

# Direct Sunshine Coast Rail Line

## Business Case Summary

March 2024



# What is a business case?

A business case provides justification and reasoning for undertaking a project and is a critical step in Queensland Treasury's Project Assessment Framework (PAF) process. The PAF process is used across government to ensure a common, rigorous approach to assessing projects at each stage of their lifecycle. The PAF ensures that a project meets strategic objectives and demonstrates value for money.

A PAF compliant business case forms the basis of advice to government and key decision makers and enables them to make an informed decision regarding whether to invest in the proposed project. Completion of a PAF compliant business case enables Queensland Treasury and key decision makers to assess projects on a like for like basis.

The business case is still a planning document, and more detail is required to further develop the project. Following the business case, and if governments decide to invest in continuing the project, next steps in the PAF process are confirming the delivery model and approach to procurement.

## Overview

Located 100km north of Brisbane, the Sunshine Coast is Queensland's fourth most populated urban area and a global tourism destination. Renowned for its relaxed lifestyle, clean environment and proximity to the state's capital city, Brisbane, it has been attracting high numbers of new residents and visitors for decades. In 2020, when the COVID-19 pandemic (COVID) sparked a trend towards regional migration, the Sunshine Coast emerged as one of the nation's most popular places to relocate, further escalating the region's growth and fast-tracking its transition to the ninth largest urban area in Australia.

The region has the nation's largest urban area without a direct rail connection. Investment in the transport network will prepare the Sunshine Coast for the next phase in its evolution.

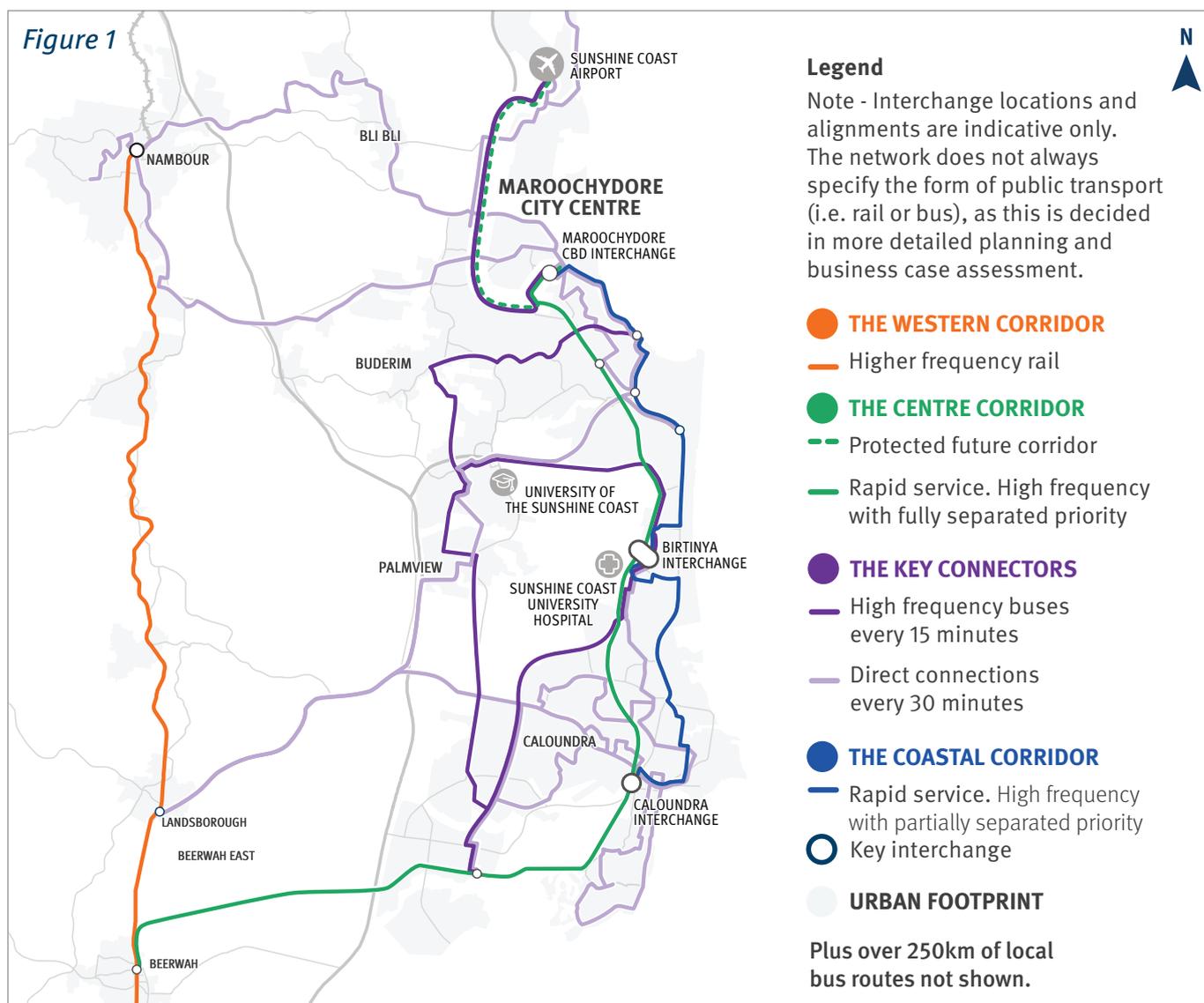
The Queensland Government is working to fill this nationally recognised gap in public transport by planning and designing an urban rail line linking growth areas of the Sunshine Coast to Brisbane and beyond. The business case for the Direct Sunshine Coast Rail Line Project (the Project, DSC Project, DSC) is now completed.

The DSC rail line will take train services into the urban core of the Sunshine Coast, connecting major development areas, beachside suburbs, business precincts and tourist hubs to the state's existing passenger rail network via the North Coast Line, located inland of the urbanised coastline. Stations are proposed in each growth hub, enabling residents to choose public transport over private vehicle travel – important progress for a region which currently boasts Australia's second highest private vehicle ownership rates and increasing local and regional road congestion.

With the DSC Project in place, catching a train will become the fastest and most reliable way to travel between the Sunshine Coast and Brisbane. Travel time savings of at least 45 minutes will be enjoyed by passengers (compared with private vehicle travel) between Maroochydore and Brisbane in peak hours, encouraging commuters, tourists and day trippers alike to use public transport for regional journeys. Given the Sunshine Coast hosts 11 million visitors each year, the DSC Project will play a critical role in supporting tourism to and within the region.

Travel on the DSC rail line will also become the fastest and most reliable way to move locally within the Sunshine Coast, giving residents greater travel choice and reducing transport inequity.

DSC is the most critical building block for unlocking the vision of the Sunshine Coast’s future public transport network, as set out in the Queensland Government’s *Southern Sunshine Coast Public Transport Strategy* (SSCPTS). A centrally located, high-capacity and high-frequency service for medium to long-distance travel is the key element for establishing a successful public transport network based on a ‘trunk and feeder’ style system. DSC, complemented by an enhanced public transport network, will become the platform for the region’s ongoing sustainable development, encouraging a higher percentage of trips to be made via climate-friendly public transport.



By linking major regional centres via fast, regular and reliable train travel, the DSC rail line will unlock and accelerate affordable housing, accelerate supply of diverse housing, and encourage gentle intensification of density in priority growth areas identified in *Shaping SEQ 2023*. It would shape well-designed communities around high quality public and active transport. Six new stations are proposed in locations selected to balance convenience for residents with fast, end-to-end journey times connecting the emerging city center of Maroochydore to Moreton Bay, Brisbane and beyond.

Delivery of rail between Beerwah and Maroochydore is anticipated to take a decade or more, even when working across multiple work fronts at the same time. Without staging, no sections of the rail corridor would be able to be operationalised before this time. Due to the length of the corridor, and the time that it is likely to take to construct this line, the business case recommends progressive delivery of this project.

The business case recommended initially staging the project to Birtinya by 2032, before commencing future stages. Although recommended, delivery to Birtinya by 2032 introduces additional delivery risks which are required to be better understood in the next stage. These risks, if realised, could impact cost and timeframes significantly and may prevent opening by 2032.

**Following consideration of the business case, the Queensland Government has committed \$2.75 billion to deliver Stage 1 of the Direct Sunshine Coast Rail Line project. Construction of Stage 1, including further planning to Birtinya, is expected to cost between \$5.5 billion and \$7 billion.**

Stage 1 includes:

- delivery of a dual-track rail line (and associated infrastructure, including 1 upgraded and 2 new stations) from Beerwah to Caloundra
- planning, design and market engagement to confirm delivery costs and timeframes to deliver DSC to Birtinya
- protection of the revised DSC alignment from Beerwah to Maroochydore.

# Project background

## A growing region

The Sunshine Coast is one of Queensland's fastest growing regions, expected to reach more than 600,000 residents by 2046. The strongest growth is forecast to occur in the existing urban corridor between Caloundra and Maroochydore, and within a new residential growth corridor between Beerwah and Caloundra.

As shown in Figure 3, the new rail corridor begins at the North Coast Line at Beerwah, branching off via Beerwah East. It travels over the Bruce Highway, through major growth areas to Caloundra and continues north through Birtinya and over the Mooloolah River to Maroochydore.

The DSC will directly service both the existing urban corridor and the new residential growth corridor, which includes a priority development area (PDA) at Caloundra South (Aura) that is expected to host about 50,000 new residents. In addition, *Shaping SEQ 2023* identifies a potential major development area at Beerwah East, which could see up to 100,000 additional residents on the Sunshine Coast over the next 50 years (in a 'high growth' scenario). Combined, the projected population of this southern growth corridor between Beerwah East and Caloundra South could house up to 150,000 additional residents, or equivalent to the current population of Darwin. Growth areas such as these will help to provide more affordable and diverse homes for Queenslanders, which will be critical to addressing national housing pressures over the coming years. In addition, rail stations are catalysts for transit-oriented development, providing additional opportunities for new and accelerated affordable housing alternatives, unlocked through delivery of this corridor.

The DSC corridor also connects large growth areas within the Moreton Bay region such as Caboolture, Elimbah, Burpengary and Morayfield to the Sunshine Coast, offering newly accessible opportunities for employment, education, health care, retail and recreation. Residents within the Moreton Bay region will enjoy the option of an almost equivalent commute time to the Sunshine Coast or Brisbane.

The DSC rail corridor directly links almost all economic centres and residential growth areas on the southern Sunshine Coast, which is where most of the region's existing homes and workplaces are located and most daily trips take place. This urbanised area is currently only serviced by suburban buses sharing increasingly congested local roads. These economic centres are currently only accessible for inter-regional travellers via private vehicle or two or three-seat public transport journeys, which can take up to three hours, from Brisbane or Moreton Bay. Given this, the Queensland Government's plan for managing South East Queensland's growth, *Shaping SEQ 2023*, nominates the DSC rail line as 'region-shaping infrastructure' (RSI), acknowledging it as one of the most important projects to sustainably manage growth across the broader region.

# The Direct Sunshine Coast Rail Line – a history

Strong future growth in the Sunshine Coast leading to road congestion and social inequity was first formally studied in the 1998 Caboolture to Maroochydore Corridor Options Study (CAMCOS). A corridor (sometimes referred to as “the CAMCOS corridor”) between Beerwah and Marcoola was protected for a regional heavy rail line and up to nine stations in 2001, following the completion of the study. CAMCOS recommended the introduction of new bus services prior to ultimately constructing a future rail line.

In 2009, the section of the North Coast Line between Caboolture to Beerburrum was duplicated. This duplication work was a critical initial step to one day connecting a spur line to the Sunshine Coast.

In 2010, a Strategic Assessment of Service Requirements (SASR) for the project was undertaken indicating that investment in rail was not warranted prior to 2031.

Technical studies were undertaken between 2015 and 2019, as new development commenced in the areas adjacent to the corridor. These studies resulted in minor realignments to the protected corridor to accommodate and respond to land use planning.

In 2020, a private consortium, North Coast Connect, undertook a business case to provide faster rail services between Brisbane and the Sunshine Coast. This business case was presented to Infrastructure Australia for consideration. Infrastructure Australia chose not to add the project to the priority list at that time. Infrastructure Australia recommended further work to align this planning with the Queensland Government’s passenger rail planning and to resolve potential delivery risks which may present due to challenging terrain, environmentally sensitive areas and the level of design. Infrastructure Australia did welcome the opportunity to review a revised business case that included a stronger case for the proposal, a better balance of cost and benefits and which illustrated how delivery risks could be managed.

In 2021, the Queensland Government commenced early works for Stage 1 of the Beerburrum to Nambour Rail Upgrade project. This project is underway and includes duplication of the rail track between Beerburrum and Beerwah. This is an important enabling project for the DSC.

In 2022, the Queensland Government released *SEQ Rail Connect*, the Queensland Government’s rail blueprint which sets out how the rail network will evolve to meet the future needs of the growing South East Queensland region. The DSC was identified as a “next” priority in this strategic plan, set to commence following the completion of Cross River Rail.

In 2022, the Queensland Government commenced a Preliminary Evaluation for the DSC, the second phase of the Project Assessment Framework process. This Preliminary Evaluation was co-funded by the Australian Government in a 50:50 funding arrangement. Modelling undertaken to inform this Preliminary Evaluation found that problems on the transport network had intensified over the past decade driven by strong growth within the region and that a rail line should be accelerated to assist the region to respond to growth.

In early 2023 the Queensland Government commenced a detailed business case for the DSC, the third phase of the Project Assessment Framework. This business case built on the previous planning work in CAMCOS and the North Coast Connect business case and was completed in late 2023.

## Strategic alignment

This project has strong strategic alignment with multiple policies and strategic plans across all levels of Government. These include strategic plans related to SEQ's transport network, public transport, rail blueprints, land use, regional growth, climate change, smart cities and more.

## Project need and priority

### *Regional growth is increasing travel demand*

As the region grows, road congestion is forecast to worsen – both on local roads and the Bruce Highway, which connects Brisbane, Moreton Bay and the Sunshine Coast. Trips around the Sunshine Coast are expected to increase by 45% daily between 2021 and 2046 (over 800,000 additional daily trips on the local network by 2041) and trips on the Bruce Highway are expected to increase by 49% daily between Brisbane and the Sunshine Coast by 2045.

### *Growing road congestion impacts safety, travel times and network performance*

Modelling shows that congestion around the Sunshine Coast region will increase over the coming decades without intervention, with average travel speeds dropping by 12% and travel times increasing by 16% by 2046. Without the provision of faster and more efficient public transport, congestion on the regional road network is expected to increase from 49 congested lane kilometres in 2021 to 187 congested lane kilometres by 2046, impacting road safety, travel times, liveability and tourism.

*\*Congested lane kilometres in this instance means the number of kilometres of traffic congestion.*

### *An inadequate public transport network for a growing region*

Current public transport offerings on the Sunshine Coast do not provide an attractive alternative to travel by private vehicle. While bus services do operate within the region, there are some challenges that limit the efficiency and competitiveness of these services:

- the routes are long due to the length of the beachside urban corridor between Pelican Waters and Maroochydore, and beyond to Noosa (north/south) and the expansive distance between the hinterland and coastal regions (east/west).
- services operate on the road network, which means that they are also subjected to the same congestion that is experienced by private vehicles.

As a result, these bus trips are often slower than car trips, making the services less attractive and discouraging people from trying public transport, if they have the choice to use their car.

The existing North Coast Line services the western region of the coast, with people travelling to and from the growing eastern suburbs and beaches needing to interchange with a bus service or park 'n' ride, adding time to an already lengthy trip. Coastal residents commuting to Brisbane or visiting for medical services, entertainment or other reasons using only public transport experience return journey times of up to 5 hours of travel per day.

As a result, a low percentage of trips are currently made on public transport – both within the Sunshine Coast region, and for those travelling between Brisbane, Moreton Bay and the Sunshine Coast. Current commuter numbers demonstrate that those who can, generally choose to drive for most or all of their trip. Some commuters drive to stations further south on the North Coast Line, while some drive the entire journey – both contributing to congestion of the Bruce Highway during peak times. Modelling shows that by 2046, peak hour trips from the Sunshine Coast’s urban center to Brisbane will take over three hours by car without investment in alternatives.

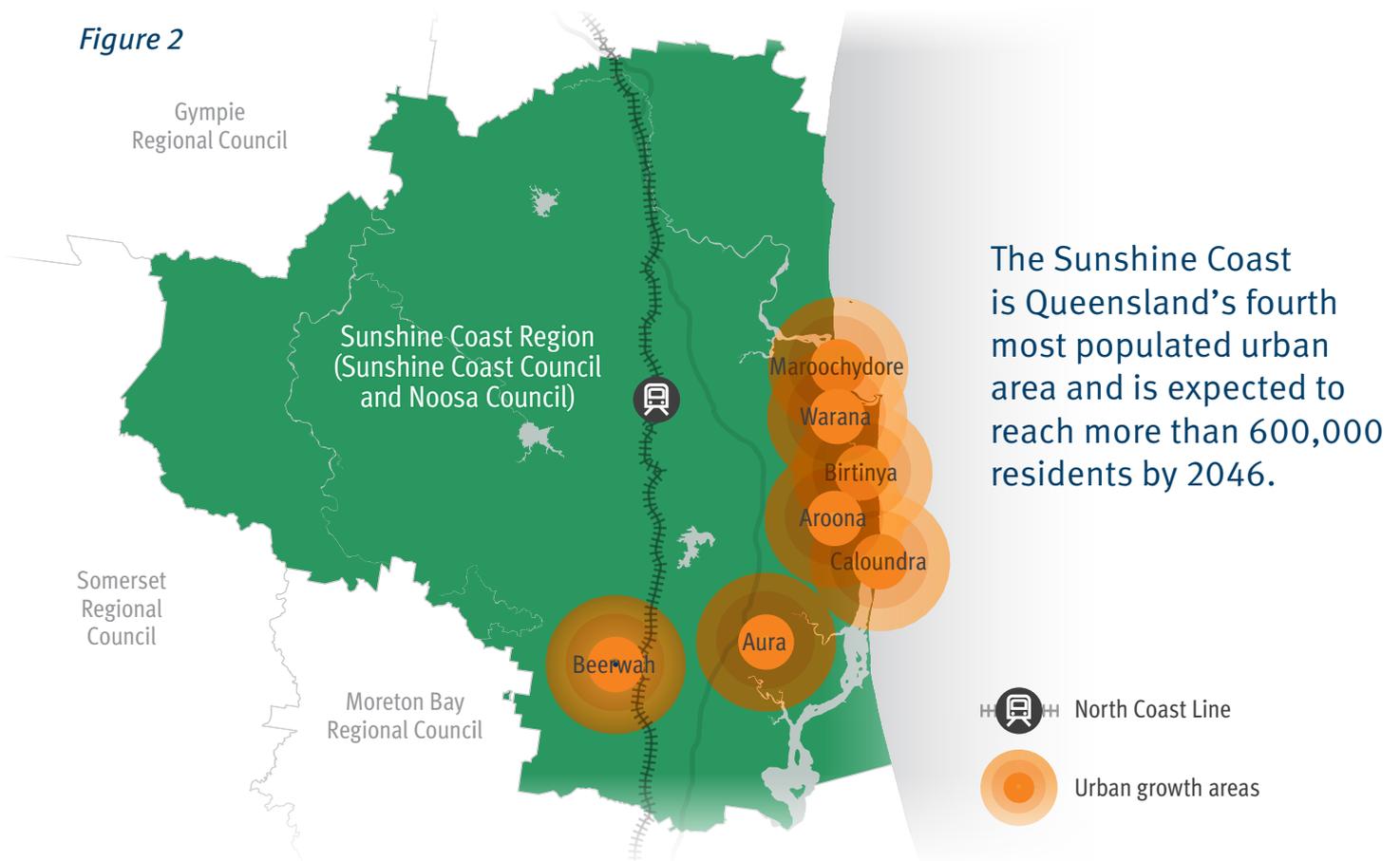
For most residents, travelling to local destinations from home is much easier by car than public transport, leading to road network congestion and social disadvantage. Older residents, younger people and residents in outer suburbs are particularly at risk of experiencing transport inequity.

*An opportunity for better integration between public transport and land-use*

Integrated transport and land-use planning lies at the core of government growth management plans. Transport infrastructure can help to shape the urban form by signalling where new or intensified development is feasible and by supporting this development with fast, frequent and reliable transport. It also generates opportunities for agglomeration economies, which are the benefits that come when people and businesses cluster together in cities, creating the drawcard for high-value industry development.

Directly connecting established economic hubs via high-quality public transport has potential to stimulate business activity, foster enhanced industry interactions, improve access to employment opportunities and support economic growth.

Figure 2



# The cost of the problem

Infrastructure Australia requests that problems are monetised (costed) so that problems can be more easily compared against each other within and across sectors as well as across different states and territories. This cost of the problem exercise helps Infrastructure Australia to assess if a proposed solution is feasible, on economic grounds.

Public transport projects are often assessed using more than economics alone, as there are many benefits that cannot be monetised that are associated with public transport (such as quality-of-life impacts). Problems that result in a cost to society of over \$30 million per year are considered by Infrastructure Australia to be nationally significant.

Overall, the cost of ‘the Problem’ that the DSC project is seeking to resolve is deemed to be nationally significant. The nominal cost of excessive congestion to society in the absence of intervention is costed at \$186.2 million per year in 2031, with this value increasing to \$341.9 million per year in 2046. Over a 50-year period, this amounts to \$2.3 billion in present value terms. ‘Problems’ costed include excessive travel time, excessive vehicle operating costs, delay, congestion and cost of vehicle crashes.

## Why a public transport solution?

As the region grows and more people begin to call the Sunshine Coast region home, congestion is expected to increase. People will spend more time in traffic and less time doing the things that they love. If left unaddressed, this will degrade the liveability of the Sunshine Coast region.

While the introduction of high-quality public transport is good at slowing congestion and creating more space on the road for important service and freight vehicles, it also has many other proven benefits:

- **Unlocks more sustainable development and affordable housing**  
Communities designed around high-quality public transport benefit from enhanced liveability. It is easier for people to move around and access important services. Integrated transport and land use unlocks opportunities for more affordable housing, where people are not required to own a car to get around, minimising cost of living pressures while still enabling connection. Less car parks means more space for homes and recreational areas.
- **Improves regional productivity**  
With more people getting to where they need to go more quickly, our productivity improves. This has positive benefits on the local and regional economy and saves us time – meaning people spend less time travelling and more time doing the things that they love.
- **Improves travel safety**  
Less vehicles on the road reduces the risk of road incidents. Commuters and tourists alike will benefit from safer journeys around South East Queensland.

- **Moving closer to net-zero**

A full train can carry up to approximately 1,000 people. That is up to 1,000 cars off the road with every scheduled train service – thousands of cars off the road each day. The transport sector is projected to be the largest contributor to greenhouse gas emissions in Australia by 2030. Moving more people on electric rail services will move us closer to Australia's Net-Zero 2050 targets.

- **Improving social equity**

As our population grows, so does the percentage of people that cannot and chose not to drive. Being able to connect these people with important services, for example, an after-school job, medical appointments and social services, is a key benefit of public transport.

- **Health benefits**

When placed within existing and new growth areas, train stations can encourage more sustainable development. This enables people to be able to walk, cycle or scoot from their home to the station and surrounding facilities, encouraging more active forms of travel within our communities.

# Project options

The business case undertook a comprehensive review of the previously protected CAMCOS alignment and proposed station placement. The alignment was reviewed to ensure that it is now suitable to accommodate the construction of a modern railway (to modern rail standards set by Queensland Rail), and station placement and configuration was assessed to better determine which stations will best service the Sunshine Coast community now and into the future.

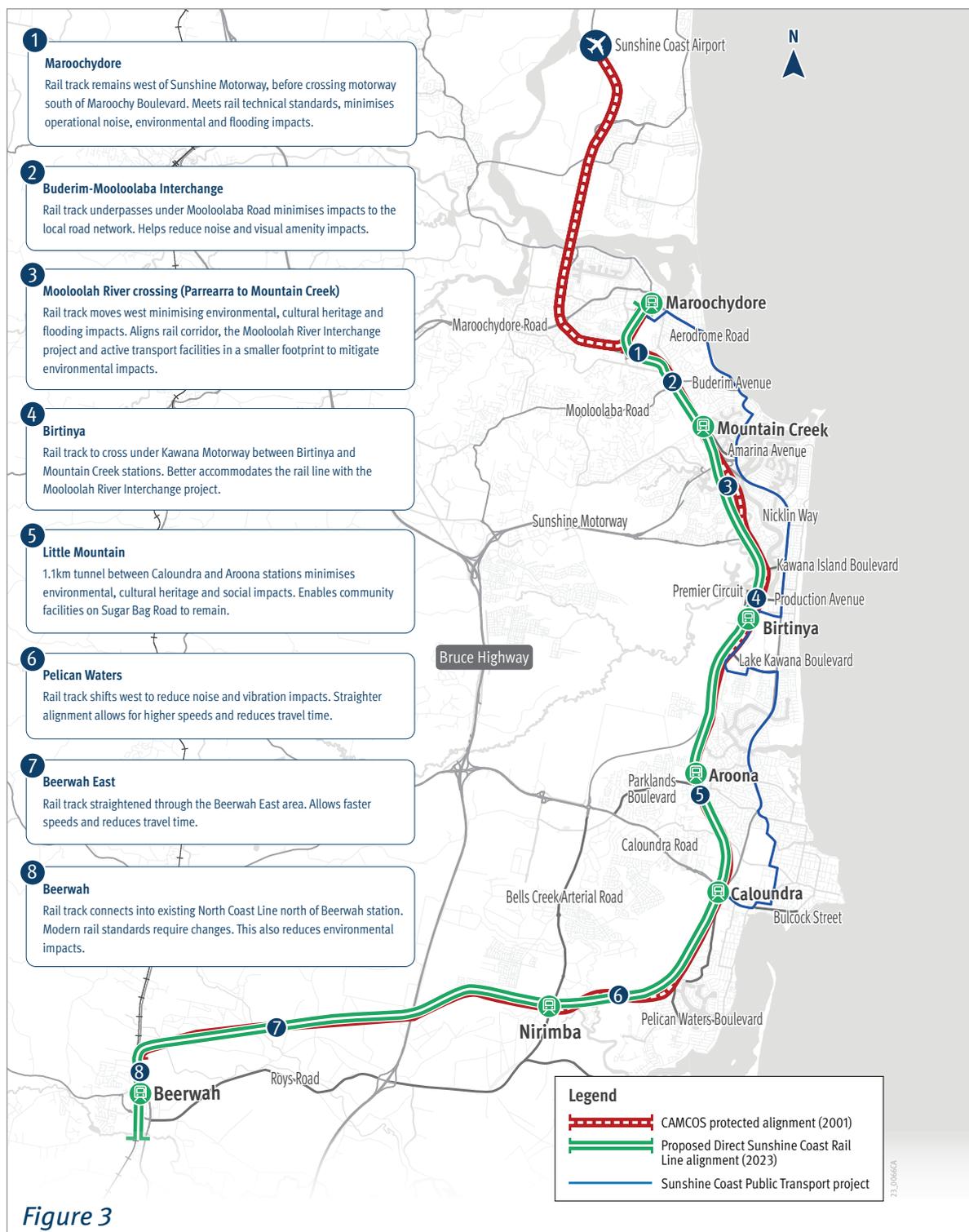


Figure 3

## Alignment review

To optimise the alignment, the Queensland Government undertook a detailed engineering assessment of the route, which included review of corridor widths, maintenance requirements, operational requirements, opportunities to enhance rail speeds, and the design of grade separated road and rail interfaces. This engineering assessment was informed by key stakeholders such as Queensland Rail and Sunshine Coast Council. Site surveys, flood modelling, environmental surveys, engagement with the Traditional Owners (Kabi Kabi) and feedback from the community (through consultation undertaken in July/August 2023) also informed proposed amendments to the alignment.

Amendments proposed to the corridor because of this work are summarised in Figure 3. Where possible, the alignment was held within the previously protected corridor to avoid additional property impacts.

## Station configurations

The nine original stations identified in the CAMCOS planning were reviewed during the business case stage. The assessment concluded that Parrearra station, Creekside station and Pelican Waters station should be removed from project scope. Reasons for removal included:

- **Complex engineering challenges:** located in areas that are prone to flooding or in sensitive environmental areas.
- **Accessibility challenges:** stations located in areas which would force traffic onto local streets. No connections able to be provided from higher order roads to these stations.
- **Multi-modal challenges:** due to accessibility and engineering constraints these stations would struggle to support a park 'n' ride facility and bus interchange facility at the station.
- **Limited demand:** as a result of the accessibility and multi-modal challenges, transport modelling demonstrated limited demand at these stations compared with other proposed stations on the line.
- **Faster journey times:** modelling indicated that reducing the total number of stations supported higher average train speeds and less frequent stopping, leading to faster journey times for customers.

The business case then assessed configurations of the remaining stations. Two main options were assessed. The first, a four-station option, with new stations proposed at Nirimba (Aura), Caloundra, Birtinya and Maroochydore. The second, a six-station option, with new stations proposed at Nirimba (Aura), Caloundra, Aroona, Birtinya, Mountain Creek and Maroochydore.

These options were assessed against criteria including patronage, accessibility, connectivity, travel times, mode-shift, resilience and reliability. The community were also asked to provide feedback on stations during consultation and engagement in July and August 2023, with many community members sharing positive feedback on Aroona and Mountain Creek stations. This valuable feedback was considered when assessing station configurations.

The six-station option was evaluated as the preferred option. Initial plans for these stations were shared with the community during consultation in November and December 2023. Further consultation with the community and stakeholders is proposed as the DSC project progresses to refine station designs and ensure that they meet customer needs.

# Key features

A design and proposed service plan for the DSC corridor was developed during the business case, in consultation with key stakeholders such as Queensland Rail and Sunshine Coast Council.

Key elements include:

- 37.8km dual track, narrow gauge rail line between Beerwah and Maroochydore, and associated rail systems (including overhead lines, traction power and signalling)
- new stations at Nirimba (Aura), Caloundra, Aroona, Birtinya, Mountain Creek and Maroochydore, a rebuilt station at Beerwah and provision for a future station at Beerwah East
- approximately 17km of structures (where required for flood mitigation and road/rail separation) and an approximately 1.2km tunnel at Little Mountain (with associated fire, life safety system and mechanical and electrical systems)
- new stabling facilities at Beerwah South and Birtinya
- active transport corridors and expansion of local walking and cycling networks around stations
- park 'n' ride facilities at all stations, except Maroochydore (to discourage people driving into the future city centre), and kiss 'n' ride and bus interchange facilities at all stations.

## Service plans

- Services are proposed to operate on an express stopping pattern south of Beerwah, generally following the current Caboolture express stopping pattern.
- Service types will follow those as set out in the *SEQ Rail Connect* blueprint – long distance express category.
  - Faster, more reliable express services for customers travelling long distances from the Sunshine Coast
  - Long-distance connections between cities more than 30km from the Brisbane city centre
  - Wider station spacing
  - Trains with passenger amenities where possible
  - Predominantly express services
- Peak and off-peak service levels will be confirmed closer to opening.

## Stations

All stations are designed to cater for up to 5,000 customers per day. Caloundra and Maroochydore stations are anticipated to attract higher patronage levels and will be designed to support interchanging between train, bus and other transit services. As premium 'flagship stations', both stations are expected to become local destinations incorporating commercial and retail activities.

The rebuilt Beerwah station is proposed to function as a major interchange and its design also supports greater pedestrian connectivity between the station's platforms. Stations generally feature park 'n' ride, kiss 'n' ride and end-of-trip facilities and cycle storage, as well as interchanges or stops for bus services.

Stations have been designed as dynamic, inclusive civic spaces that integrate into the urban fabric. Two pedestrian bridges at Beerwah station are proposed to make it easier for surrounding communities to cross the existing North Coast Line. A new active transport bridge from Mountain Creek station over the Sunshine Motorway is proposed to better connect neighbourhoods and facilities west and east of the motorway, including Mooloolaba Beach, a popular local destination.

Adoption of universal design principles, input from representatives via a Stakeholder Interest Group (SIG), and learnings from other rail projects have shaped the station designs to provide equitable community access and easy wayfinding, and comply with relevant legislation and guidelines including the *Disability Discrimination Act 1992* (DDA) and *Disability Standards for Accessible Public Transport 2002* (DSAPT). Well-located carparks, kiss 'n' rides, entry points and access roads support safe, unobstructed travel for pedestrians and cyclists, and are designed to provide efficient local traffic movement around stations. All station platforms are designed to accommodate at least six-car trains (160m long) and will be future-proofed for nine-car trains (230m long). Much of the corridor supports train speeds of up to 160km/h.

## Active transport

The DSC project is proposed to deliver new and upgraded active transport infrastructure for the Sunshine Coast region. Key objectives include the safe connection of people to stations, and accessible connections to key destinations around the stations. Active transport links are proposed to connect communities on either side of the rail corridor, improving access and ensuring that the new rail line does not separate neighbourhoods.

## Other infrastructure

Yards for stabling and maintenance of trains have been designed at Beerwah South and Birtinya. Ballasted track is proposed for the at-grade rail track, with slab-track on longer elevated structures given it has a much longer design life and less maintenance requirements. Powering the new tracks will require track overhead line electrification (OHLE), and rail maintenance access road (RMAR) passing bays have been provided at regular intervals along the corridor. Maintenance access has been designed in close consultation with Queensland Rail.

The concept design includes construction of 14 road-over-rail bridges and 10 rail-over-road bridges, including across both state and Sunshine Coast Council controlled roads. Underpasses and culverts will be required in key locations for active transport crossings and overland flow and flood immunity considerations.

## Geotechnical, hydraulic and drainage considerations

The hydraulic drainage design and flood impact assessment for the DSC project has been assessed with other 'concurrent' projects to understand and assess cumulative impacts. The DSC project has been designed to meet flood immunity and drainage requirements.

## Public Utility and Plant (PUP) considerations

There is critical PUP infrastructure along the rail corridor, such as overhead electrical lines, pump stations and large trunk sewer mains, that will require relocation or protection before DSC can be constructed. These have long lead times both for design and construction. The Birtinya to Maroochydore section includes most of the critical PUP infrastructure, increasing delivery risks and timeframes associated with this section of the corridor.

Further PUP investigations are proposed in future project stages.

## Traffic management during construction

High-level constructability assessments were undertaken to inform the business case. DSC will require imports of large fill quantities, delivery of high numbers of pre-cast units, and supply of concrete and other materials to site on a regular basis. DSC will also generate thousands of local jobs. While not anticipated to be located in one area, this is a significant workforce to manage, and parking during construction will need to be further considered. Staging of the project would reduce some of these impacts.

Traffic management also extends to the management of interfaces with the live rail environment at Beerwah. A concept staging plan has been developed for rail operations during construction. This plan primarily seeks to minimise disruption to services (passenger, freight and long-distance rail) and passengers during construction, and will require multiple stages of construction, including potential short-term track closures of the North Coast Line.

## Designing to minimise environmental and cultural heritage impacts

The proposed rail corridor passes through areas with high environmental value. DSC is in close proximity to the boundary of the Moreton Bay Ramsar wetland and waterways within the project area flow to this wetland. If approved to proceed, the works will require clearing of native vegetation and will have direct and indirect impacts to threatened flora and fauna and their habitats. Design refinements were made in the business case stage to minimise environmental and cultural heritage impacts.

While the gazetted CAMCOS corridor largely avoids national parks and state forests, the alignment was further adjusted in the business case stage to avoid impacting Beerwah Forest Reserve, which was recently gazetted as a conservation park. Twin mined tunnels were also selected over cut-and-cover tunnels at Little Mountain, north of Caloundra station, to further reduce land, community, environmental and cultural heritage impacts.

Elevated structures are used on more than 40% of the alignment to minimise hydrological and ecological impacts and to avoid disturbing acid sulfate soils commonly found in low-lying areas. A 6.7km viaduct structure carries the rail line through the wetland areas between Bells Creek and Caloundra and the rail line also passes on structure across Currimundi Creek and Lake Parrearra, through the Mooloolah River floodplain and at other key locations. Elevating the rail line will also help to minimise impact to cultural heritage areas in the floodplain and facilitate fauna movement through the wetlands. An at-grade rail access track to the viaduct is proposed rather than a full rail maintenance access road, to reduce the clearing footprint and hydrological impacts of this infrastructure.

There are existing fauna movement corridors across the DSC alignment in vegetation and along waterways. A preliminary fauna movement strategy has been developed that identifies potential locations for rope bridges, culverts and fauna fencing to enable wildlife to move safely between habitats and across the rail corridor. Where feasible, waterway crossings have been designed as bridge crossings to further aid in movement and minimise impacts to riparian areas and fish passage.

Thirteen potentially contaminated land sites are listed on the Environmental Management Register, including the proposed site for the Mountain Creek station which is located at the Buderim Resource Recovery Facility. During the business case stage, the station footprint was refined to reduce the risks associated with building over capped landfill and the disposal of contaminated material.

## Transport modelling

- Rail becomes the fastest and most reliable way to travel between the Sunshine Coast, Brisbane and Moreton Bay. By 2031, catching the train will be between 45 and 57 minutes faster than driving between the eastern suburbs of the Sunshine Coast and Brisbane in the morning peak.
- By 2046, 12.5% of all trips between the Sunshine Coast and Brisbane are forecast to be made on the rail network in the morning peak. This is comparable with the total percentage of rail trips between Brisbane and the Gold Coast in 2046. This is a significant increase in rail trips for the Sunshine Coast – the current percentage is approximately 4.3%.
- By 2046, the number of times people board a train on the Sunshine Coast will increase by an additional 9,400 trips per day. This is an increase of approximately 8% to the total South East Queensland rail network patronage.
- By 2031, approximately 52,000 kms of road travel will be removed from the network per day, as people choose to catch the train instead of drive.
- All public transport trip numbers increase across the Sunshine Coast (bus and rail) as more people connect to other services at stations.
- Active transport trips increase in the region, with people choosing to walk or cycle to stations to connect with rail.
- Residents of Moreton Bay will have a < 45 minute journey to the Sunshine Coast via rail, increasing employment, education and healthcare options for people across the SEQ region.

Traffic congestion will worsen significantly without the DSC, with average speeds across the Sunshine Coast reducing from 58 km/h in 2021 to 51 km/h by 2046.

## Legislative and regulatory review

An analysis of legal and regulatory issues found there to be no insurmountable legal risks that would cause the DSC Project to not progress to the next stage.

# Whole-of-government policy issues

## Policy compliance

Analysis of whole-of-government policy issues found there are no policy issues that would prohibit DSC from proceeding to the next stage. Procurement and delivery of the DSC Project is proposed to be undertaken in accordance with Australian and Queensland government procurement, employment, accessibility, climate change and sustainability policies.

## Employment and economic growth

Construction of the DSC rail line offers a unique opportunity to increase local jobs and provide development and training opportunities for residents of the Sunshine Coast, Moreton Bay and Brisbane. Given rail is a specialised field in the civil and construction industry, some intra or interstate migration for roles is also anticipated. It is anticipated the DSC Project will support an average of 3,300 (approximately) direct, full-time equivalent (FTE) jobs over the life of the project. This estimate is subject to change with project costs and estimated start and duration of delivery.

Long-term employment and economic benefits to the tourism sector could also be expected. Even with the impacts of COVID, Queensland's multi-billion dollar tourism industry remains a driving force in the economy, employing 1 in 15 Queenslanders. Towards Tourism 2032, a 10-year plan for the tourism sector, identifies 'regional connectivity and accessibility' as a key challenge to be overcome in growing the state's visitor economy. Connectivity is a particular issue for the Sunshine Coast. Domestic day-trippers and overnight visitors, most of whom arrive via Brisbane, generally opt to drive to the Sunshine Coast via the Bruce Highway, which is exacerbating congestion and resulting in long, unreliable trip times that regularly extend beyond three hours.

Delivery of the DSC rail line would provide tourists with a fast, reliable rail journey from the Brisbane Airport to iconic tourism destinations along the coastline. Construction by 2032 would also support transport operations for the Brisbane 2032 Olympic and Paralympic Games, while providing legacy benefits to the local community and region.

Over the longer term, this improved access to local sporting venues and tourism destinations, would strengthen the Sunshine Coast's positioning as the major events capital of regional Australia.

## Public interest assessment

For the DSC Project to be in the public interest, there should be equity between the recipients of the benefits and bearers of associated costs. A social impact assessment found that most positive impacts of the new rail line will be long lasting, with benefits extending across the broader South East Queensland region, while negative impacts will generally be short-term and localised.

The DSC rail line will become the foundation of a new public transport network for the Sunshine Coast, offering residents an attractive, sustainable transport alternative to driving their car. Moving around the Sunshine Coast will become quicker and easier, with fast, frequent train services connecting homes to hospitals, schools, shopping centres, workplaces and other places people want to go. For people living near the rail corridor, trips by train to major centres will be quicker than by car.

Station locations have been selected to maximise access to key destinations, whether this be health services clustered around the Sunshine Coast University Hospital or the nearby sports precinct at Birtinya, world-famous surf beaches at Caloundra and Mooloolaba (via Mountain Creek station), established and new shopping areas in Maroochydore and Nirimba (Aura), local schools at Aroona or the tourism attractions of Australia Zoo and Glass House Mountains at Beerwah.

People who are older, have a disability or are from lower socio-economic households will particularly benefit from improved public transport access to social, cultural, health, education and other facilities. Compared to the rest of Queensland, the Sunshine Coast region has a greater proportion of people aged over 65 years. The Socio-Economic Index for Areas (SEIFA) also identifies communities along the DSC rail corridor at Beerwah, Caloundra, Little Mountain, Aroona, Mountain Creek and Alexandra Headland as more disadvantaged areas. Public transport can support these communities by providing choice for those that do not have access to a private vehicle, linking them to workplaces, essential services and friends and family, enabling them to participate in community life and reducing the risk of transport inequity.

Expansion of local active transport networks by the Project will encourage more walking and cycling, more often, with the associated health, wellbeing and cost-of-living benefits of these activities. Congestion could be expected to ease as more people opt to leave their car at home, which has the potential to reduce environmental pollution and the scale of future road infrastructure upgrades.

While commuters will benefit daily from time savings for trips to Brisbane, residents across South East Queensland may also take advantage of faster 'same-seat' rail travel between the Sunshine Coast, Brisbane and the Gold Coast to increase their trips for social, cultural, entertainment, recreational and other purposes. With the DSC operational, Sunshine Coast residents, for example, could travel by train to a cricket match at The 'Gabba, visit the Gallery of Modern Art in South Brisbane or watch a live concert at Riverstage. Trips to the Sunshine Coast could likewise increase, and a percentage of the 35,000 daily tourists who already visit the region in peak seasons may choose a train trip rather than travelling by private vehicle, with flow-on benefits to traffic flows on the Bruce Highway.

People living in beachside towns and new inland neighbourhoods will find it easier to travel to work in established economic hubs at Maroochydore, Mooloolaba, Caloundra and Currimundi, emerging hubs at Birtinya and Caloundra South or Queensland's primary economic hub in Brisbane's inner city. Better connecting these regional activity centres to each other will foster economic prosperity and may attract high-value industries with the potential to broaden work opportunities and raise income levels.

DSC will unlock urban renewal opportunities in the coastal corridor and enable more affordable living in the southern growth corridor by maximising access to high-quality public transport and reducing the region's reliance on car travel. By providing faster and more convenient access to South East Queensland's premier cultural and recreational attractions, and higher order services in Brisbane, it has the potential to improve social cohesion by supporting greater community interactions.

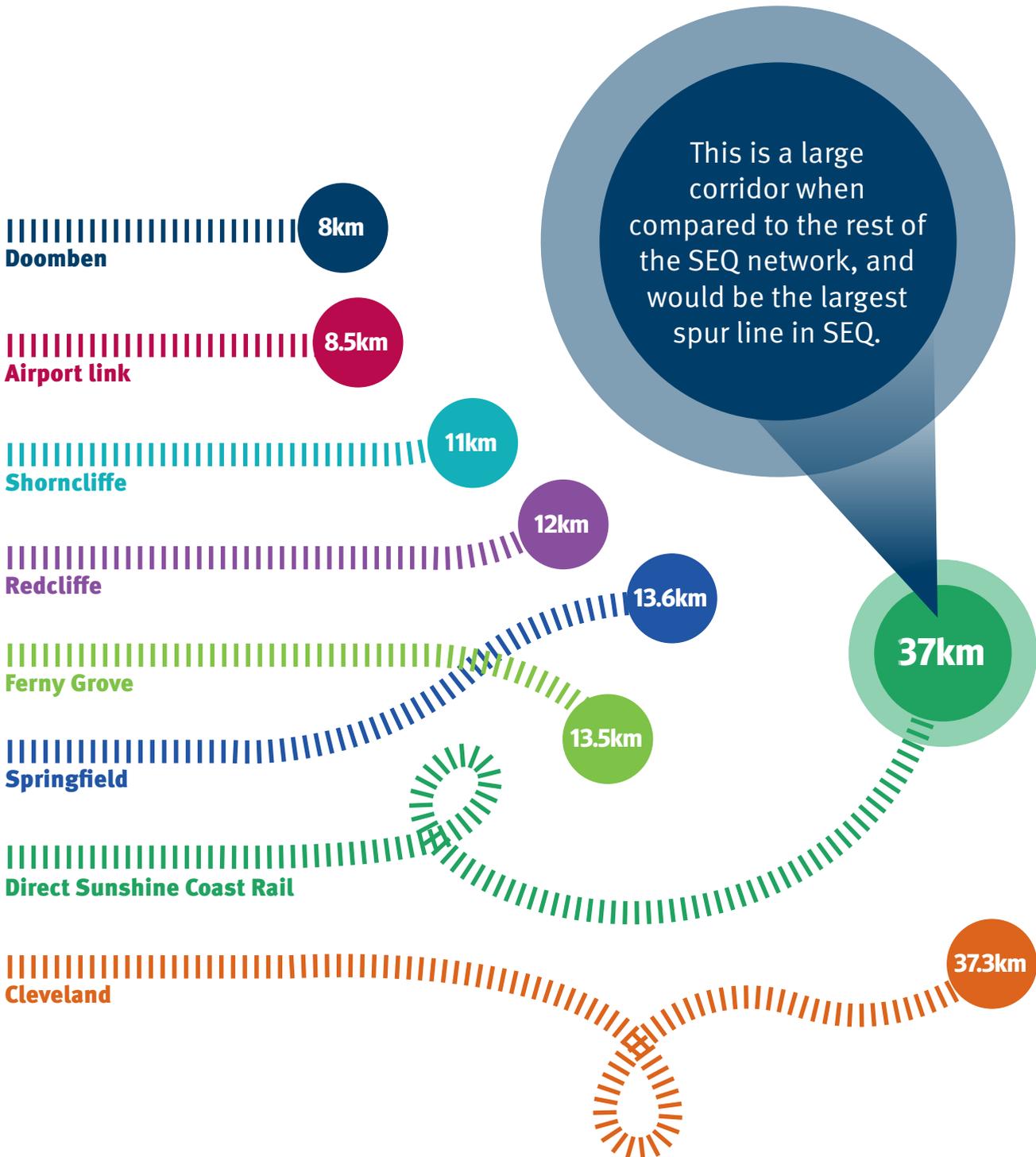
While the benefits of improved public transport provision will be experienced across South East Queensland, localised impacts will occur in the form of some land acquisitions and temporary construction impacts such as noise, vibration or changes to road and property access. These impacts can be reduced by acquisition (where appropriate) and compensation measures, effective construction management plans and noise and air quality attenuation. Much of the rail line will be elevated, sometimes near residential areas, schools and other community facilities such as hospitals, which may impact visual amenity. Potential operational impacts such as noise, visual impacts from rail infrastructure such as noise barriers or undesirable behaviours around stations will be mitigated through detailed design, where possible.

Community consultation was undertaken in mid-2023 as part of an integrated engagement exercise that also included the Kawana Motorway, Mooloolah River Interchange (MRI) and Sunshine Coast Public Transport (SCPT) projects. Combining the consultation activities for these major projects enabled TMR to effectively communicate project interfaces and ensure robust, well-rounded engagement. A further round of community consultation was undertaken in late-2023 to share the outcomes of the initial consultation. Consultation activities revealed strong community support for the DSC rail line, and for improving active transport infrastructure as part of these works. Many community members pointed to existing congestion levels, especially on the Bruce Highway, and expressed a desire for construction to occur as soon as possible. Concerns however were raised about property, environmental and noise impacts, particularly at Pelican Waters. Many people who expressed concerns about negative environmental impacts however also acknowledged the broader environmental benefits of public transport for the region. In general, community members expressed support for all stations.

# Construction program and staging assessment

The DSC project would span over 37km of dual rail track and include unique elements such as rail on structure and tunnels. This is a large corridor when compared to the rest of the SEQ network, and even when staged, would be the largest linear rail project undertaken in 15 years.

Comparable rail corridor lengths in SEQ:



A construction program was developed with input from expert industry advisors. Even when staged or built concurrently, this program demonstrated that construction of the dual track rail line to Maroochydore would not be feasible prior to 2032. This program assumed that pre-delivery work would commence immediately following business case completion, and that multiple construction sites could be underway along the length of the project from 2026 onwards.

Construction of the corridor between Birtinya and Maroochydore carries the highest construction risks due to the presence of significant utilities (power, water and sewer), crossing of the Mooloolah River, construction adjacent to the Mooloolah River National Park and landfill at Mountain Creek and interaction with the Sunshine Motorway. Comparatively, construction of rail to Birtinya is largely within a greenfield environment or within new development areas. These greenfield environments still present significant environmental approvals risks, however contain less risk of unknown utilities and complexities of working in constrained urban environments.

*\*A greenfield environment is an area that has not yet been impacted by development and is not heavily urbanised.*

Due to the length of the corridor, unique risks associated with discrete sections of the corridor, and the time that it is likely to take to construct this line, the business case recommends to deliver this project progressively.

Benefits of progressive delivery include:

- Early opening of the rail line as future stages continue to be constructed, noting benefits of rail (and public transport more generally) include reducing congestion
- Ongoing local jobs for the region to support delivery of the project
- Hands on training and apprenticeship opportunities with ongoing pipeline of work within the region
- Minimise construction impacts on the Sunshine Coast community
- Opportunity to build supporting infrastructure such as active transport and bus infrastructure that will enable people to safely and conveniently access stations. This supporting network is proposed to grow as the rail line does.

## Project staging

Staging options considered the type of construction work to be undertaken along the corridor, sensible locations to construct a temporary terminus and sizes of construction packages to attract market interest. These stages could be constructed concurrently or sequentially, pending market capacity.

*Table 1: Project packages*

Stage	Name	Description
Stage 1	Beerwah to Caloundra	Delivery of the rail line from Beerwah Junction to Caloundra station, including construction of Nirimba (Aura) station, Caloundra station and Beerwah South Yard and rebuilding the existing Beerwah station
Stage 2	Caloundra to Birtinya	Delivery of the rail line from north of Caloundra station to Birtinya Yard, including construction of Birtinya station, Aroona station and Birtinya Yard
Stage 3	Birtinya to Maroochydore	Delivery of the rail line from north of Birtinya station to Maroochydore, including construction of Mountain Creek station and Maroochydore station

A program was developed for both a Caloundra staging option and Birtinya staging option. These programs included parallel works packages along the site, with works to Caloundra occurring at the same time as works to Birtinya to achieve operation by 2032. Undertaking both stages at once does increase interface risks between the works packages, such as material availability and the coordination of different contractors across multiple work sites. These interface risks could be mitigated when choosing delivery models for the project and considering resources to support the delivery of the project.

Although staging programs demonstrated that rail could be operational to Caloundra and/or Birtinya by 2032, the complex scope of works between Caloundra and Birtinya introduces significantly more risk to the overall delivery program. Scope between Caloundra to Birtinya is complex and includes a tunnel at Little Mountain as well as extensive bridges and viaducts due to the number of creek crossings and low-lying terrain.

Considerate of the objective to construct rail to Maroochydore as soon as possible, the business case recommended delivery of the initial stage to Birtinya. The business case, however, went on to note that this recommendation was based on programming assumptions that would be tested and resolved prior to construction commencing in 2026. Assumptions to be tested and resolved include:

- Environmental approvals
- Production rates for pre-cast materials
- Geotechnical conditions (in some areas)
- Tunnelling process and production rates
- Potential early works scope
- Commercial agreements with interfacing stakeholders
- Timeframes for delivery of adjacent road and rail projects

More investigations and formal market engagement is recommended prior to confirmation of delivery timeframes and costs for this section from Caloundra to Birtinya.

Therefore the Queensland Government has committed to delivery of Stage 1 to Caloundra by 2032, while also committing to undertake further planning, design and market engagement activities to Birtinya to better understand the program and costs associated with Stage 2.

## Cost and risk

Cost estimates were prepared in accordance with Queensland Government standards, and the International Standard for Risk Management ISO 31000. Assessment of project risks informed the cost estimate, with risk contingency calculated through a Monte Carlo simulation.

Key risks for the project, which are consistent between project options relate to:

- **geotechnical** – new geotechnical information resulting in design and cost changes
- **environmental** – potential issues with approvals due to threatened species, working by watercourses, cultural heritage and noise and vibration issues during and after construction
- **stakeholders** – potential issues concerning property resumptions and PUP management
- **procurement** – challenges securing in-demand and specialist resources
- **preconstruction** – potential issues regarding PUP relocation, and interface with other works being planned
- **construction phase** – issues with working adjacent to live transport corridors, requirements for specialist subcontractors and materials, and potential for damage to existing unidentified PUP
- **finalisation** – testing, commissioning, and integration challenges.

### Cost estimates and funding envelopes

Business case costs are not final costs. Lessons learned from other international mega-projects include applying a funding envelope to business case costs, as estimates are subject to change as pre-delivery work is further developed and market engagement occurs.

The Queensland Government accelerated some site work during the business case stage, where possible, to improve the confidence of the cost estimate. Accelerated works included general environmental surveys, seasonal environmental surveys, detailed workshops with Queensland Rail (to inform design, maintenance, and operational assumptions) and early consultation with expert industry advisors. Although this work has helped to inform the business case cost estimate, there are still many unknowns that will need to be better understood to refine the cost estimate. Further information will be gathered during the pre-delivery stage which will assist to mature the P90 cost estimate developed within the planning stages.

The below cost estimates were developed at this business case stage.

*Table 2: Planning estimates*

Stage	Beerwah to Caloundra	Beerwah to Birtinya	Beerwah to Maroochydore
Planning estimates	\$5.4 billion	\$8.4 billion	\$12 billion

Stage 1 is expected to cost between \$5.5 billion and \$7 billion. The additional \$100 million includes provision for corridor protection to Maroochydore and further planning, design and market engagement activities to Birtinya.

# Economic analysis

Economic appraisal was undertaken to measure the net economic benefits to South East Queensland associated with the DSC Project, using cost-benefit analysis (CBA). CBA is the most widely used and accepted economic appraisal and evaluation technique applied in the assessment of infrastructure projects in Australia.

It provides a framework for identifying, measuring and monetising a range of economic, social and environmental costs and benefits for an investment decision. The CBA was conducted in line with the required evaluation frameworks and guidance on economic appraisals.

The economic analysis determined that the project delivers substantial benefits for public transport users, road users, the community and the broader economy by better connecting the current and emerging population and activity centres on the Sunshine Coast with an efficient and sustainable public transport option.

The costs and benefits identified in an economic assessment typically occur over a number of years. With infrastructure projects, costs are generally very high in the early years as the project is being built. It is not until after the project is built and people are using it that the benefits can be gained.

In order to compare costs and benefits over time, the values attached to costs and benefits need to be converted and expressed in today's dollar value. This is referred to as 'discounting' future values.

It is common for projects with long construction timeframes to have a lower benefit cost ratio (BCR) as the costs are expended from day one but the benefits are gained from project opening and discounted back over the long period of construction. Therefore, the present value of the benefits is low but the present value of the costs is high.

The 'discount rate' is the percentage rate at which future values are reduced to bring them into line with today's values. Determining an appropriate discount rate is important as the discount rate chosen reflects a judgement about the future value of costs and benefits associated with a project.

Infrastructure Australia advises the use of a discount rate of 7% (real) for public infrastructure projects (with sensitivity testing at 4% and 10%), largely on the basis that it reflects the opportunity cost of the investment. The Queensland Government also apply a 7% (real) discount rate for evaluation of potential investments.

Economic analysis considers value of time, vehicle ownership and operating costs, crowding (on public transport), crash costs, improved health benefits, environmental externalities, amenity improvements, avoided road maintenance, capital costs and public transport operating costs. Wider Economic Benefits (WEBS) have also been included and assessed. These include growth of employment centres, providing better links between jobs and skilled labour, increase in production of goods and services that use transport and increased competition (caused by improvements in affordable transport offerings which help new firms to enter the market and more effectively compete). These benefits are quantified and monetised (where possible) and then assessed against project costs to calculate a BCR.

## Benefit Cost Ratios for public transport

Public transport BCRs are traditionally challenging to calculate. Some benefits associated with easing congestion, travel time savings and so on can be easily monetised, however improved quality of life, liveability, connectivity, accessibility, social equity and so on are unable to be easily monetised. This means that these benefits are not considered as strongly within the economic assessment.

*Rail projects are also generally more expensive than road projects per kilometre. This results in BCRs which appear lower than other infrastructure projects.*

The approach to monetising forecast performance (the number of people using public transport known as ‘patronage’) is also limiting for new public transport connections as the current public transport patronage in the area is usually low due to an inadequate existing public transport network. Therefore, any percentage increase to monetise patronage benefits is from a low base. For example, a 100% increase of 10 people is 20 people (10 more), whereas a 100% increase of 100 people is 200 people (100 more).

To better assess the potential performance of the DSC project, case studies were included in the business case for comparable rail projects. These case studies assessed performance post opening, comparative to forecast business case performance. These case studies demonstrated that comparable rail projects which connect regional growth areas to their nearest capital city, generally out-perform their forecast transport modelling projections, with real patronage significantly higher than forecast patronage on these lines.

*Table 3: Economic appraisal results for staging delivery*

4% discount rate	Staged to Caloundra	Staged to Birtinya	Staged to Maroochydore
BCR	0.29	0.24	0.23
BCR with WEBs	0.37	0.32	0.32
BCR with WEBs and second round benefits			0.40
7% discount rate	Staged to Caloundra	Staged to Birtinya	Staged to Maroochydore
BCR	0.15	0.13	0.12
BCR with WEBs	0.19	0.17	0.17
BCR with WEBs and second round benefits			0.21

# Market sounding

A review of the pipeline of projects both within Queensland and nationally, as well as a review of relevant precedent projects, was undertaken to inform a market sounding assessment. This analysis indicated:

- a general shift towards more collaborative delivery models for large, complex infrastructure projects
- precedent for a separate line-wide package for more complex signalling, systems and integration works as well as precedent for the separation of works in urban environments
- challenges in terms of market capacity, in particular as it relates to resourcing requirements.

While these factors have been considered in developing a Packaging and Delivery Model Strategy that is likely to be attractive to the market, while also meeting government requirements, these market challenges indicate the importance of undertaking a formal market sounding as part of the pre-delivery stage. The Queensland Government will continue to monitor and consider the market conditions, and associated challenges (including environmental approvals), to help ensure the procurement processes are likely to be suitably attractive and result in strong market appetite.

# Delivery options assessment

An assessment of potential packaging and delivery model options was undertaken to identify a recommended Packaging and Delivery Model Strategy for the Project. This packaging strategy will be subject to further consideration in the next project stage and will be used to seek feedback from the market during future market sounding activities.

# Conclusions and recommendations

Investigations undertaken for the DSC business case confirm the findings of Infrastructure Australia's *Regional Strengths and Infrastructure Gaps – Regional Analysis: Queensland* (RSIG) (2022) that the Sunshine Coast's public transport network is inadequate for its growing population.

The CAMCOS Impact Assessment in 2001 first stated:

*As the number of people living and working on the Sunshine Coast grows, the high costs of car dependency are becoming noticed through the financial costs of providing additional road capacity, environmental costs of air pollution and the increasing congestion and impacts on business and industry.*

This study noted that a major shift towards efficient, environmentally sustainable and accessible modes was needed. It advocated for the protection of a rail corridor to enable better public transport outcomes for the Sunshine Coast and to curb or reverse trends in private vehicle ownership, providing a progressive rail connection between Beerwah and Maroochydore.

Now, almost 23 years after the completion of the CAMCOS work, the Sunshine Coast boasts the second highest car ownership in Australia. It has developed into a region that is highly reliant on private vehicle travel and has limited competitive or attractive public transport alternative for those wishing (or needing) to travel between the Sunshine Coast, Moreton Bay or Brisbane. To travel between Brisbane and key growth areas and destinations to the east of the Sunshine Coast via public transport requires a minimum of a 2.5 hour trip.

The Sunshine Coast has now reached a critical juncture where decisions are needed about how it will continue to grow, with ramifications for the broader South East Queensland region. Modelling demonstrates that strong growth between the areas of Brisbane, Moreton Bay and the Sunshine Coast will continue to place pressure on both regional and local road networks over the coming decades. Without significant commitment to the development of a balanced multimodal network, incorporating competitive and accessible public transport, the future for this corridor and region looks increasingly car dependent. Modelling already considers significant investment to the Bruce Highway and, unsurprisingly, congestion continues to increase. As new growth areas unfold around the region to increase the supply of affordable housing options for Queensland's booming population, delivering a more efficient, environmentally sustainable and accessible network is becoming even more important.

Left unaddressed, the gap in infrastructure provision on the Sunshine Coast will continue to restrict accessibility, resulting in social inequity and limiting local and regional economic activity. Public transport offers greater freedom and independence for people unable to access a private vehicle or drive due to affordability, age and ability. It opens up opportunities for employment, education, health care, recreation and connection with others that may otherwise be beyond reach.

A major intervention is required to support more sustainable travel across the Sunshine Coast and South East Queensland. Provision of attractive public transport services will be critical to Queensland reaching its climate goals, reducing congestion and encouraging an uptake in more sustainable trips to, from and within the Sunshine Coast region.

The delivery of the DSC Project from the North Coast Line at Beerwah to Maroochydore, enabling single-seat journeys from the growth areas of the Sunshine Coast to Moreton Bay, Brisbane and beyond, will be a significant step-change in the public transport landscape for the region.

## Progressive delivery

This business case offers a stageable solution for progressive delivery of this 37.8km corridor. This offers a more affordable option for investment, while incrementally delivering benefits to the community. Staged delivery mirrors the approach applied to other large public transport programs such as the Gold Coast Heavy Rail Extension and the Gold Coast Light Rail projects, bringing the service into operation sooner and creating a pipeline of work for industry.

The business case recommends staging to Birtinya. The costs and program to Birtinya include assumptions related to key project risks, which should be tested in the next phase:

- Environmental approvals
- Production rates for pre-cast materials
- Geotechnical conditions (in some areas)
- Tunnelling process and production rates
- Potential early works scope
- Commercial agreements with interfacing stakeholders
- Timeframes for delivery of interfacing road and rail projects

Staged delivery of rail to Caloundra can be progressed while further investigations are undertaken to confirm costs and timeframes for delivery of rail between Caloundra and Birtinya.

The staged delivery of this network aligns with the objectives of the *Southern Sunshine Coast Public Transport Strategy* and will provide an inclusive, connected, safe, accessible and reliable travel experience for residents and visitors of the Sunshine Coast.

## Next steps

Following consideration of the business case recommendations, the Queensland Government has committed to deliver Stage 1 of the Direct Sunshine Coast Rail Line project.

Stage 1 includes:

- Protection of the revised alignment from Beerwah to Maroochydore
- Delivery of a dual-track rail line (and associated infrastructure, including 1 upgraded and 2 new stations) from Beerwah to Caloundra
- Planning, design and market engagement to confirm delivery costs and timeframes to deliver DSC to Birtinya

The Queensland Government has committed \$2.75 billion in funding to deliver Stage 1 (Beerwah to Caloundra). Construction of Stage 1, and further planning to Birtinya, is expected to cost between \$5.5 billion and \$7 billion.

The business case has been issued to Infrastructure Australia for review.

