CHAPTER 2
Project need
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2. Project need

This chapter outlines the need for Brisbane Metro, including the strategic policy context driving the need for a project response, current and future public transport network issues and constraints, and bus network problems and challenges. The options assessment for Brisbane Metro in developing a project response to the identified problems and challenges is provided in Chapter 4.

2.1 Background and context

Cities are the principal drivers of the nation’s economic growth. The four largest capital cities in Australia – Sydney, Melbourne, Brisbane and Perth contribute over 60% of Australia’s gross domestic product. Brisbane is a thriving New World City, with a strong and productive economy, and is Queensland’s gateway to the global economy. The prosperity of Brisbane’s economy is critical to the prosperity of industry within Queensland and Australia.

CBDs and inner city locations provide highly concentrated centres for employment, particularly in knowledge-intensive activities and specialised services. As such, they generally experience higher levels of productivity than rural and regional towns and cities, i.e. inner city businesses generally provide jobs that contribute more to the growth of the economy, compared to jobs in outer areas that generally serve the domestic market. The concentration of jobs in these centres provide businesses with access to a large pool of skilled workers, and provides the opportunity to obtain the benefit from proximity to suppliers and customers, driving efficiencies and generating further opportunities.

With the changing spatial distribution of employment, many jobs (in particular, higher-skill, higher-paying jobs) are centralising in Australia’s major cities. At the same time, much of the population growth across Australian cities continues to occur in outer urban areas. The result is that an increasing number of people are living further away from city centres and the jobs they provide, leading to a growing need to effectively connect homes and workplaces.

Transport is an enabler of economic activity, providing access for workers to jobs and for goods and services to markets. Ineffective or inefficient movement of people and goods to, and within inner cities, has the potential to reduce productivity and impact economic growth at local, state and national levels. Transport improvements can increase the strength of agglomeration (the critical mass and concentration of activities) to the extent that they increase connectivity within the spatial economy of a city. By changing the way people and firms have access to economic activity, transport increases the potential realisation of agglomeration externalities and the productivity effects derived from it. Most world-class cities have invested in fast, efficient public transport systems to provide viable alternatives to private vehicles. These cities have used transport investments to reduce congestion, and its associated costs, and enable economic opportunity and growth.

2.2 Strategic policy context

A range of Australian Government, Queensland Government and Council plans and policies have informed the need for Brisbane Metro.

2.2.1 Australian Government

Australian Infrastructure Plan

The Australian Infrastructure Plan sets out the infrastructure challenges and opportunities facing Australia over the next 15 years and the solutions required to drive productivity growth; maintain and enhance the nation’s standard of living; and ensure Australian cities remain world class.

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2 Department of the Prime Minister and Cabinet (2016) Smart Cities Plan
3 Infrastructure Australia (2016) Australian Infrastructure Plan, February 2016
The Australian Infrastructure Plan outlines a long-term strategy that lays the foundation for a more productive Australia. Key reforms proposed relate to:

- productive cities, productive regions
- efficient infrastructure markets
- sustainable and equitable infrastructure
- better decisions and better delivery.

The Australian Infrastructure Plan identifies the need for Australia to upgrade its urban passenger transport networks so they are more integrated, have higher capacity and are able to meet the twin demands of population growth and rising expectations for service levels. At the same time, the structure, operation and use of these networks should be transformed to meet connectivity needs.

Brisbane’s high degree of connectivity by car is noted in the Australian Infrastructure Plan, with a large component of metropolitan Brisbane able to access over 50% of the city’s jobs by a 45-minute car trip. In contrast, the Australian Infrastructure Plan identifies public transport connectivity is much lower, with fewer than 10% of jobs able to be reached by a one-hour public transport journey in large sections of metropolitan Brisbane. A key conclusion from the Australian Infrastructure Plan is that workers need high-frequency, interconnected public transport systems to move them efficiently and comfortably. Australia’s largest cities, including Brisbane, should start planning for integrated, timetable-free, ‘turn-up-and-go’ train and bus services – similar to New York, Singapore, London and Paris.

Brisbane Metro aligns with the Australian Infrastructure Plan through delivery of a high-frequency service integrated with existing public transport nodes, improving journey times and accessibility to and within the inner city. It is expected that greater efficiency in public transport will reduce car dependency and encourage a mode shift away from private transport, freeing up road space for freight vehicles (among others).

Urban Transport Strategy

The Urban Transport Strategy identifies key transport issues that need to be considered in the context of continued growth in urban cities. They include:

- integrating transport systems
- integrating long-term infrastructure planning and land use planning
- the impact of urban transport systems on productivity
- the importance of urban access and equity, coherent and consistent funding and financing, consistent measurement and reporting of results.

The Australian Government aims for urban transport systems to allow for productive national outcomes and to be planned in conjunction with land use plans. The Urban Transport Strategy states that, while large infrastructure projects are not the only urban transport issue, they can be very influential on system performance and land use over time. Finding the right balance between private car use and public transport is a key issue that impacts not only on travel but also on freight.

Productivity is influenced by the amount and type of travel undertaken. Travel is influenced by where people live and work and the convenience and user cost of transport options such as walking, car, or public transport.

Brisbane Metro aligns closely with the Urban Transport Strategy by providing a more efficient, resilient and integrated transport system, improving connections between people’s homes and workplaces. This will support economic growth in the Brisbane region.

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**Australian Infrastructure Audit**

The *Australian Infrastructure Audit* takes a strategic approach to assessing Australia’s infrastructure needs, examining the drivers of future infrastructure demand, particularly population and economic growth. The *Australian Infrastructure Audit* provides a top-down assessment of the value-add, or direct economic contribution of infrastructure, considers the future demand for infrastructure over the next 15 years, and delivers an evidence base for further gap analysis, long-term planning and future investment priorities.

The *Australian Infrastructure Audit* found that, without action, Australia’s productivity and quality of life will be tested, with population and economic growth set to cause increasing congestion and bottlenecks. Key findings included:

- growth in Brisbane will impose additional demands on urban infrastructure, already subject to high levels of demand
- infrastructure decision-making must place a high priority on productivity growth, through efficient management of existing infrastructure, rigorous and disciplined evaluation of investment initiatives and efficient delivery of new projects
- the cost of congestion in our capital cities, estimated at $13.7 billion in 2011, is expected to increase to around $53.3 billion by 2031 in the absence of additional capacity and/or demand management.

Major reforms are needed to improve the way infrastructure is planned, financed, constructed, maintained and operated to ensure it can underpin gains in Australia’s productivity in the decades ahead, and contribute to economic growth.

**State of Australian Cities 2014-2015**

The *State of Australian Cities 2014–2015* report analysed cities in relation to population, settlement, economy, human capital and infrastructure and transport. The study states that issues of space, and the potential conflicts of the usability of cities with the movement of goods and people are key concerns for the continued growth of productive cities. Economic output of the major cities has grown, and as such, transport networks are experiencing significantly higher demand than planned for the networks.

Australia’s cities are increasingly characterised by the significant spatial divide between areas of highly productive jobs and the areas of population-based services, reflected through the price premiums associated with houses that have better access to the city centre.

While there is evidence that Australia’s major cities are increasing in density, driven by the construction of higher-density apartment developments in inner city locations, growth in the detached housing market in urban fringe areas remains strong. These urban fringe areas are also becoming more distant from established employment, education and health opportunities. In the past decade, the rate of average annual growth of public transport patronage (2.4%) surpassed the rate of population growth in capital cities (1.8%), and as such demand for public transport modes such as buses and heavy rail is continuing to increase.

The *State of Australian Cities* also highlights the criticality of integrated planning outcomes to anticipate and address growing demand and avoid unnecessary additions to transport tasks, making efficient use of existing transport infrastructure and identifying and planning for future needs.

**Smart Cities Plan**

The *Smart Cities Plan* sets out the Australian Government’s vision for cities.

- Smart investment – we will become smarter investors in our cities’ infrastructure by:
  - prioritising projects that meet broader economic objectives

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7 Department of Prime Minister and Cabinet (2016)
- treating infrastructure as an investment wherever possible
- getting involved early to ensure rigorous planning and business cases
- increasing investment (i.e. investigating value capture opportunities).

- Smart policy – we will coordinate and drive smarter city policy by:
  - delivering ‘city deals’
  - leading regulatory reform
  - measuring success.

- Smart technology – we will drive the take-up of smart technology to improve the sustainability of our cities and drive innovation by:
  - thinking of technology solutions first
  - leveraging open and real-time data
  - driving use of energy efficient technologies.

The Smart Cities Plan highlights the challenges facing cities around economic transition, jobs, housing and transport. Businesses have an incentive to locate in areas with access to the largest numbers of potential employees. At the same time, people have an incentive to settle where they can access the greatest number of employment opportunities. As economic activity becomes more concentrated, demand for housing and land in nearby areas rises. To deal with rising prices, Australians have taken on relatively high levels of household debt, moved to the outer suburbs, or both. With more people living in outer suburbs, people are travelling longer distances and for longer periods to get to work.

Congestion affects passenger networks. While no city around the world has eliminated congestion, most world-class cities have invested in fast, efficient public transport systems that provide viable alternatives to private passenger vehicles. Well-designed public transport networks, including heavy and light rail, buses, ferries and integrated active transport, are an efficient, convenient and environmentally friendly way of transporting large numbers of people within and between cities. Better accessibility needs a combination of demand management and investment in public transport, roads and active transport, including walking and cycling.

The Smart Cities Plan outlines the concept of a ‘30-minute city’ where everyone can easily access the places they need to visit on a daily basis, wherever they live. It involves planning cities so residents can access employment, schools, shopping, services and recreational facilities within 30 minutes of home.

2.2.2 Queensland Government

State Infrastructure Plan

The State Infrastructure Plan sets the Queensland Government’s strategic direction for infrastructure by identifying what is required from infrastructure and how these objectives can be best achieved. These objectives and directions seek to address the high-level challenges facing Queensland over coming decades.

The State Infrastructure Plan outlines four objectives to guide infrastructure priorities:

- improving prosperity and liveability
- infrastructure that leads and supports growth and productivity
- infrastructure that connects communities and markets
- improving sustainability and resilience.

Specific to transport infrastructure requirements, the *State Infrastructure Plan* outlines the strategic responses and priorities to these objectives. This is to enable Queensland Government departments and industry to align their activities in response to these priorities, including:

- focusing on maintenance and rehabilitation of existing infrastructure to reduce the long-term cost of repair and improve network resilience
- seeking innovation and technology solutions to create a better performing and lower emissions transport system
- seeking public transport solutions, including demand management, to address the strong growth of South East Queensland
- digitally connected smart infrastructure to improve capacity, safety and security.

Brisbane Metro supports the key objectives of the *State Infrastructure Plan*, and is guided by its principles to ensure transport outcomes support the wider transport network and land use opportunities. It addresses the key transport responses of the *State Infrastructure Plan* by maximising use of existing infrastructure, connecting areas of high growth and high productivity, providing a solution to move more people while minimising costs, delivering new generation vehicle technologies, and use of ‘smart’ systems to enhance customer experience and use additional capacity in the existing infrastructure.

**ShapingSEQ**

*ShapingSEQ: South East Queensland Regional Plan 2017* provides a framework for managing the region’s growth over the next 25 years and sets a vision for the next 50 years in response to the region's expected population changes, both in size (from 3.5 million in 2016 to 5.3 million people by 2041) and demographics. It proposes policy directions and benchmarks to address expected growth. It seeks to boost jobs growth across the region, in the industries of the future. *ShapingSEQ* will drive for a region that is smart, sustainable, compact, connected, safe and healthy for now and into the future.

*ShapingSEQ* discusses the long-term vision to change the region’s transport priorities to achieve a more sustainable, healthier and fairer transport system, and the priority of public and active transport. This includes making the most of existing systems and targeting strategic investment in new region-shaping infrastructure. Integrated land use and infrastructure planning is fundamental to achieving community aspirations, economic growth, and efficient and affordable infrastructure delivery.

Brisbane Metro supports the 50-year vision for South East Queensland of good public transport network integration and connectivity, with frequent, reliable services to connect people to their destinations, reducing car dependence and improving inner city amenity. Brisbane Metro will integrate with and complement other public transport modes, including developments such as the proposed CRR project, to provide additional accessibility to, and circulation within, the inner city.

**Connecting Brisbane**

The *Connecting Brisbane* strategy was jointly developed by the Queensland Government and Brisbane City Council, in consultation with the Australian Government. It provides a holistic strategy for Brisbane’s passenger transport system, to set Brisbane’s public transport network up for the future as it emerges as a New World City. The vision for the future of public transport in Brisbane is to create a customer-friendly, efficient, integrated and reliable system that promotes connectivity and provides a foundation for future growth and innovation.

*Connecting Brisbane* identifies a passenger transport system transforming from a radial network, with buses and trains making long journeys into the city centre, to a ‘turn-up-and-go’ high-frequency trunk network supported by feeder services, improving service and reducing duplication.

Brisbane Metro is a fundamental part of the *Connecting Brisbane* strategy. It supports key visions for the future of the transport network including provision of an efficient, reliable and modern service and network, connecting

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9 DILGP (2017a) *ShapingSEQ: South East Queensland Regional Plan 2017*, August 2017
10 DILGP (2017b) *Connecting Brisbane*, June 2017
people, businesses and places, particularly major facilities, services and hubs in Brisbane. It establishes a
foundation for growth and innovation through a network with the flexibility to grow and evolve in response to
changing needs into the future.

2.2.3 Brisbane City Council

Brisbane City Plan 2014

*Brisbane City Plan 2014* (City Plan) is Brisbane’s strategic planning framework. It is influenced by a range of
plans, including:

- *Brisbane Vision 2031*\(^{11}\)
- *Brisbane Economic Development Plan 2012-2031*\(^{12}\).

City Plan provides a strategic framework that seeks to ensure Brisbane has an outstanding lifestyle and a
globally competitive economy supported by safe, efficient and reliable public transport. The framework supports
growth along major road corridors and within and near major centres including the city centre and city frame
areas such as Fortitude Valley and South Brisbane. Regional centres such as Chermside and Upper Mt Gravatt
are also identified growth nodes. Key strategic transport objectives reflected in City Plan include:

- Brisbane has a safe and efficient public transport network
- public transport is the preferred mode of travel to the city centre and the city's other major centres, and
  provides a high level of access to all facilities and services in Brisbane, reducing the need to use a
car.

Brisbane City Centre Master Plan 2014

The *Brisbane City Centre Master Plan 2014*\(^{13}\) (City Centre Master Plan) sets the vision and strategic framework
to manage the forecast growth in the CBD and city frame over the next 20 years – around 50 more office and
apartment towers will be needed to accommodate demand, there will be an 80% increase in public transport
journeys as more people commute and city centre streets will have double the number of pedestrian trips.

Strategic development sites identified in the City Centre Master Plan include the Brisbane Transit Centre and
Woolloongabba area. The City Centre Master Plan envisages redevelopment of the Brisbane Transit Centre to
deliver a safe and attractive gateway marking the western entry to the city centre. Woolloongabba is identified
as a suitable location for a key transport interchange for regional commuters, enabling them to access inner city
destinations without congesting the main transit corridors.

City frame renewal precincts identified in the City Centre Master Plan include Valley Heart and Centenary Place,
City West and Petrie Terrace, Kurilpa and Spring Hill. Other renewal precincts that have a significant
relationship with the core of the city centre include Woolloongabba, Milton, Kangaroo Point and Bowen Hills.

The City Centre Master Plan’s transport strategy ‘where people connect’ states that public transport will be the
best way to commute to the city centre and investment will be made in high-capacity and high-frequency transit
to maintain the city’s strong growth. It also indicates Brisbane will boast an extensive intermodal network, new
transit infrastructure and improved services to sustain continued growth and prosperity.

Brisbane Metro aligns with the City Centre Master Plan by improving public transport efficiency and the
customer experience of public transport in Brisbane, reducing traffic-related impacts to the city streets and
improving amenity for pedestrians and businesses.

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\(^{11}\) Brisbane City Council (2013) *Brisbane Vision 2031*

\(^{12}\) Brisbane City Council (2012a) *Brisbane Economic Development Plan 2012-2031*

\(^{13}\) Brisbane City Council (2014) *Brisbane City Centre Master Plan – A vision for our open city 2014*
Brisbane Vision 2031

Brisbane Vision 2031\textsuperscript{14} is Council’s long-term community plan for the City. The main priorities for Brisbane Vision 2031 are to:

- maintain or improve quality of life for the Brisbane community
- ensure that Brisbane has the services and infrastructure to meet the liveability and sustainability challenges of the future
- provide an overarching plan of action for Council, its partners and the people of Brisbane until 2031.

The themes in Brisbane Vision 2031 outline the shared aspirations for Council and the community. The most relevant theme for Brisbane Metro is ‘our accessible, connected city’. Aspirations to achieve this theme include:

- Brisbane is an accessible city for everyone – residents, workers, students, visitors and business people can move easily throughout the city
- road, public transport and active transport networks provide safe, efficient, fast and reliable travel options throughout the city – these networks help deliver economic benefits to Brisbane and support the growing community and changing economy.

Brisbane Metro aligns with Brisbane Vision 2031 by delivering a safe, connected and reliable public transport network and services to support projected population and economic growth, and a vibrant 24-hour inner city and subtropical lifestyle. It supports the vision’s aspirations through increasing public transport mode share, improving travel time reliability, accessibility and sustainability, providing for the safe movement of people around the city, and providing infrastructure to support population, employment and economic growth.

Brisbane Economic Development Plan

The Brisbane Economic Development Plan 2012-2031\textsuperscript{15} indicates significant capacity building will be required to meet growth opportunities, including expanding transport infrastructure and improving public transport services, particularly those that serve commercial and industrial precincts.

The Brisbane Economic Development Plan notes business precincts across the inner city must be linked by good public transport networks for corporate businesses to enjoy efficient connectivity and to realise the associated agglomeration benefits. It also indicates that moving people efficiently into and around inner city employment hubs from across the region, particularly from areas outside of Brisbane as the broader South East Queensland region grows, will be critical to future economic growth.

Brisbane Long Term Infrastructure Plan 2012-2031

The Brisbane Long Term Infrastructure Plan 2012-2031\textsuperscript{16} is intended to guide the prioritisation and alignment of Brisbane’s infrastructure as the city grows. It acts as a reference for other levels of government and the private sector. Key objectives of the Brisbane Long Term Infrastructure Plan include:

- grow the economy: road and public transport networks provide efficient and reliable travel options for workers to access jobs, residents and visitors to access services, and business and industry to operate effectively and productively
- build the community: the transport network delivers people to their desired destination.

The Brisbane Long Term Infrastructure Plan highlights the importance of public transport to maintaining the liveability of the city. Brisbane’s public transport system will evolve to provide:

- reliable, frequent and accessible services
- access to major centres, services and facilities that meet the needs of commuters

\textsuperscript{14} Brisbane City Council (2013)
\textsuperscript{15} Brisbane City Council (2012a)
\textsuperscript{16} Brisbane City Council (2012b) Brisbane Long Term Infrastructure Plan 2012-2031
well-connected, multi-modal networks with seamless integration between different modes.

The Brisbane Long Term Infrastructure Plan recognises that ensuring ease of access and use of public transport facilities, including for people with disability is integral to achieving the outcomes sought for the public transport network. Locating bus and rail interchanges at strategic interconnection points, and providing ‘park and ride’ facilities where appropriate at key bus and rail station locations will facilitate this outcome. The plan also notes that dedicated busways and high-frequency services, particularly during peak times, will improve the reliability of, and demand for public transport services.

**Draft Transport Plan for Brisbane – Strategic directions**

Council is currently developing a new transport plan for Brisbane to outline how it intends to address the transport challenges facing Brisbane over the next 25 years and beyond, to achieve Council’s vision for the future. The Draft Transport Plan for Brisbane – Strategic directions was released for consultation in November 2017 and provides a framework to guide future decisions about transport programs and initiatives in Brisbane and ensure the transport network, regardless of responsibility, meets the city’s transport needs while being flexible to respond to the opportunities and challenges ahead.

The Draft Transport Plan for Brisbane is underpinned by a number of transport principles that guide decisions about the transport network.

- **People first** – transport must meet people’s needs and provide suitable choices for movement of people and goods.
- **Safety** – support the safety of people using our transport networks and those who may be impacted by our networks.
- **Sustainability** – make planning decisions that are financially, socially and environmentally sustainable.
- **Equity** – transport networks provide a reasonable level of access for all. The benefits and costs of transport should be shared equitably within and across existing and future generations and embrace opportunities to adapt to change.
- **Effectiveness** – transport infrastructure and services should be fit-for-purpose and deliver intended outcomes.
- **Connectivity** – transport provides legible and connected paths of travel from trip start to finish.
- **Integration** – transport networks and services must work together and are considered in partnership with land use and economic planning decisions.
- **Asset utilisation** – Address transport performance and whole-of-life economic, social and environmental costs in planning and decision making and maximise benefits from existing transport infrastructure and services.
- **Demand management** – manage demand and influence transport choice for movement of people and goods to improve network efficiencies and reduce or delay the need for new infrastructure.
- **Environmental management** – manage transport to protect and enhance the city’s air, water, vegetation and natural habitats.

The Draft Transport Plan for Brisbane sets out the challenges, opportunities and strategic directions for the future based on four themes – enhancing liveability, delivering economic benefits, harnessing innovation and evolving the network.

Encouraging more trips by sustainable modes of transport and reducing congestion are key strategies for ensuring Brisbane’s liveability is protected and enhanced. Providing travel to work options that meet commuters’ needs while allowing efficient network operation through increased use of public and active transport for commuter travel is a key outcome for the draft plan, allowing people are able to get to employment steadily and reliably.

17 Brisbane City Council (2017) Draft Transport Plan for Brisbane – Strategic directions
The strategic use of technology to improve the efficiency and effectiveness of transport networks and services is identified as a key outcome for 'harnessing innovation'. This includes the use of Intelligent Transport Systems and technology-enhanced systems. Ensuring Brisbane’s transport networks are planned to meet projected population and employment needs and designed to optimise effectiveness and performance of the network as a key outcome for evolving the network.

The final transport plan will be released in 2018 and will replace the current Transport Plan for Brisbane 2008-2026.

2.2.1 Policy context summary

The need for improved public transport, and connectivity between homes and businesses has been identified by all levels of government as critical to managing projected population and employment growth as well as managing congestion and increasing economic productivity in Brisbane.

2.3 Brisbane’s transport challenges

2.3.1 Strategic accessibility, connectivity and productivity challenges

As Brisbane and the wider region grows, transport to, and around the city, will become increasingly challenging. Population growth will occur in Brisbane’s outer suburbs and surrounding local government areas, while the main employment centre will remain the CBD. Other key employment nodes are also focused at principal activity centres such as Indooroopilly, Garden City, Chermside and Carindale as well as other key activity centres such as major hospitals and tertiary educational institutions.

Figure 2.1 shows the forecast share of population and employment growth in the Brisbane Local Government Area (LGA) and the Brisbane Statistical Division. The majority of residential growth in the Brisbane Statistical Division to 2041 is forecast to be outside of the Brisbane LGA, while much of the employment growth remains within the Brisbane LGA. This presents a considerable transport challenge for the region.

Figure 2.1: Forecast Brisbane LGA share of population and employment growth (2016 to 2041)\textsuperscript{14}

\begin{figure}[h]
\centering
\includegraphics[width=\textwidth]{figure2.1.png}
\caption{Forecast Brisbane LGA share of population and employment growth (2016 to 2041)\textsuperscript{14}}
\end{figure}

\textsuperscript{14} TMR (2016) Forecast data for Brisbane LGA share of population and employment growth (2016 to 2041), November 2016
Poor land use outcomes, such as urban sprawl, can also erode regional accessibility and connectivity. Predominantly dormitory suburbs in greenfield areas result in residents commuting to areas of employment. With housing policies aimed at boosting construction of new houses, significant development continues to take place in greenfield sites on the outer urban areas, where public transport accessibility is limited and of a lower level of service than inner areas, resulting in higher levels of car dependency. Inner area residential densification within the Brisbane LGA is also increasing, placing higher demands on public transport and active transport networks in these areas where car ownership and residential parking provision is lower than in fringe areas.

Growing demand for mobility and connectivity is placing pressure on Brisbane’s existing transport networks, resulting in longer and more variable travel times, crowding on public transport services, and significant peak period congestion on the arterial road network. With population growth in the wider region and employment opportunities in inner city precincts, there will be greater demand for people to travel in Brisbane on all transport modes. Public transport trips to and within inner Brisbane are projected to grow from 260,000 trips per day in 2016 to 550,000 trips per day in 2041, an increase of more than 110% in public transport demand based on the Brisbane Metro Transport Model 2017.

This increased demand for the transport network coupled with degrading travel times will result in a significant decline over the next 25 years, in the percentage of jobs that can be accessed within a 30-minute public transport trip (refer to Figure 2.2). Figure 2.2 indicates limitations on access to employment for people living in the outer areas of Brisbane and surrounding local government areas. For the majority of people more than 10 kilometres (in straight line distance) from the General Post Office, less than 20% of jobs can be reached within 30 minutes on public transport; dropping to less than 10% by 2041.

Figure 2.2: Percentage of Brisbane jobs that can be accessed within a 30-minute public transport trip\(^\text{19}\)

\[^{19}\text{Brisbane Metro Transport Model (2017)}\]
Without good transport accessibility, residents of outer areas have access to fewer jobs than inner city residents, particularly to higher value jobs located in city centres, and are therefore more vulnerable to fluctuations in the economy.

Without an effective transport network, population increases, and therefore travel demand, will increase travel times (particularly for commuting journeys), increase the variability in travel times, and increase congestion. This negatively impacts the economy, reducing productivity and increasing transport costs for freight. As such, transport connectivity is important in supporting both high-productivity agglomerations and labour market participation.

Agglomeration is when people and businesses co-locate to draw benefit from being in proximity to each other. A key factor to improving productivity is through agglomeration benefits, with labour mobility critical to achieving this. Highly skilled and educated people tend to congregate in areas such as cities, which provide high value jobs. This collective pooling of skills has synergistic effects on productivity, fostering the growth and spread of knowledge, encouraging innovation, attracting other talented people and boosting labour participation.

Agglomeration has benefits for employers, employees and the wider economy. Employers have access to a greater pool of skilled workers and can better match these workers to knowledge-intensive jobs. Workers have access to higher value jobs and a more resilient job market, which provides alternative opportunities in the event that an individual firm or a market sector experiences a downturn. Agglomeration also assists with the spread of knowledge throughout the economy, both between firms and from worker to worker.

Poor accessibility and connectivity limits potential productivity improvements by limiting the ability of businesses and people to agglomerate, i.e. to connect and share opportunities, skills and knowledge. Connecting residential areas in the greater urban area with employment is essential to maintaining a productive city. Longer and more variable commute times, crowding and congestion are detrimental to meeting this fundamental need. The productivity benefits of agglomeration are best achieved by investment in public transport infrastructure to efficiently link workers with the knowledge-intensive jobs that drive economic activity.

The strategic challenges can be summarised as:

- economic growth and productivity: failing to efficiently connect people and jobs as well as connecting businesses will hold back economic growth and improvements in productivity
- accessibility and connectivity: jobs are increasingly concentrated in the inner city and population growth in outer areas, which creates increased commute times and need for more private vehicle and/or public transport capacity into and within the inner city. As the built environment limits ability to provide additional private vehicle capacity, the focus is to provide additional public transport between the outer population and inner employment.

2.3.2 Public transport challenges

Unlocking these strategic accessibility challenges will require a focus on investments and improvements principally in our public transport system to serve the increasingly urbanised jobs market and support the transition to knowledge and service industries. However, the transport system is already constrained and forecast to worsen.

Impacts of growth on passenger capacity on the bus network and rail network are shown in Figure 2.3 and Figure 2.4 respectively. These are plots of passenger demand compared to total capacity for the morning peak periods in 2016 and 2031 and show that Brisbane’s existing public transport network is already near capacity on several links in peak periods, which worsens by 2031. This is due to:

- rail network key capacity constraints:
  - the capacity of the Merivale Bridge
  - flat junctions at Park Road, Roma Street, Roma Street West and South Brisbane

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21 DiRD (2015)
- speed restrictions and platform capacity at Central station
- capacity of central city rail tracks (i.e. eight suburban tracks feeding four inner city tracks)
- dated signalling technology

bus network key capacity constraints:
- platform capacity and customer boarding inefficiencies at all inner busway stations, particularly Mater Hill, South Bank and Cultural Centre stations leading to crowded and unpleasant passenger experiences
- capacity and safety issues at the Melbourne Street busway portal (i.e. due to a non-segregated busway)
- intersection capacity at North Quay/Victoria Bridge; Melbourne Street/Grey Street and the Allen Street South East Busway exit to Stanley Street (i.e. road congestion resulting in delays to the busway)
- kerb space constraints and congestion on core CBD streets
- insufficient layover space in and around the CBD.

These constraints cause delays and congestion on the rail and bus networks, increasing the likelihood of network failure and resulting in longer, less reliable bus and rail trips. Without investment in public transport, there will be insufficient capacity to comfortably and reliably meet the projected growth in population and employment. This will have economic ramifications for Brisbane with greater congestion, impacting workers accessing jobs, eroding labour productivity and increasing transport costs.

The bus related challenges and deficiencies form the focus for Brisbane Metro. Rail problems are being addressed through several projects being led by the Queensland Government including the European Train Control System (ETCS) – Inner City and the proposed CRR projects.

It is recognised that bus and rail work together as part of an integrated network. The busway physically intersects with the rail network at two primary locations (i.e. Roma Street and Boggo Road stations), and at two secondary locations (i.e. South Bank and Buranda). These locations act as interchange points allowing customers to move between services and corridors in order to access a wider range of destinations than would otherwise be possible through each mode individually.
Figure 2.3: Weekday morning peak passenger demand relative to total capacity (bus network) (2016 to 2031)\textsuperscript{22}

\textsuperscript{22} Brisbane Metro Transport Model (2017)
Figure 2.4: Weekday morning peak passenger demand relative to total capacity (passenger rail network) (2016 to 2031)\(^{23}\)

\(^{23}\) Brisbane Metro Transport Model (2017)
2.3.3 Bus challenges

A summary of the current bus challenges is shown in Figure 2.5.

Figure 2.5: Current bus network challenges
Those challenges that underpin the need for Brisbane Metro can be categorised as:

- accessibility and connectivity
- insufficient effective capacity
- degrading journey times and reliability
- customer experience – legibility and connectivity issues
- operational inefficiencies
- worsening inner city amenity.

### Accessibility and connectivity

Accessibility and connectivity are affected by a number of factors including service frequency, reliability, cost, destinations serviced, ease of interchange and travel time.

Interchange between modes and services in Brisbane has historically been associated with long wait times and/or long walk times where the modes are not seamlessly integrated and where service frequencies may be insufficient to mitigate the additional wait time involved. This lack of customer focus in physically and functionally integrating services has tended to create a culture which does not actively support interchanging thereby limiting the destination choice and connectivity potential of the combined public transport network.

The current bus operations include, variable floor heights, limited next stop information single door boarding and cash fare payment on board which leads to slow boarding times and customer frustration.

Poor connectivity limits potential productivity improvements by limiting the ability of business and people to agglomerate and labour market participation. Passengers intuitively recognise the limitations of poor connectivity and have consistently raised this as a key aspect of Brisbane’s public transport that they would like improved.

### Insufficient effective capacity

Infrastructure constraints on critical sections of the busway and road network limit throughput and control capacity. The majority of services from the south-east are required to pass through the Woolloongabba busway junction and then cross the river for access to the CBD using either Victoria Bridge or Captain Cook Bridge.

In 2016, the South East Busway at the Woolloongabba junction carried approximately 12,000 customers inbound per hour in the morning peak. This compares to approximately 6,500 customers on the rail lines approaching from the south (i.e. Cleveland, Beenleigh and Gold Coast lines), highlighting the critical line haul role that bus plays in this part of the public transport network. While the busway could carry more passengers, its effective capacity is limited by bus occupancy, poor peak journey times and declining reliability.

Bus movements via the Victoria Bridge are already constrained by the intersection capacity at each end of the bridge (i.e. North Quay and Grey Street), and by the capacity of the Cultural Centre station. Bus movements on the Captain Cook Bridge are affected by general traffic congestion, in particular on the off-ramps leading into the CBD.

Inner sections of the South East Busway are also constrained by station capacity at peak times, which is influenced by bus dwell times, platform lengths and stopping arrangements. Station capacity constraints are evident at key busway stations such as the Cultural Centre, Mater Hill and South Bank stations. This causes undesirable bus queuing and delays on station approaches in the busway network and on the Victoria Bridge as buses wait for platform space.

The Cultural Centre station, which is a key determinant of capacity across the Victoria Bridge, already operates over capacity in peak periods (refer to Figure 2.6 and Figure 2.7). The busway station has been over capacity since 2008, resulting in increasing travel times and unreliability of service for customers over the past 10 years.
Overall, the approach to the CBD for buses from the south along with river crossing capacity presents the most critical areas of constraint. There are also significant congestions issues emerging on core CBD streets such as Elizabeth and Adelaide Streets, and station constraints are now also evident at King George Square and Roma Street stations.

24 TransLink (2016a) Inbound/outbound daily bus volumes/capacity at Cultural Centre station, provided November 2016
25 TransLink (2016a)
Degrading travel time and reliability

Capacity constraints on the network are impacting bus reliability and travel time performance. With significant forecast population and employment growth, congestion on the road and busway networks will continue to increase, impacting on bus travel times for residents and visitors, with flow-on to the region's economy and lifestyle.

Variability in travel times is an indication of reducing reliability. A comparison of actual boarding and alighting times from go card data and scheduled travel times for a journey between Buranda and King George Square stations in the morning and evening peak periods shows the highly variable nature of travel times (refer to Figure 2.8 and Figure 2.9).

A range of adverse outcomes are anticipated to result from these forecast deteriorating operating conditions. 

- Uneven loading of services and inefficient use of capacity as a result of ‘bus bunching’, where services catch up to each other with the first bus overcrowded and following buses under-utilised.
- Cumulative flow-through impacts for operations, such as buses being late for the start of their next service.
- An increase in the relative cost of operating bus services. Degrading travel times mean more fleet and driver hours will be required to maintain the same service frequencies over time.
- Degradation of customer experience, especially for standing customers in stop/start conditions.

Figure 2.8: Travel time between Buranda and King George Square stations (peak direction) (2016)

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TransLink (2016b) Go card ticket data (2011 to 2016), provided September 2016
Customer experience – legibility

Several aspects of the current bus network structure and operations impact negatively on the customer experience. As well as capacity/congestion and related travel time and reliability issues already raised, network complexity and legibility are current issues for some customers, particularly infrequent users.

Network complexity arises partly from a range of different bus ‘product’ types often with different stopping patterns operating on the same corridor. Service types include pre-paid Rocket, BUZ, CityXpress, CityBus and cross-town services. While this arrangement may lead to choices of route or destination for customers, it can work against other objectives around frequency, connectivity and efficiency. For example, while a number of arterial road and busway corridors in Brisbane have frequent bus routes, and/or overlapping routes with high combined frequencies, the complex nature of the network can create uncertainty and confusion. The lack of certainty of when the next bus will access their destination can lead to potential users not taking advantage of the full range of available services and therefore not experiencing the convenience of their combined ‘turn-up-and-go’ frequency.

Operational inefficiencies

Some aspects of the current network structure also impact on the efficiency of the public transport (particularly bus) network, e.g. the current network structure includes a range of coverage (all stops) services to meet community service obligations that overlap with other trunk/line haul services using the constrained inner parts of the busway network in peak hours. This adds to congestion and contributes to delays for all services. The current route structure with different stopping patterns can also result in uneven loadings between services. This is particularly evident in the evening peak where several bus services to the same corridor may leave from different CBD stops or stations and passengers must make a choice as to which stop or station to go to access their service.

Limited frequent and attractive cross-town connectivity can also result in increased reliance on the CBD and the inner city for transfers that might otherwise be possible at suburban or regional centres. This impacts on the number of customers using critical and congested inner city corridors and stations contributing to capacity constraints.

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27 TransLink (2016b)
One-way streets within the CBD also present challenges to efficient bus operations as they preclude access to that part of the city from both directions; eliminate large sections of kerb space from potential use as bus stops; and require return services to operate from different streets, reducing legibility. A lack of inner city layover is also contributing to inefficient bus operations, resulting in increased dead running.

A range of boarding and ticketing practices also impact bus dwell times and ultimately the operational efficiency and capacity of the bus network (e.g. bus drivers are often involved in fare collection, revenue protection and responding to customer enquiries, resulting in delays and reducing bus throughput at stops). In addition, current ticketing policies mean that customers are generally required to board from a single front door increasing the time taken to load a bus, while buses stopping at different points on the platform or kerb require customers to negotiate past other waiting or boarding customers, creating platform congestion and reducing the capacity of stations.

**Worsening inner city amenity**

Bus services can face significant congestion in the inner city, which impacts on travel times and reliability for bus customers and operators and detracts from the amenity of the CBD streets. Buses are both impacted by and contributors to the congestion, due to their size and need to service surface bus stops. In particular, bus congestion is clearly evident along Adelaide and Elizabeth Streets in the morning peak period, due to the high volumes of services travelling from northern and western suburbs, and over Captain Cook Bridge.

The high volume of buses along the busways result in substantial amenity impacts at the Cultural Centre precinct, along Victoria Bridge and along Melbourne Street. The movement of buses from the South East Busway portal at Melbourne Street to and from the station restricts pedestrian movement in the precinct, and detracts from the important east-west connection between the CBD and West End.

As employment and population continue to grow within the inner city, the demand for travel through and within the CBD and inner Brisbane will increase, leading to increased vehicular congestion and further impacts on amenity. At the same time, the importance of public space and amenity also rises as population and employment density increases in the inner city neighbourhoods. Local streets need to serve both transport and public space functions as residents and workers increasingly shop, walk, meet and relax in local streets and spaces.

Widening roads and increasing traffic volumes will not be compatible with these aspirations for vibrant, liveable neighbourhoods. New public transport infrastructure will need to integrate well with surrounding streets and public spaces and respect the increasing importance of their place functions.

**2.3.4 Summary of Brisbane’s transport challenges**

Brisbane’s transport network is now at a critical juncture in its evolution as emerging issues challenge the region’s growth aspirations. Promoting public transport as the preferred mode for accessing the CBD and inner city, especially during peak hours, will be essential to addressing these issues.

Strong growth in private car use can incur significant infrastructure costs and restrict economic activity. Continued growth in car travel will increase congestion and impact on freight and commercial movements, increasing the cost of conducting business and transporting goods.

Due to critical network constraints, serving the anticipated growth in public transport demand across the region, particularly for travel to and within Brisbane’s inner city, will be impossible without additional infrastructure. Based on the current operating profile, existing bus infrastructure is reaching capacity and cannot accommodate significant growth. The reliability and operational efficiency of the bus network is also reducing due to the constraints of the network, particularly within the CBD.

Brisbane’s rail network has limited capacity and coverage compared with other major Australian cities, particularly across Brisbane’s inner city and CBD. This is due, in part, to limited Brisbane River crossings and the location of inner city stations in relation to commercial precincts. Rail services to and through Brisbane’s inner core also continue to experience growth as people across South East Queensland seek to access
services and jobs in the region’s primary activity centre. However, the existing inner city rail system has insufficient capacity to serve the forecast demand for CBD access.

2.4 Implications without a project solution

The future implications for the current problems of the bus network as a result of growth and without a project solution are:

- capacity constraints caused by physical bottlenecks on the busway network, including stations and intersections will lead to further worsening of travel times and increasingly mean more variable (less reliable) journey times
- continued deterioration of the overall efficiency of the bus network, with more drivers needed to maintain current frequencies due to slower journey times
- continuation of the ‘single-seat to the city’ network operating approach particularly for low patronage coverage services, coupled with complex routes, stopping patterns and overlapping peak and all day services will mean increasing numbers of buses on CBD streets, affecting amenity and liveability of the inner city.

2.5 Project requirements

The strategic plans and policies and transport challenges described in section 2.2 and section 2.3, set the context for the need to intervene into the current transport system and develop solutions which address the identified problems. This leads to a set of key project requirements to guide the development and subsequent assessment of Brisbane Metro. Key challenges and desired project outcomes are summarised in Table 2.1. These set the framework for the project requirements, assessment of project options and the development of the preferred project which are described in Chapter 4.

Table 2.1: Challenges and key outcomes

<table>
<thead>
<tr>
<th>Challenge</th>
<th>Outcomes sought</th>
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</thead>
<tbody>
<tr>
<td><strong>Strategic problems</strong></td>
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<tr>
<td>Accessibility and connectivity</td>
<td>• Greater capacity and improved quality of service from Brisbane’s transport network to:</td>
</tr>
<tr>
<td></td>
<td>• provide connections between key areas</td>
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<tr>
<td></td>
<td>• support the transformation of the city to support agglomeration opportunities</td>
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<tr>
<td></td>
<td>• increase capacity during peak periods to service access to the job market.</td>
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<tr>
<td></td>
<td>• Provide efficient and effective connections to the surrounding region.</td>
</tr>
<tr>
<td></td>
<td>• Ensure residential growth areas are well connected with employment centres through efficient high-capacity transport modes.</td>
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<tr>
<td></td>
<td>• Provide better multimodal connectivity and interchange opportunities.</td>
</tr>
<tr>
<td>Economic growth and productivity</td>
<td>• Greater capacity and improved quality of service from the transport system to:</td>
</tr>
<tr>
<td></td>
<td>• ensure sustainable outcomes for the transport system by providing the right choice of mode for each transport tasks</td>
</tr>
<tr>
<td></td>
<td>• increase capacity and reduce travel times during peak periods to service access to the job market</td>
</tr>
<tr>
<td></td>
<td>• support new urban development opportunities</td>
</tr>
<tr>
<td></td>
<td>• manage urban growth in a sustainable manner</td>
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<tr>
<td></td>
<td>• support city building outcomes</td>
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<tr>
<td></td>
<td>• support economic growth opportunities and provide connections between market hub areas.</td>
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<tr>
<td><strong>Transport problems</strong></td>
<td></td>
</tr>
<tr>
<td>Car dependency and road congestion</td>
<td>• More (increased capacity and frequency) inner city public transport provision to support improved access to jobs and services.</td>
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<tr>
<td></td>
<td>• Reduce reliance on private vehicle access to the CBD and other major activity centres.</td>
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</table>
### Challenge

<table>
<thead>
<tr>
<th>Inadequate capacity to meet future public transport demand</th>
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<tbody>
<tr>
<td>• More (increased capacity and frequency) public transport services to support improved access to jobs and services into and within the inner city.</td>
</tr>
<tr>
<td>• Enhanced integration between bus and rail network.</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Brisbane’s topography and historic pattern of development impacts on network efficiency</th>
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<tr>
<td>• Improve efficiency and capacity of current river crossings between the CBD and the south-east</td>
</tr>
<tr>
<td>• Provide more direct and timely access to the CBD by public transport from the south-east to provide attractive alternative to private vehicle travel.</td>
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<tr>
<td>• Encourage travel by the most sustainable and efficient modes.</td>
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</tbody>
</table>

### Bus problems

<table>
<thead>
<tr>
<th>Role of bus is understated and multi-faceted</th>
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<tbody>
<tr>
<td>• Integrated transport network where bus and rail are not seen as competing but are complementary and connected.</td>
</tr>
<tr>
<td>• Faster and more reliable trip times for public transport customers.</td>
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<thead>
<tr>
<th>Sustained growth and demand</th>
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<tbody>
<tr>
<td>• Alleviate inner city bus network constraints to unlock capacity.</td>
</tr>
<tr>
<td>• Provide public transport in outer growth areas.</td>
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</table>

<table>
<thead>
<tr>
<th>Capacity constraints limit potential growth of bus services</th>
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<tbody>
<tr>
<td>• Bus route simplification and improved legibility.</td>
</tr>
<tr>
<td>• Improved travel times and capacity across key bottlenecks.</td>
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</table>

<table>
<thead>
<tr>
<th>Degrading journey times and reliability</th>
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<tbody>
<tr>
<td>• Improved connectivity and capacity between the north and south of the river.</td>
</tr>
<tr>
<td>• Greater resilience within the public transport network due to unplanned disruptions and incidents.</td>
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</table>

<table>
<thead>
<tr>
<th>Network and operational inefficiencies impact capacity and dwell times</th>
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<tbody>
<tr>
<td>• Optimised bus network and more efficient busway operations.</td>
</tr>
<tr>
<td>• Improved connectivity.</td>
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<table>
<thead>
<tr>
<th>Worsening amenity in the inner city</th>
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<tbody>
<tr>
<td>• Reduction of buses stopping on CBD streets.</td>
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<tr>
<td>• Reduced traffic congestion within inner city due to buses.</td>
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