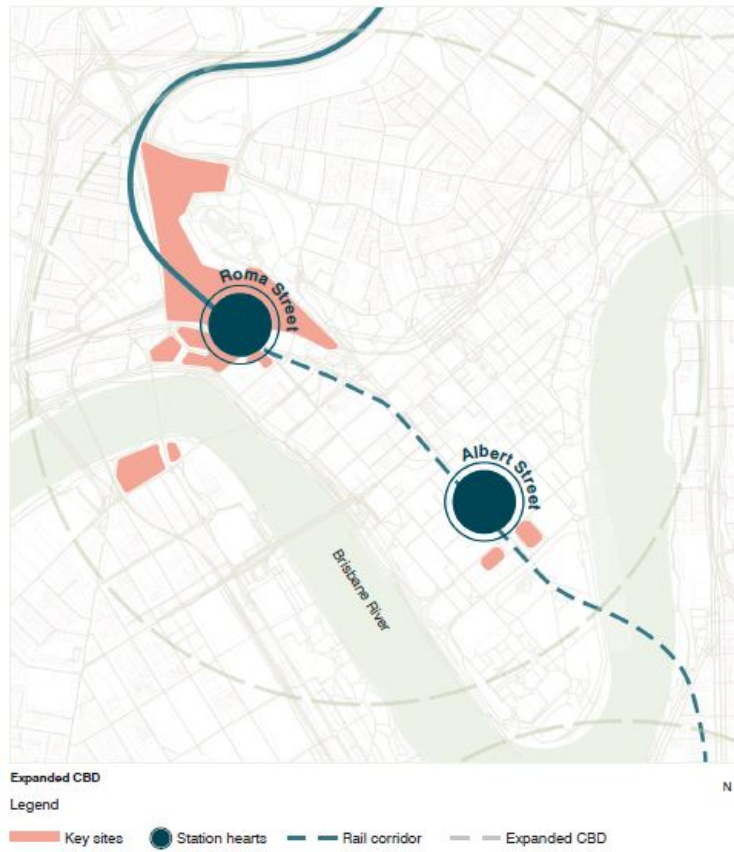


Figure 6.4: Location of CBD Stations



6.3.2.1 Roma Street

Local Context

A major CBD street, Roma Street is located on the north-western edge of the city centre. Roma Street also hosts an iconic transit hub, with suburban bus and rail connections at the existing Roma Street station adjoining wider regional bus and rail links at the Brisbane Transit Centre (BTC). This premier transport interchange is the city's primary gateway for long-distance tourists and the everyday gateway for residents and workers.

Surrounded by high-density residential and commercial development, Roma Street is also a focal point for legal and judicial activity, with the presence of the supreme, district and magistrate's courts and the Queensland Police headquarters. An entertainment precinct borders the precinct's north-west perimeter, with destinations such as The Barracks and Caxton Street which attract thousands of people particularly before and after events held at nearby Suncorp Stadium.

A unique aspect of this station precinct is the adjacent open space, Roma Street Parklands, the CBD's second largest green space. Roma Street Parklands provides important pedestrian and cycle links from Roma Street to Spring Hill and nearby landmarks such as the Normanby Fiveways and Tower Mill.

Planning Context

The Brisbane City Plan 2014 (City Plan) details the planning outcomes and framework for the Roma Street station site. More detail is provided in the City Centre Neighbourhood Plan. The planning framework supports high-density mixed-use development across Brisbane's CBD, with a development height limit of 274 metres, as set by the Civil Aviation Safety Authority (CASA). Land-use zoning within the Roma Street station precinct provides for the largest and most diverse range of uses, consistent with existing development in Brisbane's CBD across residential, retail and commercial uses.

The Brisbane City Centre Master Plan 2014 (BCCMP) outlines a number of transformative projects for Brisbane's CBD, referencing the Roma Street precinct as the city's premier transport interchange. The BCCMP outlines BCC's vision for Roma Street station to become an attractive gateway marking the western entry into the city centre. It also highlights its role in connecting the city's green spaces via a pedestrianised Albert Street, with a high level of integration between development and the public realm.

The CRR Project is consistent with current planning frameworks and desired outcomes. As a result, the CRR Project is not expected to solely drive increased density within the precinct. Potential development opportunities across the precinct would largely be driven by precedent development in the Brisbane CBD, as well as identified market demand. Due to the current planning use and density allowances, development around the precinct can be accommodated without changing the planning schemes.

It is noted that the CRR Project may positively affect development opportunities in the city's inner-west. The Draft City West Neighbourhood Plan identifies a level of uplift in density allowances on some sites located within proximity to the Roma Street station.





Figure 6.5: Roma Street Station Precinct Context

Precinct Vision

The Roma Street station precinct will become the western gateway to the CBD and a new transit portal to the city centre. The CRR Project will unlock the potential of the BTC and other key development parcels to create an enlivened, mixed-use precinct, helping realise BCC’s vision for a grand transit interchange. Roma Street itself will be enhanced as a subtropical boulevard that celebrates arrival into the city centre with a distinctly Brisbane welcome.

Anchoring the view corridor along George Street, Roma Street station will become a landmark public space – a new ‘outdoor urban room’ of human scale. Designed for Brisbane’s subtropical climate, this space will mix gardens with cafes, retail, event spaces and possible new arts and cultural facilities. Redevelopment of the station precinct offers the potential to connect inner-western suburbs to city parks, with new pedestrian bridges and, potentially, new development spanning transport infrastructure to the Roma Street Parklands, Memorial Park and the city centre itself.

Together, the CRR Project and Roma Street station redevelopment will catalyse future growth in the city’s western sector, attracting investment, inspiring renewal and delivering new connections to the city centre and surrounding suburbs. Redevelopment will also support’s BCC’s plans to expand Roma Street Parklands into an impressive, integrated parkland connected to other green spaces on the city’s ridgeline.

City-Building Outcomes

Development of Roma Street station will:

- establish a regional transport interchange for all local, city-wide, regional and interstate public transport
- reinforce Albert Street’s transformation into a green spine connecting Roma Street Parklands and the City Botanic Gardens



PROJECT BENEFITS

- reinforce the western gateway to the CBD and improve the quality of the public realm
- reconnect the Brisbane River to Spring Hill
- protect long-term renewal and CBD-expansion opportunities associated with the Roma Street rail corridor and station and BTC.

Station Development Opportunities

Roma Street station development will support, facilitate and catalyse a range of development and uses include:

- entertainment and recreation precinct
- mixed-use development
- commercial (employment, small business and service industry)
- high-density residential (long and short-term accommodation).



6.3.2.2 Albert Street

Local Context

The southern section of Albert Street lies within the heart of the CBD, running north-west from the City Botanic Gardens to the Queen Street Mall. Albert Street is an important pedestrian link, connecting the Queen Street Mall, traditionally the retail hub of the CBD, and major central transport services to the lesser serviced southern CBD. Albert Street is also located close to major employment areas such as the Eagle Street commercial zone, new riverside development such as Queen's Wharf Brisbane, administrative services concentrated at nearby lower George Street and QUT's Gardens Point campus.

Albert Street's southern end, near the City Botanic Gardens, has traditionally been a CBD-edge precinct with secondary uses and lower-scale buildings. Recent development activity and current applications indicate a renewed interest in this area resulting in more intensive development and a more active mix of uses.

BCC's vision is to transform Albert Street into a subtropical corridor linking Roma Street Parklands to the City Botanic Gardens.

Planning Context

City Plan details the planning outcomes and framework for the Albert Street station site. More detail is provided in the City Centre Neighbourhood Plan. The planning framework supports high-density mixed-use development across Brisbane's CBD, with a development height limit of 274 metres, as set by CASA. Land-use zoning within the Albert Street station precinct provides for the largest and most diverse range of uses, consistent with existing development in Brisbane's CBD across residential, retail and commercial uses.

The BCCMP outlines a number of transformative projects for Brisbane CBD, with specific reference made to the pedestrianisation of Albert Street. This is further covered in BCC's Albert Street Vision, which details the integration of public space with development, including CRR station access portals, between Roma Street Parklands and the City Botanic Gardens.

The CRR Project is consistent with current planning frameworks and desired outcomes. As a result, the CRR Project is not expected to solely drive increased density within the precinct. Potential development opportunities across the precinct would largely be driven by precedent development in the Brisbane CBD, as well as identified market demand. Due to the current planning use and density allowances, development around the precinct can be accommodated without changing the planning schemes.





Figure 6.6: Albert Street Station Precinct Context

Precinct Vision

The Albert Street station will become a truly ‘central’ station that enlivens the southern CBD and assists in Albert Street’s transformation into a subtropical boulevard. Generous public spaces will create welcoming meeting places and allow the easy flow of patrons and pedestrians onto Albert Street.

Living design elements will enrich Brisbane’s green spine down Albert Street, with vegetated ‘green collars’ around the station doubling as performance and dining spaces. Trees planted within multiple public spaces within the station precinct will frame long vistas down the street. Design elements will also improve east-west connections between Queen’s Wharf Brisbane and Eagle Street.

The station’s location will optimise the station’s catchment by serving areas with a recognised deficit in public transport and an identified cluster of renewal and future development sites. Together, the CRR Project and initiatives to open up Albert Street through its partial closure to road traffic will catalyse future commercial, residential and retail growth in the southern CBD, alleviating growing pressure on the Queen Street Mall and delivering new connections to primary CBD destinations.

City-Building Outcomes

Development of Albert Street station will:

- establish a truly central station that addresses public transport shortages in the southern CBD
- promote Albert Street as a premier people street and support the street’s transformation into a green spine connecting Roma Street Parklands and the City Botanic Gardens
- create a new public space at the heart of the southern CBD
- promote a more legible structure for the CBD, with improved pedestrian connections
- facilitate the ongoing renewal and intensification of the CBD and opportunity sites.



Station Development Opportunities

Albert Street station development will increase the commercial and residential density directly adjacent to the station while supporting, facilitating and catalysing a range of development and uses including:

- mixed-use development
- commercial development (employment, small business and service industry)
- high-density residential development (long and short-term accommodation)
- green links between Roma Street Parkland and the Botanic gardens.

6.3.3 The Southern Station Precincts

The two southern stations, Woolloongabba and Boggo Road, will activate residential redevelopment around the stations while strengthening Brisbane’s ‘knowledge corridor’ by linking regionally significant health and education precincts.

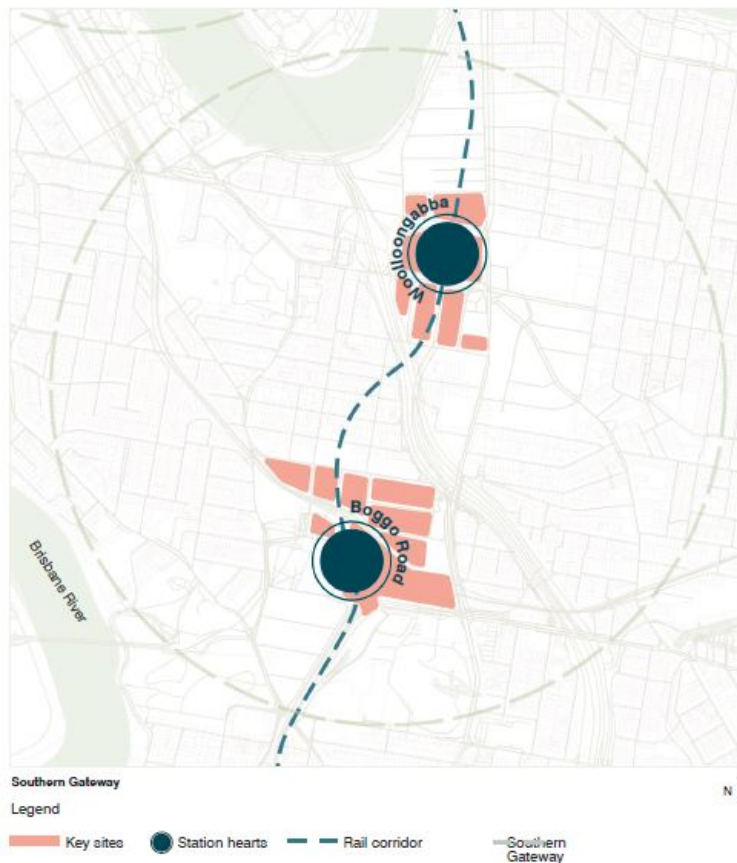


Figure 6.7: Location of Southern Stations



6.3.3.1 Woolloongabba Station

Local Context

Just one kilometre south of Brisbane's CBD, Woolloongabba has been identified as a key location for city growth and a major near-city employment and mixed-use precinct in the future.

Woolloongabba station sits adjacent to one of Brisbane's premier sporting arenas, the Brisbane Cricket Ground, commonly known as The Gabba. Attracting large volumes of spectators all year round, this venue requires a station precinct able to cater for times of high movement and activity, while also being adaptable to moderate and peak-hour commuter everyday use. The station is also located near the Mater Hospital precinct.

The station precinct already has access to high-frequency public transport including the South East Busway. This, coupled with its proximity to the CBD, gives it great potential for an increased uplift in residential and mixed-use development.

Planning Context

The Woolloongabba PDA Development Scheme outlines the desired planning and density outcomes for the Woolloongabba CRR station precinct. Land use under the development scheme across the precinct supports the broader health uses in the Mater Hospital precinct and entertainment uses at The Gabba.

The PDA's vision is for an urban transit-oriented precinct incorporating residential, retail, commercial and recreation facilities supported by transit amenity. The CRR Project will support the achievement of this vision by greatly improving accessibility.

The development scheme identifies a range of preferred land uses including primarily retail, community and cultural uses at ground level, with supporting residential and commercial office space located above, in most areas. This is consistent with the intent of the CRR Project.

Significant opportunities exist across the entire site for high-density staged development with mixed uses, where previously zoning would have allowed development of this type. As a result of current planning and density allowances, the CRR Project is not expected to drive a change in land use or density, however, it will support development in the Woolloongabba PDA.



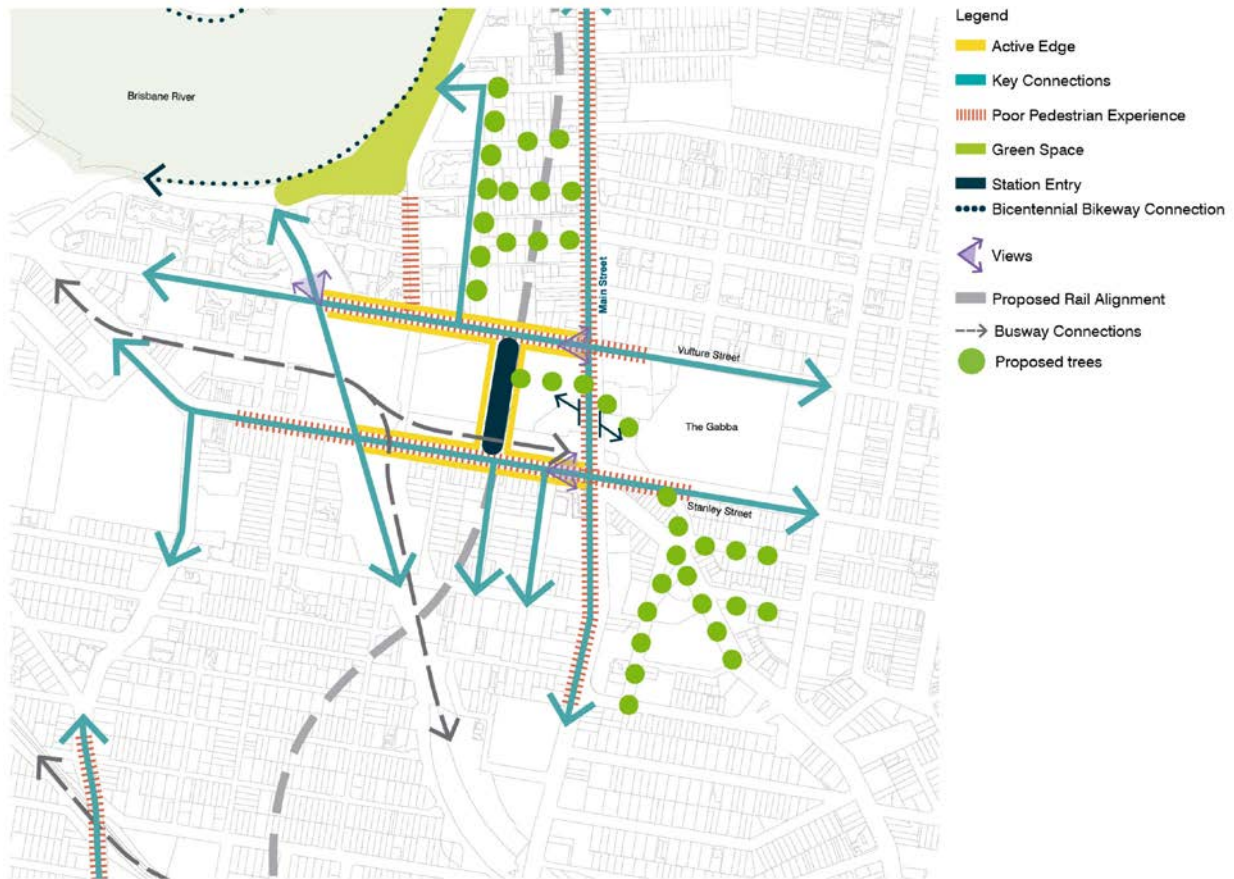


Figure 6.8: Woolloongabba Station Precinct Context

Precinct Vision

The Woolloongabba station precinct will be transformed from an under-utilised inner-urban site into a mixed-use hub, coupling commercial, residential and retail development with world-class public transport. Adding a new CRR station to the existing busway station will give the site outstanding access to public transport, enabling it to become a major intermodal transit interchange.

The station’s location near The Gabba creates the opportunity for a nationally significant sport and events precinct to emerge. Enhanced pedestrian connections along all major road frontages – including along the northern side of Stanley Street where people cannot currently walk – will create an attractive link between The Gabba and Mater Hospital precinct and provide direct access to the main plaza and proposed public transport interchange. Opportunity exists for Stanley Street to become important pedestrian and cycle link between the renewal and intensification areas of Woolloongabba Central and Kangaroo Point South and South Bank, South Brisbane and the CBD.

The station precinct itself will become a multi-purpose public realm. During game days at The Gabba, generous and central public realm circulation spaces will enable large volumes of patrons to move through the space while providing venues for activities such as market stalls. Outside of game day, the highly activated public realm, potentially containing a mix of retail, cafes, and restaurants, will cater for the local residents and commuters. This activation will enable the station to integrate within its local context and build upon the finer grain commercial uses along Stanley Street and Ipswich and Logan roads. This will prioritise Stanley Street as a high-street retail precinct and draw patronage through the station precinct.



City-Building Outcomes

Development of the Woolloongabba station will:

- catalyse redevelopment of Woolloongabba PDA, Woolloongabba Central and Kangaroo Point South
- establish Woolloongabba as a key southern intermodal interchange
- support the emergence of a vibrant sports and events precinct
- enable improved pedestrian access and walkability
- reinstate the function of Stanley Street as an important street and reinforce it as a major connection from the southern suburbs to the CBD.

As a result of the increased in high-capacity public transport, transit amenity in the local area will increase substantially (see Chapter 13: Value Creation and Sharing Assessment for more detail).

Station Development Opportunities

Woolloongabba station development will increase in the commercial and residential density directly adjacent to the station while supporting and catalysing a range of development and uses including:

- mixed-use development
- commercial development (employment, small business and service industry)
- high-density residential development (long and short-term accommodation)
- high-quality and high-frequency transit interchange to significant cultural and sporting events.

6.3.3.2 Boggo Road Station

Local Context

Three kilometres south of Brisbane's CBD, the Boggo Road area contains a mix of residential, commercial and light industrial uses. Boggo Road station is located in the heart of Brisbane's 'knowledge corridor', a spine of tertiary campuses, research precincts, cultural facilities and medical institutions stretching from the RBWH to UQ. Part of the Boggo Road Urban Village and Ecosciences Precinct, which also houses CSIRO, the station is adjacent to the PA Hospital, which hosts biomedical research institutes including the Pharmacy Australia Centre of Excellence and Translational Research Institute.

The popular Eastern Busway passes through the area, providing a high-frequency public transport connection from the PA Hospital to the Eleanor Schonell Bridge and UQ. It also connects to the CBD via the South East Busway. Passengers can interchange between bus and train services at the Boggo Road busway station.

Local neighbourhoods are dominated by older character housing, commonly known as 'timber and tin', which is protected through City Plan and the Draft Dutton Park Fairfield Neighbourhood Strategy. Neighbourhoods are typically low-density, with individual dwellings on generous lots, however, this will change in some areas with significant land-use diversification and residential intensification planned, particularly around the Buranda precinct to the east.



Planning Context

Zoning contained in City Plan focuses on preserving the land use for the Dutton Park area as low-density residential (including character residential). Land-use plans around the CRR station support the PA Hospital precinct as an important medical, education and research precinct and Boggo Road Urban Village as a mixed-use area including residential, retail, commercial, environmental research and recreational facilities.

A neighbourhood plan strategy for the Dutton Park–Fairfield area has been drafted. This strategy broadly retains the current land-use intent while opening small pockets up for low to medium-density residential, retaining the role of the PA Hospital and the Boggo Road Urban Village and widening the protected area of character residential.

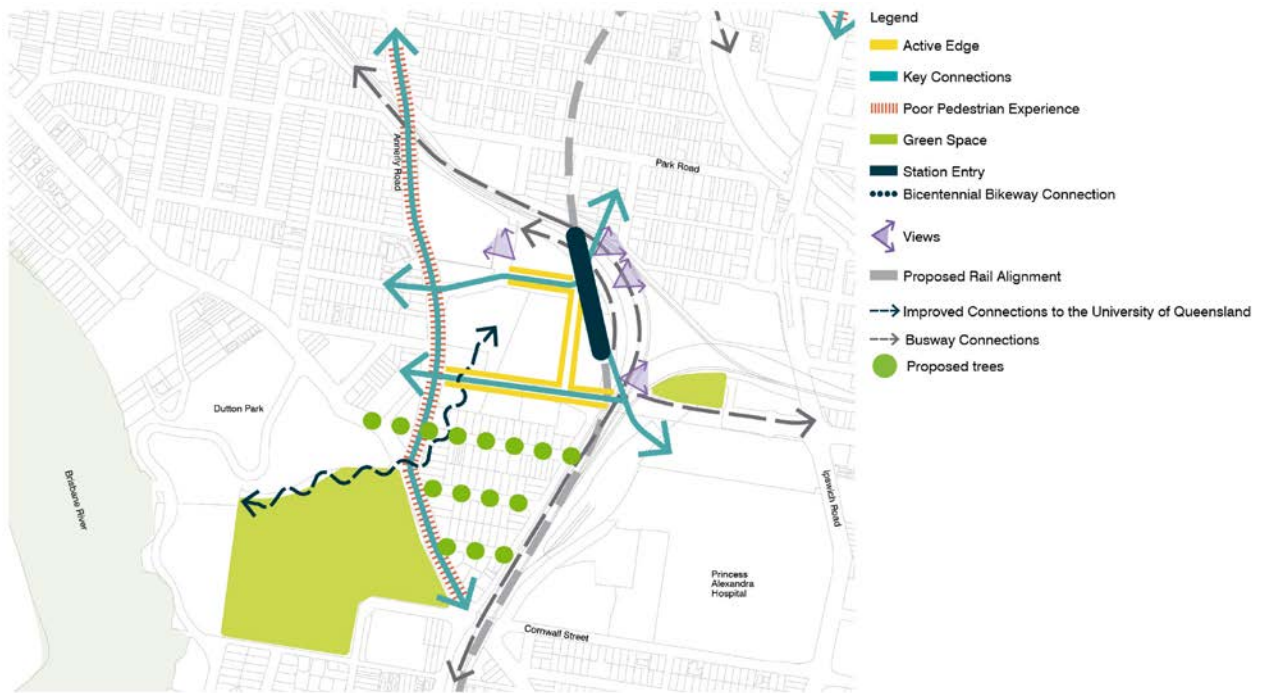


Figure 6.9: Boggo Road Station Precinct Context

Precinct Vision

The Boggo Road station precinct will become a world-class health, science and knowledge cluster and mixed-use precinct connecting Boggo Road Urban Village, UQ and PA Hospital to Brisbane’s CBD and the Gold Coast.

Elements central to achieving this vision, including a high proportion of government-owned land, high levels of transport accessibility and the agglomeration of major health, knowledge and research activities, are already in place, making it well-positioned to cater for anticipated future growth in these sectors. The surrounding residential zoning also offers opportunity for new higher density development, while new active transport links will promote a more sustainable approach to inner-city living.

Cross connections over the current rail and bus corridors will link the Boggo Road precinct to the PA Hospital and other health services, creating permeability through what is currently a solid barrier within the urban footprint. Developing over the rail corridor would utilise a currently inaccessible part of the existing urban fabric and, in turn, provide new opportunities for extra green open space and an attractive public realm interface.



The combination of mixed-use and residential development opportunities, underpinned by city and river views, give this area the capacity to support a major specialist centre outside the CBD and to boost the region's knowledge economy.

City-Building Outcomes

Development of Boggo Road station will:

- facilitate the continued development of a major health, science and knowledge precinct
- create new connections between communities and activities currently separated by rail and road infrastructure
- promote convenient and rapid rail–rail and rail–bus interchange
- encourage intensification of land uses in close proximity of the station to take advantage of city and river views.

Station Development Opportunities

Boggo Road station development will increase the commercial and residential density directly adjacent to the station while supporting and catalysing a range of development and uses including:

- mixed-use development
- commercial development (employment, small business and service industry)
- residential development (long and short-term accommodation)
- research, science and knowledge industry expansion.

6.4 Transport and Network Benefits

This section details the key transport benefits resulting from the CRR Project and outlines:

- transport modelling methodology, including key assumptions
- transport modelling forecasts, including discussion on alternate population forecasts
- transport outcomes related to the CRR Project
- benefits used in the CRR Project's economic assessment, including reliability improvements
- future enabled investments associated with the CRR Project.



6.4.1 Transport Modelling Methodology

An assessment framework – based on detailed rail operations and transport modelling – has been used to assess the capacity and reliability benefits provided by the CRR Project. The modelling process undertaken is depicted in Figure 6.10.

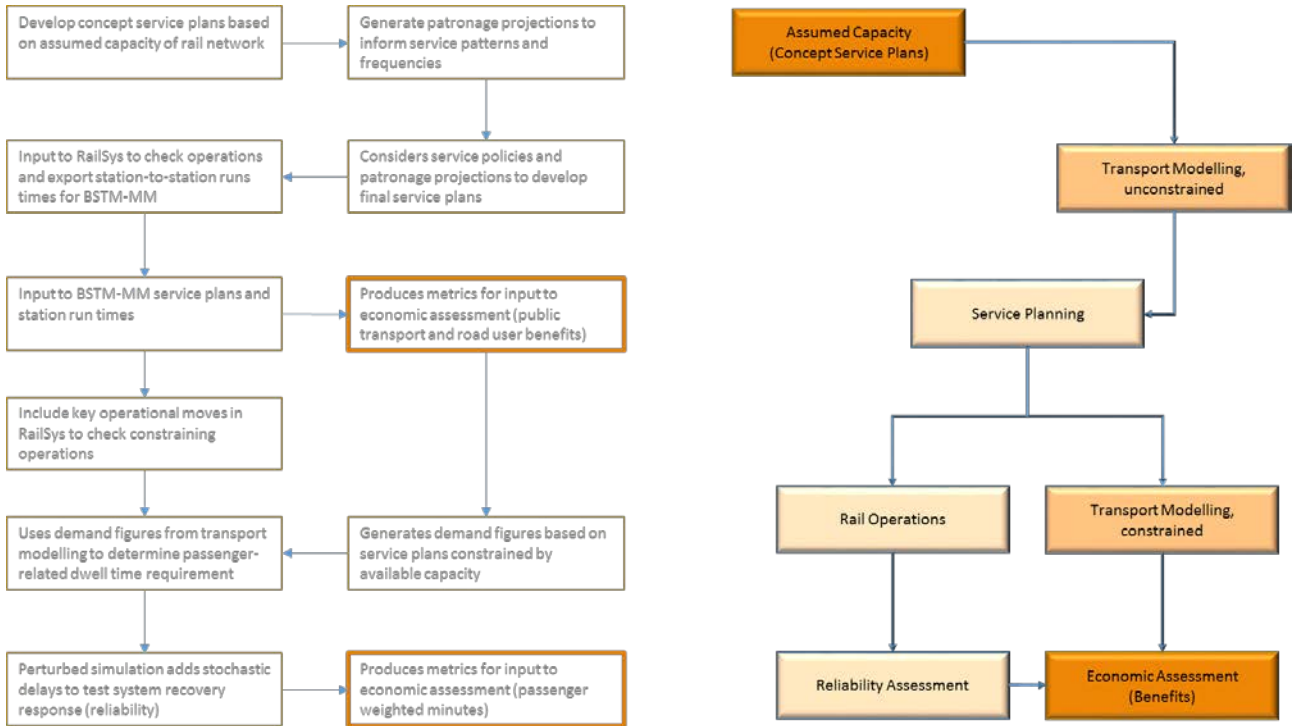


Figure 6.10: The CRR Project Modelling Framework

6.4.1.1 Rail Operations Modelling

Rail operations modelling was undertaken to determine the optimal allocation of rail services to match demand and capacity in corridors for a base case ‘without’ the CRR Project and a project case ‘with’ the CRR Project.

The rail operational modelling allowed for a mix of service types such as express and all-stop services. It provides a key input into both the strategic modelling task and assessments of operational costs and rollingstock requirements.

The existing capacity of each corridor through the inner city, both ‘with’ and ‘without’ the CRR Project, has been assessed as the basis for future peak timetables and included in the rail model. Future demand growth on the network has been considered in the development of train service plans that optimise network operations (interlinking of service corridors) and allocate services to meet train demand.

These service plans, both ‘with’ and ‘without’ the CRR Project become a key input into the strategic transport modelling.



6.4.1.2 Strategic Transport Modelling

The purpose of the strategic transport modelling was to estimate the impact of the additional capacity and frequency for rail services, provided by the CRR Project, on travel demands in Brisbane. This includes:

- the mode shift (reallocation of travel demand) to rail
- reduced congestion on competing transport modes
- reduced crowding on rail services
- reduced travel time associated with higher frequencies, with less time spent waiting for a train.

Modelling was undertaken using TMR's Brisbane Strategic Transport Model – Multi Modal (BSTM-MM), which is employed for strategic transport planning in Brisbane. The BSTM-MM was further developed to assess patronage forecasts and revenue associated with rail. This model is known as the CRR Project model and provides the basis of all patronage and benefit forecasts reported in this chapter.

6.4.1.3 Modelled Transport Network

The modelled transport network includes both existing and future rail, bus and road network infrastructure across the study area for both the 'with' and 'without' cases. Model inputs are based on current TMR and local government project commitments and were informed by documents such as the Queensland Transport and Roads Investment Program.

The CRR Project was included in the model for the 'with' project case. The Reference Project consists of two parallel tunnels extending from Dutton Park to the Exhibition Loop at Spring Hill, via the Brisbane CBD. It includes new underground rail stations at Boggo Road, Woolloongabba, Albert Street, Roma Street and an upgraded Exhibition station.

The transport network assumptions underpinning the assessment of the CRR Project were developed prior to the release of information regarding BCC's Brisbane Metro proposal. While this proposed enhancement to the busway is therefore not included in the transport modelling undertaken for the CRR Project, a qualitative assessment of the complementary benefits of Brisbane Metro and the CRR Project is discussed in Section 6.4.7.

For the base case ('without' project), indicative train service plans were developed to meet demand using available infrastructure capacity. Service plans and operating strategies for the 'without' case were kept consistent with existing operations on the rail network but maximised to make best use of existing infrastructure and the additional capacity benefits of the European Train Control System (ETCS) – Inner City Project on the main lines. This includes consideration of the service planning policy and supporting measures such as encouraging peak spreading and improved efficiencies due to further sectorisation of the rail network.

For the 'with' project case, train service plans maximise the use of additional new infrastructure. This enables a higher frequency of rail service to meet projected increases in passenger demand. The 'with' service plans provide for 18 trains per hour (tph) in the morning peak hour (northbound) in 2026 in the CRR tunnel.



In the southbound direction, the CRR Project is able to meet passenger demand for 12tph in 2026. Beyond that the ability to utilise the ultimate capacity of the tunnel (24tph) would be dependent on further augmentation of the connecting surface network to the north and south of the project. The CRR Project would also support north–south sectorisation with Nambour, Caboolture and ultimately Caloundra in the north able to run through the city and connect with Varsity Lakes (Gold Coast) in the south. In the future, the CRR Project would be able to accommodate longer trains (i.e. equivalent length nine-car train sets) however these have not been modelled as they are beyond the timeframes of the evaluation period.

Indicative future service plans for 2026 and 2036 ‘with’ CRR are shown in Figure 6.11 and Figure 6.12.

2026 AM Peak Period Services per Hour with CRR + ETCS



Figure 6.11: 2026 Morning Peak Hour Rail Service Plan



2036 AM Peak Period Services per Hour with CRR + ETCS



Figure 6.12: 2036 Morning Peak Hour Rail Service Plan



6.4.2 Land-Use Demographics

The geographic distribution of population and employment growth are the most influential factors driving forecast changes in travel demand. The CRR Project model is able to forecast future travel demand based on calibrated relationships between these socio-economic variables and travel behaviour. The population and employment forecast assumptions used were the most up-to-date and complete set of data provided by the Government Statistician at the time of modelling (2015 edition, medium series). Based on these forecasts, by 2036, the Brisbane Statistical Division is forecast to reach a population of 3.1 million (1.6 per cent per annum growth), with more than 80 per cent of the growth in population outside of the Brisbane LGA. This is highlighted in Figure 6.13 with the Brisbane LGA shown in yellow against the broader Brisbane Statistical Division. Over the same period, total employment for the study area is forecast to reach 1.7 million (1.6 per cent per annum), with over 207,700 jobs in the Brisbane CBD compared to approximately 145,700 jobs in 2015.

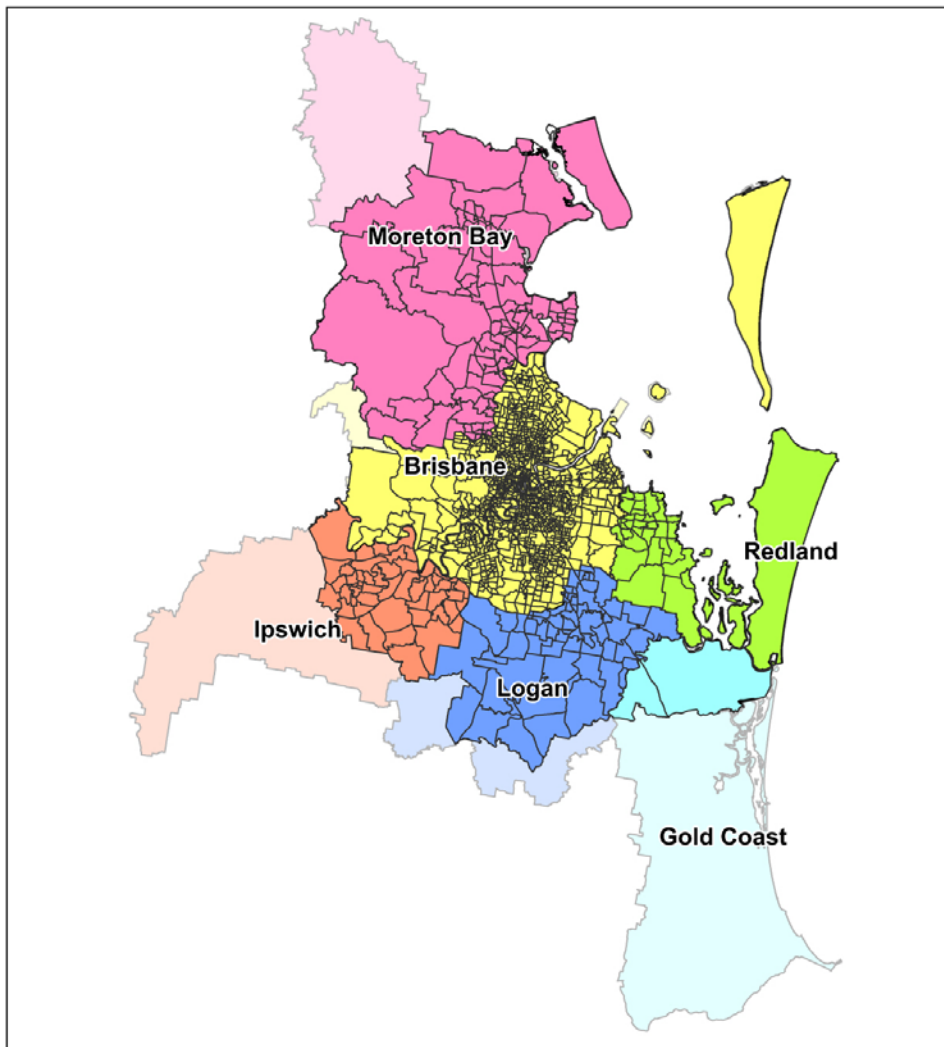


Figure 6.13: Brisbane Statistical Division and Brisbane LGA map



6.4.3 Fairer Fares

In response to the recommendations of the independent Fare Review Taskforce, the Queensland Government introduced the Fairer Fares package, which took effect from 19 December 2016. Fairer Fares impacted on the CRR Project model in two primary ways:

- It altered the fare zoning system, with the existing 23 zone system across SEQ consolidated to eight zones. This was achieved by aggregating a number of zones, with some fine-tuning of the new zone boundaries. Details on the new fare zone boundaries were sourced from TransLink.
- Fare prices were adjusted for each zone (typically downwards). Additionally, the price rise anticipated in 2017 (with CPI) was delayed to 2018. In the model, this was assumed to represent an additional 2.5 per cent saving on the 2017 fares. Beyond 2017, it was assumed that fares will rise with CPI.

6.4.4 Other Assumptions

Changes in the cost of travel and user's sensitivity to costs are important factors in travel behaviour. Compared to the base year prices, the transport model assumes:

- inflation – to grow at 2.5 per cent per annum
- CBD parking charges – to grow at 2.5 per cent per annum above the rate of inflation
- toll road charges – to grow in line with the rate of inflation
- vehicle operating costs (fuel) – to grow in line with the rate of inflation
- value of time – to grow at 1.5 per cent per annum above the rate of inflation (in line with assumed average weekly earnings growth of four per cent per annum).

6.4.5 Model Validation

The performance of the updated, calibrated base year model (2015) was compared to available, observed data for an average weekday in 2015. This included:

- daily and peak period rail transaction data at each station (boardings, alightings and line loadings)
- daily and peak period bus and ferry ticketing data (boardings) by operator and corridor
- daily and peak period traffic counts across key cordons through the study area (including a Brisbane River and CBD circle cordon).

The validation comparisons illustrate an appropriate match to observed data.

Independent peer review of the strategic transport modelling processes, assumptions and outcomes was undertaken. It concluded that the modelling methodology and level of validation are considered fit for purpose in assessing the benefits of the CRR Project.

6.4.6 Transport Modelling Forecasts

Transport forecasts have been run 'with' and 'without' the CRR Project for the following scenarios:

- 2015 – the base year model (existing networks)
- 2026 – the modelled forecast year 'with' and 'without' the CRR Project
- 2036 – the final modelled forecast year 'with' and 'without' the CRR Project.



Transport forecasts for the Brisbane area, using the CRR Project model, indicate that demand for public transport is forecast to double from 2015 to 2036. Chapter 3: Problem shows that ‘without’ the CRR Project, future public transport service levels will significantly decline – more people will face overcrowded rail and bus services and increasing traffic congestion on all major roads, especially key arterial roads near the inner city. The modelling shows that total person trips across the modelled network⁴² increase by 2.74 million trips per day from 2015 to 2036.

Of these trips, public transport accounts for more than 10 per cent of the total transport task in 2036, up from a 6.8 per cent mode share in 2015. Despite this, car trips will continue to grow significantly and increase by 1.9 million car users per day by 2036 – an increase of 30 per cent over today’s car travel on the network. However, with the CRR Project in place, there will be a shift to public transport of 23,000 trips per day, relieving pressure on the road network and providing improved access to destinations such as the CBD. The modelling forecasts the share of journeys (as a proportion of all trips) made by rail to the CBD to increase from 47 per cent without the CRR Project to 51 per cent with the CRR Project in 2036.

Table 6.2 shows the breakdown of the daily public transport task between the two primary modes in SEQ (rail and bus). This table shows that on a person-trip basis in 2015, buses carry a higher proportion of the transport task compared to rail. However, on a passenger-kilometre basis, rail carries a higher proportion of trips (12 per cent more than bus), given it is servicing destinations further from the CBD. Over time, as the region expands and road travel becomes more congested, rail is forecast to grow at a faster rate than bus and carry a similar proportion of the daily travel task. With the CRR Project in place, rail will carry 559,000 daily person trips in 2036 compared to buses carrying 628,500 person trips. On a passenger-kilometre basis, rail will carry the bulk of the public transport task by 2036 (1.43 times more than buses).

PERIOD	2015	2026				2036			
		USERS		GROWTH		USERS		GROWTH	
		WITHOUT CRR	WITH CRR	WITHOUT CRR	WITH CRR	WITHOUT CRR	WITH CRR	WITHOUT CRR	WITH CRR
RAIL USERS									
AM 2hr peak	51,700	104,000	110,100	101%	113%	147,100	160,300	185%	210%
PM 2hr peak	41,500	95,100	101,100	129%	144%	132,200	146,500	219%	253%
Daily	177,200	368,800	386,800	108%	118%	511,700	559,300	189%	216%
BUS USERS									
AM 2hr peak	77,800	122,700	120,100	58%	54%	155,800	149,700	100%	92%
PM 2hr peak	55,600	95,600	94,700	72%	70%	122,600	116,800	121%	110%
Daily	321,600	509,800	508,400	59%	58%	638,600	628,500	99%	95%
TOTAL PUBLIC TRANSPORT USERS									
Daily	513,700	875,200	883,300	70%	72%	1,130,600	1,152,400	120%	124%

Table 6.2: Daily Public Transport Demand By Mode⁴³

⁴² The modelling network includes the areas in the BSTM-MM boundary .

⁴³ The totals in this table include the ‘ferry mode’ which is not included in the data above. The rail and bus data also includes ‘chain-trips’ (that is, bus to rail interchanges) which are only counted as one trip in the totals.



Table 6.3 provides a breakdown on the travel demand and mode into the CBD during the morning peak period (two hours). This table shows that car travel to the CBD will remain relatively static over the next 20 years as there is limited potential for road capacity and car parking space to increase during peak periods. Rail travel currently shares this travel market with bus (in terms of person trips). Rail will grow significantly to 94,800 person trips in the morning peak period by 2036 'with' the CRR Project. Bus travel to the CBD will also grow from 35,400 person trips in 2015 to 51,200 in 2036 'with' the CRR Project (increasing by a further 10 per cent if the CRR Project is not provided). Over the next 20 years, rail will cater for the majority of all new trips to the CBD with bus continuing to play a strong supporting role, catering for around 20 per cent of all new CBD trips.

TWO - HOUR MORNING PEAK	2015	2026			2036		
		BASE	CRR	PERCENTAGE CHANGE	BASE	CRR	PERCENTAGE CHANGE
Car	41,400	40,500	39,800	-1.8%	40,600	39,300	-3.1%
Rail	35,500	65,200	68,800	5.6%	87,700	94,800	8.1%
Bus	35,400	48,000	44,600	-7.1%	57,500	51,200	-10.8%
Ferry	1,000	1,900	1,900	0.7%	2,300	2,200	-0.7%
TOTAL	113,300	155,600	155,100	-0.3%	188,000	187,600	-0.2%

Table 6.3: Forecast Morning Peak Travel Demand to the Brisbane CBD

Figure 6.14 shows the two-hour person trips to the CBD for 2026 and 2036 both 'with' and 'without' the CRR Project. This figure further demonstrates the role of the CRR Project into the future, with rail carrying the largest proportion of travel demand to the CBD during the morning peak and bus playing an important supporting role.



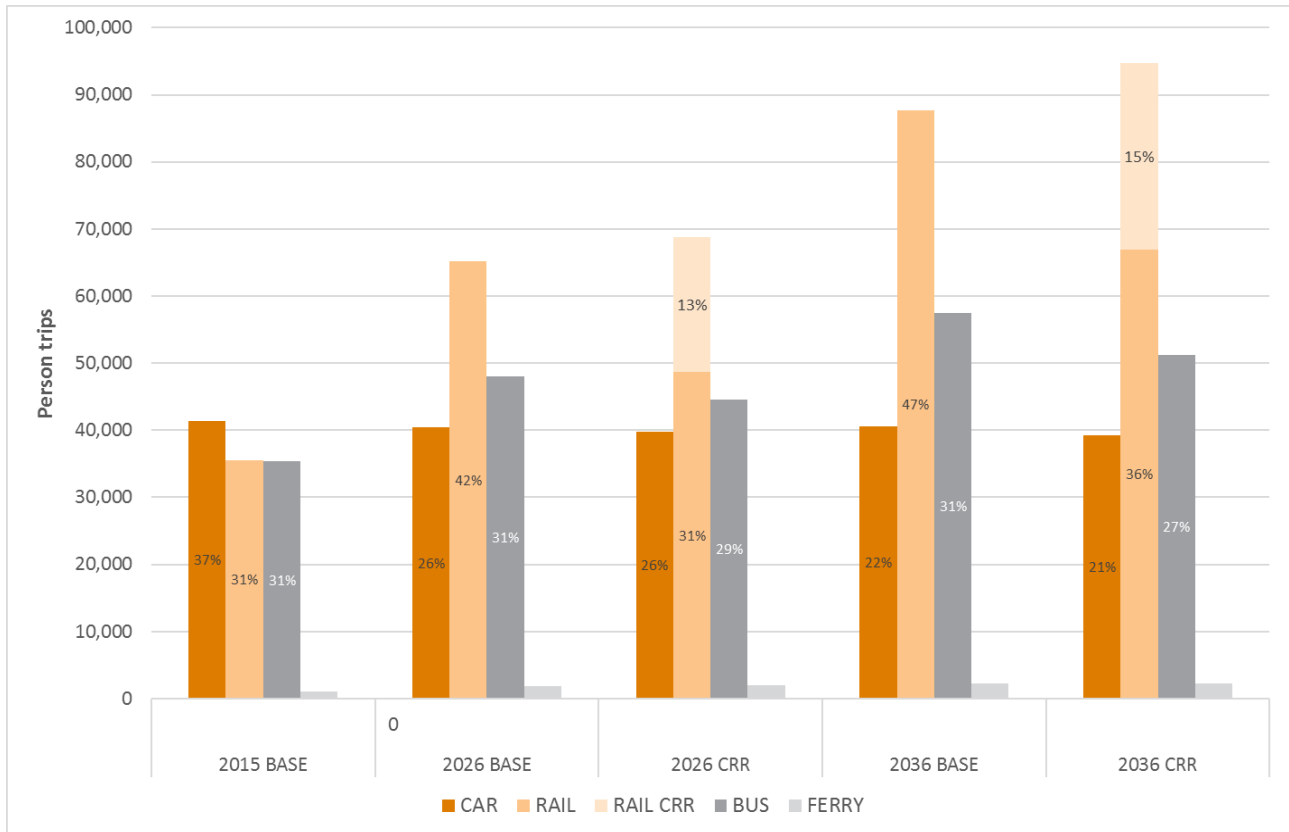


Figure 6.14: Two-Hour Peak Person Trips to the CBD by Mode

6.4.7 Transport Network Benefits

As outlined in Chapter 3: Problem, the region’s transport network is now at a critical juncture in its evolution. The CRR Project will be a key enabling project in the revitalisation of the SEQ rail network. Specifically, it will reinforce the role of public transport as the preferred mode of travel especially when accessing key activity centres such as Brisbane’s CBD. The project will unlock the region’s rail capacity, alleviating existing constraints and cementing the future function of the rail network as the ‘backbone’ of the public transport network.

Forecasts indicate there will be a tripling of rail demand between now and 2036 across the region as people seek improved access to jobs and services at key economic hubs such as the CBD. The CRR Project will enable the rail network to meet forecast demand, provide travel time benefits to commuters and influence travel choice. It will increase network capacity and create a more direct route to the CBD, enabling faster and more frequent services from across the region and new opportunities to expand the rail network.



The benefits of the CRR Project quantified in this section exclude any benefit due to BCC's Brisbane Metro proposal, however it is anticipated that together, the CRR Project and Brisbane Metro will:

- Enable a strengthened focus on feeder services to higher frequency and capacity trunk routes (rail / busway), with the bus services withdrawn from the busway re-invested in the suburban network. This will provide more opportunities for passengers to connect to the higher frequency rail services afforded by the CRR Project.
- Provide an enhanced ability to cater for the distribution of passengers around the inner city, freeing up capacity on CRR and at new CRR stations to cater for long distance commuters from the dormitory catchment areas.
- Provide more opportunities for passengers to easily transfer between bus and rail at key interchange locations such as Boggo Road station and Roma Street station.
- Serve complementary catchment areas. Rail, including CRR, predominantly serves the long-distance commuter market from areas such as the Moreton Bay Regional Council area, the Sunshine Coast, Gold Coast and Springfield / Ripley corridors. Brisbane Metro will serve shorter trips within the Brisbane LGA.

6.4.7.1 Future Public Transport Demand

Rail services to and through Brisbane's inner core continue to experience growth as more people across the region access services and jobs in the region's primary activity centre. However, the existing inner-city rail network will be unable to meet forecast future demand for CBD access from growth areas along Brisbane's rail corridors and to emerging greenfield development sites. In response, the CRR Project will provide new dedicated rail infrastructure and connect areas previously remote from the city's existing main rail stations (Roma Street and Central stations) to fast and frequent rail travel. With a new station at the southern end of the CBD, passengers will have shorter trips to the station, with less time spent in vehicles, walking in the CBD and on interchange transfers.

The new CRR Project will unlock public transport capacity, with key outcomes for the network including:

- a doubling of public transport capacity across the river into the Brisbane CBD from the south, providing ultimate capacity for 24 rail services per hour in each direction
- higher public transport use equating to an increase of 23,000 trips on public transport per day in 2036, predominantly due to an increase in forecast rail demand with a minimal reduction in daily bus patronage
- enables 116 services to access the CBD in the morning peak hour in 2036 with an ultimate capacity of 134 services
- reduced public transport journey times, waiting times, access times and a relief of public transport crowding
- improved CBD public transport accessibility and modal integration.

6.4.7.2 Road Congestion

Chapter 3: Problem explains that increasing private car use could add to infrastructure costs and stifle economic activity by worsening congestion, which in turn, would limit freight and commercial movements and make it more expensive to do business. With the CRR Project operational, more commuters are forecast to use the train as their preferred mode of travel to the city.



Overall, implementation of the CRR Project is forecast to reduce private vehicle kilometres travelled by 526,000km per day and generate a small increase average private vehicle travel speeds (1km/hr)⁴⁴.

This will reduce congestion in the busiest part of the road network, with substantial savings in urban road congestion costs. The Australian Infrastructure Audit (Infrastructure Australia) indicates that the cost of congestion on the Brisbane–Gold Coast–Sunshine Coast transport network is approximately \$2 billion. The CRR Project will help avoid these costs, which are predicted to increase to around \$9 billion in 2031⁴⁵.

With the CRR Project in place, the avoided costs to the economy of road congestion are estimated at \$240 million annually in 2036, compared to a scenario ‘without’ the CRR Project.

Specific benefits accruing to the road network include:

- reduced private car use (CRR Detailed Business Case 2016 estimated a decrease of 18,500 people travelling each day by car)
- reduced private vehicle kilometres travelled
- increased road speeds
- improved network reliability (for road, bus and rail networks) with benefits to transport operators.

6.4.7.3 Supply Chains

Increasing the capacity and use of the rail system will result in faster travel times and speeds on the road network. These benefits will be most pronounced on the motorway network, given the CRR Project will tend to attract commuters from outer greenfield areas that might otherwise use the motorway network. These benefits will accrue to road-based freight vehicles and improve their ability to service their markets in a timely manner.

From a rail freight perspective, the potential impacts of the CRR Project are manageable considering service levels and forecast freight demand. Where uncertainty exists, mitigation measures can be implemented on an incremental basis to ensure the rail freight system is able to meet its obligations prior to a long-term solution being provided, potentially as part of the Inland Rail project.

6.4.8 Rail Network Benefits

6.4.8.1 Service Frequency

The CRR Project will enable the broader rail network to perform its desired role within SEQ’s transport system. With the CRR Project, service frequency – a core determinant in travel behaviour – will increase significantly in order to meet forecast demand, making rail more attractive to patrons.

The higher frequencies enabled by the CRR Project will mean that commuters spend less time waiting for a train with service frequencies on some lines approaching a turn-up-and-go (no timetable required) type of service. For example, commuters from the Gold Coast will save on average four minutes in waiting time for a train with the CRR Project.

Table 6.4 provides an outline of the ‘boardings and alightings’ (daily throughput) at each CRR station in 2026 and 2036.

⁴⁴ CRR Project model 2016

⁴⁵ State Infrastructure Plan



YEAR	STATION	BOARDING	ALIGHTING	TRANSFER (BOARDING + ALIGHTING)	TOTAL
2026	Boggo Road	1,070	760	13,320	15,150
	Woolloongabba	2,280	2,040	5,020	9,340
	Roma Street	5,420	5,530	18,450	29,400
	Albert Street	20,660	25,150	800	46,610
	Exhibition	1,820	3,310	640	5,770
	TOTAL	31,250	36,790	38,230	106,270
2036	Boggo Road	1,610	1,530	19,680	22,820
	Woolloongabba	5,110	4,630	8,240	17,980
	Roma Street	8,340	8,560	29,420	46,320
	Albert Street	29,130	36,840	1,290	67,260
	Exhibition	2,950	5,140	1,340	9,430
	TOTAL	47,140	56,700	59,970	163,810

Table 6.4: Boardings and Alightings at CRR Stations

Supporting this improved frequency, the CRR Project will also provide more stations in more parts of the inner city, primarily in key identified growth precincts. The forecast estimate of daily throughput at the CRR stations in 2026 and 2036 is shown in Figure 6.15. This illustrates the predominance of the two inner-city stations at Roma Street and Albert Street and again highlights the important transfer functions of both Roma Street and Boggo Road stations for the CRR Project.

The data shows:

- total daily passenger flows at the CRR stations of 106,000 in 2026 and 164,000 in 2036
- daily patronage at the new Albert Street station of 46,600 in 2026 growing to 67,300 passengers per day by 2036
- significant transfer activity at Roma Street, with 18,450 transfer boardings and alightings per day by 2026 and 29,400 per day by 2036, between surface rail and CRR as well as between bus and CRR
- Boggo Road becoming a significant interchange station in the public transport network due to its close proximity to the Eastern Busway and connecting key health, education and business precincts.



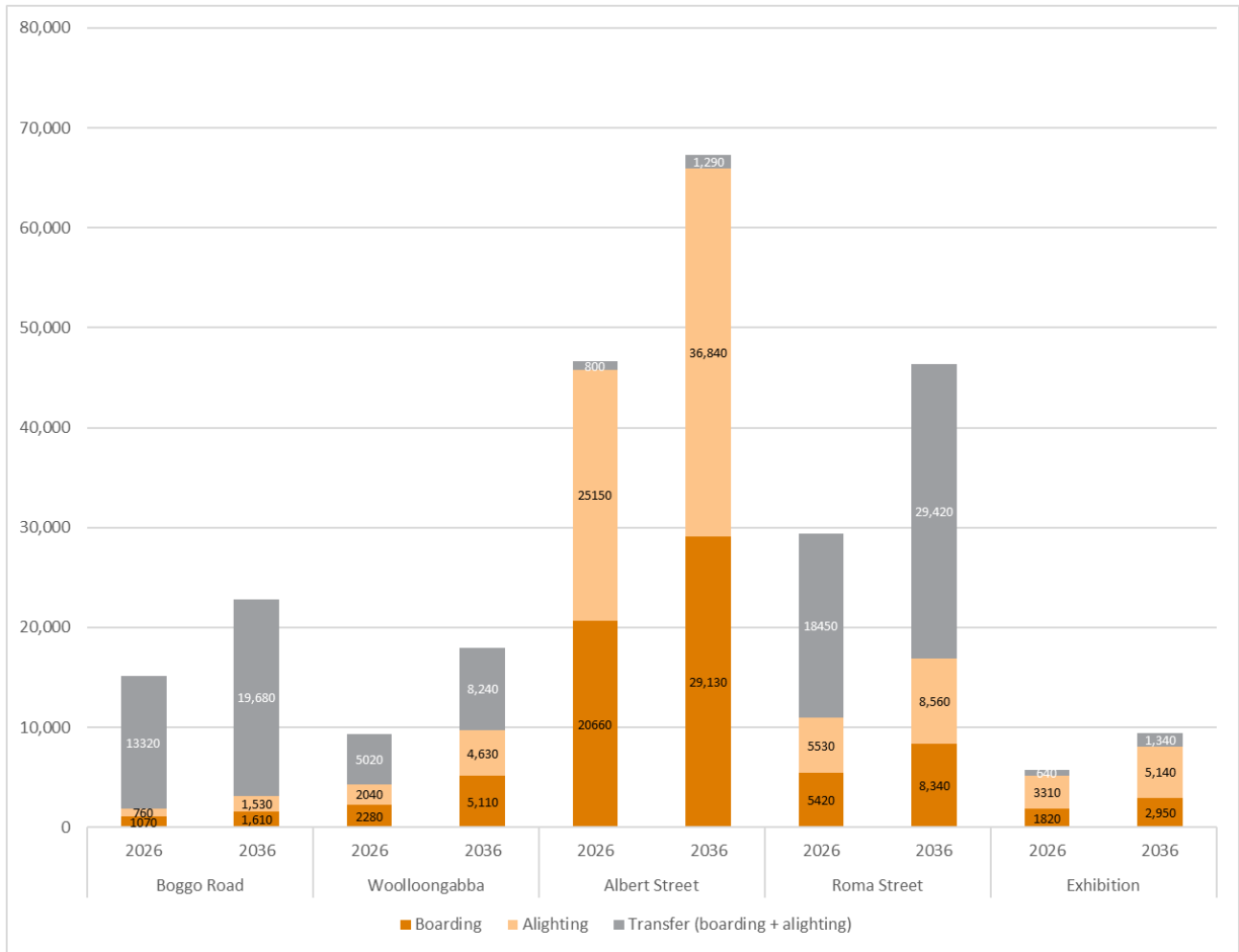


Figure 6.15: Forecast CRR Station Daily Passenger Movements, 2026 and 2036

The CRR stations are forecast to serve about 40,000 passengers in the morning peak period (nearly 40 per cent of the total daily use of CRR) comprising 10,500 at Roma Street station, 17,700 at Albert Street station in the southern CBD, 5,400 at Boggo Road station, 3,700 at Exhibition station and 2,800 at Woolloongabba station. This is forecast to grow to almost 56,000 by 2036.

At Woolloongabba, the new station will also help clear crowds from sporting events at The Gabba. The new Boggo Road station will become a primary interchange location in the network, enabling commuters to interchange between the rail and bus networks. For example, the Boggo Road/Park Road stations are forecast to be SEQ’s second busiest place for interchange, second to Roma Street station, and will see 134 trains passing through during the morning peak period, nearly double the amount of trains running today. At this number of trains, interchanges will be supported given the significant reduction in waiting times. For example, a rail service will depart Boggo Road/Park Road every minute by 2036. Commuters will benefit by being able to easily and quickly change trains to directly access the southern part of the CBD from this location or to change to a bus services travelling to UQ.



6.4.8.2 Journey Times

Reduced journey times is the key benefit public transport users will enjoy due to the CRR Project. This reduction can be made up of a number of different elements, including:

- Travel time (or in-vehicle time) – the time a commuter spends within the vehicle, which can be influenced by journey distance, speed and the type of service (e.g. an all-stops service versus an express service).
- Wait time – the time that a commuter spends waiting for a train. Higher frequencies will mean that commuters would spend less time waiting for a train. Once the service reaches a turn-up-and-go level of service the waiting time is virtually eliminated.
- Access time – the time a commuter spends in accessing the service, which can be made up of a combination of modes (e.g. walking or car). This time is heavily influenced by the proximity of the service to the commuter’s origin or destination.

Reduction in wait time is broken down as follows:

- The average wait time per passenger trip is about 7.7 minutes today (2015). Additional rail services into the inner city and CBD in 2026 and 2036 due to the CRR Project will reduce this average wait time to 6.9 minutes by 2026 and 6.6 minutes by 2036.
- These wait time benefits will accrue primarily to passengers on long-distance commute services from the south and north. Afternoon peak period passengers waiting at CBD stations will also enjoy reduced wait times.

Reduction in travel time is broken down as follows:

- Average public transport trip times will fall slightly in 2026 across the network due to the shorter distance and faster commute for passengers from the south to the southern CBD.
- Overall, there will be a small increase in total public transport passenger hours across the average weekday, which is in line with the projected increase in public transport patronage in 2026 and in 2036.

Reduction in access times (walking) is broken down as follows:

- The new Albert Street and Roma Street stations will improve access and egress times for passengers using these stations, compared to using existing stations.
- The total number of public transport interchanges will be higher in 2026 and 2036 than in 2015 as a result of a greater number of passengers. With the CRR Project, there will be an increase in the average number of interchanges used per passenger, compared to the ‘without’ base case of 0.02 in 2026 and 0.05 in 2036 due to the increased interchange opportunities, particularly at Roma Street and Boggo Road stations.

6.4.8.3 Crowding

The CRR Project will address many of the negative perceptions of public transport such as limited service frequency and overcrowding. Forecasts indicate that as many as 300 people per trip will be forced to stand for long periods of time on each express service from Petrie and Beenleigh by 2036 if the CRR Project is not completed by then. Modelling undertaken for the CRR Project shows that by 2036, there will be an increase from 4,900 crowded hours per day in 2015 to 48,200 crowded hours on the rail network without the project. These outcomes are summarised in Table 6.5.



	2015	2026			2036		
	BASE	WITHOUT CRR	WITH CRR	DIFFERENCE	WITHOUT CRR	WITH CRR	DIFFERENCE
CROWDING RELIEF							
Additional crowded time (hours)	4,900	14,600	11,100	-23.7%	48,200	34,200	-29.0%

Table 6.5: Reduction in Crowded Hours Due to CRR Project across the SEQ Network (Daily Peak Period)

The CRR Project will reduce the number of passengers required to stand for long periods or spend time on overcrowded trains. The additional services enabled by the CRR Project will see a 24 per cent reduction in crowding, with significantly improved service levels for customers in 2036. The CRR Project reduces the percentage of commuters standing on scheduled Gold Coast services to less than 25 per cent and those standing longer than 20 minutes to less than five per cent in 2036.

This will see the forecast crowded time on the network reduced by 14,000 hours per day in 2036 and by 3,500 hours per day in 2026. This crowding relief will predominantly be gained by passengers travelling in peak periods on longer commuter train services from the south (Gold Coast) and north (Sunshine Coast).

6.4.8.4 Reliability

In the base case, against a backdrop of increasing passenger demand, the rail network is likely to become increasingly unreliable in future years as more and more services are crowded onto limited rail infrastructure. This highlights a key concept in rail capacity assessment: capacity and on-time reliability are inseparably linked. That is, minimal acceptable reliability defines capacity as shown in Figure 6.16.

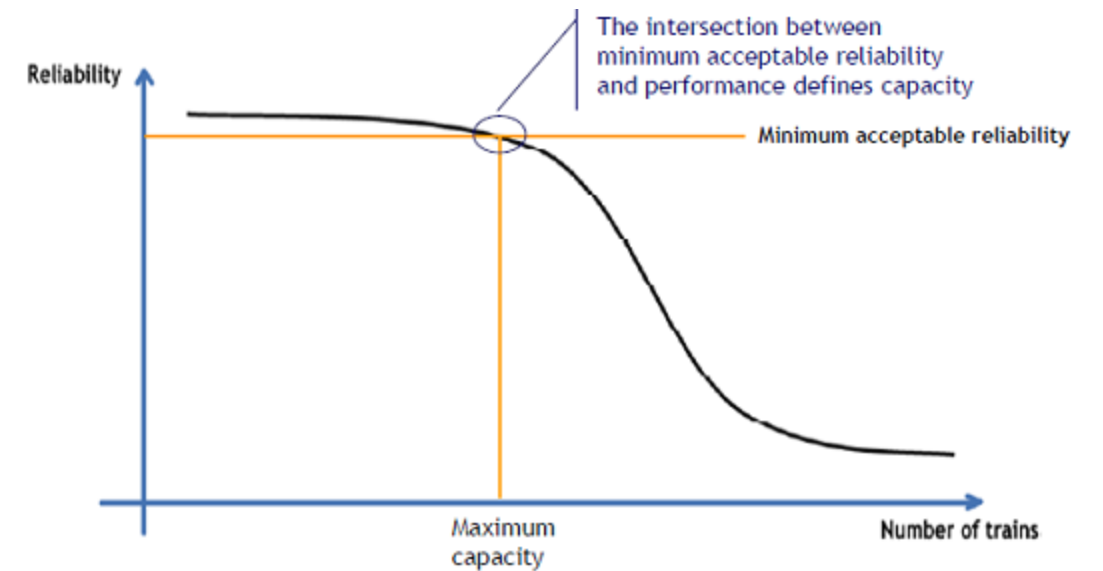


Figure 6.16: Minimum Acceptable Reliability



The direct relationship between capacity and on-time reliability is further illustrated in Figure 6.17. Adding more services to the network will negatively impact on-time reliability as more capacity is used. When the network approaches or exceeds its capacity limit, the cumulative effect of more risk of delay accelerates the deterioration in on-time running.

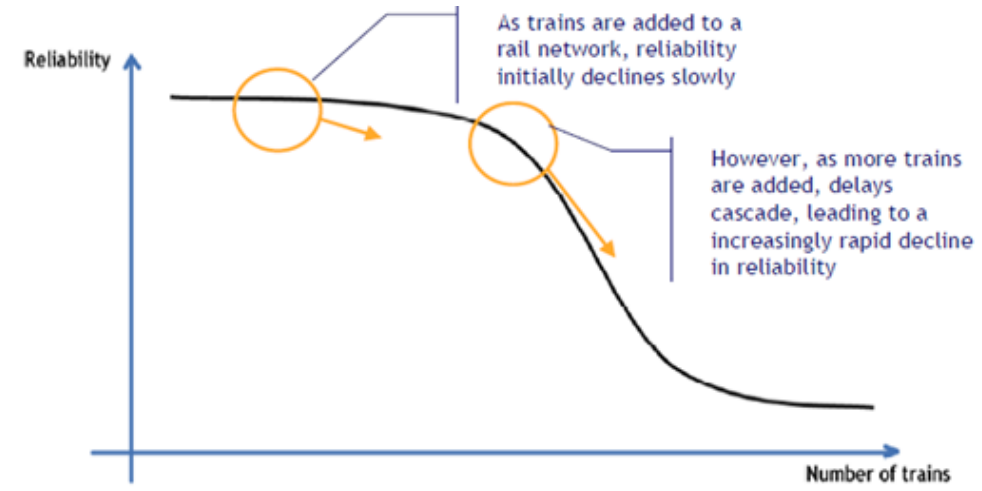


Figure 6.17: Declining Reliability

As a result of this projected unreliability, the incidences of train services not running to the scheduled timetable is likely to increase. Operational analysis was used to assess the reliability of train service plans 'with' and 'without' the CRR Project based on the level of demand across the network. On-time reliability was forecast for both the 'with' and 'without' project scenarios for 2026 and 2036. These forecasts were derived using dynamic simulation of the detailed timetables developed to match proposed service plans in the RailSys software package. Passenger and service lateness was then forecast for services operating across a typical day.

In summary, performance (reduced lateness) demonstrably improves across nearly all time periods and forecasts years when the 'with' project case is compared to the 'without' base case. This is most noticeable in the morning peak period when the rail network is typically under in the most stress. This demonstrates that even when services are increased 'with' the CRR Project, the trains are able to maintain their schedule and run more reliability.

6.4.8.5 Enabled Investments

While the CRR Project will increase capacity on SEQ's rail network from the first day of operations, it will also enable program-level infrastructure investments to further unlock network capacity. These investments are outlined in South East Queensland's Rail Horizon (2016) and include:

- Higher capacity, longer trains: The CRR Project will provide enabling works to facilitate the future rollout of nine-car trains, which offer a cost-effective means to increase network capacity. All CRR stations will be developed to allow easy conversion for longer trains.
- New generation signalling: The CRR tunnel will incorporate new generation signalling within the tunnel. This, combined with an additional rollout in the inner city, will facilitate the future rollout of new generation signalling across the entire SEQ rail network.
- Contiguous network augmentation: Additional surface works to the north and south of the tunnel will provide additional capacity to increase trains throughput in the inner city.



PROJECT BENEFITS

- Network expansions: By increasing capacity in the inner core, the CRR Project will enable new rail lines into greenfield areas, expanding the reach of the rail network.

While these options will be subject to their own business cases, the CRR Project will enhance their investment rationale.

