

# CITY TO GUNGAHLIN LIGHT RAIL PROJECT DELIVERY REPORT

JUNE 2019



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**The City to Gungahlin light rail project is the first stage of a Canberra-wide light rail system which is fundamentally improving the way we work, live and connect.**

The ACT Government in partnership with Canberra Metro has delivered the first stage of light rail within budget and to a world-class standard.

# 1. Chief Minister and Minister Remarks

Stage one of our light rail network, from Gungahlin to the City, is a visionary project that positions Canberra to remain the world's best city during its second century. The ACT Government has always been confident this project would generate substantial benefits for our city. Those benefits are already being realised.

A high quality public transport system will strengthen our social fabric, enhance economic opportunities and benefit our natural environment so that future generations of residents and visitors can enjoy the city as we do today. Our public transport ambitions reflect the progressive spirit of the Canberra community.

Light rail is the largest single public investment made by the Territory since self-government. It demonstrates that as Canberrans we can script our own future, one which reflects our values, our history and our people to create a city in which we all want to live.

As the first stage of a city-wide light rail network, we are pleased to see the project delivered under budget and within the timeframes of our original investment decision.

We are delighted with both the design and operations of our light rail system.

The funding and delivery model of the project also broke new ground, with the ACT Government having entered into one of its first Public-Private-Partnerships. We are grateful to the Canberra Metro consortium for working in true collaboration with the ACT Government in delivering this project. We recognise the efforts of Canberra Metro throughout all stages of the project and thank the consortium for the constructive manner in which we worked together.

Within the ACT Government, all stages of the project were managed within a sound governance structure involving both senior Government and independent board members. In this regard, we would particularly like to thank the Chair, John Fitzgerald, and the other independent member Michael Kerry.

We would also like to sincerely thank the many hard-working people who have contributed to the successful completion of this project, including both ACT Government and Canberra Metro staff and advisors. Finally, we would like to thank all Canberrans, particularly residents and business owners along the corridor, for their patience and support during the project's construction phase.



**Andrew Barr** MLA  
CHIEF MINISTER



**Meegan Fitzharris** MLA  
MINISTER FOR TRANSPORT



GUNGAHLIN PLATZ

Alinga Street

TC

CAF

Alir

SPORT  
WIRTSCHAFT

## 2. Chair Remarks

This report records a major milestone for the city of Canberra. It reviews the implementation of the ACT Government's transformational City to Gungahlin light rail project.

It has been an honour for me to serve as Chair of the Light Rail Project Board. I have had the privilege of serving with highly skilled and dedicated colleagues in the planning and delivery of this project. I would like to thank my fellow Board members for the collegiate and professional contributions you each made to the work of the Board. I would also like to thank Chief Minister Barr, Minister Fitzharris, former Chief Minister Gallagher and former Minister Corbell and their Cabinet colleagues for their guidance to, and support for, the project.

Canberra Metro has delivered for Canberrans an outstanding light rail system. The Light Rail Project Board acknowledges the crucial role of construction and operation played by Canberra Metro in this project. The Board thanks Canberra Metro and looks forward to continuing to work with it over the coming decades.

The project team within Transport Canberra have also worked exceptionally hard to deliver this project. They have embraced every challenge and continually sought new and innovative solutions. It is obvious to me that they genuinely care about achieving the best possible outcome for Canberra and I am proud to have worked with them.

The project team received great support from the broader Transport Canberra and City Services Directorate and colleagues from across government including from the Chief Minister, Treasury and Economic Development Directorate, the Environment, Planning and Sustainable Development Directorate, the City Renewal Authority and the Suburban Land Agency. The project greatly benefitted from the commitment of the National Capital Authority, its Chair, Terry Weber, Board, CEO and Chief Planner. The Independent Certifier, Office of the National Rail Safety Regulator and ACT Utilities Technical Regulator each also played key roles in the project's approvals chain. I thank all involved for their efforts in successfully facilitating and delivering this project.



**John Fitzgerald**

CHAIR

## 3. Executive Summary

This Project Delivery Report reflects upon outcomes from the procurement and delivery of the City to Gungahlin Light Rail project.

As with any large, complex infrastructure project, the delivery of the project saw successes, encountered challenges and generated lessons to bear in mind in the future delivery of other projects. This report summarises the performance of, and key lessons learnt from, the project's procurement and delivery phases. This will inform other complex infrastructure projects across the Territory and future expansions of our light rail network.

The Territory acknowledges and thanks Canberra Metro for its vital role in the project. As the ACT Government's partner under the project's PPP structure, Canberra Metro were responsible for designing, constructing and now operating the first stage of Canberra's light rail system. This report is written from the ACT Government's perspective and reflects budget, program and other project outcomes for the ACT Government. Notwithstanding this is an ACT Government report reflecting ACT Government outcomes, the ACT Government thanks Canberra Metro for its review of this report prior to its publication.

### 3.1 Project Overview

The nation's capital is a vibrant and growing city and the hub of the Canberra region. To sustainably accommodate its future growth and to position Canberra for its second century, the Australian Capital Territory Government embarked on its largest single infrastructure project to date.

City to Gungahlin Light Rail (the Project) is the first stage of a world-class, city-wide light rail network that will have a transformative effect on the future of our city. Light rail will improve the way we move around our city, stimulate urban renewal and allow us to respond to growth in a way that is sustainable and maintains our high standard of living.

On 20 April 2019, the City to Gungahlin Light Rail service commenced public passenger operations. It is a 12km light rail service, comprising 13 stops, 14 Light Rail Vehicles (LRV's) and one maintenance depot. The project, delivered under a 20 year Availability Public Private Partnership (PPP) with Canberra Metro, encompasses the design, construction, finance, operations and maintenance of the light rail system. It represents the largest single investment by the Territory since self-government. The entities comprising the Canberra Metro consortium as at 1 June 2019 are outlined in Table 17 on page 38.

The vision for the City to Gungahlin light rail as set out in the 2014 Project Business Case is to 'Boost Canberra's sustainable development by changing and improving transport options, settlement patterns and employment opportunities.'

In doing so the project aimed to address two key problems; the need for better, more sustainable transport options to reduce car dependency and improve transport capacity; and the need for sustainable urban form.



**TABLE 1**

Needs of the territory	Value of light rail
Building alternative transport capacity	<ul style="list-style-type: none"> <li>• Improve customer experience, health and accessibility for locals and visitors</li> <li>• Reduce traffic congestion and ACT's carbon emissions per capita</li> <li>• Increase public transport mode share</li> </ul>
The need for sustainable urban re-development and increased urban densification	<ul style="list-style-type: none"> <li>• Deliver cost-effective public infrastructure and services to households</li> <li>• Increase productivity</li> <li>• Facilitate densification which, in turn, propels higher population growth</li> </ul>
Canberra faces substantial economic challenges which have the potential to increase social and economic dislocations	<ul style="list-style-type: none"> <li>• Create jobs and economic growth</li> <li>• Increase diversity and resilience of the territory economy</li> <li>• Increase revenue through appreciation of land values along the corridor</li> </ul>
The Federal Highway-Northbourne Avenue corridor is a sub-optimal gateway to the Nation's capital	<ul style="list-style-type: none"> <li>• Fulfil the Griffin vision for the city</li> <li>• Create a grander entrance to the City befitting its status as the National Capital</li> </ul>

At the time of publication, the project is in its “Final Completion” phase with a number of minor construction and associated items to be completed in accordance with the Project Agreement.

## 3.2 Project Design

The ACT Government is particularly pleased by the project’s urban design. This outcome was due to the efforts of Canberra Metro and its designers, together with guidance provided by the ACT Government, the project’s Design Review Panel and the National Capital Authority.

Canberra Metro and the Territory worked together to implement a number of improvements to the project’s original scope through the detailed design development and delivery stage. Some of the most significant include:

- Enhanced light rail stop design - with improved aesthetics, larger areas sheltered from the weather, higher quality public seating and associated conveniences such as place to rest a bag while seated.
- Incorporation of public art in the design of each stop.
- High quality seating and custom seat fabric within the light rail vehicles to enhance passenger comfort and promote Indigenous culture.
- Enhanced landscaping.
- The future-proofing of city infrastructure where associated with other elements of project work, such as storm water drainage.
- Comprehensive customer engagement and customer experience assessment to optimise passenger accessibility and comfort.

Combined, these scope enhancements have delivered additional benefits for light rail users and the people of Canberra.

### 3.3 Budget, Program and Economic Outcomes

The project has been delivered by Canberra Metro for the ACT Government for around \$108 million less than the original business case estimate, around \$32 million less than the design and construction cost estimate at contract signing, and within the timeframe originally anticipated by the business case.

The stated benefits and opportunities of the project are also being realised. Along the corridor, new development is proceeding at pace. This will further enliven the corridor, promote economic growth and create more compact, connected centres consistent with the ACT Planning Strategy.

The regeneration of the Northbourne corridor has been complemented by the ACT Government's decision to renew 1288 public housing units and to access additional funding through the Commonwealth Government Asset Recycling Initiative.

Initial patronage outcomes have also exceeded the projected estimates set out in the project's business case, although it is noted that the first month has involved a free travel period.

The headline elements of the business case investment rationale, and the corresponding outcomes now observable, are set out in Table 2.

**TABLE 2** Comparison to key elements of the 2014 business case

	Business Case (2014)	Contract Summary (2016)	Final Outcome (2019)
Capital Cost (inc. Territory-held contingency)	\$783m	\$707m	\$675m
Completion Date / Commencement of Services	Operations to commence in 2019	Operations to commence in early 2019. Project Agreement stated September 2018 date.	Passenger operations commenced 20 April 2019
Benefit Cost Ratio	1.2	1.2	At least 1.3*

\* Benefits are held constant per the project's business case. Updated for Territory cost outcomes.

### 3.4 Lessons Learnt

Any project of this size and complexity will present valuable lessons which will inform future infrastructure development and major investment decisions.

The successful elements of the project's delivery may be largely attributed to several project-specific factors, including:

- **Clear Project Aspirations** that were established early and maintained throughout the project to guide key decisions. Business case analysis was robust;
- **A Delivery Model** that optimised value for money to the Territory, best managed risk and facilitated better project outcomes;
- **An Affordability Signal** provided by the Territory during the procurement phase to align the market expectations with Territory objectives;
- **A Delivery Focus and Sound Governance Framework** from the outset of the project that saw the early establishment of a dedicated Sub-Committee of Cabinet, project board and consideration of the commercial, technical and transitional arrangements needed to successfully deliver a major infrastructure project;
- **A Design Review Working Group** established early in the process to facilitate robust discussion and quick resolution of design elements, including National Capital Authority participation;

- **Proactive Safety** management which assessed trends to identify and manage key periods of safety risks, such as after holidays and long weekends; and
- **A Dedicated Community Engagement** approach to assist the community understanding and engagement with the project.

Crucially, the successes of the project have in large part been thanks to the ACT Government's private sector partner, Canberra Metro. Canberra Metro and the ACT Government worked together in a collaborative, commercially pragmatic manner to deliver the project and ensure both parties are positioned well for the operations and maintenance of the system over the coming decades.

The project also encountered challenges and feedback for improvement at various stages. In this respect, the ACT Government has noted areas for future focus in relation to:

- The structuring of delivery contracts, particularly in relation to the design development process and 'proceeding at risk' during delivery;
- The processes associated with obtaining various third-party approvals;
- Engagement with the local subcontractor market;
- Operator involvement during the project's design phase;
- The maintenance of the delivery site during construction; and
- Engagement with local businesses.

### 3.5 Purpose of this report

The City to Gungahlin Light Rail project represents the largest single contract entered into by the Territory since self-government. It is also one of the most significant investments in the history of Canberra.

This report is intended to meet two objectives:

1. To provide interested stakeholders with a summary of the project's aspirations, key features and initial outcomes; and
2. To provide an initial 'Post-Implementation Review' under the ACT Government's Capital Framework, including assessing and reporting on key lessons learned, noting this project commenced prior to implementation of the Capital Framework. A future review of benefits will occur consistent with the ACT Government's Capital Framework within 12 months of operations commencing.

## 4. Project Overview

### 4.1 Starting Goals and Aspirations

The Canberra *Statement of Ambition* envisions Canberra as one of the world's most liveable, welcoming and competitive cities. Canberra is a dynamic and vibrant growing city with a desire to embrace change while celebrating its heritage. Achieving this vision requires investment in a better transport network that supports a diverse economy, urban renewal, and which allows the city to grow in an economically and environmentally sustainable manner.

The City to Gungahlin Light Rail project supports the future ambitions for our City and cements its role in the broader Canberra region.

As the first stage of a city-wide light rail network, the City to Gungahlin Light Rail project presents the largest single infrastructure project ever undertaken by the Territory, and one of its first public private partnerships (PPP). This first stage will help shape the nation's capital as a more compact, inclusive and progressive city while enhancing the lifestyle available to its community.

The original business case approved by Cabinet sets out the project vision as:<sup>1</sup>

**To boost Canberra's sustainable development by changing and improving transport options, settlement patterns and employment opportunities.**

Inspired by Walter Burley Griffin's master plan for Canberra, the business case for the project is based on two fundamental drivers:

- The emerging and significant need to reshape the forecast demands on transport and capacity within the ACT. Major urban infrastructure or redevelopment mechanisms such as light rail enables us to reduce the already high and rising level of car dependency, associated traffic congestion (particularly along the Northbourne Avenue – Federal Highway corridor).
- The growing and essential requirement within the Territory for sustainable urban re-development to reduce the negative impacts resulting from population dispersion by increasing densification, where appropriate, within the ACT (as outlined in the ACT Planning Strategy). This is paramount given the potential constraints over the future supply of developable greenfield land in the ACT.

With a travel time of around 24 minutes, light rail will offer a significantly reduced travel time compared to private cars while also reducing future car travel times through an enhanced road network capacity.

**TABLE 3** Capital Metro Impact on Travel Time<sup>2</sup>

	With Light rail	Without Light rail
Average Gungahlin to City morning peak car travel time Forecast for 2031	42 minutes	57 minutes

To realise these benefits, the ACT Government established four principles for the Project which informed all aspects of its design, procurement and delivery.

<sup>1</sup> CMA Full Business Case, page 27

<sup>2</sup> CMA Full Business Case, page 51

**TABLE 4** Project Aspirations

	Project Aspiration	Community Outcomes
Customer Experience	To attract Canberrans to public transport through frequent, reliable, easy to use, seamless, safe, clean and modern light rail services	<ul style="list-style-type: none"> <li>• Increase in mode share of public transport</li> <li>• Optimised frequency</li> <li>• Service reliability</li> </ul>
Urban Design	To provide a light rail system that demonstrates excellence in urban design befitting its prominent location in the primary gateway to Australia's capital city. The system will exhibit exemplary and creative integration with the built environment and stimulate urban renewal.	<ul style="list-style-type: none"> <li>• Sustainable urban redevelopment stimulated along the corridor</li> <li>• Revitalisation of the Northbourne Avenue corridor</li> </ul>
Community	To engage local industry, minimise disruption and reflect the Territory's environmental focus in the Project's delivery and operations	<ul style="list-style-type: none"> <li>• Grow a more diversified Canberra economy</li> <li>• Increase social and economic participation</li> <li>• Reduce carbon and other emissions</li> </ul>
Affordability	To procure a light rail system that is affordable for the ACT community	<ul style="list-style-type: none"> <li>• Affordable capital and operational costs</li> </ul>

## 4.2 The project

On 17 May 2016, the Territory entered into an availability-based PPP with Canberra Metro Pty Ltd (Canberra Metro) for the City to Gungahlin Light Rail project with two key project phases:

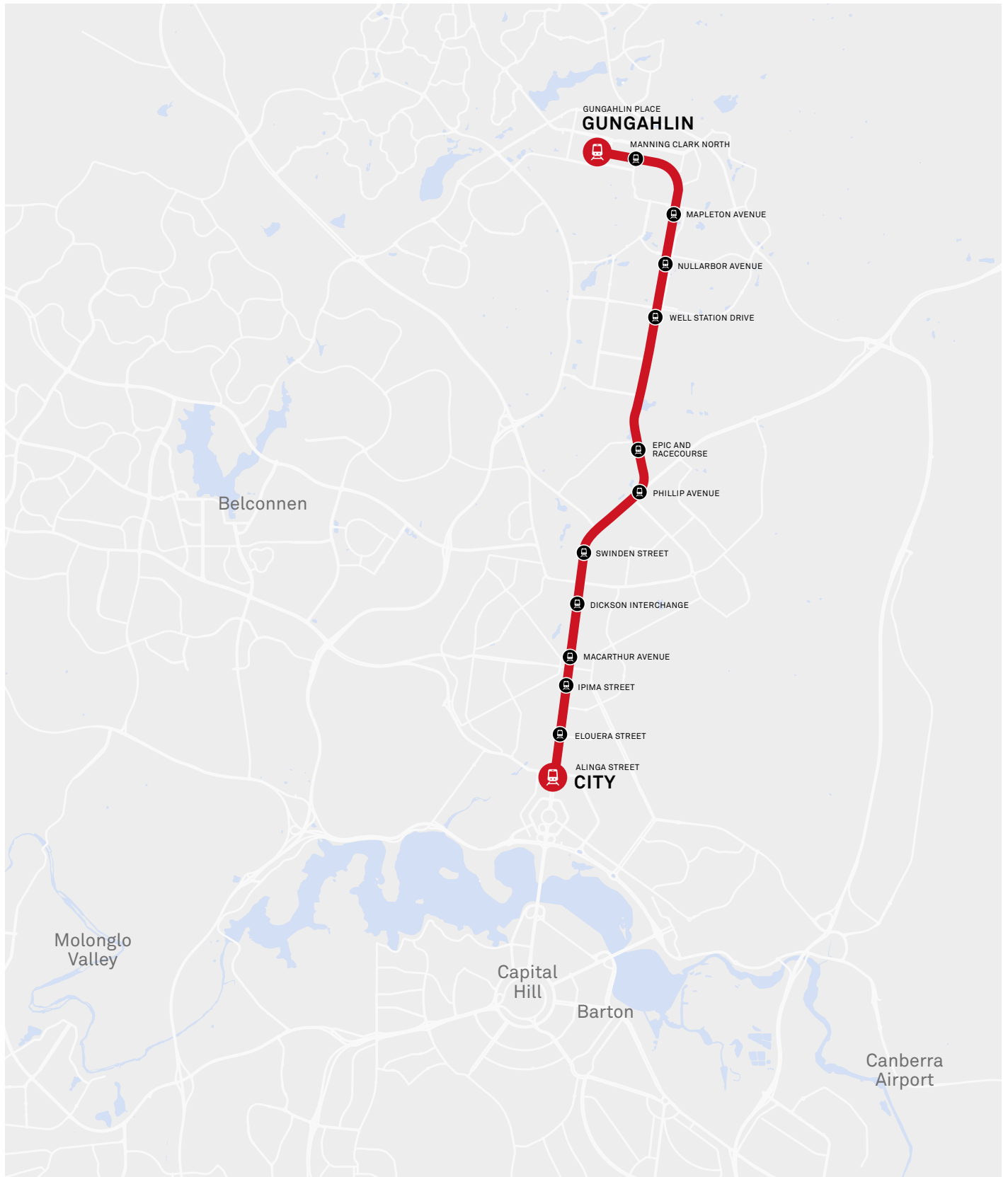
- Delivery: including the design, construction, commissioning and completion of the system from Gungahlin to the City; and
- Operations: including the operation and maintenance of that light rail system over a 20-year period.

As at 20 April 2019, the light rail system had commenced passenger operations with the following project elements having been delivered by Canberra Metro:

- 24 kilometres of light rail track over a 12km alignment
- 13 stops
- 14 light rail vehicles (LRVs)
  - Each LRV is 33 metres long and can carry over 207 passengers
  - Seating capacity of 66 passengers
  - Each LRV is equipped with heating and air-conditioning systems, two priority seats, two dedicated spaces for wheelchairs and four bike racks
  - The LRVs are fully accessible with low floors (no steps throughout)
- 442 CCTV cameras
- 276 Passenger Information Displays
- 166 Help Points
- A maintenance depot / Operations Control Centre (OCC) that is manned around the clock 365 days of the year

Figure 1 shows the operational route and Table 5 specifies the physical characteristics which makes the whole operation work.

**FIGURE 1** Route for the Capital Metro between Gungahlin Place and Alinga Street



**TABLE 5** Summary of Key Physical Characteristics

Feature	Description
Route	The light rail commences at the City, just north of Alinga Street on Northbourne Avenue and extends north along Northbourne Avenue and Flemington Rd to terminate at Hibberson Street, Gungahlin.
Route alignment	The light rail follows a median alignment for much of its length with a verge alignment from approximately Sandford St Mitchell to the Federal Highway.
Track	Standard gauge, double track at grade.
Termini and stops	Termini are situated at Hibberson Street east of Gungahlin Place, Gungahlin and on Northbourne Avenue north of Alinga Street, City. The route includes 11 intermediate stops at: <ul style="list-style-type: none"> <li>• Elouera Street</li> <li>• Ipima Street</li> <li>• Macarthur Avenue</li> <li>• Dickson Interchange</li> <li>• Swinden Street</li> <li>• Phillip Avenue</li> <li>• EPIC and Racecourse</li> <li>• Well Station Drive</li> <li>• Nullarbor Avenue</li> <li>• Mapleton Avenue</li> <li>• Manning Clark Crescent</li> </ul>
Power transmission and supply	Five traction power substations have been installed along the alignment. The traction system (as will be the case for all systems and infrastructure) has been designed to meet required reliability and availability performance criteria.
Depot	A depot for LRV stabling, maintenance and housing of the control centre located in Mitchell.
Signalling	Traffic signalling is used to manage potential conflicts between light rail vehicles and road vehicles at intersections with the light rail system designed around signal priority.
Communications and wayfinding systems	Passenger Information Display Systems with visual and audible service is presented at each stop and within light rail vehicles. The ICT and Customer Information Systems play a vital role in meeting customers' service expectations. The light rail system has been integrated with the Territory's public transport ticketing system.
Customer Service Officers (CSO)	Customer Service Officers (CSO) are available on the network every hour of service.

## 5. Benefits Realisation

### 5.1 Measuring Benefits

In accordance with the 2014 Project Business Case, the Project's benefits are divided into three broad categories: Improved Transport Network, Land Use and Wider Economic Impacts. Due to the long-term nature of investment in infrastructure of this size, benefits are measured over many years and decades.

Benefits realisation will be enhanced through an active approach to benefits management.

To this end, the ACT Government has identified key indicators to measure and track the realisation of benefits outlined in the original business case. Table 6 below indicates that, with respect to the benefits outlined in the Project Business Case, the project is generally on track to realise its stated benefits.

**TABLE 6** Project Benefits

Project Benefit	Description	Actual vs expected	Commentary
Public transport use	Increase the mode share of public transport and increase the use of public transport for trips to work and at other times.	On track	A Gungahlin to the City journey time of around 24 minutes will support realisation of the forecast increase in use of public transport. Patronage will be monitored on a regular basis. Initial patronage figures have exceeded estimates.
Road traffic congestion	Reduce road traffic congestion and associated costs, particularly on and adjacent to the light rail corridor.	Modelling not yet available	This benefit is expected to flow from increased use of public transport
Carbon emissions	Reduce per-capita carbon and other emissions.	Modelling not yet available	This benefit is expected to flow from increased use of public transport.
Customer experience	Improve customer experience for locals and visitors.	Survey not yet undertaken	Transport Canberra continues to invest in wayfinding, better passenger information systems, integrated ticketing and complementary infrastructure to help the customer access, use and understand the network and enhance their overall experience. The light rail stops, interchanges and on-board facilities have been designed to optimise customer outcomes.
Accessibility	Improve accessibility to services, business, places of employment, recreation, entertainment cultural or social significance for the people of Canberra	On track	Light rail connects the fastest growing population area with the fastest growing jobs precinct in the city. It also connects to our major events and celebrations hub in the city.
Active travel	Support uptake of active travel including cycling and walking.	Not yet available	All light rail stops are connected to the broader active travel network and all LRVs have the ability for passengers to board with bicycles to promote active travel and public transport mixed-mode journeys.



Project Benefit	Description	Actual vs expected	Commentary
Urban densification	Stimulate residential development and re-development along the light rail corridor generating higher population density.	On track	Redevelopment is underway along the corridor – with a strong focus on the Northbourne Ave section
Public housing renewal	Improve outcomes for public housing tenants and support the renewal of Canberra's urban areas.	On track	The Public Housing Renewal Program is on track to complete the replacement of 1288 public houses and the replacement of these properties from the light rail corridor with more modern, comfortable and energy efficient homes.
Business and commercial growth	Grow a more diversified Canberra economy through increased business/commercial floor space along the light rail corridor.	On track	Redevelopment of the corridor, particularly Northbourne Avenue, is attracting new business/commercial operations such as the Mantra Hotel at 'Mid Town' and the new ACT Government office and mixed-use development at the Dickson interchange.
Efficient public infrastructure and services	Deliver more efficient public infrastructure and services through higher population densities along the light rail corridor.	On track	Redevelopment of the corridor is incorporating upgrade and optimisation of public infrastructure
Development pressure	Relieve pressure on greenfield development in the ACT and protect conservation values through increased development and population density along the light rail corridor.	On track	Development and sales programs in the corridor are helping meet demand from property buyers and enabling population growth in Canberra without increasing demand for greenfield sites
Property values	Contribute to increasing property values within the light rail corridor.	On track	Industry professionals are on the public record stating that property values in the corridor are already benefiting from the project investment.  From 2014-2018, average house prices increased by 17% across the whole of the ACT but were higher in the regions incorporating the light rail corridor – 39% in the Inner North and 27% in Gungahlin over the same period.
City entrance	Contribute to the enhancement of Northbourne Avenue as a grand entrance to the city of Canberra in alignment with the historic Griffin vision for the corridor	On track	The use of a Design Review Panel and close collaboration through the NCA works approval resulted in an enhanced quality design. All 'hard' elements (such as poles, stations and paved surfaces) have been constructed according to the approved design. The landscape has been planted according to the design but will require close care until fully established.

Project Benefit	Description	Actual vs expected	Commentary
Public realm	Contribute to the enhancement of the urban design and public realm, particularly in the Civic Plaza precinct.	On track	The design and construction of Northbourne Plaza (between the Sydney and Melbourne Buildings) was undertaken as an enhancement to the project scope. This has also been managed within the overall project budget.
Asset recycling	Maximise to the Territory the benefit of the Commonwealth Asset Recycling Initiative.	Achieved	The Territory reached the maximum / capped bonus under the ARI.
Employment, direct	Create jobs through both construction and operational phases.	Mostly Achieved	During the delivery phase over 4,750 workers were inducted to the worksite. 33 additional undergraduate roles filled. 75% of all jobs were "Local Sustainable Jobs". Target of 70% met. 30% Diversity and Equity representation. Target of 10% met The delivery phase apprenticeship and traineeship target was not met, in part due to the specific nature of the work required, with 17 apprentice and 1 trainee positions filled.
Employment through economic growth	Create jobs through the economic growth and development stimulated by light rail	Modelling not yet available	Linked to overall population growth in the corridor

## 5.2 Accelerating Urban Renewal

The City to Gungahlin Light Rail business case highlighted the Project's potential to drive land use change, particularly along Northbourne Avenue.

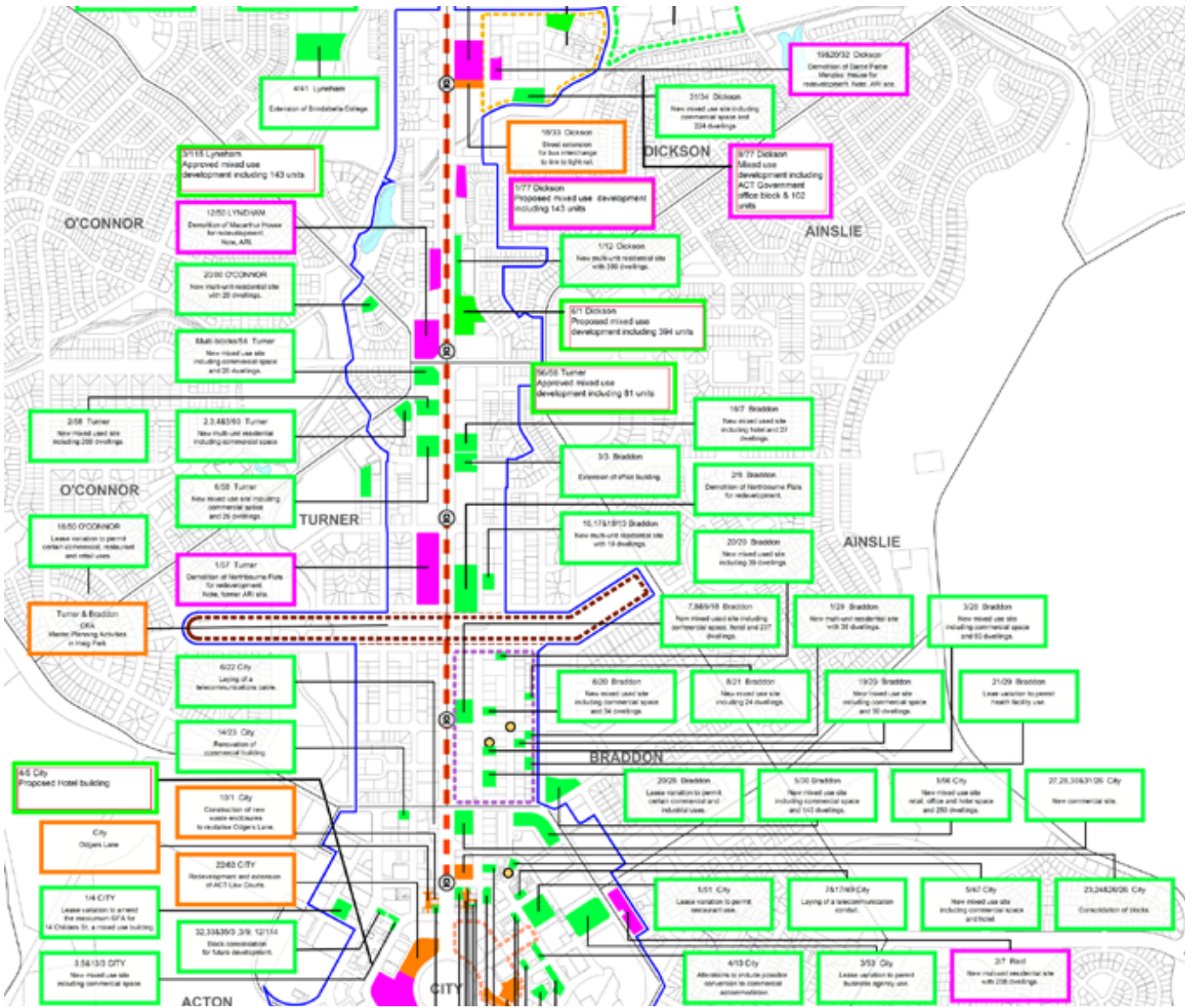
The renewal of Northbourne Avenue is now well-underway and is generally exceeding expectations.

The map at Figure 2 shows the sites where significant urban renewal has commenced, and in some cases been completed, since 2016.

The conversion of a disused office building into the Mantra Hotel at the intersection of Wakefield Avenue and Northbourne Avenue was one of the earliest private investments stimulated by light rail. In 2016, the developers of that project said, "*The light rail was one of the keys in our decision-making to purchase the site and then to grow Midtown into what it's going to become' and 'If the light rail wasn't planned it would be a vastly different development than what we're putting in now.*"

From November 2016 to March 2019, the value of development approvals granted along Northbourne Avenue exceeded \$394m.

FIGURE 2 Development Applications along the corridor – Source: ACT Government, 2019



**LEGEND**

- Government Works
- Private
- Land Release
- B LRT Route/Stop - Stage 1 Construction
- Micro Parks
- CRA Boundary

## 5.3 Estimated Impact on Benefit-Cost Ratio (BCR)

The original business case forecast a Benefit Cost Ratio (BCR) of 1.2. The main factors that will influence the actual ratio are:

- **Final / Actual costs** – the final financial costs total being lower than the business case assumption will increase the BCR if all other factors remain steady;
- **Final benefits** – the likelihood that all forecast benefits will be materially realised, with some at higher than forecast levels, will increase the BCR if all other factors remain steady; and
- **Timing of benefit realisation** – if some benefits are realised earlier than forecast and this is not offset by delays in other benefit realisation, the BCR will increase with all other factors steady.

While it is not possible to comprehensively re-value the project's benefits at this early stage, it is possible to demonstrate the impact of delivering the project at a cost lower than forecast and the impact of benefits being realised to a higher level and sooner than forecast.

As outlined below in Chapter 7, the final capital cost of the Project is \$675m. This is considerably lower than the business case estimate of \$783m. The net present value of future operating expenses remains consistent with the business case estimate.

Simply taking account of this improved cost outcome, while holding all other factors fixed, the benefit cost ratio would rise from 1.2 to 1.3.

Early indications are that some project benefits, such as urban renewal and job creation along the corridor, may be being realised faster than assumed in the original business case. Key examples of this are the completion of several new apartment buildings, the sale of government properties along Northbourne Avenue and the opening of the new Mantra Hotel 'Mid Town' at the intersection of Northbourne Avenue and Wakefield Avenue.

For comparison purposes, the impact of higher and earlier benefits realisation can be demonstrated by increasing the assumed value of the benefits by 10% or 20% which would result in a BCR of 1.4 and 1.5 respectively.

The tables below set out the impact of each of these on the benefit cost ratio (calculated at the central 7% discount rate consistent with the original business case).

**TABLE 7** Change in BCR from Business case to Commencement of Operations

Benefit Cost Ratio (Base Case - 7% discount rate)	Original Business Case Benefits
Original Business Case: Capital Costs + Operating Costs	1.2
Actual Capital Costs + Updated Forecast Operating Costs	1.3

## 6. Design Quality & Scope Evolution

The ACT Government has a clear vision that the city of Canberra will succeed by design – with integrated strategy, design, delivery and leadership in our built environment. Achieving this ambition requires sound design governance and a commitment to pursuing objectively better design outcomes. The Project has presented an opportunity to demonstrate that good design can markedly improve project outcomes whilst remaining within the total budget for the project.

Key mechanisms used to pursue high quality design outcomes on the light rail project included:

- The commitment of Canberra Metro and its design advisors to ensuring quality design outcomes;
- Establishment of a Design Advisory Panel (DAP) early in the project to provide high level independent expert advice and expertise on urban design, architecture, landscape and public art.
- Recruitment of an in-house Urban Design Manager to oversee the design, development and implementation/ construction of all public realm elements including architecture, landscape, urban design, public art, wayfinding and signage.
- Ensuring the contract allowed for the involvement of Design Working Groups and stakeholders from a broad range of perspectives to help improve the design development.

The commitment to high quality design resulted in improvements to the urban design and engineering quality of the completed project. At key decision-points, it provided Canberra Metro and the project team with a framework that encouraged and enabled them to decide in favour of the higher-quality outcome as set out below.

### 6.1 Urban Design Improvements

Canberra Metro was responsible for the design of all aspects of the project. The formal design quality of light rail stops benefited from the advice of the Design Advisory Panel and working through the ACT's Environment Planning and Sustainable Development Directorate (EPSD) and National Capital Authority (NCA) development approval processes. The images below contrast the design developed for business case purposes with the final approved design.

**IMAGE 1** Typical Light Rail Stop – Light Rail Business Case



**IMAGE 2** Alinga Street – final design



The landscape and surrounding infrastructure also received careful design consideration and review.

The palette of materials and colours draws inspiration from some of the most significant places in the National Capital. The paving complements other new and refurbished parts of the city centre, unifying the look and feel of new infrastructure with the best existing parts of our city. The colour and finish of the new street lights and light rail power poles along Northbourne Avenue is called ‘eternity bronze pearl’ and is similar to that used on other significant roadways such as Anzac Parade.

Some of the specific elements of improved design at light rails stops includes changing from a single plane skillion roof to a cantilevered-end roof that extends better weather protection while maintaining a sense of welcome and safety.

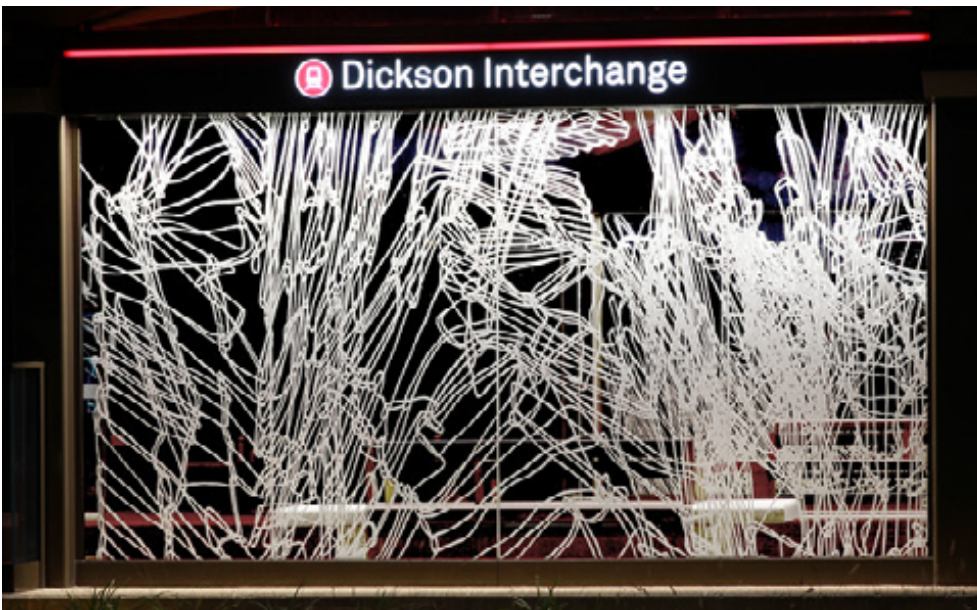
**IMAGE 3** Final cantilevered-end design



The Territory and Canberra Metro also embraced a commitment to public art – ensuring it would be integrated into the design.

Working closely together the Territory and Canberra Metro jointly developed a curatorial theme, identified a shortlist and selected the Artist. The artist, Hannah Quinlivan, collaborated with the Design Team to develop her response. The final work is a monumental drawing that draws on the artist’s “observations of the urban rhythms surrounding the Gungahlin to City Light Rail to create a public artwork effectively extending the entire length of the route. The unique composition at each Station creates a series of visually connected drawings. Printed onto glass in crisp white ink, the linework casts dappled patterns onto the ground and adjacent surfaces reflecting changes in light and shade. The shadow play echoes the dynamic nature of travel and registers the ebb and flow of people and place”.

**IMAGE 4** Dickson Interchange artwork



One of the most significant urban design improvements undertaken beyond the core needs of the light rail project is the upgrade of Northbourne Plaza between the Sydney and Melbourne Buildings in the city. These works, delivered by Complex Civil, extend the public domain from under the covered walkways and arches of our city’s most significant buildings, out towards Northbourne Avenue, creating new places for people to gather, to eat and to enjoy our city centre. These improvements won the Civil Contractors Federation Earth Award for excellence in civil infrastructure.

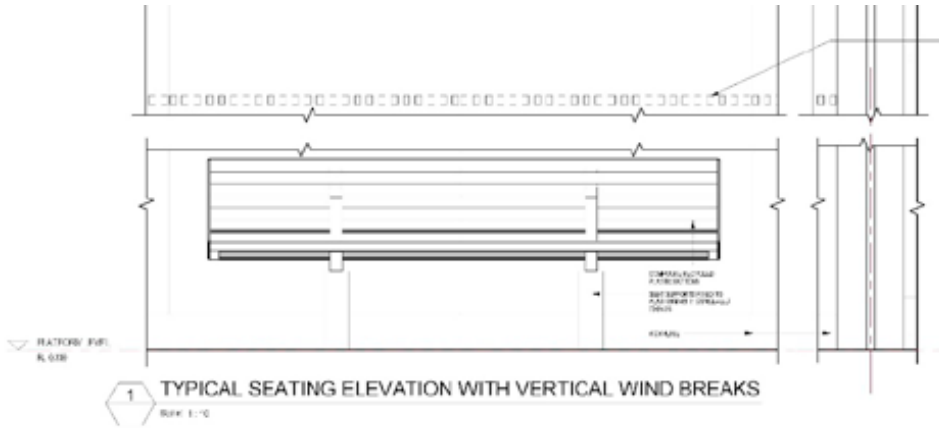
**IMAGE 5** Northbourne Plaza



The design approach also placed a great emphasis on the human experience of using light rail. Canberra Metro and the Territory used formal 'customer experience' and 'human factor' assessment processes to optimise many elements of the design – ranging from seat fabric (more comfortable), seating at stops (higher quality seating and places for a passenger's bag) and hand grips within the light rail vehicles (placed at the best heights and angles to promote ease of use and passenger comfort).

Concept design included standard looking seats with recycled plastic slats.

**IMAGE 6** Seat – during design



Final design includes platform seating made from timber, bronze and polished concrete with a place to rest a bag.

**IMAGE 7** Seat – final design





The customer experience reviews involved the members of the Design Working Groups and key stakeholders from across our community such as disability advocates, community organisation representatives and technical specialists who focus on the perspectives and needs of specific user groups such as children and older persons.

All the above improvements took the design of individual elements from merely satisfying minimum technical requirements to delivering a high-quality bespoke outcome. Across the project these individual decisions to pursue a higher design standard have culminated in a world class urban infrastructure outcome that celebrates our city, history and community and is befitting of Canberra's role as the nation's capital.

## 6.2 Engineering Improvements

The commitment to seek higher standards while managing financial impacts was also evident through the Project's engineering design process.

Within the final capital cost, the project was also able to deliver the following additional works:

- Future proofing storm water infrastructure under Northbourne Avenue to the south of Morphett Street;
- Installation of dynamic lighting at key stops – allowing discrete but tangible colour effects through a programmable and variable lighting system;
- Realigning intersection design to improve efficient movement for road vehicles at the Phillip Avenue and Swinden Street intersections; and
- Additional works to improve pedestrian path network connections at EPIC – ensuring connectivity from the gates of EPIC to the light rail stop.

## 7. Budget

The Project's design and construction cost to the Territory was approximately \$675 million. This is approximately \$108 million under the \$783 million design and construction cost estimated in the Project's approved business case (including contingency), and approximately \$32 million less than the Project's anticipated \$707 million design and construction cost at contract signing.

### 7.1 Starting Financial Position

The Project is being delivered and operated as an Availability Public-Private Partnership ("PPP"). Under this contract model, the construction costs to the Territory are not paid as a single lump sum once construction is complete. Instead, the Territory's construction costs are effectively paid in two ways:

1. A portion of the availability payments paid over the 20 year operating term, together with the 'Territory Contribution' paid at the end of the construction phase, go to reimbursing Canberra Metro for the Project's construction costs; and
2. The construction-phase contingency held by the Territory is paid during the delivery phase as and when required for certain construction-related costs to be borne by the Territory.

Under the Project's approved business case of 2014, the Project's design and construction costs were estimated to be \$783 million (inclusive of a \$117 million contingency)<sup>3</sup>.

The Project Agreement between the ACT Government and Canberra Metro was executed on 17 May 2016. At that time the Project's anticipated design and construction costs were \$707 million. Table 8 summarises the contracted breakdown of this figure:

**TABLE 8** Costs at Contract and Financial Close

Component	Anticipated Cost at Contract Signing (\$m)
Base Design and Construction Costs*	589
Contingency	117
<b>Total</b>	<b>707</b>

\* used in the calculation of availability payments.

<sup>3</sup> As set out in the business case, this figure is exclusive of agency and independent certifier costs. Design and construction costs stated throughout this document are presented on the same basis to enable a like-for-like comparison with the original business case.

## 7.2 Actual Financial Position

The Project's actual design and construction costs to the Territory were approximately \$675 million. This is approximately \$108 million under the design and construction cost estimated in the Project's approved business case (which was \$783 million), and approximately \$32 million less than the Project's anticipated design and construction cost at contract signing (which was \$707 million). This is summarised as follows:

**TABLE 9 Actual Cost Outcomes**

Component	Business Case Estimated Cost (\$m)	Anticipated Cost at Contract Signing (\$m)	Actual Cost
Base Design and Construction Costs to the Territory*	610	589	589
Contingency	173	117	85
<b>TOTAL</b>	<b>783</b>	<b>707</b>	<b>675</b>
Difference to Actual Cost:	(108)	(32)	

\* used in the calculation of availability payments, and exclusive of agency and independent certifier costs.

'Base' design and construction costs attributable to the Territory did not change from the time of contract signing in May 2016. This amounts to \$589 million.

The Territory held a construction-phase contingency of \$117 million for two categories of Project costs:

1. To pay for risks which would be realised during the Project's construction phase (typically administered through claims made by Canberra Metro); and
2. To pay for any modifications to the Project's scope.

Actual contingency usage was approximately \$85 million, or approximately \$32 million less than budgeted at contract close<sup>^</sup>. This amount is indicatively apportioned as follows:

**TABLE 10 Contingency Usage**

Component	Approximate Contingency Usage (\$m)
Payments to Canberra Metro in Settlement of Construction Claims (April 2019)	76.1
Modifications Paid to Canberra Metro (April 2019)	3.9
Modifications Paid to Canberra Metro (Pre - April 2019)	1.1
Modifications – 3rd Party	4.0
<b>TOTAL</b>	<b>85.1</b>
Difference to Budgeted Contingency:	(32)

[<sup>^</sup> This amount may be subject to minor adjustments as final costs and reductions are realised in the period to 'Final Completion,' as discussed below]

## 7.3 Settlement of Construction Claims

Major infrastructure projects involve elements of uncertainty. At the outset of the Project, it was recognised that various risks would be realised with an associated cost to the Territory. Key Project risks are discussed in Chapter 12, but included risks associated with the unexpected discovery of utility services, planning risks, weather, unexpected site conditions, interface risks and other risks.

Although it was recognised that risks would be realised, and as with any other major infrastructure project, it was not possible to specifically identify at the outset of the Project the exact nature, timing or value of risks that would actually occur. Consequently, the Territory held a construction-phase contingency of \$117 million against all risks.

The Project's contract contains mechanisms for the ACT Government to compensate Canberra Metro for certain risks arising in the Project. Generally, those mechanisms involve Canberra Metro making a claim to the Territory when risk events arise.

Various claims were made by Canberra Metro through the course of the Project's construction phase relating to the realisation of Project risks. Those claims then became the subject of discussions between Canberra Metro and the Territory. Those discussions culminated in the finalisation of all outstanding claims in April 2019. As a guide, the Territory internally apportioned the total payment to Canberra Metro against risks (and associated claims) as follows:

**TABLE 11 Construction Claim Payments**

Claims	Indicative Apportionment
Additional costs and time for delay associated with relocation of utilities	\$20,451,232
Stops – additional costs associated with the increased scope of works for an enhanced Stops design related to planning processes	\$6,157,078
Drainage – additional costs and time to design and carry out the additional drainage works to futureproof the stormwater assets	\$7,470,278
Design review – additional unanticipated costs associated with the design development process	\$3,606,366
Change to public holiday date from after the Date for Services Completion to before the Date for Services Completion	\$0
Unanticipated additional resourcing incurred by Canberra Metro as a result of risk events occurring	\$21,760,456
Other additional requirements imposed through planning approval process: <ul style="list-style-type: none"> <li>- gas main realignment</li> <li>- enhancements to back of stops</li> <li>- painting of brackets on OLE</li> <li>- light fitting glare solution</li> <li>- P1 pylon prototype</li> </ul>	\$1,628,163
Additional scope associated with Project risks: <ul style="list-style-type: none"> <li>- Utility augmentation issues</li> <li>- Contamination issues</li> <li>- Feeder pillar installation</li> <li>- Additional painting</li> <li>- WiFi brackets and Boxes</li> <li>- Traffic signal pole caps</li> <li>- Central Control System Enhancements</li> <li>- Innovative Design additional resources</li> <li>- Morphett Street cyclist signalisation</li> </ul>	\$1,927,014

Claims	Indicative Apportionment
<b>Sub Total</b>	<b>\$63,000,587</b>
Other Avoided Costs (including legal, technical experts and agency costs of defending various claims arising from risk events that arose on the project)	\$13,050,877
<b>Total Value of Claims at Settlement (April 2019)</b>	<b>\$76,051,464</b>

## 7.4 Modification Payments

A comparatively modest number of modifications to the Project's scope were agreed through the course of the construction phase. Those modifications had positive, negative and nil costs to the Territory. The finalisation of commercial arrangements for the majority of the modifications occurred as part of the broader finalisation of outstanding claims in April 2019. As a guide, the Territory internally apportioned the total payment to Canberra Metro against scope modifications as follows:

**TABLE 12** Modification Payments

Modifications	Apportionment
Rationalisation of entrance to Yowani	\$477,520
Integration of LDA Works on Flemington Road	\$240,763
Relocation of Traction Power Station No.4	\$51,477
Rationalisation of mid-block crossings	\$(219,180)
Change to the scope of CM's works on Kate Crace Street to accommodate City Services works	\$(339,638)
Changes in relation to flow width drainage requirements	\$(30,000)
Undertaking of monthly drone fly-overs to generate time-lapse photography.	\$29,750
Change to street lighting pit requirements.	\$(40,000)
Inclusion of fire suppression in the LRV's.	\$528,290
Change to the proposed street furniture within the Light Rail corridor	\$1,055,000
Enhancements to the Stops design	\$3,897,180
Changes to rationalise the Bifurcation Pits Design	\$(1,075,000)
Change to the requirements around retaining walls	\$(40,000)
Procurement of the IP rights for the relevant artwork from Uncle Jimmy	\$5,000
Change for a new shared path facility between EPIC Stop and proposed EPIC signalised intersection along the western alignment	\$700,000
Change associated with the National Safety Regulators (ONRSR) fee structure	\$151,200
Changes to the Innovative Design - Alinga Street Stop Design	\$845,521
Changes to the Innovative Design - Dynamic Lighting work	\$416,341
Changes to the Innovative Design - Northbourne Plaza works	\$1,705,165

Modifications	Apportionment
Changes to the proposed street furniture within the verge south to Antill Street	\$66,767
Additional graphic visualisations provided during the project	\$12,000
Additional O&M costs associated with the additional smoke detection system to the LRV's	\$91,800
Media services to record the arrival and transport of the first LRV from port of arrival to the Depot in Canberra	\$41,785
Changes to the Innovative Design works for Northbourne Plaza Median	\$1,970,000
Additional cross drainage infrastructure works at CH51110	\$126,463
Removal of the Innovative Design Area - Northbourne Plaza verge works	\$(6,010,170)
Changes to the Hibberson St lighting	\$319,132
Changes to some graphic signage icons as a result of the finalisation of the TCCS signage strategy	\$64,917
Licence fee payment	\$6,250
<b>Total – All Modifications Payable to Canberra Metro</b>	<b>\$5,048,333</b>
Note: Modifications payable to Canberra Metro comprise:	
• Modification Amounts Paid to Canberra Metro Prior to April 2019	\$1,099,797
• Modification Amounts Payable to Canberra Metro April 2019	\$3,948,536
<b>Total:</b>	<b>\$5,048,333</b>
Modification Payable to 3rd Party for Northbourne Plaza Works (approx.)	\$4,000,000
<b>Total – All Modifications</b>	<b>\$9,048,333</b>

The following Table 13 outlines modifications agreed to through the course of construction with no financial impact.

**TABLE 13 Modifications with no financial impact**

Modifications
Rationalisation of Equestrian Crossing
Relocation of Traction Power Station No.1
Rescoping of SIDRA Analysis
Change in Project Plan reviews
Inclusion of IC nomenclature for “comments” and “conditions” for design reviews.
Postponed access to Coranderrk Compound
Clarification of review periods
Changed for accessing Flemington Road and Manning Clarke intersection
Change to Public Realm design scales from 1:100 to 1:250
Amend layout of Condamine Street intersection.
Verge reconfiguration and combined services route (CSR) at Flemington Road

## Modifications

Removal of auto-tensioned contact wire provision

Modernisation of LRV driver's desk

Amend planned verge planting species

Amended specification review periods.

Change in location of pedestrian crossing on Hibberson Street

Amended requirement of auto-tensioning system for the contact wire

Change to enable IC to provide either of partial or full certificate on rejected design packages

Change to communications channel for time sync and for CCS commands to LRV PIDS

Changes to Safety Assurance Reporting

Minor modification to vertical platform alignment

Amendment of City driver facility for City to Woden provision

HVAC SPR requirements on LRV

Intersection modification Northbourne Ave, Swinden St & Yowani Intersection

Removal of PID's at Intersection stops

Stage 3 design documentation for temporary works

Works Approval Fees

Additional O&M works for Innovative Design Modifications.

Additional O&M works for Stops Design Modifications.

Amended passenger count systems

Removal of need for stops prototype

Relocation of feeder pillars

FAT's to be complete prior to LRV shipment

Reduction in bicycle racks

On board LRV changes, door closing, CCTV driver display and relocation of fire extinguishers.

Improvements to alarm systems for TPS and Traction Power Reticulation System functionality

Changes to the road traffic signal controller SPR

Change to permit an interim certificate to be issued by the IC

Change the recording requirements for social media comments

Changes to all platform TGS

The total construction-phase contingency usage may be subject to minor adjustments, up or down, in the period to 'Final Completion.' In this respect:

1. As noted above, in April 2019 the ACT Government and Canberra Metro reached a commercial agreement on matters relating to outstanding risk claims and modifications. Costs associated with resolution of these matters are within the ACT Government's Project budget. The amount payable to Canberra Metro in this respect is \$80 million (this is equivalent to the \$76.1 million for risk claims finalisation and \$3.9 million for modifications finalisation as listed above). That amount is payable in three instalments - \$40 million paid upon agreement, \$20 million following operations commencement and \$20 million in 2019-20 at 'Final Completion.' The final instalment may be reduced if 'Final Completion', (that is the date when all remaining works to be completed have been completed), occurs later than expected; and
2. There may be a need for additional minor contingency usage in relation to other costs in the period to 'Final Completion.'

All figures in this paper are stated ex-GST.

## 7.5 Availability Payments and Territory Contribution

- The Territory paid for project scope modifications and settled claims by making payment from the Territory-held contingency in April 2019, rather than by increasing the availability payments to be made to Canberra Metro over time (which would have attracted associated financing and other costs). As a consequence, the timing and quantum of anticipated availability payments has not changed since the Contract Summary of June 2016, with the exception of:
- The availability payments to be made in the 2018-19 financial year. Under the Project Agreement, the date for operations commencement was 1 September 2018. Operational commencement occurred in April 2019. Under the terms of the settlement of outstanding claims reached with Canberra Metro, Canberra Metro was not granted an extension to the 20-year operating and maintenance period. Consequently, Canberra Metro has foregone approximately \$21.9 million of availability payments in the 2018-19 financial year.

Under the terms of the settlement of outstanding claims reached with Canberra Metro, a \$245,000 per annum amount, indexed, is to be paid to Canberra Metro associated with increased operations and maintenance costs relating to items listed in the tables above.

The project's availability payment profile (annualised) is as follows (\$million, nominal):

**TABLE 14** Availability Payments

Financial Year Ended 30 June	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Availability Payments (\$'000s)	14,400	54,520	54,976	56,104	57,081	59,518	59,600	63,261	60,536	62,177	63,267
Financial Year Ended 30 June	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Availability Payments (\$'000s)	64,578	67,355	67,634	78,879	69,326	70,827	71,743	73,712	76,275	13,340	-



The project's availability payment profile may change over time for reasons which include:

- The Territory 'abating' payments for Canberra Metro's failure to meet service quality and on time;
- running standards;
- The occurrence of Territory-retained risk events which are financed through the availability payment regime; and
- Periodic debt refinancing throughout the term of the contract.

Under the terms of the Project Agreement with Canberra Metro, a Territory Contribution of \$375 million was to be made upon light rail services commencing. That amount was paid in April 2019.

## 7.6 Net Present Cost

As set out in the June 2016 Contract Summary, the project's net present cost (NPC) was anticipated to be \$939 million (measured as at 1 January 2016). That figure included:

- The NPC of all availability payments to be made by the Territory over the contract's 20 year operating term;
- The NPC of the Territory Contribution to the project; and
- The NPC of the value of the contingency applied to the project by the Territory in respect of Territory-retained risks.

The Net Present Cost of the project<sup>4</sup> is now expected to be \$872 million. This is set out in the table below and takes into account:

- The adjustments to the availability payments noted above;
- The changed timing to the payment of the Territory Contribution; and
- The reduced amount, and changed timing, of contingency usage by the Territory.

**TABLE 15** Net Present Cost

Cost Component	Net Present Cost (\$ million)	
	Territory Payments per 2016 Contract Summary	Net Present Cost (\$ million) Revised for Actual Costs
Availability Payments	520	504
Territory Contribution	305	295
Territory-retained Risk Contingency	114	73
<b>Net Present Cost (7.52% discount rate)*</b>	<b>939</b>	<b>872</b>

\* Note 1: Refer to the Australian Government National Public Private Partnership Guidelines, Volume 5, for discount rate methodology

4 As at the same measurement date of 1 January 2016, and on a like for like basis excluding agency and independent certifier costs incurred by the Territory.

## 8. Program

The following comparison shows how the program evolved as the project moved from business case to tendering to delivery phases. The Project was ultimately delivered within the timeframe originally envisaged in the Project's business case.

**TABLE 16** Program overview

Milestones	Actual	Contract Summary	Business Case
Business case submission date and funding amount requested	September 2014		
Invitation for Expression of Interest	October 2014		Q4 2014 – Q1 2015
Announcement of shortlisted bidders	March 2015		
Release of Request for Proposal (RFP)	April 2015		Q2 2015 – Q4 2015
Request for Proposal (RFP) successful tenderer announced	Feb 2016		
Contract close	17 May 2016	May 2016	Q1 – Q2 2016
Financial close	24 May 2016	May 2016	Q1 – Q2 2016
Commencement of design and construction	25 May 2016	May 2016	H1 2016
Canberra Metro proposed operations commencement	April 2019	September 2018*	
Commencement of passenger operations	20 April 2019	Early 2019	2019
End of project term	August 2038	2039	2039

\* As proposed by Canberra Metro.

The Project Agreement contains the concept of a “Date for Services Completion” together with a mechanism for adjusting that date to account for actual project conditions. Under the Project Agreement, operational services were to commence in September 2018. During construction Canberra Metro revised its anticipated date for operations commencement, with passenger operations ultimately commencing in April 2019. This actual date was consistent with anticipated dates originally stated in the project's Business Case and Contract Summary.

## 9. Governance Model Assessment

From the outset, the Territory committed to a sound project governance framework by establishing a standalone delivery agency (the Capital Metro Agency) and a project advisory board. The board was commercially minded and had a deep understanding of the ACT Government. It comprised Directors-General from across the ACT Public Service, with an independent member and an independent Chair as its official representative and spokesperson.

In July 2016, Transport Canberra was formed to manage all public transport operations within the Territory by combining its bus and light rail activities. A dedicated Project team remained within Transport Canberra and the Project's advisory board continued its activities.

This governance arrangement, which remained a constant feature of City to Gungahlin Light Rail project, was led by six Project Governance Principles administered in accordance within a broader corporate governance framework of accountability, transparency, integrity, stewardship, efficiency and leadership.

Project Governance Principles:

- Ensure there is a single point of accountability for the success of the project – the Project Owner;
- The Project Owner must be focused on delivering a transport service, not merely an asset;
- Where possible apply the best features of corporate governance to the Project's governance;
- Constructive tension should exist within the structure;
- There must be appropriate separation of project governance from organisational governance structures; and
- There should be proper placement of project decision makers in relation to project stakeholders.

The core responsibility of the Board was to provide advice to the ACT Government in respect of the planning, procurement and delivery of the light rail. Its primary focus was on strategic decision making for the project and wider network, drawing principally on recommendations tabled by the Project Director and project team in its decision making.

Both the Board and Canberra Metro Project Team were enduring throughout the life of the project. The project team has also been subject to close and active oversight from the Deputy-Director General, Transport Canberra and the Director-General, TCCS.

To support the Board and Executive, the following executive committees were also established:<sup>5</sup>

- Project Audit Committee: to oversee the project governance framework on behalf of the Director-General;
- Project Corporate Governance Committee: The Corporate Governance Committee supports the Director-General's ability to implement, maintain and report on corporate governance; and
- Project Risk Management and Change Control Committee: The Risk Management and Change Control Committee supported the Director-General's ability in managing the Project's risk profile, including both Project and Corporate risks.

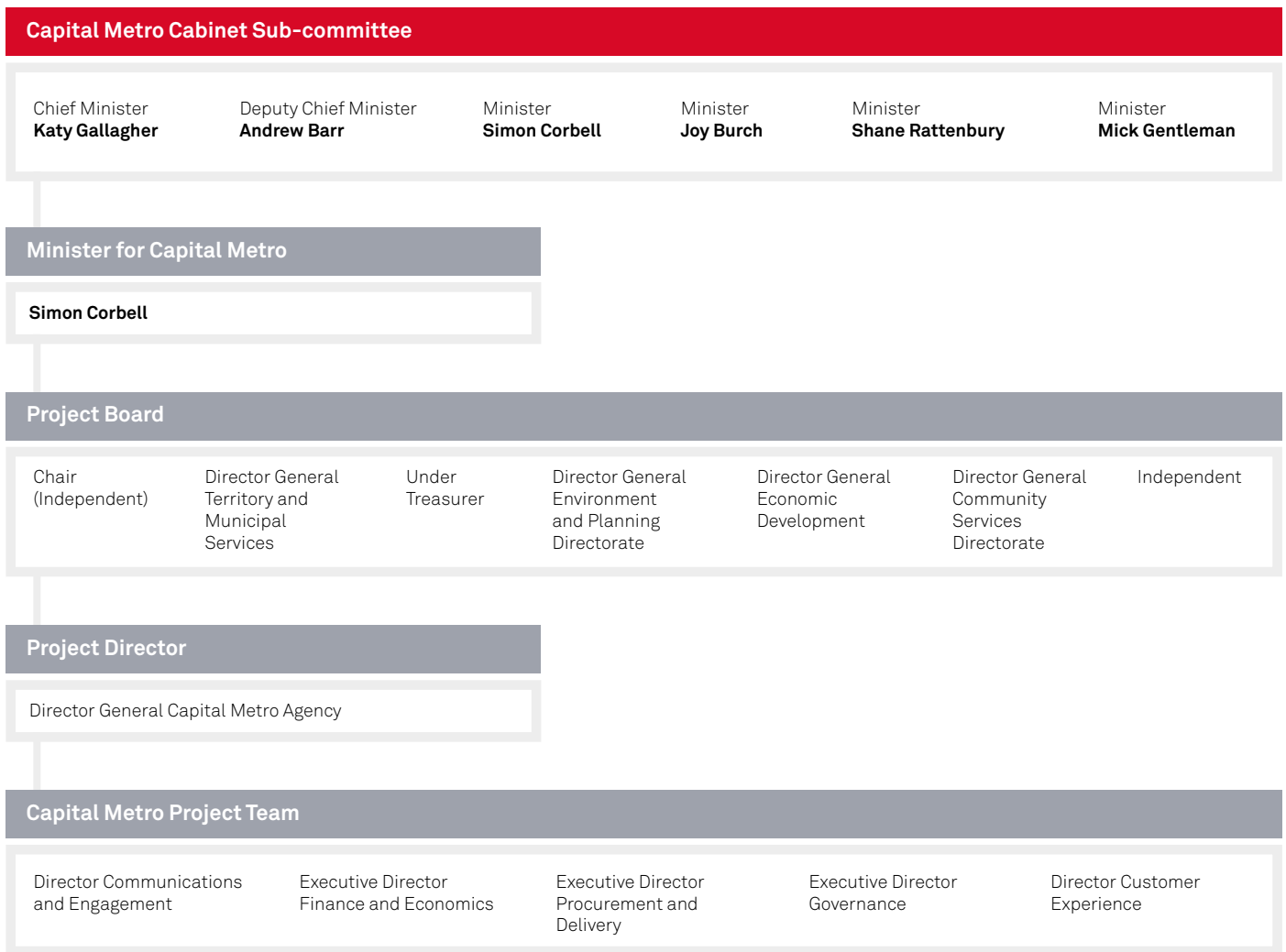
Good governance had the following positive impacts on the Project:

- Clear leadership and direction on the project;
- Timely flows of communication from the Territory directorates and agencies through to Government; and
- Ability for the Territory to make well informed and prompt decisions on key project matters.

5 Governance Framework, page 3

The original governance structure, including minor amendments, is shown in the figure below.

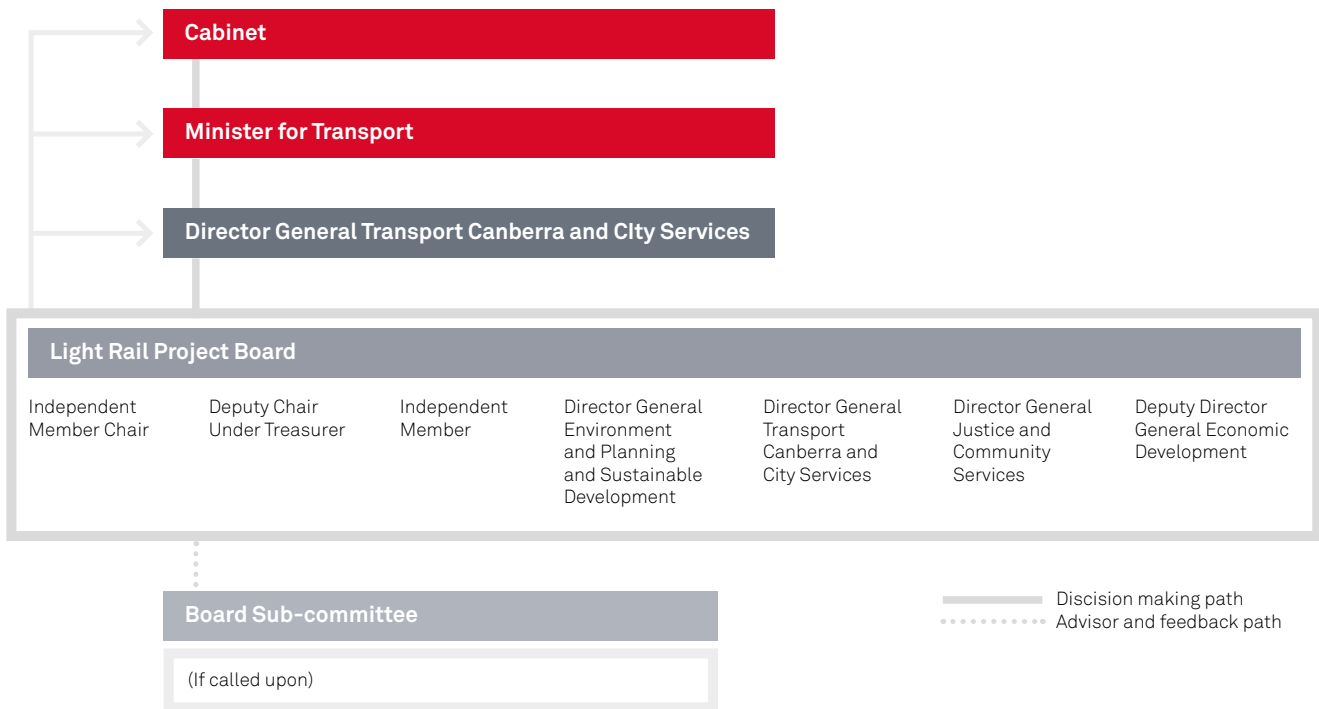
**FIGURE 3** Original Governance Model<sup>6</sup>



6 CM Full Business Case, page 140

The governance structure for the project as at the commencement of light rail operations was as follows:

**FIGURE 4** Light Rail Project Board Governance Structure<sup>7</sup>



The successful delivery of the Project may in part be attributed to its governance arrangements. In particular:

- An independent Chair with deep commercial, project and government experience provided invaluable assistance to Transport Canberra and sound advice to Cabinet;
- The participation of the Under-Treasurer and other Treasury officials throughout the Project ensured ongoing Treasury input into strategic Project decisions;
- An independent Board member with deep design and urban realm experience enhanced Project outcomes;
- The existence of the Project Board enabled recommendations to proceed quickly to Cabinet for decisions. This was vital for the timely progression of the Project;
- A dedicated Project team enabled senior-level focus to be maintained on the successful procurement and delivery of the Project;
- The participation of other Directors-General and senior officials on the advisory Board facilitated the timely progression of other elements of the project, related projects and necessary legislative amendments and the roll-out of safety campaigns; and
- Regular engagement by the Project Board with Canberra Metro’s Board and senior officials of the Canberra Metro consortium.

<sup>7</sup> Light Rail Project Board Charter, page 8

# 10. Delivery Model

## 10.1 Key Parties and Advisers

The Canberra Metro consortium is a consortium consisting of Pacific Partnerships (operator and equity investor), CPB Contractors (builder), John Holland (builder, operator and equity investor), UGL (operations), Mitsubishi Corporation (equity investor), Aberdeen Infrastructure (equity investor), Deutsche Bahn Engineering and Consulting (operations consultant), CAF (light rail vehicle supplier) and Mitsubishi UFJ Financial Group. These consortium members all have national and international experience in delivering infrastructure PPPs.

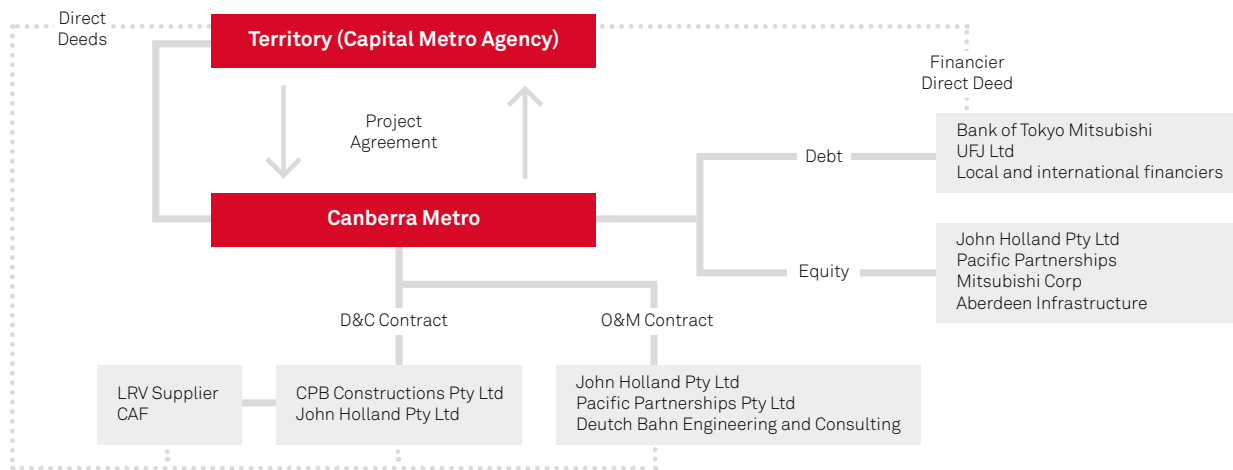
**TABLE 17** Relevant Parties under the contractual arrangements<sup>8</sup>

Entity	Role
Transport Canberra (representing the Australian Capital Territory)	Transport Canberra (formerly CMA) is the Territory Government authority that has responsibility for leading the delivery of the Project on behalf of the Territory
Canberra Metro Pty Limited	In its personal capacity and as trustee for the Capital Metro Trust is the main contracting party with the Territory. Canberra Metro has in turn entered into a range of contractual relationships with its consortium partners to deliver elements of the Project. Canberra Metro was ultimately responsible for project delivery and will, among other things, provide overarching management for the duration of the Project.
John Holland Pty Ltd Pacific Partnerships Mitsubishi Corporation Aberdeen Infrastructure	<b>Equity Providers</b> Committed to provide the equity required for the Project by Canberra Metro
A number of financiers (including Bank of Mitsubishi UFJ Financial Group Ltd and local and international banks)	<b>Debt Financiers</b> Canberra Metro arranged debt funding through a number of financiers
John Holland Pty Ltd and CPB Constructions Pty Ltd	<b>D&amp;C Contractor</b> Canberra Metro engaged them to design, construct and commission the Project
Canberra Metro Operations Pty Ltd, a joint venture between John Holland Pty Ltd and UGL (who joined the consortium after financial close) in association with Deutsche Bahn Engineering and Consulting	<b>O&amp;M Contractor</b> Will operate and maintain the light rail system for the 20 year term
Construcciones y Auxiliar de Ferrocarriles S.A. (CAF)	<b>LRV Supplier</b>
APP Corporation Pty Ltd	<b>Independent Certifier</b> Engaged by TCCS and Canberra Metro to act as the independent reviewer for the Project.

<sup>8</sup> Capital Metro Project Summary, page 12

The figure below illustrates the contractual relationships as at contractual close under the Project Agreement.

**FIGURE 5 Contractual Relationships under Project Agreement<sup>9</sup>**



## 10.2 Delivery Model Assessment

Detailed delivery model analysis undertaken during the business case phase explored a range of potential delivery mechanisms for the project. After a detailed assessment of the various delivery models, a PPP procurement model was identified as the preferred option. This was assessed as the preferred procurement model on the basis that:

- Risk transfer under a PPP approach would allow the Territory to retain an acceptable level of risk on the complex design and construction of the Project, as a brown-field development across 12 kilometres of key Territory infrastructure;
- PPP delivery transfers maintenance and facilities management risk, site risk, asset capability risk and interface risk to the private sector in an integrated manner;
- PPP delivery provides optimal whole-of-life costs as the private sector is responsible for long-term maintenance and facilities management in addition to design and construction, which should drive an optimal whole-of-life outcome; and
- There is sufficient market depth to allow the Territory to achieve a competitive outcome through this model

Through the current stage of the project, it is evident the chosen delivery model has been successful.

Of all delivery model justifications, risk transfer has been particularly relevant to the Project. The Territory's Partnerships Framework emphasises that best value for money is achieved by allocating risks to the party best able to manage them. The Project Agreement was structured with a strong focus on which risks should be:

- Retained by the Territory
- Transferred to the private sector, and/or
- Shared between the parties.

Within the structure of an Availability PPP, the Territory sought a bundled design, construction, operations, maintenance and financing package. In the absence of an incumbent system or operator, the Territory was able to package most project elements and procure the project through a competitive tender process.

The delivery model:

- Allowed the market to identify and attract the best suppliers and avoided the requirement for a large project management office to contract in procurement and contractor integration;
- Generated market interest given the size of the integrated project; and
- Addressed future flexibility and permits future modifications to system arrangements.

<sup>9</sup> Capital Metro Project Summary, page 13

Over the duration of the Project, the selection of this delivery model has allowed the Territory to effectively and efficiently contract Canberra Metro for the following outcomes:

- To coordinate and manage the design and construction of the Project in accordance with the Project Agreement and design requirements so that the assets, when manufactured or constructed, will be fit for their purpose and will comply with contract requirements;
- To ensure the safety of people and property near the Project and minimise obstruction, interference and nuisance during the course of delivery;
- Ensuring liaison with all relevant government agencies and utilities providers to coordinate its activities and ensure the provision and integration of all utility and external infrastructure in the vicinity of the Project;
- Satisfying the requirements of and complying with all key planning approvals, including all conditions and requirements of such key planning approvals;
- Complying with all environmental requirements; the delivery phase program and the delivery phase licence;
- Procurement of necessary debt and equity to fund the delivery of the Project;
- Taking out a range of insurances and ensure that all insurance proceeds received under the contract works policy or the industrial special risks policy be deposited into the Insurance Proceeds Account;
- Undertaking commissioning of the Project in accordance with the requirements of the National Rail Safety legislation; and
- Undertaking the balance of the works required to achieve ‘final completion,’ including finalising works and rectifying any defects.

### 10.3 Project Agreement

The key contract that exists for the project is the Project Agreement between Canberra Metro and the ACT Government. In drafting the Project Agreement, the ACT Government had the benefit of drawing from the contracts of other Australian light rail projects, particularly in relation to the key terms, scope and performance requirements, and payment mechanism.

A draft of the Project Agreement was contained in the project’s Request for Proposals, with shortlisted bidders required to set out proposed changes to the document as part of their bids. Following the announcement of a preferred bidder in early 2016, a period of intensive contract negotiations ensued.

On 17 May 2016, the Director-General of the Capital Metro Agency, on behalf of the Territory, executed the Project Agreement with Canberra Metro to design, construct and finance the Project and to operate and maintain the Project over a 20 year period. Financial Close was subsequently achieved on 24 May 2016, whereby remaining contractual and funding arrangements were finalised between the Territory, Canberra Metro, its key subcontractors and debt and equity providers.

The Project Agreement came into full force on achieving Financial Close.

The Project Agreement itself contemplated that the Project would require variations and modifications over its course. While the fundamental features of the Project Agreement have remained unchanged, there have been several approved variations or supplements to the Project Agreement to reflect emerging project conditions and commercial discussions. They are as follows:

- Five deeds of amendment to the Project Agreement were entered into to reflect project modifications and other minor changes;
- Deed of Settlement (April 2019) – was agreed so as to finalise project modifications and the resolution of claims as described in Chapter 7 above; and
- Deed of Amendment (April 2019) – to provide a mechanism for the parties to clarify ahead of operations commencing:
  - Those project elements to be completed following the commencement of operations (and before ‘Final Completion’); and
  - Those project elements which the Territory accepts “as-is”.



# 11. Stakeholder Engagement

## 11.1 Engagement with Local Community

From the commencement of the Project, all relevant parts of the ACT Government worked to create a coordinated and comprehensive pathway to engage with stakeholders across the community. The overall aim was to establish and maintain open communication channels that would keep the Canberra community and stakeholders informed and allow feedback and comments to be shared throughout the project.

With such a significant investment in city infrastructure, strong community interest was inevitable. The key messages shared with the community in the early stages of planning the light rail network revolved around:

- Improving public transport: Frequent, fast, reliable light rail services will improve public transport access;
- Better journeys for customers: Modern, high quality light rail vehicles and stops with a single electronic ticketing will provide reliable, comfortable, accessible journeys for customers;
- Addressing congestion: Congestion is set to cost Canberra \$700 million a year by 2031. Light rail will provide a more modern, reliable and sustainable alternative;
- Economic benefits: Light rail is estimated to deliver over \$1 billion in economic benefits for Canberra through improved public transport, productivity and urban renewal; and
- Sustainable public transport: Light rail offers a clean, quiet, low-emission alternative to cars and buses that provides environmental benefits and encourages healthy active travel.

The Project team undertook a range of activities to help residents and business owners of Canberra understand the benefits of the City to Gungahlin Light Rail as well as the construction process.

## SCHEDULE OF COMMUNICATIONS ACTIVITIES

### **Between January 2017 and July 2018 weekly and/or fortnightly Gungahlin Retailer meetings were held at Gungahlin Village.**

These meetings included representatives from:

- Gungahlin Village
- Gungahlin Market Place
- Gungahlin Local Area Command
- Winyu House
- Gungahlin Eastlakes Football Club
- Light Rail Business Link
- Communities at Work.

### **From July 2018 the Gungahlin Retailers Meeting was moved to a monthly fixture. It continues as the Gungahlin Advisory Group meeting which meets monthly.**

Since early-on in the project, quarterly community and business engagement events specifically for Gungahlin have been hosted. These have included:

- Gungahlin Community information evening – 22 March 2017
- Hibberson Street retailer's breakfast – 28 March 2017
- Gungahlin community pop-up stalls at Gungahlin Village – April/May 2017
- Gungahlin Village community and business reference forum – 27 June 2017
- Gungahlin business update at Winyu House – 6 September 2017
- Gungahlin community pop-up stalls at Gungahlin Marketplace – October/November 2017
- Gungahlin retailers construction update at Winyu House – 30 November 2017
- Harrison School community information session – 22 February 2018
- Gungahlin Community Council public meeting – 13 June 2018
- Glow Ride Community bike riding pop-up event at Yerrabi Ponds – 6 October 2018

Other key activities during the life of the project have also included:

- Door knock to residents and businesses immediately adjacent to the corridor informing of commencement of works – June-July 2016
- Hosted community information pop-up stall at the Celebrate Gungahlin Festival – 10 April 2017
- Meet the Retailer Social media/website campaign to promote Hibberson Street retailers, this involved profiling the individual businesses – June 2017
- Hosted a pop-up stall at Gungahlin Football Club Registration Day – April 2017
- Hosted pop up stall at Burgmann Anglican School fete – May 2017
- Doorknock to Hibberson Street businesses to provide an update on works due to an extension to the construction schedule – 18 January 2018
- Goodwin Retirement Village presentation – 17 May 2018
- Rail Ready Safety Celebration hosted at Gungahlin Village with vouchers provided for people to purchase items from stores within Gungahlin Village 12 August 2018
- Doorknock to each business in Hibberson Street (Gungahlin stop) to inform of new paving taking place July 2018
- Hosted a pop-up stall at the Amaroo School Fete – 25 October 2018
- Hosted bus tours for people interested in the construction of light rail which included a stop at Hibberson Street and vouchers were provided to purchase items from two businesses; Cold Rock and Gloria Jeans Café December 2018
- Mother Theresa School Assembly on Rail Safety – Dec 2018
- Harrison School Assembly – Nov/Dec 2018
- Informal door knocks and drop ins to businesses as and when required.

## 11.2 Engagement with Business Owners

The Canberra Business Chamber put a proposal to government to lead engagement with the business community through a new 'Light Rail Business Link' program (LRBL). The ACT Government accepted the proposal and provided funding for the Canberra Business Chamber to:

- manage engagement with local businesses along the corridor and in the Gungahlin precinct
- improve industry engagement
- provide information, training and support for local traders and business owners in the Gungahlin precinct
- dedicate time, expertise and marketing support for local businesses to prepare for the arrival of light rail terminus to the precinct
- conduct business forums and support for new business initiatives through dedicated engagement and communications inputs.

The LRBL sought to engage businesses surrounding the construction activities along the length of the corridor.

In 2018, the Territory, with the support of the LRBL, prepared a Business Impact Assessment of Territory led construction projects in Gungahlin to better understand the cumulative impact of construction activities to improve practices for current and future projects.

ABS retail trend data was analysed to assess the impact light rail construction may have had on businesses activity in Gungahlin. The study revealed that Gungahlin's total number of businesses grew from 299 businesses in 2009 to 531 businesses in 2017, an overall increase of 78% and an increase of 32% in five years leading up to 2017. In the year since the commencement of light rail construction, the number of businesses grew by 5, or 1.0%, compared to 8.5% in 2016 and 3.9% in 2015. Over the same period the growth rate for ACT businesses was 0.1%. Given the data, and the lack of a counterfactual, it is difficult to draw any definitive conclusions from the analysis.

The Canberra Business Chamber, via the LRBL, undertook a survey of businesses to garner perceived business impacts and sentiment about the future. While construction activities were perceived to have a negative impact on businesses, there was general optimism for the future. The study highlighted areas of improvement to reduce business impacts from construction projects ranged from strategically spreading works over a longer period but limited to smaller areas, providing greater certainty about the timing and extent of road closure and noisy activities, assistance with better wayfinding signage for customers and practical measures like window and façade cleaning where construction activities have generated excessive dust.

The Project undoubtedly resulted in disruption to local businesses during its construction phase. However, the exact influence attributable to the Project is difficult to discern in the context of other projects in the vicinity, the expansion of other shopping districts in the region and general business conditions and individual business strategies.

The LRBL successfully established and facilitated communication link between local business and Government on the project.

## 11.3 Engagement with Regulators

From project inception, the Capital Metro Agency and subsequently Transport Canberra has maintained engagement with regulators overseeing the project, including WorkSafe ACT, the Utilities Technical Regulator and the Office of the National Rail Safety Regulator (ONRSR). This has allowed the following achievements:

- Ensuring new regulations required for the introduction of light rail into the Territory were appropriately designed in a timely manner to allow them to be clearly communicated to shortlisted bidders during procurement;
- Providing for a clear allocation of responsibilities between the various regulators, achieving appropriate oversight and accountability is maintained while minimising duplicative regulatory compliance requirements; and
- Giving the market confidence and certainty in bidding for a project delivering a new mode of transport into the Territory, particularly in respect of regulatory compliance.

A key learning from the Project is that early and regular dialogue with relevant regulators is highly desirable.

## 11.4 Engagement with the National Capital Authority

The City to Gungahlin light rail project traverses the City's northern approach route of Northbourne Avenue, which is a key corridor in the National Capital Plan (NCP). As such, early and regular engagement with the National Capital Authority (NCA), as planning authority for the areas of national significance on the project alignment, has been essential. This engagement allowed for:

- The NCA to provide critical input into how the project would achieve one of its objectives, being to revitalise the Northbourne Avenue corridor, through the alignment of planning controls over both Territory and Commonwealth areas to make Northbourne Avenue a more active and socially connected precinct for all types of Canberrans and a fitting gateway to the nation's capital, both increasing activity at ground level and boosting the image of the city;
- Early NCA input into concept design development, allowing for NCA requirements unique to the national capital entry of Northbourne Avenue to be accounted for in the business case;
- The NCA's requirements and expectations, and the unique nature of the Territory's dual planning system, to be communicated to shortlisted bidders during RFP, and for NCA input into RFP evaluation; and
- A productive relationship with the NCA during project delivery and the finalisation of detailed design - the established relationship ensured issues were dealt with practically and in a timely manner.

As a consequence of the Project, the ACT Government and Canberra Metro now have a greater understanding of the nature and number of individual NCA Works Approvals which are required for light rail projects in the Territory. The Project has also served to highlight the areas of greatest interest to the NCA in considering Works Approval applications for light rail projects.

## 11.5 Engagement with Other Light Rail Teams

Capital Metro Agency and Transport Canberra engaged with other project teams overseeing the development of light rail projects across Australia. This allowed the ACT Government to understand their lessons learned and key successes, achievements, opportunities and challenges. This engagement also assisted in identifying issues early and developing strategies to address those issues, both through procurement and delivery.

The ACT Government wishes to thank all other jurisdictions who have assisted the Transport Canberra light rail team through the course of the project's development, including the Queensland, New South Wales and Victorian Governments.

## 12. Risks

### 12.1 Approach to Risk Management

The ACT Government adopted a robust risk identification and management process aimed at early detection and clear delineation of risks so that timely action could be taken to avoid risks or, if not possible, mitigate consequences. In parallel, Canberra Metro maintained its own risk management processes in relation to the risks it bore under the Project Agreement.

The ACT Government managed and maintained a risk register throughout the delivery phase. This was the subject of regular review by the Project's Risk and Change Management Committee.

Risks were considered present the occurrence (or non-occurrence) of an event introduced uncertainty to project objectives, including risks around:

- Delivering to the current budget;
- Delivering to the current program;
- Meeting all performance requirements;
- Maintaining the environment;
- Maintaining health and safety;
- Maintaining the reputation of Transport Canberra & City Services (TCCS) and ACT Government; and / or
- Performance of the project against the project objectives.

The allocation of risks in the Project Agreement reflected, market conditions, principles set out in The Partnerships Framework (whereby risks are allocated to the party best positioned to manage them in order to achieve best value for money) and ultimately the commercially agreed position between Canberra Metro and the ACT Government.

The risks were therefore either<sup>10</sup>:

- retained by the Territory
- transferred to the private sector, and/or
- shared between the parties (not necessarily equally)

The obligations of each party in managing these risks are in the Project Agreement and associated documents.

10 Capital Metro Project Summary, page 17



## 12.2 Risk Identification

Newly emerging risks were captured by the ACT Government through its monthly risk review process managed through Transport Canberra and its Risk and Change Management Committee (RCMC), using the framework in Figure 6.

**FIGURE 6** Overall Risk Management Process<sup>11</sup>



## 12.3 Key Risks Realised

The key risks realised were broadly in relation to planning risks, weather, unexpected site conditions, interface risks and unexpected utility services works. The list of categories against which the materialised risks were paid is shown in Chapter 7 under 'Settlement of Construction Claims.'

<sup>11</sup> TCLR – Risk Management Procedure, page 10

## 13. Safety and Performance

The ACT Government places the utmost emphasis on maintaining the health, safety and wellbeing of the community and its workforce. The ACT Government considers health, safety and wellbeing to be fundamental in pursuing excellence in service delivery. Throughout the course of the Project, Canberra Metro was also clear that safety matters were its paramount consideration.

The ACT Government strives to foster leaders and innovators in building environments conducive to people being safe, engaged and healthy so that they can thrive and perform to their full potential thereby maximising their contribution to their workplaces and the broader ACT community.<sup>12</sup>

The Public Sector Health, Safety and Wellbeing Strategy 2019 – 2022 has been designed to deliver improved engagement, participation and productivity of our people through an integrated work health, safety and wellbeing approach.

One of the top five evaluation criteria within the Invitation for Expressions of Interest was for the respondent to demonstrate excellence in safety management.

**TABLE 18 Invitation for Expressions of Interest Evaluation Criterion 3: Safety**<sup>13</sup>

3(a)	Demonstrated capability in relation to the safe design, delivery, operations and maintenance in one or more of light rail, rail, mass transit or other comparable projects.	Pass / Fail
3(b)	The extent to which the Respondent's proposed approach to the safe design, delivery, operations and maintenance of the project demonstrates a thorough understanding of safety matters that will be associated with the project.	Comparative Assessment

Within the Invitation or Expressions of Interest, customer experience is the first of four listed project aspirations. The first key principle pertaining to customer experience was that of customer safety<sup>14</sup>:

**A light rail system that is safe in operation and meets or exceeds all relevant Australian and /or international safety standards.**

Contractually, Canberra Metro was responsible for fulfilling the following criteria in relation to safety:

- Implementing and maintaining excellent safety practices in the design, construction, operations and maintenance of the light rail system.
- Obtaining and maintaining rail safety accreditations for the project in accordance with the rail safety national legislation.
- Establishing and managing appropriate emergency response and incident management protocols and procedures, including interfaces with emergency services authorities.
- Ensuring the design of all public areas facilitates crime prevention through environmental design principles.
- Adhering to and reporting performance against key performance indicators.

<sup>12</sup> Public Sector Health, Safety and Wellbeing Strategy 2019 – 2022 [https://www.cmtedd.act.gov.au/\\_data/assets/pdf\\_file/0018/1322244/ACTPS-Work-Health-Safety-and-Wellbeing-Strategy.pdf](https://www.cmtedd.act.gov.au/_data/assets/pdf_file/0018/1322244/ACTPS-Work-Health-Safety-and-Wellbeing-Strategy.pdf)

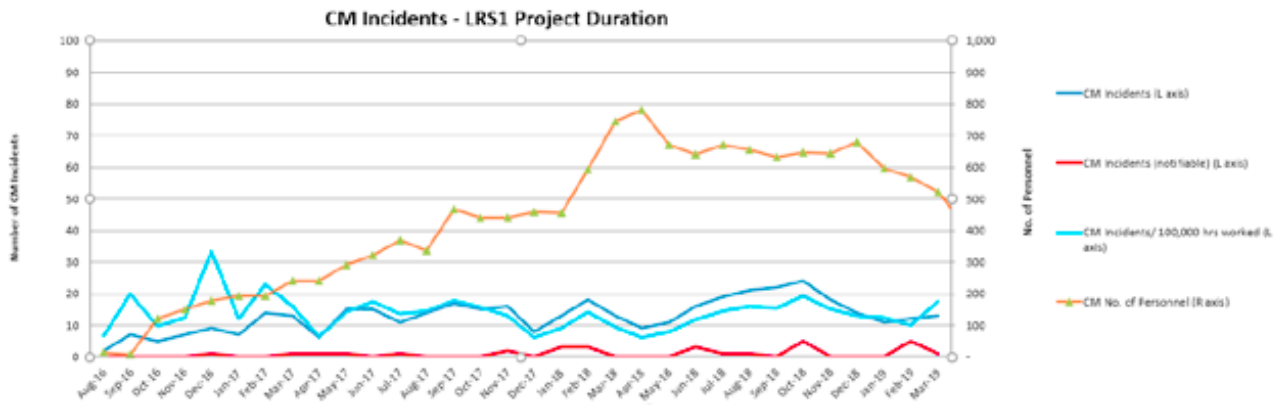
<sup>13</sup> Invitations for Expressions of Interest, Capital Metro, ACT Government, page 29

<sup>14</sup> Invitations for Expressions of Interest, Capital Metro, ACT Government, page 16

## 13.1 Safety Incidents during Design and Construction

The following illustrates the trends on safety incidents that occurred throughout the duration of the design and construction phase.

**FIGURE 7** Canberra Metro Incidents Analysis<sup>15</sup>



A number of safety incidents occurred through the construction phase of the project, including:

- Striking underground services, including street light cabling, telecommunication cabling, gas main and a water main;
- Workers entering plant operating zone;
- Minor injuries associated with the hydro-vac operations;
- Vehicle collisions;
- Plant failures and trailer roll-over;
- Track welding incident;
- Entry into an inadequately supported excavation;
- HV conduit strike;
- Body strain injuries;
- Drug and alcohol test failures;
- Pedestrian LRV strike during testing and commissioning; and
- Other incidents, including near misses.

## 13.2 Safety Management

Throughout the design and construction, the Territory managed safety through:

- Safety policy;
- Rail Safety Strategy; and
- WHS Management Plan for the project.

Canberra Metro managed safety via the following plans and procedures:

- Canberra Metro Accreditation, Safety and Systems Assurance Plan;
- Canberra Metro WHS plan and Rail Safety Plan; and
- Canberra Metro site induction.

<sup>15</sup> Project Board Paper - Item 02 - LRS1 Monthly Project Report - Attachment A (cleared) (A19276562), page 9 – Chart time horizon extended



The following are in place to ensure the health and wellbeing of ACT Public Service (ACTPS) level Project staff:

- The corporate health and wellbeing initiative;
- ACT Public Service (ACTPS) work health and safety working group;
- ACTPS human resource guidelines on leave and allowances;
- ACTPS security and incident reporting procedure; and
- ACTPS work health and safety working group.

Various initiatives were implemented to reduce the number of safety related incidents encountered throughout the delivery phase. Some of these included<sup>16</sup>:

- Frequently reporting on and managing safety incidents in board reports. Classifying the number of incidents into categories such as First Aid Incident (FAI), Medically Treated Incident (MTI), Property Damage, Unsafe Act, Unsafe Condition. Reporting on several stats including incidents per hours worked and number of events per period so that changes in incidents could be monitored, managed and minimised.<sup>17</sup>
- To address concerns and expectations to the workforce, including the need for safety to be practiced by workers while on site, Canberra Metro implemented the “Fix, Stop, Change, Improve, Challenge Statistics” method in September 2017. This was well received in the field, with 348 responses from around 400 people on site. The initiative did not ultimately have a significant impact on the number of incidents.
- Would need to force compliance if not self-imposed, noting that the latter is generally more effective.
- Transport Canberra Light Rail (TCLR) Construction Surveillance team undertook a due diligence role on the project. TCLR’s main duties in the field related to safety included:
  - Attending safety walks, incident review meetings and daily prestart safety briefings
  - Observing and engaging with Canberra Metro when safety measures and requirements are not being implemented correctly.
  - Undertaking Temporary Traffic Management Plan implementation audits and working with Canberra Metro to improve temporary traffic measures on site.
  - Working with Canberra Metro and the Independent Certifier e.g. on the re-opening of intersections and roadways after works have been completed.
- Canberra Metro is the subject of regular safety audits during the life of the project, including from:
  - The Office of the Federal Safety Commissioner (annual audit),
  - Active Certification Audits by Infrastructure Finance and Capital Works (quarterly audits) and
  - Internal safety system audits by John Holland and CPB internal safety team.
  - ACT Worksafe who developed a constructive working relationship with Canberra Metro and were responsible for investigating reportable incidents.
- In December 2018, Canberra Metro conducted research under the Rail Ready Safety Campaign on awareness of rail safety messages through the Les Winton Canberra Omnibus survey which uses a representative sample of 1,000 adults across Canberra. It is a statistically robust sample of the wider population (in terms of age, gender, socioeconomic demographics), with a low error margin. The purpose of conducting the research so early in the campaign was to benchmark rail safety awareness among Canberra’s public with the expectation that awareness will continue growing in parallel with the campaign roll out.

Through the course of the Project’s delivery, a number of initiatives were in place to ensure incidents were minimised and to provide both a level of transparency and a positive incident reporting culture within Canberra Metro. This is important as issues cannot be addressed and resolved if they are not reported.

16 Project Board meeting 51 - Construction and Safety (A19276540), page 2

17 Project Board meeting 51 - Construction and Safety - Attachment A (A19276541), page 2

## INCIDENTS

**There were two major operational safety incidents in early March 2019, which are described below.**<sup>18</sup>

### *Pedestrian injury 9 March 2019*

On Saturday 9 March 2019, a pedestrian was injured in the light rail corridor. The incident notification report provided by CM described the incident:

About 7:47am on Saturday 9/3/19, LRV001 was travelling North across the intersection of Barry Drive with a white T signal and authority to proceed. A pedestrian stepped into the path of the LRV contrary to the red pedestrian signals. The driver took immediate evasive action and full emergency braking and horns were applied, however the pedestrian was struck by the front of the LRV. Emergency services in attendance and pedestrian taken by ambulance to hospital. Regulators notified as required.

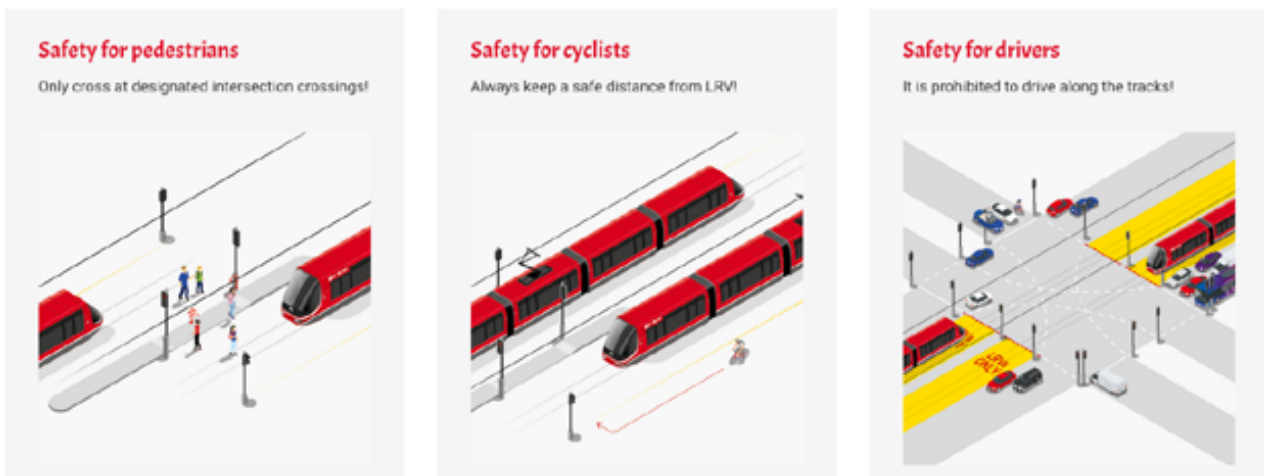
Under national rail safety law, it is the responsibility of the accredited operator, namely CM Operations (CMO) to report a notifiable incident to the CM obligation to report this incident to ONRSR and respond to any ONRSR findings.

### *LRV moved through red T-light 9 March 2019*

On 12 March 2019, TCLR was alerted by CM to a dashcam video posted on social media by a member of the public, which showed a car proceeding to an intersection with a green traffic signal, and a near miss with an LRV. TCLR has received results of the initial CMO investigations into these incidents. CM is finalising the incident report in preparation to send to ONRSR for actioning.

The above incidents crystallise the importance that has been placed on safety by both Canberra Metro and the ACT Government and the value of continuing to put safety initiatives at the forefront. The section below describes some of the safety initiatives being used to build awareness, including the Rail Ready Campaign.

**IMAGE 8** Canberra Metro Rail Ready material. Source Canberra Metro, 2019



<sup>18</sup> Project Board Paper - Item 02 - LRS1 Monthly Project Report - Attachment A (cleared) (A19276562), page 5

## 14. Key Lessons

The City to Gungahlin Light Rail project is the most significant transport infrastructure project ever undertaken by the Territory, as well as its largest Public Private Partnership (PPP).

Completion of the Project presents an opportunity to reflect on the undertaking of the project to date, including through project inception, scoping, procurement and delivery and recognise the lessons that can be taken from those processes.

The following “lessons learned” by the ACT Government can help guide the delivery of future major projects in the Territory.

### 14.1 General Lessons

#### Successes and achievements

**Setting Clear Project Aspirations early in the project** – The vision, aspirations and objectives for the Project were developed early and approved through the Project Board and Cabinet. These aspirations and objectives (set out in the Full Business Case and Contract Summary) were clearly articulated then referred to and considered throughout the undertaking of business case development, procurement and delivery. This continued focus on the aspirations and objectives provided a yardstick against which key decisions could be made and assessed.

**Pursuing a PPP Delivery Model** – A range of delivery models were considered during the business case phase. Detailed assessment of the options identified a PPP model as the preferred option for reasons outlined in this document

To date, the delivery model has proven beneficial to the Territory in achieving its stated objectives, particularly with respect to allocating interface risk, site risk and asset suitability risk to the private sector. The ACT Government notes, however, that a PPP approach may not necessarily be the optimal approach for all future stages of light rail, and each project stage must be considered in its individual context.

**Clear and Consistent Governance** – The ACT Government committed to a governance framework from the outset of the project which remained consistent throughout the project’s delivery. The governance framework provided for clear leadership, steering and decision making, clear communication between the project Board and Government, and comprised both government and non-government Board members with strong commitment to the project.

**Skilled staff and advisors** – The Territory focused on attracting and retaining highly skilled individuals with quality experience rather than seeking a large project team. Investing in appropriately expert advisors through the course of the Project and maintaining a comparatively small team proved very effective in making high quality, timely and informed decisions in complex environments.

**Engagement with, and learning from, other Light Rail project teams** – The Territory engaged with other project teams overseeing the development of light rail projects in Australia, to understand their lessons learned and key successes, achievements, opportunities and challenges. This engagement assisted in identifying issues early and developing strategies to address those issues, both through procurement and delivery.

**Ongoing engagement with the National Capital Authority** – Early and regular engagement with the National Capital Authority, as planning authority for the areas of national significance, was essential to successful delivery of the project. Allowing the input from the NCA on critical elements helped shaped outcomes high quality outcomes for the project, for the city in its role as the nation’s capital and for Canberrans. Communicating the unique nature of the Territory’s dual planning system to the shortlisted bidders during the RFP phase enabled the Territory to clearly outline expectations and risks to the market and enhance certainty in the delivery model.

## Opportunities and challenges

**Integration of Rail with Bus Network** – The commencement of light rail necessitated a re-design of bus operations in the Territory. Practical challenges arose in fixing a date for the bus network change (which typically occurs in the ACT during school holidays) while the date for light rail operations was subject to potential change until the very date of operations commencing. This in turn necessitates contingency planning to be undertaken at an early stage.

**Operational Readiness** – Delivery agencies need to be aware of their roles and responsibilities moving from delivery into operations and take active and early steps to ensure operational readiness. This includes early engagement of key personnel, preparation of operations manuals and procedures, contingency planning and training. Early engagement with other Territory directorates and agencies is also critical, particularly where those agencies are expected to undertake new or significantly changed activities.

**Workforce Attraction and Retention** – Major project delivery requires the engagement of human resources in a manner that is different to ordinary staff recruitment in the ACT Government. The Project's delivery phase meant some specialised and other skills were required only for a number of years, including skills not necessarily resident in Canberra. In addition, the Project was operating in the context of a heated Australian infrastructure market and in the context of some political uncertainty in the lead-up to the 2016 ACT elections. This created challenges in attracting and retaining resources to the Project.

**Co-ordination with other Territory projects** – While major infrastructure projects always involve a significant degree of community disruption during construction, delivery agencies need to be aware of other Territory projects in the vicinity of their projects and the potential for extended or excessive construction disruption to nearby community and business. Early engagement with other Territory directorates and agencies to understand planned projects and co-ordinate them in a manner that minimises the disruption to the community and business is critical.

**The Release of Information** – The Project rightly attracted significant community interest with a desire for openness and transparency through the Project's planning and delivery phases. By comparison to other jurisdictions, the ACT Government has been exceptionally transparent throughout the Project with the release of the Project's business case, Project Agreement, Contract Summary, this document and other materials. However, a challenge does arise in that the desirability of publicly releasing information must be balanced against the public interest to be gained from third-parties having confidence they can deal confidentially with the ACT Government on certain matters, and from the project team having sufficient space in which to work through complex project issues.

## 14.2 Procurement

### Successes and achievements

**Timeframes** – Through management focus and good governance, the Territory generally met all timeframes promised to the market during project scoping and procurement - this in turn gave confidence to the market in doing business with the Territory on such a major tender process.

**Awareness of the broader market** – Significant attention was paid during market sounding and business case development on the broader markets in which potential bidders were operating, both in Australia and in the region. These considerations supported the choice of the availability PPP delivery model, which was generally preferred in market soundings and which ultimately attracted tier 1 bidders at the EOI stage.

**Affordability focus** – The Territory chose to provide an affordability signal to the market during the procurement process, including through the release of the full project business case and indicating the importance of affordability to both project respondents. Both RFP responses were highly competitive and met the Territory's affordability objective for the project.

**Shortlisting for RFP** – The decision to shortlist two bidders at the EOI stage was appropriate for a project of this scale. This decision was based on feedback received during market sounding. The quality and competitiveness of RFP responses also indicated that shortlisting to two bidders retained an appropriate level of competition within the procurement process.

## Opportunities and challenges

**Utility engagement** – The Territory was acutely aware of the risk that impacted utilities, both known and unknown can have on the timely delivery of a linear infrastructure project. Early identification of impact utilities is essential to mitigating utility interface risk. The Territory, in conjunction with its technical, commercial and legal advisers developed a utility interface management strategy early in the procurement phase, with a view to handing over detailed preliminary information to shortlisted bidders. This information, plus an opportunity to engage directly with utilities, was well received by the market and allowed for the market to accept utility interface risks on the project. Nevertheless, as evidenced by Canberra Metro claims relating to utility matters, it is clear that third-party utility requirements represent a clear and ongoing risk to the delivery of major projects.

**Early engagement of legal advisors** – Experience from the inception stages of the project is that legal advisors should be engaged at project inception and at the same time as commercial and technical consultants. This will ensure legal advisors are across key project issues at the same time as the project team and allow for early identification of issues to feed into the project scoping process. In the case of the Project, Transport Canberra benefitted from very early support from the Government Solicitor's Office. It may have been beneficial to bring the Territory's external legal advisor into the Project at an earlier stage of the Project's development.

**Independent Certifier Extension Costs** – The Independent Certifier is an important project participant, and their procurement should be given sufficient resources and time to ensure a proper evaluation is undertaken. If possible, it would be beneficial for the evaluation panel to include at least one person who has worked with an independent certifier before throughout the life of a project, to ensure the best result is achieved. In particular, it would be beneficial to clearly understand the Independent Certifier's expectations and arrangements in the event of project delay, and how any additional costs arising from such delay should be allocated between the parties.

## 14.3 Delivery

### Successes and achievements

**Delivery Focus** – From the outset of the Project, the Territory demonstrated a delivery focus. This commenced with the establishment of a dedicated project implementation agency (CMA) with a strong and commercially minded Board and leadership team. This standalone arrangement continued until the Project's contract was signed. The delivery focus was maintained as a dedicated project team was maintained within the larger TCCS.

The project implementation team held the delivery focus during design, construction and commissioning of the Project, showing an openness to resolving commercial and technical issues in a practical and reasonable manner, while ensuring the Territory's objectives for the project and key non-negotiables, such as safety and customer experience, would still be achieved. This focus has been assisted through a direct relationship between the Territory executive and senior representatives of the Project consortium companies. The focus on delivery has allowed for delays to be minimised and has ensured delivery within the Territory's budget.

**Early Issue Identification** – The abovementioned project focus, along with the use of skilled employees and advisers allowed the Territory to identify potential project risks and prepare initial responses in advance of issues arising. This proactive approach to issue identification ensured the Territory was spending less time reacting to unexpected issues and more time addressing issues and implementing practical project solutions in a considered manner.

**Design Review Working Group** – Design working group meetings were established early in the design review process. This enabled the Territory, IC and delivery contractor to get together weekly and discuss comments made on design packages. The design review working group worked well during the Project, facilitating the discussion of key design issues face-to-face in order to resolve them as quickly as possible.

**Claims** – It was expected that contractor would make claims throughout the project of varying magnitude. The use of specialist external legal providers skilled in major construction disputes and project management, supported by the Government Solicitor's Office, allowed the Territory to approach claims in a comprehensive and consistent manner, and to form a considered position in the settlement of those claims.

## Opportunities and challenges

**Proceeding at risk** – On a project of the size and complexity of light rail, in order to allow for project timeframes to be adhered to, some ability for the contractor to proceed at risk (i.e. where designs are partially certified) can be beneficial and allow for the contractor to manage the project's program. However, it is important that this is balanced with appropriate measures to ensure that issue resolution is not prolonged unduly, resulting in issues remaining unresolved towards the end of the delivery phase.

**Project Risk** – Notwithstanding the contractual allocation of risks, where a project encounters problems or delays, these will often result in reputational and associated risks for the Territory even though the commercial risk may be with the contractor. As such, delivery agencies should remain involved in issue identification and work with contractors to resolve issues appropriately and maintaining a “best for project” outlook.

**Safety** – After undertaking an audit of safety issues that have arisen during delivery of the project, the Territory noted an increase in the occurrence of safety incidents after holidays, breaks in construction and long weekends. The Territory and contractors should be aware of this increased risk and implement steps to proactively manage safety awareness around return to work phases.

**Program** – The project program is an essential tool maintained by the contractor and a comprehensive and accurate program will provide a clear insight into the progress of the project. While the Project has been delivered within the timeframe forecast by the business case, the Territory could consider the latest market approach to the status of the construction program in the contract and understand the potential implications of each approach. Early works may also mitigate later program pressures.

**Regulator Engagement** – Given the criticality of certification from various regulators for the commissioning and commencement of operations for light rail, future contractors should be encouraged to work closely and constructively with relevant regulators from an early stage on the project, including throughout design and construction, allowing for early identification and agreed resolution of issues.

**Site appearance** – The Territory should consider the most appropriate mechanisms to encourage contractors to maintain a tidy site appearance throughout construction, particularly in projects with long construction timeframes, projects in key areas of the city where site aesthetics are particularly sensitive and in areas close to business.

**Operator Involvement** – Substantial operator involvement during the early stages of Project design will assist in the finalisation of a project's delivery phase. The Territory might consider mechanisms related to facilitating operator involvement through the early stages of a project.

## 14.4 Community and Business Engagement

### Successes and achievements

**Community Engagement and outreach** – The early establishment of a small but dedicated community engagement team greatly assisted the community to understand the scope, benefits, timelines of the project as well as the temporary disruptions the construction process would cause. The engagement effort used as many methods as possible, including social media campaigns to reach as many people as possible. Messages and methods were customised to meet the needs of specific target groups including in different parts of the city, during different stages of project delivery and based on the information that citizens most needed to know.

**UNSW relationship** – The Territory's development of a relationship with the University of NSW at ADFA was a successful example of the leveraging of the project to achieve broader outcomes within the Territory. Under this program developed through an MOU between the Territory and UNSW, the project was leveraged to facilitate the opening of undergraduate engineering degrees at UNSW Canberra for civilian students. Engineering students from UNSW's Australian Defence Force Academy campus spent time working with the project delivery contractor on the Project, gaining valuable insight into the undertaking of major infrastructure projects, while providing Canberra based engineering students with valuable practical skills and insights.

**Business Engagement** – The ACT Government funded Light Rail Business Link Program (LRBL), independently delivered by the Canberra Business Chamber (CBC), was successful in coordinating and providing an established communication link between local business and Government on the project.

The LRBL program was designed to maximise the benefits of the Light Rail City to Gungahlin for all Canberrans by building links between Government, the local business community, and Canberra Metro. Acting as a conduit between stakeholder groups, CBC, via the LRBL program was intended to ensure opportunities for local business are maximised and any concerns are communicated. All businesses were encouraged to be “project ready”, to take advantage of this significant infrastructure investment by ensuring they have appropriate skills to participate where possible. Specific training opportunities and information sessions are available.

## Opportunities and challenges

**Business Engagement** – Notwithstanding the success of the LRBL in communicating with local business, the ACT Government’s Business Impact Assessment of ACT Government-led construction activities in Gungahlin published in September 2018 also identified that areas which respondents believed the ACT Government could improve on for future construction projects to reduce business impacts. Suggestions from respondents ranged from strategically spreading works over a longer period but limited to smaller areas, providing greater certainty about the timing and extent of road closure, noisy activities and delays, assistance with better wayfinding signage for customers and practical measures like window and façade cleaning where construction activities have generated excessive dust. The ACT Government will incorporate these findings when planning for future construction activities to better understand and communicate impacts to businesses, to minimise impacts through improved coordination and by enhancing its proactiveness of impact management.

**Local Subcontractor Involvement** – It is desirable to utilise large infrastructure projects to strengthen the local subcontractor market. The participation of local subcontractors will depend not only on head-contractor activities to entice local market participation but will also in part depend upon other opportunities in the market for local contractors, industrial considerations, local subcontractor familiarity with ‘tier 1’ processes, and other factors. Continued liaison with the local subcontractor market should be undertaken in advance of future stages of light rail.

**Traffic impacts** - While bidders are often asked on major projects to provide fixed timeframes for road occupations, changes to traffic requirements will change frequently due to weather events, resequencing and other events. Contract arrangements need to address this need for flexibility, while maintaining a level of contractor accountability to minimise traffic impacts throughout the project. Defining clear functions and powers of approval for any stakeholder to Territory based temporary traffic impacts group would likely assist in this process.

It is also important that traffic impacts continue to be widely communicated to the public through as many means as possible (radio, social media, websites, site signage). This was generally done well throughout the project but will always need to be an area of significant effort.

## 15. Glossary and Interpretive Notes

TERM	DEFINITION
ACT	The Australian Capital Territory (ACT) as self-governing territory in the south east of Australia.
ACT Government	The ACT Government as the executive authority of the ACT. The executive is the organ exercising authority in and holding responsibility for the governance of a state. The executive executes and enforces law.
Business Case	The Business Case for City to Gungahlin Light Rail.
Chief Minister	The Chief Minister of the ACT Government, Andrew Barr MLA.
Canberra Metro	Main contracting party with the Territory and has entered into contractual relationships with consortium partners to deliver the Project. Ultimately responsible for project delivery and management to project completion.
CMA	Capital Metro Agency – A former Directorate of the ACT Public Service, merged with TAMS in July 2016 to form the Transport Canberra and City Services Directorate (TCCS).
EOI	Expressions of Interest – an invitation for the private sector to express their interest in delivering the Project.
EPDS	Environment, Planning and Sustainable Development Directorate - A Directorate of the ACT Public Service.
NCA	National Capital Authority – A Federal Government body responsible for the management of commonwealth land within the ACT (for example, Lake Burley Griffin and the Parliamentary Triangle).
Parliamentary Agreement	<i>Parliamentary Agreement for the 8th Legislative Assembly for the Australian Capital Territory.</i>
PPP	Public-Private Partnership – a procurement mechanism for which the ACT Government is procuring a private consortium to design, construct, maintain and operate light rail.
Project Board or Board	The Light Rail Project Board.
RFP	Request for Proposal – a complex tender document provided to shortlisted bidders detailing project requirements.
The Project	Stage 1 of the Canberra Light Rail Network – a 12 kilometre route from Gungahlin in Canberra's north to the City (down Flemington Road and Northbourne Avenue).
Transport Canberra and City Services (TCCS)	Previously Capital Metro Authority (CMA). On 1 July 2016 the Capital Metro Agency was amalgamated with Territory and Municipal Services Directorate to form a new ACT Government directorate, Transport Canberra and City Services (TCCS).





CITY TO GUNGAHLIN LIGHT RAIL  
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