

## 2. Review of the Cross River Rail project

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The Cross River Rail (CRR) project is being delivered by the Cross River Rail Delivery Authority (the Delivery Authority) and is the largest single infrastructure project currently under construction in Queensland. It is budgeted to cost \$6.888 billion and as of 30 June 2022, \$4.6 billion had been spent on it.

The project is made up of 10.2 kilometres of new rail infrastructure from Dutton Park to Bowen Hills, including 5.9 kilometres of twin tunnels under the Brisbane River and Central Business District and 4 new underground stations – Woolloongabba, Boggo Road, Albert Street, and Roma Street. It will also deliver upgrades to 8 above-ground stations – Salisbury, Rocklea, Moorooka, Yeerongpilly, Yeronga, Fairfield, Dutton Park, and Exhibition.

In addition to the CRR project, the Delivery Authority is responsible for a wide range of CRR-related work, including introducing the European Train Control System (an advanced signalling system) for the whole of South East Queensland.

The state, through Queensland Rail and the Department of Transport and Main Roads, is also delivering major rail-related projects.

Due to the size and complexity of the projects, there is a heightened degree of scrutiny by stakeholders, including of the effectiveness of the procurement activities undertaken by the Delivery Authority in delivering the CRR project.

Given this level of public interest, we have performed an independent review of the business cases supporting the investment decisions to enter into the project and the Delivery Authority's major procurement activities. In this chapter we also provide an overview of the CRR project, and discuss progress, costs, and funding estimates.

### Progress of the Cross River Rail is affected by supply chain issues

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The project is expected to cost \$6.888 billion and is funded through \$5.389 billion of state contributions and \$1.499 billion in private finance contributions. A total of \$4.6 billion (67 per cent of the project budget) had been spent on the CRR project by the Delivery Authority as of 30 June 2022. As a result of market forces and schedule adjustments, the actual amount spent to date is about \$452 million (9 per cent) less than the projected expenditure for the CRR budget. Expenditure on other projects being undertaken on behalf of Queensland Rail and the Department of Transport and Main Roads is also \$200 million less than projected.

The project is being delivered at a time when a lot of public infrastructure is being constructed all over Australia, causing competition for resources. High rainfall, the Ukraine conflict, and the COVID-19 pandemic have also affected the delivery of the project. These factors have delayed supply and increased the costs of materials and the workforce.

To mitigate some of these factors, the Delivery Authority and its contractors have pre-ordered long lead-time materials, increased their workforces, rescheduled work programs, and extended working hours to deliver the project. The Delivery Authority has been monitoring these impacts since early 2022 and working with all stakeholders to determine strategies to deal with potential effects on time and cost.

The Delivery Authority will need to continue to monitor performance and budget, and adjust for impacts relating to the supply chain and consequential pricing outcomes.

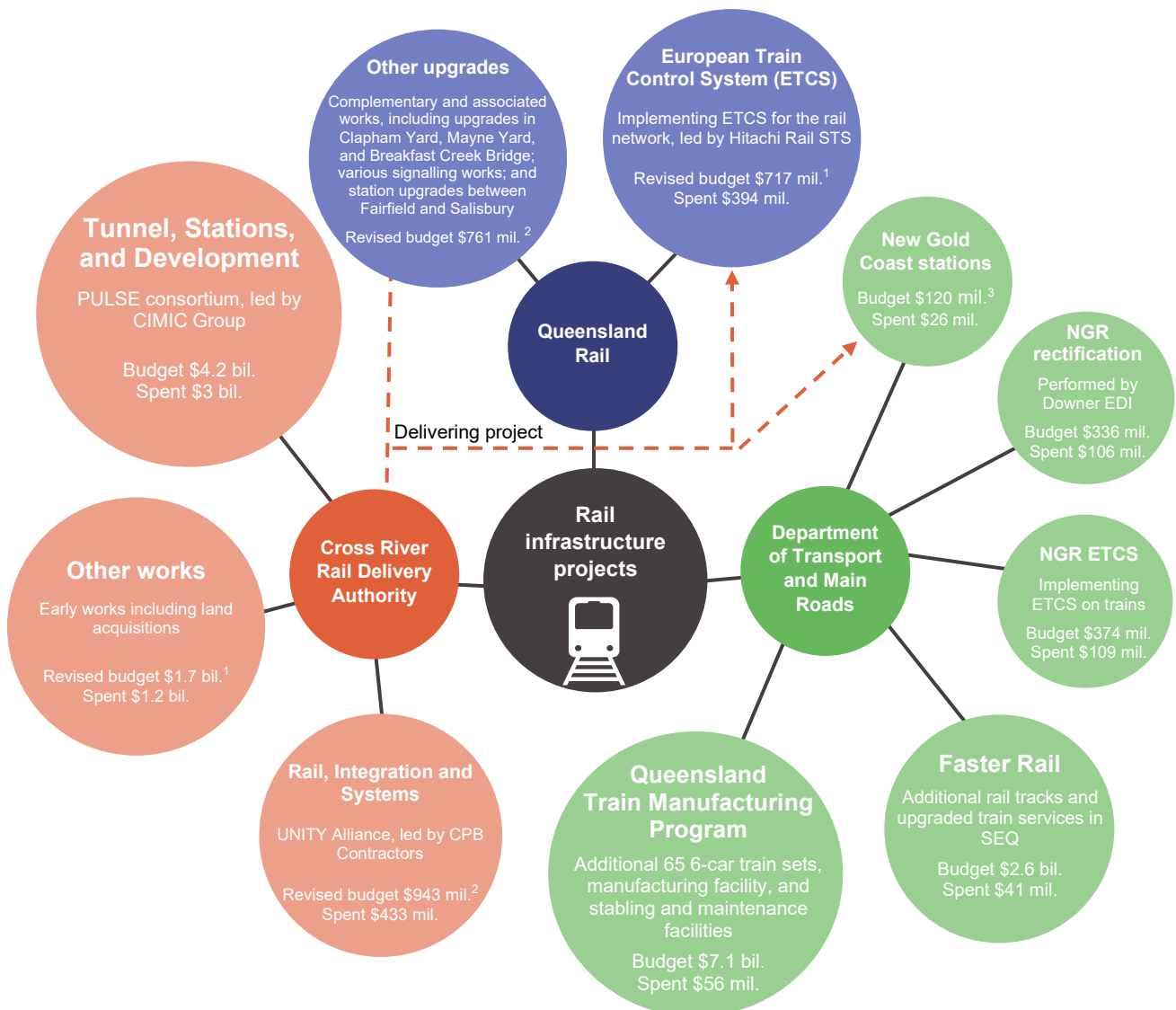
## Cross River Rail – expected costs and funding

The \$6.888 billion CRR budget has 3 components: Tunnel, Stations and Development; Rail, Integration and Systems; and other works such as land acquisitions.

The Delivery Authority is also undertaking several other related projects for the Department of Transport and Main Roads and Queensland Rail, to maximise efficiencies while contractors are already working in the rail corridor. Broadly, these include safety upgrades, accessibility improvements, asset replacements, and changes to facilitate *SEQ Rail Connect* (a strategy to deliver a single, integrated transport network accessible to everyone in the growing South East Queensland (SEQ) region). Specifically, these include upgrades to train stabling yards, bridges, and stations (called ‘complementary and associated works’ – \$761 million) and the implementation of the European Train Control System (\$764 million).

The projects and their funding sources are outlined in Figure 2A.

**Figure 2A**  
Major rail and associated infrastructure projects (expenditure as of 30 June 2022)



**Notes:**

1 The total budget for the ETCS work package is \$764 million, with Queensland Rail funding \$717.3 million and the Delivery Authority funding \$46.8 million from the Other works budget.

2 The total budget for the Rail, Integration and Systems work package is \$1.7 billion, with Queensland Rail funding \$761 million and the Delivery Authority funding \$943 million.

3 The total budget for New Gold Coast stations is \$187 million, with the Department of Transport and Main Roads funding \$120 million, and Queensland Rail funding \$67 million.

NGR – New Generation Rollingstock.

Source: Compiled by the Queensland Audit Office.



## Funding for design modifications and other project changes

Scope and design changes to major projects can occur as issues arise during the planning, design, and construction phases. Common risks that can result in modifications include defective or erroneous designs, latent conditions (a physical condition on or near the construction site that could not reasonably have been anticipated, for example, the discovery of soil contamination), ineffective integration of sub-projects, and substandard quality of work by the engaged contractors. All budgets for major projects include a contingency to allow for these risks to be addressed as they arise, but this budget needs to be carefully managed.

As of 30 June 2022, the contingency for the CRR project remained within budget.

## The Cross River Rail project has 3 major works packages

The CRR project is progressing through the design and construction phase. The Delivery Authority is monitoring external impacts on the costs and time frames of the project, and developing strategies to mitigate these impacts. It is delivering 3 major works packages:

1. Tunnel, Stations and Development (TSD) – \$4.2 billion
2. Rail, Integration and Systems (RIS) – \$1.7 billion
3. European Train Control System (ETCS) – \$764 million.

A component of the RIS project is called the complementary and associated works package, which is being separately funded by Queensland Rail as this work relates to the broader rail network. Queensland Rail is also funding \$717.3 million of the ETCS package as it also relates to the broader rail network, with \$46.8 million funded by the Delivery Authority.

The 3 major works packages are outlined in the following pages.

## Tunnel, Stations and Development – \$4.2 billion

Tunnel, Stations and Development (TSD) is the largest work package, and includes the boring of the twin tunnels, construction of each of the underground stations, and related works.

### Figure 2B Tunnel, Stations and Development – contract details



Public–private partnership with Pulse Consortium: Public–private partnerships are cooperative agreements generally entered into with private sector entities for the delivery of government services.

The Tunnels, Stations and Development work package includes the design and construction phase over the 5-year construction period, and a 25-year agreement for ongoing maintenance services when the CRR becomes operational from mid-2025.

State funding of \$2.7 billion.

Private finance contributions of \$1.499 billion.

Source: Queensland Audit Office from Cross River Rail Delivery Authority management reports.

**Figure 2C**  
**Tunnel, Stations and Development – progress**

2019–20	2020–21	2021–22	2022–24	2024	2025
Completed	Completed	Completed	Underway	Up next	Completion
Tunnel, Stations and Development contract awarded (July 2019)	Drilling completed (December 2021)	Excavation completed (June 2022)	Tunnel and stations fit-outs underway	Testing	Operational service
<b>Rollout to current and future rail projects</b>					

Source: Compiled by the Queensland Audit Office.

## Rail, Integration and Systems – \$1.7 billion

The Rail, Integration and Systems (RIS) work package will integrate the CRR project with the existing train network. This will include electrical works and operation systems and controls, as well as signalling and communications work. It will also deliver upgrades to the accessibility (for people with a disability) of 6 suburban stations.

**Figure 2D**  
**Rail, Integration and Systems – contract details**

<b>i</b>	<p>Alliance contract with UNITY (an alliance agreement is a multi-party contract, in which all parties agree to a single set of terms and conditions to deliver the project and share the risks of the success or failure of the project).</p> <p>Project budget of \$1.7 billion.</p> <p>Delivered by the Cross River Rail Delivery Authority.</p> <p>Funded by Queensland Rail (\$761 million) and Cross River Rail Delivery Authority (\$943 million).</p>
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Source: Queensland Audit Office from Cross River Rail Delivery Authority management reports.

**Figure 2E**  
**Rail, Integration and Systems – progress**

August 2019	2021–23	2024–25	2025
Completed	Underway	Finalisation	Completion
RIS contract awarded (August 2019)	Station upgrades and rail track installations	Testing and commissioning	Operational service
<b>Rollout to current and future rail projects</b>			

Source: Compiled by the Queensland Audit Office.

In October 2021, a major design modification was made relating to the tunnel structure and the southern tunnel entrance. There were issues relating to the track geometry (for example, the curve of the track) and platform gaps, which were addressed by realigning the track to fit with the modified design and changing the location at which the southern tunnel surfaces from the original site in Yeerongpilly to the current site in Dutton Park.


The redesign increased the cost to the Delivery Authority of the Rail, Integration and Systems work package and the Tunnel, Stations and Development work package by approximately 3 per cent of the combined RIS and TSD budget. This is being met from the project's contingency.

As part of the redesign of the southern area modifications, consideration was given to the location of the station, with 2 options considered. Both were assessed as appropriate, with advantages and disadvantages. We reviewed all documents associated with this assessment and decision and did not identify any matters of significance relating to the assessment of the options or the decision on station location.

## European Train Control System – \$764 million

The European Train Control System (ETCS) work package will deliver an advanced signalling system providing continuous information on the position, direction, and speed of all trains. It will also allow passengers to have access to real-time (as it is happening) information on train schedules. ETCS is required for the operation of the CRR tunnels and for the wider South East Queensland rail network.

**Figure 2F**  
**European Train Control System – contract details**

	Alliance agreement with Hitachi Rail STS.
	Project budget of \$764 million, renegotiated from \$646 million due to the addition of upgrades to increase the capacity of conventional signalling for specific areas.
	Delivered by the Cross River Rail Delivery Authority.
	Funded by Queensland Rail.

Source: Queensland Audit Office from Cross River Rail Delivery Authority management reports.

**Figure 2G**  
**European Train Control System – progress**

July 2018	October 2019	January 2022	2024–25	2025
Completed	Completed	Completed	Up next	Completion
Transferred from Queensland Rail to Cross River Rail Delivery Authority	Fixed price contract (\$646 mil.)	Change to alliance agreement (increased scope to \$764 mil.)	Integration testing and commissioning	Operational service
			<b>Rollout to current and future rail projects</b> 	

Source: Compiled by the Queensland Audit Office.

The contract was initially awarded to Hitachi Rail STS as a fixed priced contract but was later negotiated to a collaborative contracting model (an alliance agreement). This was done to incentivise delivery and improve coordination and risk management between all parties involved in delivering the project.

The alliance agreement includes the original scope requirements for designing, building, installing, testing, and commissioning the signalling system for an operational CRR line from the northern tunnel portal to the southern tunnel portal. It also includes an upgrade to the capacity of conventional signalling for the Northern and Mayne areas (including the Exhibition, Mayne East, and Albion stations).

The new alliance contract outlines provisions to deliver future rail projects requiring ETCS deployment. Decisions on this are made by the Department of Transport and Main Roads as the project sponsor, or as part of the preparation for an Olympic-ready high-capacity railway. Any additional scope is expected to be contracted as required and as funding becomes available.

## We did not identify any significant issues relating to procurement processes

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Procurement processes across all Queensland public sector entities are guided by various Queensland Government policies and legislative frameworks.

We have reviewed the Delivery Authority's procurement activities for each of the 3 major work packages and have not identified any significant issues relating to these.

The procurement activities we assessed included:

- early works activities, including assessing procurement plans, developing project specifications, and appointing and using probity advisors (who provide advice and assistance before and during procurement processes)
- contractor tendering processes and the evaluating of prospective bids
- contractor negotiating processes and contract signing.

Our review also considered whether contract management plans were developed to monitor ongoing contract deliverables and outcomes.

We have not assessed the effectiveness of the contract management processes implemented relating to the 3 major work packages as part of this review. We have also not assessed the merits of the project or whether it represents value for money.

## Business cases supporting Cross River Rail project investment decisions

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We have assessed the 3 detailed business cases prepared for the CRR project.

Business cases are used by governments to make good, informed decisions on major investments. Prepared after opportunities or problems are identified and potential response options are analysed, they document and calculate the expected benefits, impacts, and costs. They should provide clear, comprehensive evidence for decision-makers.

Business cases also include projections and assumptions, which can change over time. For the CRR project, 3 detailed business cases have been prepared:

- the original, finalised in September 2011
- an updated detailed business case, finalised in June 2016, including a major design change to reduce the length of the tunnels from 10 kilometres to 5.9 kilometres
- an updated business case, released publicly in August 2017, including increases in rail network capacity, decreases in rail fare prices, and an extension of 10 years to the timeline to achieve project benefits.

We assessed the business cases against the frameworks and guidelines that were relevant at the time they were prepared. We did not identify any significant issues in relation to their compliance with these frameworks and guidelines.

### Forecasted benefits exceed costs in the detailed business cases

The Queensland Government decided to proceed with the CRR project based on forecasted benefits being greater than costs, in what is known as a benefit-cost ratio. These ratios are based on complex calculations containing significant assumptions and estimation techniques regarding a project's forecast benefits and costs.



Each of the 3 business cases indicated that benefits exceed costs. They also contained sensitivity analyses (investigations of potential changes and their impacts on conclusions) that produced a range of different benefit-cost ratios, all of which indicated a positive outcome.

Sensitivity analysis in the 2016 detailed business case model forecasts indicated that the project will continue to have a positive benefit-cost ratio unless costs increase by more than 20 per cent and benefits decrease by more than 20 per cent. A delay in the project delivery will also impact on the ratio. An overrun of 2 years would affect the results.

We reviewed the June 2016 business case in detail (this business case had the most detailed analysis, with the 2017 business case being an update for changes in estimates and assumptions). The key measures and assumptions outlined in it include population forecasts, rail patronage growth, road user benefits, and construction costs.

The COVID-19 pandemic has impacted on working arrangements, with many people still working from home and not needing to travel. Queensland has also experienced significant population growth in recent years, and this is expected to continue in the lead-up to the Brisbane 2032 Olympic and Paralympic Games. These factors are both likely to impact rail patronage and any consequential impact on road usage.

The business case projected that the daily rail passenger usage in South East Queensland with the operation of CRR would increase by 103 per cent over the period from 2015 to 2026 (an average increase of 6.65 per cent per annum). The actual Queensland Rail Citytrain Network Passenger trips (pre-CRR) data shows the increase in passenger trips for the 4 years from 2015 to 2019 was only 6.6 per cent (an average of 1.6 per cent per annum). Our report *Transport 2021* (Report 10: 2021–22) noted rail passenger numbers reduced by 25.3 per cent in 2020–21 due to the COVID-19 pandemic. In recent months, rail passenger numbers have started to slowly improve. There will need to be a significant increase in passenger trips over time for the forecast benefits of the project to be achieved.

Another measure of success in the business case related to road user (or 'decongestion') benefits. This is tied to the shift of transport mode from road to rail, which frees up road space in congested areas and provides a reduction in costs associated with vehicle operation and with crashes. In the business case, road user benefits represent \$3.6 billion (64.7 per cent of the benefits in the 2016 detailed business case) of the total projected benefits of the project.

## Plan to achieve intended benefits over time

Queensland Treasury's *Project Assessment Framework* requires that appropriate plans be developed and implemented for the commissioning of a project, to ensure the intended benefits are achieved over time. This involves reviewing and updating the business case to reflect current financial and non-financial information. In the framework, this stage is referred to as 'Establish service capability', which is a precursor to proceeding to the 'Deliver service' stage of the framework.

In August 2022, the Department of Transport and Main Roads released *SEQ Rail Connect* – a strategy to deliver a single, integrated transport network accessible to everyone in the growing South East Queensland region. A focus of the strategy is getting ready for Cross River Rail.

The expected benefits of the CRR project should continue to be monitored, and appropriate transport and other strategies implemented, to maximise rail patronage and road user benefits over the medium and long term.