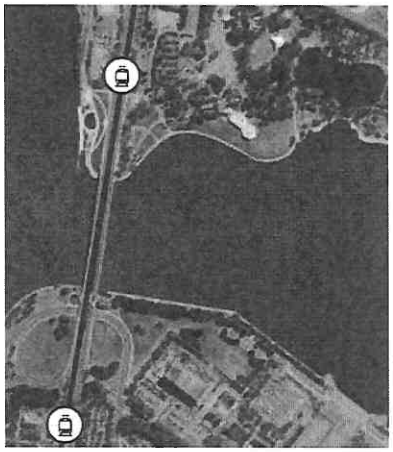
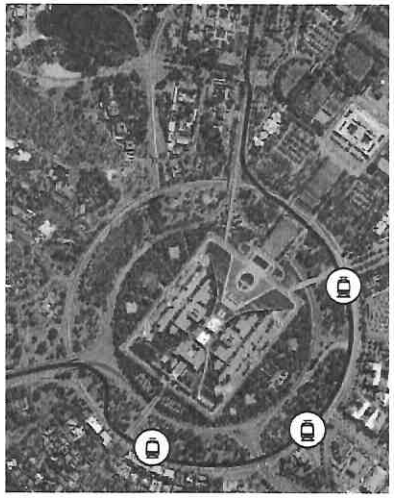
5.11.2 Light rail stops

The stops for Stage 2B will have similar design and accessibility features to those of 2A and City to Gungahlin, and have been chosen based on proximity to activity centres and precincts, transport connectivity, place making opportunities and key attractors. The location of each stop along the proposed 2B route alignment is detailed in Table 5-7. The stop at Commonwealth Park is not included as it is constructed as part of Stage 2A. Figure 5-13 provides an overview of areas within the walking catchment of proposed stop locations.

Table 5-7: Proposed stop locations, type and access arrangements

	Stop	Location	Type	Access
	**Albert Hall** 	The stop will be at the southern end of Commonwealth Avenue adjacent to Albert Hall.	*Island*	The stop will be accessed from a new signalised pedestrian crossing adjacent to Kaye Street. The two side platforms will be boarded from one end only. Figure 5-7 depicts the key sites within a 5 and 10 minute walk of the stop, including Albert Hall, the National Library and the Treasury. Depending on the route option, the stop will function as the primary stop servicing Questacon and the National Library. In the future (autonomous) shuttle could run between Albert Hall and Kings Ave to provide enhanced connectivity to key features within the triangle that are beyond a 5-minute walk (for example, the National Gallery of Australia).

	Stop	Location	Type	Access
	**Kings Avenue** 	This stop is located on the inside of State Circle, south of Kings Avenue.	*To be confirmed following further technical analysis and design*	The stop will be accessed from the existing signalised road crossing at Kings Avenue. This stop is a short walk to both Parliament House, and part of the Barton employment precinct (within 5-10 minutes). Figure 5-13 depicts the key sites within a 5 and 10 minute walk of the stop.
	DFAT 	This stop is located on the inside of State Circle, opposite Sydney Avenue.	*To be confirmed following further technical analysis and design*	The stop will be accessed from the existing signalised road crossing. This stop is a short walk to the Barton employment (for example, 5,000 people work in the DFAT building) and residential precinct and a large portion of the Parliamentary Triangle (within 5-10 minutes). Figure 5-13 depicts the key sites within a 5 and 10 minute walk of the stop.
	Melbourne Avenue 	This stop is located on the inside of State Circle, east of Melbourne Avenue.	*To be confirmed following further technical analysis and design*	The stop will be accessed from the existing signalised road crossing at Melbourne Avenue. This stop is a 5-10 minute walk to the Deakin and Forrest residential area. The stop would provide an effective access point for Parliament House, but could only be accessed via staff due to pass card requirements. Figure 5-13 depicts the key sites within a 5 and 10 minute walk of the stop.

	Stop	Location	Type	Access
	**Hopetoun Circuit** 	The stop will be located at Adelaide Avenue, adjacent to the Hopetoun Circuit overbridge. The stop will function as the primary stop for Deakin and south Yarralumla.	*Island platform*	The stop will be incorporated into the Hopetoun Circuit overbridge and intersection. It will be accessed via a stair and elevator from Hopetoun Circuit to the centre island platform. The Deakin shops are a 400m, 5 minute walk away. Kiss and ride and bicycle parking opportunities will be provided. Pedestrian and cycle integration with the stop will be a key part of ensuring that the stops are well used by the local community. This may include the provision of bike storage facilities.
	Kent Street 	The stop will be at Adelaide Avenue adjacent to the Kent Street overbridge. The stop will function as the primary stop for areas of West Deakin.	*Island platform*	The stop will be incorporated into the Kent Street road bridge and intersection. It will be accessed via a stair and elevator from Kent Street to the centre island platform. Kiss and ride and bicycle parking opportunities will be provided. Pedestrian and cycle integration with the stop will be a key part of ensuring that the stops are well used by the local community. This may include the provision of bike storage facilities/
	Carruthers Street 	The stop will be located at Yarra Glen, adjacent to the Carruthers Street overbridge. It will function as the primary stop for Curtin, north Hughes and south Deakin.	*Island platform*	The stop will be incorporated into the Carruthers Street road bridge and intersection. It will be accessed via new pedestrian overpass. The location of the overpass on the Northern side of Hopetoun Circuit will provide better east west connections than the current thin path on the bridge. The existing path on the southern side of the bridge is wider, therefore balancing pedestrian accessibility on either side of the road. The Curtin shops are a 400m, 5 minute walk away. Kiss and ride and bicycle parking opportunities will be provided. Pedestrian and cycle integration with the stop will be a key part of ensuring that the stops are well used by the local community. This may include the provision of bike storage facilities.

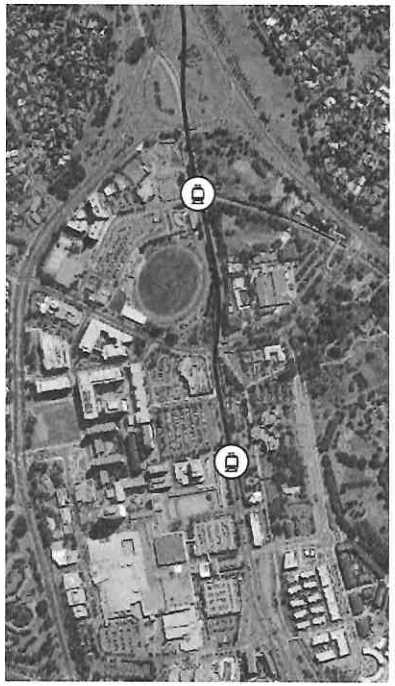
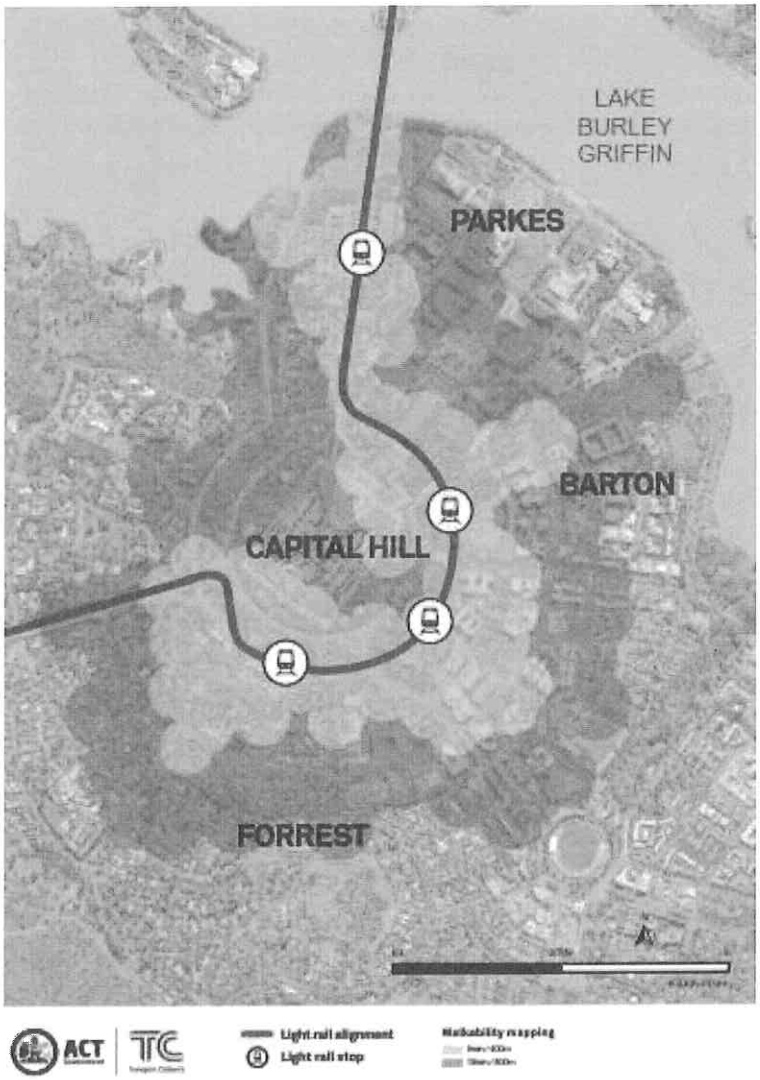
	Stop	Location	Type	Access
	**Philip Oval** 	The stop will be located in an existing road easement south of Melrose Drive, adjacent to the existing drainage channel.	*Side platform, off-road*	The stop will be accessed via a shared path from Melrose Drive and Launceston Street, with future connections across the culvert to be further assessed. The catchment for the stop includes Philip Oval and the Sports Centre, Canberra College and several residential developments that are planned or likely in the immediate vicinity. A Park and Ride will be provided at Philip Oval. Yarra Glen roundabout works could enable an effective connection to the Hughes Shops located less then 800m away from this stop
	Woden Terminus 	The stop will be located at Callam Street opposite Bowes Street. The stop will function as the primary stop for the Woden Town Centre and will be integrated with the bus interchange.	*Side platform / Bus interchange*	The stop will be highly visible on Callam Street opposite Bowes Street. It will be accessed by a signalised pedestrian crossing on Callam Street at one end of the stop only. Callam Street will be closed to general road traffic (except buses, LRVs and emergency vehicles) between Bowes Street and Bradley Street. This will consolidate bus and light rail infrastructure onto Callam Street, providing a 'transit mall' that allows for public transport transfers and frees up space elsewhere for development and activation. Connectivity to the Woden Town Centre will be via new footpaths.

Figure 5-13: Walking catchment surrounding proposed stops



5.11.3 Operating hours and scheduling

The operating hours for Stage 2B will be similar to Stage 2A, with:

- The first service northbound from Woden to Gungahlin proposed to leave at or before 0600 on weekdays and Saturdays, and at or before 0800 on Sundays
- The last service northbound from Woden to Gungahlin proposed to leave at or after 2330 on Sundays to Thursdays, and at or after 0100 on Friday and Saturday nights (i.e. 0100 Saturday and Sunday)

The frequency of the service will be identical to Stage 2A and City to Gunghalin, mentioned above.

5.11.4 Light rail vehicles

The proposed LRV fleet size for the City to Gungahlin and then City to Woden network in total will be 30, though this is subject to ongoing design development. This will require the purchase of 12 additional LRVs (if 4 are purchased for Stage 2A). Similar to Stage 2A, all new LRVs will be similar in size and performance to the City to Gungahlin Light Rail LRVs but not necessarily identical, to achieve any improvements in technology.

5.11.5 Bus network integration

The Woden Bus Interchange will be a major facility located on Callam Street in the Woden Town Centre to complement and support light rail, providing convenient and seamless transfers for public transport passengers. Callam Street is to be reimagined as a transit boulevard between Bowes Street and Bradley Street, prioritising pedestrian and public transport movements and removing the role of private vehicle traffic on the street (i.e. Callam Street between Bowes Street and Bradley Street will be closed to private vehicles).

The light rail terminus is currently proposed to be either in the median or western verge of Callam Street, with bus stops along each side of the street. The design of the terminus will be mindful of the extension opportunities south of Woden Terminus, such as to Mawson. Retaining the potential for extensions may leverage significant development opportunities and provide for better integrations with the bus network and the planned new bus depot in Woden.

5.11.6 Depot

The depot will be expanded as part of Stage 2B to cater for the predicted 16 vehicles[86] that will be required to service the full City to Woden route, with a total fleet size of 30 for the Gungahlin to Woden alignment.

The stabling area will be expanded and further turnouts and crossovers will be required to facilitate extra connectivity and the maintenance building will be expanded to incorporate a third inspection bay and more stabling tracks.

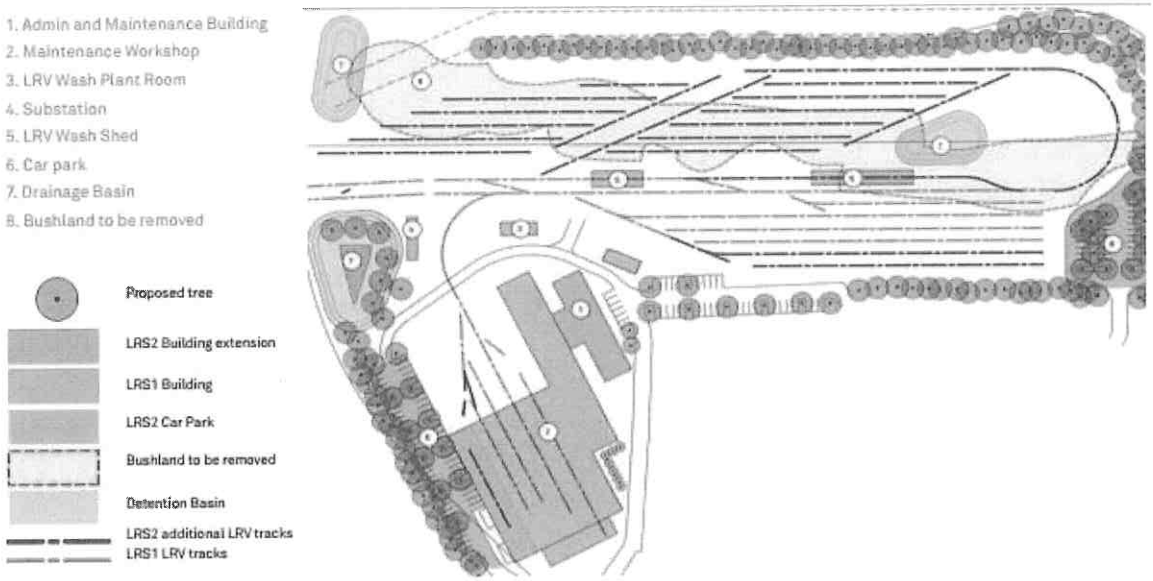
More staff will be required to operate and maintain light rail, including LRV drivers and customer service, rolling stock maintenance, infrastructure maintenance and supervisory and administrative staff.

A new office building parallel to the existing building is considered the most feasible option to accommodate additional staff facilities and working space as it will allow for almost all of the existing building to be used throughout construction. Increased car parking will also be required to accommodate additional staff who drive to work at the depot.

The extra office administration building, stores building, car park extensions and road layout changes are intended to be constructed contemporaneously (as opposed to commencing and completing each component sequentially). This is likely to be more efficient and less disruptive to ongoing operations. The plan for the updated depot is shown in Figure 5-14.

[86] *Four LRVs purchased as part of Stage 2A, plus an additional 12 LRVs anticipated to be procured as part of Stage 2B*

Figure 5-14: Updated depot for City to Gungahlin Light Rail and Stage 2B



Sign off that the functional brief/output specifications are sufficiently progressed in order to go to market under the delivery model selected and within the procurement timeline outlined in the Business Case.
Review 1 (Major Projects Canberra) Officer Name: _____
Signature: _____
Date: _____

6.0 Cost, Contingency and Financial Analysis

Key messages

- Estimated total Project outturn costs (nominal, P75) are $225.8m, including $60.7m contingency but excluding:
    - Potential additional Project scope, such as additional light rail vehicles, costs associated with wire-free running and additional works at the Mitchell depot; and
    - Separate projects, including the raising of London Circuit (if approved) and the construction of the Sandford Street Stop in Mitchell.
- Agency costs to support the delivery of the Project are not included in the abovementioned Project outturn cost. Agency costs will be subject to ordinary budget approval processes.
- Operating expenditure (including ongoing operations, maintenance and lifecycle costs) associated with the first full financial year of operations is anticipated to amount to approximately $8.3m, (including $3.1m contingency) (nominal, P75).
- The cost estimations in this Chapter do not represent a Project budget.

6.1 Cost estimate

6.1.1 Overview notes

The cost estimate contained within this Business Case is an *estimate only* and is not based upon final Project design (which will only occur following the Project's procurement process if the Project proceeds). The ultimate cost associated with the Project will be a function of many factors, including:

- Final Project scope and the ACT Government's Project requirements during the procurement process;
- Market capacity and other infrastructure projects underway; and
- The allocation of risk between parties and the realisation (or otherwise) of such risks.

The following Chapter outlines the cost estimate for the Project considered in this Business Case and outlined in Chapter 5.0.

Assumptions underlying the cost estimate are detailed in Table 67 in the Assumptions Book at the end of this document.

6.2 Project outturn cost estimate

The estimated Project outturn cost to deliver the Project has been calculated in two stages:

- The ACT Government engaged an expert and well-regarded cost estimation firm with deep, recent Australian light rail experience to calculate a non-risk adjusted base cost estimate. This firm also produced the opex / whole of life costs noted in this paper. That cost estimation firm calculated its estimate based upon:
    - A definition design generated by technical advisors;
    - Discussions with Major Projects Canberra and its technical advisors regarding proposed features of the light rail system; and
    - Its market knowledge regarding rates and other costs.
- A risk (contingency) figure was estimated by the ACT Government's commercial advisors following:

- The receipt of inherent risk percentages to reflect cost estimation risk supplied by the cost estimator;
- Contingent risk identification, allocation and quantification workshops conducted in conjunction with Major Projects Canberra and its advisors; and
- Monte Carlo analysis conducted on risk figures (contingent and inherent) generated during the foregoing workshops.

Based upon those cost and risk estimation processes, the anticipated Project outturn cost for the Project is outlined in Table 6-1 below.

Table 6-1: Project outturn cost estimate ($m, nominal, P75)

Cost area	Cost
Stops and Precincts	2.6
Roads and Utilities Infrastructure	18.8
Rail Alignment	12.3
Signalling, Rail Systems and Power	26.2
Depot and Stabling	7.4
Preliminaries	28.3
Traffic Management	3.4
Design	10.1
Insurance	2.2
Security & Bonds	0.9
Contractor's Overhead & Profit	13.4
Total Capital Cost	**125.5**
Rolling Stock[87]	23.1
Total Alignment Costs	**148.6**
Escalation	16.5
Subtotal	**165.1**
Contingency	60.7
Project Outturn Cost	**225.8**

The Project outturn cost to construct Stage 2A is made up of:

- 66% total alignment costs, of which the most significant contributors are preliminaries and signalling, rail systems and power which represent 19% and 18% of the total alignment cost respectively;
- 7% escalation;
- 27% contingency. This contingency figure is at a P75 level (discussed in further detail in Section 6.4)

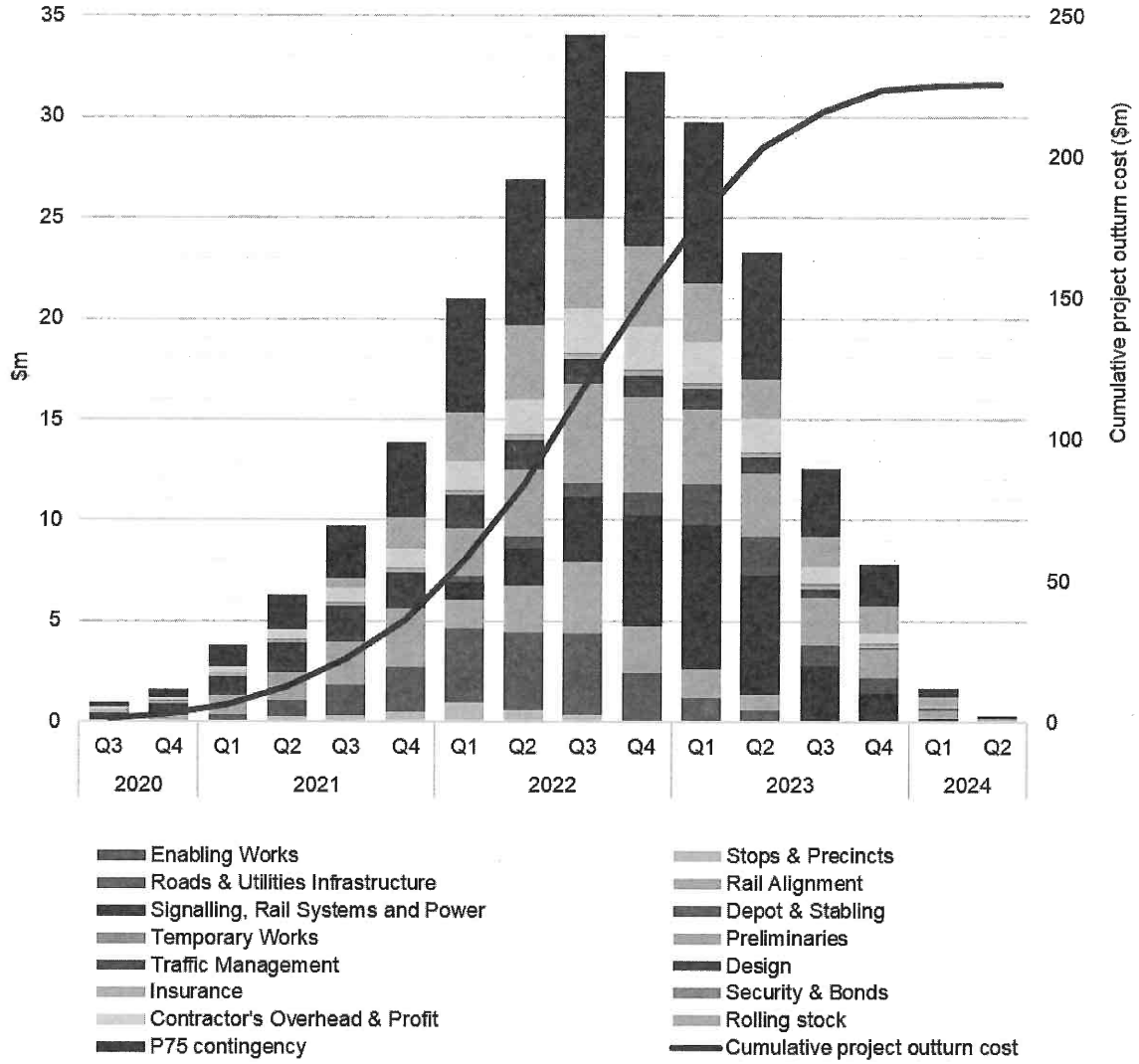
[87] *Before escalation and contingency*

6.2.1 Profile of capital cost

The following figure show the anticipated profile of Project outturn costs as per the breakdown of the capital cost provided by the cost estimator. The primary axis represents the expenditure for each category and the secondary axis represents the cumulative Project Outturn Cost over the period.

The figure highlights that construction activity peaks in 2022 Q3.

Figure 6-1: Quarterly profile of Project outturn costs ($m, nominal, P75)



6.2.2 Cost exclusions

Excluded from the cost estimate are:

- Scope exclusions:
    - Items outside the project scope, such as expansion of Mitchell Depot, the cost of retrofitting the existing fleet with wire-free technology, a Sandford Street stop in Mitchell and environmental offsets. These cost components can be found in Section 6.2.3;
    - Stage 2B costs, including 'early contractor involvement' costs associated with progressing planning and design for Stage 2B to Woden;
    - Any costs associated with raising London Circuit at Commonwealth Avenue;

- The construction of the ramp from London Circuit to Commonwealth Avenue, which is not required assuming the reconfiguration of the intersection to be at-grade;
- Other road works which may be beneficial to the Project

- Internal and procurement cost exclusions:
  - Internal ACT Government and advisory costs (including legal costs, independent certifier and Major Projects Canberra or Transport Canberra and City Services agency costs)
  - Costs associated with renegotiating City to Gungahlin Light Rail contract arrangements or costs associated with a revised City to Gungahlin Light Rail payment mechanism
  - Costs associated with a delayed start to the Project due to longer than anticipated Commonwealth Government approval processes
  - Any costs associated with amending the procurement approach during the Project's procurement phase, bid costs and costs associated with alternative procurement approaches should the recommended approach prove unsuccessful

6.2.3 Additional scope elements

The Project Outturn Cost outlined above excludes a number of scope items, that either are (i) not strictly necessary for the operation of Stage 2A, (ii) attributable to the City to Gungahlin route alignment or (iii) may be required following further Project development or consultation. An overview of these elements and the benefit of potentially procuring them in conjunction with Stage 2A are outlined in the table below. Capital costs and contingency figures are indicative and subject to further refinement.

Table 6-2: Indicative cost of additional scope or separate projects ($m, nominal, P75)

Scope element	Benefits of procurement in Stage 2A	Estimated cost
Additional four LRVs	• May provide opportunities for cost efficiencies and economies of scale in the production run, leading to a lower cost per vehicle • Assist in minimising impacts on City to Gungahlin Light Rail should wire-free running be required by the NCA to obtain planning approvals (see below) • May provide additional flexibility to ensure headways are met should Mitchell Stop be constructed (see below), or increased headways are proposed for City to Gungahlin Light Rail	35.0[88]
Depot expansion	• Provide flexibility to accommodate any additional fleet purchased by the ACT Government (see above)	69.3[89]
Wire-free running and urban design finishes	• The JSC recommended, and the Commonwealth Government agreed, that any light rail on or crossing Commonwealth Avenue, Kings Avenue, State Circle, Brisbane Avenue, Sydney Avenue, Canberra Avenue (to Manuka Circle), Hobart Avenue, Melbourne Avenue, Adelaide Avenue (to Kent Street) and in the Parliamentary Zone to be wire-free. This spans part of Stage 2A and 2B. As such it is likely that to obtain approval for City to Woden Light Rail sections of wire-free running will be required	28.0[90]

[88] *Contingency has been included on a proportional basis. A bottom up risk assessment has not been undertaken*

[89] *Contingency has been included on a proportional basis. A bottom up risk assessment has not been undertaken*

[90] *This is a high level estimate that refers to costs associated with the fitting of on-board energy storage systems to LRVs. It is likely that wire-free running requirements would result in other additional costs (e.g. charging stations) being incurred, but may also result in costs currently in the Project scope not being required (e.g. overhead catenary). Contingency has been included on a proportional basis. A bottom up risk assessment has not been undertaken*

Scope element	Benefits of procurement in Stage 2A	Estimated cost
	• As was the case with City to Gungahlin Light Rail, higher standard urban design finishes (when compared to light rail projects in other cities) are likely to be required to meet the NCA's standard to obtain Works Approval • Includes cost of batteries on new LRVs and retrofitting of the existing fleet • Will support urban amenity outcomes	
Sandford Street Stop in Mitchell	• Facilitate earlier delivery of the ACT Government commitment to construct a light rail stop at Sandford Street in Mitchell • Potential to minimise procurement and agency costs by procuring these works as part of a larger package • Potential for construction and consequently cost efficiencies in delivering the works as part of a larger package	7.9[91]
Environmental offsets	• Likely to be required to meet regulatory and planning approvals	1.0[92]
Total additional scope cost		**141.3**

6.2.4 Project outturn cost estimate notes

The following is noted regarding the Project outturn cost estimate:

- The Project Outturn Cost does not represent a Project budget. It represents an estimate of Project outturn costs only. A Project budget shall only be finalised following completion of the Project's procurement process;
- The estimate is based upon the Project's Definition Design;
- Any apparent errors in summation are due to rounding;
- There exist several risks and mitigation strategies associated with the Project which may impact upon the ultimate Project cost;
- Escalation allowance has been calculated by the cost estimator, based on a mix of materials' indices; and
- The expected Project outturn cost incorporates a P75 risk adjustment. This has regard to the extent of works undertaken on the Project to date, including various concept and definition design iterations. The full anticipated risk profile associated with the Project is summarised below in Section 6.4.

6.2.5 Benchmarking

Capital cost benchmarking of light rail projects is an especially challenging task, as:

- There is comparatively little cost information publicly available at a detailed level. This makes it difficult to determine whether projects are being compared on a like-for-like basis. For example, it is not always apparent whether items such as rolling stock, depots and utilities relocation have been included in publicly available figures;

[91] *This is the anticipated cost of constructing the Sandford Street Stop as estimated and provided by Canberra Metro. For the purposes of this analysis, Canberra Metro's estimate was assumed to already include a provision for contingency*

[92] *This is a high level indicative estimate of the potential environmental offset required and is subject to further analysis*

- Projects may have very different physical characteristics (e.g. bridges, tunnelling) which substantially impact the cost per kilometre of the system;
- Some costs may be included in other light rail projects which are not strictly a direct component of the light rail Project; and
- Light rail projects may involve route extensions or conversion of heavy rail lines, further complicating the ability to make like-for-like cost comparisons.

Nevertheless, in determining the cost estimate contained above, the Project's cost estimator has had regard to confidential benchmarking data.

6.2.6 Comparison to City to Gungahlin cost estimate

Care should be taken when comparing the cost per kilometre for the Project to that of the City to Gungahlin project. While the Project has a higher cost per kilometre when compared to City to Gungahlin Light Rail, this comparison does not account for a number of important factors, including:

- Passage of time: due to the passage of time, costs have been subject to escalation since City to Gungahlin Light Rail's cost was agreed. On top of this, the large number of projects in planning of delivery on the east coast (see Figure 8-3) has impacted on demand for key inputs and anticipated escalation rates;
- Complexity: the Project requires the construction of large structures, such as a ramp and bridge over Parkes Way (detailed above). City to Gungahlin Light Rail did not require any large structures. Furthermore, Stage 2A reflects predominantly running along what is currently a street (as opposed to median) environment;
- Scale: the smaller scale of the Project at 1.6km, when compared to City to Gungahlin Light Rail at 26km, may impact on the achievement of economies of scale; and
- Contingency: to account for the increasing complexity of the Project, particularly in relation to planning and approvals and interfaces with surrounding Projects in and around the route alignment (see Section 8.2.3), the Project has a larger contingency when compared to City to Gungahlin Light Rail.

6.3 Operating cost and whole of life expenditure estimate

The operation and mobilisation periods assumed for the purposes of this Business Case are outlined in Table 6-3.

Table 6-3: Indicative operating period assumptions for analysis only[93]

Assumption	Value
Operator mobilisation period	Four months prior to the commencement of operations
Operations start date	2024
Operations end date[94]	August 2038

[93] *It should be noted that changes to these timing assumptions will impact on the nominal figures reported in this Section*

[94] *The operations end date for the Project will coincide with the conclusion of the existing City Gungahlin Light Rail concession period*

6.3.1 First year of operations opex estimate

Operations, maintenance and lifecycle costs relating for the first year of operations for the Project are shown in Table 6-4.

Table 6-4: Project Opex cost estimates – first year[95] of operations ($m, nominal, P75)

Cost area	Cost
Salaries and wages	2.5
Depot / Stabling Costs	0.1
Operations and General Costs	1.1
Electricity Supply	0.2
Special Events	0.2
Total Operating Costs	**4.1**
Vehicle maintenance costs	0.5
Infrastructure Maintenance	0.5
Total Maintenance Costs	**1.0**
Lifecycle Costs	**0.1**
Subtotal	**5.2**
Contingency	3.1
Total Opex	**8.3**

Salaries and wages are the most significant component of opex in the first year of operations, at 30%. As operator mobilisation occurs in the four months prior to the commencement of operations it is not included in this table.

[95] *This has been calculated as the first 12 months of operations (i.e. not financial year)*

6.3.2 Whole of life opex cost estimate

The tables and figures below outline the operating, maintenance and lifecycle costs over the operational period for the Project.

Figure 6-2: Operating, maintenance and lifecycle costs ($m, nominal, P75)

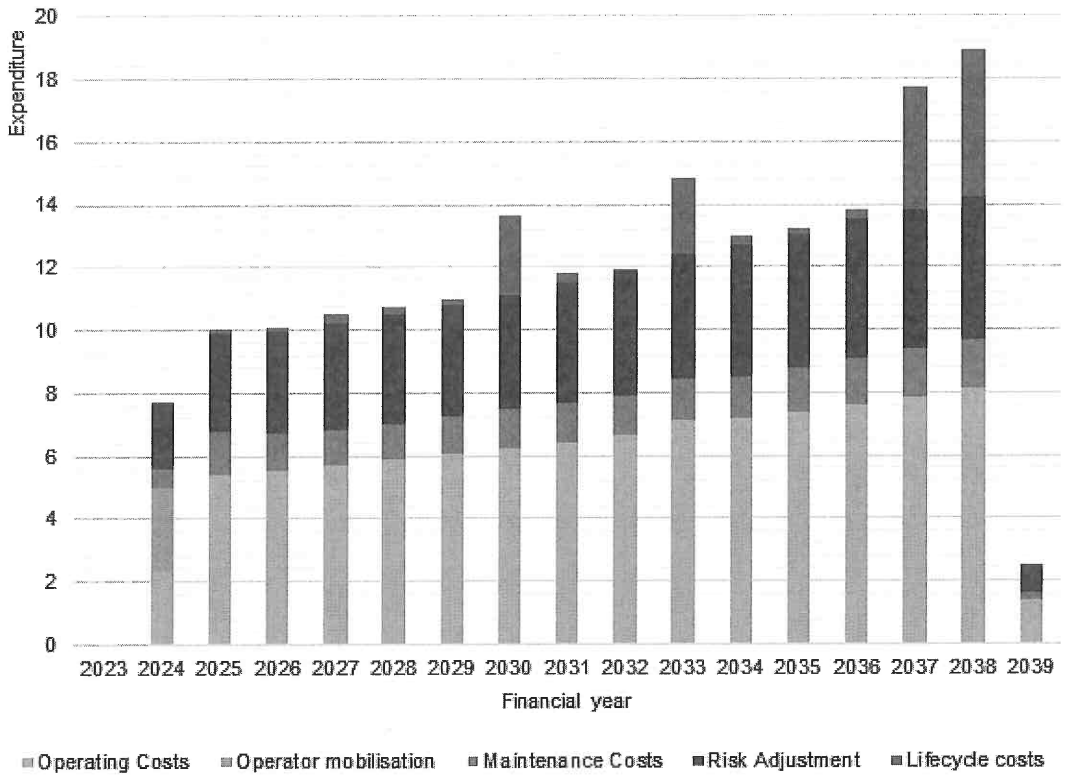


Table 6-5: Operating, maintenance and lifecycle costs ($m, nominal, P75)

Cost area	FY2024[96]	FY2025[97]	FY2030	FY2035	FY2038[98]	Whole of Life
Operating Costs	2.3	5.4	6.2	7.4	8.1	97.0
Operator Mobilisation	2.7	0.0	0.0	0.0	0.0	2.7
Maintenance Costs	0.6	1.3	1.2	1.4	1.5	19.1
Lifecycle Costs	0.0	0.1	2.5	0.2	4.7	15.8
Total Operating Cost	***5.6***	***6.9***	***10.0***	***9.0***	***14.4***	134.6
Contingency	2.1	3.2	3.6	4.3	4.5	56.9

[96] *Operator mobilisation occurs four months prior to the commencement of operations*

[97] *First full financial year*

[98] *Final full year of the O&M contracted term*

Cost area	FY2024[96]	FY2025[97]	FY2030	FY2035	FY2038[98]	Whole of Life
Total risk adjusted cost	7.7	10.0	13.6	13.2	18.9	191.5

The tables and figures above highlight the growth in operating, maintenance and risk over the period in accordance with escalation and the variable profile of lifecycle costs in accordance with the assets' expected useful lives.

Significant lifecycle costs occur periodically, with peaks in 2030, 2033, 2037 and 2038. As the operating period is assumed to conclude in August 2038, there is only two months of operational cost in the final year of operations assumed for this analysis, resulting in the lower expenditure in that year.

6.4 Project contingency

As noted in Section 6.2, contingency was calculated on a different (and larger Project scope). The contingency, as a proportion of capital cost, that was estimated has been used to determine the current Project contingency. As such this figure is an indicative estimate only. The current Project scope should be subject to a bottom up risk assessment.

The process for determining contingency for the full project scope is shown below.

The ACT Government hosted a series of risk allocation and quantification meetings to inform the Project's development.

Those meetings sought attendee input into:

- The likelihood of a risk event occurring;
- The likely cost and programme impact of a risk event occurring; and
- The likely distribution around anticipated cost and programme impacts.

Mote Carlo simulations were then applied to estimate the uncertainty levels and probability distributions associated with the Project. This risk analysis will also help inform future procurement activities.

The process resulted in the determination of the Project's P50, P75 and P90 construction and operation risk estimates. This was then applied to the core Project scope.

The results are outlined in Table 6-6 and Table 6-7 respectively.

Table 6-6: P50, P75 and P90 Project outturn cost estimates (LHS, $m, nominal) and contingency as a proportion of capital cost (RHS, %)

Cost area	P50	P75	P90
Capital Cost	165.1	165.1	165.1
Contingency	49.5	60.7	70.7
Contingency % of Capital Cost	***30%***	***37%***	***43%***
Total Project outturn cost	214.6	225.8	235.8

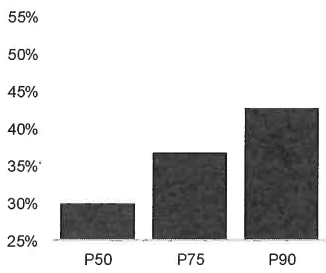
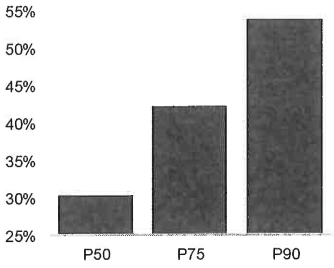


Table 6-7: P50, P75 and P90 opex cost estimates (LHS, $m, nominal) and contingency as a proportion of operating cost (RHS, %)

Cost area	P50	P75	P90
Operating Cost	134.6	134.6	134.6
Contingency	40.9	56.9	72.6
Contingency % of Operating Cost	*30%*	*42%*	*54%*
Total Opex	175.5	191.5	207.2



The Project contingency is predominantly driven by the following risks:

- Risks associated with Commonwealth planning approvals and environmental approvals for the Project;
- Risks associated with third party developments that may impact on the Project, including the raising of London Circuit, land developments such as Section 63 and the Acton Waterfront, as well as road and other infrastructure upgrades.

More information on the Project's risks is outlined in Section 8.2.3.

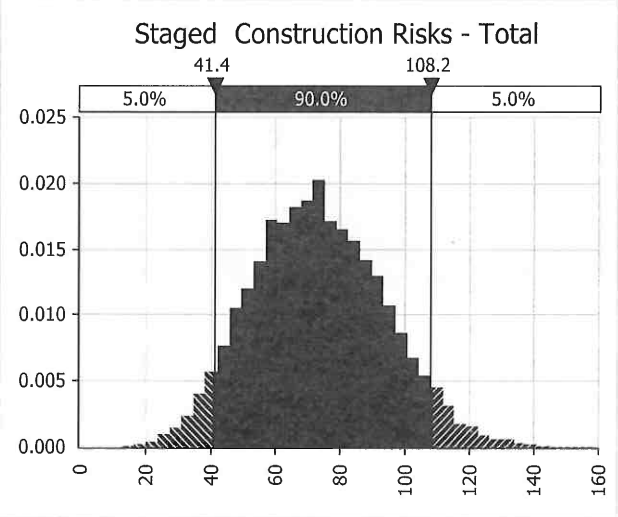
The presentation of the P75 figure for the Project outturn cost in Section 6.1 (as opposed to a P50, P75 or another figure) followed consideration of a range of factors, including works performed to date in developing this Business Case, an assessment of the anticipated approach of bidders to the procurement process and planning approval complexities.

The overall risk adjusted capital expenditure distribution profile is shown below. This histogram represents the distribution of potential risk outcomes (from a capital expenditure point of view) which may impact on the Project. In this regard:

- P50 is a mid-point estimate. It represents the Project cost with sufficient risk provision to provide a 50% level of confidence in the outcome i.e. that there is a 50% likelihood that the Project cost will not be exceeded;
- P75 represents the Project cost with sufficient risk provision to provide a 75% level of confidence in the outcome i.e. that there is a 75% likelihood that the Project cost will not be exceeded. In other words, it represents an estimate that has a 25% chance of being exceeded; and
- P90 represents the Project cost with sufficient risk provision to provide a 90% level of confidence in the outcome i.e. that there is a 90% likelihood that the Project cost will not be exceeded. In other words, it represents a conservative position, one that has an anticipated 10% chance of being exceeded.

The Monte Carlo simulation of P50, P75 and P90 construction risks is outlined below, depicting a relatively normal distribution.

Figure 6-3: Monte Carlo simulation of P50, P75 and P90 construction risks ($m, real)



6.5 Funding strategy

6.5.1 Funding strategy

The ACT Government (through ACT Treasury) is separately considering a funding strategy for the Project.

6.5.2 Revenue from operations (Farebox)

Under the contract, farebox revenue will be collected by the ACT Government. The operations phase will therefore result in revenues from operations through ticket sales to customers which will form part of the funding envelope. The following table outlines indicative potential revenues.

Table 6-8: Potential farebox revenue (nominal)

Assumption	Value
Estimated daily patronage (2026)	2,709
Estimated daily patronage (2036)	3,506
Inferred compound growth in patronage based on 2026 and 2036 patronage figures (Note 1)	2.61%
Estimated average fare per trip ($2019) (Note 2)	$1.27
Daily/annual multiplier (to convert average daily patronage to annual)	315
Estimated annual patronage revenues in first full year of operations (Nominal, $m in FY25)	**$1.0**
Estimated net present value of revenues from FY25 to FY39 ($m)[99] (Note 3)	**$16.8**

Source: Transport Canberra and City Services assumptions on estimated daily fare, considering an escalation rate of 2.5%.

Note 1: Based on a FY19 model commencement point. These are light rail revenues based on estimated light rail patronage in 2026 and 2036. This does not consider fare sharing arrangements between bus and

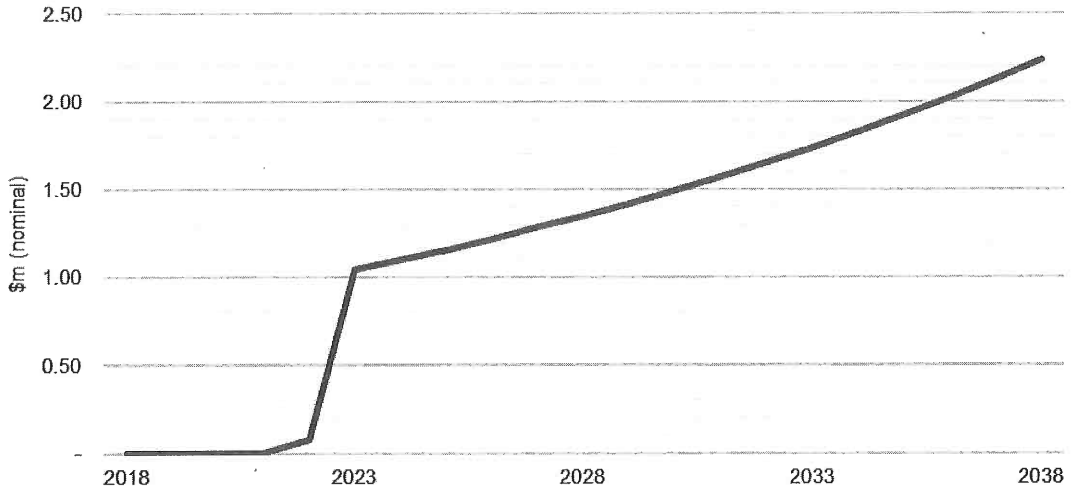
[99] *Totals represent additional patronage expected following the commencement of Stage 2A operations*

light rail trips and does not consider offsetting changes in bus patronage over the period as this will be considered separately.

Note 2: Estimated fare per trip in $2019 of $1.69 based on the Transport Canberra and City Services average fare for a MyWay journey between April 2019 and March 2019. This figure was reduced by 25% as proxy for potentially free interchanges between bus and light rail, resulting in a reduced figure of $1.27 noted in the table above.

Note 3: Discounted at 3.2%. The discount rate has been calculated as per the Infrastructure Australia Discount Rate Methodology guidelines, and updated as per the new Treasury guidance that requires usage of the Commonwealth bond rate with appropriately matching maturity and premium as the base for the Treasury risk-free rate. ACT Treasury guidelines have been developed based on the precedent discount rate methodologies and common practice in other jurisdictions.

Figure 6-4: Nominal cash flow generated from patronage (years are financial years ending 30 June)[100]



6.5.3 Other costs

The ACT Government may incur Project related costs which will not be included in the contracted amounts. In this regard:

- The ACT Government may, at its discretion, consider the provision of partial bid cost reimbursements if the Project does not proceed or for intellectual property; and
- The ACT Government will incur costs during the procurement, construction and operational phases of the Project which are not passed to third parties (for example, costs associated with independently certifying construction works). These costs will be:
    - In part influenced by commercial principles adopted during the procurement process;
    - Subject to the realisation or otherwise of risk events during the procurement and delivery process; and
    - A function of ordinary budget discussions from year to year. The apportionment of costs as either capital or operating expenditure is subject to future assessment.

[100] *The graph only includes to the end of 2038 as this is the last expected full financial year of the operating term*

6.6 Indicative Stage 2B and Delay Costs

Delivery of Stage 2B will be the subject of a separate business case with future recommendations to Cabinet once Commonwealth planning approval processes are further resolved.

Cost estimates for Stage 2B will be included in a future Business Case to Cabinet.

Indicatively however, inclusive of contingency and assuming delivery in the period FY2022 to FY2025, the estimated Project outturn cost of Stage 2B may be in the region of $1,245m (nominal, P75). Therefore, the cost of the staged delivery of City to Woden Light Rail may be $1,471m (nominal P75).

Both Stage 2A and Stage 2B may be delayed due to longer than anticipated Commonwealth Government approvals processes or due to longer than anticipated timeframes to resolve commercial matters with the Commonwealth. The table below provides an indication of additional project costs *through escalation alone* that may be realised by Project delays (and assuming delays are incurred prior to a contract for the main works being signed).

Table 6-9: Indicative Delay Costs ($m, nominal, P75)

Delay to commencement (Years)	Stage 2A (Assume 2020 Contract)	Stage 2B (Assume 2023 Contract)
1	9.1	52.3
2	17.1	92.8
3	24.8	133.5

The above analysis assumes a minimum 3% increases in costs each year with a P75 estimate based on a proportional allocation of contingency in line with the contingency levels of the City to Woden alignment through State Circle.

7.0 Economic Analysis

Key messages

- The Project is the next phase of development of a north-south light rail corridor between Gungahlin and Woden via the City. Major Projects Canberra has derived an indicative blended Benefit Cost Ratio, inclusive of wider economic benefits, between Gungahlin and Woden of 1.2.
- An indicative blended Benefit Cost Ratio, inclusive of wider economic benefits, between Gungahlin and Commonwealth Park is also expected to be 1.2.
- A Cost Benefit Analysis (CBA) was undertaken for the City to Woden (Stage 2A and 2B) route alignments to produce Benefit Cost Ratios (BCRs) and Net Present Values (NPVs).
- The full City to Woden route (Stage 2A and 2B) is expected to deliver $1,217m ($2019, PV at 7%) in benefits over the 30-year appraisal period, comprising:
    - $349m in transport benefits
    - $402m in city-shaping benefits
    - $466m in wider economic benefits
- Costs for the City to Woden (Stage 2A and 2B) Light Rail, including a P50 contingency, amount to $1,173m ($2019, real, PV at 7%), consisting of capital, operating and development costs for both Stage 2A and the full route.
- As a result, the full City to Woden (Stage 2A and 2B) Light Rail has a BCR of 1.0 and an NPV of $44m.

7.1 Introduction

This Chapter outlines the results of the Cost Benefits Analysis undertaken to support the ACT Government's consideration of City to Commonwealth Park Light Rail (Stage 2A) as the initial component in extending light rail south from the current terminus at Alinga Street to Woden.

In recognition of the ACT Government's commitment to extend light rail to Woden and provide a north-south public transport spine between Gungahlin and Woden, Major Projects Canberra has derived an indicative blended benefit cost ratio (BCR) for:

- Gungahlin to Woden; and
- Gungahlin to Commonwealth Park.

The economic appraisal outlined in this Business Case considers both:

- City to Woden Light Rail via State Circle (Stages 2A and 2B; and
- City to Commonwealth Park Light Rail (Stage 2A), with operations commencing in 2024.

An outline of the proposed timeline for the construction and operational commencement for Stage 2A and Stage 2B and other important assumptions are outlined in subsequent sections of this Chapter.

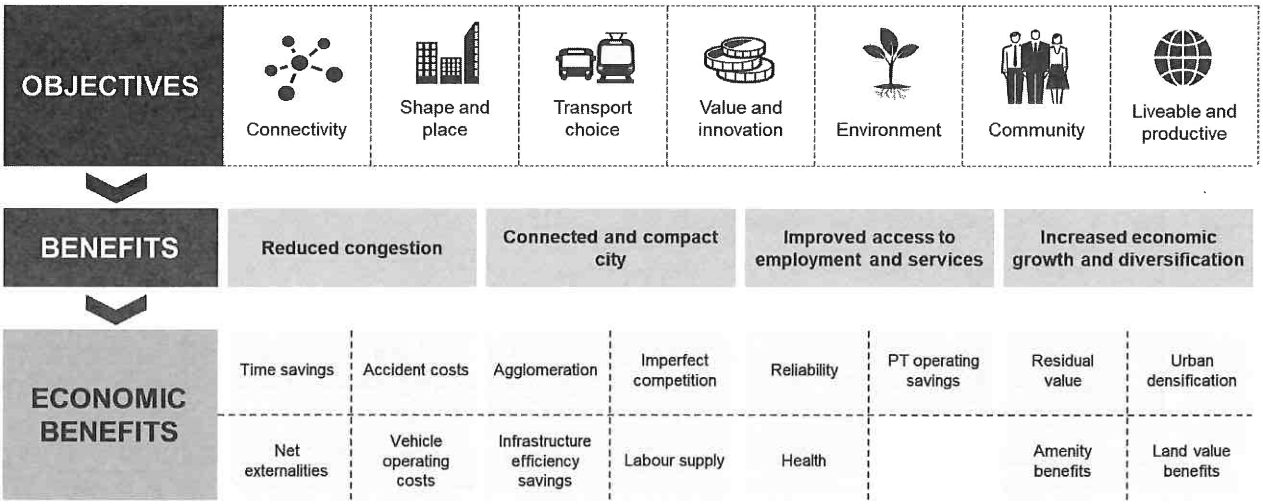
The CBA assesses the range of costs and benefits accruing to transport users, operators, the government and the general community as a result of the two options. The benefits presented in this Chapter are split into three categories:

- Transport;
- City-shaping; and

- Wider economic benefits.

These three categories align to the benefits identified in the Investment Logic Map (ILM). The figure below illustrates the relationship between the Project objectives defined, the benefits identified in the ILM and the economic benefits identified in the economic appraisal. This relationship – and the 'unlocking' of the Project's potential benefits – has been a critical consideration in the assessment and analysis of the Project undertaken for the Business Case.

Figure 7-1: Relationship between Project objectives and benefits



7.1.1 Route alignment

The indicative blended BCR derived by Major Projects Canberra encompasses the north-south public transport spine from Gungahlin to Woden and the staged development from Gungahlin to Commonwealth Park. These have not been developed on the basis of a single Cost-Benefit Analysis, but are a 'blend' of results from the Stage 1 business case cost-benefit analysis (escalated to 2019) and the Stage 2A and Stage 2A / 2B cost-benefit analysis results contained herein. As a consequence, differing assumptions underpin the indicative 'blended' BCRs in respect of light rail between Gungahlin and Woden and Gungahlin to Commonwealth Park. They are presented, however, to provide an indication of the economic benefit and cost outcomes across the entirety of the Gungahlin to Woden corridor.

7.1.1.1 Gungahlin to Woden

This analysis utilises:

- Gungahlin to the City benefits as per the Light Rail Stage 1 business case;
- Actual Gungahlin to the City project costs as presented in the Project Delivery Report; and
- Stage 2A and Stage 2B analysis as set out below.

7.1.1.2 Gungahlin to Commonwealth Park

This analysis utilises:

- Gungahlin to the City benefits as per the Light Rail Stage 1 business case;
- Actual Gungahlin to the City project costs as presented in the Project Delivery Report; and
- Stage 2A analysis as set out below.

The economic appraisal in this Chapter presents the economic results for both the Stage 2A and City to Woden (Stage 2A and 2B) light rail alignments.

7.1.1.3 City to Commonwealth Park (Stage 2A)

The proposed light rail route commences in the City's central business district from the City to Gungahlin Light Rail terminus at Alinga Street and travels south along Northbourne Avenue, around the west side of London Circuit and onto Commonwealth Avenue. The Commonwealth Park terminus stop is located on Commonwealth Avenue, north of the intersection between Commonwealth Avenue and Albert Street.

7.1.1.4 City to Woden (Stage 2A and 2B)

The proposed light rail route alignment commences in the City from the existing terminus of the City to Gungahlin Light Rail service and travels south along Northbourne Avenue before crossing Lake Burley Griffin via Commonwealth Avenue Bridge. From the Bridge it travels through the Parliamentary Triangle via State Circle (East) and continues to the Woden Town Centre via Adelaide Avenue, terminating at Callam Street.

7.1.2 Base Case

The base case represents a 'business as usual' scenario under which each respective light rail option is not constructed. The base case includes the continuation of existing programmes, such as proposed upgrades to the road network and proposed city shaping developments, such as those within the Acton Waterfront precinct, which are assumed to occur from 2024.

All options and sensitivities are presented relative to this base case. Key assumptions for the base case, including those related to the Acton Waterfront development, are outlined in Table 7-1.

Table 7-1: Base case overview

Assumption	Description
General	
Transport network	• Planned road upgrades across the Territory including a series of road upgrades on and around Parkes Way • London Circuit/Commonwealth Avenue Intersection assumed to be grade separated[101] • Several park and rides implemented in future years
Public transport	• City to Gungahlin Light Rail in operation • **Stage 2A route economic appraisal:** Canberra's 2019 bus network, with future updates in line with greenfield developments • **Full route economic appraisal:** Bus network as outlined in the Public Transport Service Plan, with future updates in line with greenfield developments • The difference between the two bus networks highlighted above include changes to the R7 and R10 rapid bus routes, the addition of peak express routes 180, 181 and 182 between Tuggeranong and the City, and the removal of other peak express services. • Public transport fares remain constant at $2.67 in real terms

[101] *Approval for works to raise London Circuit to meet Commonwealth Avenue at a newly formed signalised intersection is being sought as part of a separate Business Case. In this economic analysis, light rail will travel up a ramp between London Circuit and Commonwealth Avenue. However, under an at-grade configuration, light rail would traverse along the median through the intersection, turning right onto Commonwealth Avenue.*

Assumption	Description
Land use	Land use in the base case is consistent with the Canberra Strategic Transport Model (CSTM), with the development of the Acton Waterfront precinct occurring between 2025 and 2030 as per land use strategies, which is detailed further below.
Parking	Parking costs are assumed to increase throughout the Territory at varying rates depending on the location.
Fuel	The fuel price is assumed to be 140c per litre in 2011 and grow every year
Acton Waterfront development assumptions	
Commercial	• GFA: 36,643 m^2 • Land release timeline: gradual release of lots from FY2025 until FY2030 • Sale price: $1,800 per m^2
Residential	• GFA: 207,644 m^2 (approx. 2,076 dwellings based on 100 m^2 each) • Land release timeline: gradual release of lots from FY2025 until FY2030 • Sale price: $1,060 per m^2
Land development costs	Land development costs include professional fees, site preparation costs, infrastructure works, statutory fees, marketing costs, legal fees, council rates, sales commission and a valuation fee.

7.1.3 City to Commonwealth Park (Stage 2A) Project case

The Project case includes the construction and operation of Stage 2A and the acceleration of the Acton Waterfront development. The assumptions underlying the Project case are shown in Table 7-2.

Table 7-2: Project case overview

Assumption	Description
Transport network	Everything included in the base case with road modifications necessary to accommodate the Stage 2A route including: • Removal of the slip lane from London Circuit (westbound) to Commonwealth Avenue (southbound) • A new bridge is built to accommodate light rail travelling over Parkes Way • The London Circuit/Commonwealth Avenue Intersection is assumed to be grade separated[102] *Note: these assumptions are made for economic modelling purposes only and are subject to separate consideration by Cabinet.*
Public transport	• City to Commonwealth Park Light Rail is constructed • Base case bus network. A decision on how the bus network will integrate with the Project once operations commence will be taken in due course *Note: these assumptions are made for economic modelling purposes only and are subject to separate consideration by Cabinet.*
Land use	Land use in the Project case is consistent with the base case, except for the development of the Acton Waterfront precinct which is assumed to be accelerated i.e. construction is brought forward and have a more compressed period, as detailed in Section 7.1.3.1.
Parking	Assumptions are as per base case
Fuel	Assumptions are as per base case

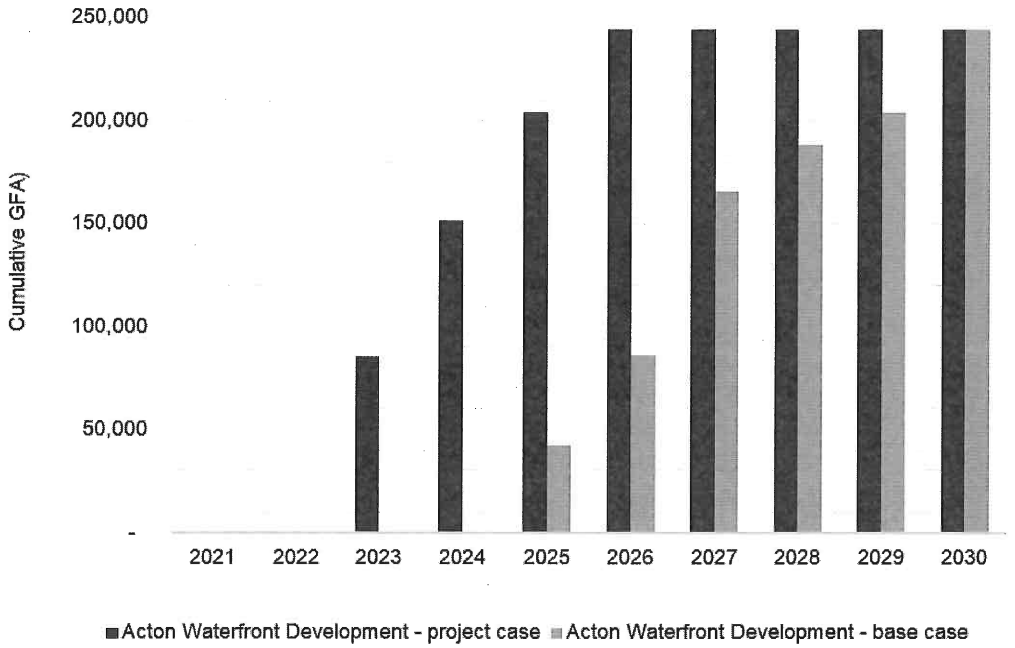
7.1.3.1 Land use assumptions

The ACT Government has stated that, although the Acton Waterfront development may proceed irrespective of the Project, construction of the Stage 2A light rail will accelerate the completion of commercial and residential developments in the precinct. As such, this CBA captures the incremental benefits that flow from the accelerated development of the Acton Waterfront.

Figure 7-2 compares the development profile assumed in the base case (which aligns with City Renewal Authority plans and the Territory land release program) with the accelerated development profile assumed in the Project case.

[102] *Approval for works to raise London Circuit to meet Commonwealth Avenue at a newly formed signalised intersection is being sought as part of a separate Business Case. In this economic analysis, light rail will travel up a ramp between London Circuit and Commonwealth Avenue. However, under an at-grade configuration, light rail would traverse along the median through the intersection, turning right onto Commonwealth Avenue.*

Figure 7-2: Cumulative GFA (residential and commercial) released at the Acton Waterfront in the project and base cases



A change to any assumptions made for either the base or Project case would have a material impact on the economic appraisal and the results presented in this Chapter.

7.1.4 City to Woden (Stage 2A and 2B) project case

The project case includes construction and operation of the City to Woden (Stage 2A and 2B) Light Rail. The assumptions underlying the project case are shown in Table 7-3.

Table 7-3: Project case overview

Assumption	Description
Transport network	As base plus road modifications necessary to accommodate the full route including: • Removal of the slip lane from London Circuit (westbound) to Commonwealth Avenue (southbound) • Intersection upgrades on Parkes Way between Kings Avenue and Coranderrk Street • A new infill bridge is built to accommodate light rail travelling over Lake Burley Griffin, noting that further consultation with the NCA will be required on the crossing • The London Circuit/Commonwealth Avenue Intersection is assumed to be grade separated[103] *Note: these assumptions are made for economic modelling purposes only and are subject to separate consideration by Cabinet.*

[103] *Approval for works to raise London Circuit to meet Commonwealth Avenue at a newly formed signalised intersection is being sought as part of a separate Business Case. In this economic analysis, light rail will travel up a ramp between London Circuit and Commonwealth Avenue. However, under an at-grade configuration, light rail would travel through the intersection, turning right onto Commonwealth Avenue.*

Assumption	Description
Public transport	Base case bus network with adaptions to accommodate light rail. These changes to the bus network have been adopted for the purposes of transport modelling only. A decision on how the bus network will integrate with the full route once operations commence will be taken in due course. Bus changes include: • R4 altered to operate between Lanyon and Woden via Greenway as a local service • R5 altered to terminate at Russell • Routes 170 and 171 were extended from Erindale to Woden, operating between Calwell and Woden as a rapid service • Other parallel bus-light rail services have been removed from the network to be redeployed as feeder buses to the full route, such as buses from surrounding suburbs to Woden • Other associated bus network assumptions have also been made *Note: these assumptions are made for economic modelling purposes only and are subject to separate consideration by Cabinet.*
Land use	• The Project case assumes that the light rail investment will unlock accelerated growth of population and employment in the light rail corridor at the expense of growth elsewhere in the ACT • The Acton Waterfront development is assumed to be accelerated; i.e. constructed is brought forward with a more compressed construction period • Land use is further outlined below
Parking	Assumptions are as per base case
Fuel	Assumptions are as per base case

7.1.4.1 Land use assumptions

An assessment of potential land use changes that will accompany the development of the full route has been developed, resulting in changed employment and population forecasts across the Territory due to an intensification of activity in the City to Woden Light Rail's area of influence.[104] It should be noted that the Territory-wide population and employment forecast and demographics remain constant between the base and project cases; only the distribution of future growth is assumed to change reflecting the City to Woden Light Rail's city-shaping potential.

The area of influence is split into seven precincts developed due to the City to Woden Light Rail as shown in Figure 7-3. These are described in further detail in Section 5.2. Notable developments in the Project case include the Acton Waterfront, North Curtin and a more compact and efficient urban form in Woden.

[104] *The area of influence for the Project was determined using spatial analysis of the route alignment. The area of influence was initially determined using a linear catchment of 1,200m either side of the route alignment in activity centres and 800m in areas outside of activity centres. To refine the area of influence local conditions were considered – constraining factors such as land uses that were unlikely to change (for example, conservation areas) resulted in a contraction of the area of influence, whereas major employment zones or existing active travel infrastructure could expand the area of influence.*

Figure 7-3: Route alignment and precincts

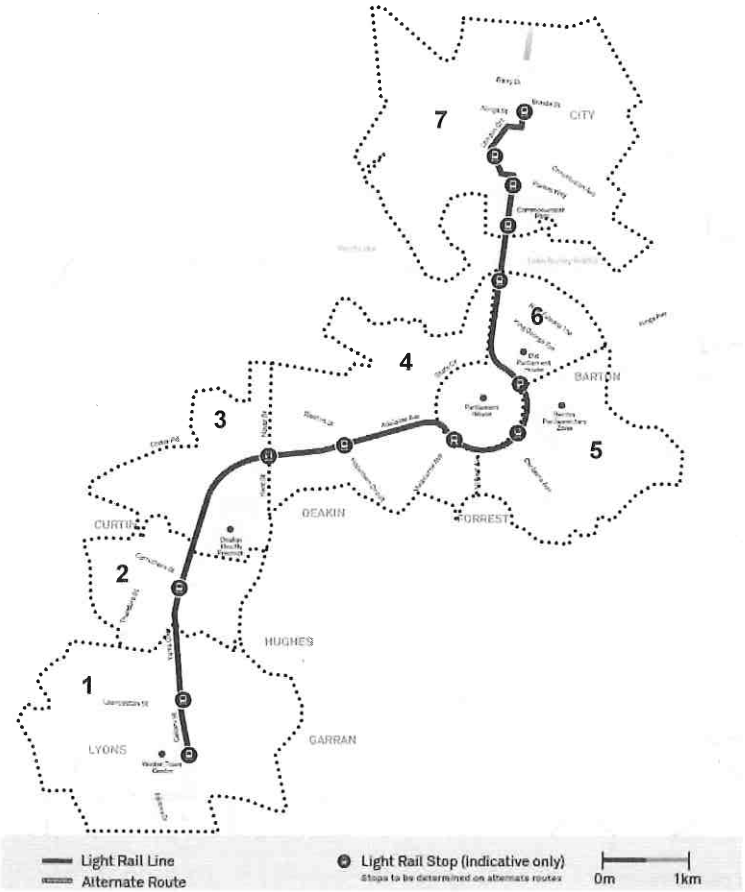


Table 7-4 below shows population and employment in the urban renewal precincts in the business as usual scenario in the base case and in the full route land use scenario in the project case.

Table 7-4: Precinct demographic changes

Precinct	Base case – BAU		Project case – City to Woden	
	Population	Employment	Population	Employment
	2046	2046	2046	2046
1	12,049	25,211	23,256	31,265
2	2,414	1,910	4,977	2,798
3	2,249	5,666	7,181	9,033
4	4,777	2,088	6,036	3,124
5	10,562	24,613	13,393	28,354
6	16	7,238	13	8,641
7	40,428	83,832	46,353	81,571
Total	***72,495***	***150,558***	***101,209***	***164,786***

7.1.5 Limitations

When interpreting the results presented in this Chapter, there are several limitations that should be kept in mind.

Firstly, while a CBA attempts to encompass all costs and benefits of a project to society, there are both elements that cannot be quantified/monetised as well as wider Project objectives that may not be well represented within the monetised benefits and costs. For example, improvement in connectivity and urban fabric are difficult to quantify in a CBA, but do provide a social benefit to the Canberra community.

Noting this, a BCR greater than 1 is not a guarantee of project success. Similarly, a BCR less than 1 does not necessarily mean the project should not go ahead. Consideration should be paid to these potential costs and benefits that have not been captured, as well as the project's strategic fit with broader Territory strategies and policies.

Light rail has specifications that make it a more attractive and convenient form of public transport. While some of these benefits are captured in the CBA (e.g. as light rail amenity benefits), this may not capture all impacts, such as:

- Relative to bus travel, light rail can provide a significant improvement to the mobility and access to opportunities for disadvantaged groups, including easy access to stops and vehicles for the mobility impaired, the elderly and for families, in a network that is easy to use and understand;
- Light rail tends to have lower physical barriers than other public transport options and requires fewer level changes;
- Light rail can assist in enhancing the reputation of Canberra as a desirable city in which to live, visit and invest;
- Given appropriate stop locations, light rail can also offer better quality access to community facilities and shopping opportunities, as well as improved personal safety relative to bus travel; and
- Light rail comfort is high when compared to other public transportation options.

Finally, there are several benefits derived by potential future projects that are dependent on both the Stage 2A and City to Woden (Stage 2A and 2B) routes (see Section 7.1.6). For example, future light rail extensions further south to Mawson or Tuggeranong, or east to Fyshwick or Kingston will have a lower capital expenditure due to the sunk costs in the constructed route. Additionally, the Project will support complementary land development projects, such as the urban renewal of the Acton Waterfront and City Hill.

In addition to the benefits that may not be captured, the following limitations should also be considered when interpreting a project's CBA:

- The economic appraisal assumes that the London Circuit/Commonwealth Avenue Intersection is grade separated. However, other sections of this Business Case assume that London Circuit is raised to meet Commonwealth Avenue at a newly formed signalised intersection, with approval for those works being sought as part of a separate Business Case. Under this road configuration, light rail will traverse the intersection, turning right onto Commonwealth Avenue. While this is not expected to have a material impact on the results, the economic appraisal does not directly align to the Project scope detailed in Chapter 5.0;
- As described in Section 7.4, the estimate of economic resource costs used for the CBA are not directly comparable to the costs presented in the financial appraisal chapter. This is caused by the following factors:

  - Economic costs are presented in real present value (discounted at 7%) terms, whereas costs in the financial appraisal chapter are presented in real and nominal terms; and
  - Economic costs are presented with P50 contingency. The financial appraisal presents costs with P75 contingency.
- The cost component of the CBA represents an estimate of the economic resource costs. Ultimately the Project outturn cost will be determined in large part by the private sector during the procurement process; and the occurrence (or otherwise) and severity of risk events during the life of the Project;
- The benefits component of the CBA may be influenced, both positively and negatively, by actions taken by the ACT Government subsequent to this business case;
- The benefits described in this Section are estimated using industry accepted methodologies, but they do not always reflect all impacts that one may perceive in practice. For example, a value that is attached to time travel savings from light rail may end up being reflected in higher property values along the rail corridor, as people value living near the light rail network. To avoid double counting of benefits, such impacts are only counted as a benefit once (in the above example they are captured as a travel time saving); and
- A CBA should not be regarded as the only tool which may appropriately be used by government in making an investment decision. It is appropriate for government to also have regard to a broad range of other factors, such as stakeholders' views, planning considerations and the Territory's overarching vision for Canberra.

It should be noted that values presented in this document have been subject to rounding. This can cause the appearance of arithmetic errors.

7.1.6 Future projects

The Stage 2A and Stage 2B route will enable future extensions of light rail from the north-south spine, which could deliver further economic benefits to Canberra. The ACT Government acknowledges that the City to Woden Stage of Canberra's Light Rail Network is a difficult stage due to constructability challenges along the route but recognises the importance of the stage as a critical element of the network.

Building the Stage 2A, and then Stage 2B, route now can therefore enable further benefits to be unlocked in the future. These benefits, which have not been included in this economic appraisal, can include:

- The reduction in the need to interchange between modes and lines;
- Better interchange between modes; and
- The potential to connect to new locations.

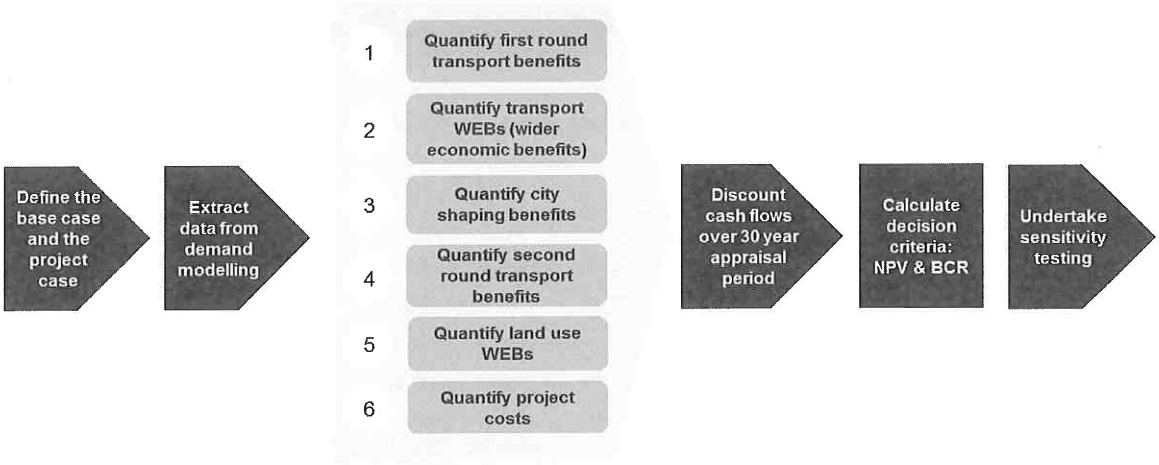
7.2 Methodology

7.2.1 Overview of method

The assessment of the economic merits of Stage 2A and City to Woden Light Rail (Stage 2A and 2B), including the consequential urban development, has been conducted using a CBA. The approach is consistent with the CBA used for the City to Gungahlin Light Rail Project, with appropriate modifications to reflect updated industry appraisal guidelines and parameters.

A high-level approach to the CBA is shown in Figure 7-4.

Figure 7-4: CBA methodology overview



There are three overarching benefit categories captured in the analysis:

- **Transport benefits** – benefits delivered due to the improvement of the transport system. It includes direct journey experience benefits such as travel time savings (to both public transport and highway users), reliability improvements and light rail amenity improvements. In addition, it captures external benefits such as reduced congestion and health benefits, and finally benefits accruing to government such as an increase in public transport fare revenue and bus operating cost savings.
- **City-shaping benefits** – benefits resulting from the land use change generated by the development of the respective Projects, and acceleration of development at Acton Waterfront as detailed in section 7.1.3.1. The benefits include land value uplift resulting from an increase in densification and infrastructure cost savings resulting from economies of scale in infrastructure provision.
- **Wider economic benefits (WEBs)** – productivity benefits that result from improved business-business and business-workforce connectivity, consisting of transport and land use agglomeration benefits.

All benefits captured under each category are shown in below. The results for all benefits and costs are discussed further in this Section.

7.2.2 Economic guidelines

This economic appraisal has been conducted in line with current guidelines, including the Australian Transport Assessment and Planning (ATAP 2018) and TfNSW Principles and Guidelines for Economic Appraisal of Transport Investment and Initiatives (released in March 2013, with updated parameters in Appendix 4 in March 2018). These guidelines, in addition to the National Guidelines for Transport System Management in Australia, provide the framework for this CBA and the relevant parameter values.

7.2.3 Economic assumptions

The economic analysis is underpinned by several parameters and assumptions. Table 7-5 identifies the key CBA parameters. Further detail on methodology and detailed parameters and assumptions is provided in the Assumptions Book at the end of this document.

Table 7-5: Key CBA assumptions

Assumption	Detail
Appraisal horizon	**City to Commonwealth Park:** The economic appraisal period includes the period of implementation (FY2022 – FY2024), and 30 years of operation. A residual value benefit is accounted for in the last year of operations **City to Woden:** The economic appraisal period includes: • The period of implementation for Stage 2A (FY2022 – FY2024), and 30 years of operation for the City to Commonwealth Park section • The period of implementation for Stage 2B (FY2022 – FY2025), and 30 years of operation for the Commonwealth Park to Woden section
Constant prices	All costs and benefits are estimated in constant FY2019 prices
Discount rate	All benefits and costs are discounted to their present value as at the start of the appraisal period. The analysis uses a 7% real discount rate as prescribed in ATAP and TfNSW evaluation guidelines. Sensitivity tests have been undertaken based on a 4% and 10% rate
Base case	Includes approved and planned road improvements and current bus network

7.2.4 Source of inputs

The table below shows the various sources for the cost and benefit inputs used in the economic appraisal.

Table 7-6: Sources of inputs to the CBA

Benefit	Input data	Source
Cost inputs	Project capital costs	Cost estimator
	Project operating costs	Cost estimator
	Development costs	Commercial advisor
Benefit inputs	Transport patronage and journey times in the base and Project cases (in 2026, 2036 and 2046)	Transport modeller
	Acton Waterfront land development timeline	Major Projects Canberra / City Renewal Authority
	Land use	Land use advisor
	Economic transport model outputs	Transport modeller

7.3 Transport model results

High-level results of the transport modelling undertaken by the ACT Government's transport modeller are presented for light rail, bus and car below.[105]

[105] *Results presented in this section represent first round benefits only – that is, they show the direct impact of construction of each Project on the transport network. Second round transport impacts caused by land use changes resulting from the construction of each Project are not shown but remain a significant aspect of the Stage 2A and City to Woden (Stage 2A and 2B) Light Rail.*

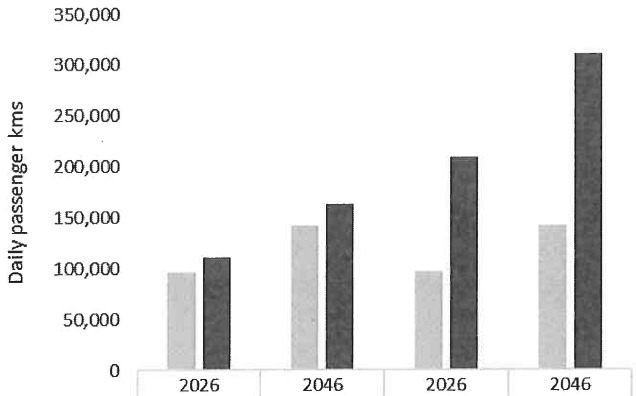
7.3.1 Light rail

The construction of the Stage 2A and City to Woden (Stage 2A and 2B) Light Rail directly increases the number of service and passenger kilometres on the light rail network in Canberra from the services provided by the City to Gungahlin corridor in the base case.

Light rail service kilometres are expected to directly increase by 14% with the introduction of Stage 2A and over double with the introduction of City to Woden Light Rail (Stage 2A and 2B). Light rail passenger kilometres are expected to directly increase over and above the relative increase in service kilometres.

Figure 7-5 shows the changes in daily light rail passenger kilometres between the base and Project cases, with a significant direct increase in patronage seen in each of the model years.

Figure 7-5: Light rail passenger kilometres (daily, 2026 and 2046)



	2026	2046	2026	2046
	Stage 2A		Full route	
Base case	96,715	142,368	97,139	142,152
Project case	111,235	163,064	208,758	310,739

7.3.2 Bus

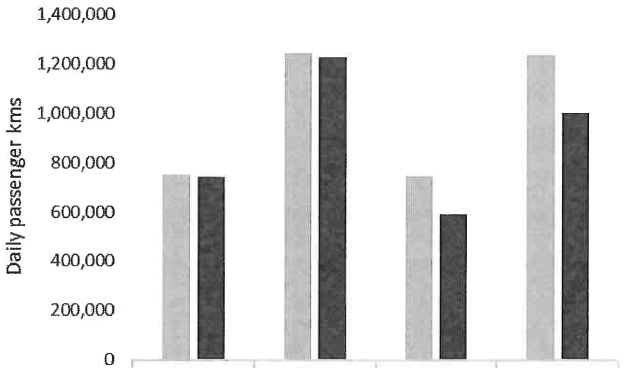
Figure 7-6 shows both the change in bus service and passenger kilometres between the base and project cases for the Stage 2A and City to Woden (Stage 2A and 2B) Light Rail. Figure 7-7 outlines the change in overall public transport service and passenger kilometres between the base and Project case.

Daily bus passenger kilometres are anticipated to decline slightly in the Stage 2A Project case when compared to the base case, while overall public transport passenger kilometres remain fairly constant over the appraisal period. Bus service kilometres, however, are also expected to decrease slightly for the City to Woden Light Rail (Stage 2A and Stage 2B) project case.

For the City to Woden (Stage 2A and 2B) Light Rail, daily bus passenger kilometres decline with the introduction of light rail, but the overall impact on public transport passenger kilometres is small, with the decrease in bus travel offset by an increase in light rail passenger kilometres.

It should be noted that a decision on how the bus network will integrate with the Stage 2A and City to Woden (Stage 2A and 2B) Light Rail once operations commence will appropriately be taken closer to the date of operations commencement (see Section 5.6.2).

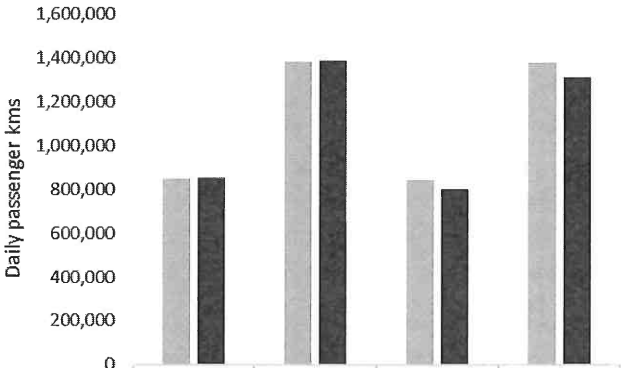
Figure 7-6: Network wide bus passenger kilometres (daily, 2026 and 2046)



	2026	2046	2026	2046
	Stage 2A		Full route	
Base case	750,108	1,241,238	746,298	1,235,176
Project case	741,017	1,226,168	589,727	999,350

While bus passenger kilometres are expected to decrease as a direct result of the introduction of light rail, overall public transport passenger trips are expected to increase (both relative to service kilometres and numerically) for Stage 2A. For City to Woden Light Rail (Stage 2A and 2B) the total public transport passenger kilometres are expected to decrease as a direct result. However, with the land use change that depends on the introduction of the full route, the passenger kilometres are expected to indirectly increase more significantly.

Figure 7-7: Network wide public transport passenger kilometres (daily, 2026 and 2046)

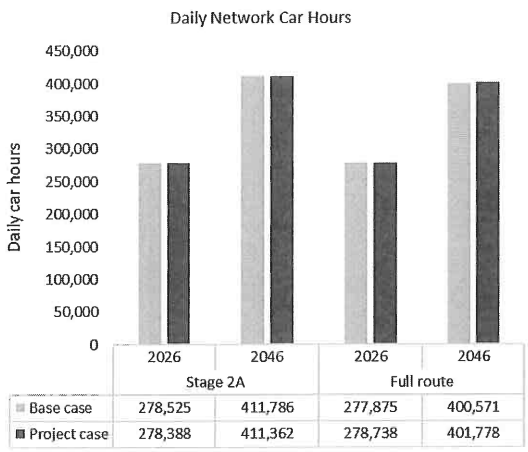


	2026	2046	2026	2046
	Stage 2A		Full route	
Base case	846,823	1,383,606	843,436	1,377,328
Project case	852,252	1,389,232	798,486	1,310,090

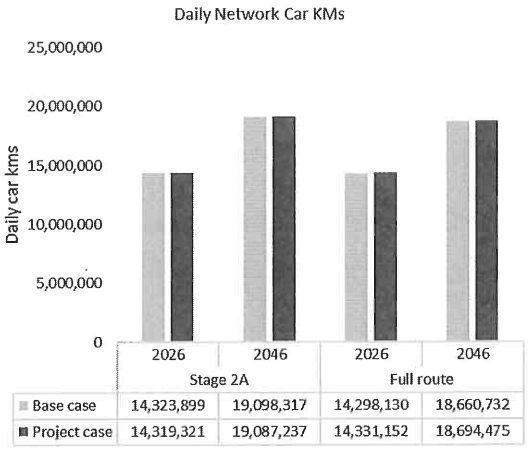
7.3.3 Highway

Figure 7-8 shows the change in car network kilometres and car hours between the base and project case for the Stage 2A and City to Woden (Stage 2A and 2B) Light Rail. Under both Stage 2A and the full City to Woden (Stage 2A and 2B) Light Rail, no significant change is expected in the first round in car network kilometres and car hours.

Figure 7-8: Network wide car kilometres and hours (daily, 2026 and 2046)



	2026	2046	2026	2046
	Stage 2A		Full route	
Base case	278,525	411,786	277,875	400,571
Project case	278,388	411,362	278,738	401,778



	2026	2046	2026	2046
	Stage 2A		Full route	
Base case	14,323,899	19,098,317	14,298,130	18,660,732
Project case	14,319,321	19,087,237	14,331,152	18,694,475

7.4 Project costs

Project costs have been provided by the cost estimator (with development costs sourced from the commercial advisor). Costs presented as part of the financial analysis have been adjusted for use in the economic appraisal for the Stage 2A and City to Woden (Stage 2A and 2B) Light Rail CBA. The cost figures used in the economic appraisal are:

- In real terms – $FY2019 (with real escalation);
- Subject to P50 contingencies; and
- Operating costs are over a 30-year appraisal period as opposed to the shorter financial appraisal period.

7.4.1 Capital costs

Capital costs for the Stage 2A route are assumed to be $162m ($2019[106], real, P50).

Capital costs for the City to Woden (Stage 2A and 2B) Light Rail route are assumed to be $960m ($2019, real, P50).

Capital costs for the Gungahlin to City component of the network are assumed to be actual project costs incurred by the Territory, as presented in the Project Delivery Report and escalated to $2019 for like-for like utilisation in the blended BCR analysis.

7.4.2 Operating costs

Operating and maintenance costs captured include those from operating the light rail routes, as well as required vehicle and infrastructure maintenance works. It does not include costs associated with operating the City to Gungahlin route. Any additional or avoided cost of services (such as bus routes that are no longer required) have been included as a benefit.

Operating and maintenance costs are expected to amount to $82m over the 30-year appraisal period for the Stage 2A route ($2019 real, P50); and to $190m over the 30-year appraisal period for the City to Woden (Stage 2A and 2B) Light Rail ($2019 real, P50). This is inclusive of life-cycle costs (renewals) required to maintain a sufficient level of operational performance.

[106] *All economic costs include real escalation to account for real changes in costs over time. In other words, the costs include escalated costs with inflation stripped out. Escalation over time that are caused by other factors (for example, technical changes, supply/demand and other effects) are accounted for when costs are escalated but not inflated.*

7.4.3 Development costs

Development costs associated with the Acton Waterfront development total $23m ($2019, real, discounted at 7%). These are costs associated with preparing Acton Waterfront for development, such as road and services connections. It represents the additional upfront cost of accelerating the development and construction of the Acton Waterfront (i.e. they are incremental to the development costs incurred in the base case).

7.4.4 Summary of Project costs

The table below shows a breakdown of the total cost for each option *for economic purposes only*.

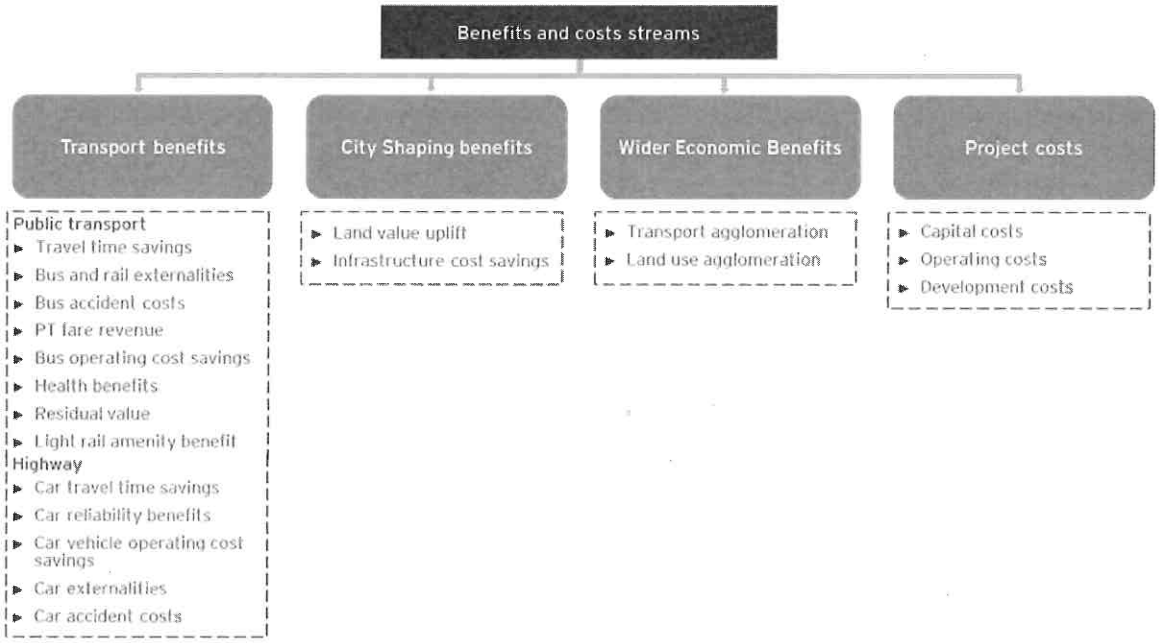
Table 7-7: Present value Project cost summary ($2019m, real, PV at 7%)

Cost Item	City to Commonwealth Park	City to Woden
Capital cost	162	960
Operation and maintenance costs	82	190
Development costs	23	23
Total Project cost	***268***	***1173***

7.5 Project benefits

This section explores the benefits captured by the CBA. Figure 7-9 shows the benefit and cost streams captured by the CBA.

Figure 7-9: Benefit and cost streams



7.5.1 Transport benefits

The transport benefits discussed in this section arise from both the change in transport provision and change in land use.

The Stage 2A and City to Woden (Stage 2A and 2B) Light Rail will have the following direct benefits on users of the transport system.

- **Travel time savings** – reduction of travel time by light rail, bus and road;
- **Reliability** – reduction in road travel time variability;
- **Vehicle operating costs** – reduction in fuel consumption and other vehicle costs;
- **Health benefits** - Increases in walking and cycling leading to improved health outcomes; and
- **Light Rail amenity benefits** – perceived amenity benefits from travel on light rail versus by bus.

In addition, the wider Canberra community will also benefit from the Stage 2A and City to Woden (Stage 2A and 2B) Light Rail through the following external benefits:

- **Externality impacts** – reduction in negative externalities associated with car and bus travel;
- **Road accidents** – reduction in accident rates and hence costs, due to modal shifts;
- **Increased public transport revenue** – revenue from new public transport users;
- **Bus operation savings** – change in bus operating costs due to changes in bus service kilometres;
- **Residual asset value** – remaining asset value at the end of the 30-year appraisal period; and

7.5.1.1 Transport user benefits

A description of the transport user benefits captured by the CBA are outlined below.

Travel time savings – Public transport

Perceived travel time savings for public transport users, including time to access transport, wait time, in-vehicle time and transfer time, because of improved public transport services. The reduced travel time costs include costs to businesses of the time their employees and vehicles spend on travel, and costs to consumers of personal time spent on travel.

Travel time savings – Highway

Perceived travel time savings for road users based on changes to in-vehicle time, because of reduced congestion and improved on-road infrastructure. The reduced travel time costs include costs to businesses of the time their employees and vehicles spend on travel, and costs to consumers of personal time spent on travel.

Reliability – Highway

Perceived travel time savings from reductions in travel time variability on road travel because of reduced congestion and improved on-road infrastructure.

Vehicle operating costs (VOC)

A change in the vehicle speeds on the network will affect vehicle operating costs, as fuel consumption and other variable vehicle costs are higher in congested than in free-flowing networks. Total vehicle operating costs comprise basic variable running costs of the vehicle (depreciation, fuel, repairs and maintenance) in resource cost terms (i.e. excluding taxes and duties).

Light rail amenity benefit

Public transport users place value on other journey characteristics than what is counted by time and cost savings. These include elements that are particularly relevant to light rail (e.g. as compared to bus), such as network legibility, reliability, comfort, permanency and physical accessibility. These 'amenity' benefits are captured as a 'discount' to the perceived incremental travel time on light rail.

7.5.1.2 Transport externality benefits

A description of the transport externality benefits captured by the CBA are outlined below.

Externality impacts

Since different transport modes result in the production of different externality costs, such as air pollution, noise, urban separation and greenhouse gas emissions, changes in travel patterns will cause changes in network-wide externalities. Externality impacts have been measured using changes in vehicle kilometres travelled, together with evidence on damage cost per vehicle kilometre travelled.

Accident costs and health

The human and physical costs of accidents on the road network have been estimated for road vehicles (car and bus) as an average cost saving per reduction in vehicle km travelled. For road users this is applied as a cost per vehicle kilometre by road type and for bus as an average cost per service kilometre.

The Stage 2A and City to Woden (Stage 2A and 2B) Light Rail have the potential to influence health outcomes for people who change their travel behaviour to more active forms (walking and cycling) because of light rail. This change in active transport movements is likely to be achieved through an increase in the number of people living in accessible locations (i.e. being able to walk to more destinations) and to access/egress from public transport modes. Greater levels of walking and cycling in turn can influence and individual's health outcomes and the wider cost burden this outcome places on the health system.

Health benefits can also be generated due to the reliability and preference of the light rail over driving. This will lead more people to walk or cycle to the nearest light rail stop as opposed to driving.

Public transport fare revenue

Additional fare revenue across the public transport network because of the Stage 2A and City to Woden (Stage 2A and 2B) Light Rail being implemented. Public transport fares are transfers (as opposed to true costs or savings). However, since the fares that new public transport users pay are captured as negative user benefits, the incremental revenues from fares received by the operator must be counted as an 'offsetting' benefit.

Avoided bus operating costs

The introduction of the proposed light rail system will result in the reduction of costs for the provision of alternative public transport services, resulting in a reduction in bus kilometres travelled. Such savings have been captured using modelled changes in bus vehicle kilometres travelled and per kilometre values on operating and maintenance costs. Assumptions regarding bus operating costs are contained in the Appendix. Note that this economic analysis has not considered savings from avoided spend on alternative (not yet approved) transport infrastructure projects.

Residual value

Additional value that the Stage 2A and City to Woden (Stage 2A and 2B) Light Rail will generate beyond the 30-year operational period in the analysis. Some components of the investment in the projects have significant life remaining at the end of the appraisal period, meaning that the asset still has the capacity to accrue benefits. Residual values are a way of capturing this remaining capacity.

7.5.1.3 Summary of transport benefits

The first and second round transport benefits, i.e. the benefits arising from each project including the land use changes are shown in Table 7-8.

Table 7-8: First and second round transport benefit summary ($2019m, real, PV at 7%)

Benefit Category	City to Commonwealth Park	City to Woden
User benefits – public transport		
Travel time savings	11	27
Light rail amenity benefits	5	30
Total PT user benefits	***16***	***57***
User benefits - Highway		
Travel time savings	12	74
Reliability	2	18
Vehicle Operating Costs	8	33
Total HWY user benefits	***22***	***125***
External benefits		
Externalities	3	56
Accident costs and health benefits	2	104
Total external benefits	***5***	***161***
Other benefits		
Public transport fare revenue	10	-8
Bus operating cost savings	0	1
Residual asset value	2	15
Total other benefits	***12***	***8***
Total transport benefits	***55***	***349***

The transport benefits above include both first and second round transport impacts. For the Stage 2A route, second round transport benefits refer to those that accrue due to the accelerated development at the Acton Waterfront, and represent the benefit of demographic changes that affect travel patterns and lead to improved network efficiencies.

For the City to Woden (Stage 2A and 2B) Light Rail, second round transport benefits are also generated by land use changes along the light rail corridor, as described in Section 7.1.4.1.

7.5.2 City Shaping Benefits

In combination with supportive government policies, light rail has the potential to drive land use changes. These will lead to additional benefits over and above those captured within transport benefits, both by realising higher and better use of existing land, reducing the cost of providing public services and delivering densification benefits such as agglomeration. Note that changes in the value of existing property stock are not captured as benefits, as these are merely manifestations of gains captured elsewhere in this economic assessment.

The land use benefits captured in the City to Commonwealth Park (Stage 2A) economic appraisal relate to the acceleration of the development timeline for the Acton Waterfront.

For the City to Woden (Stage 2A and 2B) Light Rail, city shaping benefits are also driven by land use changes in the light rail corridor between the City and Woden as outlined in section 7.1.4.1.

The land use benefits captured by the CBA are outlined below.

Land use benefits

A change in land use will generate a net economic benefit if the value of the new use is higher than the value of current use, plus the cost of achieving the change. In an unfettered market, such benefits would be exhausted by developers and land owners. However, the property markets face many constraints, including planning regulations and transactional taxes and levies. If the introduction of the Stage 2A and City to Woden (Stage 2A and 2B) Light Rail unlocks, enables or attracts additional development into the corridor, away from other parts of ACT, the balance of these constraints may add up to a net benefit. These may consist of:

- **Highest and best use**[107] – where an increase in density is only permitted if a mass transport solution like light rail is introduced, the increase in land value from the higher permitted density can be attributed to the transport solution; and
- **Transactional taxes** – where a transport improvement attracts development into a corridor that already has higher valued property, the balance of incremental transactional taxes in the corridor and foregone taxes elsewhere will be positive. This should then be attributed as a benefit to the transport improvement.

Accordingly, the benefit attributed to light rail from land use uplifts, as well as the net incremental increase in GST on residential sales and stamp duty paid, are captured as a benefit.

Light rail projects are city-shaping developments, providing a stable corridor for investment and higher value land use. As a city-shaping initiative for Canberra, light rail is expected to support changes in population and employment, stimulating urban renewal and economic diversification and helping to create a more connected, compact and competitive Canberra.

Infrastructure cost savings

Future population growth will require the provision of additional public services and physical infrastructure to ensure that existing service standards are maintained.

The future spatial location of population and jobs can impact the future government costs of providing physical infrastructure such as roads, rail and other transport, water and sewerage, electricity, gas and telecommunications. The cost to provide these services to "greenfield" (i.e. outer suburban or fringe development) locations is typically much higher per dwelling than to already well serviced "brownfield" (i.e. inner City) locations. Encouraging more of the future growth in population within built-up areas will generate an infrastructure cost saving.

7.5.2.1 Summary of city-shaping benefits

The land use impacts resulting from light rail are shown below.

Table 7-9: Land use benefit summary ($2019m, real, PV at 7%)

Benefit Category	City to Commonwealth Park	City to Woden
Infrastructure cost savings	6	35

[107] *For example, mixed use medium and high-density apartments*

Benefit Category	City to Commonwealth Park	City to Woden
Land value uplift	41	367
Total land use benefit	*47*	*402*

7.5.3 Wider Economic Benefits

The analysis of WEBs attempts to capture the productivity impacts of a project that accrue outside the transport sector, including from the effects of improved connectivity, land development, and business logistics improvement. The impacts result from both transport improvements and land use changes.

Agglomeration benefits are the result of business and commute travel time reduction which brings firms closer to each other, to workers, to their suppliers and consumers, and facilitates the knowledge and information exchanges. As WEBs are driven by accessibility, the improved connectivity delivered by the Project and the land use densification along the corridor both support increased agglomeration benefits.

Table 7-10 below summarises the transport and city-shaping wider economic benefits that result from each Project.

Table 7-10: Wider economic benefit summary ($2019m, PV at 7%)

Benefit Category	City to Commonwealth Park	City to Woden
Transport WEBS		
Transport agglomeration	20	21
City-shaping (land use) WEBS		
Land use agglomeration	28	445
Total WEBs	***48***	***466***

7.5.4 Summary Results and north-south corridor indicative blended BCR

The results presented throughout this section are summarised in Table 7-11 below. All results are presented in $million, discounted at a rate of 7%.

Major Projects Canberra has, independently of its economic advisor, derived a blended indicative BCR, inclusive of wider economic benefits, between Gungahlin and Woden and Gungahlin to Commonwealth Park of 1.2. This blended analysis utilises:

- Gungahlin to the City benefits as per the Light Rail Stage 1 business case;
- Actual Gungahlin to the City project costs as presented in the Project Delivery Report, adjusted to $2019; and
- Stage 2A and Stage 2B analysis as set out in this Chapter.

The approach to the blended BCR has not been created by new analysis or under the same process as the City to Commonwealth Park BCR presented in this Business Case. Consequently, underlying assumptions from the City to Gungahlin BCR may not be relevant and not provide the same outcome when viewed on a City to Woden basis.

The economic results presented in the 2014 City to Gungahlin Light Rail Business Case are shown in the table for reference.

Table 7-11: Results summary ($2019m, real, PV at 7%)

Benefit Category	Gungahlin to Woden (Indicative Blended)	Gungahlin to Commonwealth Park (Indicative Blended)	City to Commonwealth Park	City to Woden	City to Gungahlin ($2019m) [108]
Project benefits					
Transport benefits	901	620	55	349	569
City shaping benefits	936	581	47	402	534
Wider economic benefits	744	326	48	466	278
Total Project benefits	***2580***	***1526***	***150***	***1217***	***1380***
Project costs					
Project capital costs	1708	910	162	960	748[109]
Operating costs	476	358	82	190	286
Development costs[110]	23	23	23	23	-
Total Project costs	***2208***	***1292***	***268***	***1173***	**1035**
Results					
NPV *(excluding WEBs)*	-370	-90	-166	-422	69
NPV *(including WEBs)*	373	262	-118	44	346
BCR (excluding WEBs)	0.8	0.9	0.4	0.6	1.1
BCR (including WEBs)	1.2	1.2	0.6	1.0	1.3

[108] *Results for the City to Gungahlin Project escalated to 2019$ at 7%*

[109] *Adjusted to reflect the actual cost of the City to Gungahlin Light Rail as presented in the Project Delivery Report*

[110] *Represents incremental development costs associated with the Acton Waterfront development occurring earlier in the project case than the base case. Bringing forward the development leads to higher development costs in present value terms, and this is captured in the CBA.*

The Gungahlin to Woden and Gungahlin to Commonwealth Park results are presented for high-level illustrative purposes only, and are subject to a number of limitations, including:

- The economic results for City to Gungahlin are based on different assumptions in the base and project cases as a result of the passage of time. These differences include updated information on fuel price, population and employment and those in relation to the transport and road network in Canberra and the integration of light rail with existing bus services; and
- Whilst the BCR is higher for the City to Gungahlin route, significant differences exist in the scope of each route (for example, fewer structures were required for construction of the City to Gungahlin route). The City to Woden route is acknowledged as a more challenging route in terms of constructability but is still recognised as a key portion of Canberra's light rail network.

Results for the City to Gungahlin Project should be interpreted in conjunction with the assumptions and limitations set out in the Business Case for that Project.

7.5.5 Sensitivity analysis

The following table shows the results of sensitivity analysis that tests the robustness of the appraisal results to changes in key assumptions and results.

Table 7-12: Sensitivities ($2019m, PV at 7%)

Benefit Category	City to Woden	
	NPV	BCR
Economic Results		
Economic results	44	1.0
Sensitivities – Discount rate		
4% Discount rate	642	1.5
10% Discount rate	-222	0.8
Sensitivities – Benefits		
Benefits + 20%	287	1.2
Benefits - 20%	-200	0.8
Sensitivities – Costs		
Costs + 20%	-191	0.9
Costs – 20%	279	1.3

The sensitivities that have the largest impact on the economic results are a change in the discount rate to 4%, an increase in benefits by 20% and a decrease in costs by 20%.

8.0 Delivery model analysis

Key messages

- The recommended delivery model to be pursued in the first instance consists of two components:
    - An 'Early Contractor Involvement' contract on a sole-source basis with Canberra Metro in connection with Stage 2A. This will cover the period between this Business Case and the submission of a proposal for the main Stage 2A works by Canberra Metro. This 'Early Contractor Involvement' approach will enable development of Stage 2A to continue while Canberra Metro prepares its proposal. It will also establish a framework which will facilitate the achievement of a value for money outcome (for example, by setting out requirements for open book costs development, the independent assessment of costs, and the procurement of sub-services); and
    - Procurement of a contract for the Project's main works through a sole source negotiation with Canberra Metro. This will, at a minimum, include an integrated package consisting of the design, construction, operations and maintenance of the Project. The entry into a contract for the Stage 2A main works will come at the conclusion of the Stage 2A 'Early Contractor Involvement' process; and
- Separate approval will be sought from Cabinet in the future as to the form of the contract for the Project's (i.e. Stage 2A's) main works.

8.1 Background and approach

The methodology employed to develop the delivery model for the Project has taken into account the following considerations:

- The requirements of The Capital Framework with reference to Infrastructure Australia Guidelines;
- The interface challenges that arise due to the Project being an augmentation of the existing light rail network; and
- The contractual relationship between the ACT Government and Canberra Metro.

While the existence of an incumbent increases the complexity of the delivery model selection process, the same fundamental approach has been applied to the assessment:

- Assessing on a 'best for Project' basis with no preconceived bias in favour of one model over another;
- Undertaking a bottom up analysis based on the needs of the Project; and
- Being cognisant of the nature of the inherent Project risks.

A consultative and iterative process has been adopted to develop the delivery model, including workshops and discussions with relevant ACT Government stakeholders and advisors, such as:

- Major Projects Canberra;
- Transport Canberra and City Services;
- ACT Treasury;
- Commercial advisors;
- Technical and operational advisors;
- Legal advisors; and
- Market soundings with industry participants, including Canberra Metro.

This was supported by a range of technical briefings, benchmarking analysis of similar procurements and functioning light rail systems and risk assessments.

8.1.1 Important note

At the outset, it is important to note the following:

- **Balanced assessment:** no single delivery model option perfectly addresses all aspects of the Project. The delivery model recommendation in this Chapter is based upon a balancing of the advantages and disadvantages of potential delivery models for the Project;
- **Differing opinions:** some stakeholders and market participants may have differing opinions as to the optimal delivery model to be utilised for the Project, and as to the numerous ways in which a particular delivery model may be structured and implemented. This is particularly relevant as the Project will be procured early in Canberra Metro's operating period for City to Gungahlin Light Rail; and
- **Maintaining the option to change delivery model:** the delivery model recommended in this Business Case is based on the Territory being able to meet its objectives for the Project and drive a value for money outcome in a sole source procurement. Consequently, the recommended option is supported by a secondary delivery model option that could be implemented later in the process if necessary.

8.2 Delivery model assessment

8.2.1 General principles

Seven general principles – based on the requirements of The Capital Framework – have guided the ACT Government's assessment of potential delivery models. They are:

- Risk transfer and price certainty;
- Quality;
- Value for money;
- Time;
- Flexibility and control;
- Market capacity and interest; and
- Innovation.

The table below provides key Project considerations in relation to each of the aforementioned Capital Framework principles. The principles listed above have been given levels of priority that assisted in informing the evaluation of options.

Table 8-1: Evaluation criteria

Criteria	Key issues	Relative importance to Project
Risk transfer and price certainty	• Ensuring effective risk transfer and appropriate risk allocation to the party best able to manage each risk • Operational interface risk with the existing network, as well as the planned further extension south to Woden • Planning risks associated with NCA approvals that are required in 'Designated Areas' • Interface risk between components/packages • Importance of maintaining the existing City to Gungahlin performance regime	Very high

Criteria	Key issues	Relative importance to Project
Quality	• Provides a service of a standard equal to or greater than the existing network • Maintaining the KPIs and service level arrangements contained in the existing network's performance regime • Continuous north-south spine that provides a single-seat journey option for customers between Gungahlin and Commonwealth Park, and eventually to Woden • The Project is fit for purpose, achieving urban amenity and customer experience outcomes	Very high
Value for money	• Achieving value for money in a potentially non-competitive procurement process • Certainty of construction costs and whole of life costs (future maintenance and operational costs) • Costs incurred by the Territory in undertaking the procurement • Taking advantage of economies of scale with City to Gungahlin Light Rail where appropriate	Very high
Time	• Time to market – Parliamentary Agreement commitment to progress light rail to Woden to the procurement stage and contract signing in the current Parliamentary term • Time to completion	High
Flexibility and control	• Not preclude the future expansion of the Project (both contractually and physically), noting it is the initial stage of extending light rail to Woden • Allow for technology advances, noting the possibility of requirement for wire-free running on sections of Stage 2A and Stage 2B • Management of operations as the network expands	Medium
Market capacity and interest	• Market capacity – extensive pipeline of large rail and civil projects • Market interest in the Project given the existing City to Gungahlin Light Rail Project Agreement with the incumbent and the need for integration between stages	Medium
Innovation	• Create an incentive for an innovative solution to drive cost efficiencies • Requirement to incorporate existing network design and systems may impact level of innovation on the Project	Medium

8.2.2 Data gathering

Significant data has been collated for the purposes of assessing delivery model alternatives. This includes:

- Project objectives;
- Project requirements (scope of works and services);
- Project constraints;

- Project risk assessment;
- Project cost estimates;
- Benchmarking and case study review; and
- Other information as contained throughout this Business Case.

8.2.3 Key risks

Key risks are outlined in Table 8-2 below.

Table 8-2: Key Project risks

Risks	
Procurement risks	
Value for money	• By undertaking a sole-source procurement of the Project there is a heightened risk that value for money through the procurement process cannot be achieved and / or demonstrated.
Market capacity	• The procurement and delivery of the Project is expected to be coincide with significant levels of transport infrastructure construction activity on the east of coast of Australia. Consequently, there is a significant risk that there will be market capacity constraints impacting the budget, timing and potentially quality outcomes of the Project.
Project risks	
NCA approvals	• The alignment runs through 'Designated Areas' and as such will require the approval of the NCA. • This process increases the risk of delays and additional costs if deadlines are missed and/or additional unexpected conditions are imposed. This could include requirements for wire-free running (see wire-free risk below).
Environmental and other approvals	• Risk that the Project does not receive all other approvals required for the Project (e.g. EIS, EPBC, Territory planning approvals etc.). • There is a risk that Commonwealth environmental approvals processes may add longer than anticipated timeframes to the program, leading to delay in delivering the Project. • There is also a risk that conditions of environmental approvals may require wire-free running (see wire-free risk below).
Site access	• Sections of the route alignment run on Commonwealth land. There is a risk that this may impact on site access due to changes in Commonwealth assets, lease or license agreements. There is a risk that the Commonwealth Government may seek lease or licence terms in respect of its land which are commercially unacceptable to the Territory. This would effectively inhibit progression of the Project, even if planning approvals are provided.
Traffic management	• Risk that traffic is impacted more than expected during construction, particularly around the intersections at Commonwealth Avenue and Northbourne Avenue.

Risks	
	• The level of traffic disruption in and around the City will be impacted by the timing and approval of other projects in and around the route alignment, such as the raising of London Circuit at Commonwealth Avenue (see below).
Integration with City to Gungahlin Light Rail	• Risks related to the addition of the Project to the network, such as: o The interface with City to Gungahlin Light Rail causing issues during the delivery stage, or disruption in service once operational; and o A discrepancy in the interface specification for the integration of City to Gungahlin Light Rail and the Project.
Interface with City to Woden Light Rail	• The Project is the initial component in the extension of light rail from the City to Woden, resulting in interface and integration risks associated with the further extension. • These risks include: o Technical risks, including systems and design specifications; and o Commercial and value for money risks associated with contracting arrangements and the renegotiation of the performance regime and payment mechanism.
Interface with Third Party developments	• Risks arising due to the interface between the Project and other developments occurring in the area, such as works on Commonwealth Avenue Bridge and planned developments in City Hill and Acton Waterfront.
London Circuit	• Risks exist related to the complexities surrounding the structure between London Circuit and Commonwealth Avenue. • Significant risks may also arise due to potential concurrent work related to the raising of London Circuit. Should the ACT Government decide to raise London circuit, it is recommended that it will be appropriate to undertake that work as part of the Project (though separately accounted for). The program in this Business Case assumes that London Circuit is raised to be at-grade (approval for these works is sought as part of a separate Business Case). • Risk of consequential road investments being needed elsewhere in the network. • Risk that the Edinburgh Avenue extension will not be completed in time, causing worsened traffic conditions.
Utilities	• Risk of delay due to the location of utilities and services, particularly around London Circuit and Commonwealth Avenue, such as: o Insufficient resources or priority on the part of a utility provider for timely agreement; o Incorrectly identified utilities which result in a change in the level of works required; and o Unanticipated national or international events which impact on the Commonwealth Government's ability to address its infrastructure in the alignment.

Risks	
Patronage	• Risk of light rail patronage numbers differing from assumptions impacting transport revenue.
Site conditions	• The risk of dealing with unexpected site issues, including contamination, stormwater, geotechnical conditions, stormwater and flooding.
Safety	• Overall safety risks of passengers and workers during construction and the ability to achieve a safe delivery and operational outcome, along with the risk of not obtaining accreditation from the Office of the National Rail Safety Regulator.
Wire-free	• The JSC inquiry (see Section 1.4) recommended that light rail be wire-free between The JSC recommended that any light rail on or crossing Commonwealth Avenue, Kings Avenue, State Circle, Brisbane Avenue, Sydney Avenue, Canberra Avenue (to Manuka Circle), Hobart Avenue, Melbourne Avenue, Adelaide Avenue (to Kent Street) and in the Parliamentary Zone to be wire-free. The Australian Government agreed with this recommendation. This spans part of Stage 2A and 2B. As such it is likely that to obtain approval for City to Woden Light Rail sections of wire-free running will be required. • Should wire-free running be required the existing fleet would need to be retrofitted with battery technology to allow for an end-to-end service, as well as new vehicles having to be purchased with this technology. As noted in Section 1.8, this is anticipated to have an additional estimated capital cost of $10m (real, P75). Additionally, there is a risk that City to Gungahlin Light Rail performance requirements are not met during this process or that the process takes longer than anticipated and delays operational commencement for the Project. • Additionally, should the NCA require wire-free running late in the Project's development, the lead time needed to retrofit LRVs will likely result in a delayed operational commencement.
Community	• Risk that construction impacts on businesses.
Commissioning and start of service	• Risk of late delivery and commencement of Project operations related to not successfully testing and commissioning (for reasons other than delays caused by the ACT Government).
Cost	• Risk that the cost estimate supporting the Business Case is materially different to the final cost estimate due to the preliminary nature of the designs, incorrect assumptions, changed project timeframes, unsuccessful progression of the procurement process, unexpected planning conditions or the state of the national infrastructure delivery market.
Scope Creep	• Risk that incremental design demands increase Project costs.
Market price risk	• If relevant, interest rate risk – risk of higher interest rates when Project finance is rolled over beyond first financing periods; • Foreign Exchange risk – LRV procurement and other imported components of the Project will be subject to changes in foreign exchange rates; and

Risks	
	• General labour price risk – while being a systematic risk, it should be noted that market capacity constraints on the east coast may drive up the cost of construction labour during the Project.

8.2.4 Preliminary Packaging Assessment

Prior to shortlisting a set of potential delivery models for the Project, an initial assessment of the packaging options available was undertaken taking into account the existing Project Agreement between the Territory and Canberra Metro.

The initial packaging assessment outlined in the below table has bundled Project components into groups based on an assessment of the Project objectives, risks and technical characteristics. The packages have informed the delivery model assessment.

Table 8-3: Initial packaging assessment

Package	Components	Rationale
Operations and maintenance	Operations Maintenance (Hard and Soft FM) LRV maintenance Streetscape, furniture and landscaping maintenance	Structure allows for the provision of continuous end-to-end operations between Gungahlin and Commonwealth Park; supports integrated operations and maintenance activities across both stages; reduces interface risk; and may potentially allow for the requirements of the existing performance regime to be extended to the Project.
Alignment and civils (D&C)	Civil infrastructure Streetscape, furniture and landscaping Utilities	Components of civil infrastructure, utilities and streetscaping that have significant interface during construction are packaged together to minimise physical and timing interface risks and provide opportunities to obtain delivery efficiencies. Components of the D&C with complex interfaces with the existing light rail network have been excluded from this package and considered separately. Should the raising of London Circuit at Commonwealth Avenue project be approved by the ACT Government, these works would likely form part of this package due to their significant interface with light rail.
Systems infrastructure and expansion of existing depot	Systems infrastructure Minor depot works	Software components of systems infrastructure have a high interface with the O&M provider and therefore should be procured together. In addition, the systems software utilised for the Project should be the same as City to Gungahlin Light Rail to ensure consistency, reduce systems interfaces that could create safety issues and to avoid duplication of upfront costs. Hardware components can generally be specified and procured as part of the wider D&C package to avoid construction interfaces; however high interface

Package	Components	Rationale
		hardware components could also be procured as part of the O&M scope.

8.2.5 High level delivery model assessment

In light of the preliminary packaging analysis outlined in Section 8.2.4, a high level delivery model assessment has been undertaken to establish a shortlist of delivery model options.

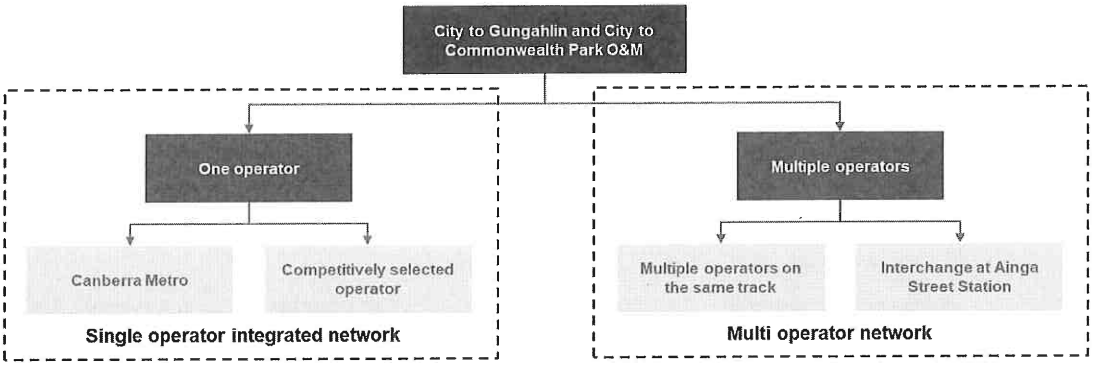
To establish the shortlist, three key structuring questions were answered to further eliminate less preferred delivery model options:

- **Single or multiple operator network** – would the Territory pursue a multiple operator network either split between the existing light rail network and the Project or with multiple operators providing services on the one alignment;
- **The preferred O&M procurement approach –** would the Territory consider pursuing a sole source procurement with Canberra Metro for all or part of the O&M components of the Project; and
- **The preferred D&C procurement approach –** what Project components should be bundled into a larger D&C package to be procured under one contract and should the D&C procurement be pursued using a sole source or competitive tender.

8.2.5.1 Single or multiple operator north-south alignment

There are a number of possible structures under which either a single or multiple operator network could be implemented as outlined in Figure 8-1.

Figure 8-1: Operator options



The findings from the assessment of multiple north-south operator models include:

- A multi operator north-south alignment would likely miss the economies of scale presented by a growing single operator network due to some duplication of infrastructure and operating costs, particularly in light of the small scale of the extension (1.6 km);
- A multi operator north-south alignment does not eliminate the need for a sole source negotiation with Canberra Metro and may increase the risk of an inferior performance regime for the Territory;
- A split multi operator north-south alignment – with an interchange at the Alinga Street Stop – is likely to provide a lower quality customer experience due to the requirement for customers to change LRVs; and
- The continuous service – without interchange – multi operator model may also have challenges achieving consistent levels of service through the network with different staff and procedures in place, in addition to the need to manage the interface requirements between operators.

Conversely, a single operator north-south alignment option would provide:

- A consistent, high quality, network-wide customer experience outcome for passengers;
- A 'one network / one system' approach that ensures fully integrated systems in operations, power control, communications, CCTV and PIDs;
- Best use of economies of scale from the existing light rail network by making the most efficient use of infrastructure, such as LRVs, depot and maintenance equipment, and support staff in customer service and corporate/administrative personnel;
- Substantially reduced interface risk between City to Gungahlin Light Rail and the Project's O&M components; and
- The potential for a consistent performance regime for City to Gungahlin Light Rail and the Project.

Based on this analysis, the Territory's preferred option is to pursue a single operator north-south alignment.

8.2.5.2 The preferred O&M procurement approach

As Figure 8-1 highlights, the single operator scenario can be achieved through:

- Engaging the existing operator, Canberra Metro, to operate the full alignment (sole source), with or without the D&C also procured on a sole source basis;
- A concession buy-out (termination) of the City to Gungahlin Project Agreement and retendering of the O&M as a separate or integrated package with other scope components of the Project, such as the D&C. This option is proposed to involve the complete buyout of the City to Gungahlin Light Rail contract which is then combined with the Project's D&C and O&M to create a new PPP taken to market as one package.

An assessment of the sole source approach versus the competitively tendered approach highlights the key considerations outlined below.

Sole source O&M approach

- Canberra Metro should bring learnings from the existing light rail network that will improve the overall offering;
- Leaves the existing D&C and O&M consortia intact, maintaining the whole of life benefits and the intra consortia defects and fit for purpose protections;
- Is likely to be the more expedient procurement approach; and
- Will be more challenging to achieve a value for money outcome when compared to a full competitive tender process.

Competitive tender through a concession buy-out (termination) of City to Gungahlin Light Rail approach

- May not attract sufficient market interest due to the perception of Canberra Metro being unfairly advantaged and the small scale of the Project;
- If sufficient market interest is achieved, then a competitive process should drive more robust pricing;
- The termination process may be expensive and extend the time required to undertake the procurement; and
- Presents some timing issues as Canberra Metro will need to continue O&M activities while the procurement is occurring. It may be challenging to drive Canberra Metro's performance effectively during this period.

Both of these options have been included in the shortlisted selection with these key considerations taken into account in the ratings in Table 8-6.

The options for procuring O&M services are influenced by other Project packages, including the interface with (or sole sourcing of) the D&C works for the Project and other key package items such as systems infrastructure. The relevant interface risks, value for money and timing considerations are considered in the following sub-section.

8.2.5.3 The preferred D&C Procurement approach

Consideration has been given to the procurement of the D&C under a combined O&M (City to Gungahlin Light Rail and the Project) approach as outlined in Section 8.2.5.2. The D&C procurement has been further considered under the following scenarios:

1. **D&C packaging structure:** should the D&C be procured as a single integrated package with the O&M (or O&M plus high interface D&C components) or separately; and if so
2. **D&C procurement approach:** should the integrated packages be procured with Canberra Metro under a sole source arrangement.

D&C packaging structure

As highlighted in the City to Gungahlin Light rail procurement model, there is benefit to integrating the D&C and O&M components – regardless of the contractor – due to the potential to:

- Minimise interface risks;
- Maximise value for money through economies of scale and efficiencies in design and overall customer experience; and
- Enhance whole of life benefits through the O&M contractor being closely involved in the D&C procurement.

These benefits are usually offset by the drawback of not being able to select the best in class contractors for each component of works and the fact that it can put restrictions on the level of input the Territory can have into the operations phase.

While these drawbacks need to be considered and managed, the benefits of this approach warrant the further examination of this option in the shortlisted delivery model evaluation outlined in Table 8-6.

D&C procurement approach

Should D&C components be bundled with O&M activities, the D&C procurement could be achieved either through:

- A concession buy-out of the existing light rail network and a full procurement of City to Gungahlin Light Rail O&M and the Project's D&C and O&M under a competitive process;
- A process whereby the D&C component is the subject of a competitive process run by the Canberra Metro SPV; or
- Canberra Metro for combined City to Gungahlin Light Rail and the Project on a sole source basis.

Key considerations in this respect – either if D&C were bundled with O&M or if it were a standalone procurement – are outlined below.

Risk

- Procuring both City to Gungahlin Light Rail and the Project with Canberra Metro under an integrated procurement model would assist in reducing the interface risk between components, while also improving whole of life outcomes; and
- Consideration should also be given to reducing the interface between the Project and the future stages across the Lake to Woden. This could include some allowance in the Project design for future proofing for an extension to Woden and provision in the commercial framework to facilitate procurement of those works on a value for money basis.

Value for money

- Canberra Metro may be able to bring economies of scale from their work on City to Gungahlin. Specifically, there may be efficiencies in design, planning and mobilisation costs;
- A competitive procurement process that results in a different D&C provider may lead to increased costs due to the interface between City to Gungahlin Light Rail and the Project's D&C contractor in the design and planning phases. This may result in different approaches to key components of the construction, leading to inconsistent customer outcomes and operational inefficiencies;
- While an open market D&C process may yield a more competitive process, there is also a risk that a failure to attract other bidders (given Canberra Metro's incumbency and the length of the augmentation) may result in higher pricing to the Territory. Additionally, a concession buy-out may be expensive adding material costs to the overall procurement process;
- A D&C process run by the Canberra Metro SPV is unlikely to attract other Tier 1 constructors, both due to the current state of the infrastructure delivery market and because of the ownership structure of the Canberra Metro SPV
- A Canberra Metro procurement may result in a streamlined contract management process as it will be an established governance structure which may minimise Territory resourcing requirements; and
- Canberra Metro may be able to bring economies of scale and minimise interface risks for the future extension of Commonwealth Park to Woden.

Time

- Canberra Metro's knowledge of the light rail network and Territory planning requirements, may support quicker delivery; and
- Sole sourcing through Canberra Metro may obviate the need for a full procurement process, potentially saving time and assisting to minimise undue delays.

On balance, procuring the Project's D&C on a sole source basis through Canberra Metro is likely to yield some time and cost efficiencies and has the potential to reduce interface risks between City to Gungahlin and any future stages to Woden.

Procurement of an integrated D&C and O&M package under a Canberra Metro and an open market process have been shortlisted and further considered in the shortlisting analysis and scoring in Section 8.2.6.

8.2.6 Shortlisted delivery model options

The initial packaging assessment and high level delivery model analysis led to a shortlisted set of delivery model options for evaluation against the criteria outlined in Table 8-1.

Table 8-4: Shortlisted delivery model options

Delivery Model	Description
Option 1: Sole source procurement with Canberra Metro for the Project's D&C and O&M as an integrated package	• Includes procurement of all major components of the Project's D&C • Includes procurement of the Project's O&M to be combined with City to Gungahlin Light Rail for an end-to-end service for the remainder of the 20 year operating period under the City to Gungahlin Light Rail contract • Private financing of the Project could be considered for this option. A final determination on the applicability of private

Delivery Model	Description
	finance to the deal could be considered in the initial negotiations with Canberra Metro
Option 2: Concession buy-out – integrated package for procurement of the City to Gungahlin Light Rail O&M plus the Project's D&C and O&M under a PPP	• Includes a buy-out of City to Gungahlin Light Rail by the Territory based on a termination for convenience scenario • Includes procurement of all major components of the Projects D&C • Includes procurement of the Project's O&M combined with City to Gungahlin Light Rail for end to end services for the remainder of the City to Gungahlin Light Rail 20 year operating period • Private financing of the Project may be considered for this option. Private finance may be used to buy out City to Gungahlin Light Rail debt
Option 3: a split O&M (sole source) and D&C (competitive tender)	• Includes procurement of all major components of the Project's D&C in a single package through the open market • Includes procurement of the Project's O&M and high interface D&C components, such systems software, to be combined with City to Gungahlin Light Rail and procured with Canberra Metro allowing for an end-to end-service for the remainder of the City to Gungahlin Light Rail 20 year operating period • Private financing of the D&C component of the Project are not considered appropriate under this option. Private finance of the City to Gungahlin project would remain in place

These shortlisted options were then taken forward for a qualitative evaluation against the criteria outlined in Table 8-1. Table 8-6 outlines the result of that evaluation and the associated drivers for each rating.

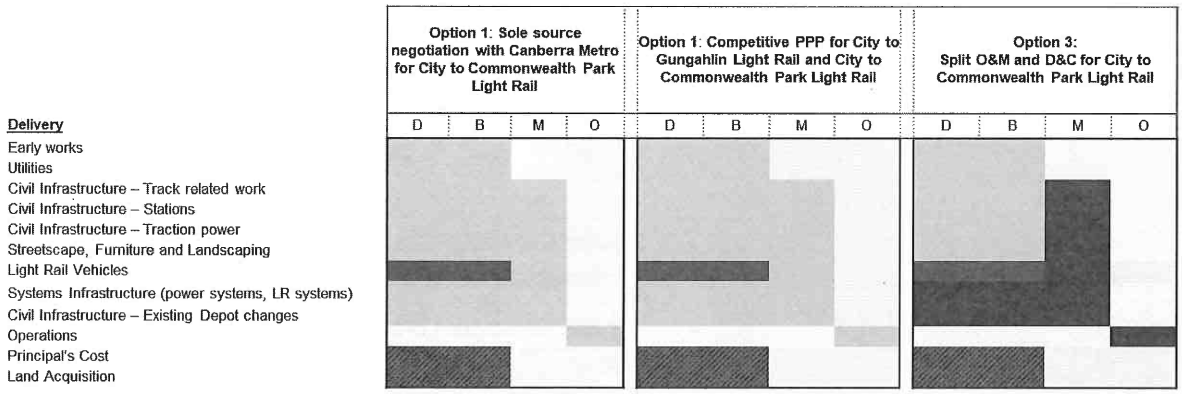
The ratings system utilised for the evaluation is outlined in Table 8-5.

Table 8-5: Qualitative rating scale

Scale	Description of scale
✓✓✓	Extremely effective in satisfying the requirements of the criterion
✓✓	Effective in satisfying the requirements of the criterion
✓	Just satisfies the requirements of the criterion
*	Ineffective in satisfying the requirements of the criterion
**	Extremely ineffective in satisfying the requirements of the criterion

The shortlisted options are diagrammatically presented below – with colours representing the different packages – followed by an assessment of the delivery models against the evaluation criteria.

Figure 8-2: Delivery model packaging options



The assessment of the shortlisted delivery models against the evaluation criteria is set out below:

Table 8-6: Qualitative evaluation of the shortlisted delivery models

Evaluation criteria	Relative importance	Option 1	Option 2	Option 3
Overall assessment		**Ranking – 1** Option 1 is the preferred option on the basis of risk allocation, time to market and market capacity as compared with Options 2 and 3	**Ranking – 2** Option 2, while providing relatively more flexibility to the Territory and a degree of risk transfer, will include termination costs and a lengthier procurement process	**Ranking – 3** Options 3 allows greater synergy with City to Gungahlin Light Rail than Option 2 but the D&C is likely to be relatively less attractive to the market and reduces the Territory's control over the process
Flexibility and control	**Medium**	✓✓ - Currently limited flexibility in the Project Agreement but could seek to enhance this through the inclusion of robust termination provisions	✓✓✓ - Ability to re-write the Project Agreement to increase flexibility for the Territory through procurement and contract negotiations	✓ - Currently limited flexibility in the Project Agreement but could seek to enhance this through an augmentation framework to increase future flexibility
Optimal risk transfer	**Very High**	✓✓✓ - Sole source will provide for a fully integrated package with risk transfer. The incumbent's familiarity with City to Gungahlin Light Rail may also enhance risk transfer for the Project	✓✓ - Single PPP structure to govern both stages and for interface risks between packages to be managed intra-consortium	✓ - Risk is taken on the D&C through a competitive process. Fitness for purpose risks between Canberra Metro and the D&C contractor likely to be significant and borne by the Territory
Quality	**Very High**	✓✓ - Option will provide continuity for the customer through one head contractor as well as tension between quality and cost	✓ - While a fully competitive process provides a basis to select the best technical solution, a termination event may impact on the delivery of City to Gungahlin Light Rail and the Project and the ability to meet timetables and retain learnings	✓✓ - Potential for the Territory to retain the benefits of a single operator for City to Gungahlin Light Rail and the Project provided that the operator has sufficient input into the D&C and into the resolution of interface issues
Value for money	**Very High**	✓ - Procurement process will not be competitive; however, there is potential for reduced procurement	✓ - Competitive procurement process provides basis for a better price noting that	✓ - Competitive procurement (and associated price competition) limited to

Evaluation criteria	Relative importance	Option 1	Option 2	Option 3
		costs, economies of scale and reduced cost pressures for interface risks	termination costs and the procurement process requirements will result in additional costs	the D&C package. Additional interface risks will need to be factored into the O&M price
Time	**High**	✓✓ - Procurement process has the potential to be quicker than a competitive tender (if successful)	✓ - A concession buyout followed by a PPP would be the most time intensive option and could therefore impact on the timeliness of the Project	✓✓ - Potentially advantageous noting that sole source may take time to draft
Market capacity and interest	**Medium**	✓✓✓ - Direct negotiation with Canberra Metro for the Project allows the Territory to secure a contractor for all aspects of the procurement	✓✓ - Current market capacity issues on the east coast exist that may impact interest on the D&C but the large size and more open (without the incumbent) field may be attractive to the market	✓ - Current market capacity issues on the east coast may impact interest for the D&C, while the interface risk between the D&C and O&M may also dampen market interest.
Innovation	**Medium**	✓ - Continuity of design and service provision should counteract the lack of substantive competition from the market under a sole source approach	✓✓ - A competitive PPP could encourage innovative solutions however there is a risk that service continuity is compromised	✓ - Competition for D&C could encourage innovative solutions however there is a risk that service continuity is compromised

While the final structure (including any private finance and commercial arrangements with the City to Gungahlin package of works) will be decided and confirmed following consideration of this Business Case, the Territory's preferred approach is Option 1 with procurement of the D&C and O&M components for the Project with Canberra Metro.

8.2.7 Consideration of delivery model under sole source

The following section outlines some key issues that have been identified and will have an impact on the Project's procurement. These issues will be considered post this Business Case and will inform the preferred delivery model, commercial structure and financing arrangements to be pursued with Canberra Metro under the sole source model.

8.2.7.1 Planning issues

While the route for Stage 2A does not enter the Parliamentary Zone and therefore is not subject to the same breadth of planning processes as Stage 2B to Woden, there remains substantial planning risks that must be negotiated before contracting with Canberra Metro.

The following is an outline of the planning risks associated with the route that may drive selection of a specified delivery model:

- The Project travels through 'Designated Land' and as such it requires an NCA Works Approval. As the City to Gungahlin project was subject to the same planning approval regime, Canberra Metro and the Territory have a good understanding of the requirements which provides greater certainty around timing and the scope of effort required. However, there remains uncertainty about the NCA's ultimate requirements until Works Approval is granted. There is a risk that the NCA may require more extensive designs than anticipated for Works Approval which could delay, add cost and increase uncertainty for the Project. The ACT Government will seek to determine the NCA's requirements before entering into agreements with Canberra Metro.
- The raising of London Circuit at Commonwealth Avenue project (if approved) presents planning issues for the Project:

1. Should the London Circuit project be approved, it is anticipated that it may delay the final design and construction timeline of the Project as the projects have a direct physical interface and therefore construction requires sequencing;
2. The complexity of the Project's design could increase; and
3. The NCA has an interest in the outcomes of the London Circuit project as it interacts with their long term plans for the area and therefore may add conditions to Project approvals accordingly.

The risk associated with planning approvals for the Project is significant. Based on current market circumstances and market sounding feedback, it is desirable that contracts be entered into for the Project once greater certainty around the likely outcome of the Commonwealth approvals process has been obtained. Major Projects Canberra does not currently recommend entering into a project for the main works until greater certainty is achieved around likely Commonwealth planning process outcomes.

It is almost certain that the private sector would not bear substantial planning risk under any contracting arrangement. Consequently, while planning risks are generally not perceived to be as severe for the Project when compared to the Stage 2B route alignment, the ACT Government will need to gain greater certainty on these matters before finalising a proposed delivery model.

The ACT Government proposes to continue discussions with the NCA to understand the planning requirements for the Project and to determine the level of design required to achieve approval. The outcome of this process will drive the level of input required from Canberra Metro in the planning process. If more detailed or broader (outside of the construction area) designs are required there may be a need to engage Canberra Metro earlier and more extensively in the design process.

In any event, the recommended delivery model to be pursued includes an 'Early Contractor Involvement' contract on a sole-source basis with Canberra Metro in connection with Stage 2A. This will cover the period between this Business Case and the submission of a proposal for the main Stage 2A works by Canberra Metro.

This 'Early Contractor Involvement' approach will enable development of Stage 2A to continue while Canberra Metro prepares its proposal, including the progression of planning approvals. It will also establish a framework which will facilitate the achievement of a value for money outcome (for example, by setting out requirements for open book costs development, the independent assessment of costs, and the procurement of sub-services).

8.2.7.2 Contractual framework with Canberra Metro

The form of the contract for the main works may be an augmentation to the existing PPP Project Agreement for City to Gungahlin Light Rail to include the design, construction, operation and maintenance of the Project. However, further consideration will be given to the final contracting structure following consideration of this Business Case and consultation with Canberra Metro.

As contractual arrangements for the Project will be shaped in part by existing arrangements under the City to Gungahlin PPP contract, it will be necessary for the ACT Government to enter into further negotiations with Canberra Metro before the form of the contract for the Project can be settled. The ACT Government will consider the impact of the change in risk profile on the existing PPP through the delivery of the Project as Canberra Metro financiers (equity and debt) will want clarity on this in determining their support for the Project and the structure of that support.

In determining the preferred contract form, the ACT Government will give consideration to whether a private financing solution will produce a value for money outcome, and how this could align with the refinancing of City to Gungahlin Light Rail debt in April 2021. Additionally, an assessment of options for a

Territory Contribution for all or part of the Project's capital works, as a lump sum or through milestone payments, will be undertaken.

Consequently, while an augmentation of the City to Gungahlin Light Rail PPP may occur, it may not be the ultimate contractual structure to deliver the Project.

A Territory Contribution and/or milestone payments may help incentivise Project delivery, drive the achievement of the Project objectives and potentially provide the Territory with greater control over Project delivery post contract execution. On the other hand, private financing solutions may incentivise the achievement of whole of life benefits and provide the ACT Government with greater comfort on the Project's deliverability, with financiers undertaking their own due diligence and ongoing monitoring of the Project to ensure they receive an appropriate return on their investment.

Separate approval will be sought from Cabinet in the future as to the *form* of the contract for the Project's (i.e. Stage 2A's) main works. The form of the contract for the main works could be a public-private partnership (PPP), design, construct, operate and maintain (DCMO), or some other form of contract.

8.2.8 Market sounding validation

Market sounding was undertaken for the City to Woden Light Rail project with light rail operators, constructors and LRV suppliers. While this focused on the entire City to Woden Light Rail alignment, the key areas considered around augmentation and market capacity remain relevant and can help guide the commercial structuring for the Project.

The purpose of the market sounding was to:

- Test the market appetite for participating in a tender process for different components of the City to Widen Light Rail and directly discuss the potential impact that the incumbent consortium may have on the procurement;
- Understand how the relationship with the incumbent could be managed during a competitive tender process;
- Receive initial market advice on the technical aspects of City to Woden Light Rail and how the interface risks with the existing network could be mitigated;
- Inform the development of commercial principles for City to Woden Light Rail; and
- Receive initial industry input on potential packaging and procurement options.

Key discussion points with respect to the delivery model, risks, costs, commercial principles and procurement process are summarised below.

8.2.8.1 Delivery model

- An important consideration in selecting the appropriate delivery model was the management of the interface with Canberra Metro who will operate and maintain City to Gungahlin Light Rail for 20 years under the existing Project Agreement;
- In general, a standalone PPP for an extension, while possible, was not the preferred delivery model approach for parties other than Canberra Metro, given the significant interface with City to Gungahlin Light Rail and likely impact on customer experience;
- Market participants believed that the interface between Canberra Metro and a different O&M provider for an extension would have significant challenges and multiple operators was not recommended given the increased network costs caused by duplication of functions (e.g. depots, control systems and associated overheads); and

- An integrated D&C package was preferred over separate civil works packages to minimise interface and timing risks.

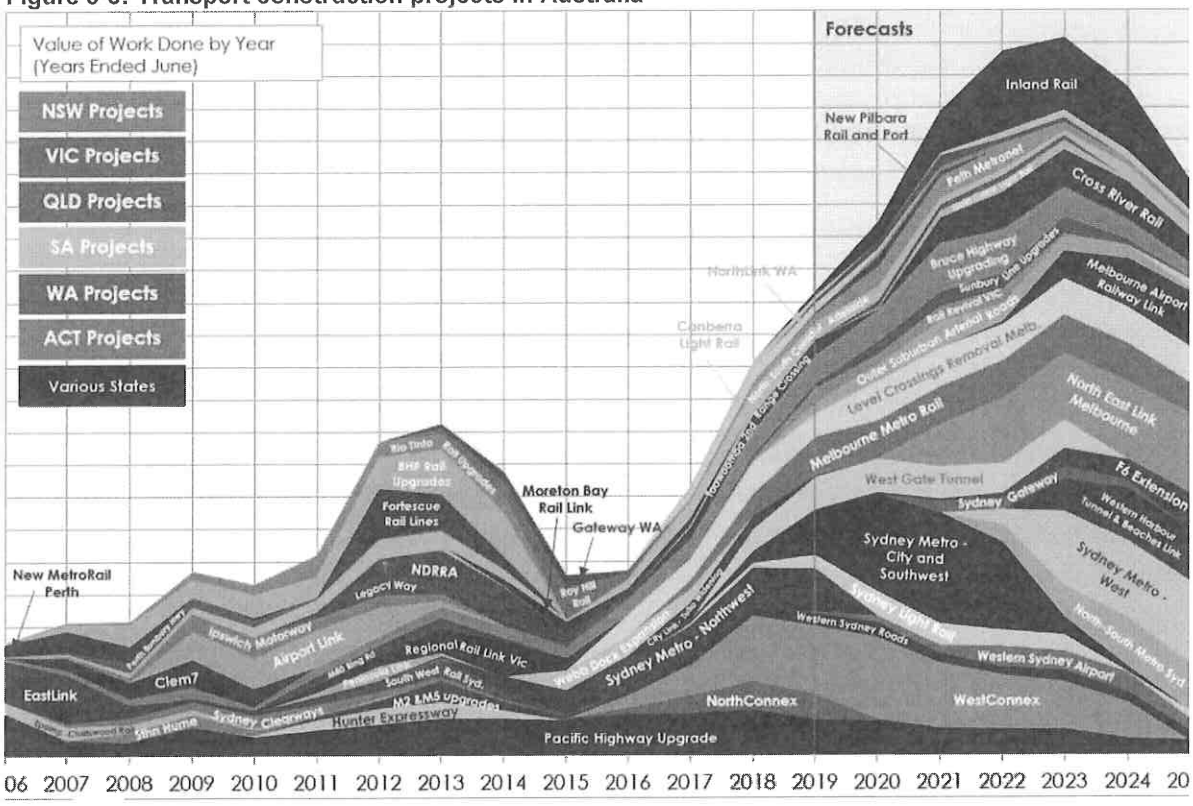
8.2.8.2 Key risks, costs and commercial principles

- In the event of a separate D&C package, a detailed interface agreement between the O&M and D&C contractors would be required to ensure that the obligations of both parties are clearly articulated and agreed;
- To ensure seamless network integration and a consistent customer experience between City to Gungahlin Light Rail and the extension, design specifications would be required for a number of design elements, such as systems infrastructure and stops; and
- The JSC inquiry recommended that the light rail be wire-free along certain sections of the Stage 2A and Stage 2B alignment, and the Australian Government agreed with this recommendation. As such, there is a risk that wire-free running will be a planning condition of the Project. If wire-free running is required, it may be a constraining factor as there is currently limited local and international wire-free running experience. All LRV operators included in the market sounding have existing wire-free capabilities or are in the final stages of developing and deploying these technologies – but not all have hybrid technology that could run both wire-free and wired technology on the one alignment. Battery and super capacitor LRV technologies is expected to continue to develop over time. Note: technology is likely to have advanced materially in the period since this market sounding was undertaken so this view should be retested with the market if an investment decision is made.

8.2.8.3 Procurement

- Industry participants expressed some interest in possibly bidding for packages in an extension to the network. However, the industry noted that the level of competitive advantage held by Canberra Metro for both the D&C and O&M packages is a significant constraint on industry participation and as a result, a competitive procurement process would need to encourage participation through a range of means including a transparent shortlisting process and open interaction with the Territory throughout the procurement process. Informally, certain potential participants have indicated they would not participate in a procurement process given the competitive advantage held by Canberra Metro and the glut of infrastructure work in the Australian market at present;
- Regarding the O&M package, there was limited interest from light rail operators noting that an incumbent exists for City to Gungahlin Light Rail and it was unlikely that a dual operator network would be feasible;
- D&C market participants indicated a possible interest in considering participation in a competitive D&C tender. However, this was caveated on the basis that the process was communicated to the market in a transparent manner and there were adequate controls in place should John Holland and CPB be participating as part of the procurement team (as members of the Canberra Metro consortium);
- Furthermore, market capacity may be constrained by other significant infrastructure projects which are expected to be in procurement and construction at the same time as the expansion. Participants indicated that there are capacity constraints on the east coast and competition for similar projects whose procurement processes will occur simultaneously with expansions development. The massive number of transport infrastructure projects currently active in Australia is shown in Figure 8-3.

Figure 8-3: Transport construction projects in Australia[111]



- Consequently, high risk delivery models with substantial interface risk and incumbent operators are deemed to be less attractive to the market. This indicates that there could be a real risk of reduced participation in a competitive procurement setting.

8.3 Recommended delivery model

The recommended delivery model to be pursued in the first instance consists of two components:

- An 'Early Contractor Involvement' contract on a sole-source basis with Canberra Metro in connection with Stage 2A. This will cover the period between this Business Case and the submission of a proposal for the main Stage 2A works by Canberra Metro. This 'Early Contractor Involvement' approach will enable development of Stage 2A to continue while Canberra Metro prepares its proposal. It will also establish a framework which will facilitate the achievement of a value for money outcome (for example, by setting out requirements for open book costs development, the independent assessment of costs, and the procurement of sub-services); and
- Procurement of a contract for the Project's main works through a sole source negotiation with Canberra Metro. This will, at a minimum, include an integrated package consisting of the design, construction, operations and maintenance of the Project. The entry into a contract for the Stage 2A main works will come at the conclusion of the Stage 2A 'Early Contractor Involvement' process.

Under this approach, separate approval will be sought from Cabinet in the future as to the *form* of the contract for the Project's (i.e. Stage 2A's) main works. The form of the contract for the main works could be a public-private partnership (PPP), design, construct, operate and maintain (DCMO), or some

[111] *Macromonitor, 'Australian Construction Outlook – Overview', https://macromonitor.com.au/australian-construction-outlook-overview/, 2019*

other form of contract. As contractual arrangements for the Project will be shaped in part by existing arrangements under the City to Gungahlin PPP contract, it will be necessary for the ACT Government to enter into further negotiations with Canberra Metro before the form of the contract for the Project can be settled. These negotiations will take place as part of the Stage 2A 'Early Contractor Involvement' works. In any event, given the sale of the Project, negotiations will proceed on the basis of an augmentation of the existing Stage 1 Project Agreement.

This recommended sole-source approach provides the most sound basis to manage interface risks for the D&C and O&M packages and maintains continuity of service quality and design between City to Gungahlin Light Rail and the Project under a single operator model that will provide a single seat journey between Gungahlin and Commonwealth Park. This approach is also likely to somewhat alleviate the risk of inadequate market participation caused by capacity constraints on the East Coast of Australia, particularly given the Project's scale and Canberra Metro's strong position as the incumbent operator.

A robust framework will be established (as described below) to ensure value for money, including mechanisms such as open book arrangements, benchmarking and competitive subcontracting.

While the Project is likely to be an augmentation to the existing PPP arrangement, it is not necessarily the case that simply augmenting the existing Project Agreement for City to Gungahlin Light Rail will be the ultimate contracting outcome. Doing so would be complex and may have a material impact on risk allocation and equity holders under that project. Consequently, following consideration of this Business Case, Major Projects Canberra will work through the potential contract form, including consultation with Canberra Metro, to ensure an optimal contracting approach is recommended to Cabinet. In order to achieve a value for money outcome for the Project, it is almost certain that (i) the allocation of risks for the Project will be different for the Project than it was for City to Gungahlin Light Rail, and (ii) amendments may be made to the existing City to Gungahlin Light Rail Project Agreement. This is because the Project will introduce additional operating risks for Canberra Metro on City to Gungahlin Light Rail, and cross-default arrangements may not be commercially appropriate between City to Gungahlin Light Rail and the Project.

8.4 Commercial principles

A preliminary set of commercial principles has been formulated to support the Business Case and the initial commercial framework for the procurement phase of the Project. These the Project commercial principles have been prepared based on an integrated delivery model for DCMO and where possible, are based on City to Gungahlin Light Rail principles. An overriding commercial principle of the Project has been to maintain positions from City to Gungahlin Light Rail.

Table 8-7: Commercial principles for discussions with Canberra Metro

Commercial Principle	Approach
City to Woden Light Rail PPP Principles	
Performance regime between City to Gungahlin Light Rail and the Project	• As outlined in Section 8.2.5, the Territory's customer experience objectives support a single operator for the whole City to Gungahlin Light Rail and City to Commonwealth Park alignment; • The single operator should be subject to a consistent performance regime between City to Gungahlin Light Rail and City to Commonwealth Park; and • This position will be subject to negotiation with Canberra Metro.
O&M risk profile and structure of the overall performance regime	• Canberra Metro is required to take O&M risk for City to Commonwealth Park with the overall position for the combined City to

Commercial Principle	Approach

	Gungahlin Light Rail and City to Commonwealth Park to be no worse than City to Gungahlin Light Rail;
	• City to Gungahlin Light Rail performance regime principles include:
	  • A base service payment for O&M, debt payments (if relevant), equity distributions (if relevant), energy, additional and special event services; and
	  • An abatement regime comprising an availability and on-time running adjustment and a service quality regime supported by KPIs.
	• This regime is to be maintained for City to Commonwealth Park; and
	• This position will be subject to negotiation with Canberra Metro.

Interface between City to Gungahlin Light Rail and City to Commonwealth Park – physical, operational and maintenance related	• All operating period interfaces between City to Gungahlin Light Rail and City to Commonwealth Park are to be managed by Canberra Metro with minimal input with the Territory.
Accreditation	• Canberra Metro will be an accredited Rail Transport Operator for commissioning, maintenance & operation.
Term	• City to Commonwealth Park operating term concludes at the end of the existing City to Gungahlin Light Rail term • Concurrency of the conclusion of City to Gungahlin Light Rail and City to Commonwealth Park terms and lifecycle costs is considered to be the most important consideration for Commonwealth Park term; • No compelling reason to shorten the overall term for City to Gungahlin Light Rail has been identified, due to the significant impact of renegotiating the City to Gungahlin Light Rail Project Agreement and lifecycle risk implications; • The proposed operations term is based on satisfying the midlife refurbishments to the City to Commonwealth Park rolling stock. All other considerations are similar to that of City to Gungahlin Light Rail (flexibility, useful asset life etc.); and • There is a trade-off between the transfer of risk (increases with a longer operations period), affordability (annual availability payment decreases with a longer operations period), whole of life costs (increases with a longer operations period) and Territory flexibility for current and future stages (decreases with a longer operations period).
Performance relief for City to Gungahlin Light Rail due to the Project D&C	• Canberra Metro to manage the interface between City to Gungahlin Light Rail operations and City to Commonwealth Park during construction and into the operations phase so as to minimise impact on the City to Gungahlin Light Rail performance; and • Relief will only be allowed in limited circumstances.
O&M requirements and interface agreement	• O&M requirements to be included in any competitively tendered D&C Briefs for the RFT.
Canberra Metro required to demonstrate Value for Money to the Territory	• Open book – agreed open book framework with Canberra Metro; • Detailed financial modelling, including the development of a Shadow Bid model, will provide rigour from a cost comparator and

Commercial Principle	Approach
	benchmarking perspective to support the procurement and evaluation process; • Competitive procurement – establish a set of contestable elements where the Territory may achieve competition through a sole source procurement with Canberra Metro; and • Market testing and assessment of comparable procurement frameworks from other Australian jurisdictions for similar procurement approaches to be undertaken.
Termination provisions	• Should the recommended delivery model approach fail to meet the Territory's objectives or a value for money outcome the Territory will have the right to pursue an alternative procurement approach and terminate the Project Agreement; • Canberra will be excluded from any subsequent procurement process; and • Consideration of an equity purchase deed for future stages.
Integration with a future Commonwealth Park to Woden stage	• Canberra Metro to be responsible for whole of corridor integration and risk – this could be captured in the commercial framework for the City to Commonwealth Park project; • Technical future proofing should be accompanied by commercial future proofing through a robust augmentation regime contemplating the extension to Woden; and • Consideration of a process for design integration between City to Commonwealth Park and the extension to Woden.

8.5 Value for money framework

The Territory intends that a robust and documented framework will govern the procurement process for the Project to ensure that value for money is achieved during the procurement process.

This framework will be used to guide negotiations with Canberra Metro for the sole source procurement to ensure value for money is obtained.

The value for money framework will contain the following elements:

- **Total cost envelope –** outlined process for establishing an appropriate cost envelope prior to entering negotiations to inform decision making on affordability and set expectations on the Project's cost
- **Competitive subcontract procurement** – establish a set of contestable elements which may be competitively subcontracted on a joint or open basis. This will also support the achievement of broader local jobs objectives of Government
- **Open book** – agreed open book framework with Canberra Metro, including independent Quantity Surveyor assessment and sign-off at agreed timeframes where appropriate to provide transparency. This process would likely include:
    - Preliminaries and insurances
    - Labour equipment and materials
    - Risk and contingency
    - Indexation and discount rates

- Reimbursable costs

The Territory would outline and agree with Canberra Metro the consequences of non-compliance, including the right to terminate.

- **Design team selection** – given Canberra Metro is likely to appoint its designers early in the procurement process to provide the technical support necessary to participate in consultation, it will be necessary to ensure measures are implemented to incentives an efficient and value for money design process. This may include:
  - Oversight of the development of Canberra' Metro's design scope and any proposed scope variations
  - Oversight of the design team procurement process
  - Approval of the successful tenderer
- **Margins and fees** – agreed margins and fees in key areas, including:
  - Mobilisation costs
  - Legal advisor fees
  - SPV management costs
  - Equity IRR and financial advisory fees (if applicable)
- **Benchmarking and financial modelling** – detailed financial modelling, including the development of a Shadow Bid model, will provide rigour from a cost comparator and benchmarking perspective to support the procurement and evaluation process. Benchmarking sources may include:
  - Shadow Bid and City to Gungahlin Light Rail pricing
  - Published LRV prices
  - Pricing information from comparable jurisdictions and project precedents
  - Fixed advisor fees
- **Plan B** – development of a credible 'Plan B' procurement approach (such as terminating the Gungahlin to the City concession or progressing another route) will:
  - Provide the Territory with a viable alternative procurement pathway should negotiations with Canberra Metro fail to achieve the Territory's objectives
  - Assist in maintaining competitive tension should it be communicated to Canberra Metro or the market that an alternative approach is being developed

9.0 Project governance

Key messages

- The Project will be procured and delivered by Major Projects Canberra in consultation with other relevant stakeholders, including Transport Canberra and City Services, the Environmental Planning and Sustainable Development Directorate, and the City Renewal Authority.
- Once delivered, the management of the operations of the Project will revert to Transport Canberra and City Services.
- It is anticipated that a consistent governance framework will be used to oversee the delivery of Stage 2B to Woden.
- Governance arrangements are indicative and subject to change following further consideration by Cabinet.

9.1 Governance structure

The Project will be procured and delivered by Major Projects Canberra in consultation with other relevant stakeholders, including the Transport Canberra and City Services Directorate, the Environment, Planning and Sustainable Development Directorate, and the City Renewal Authority. Once delivered, the management of the operations of the Project will revert to the Transport Canberra and City Services Directorate.

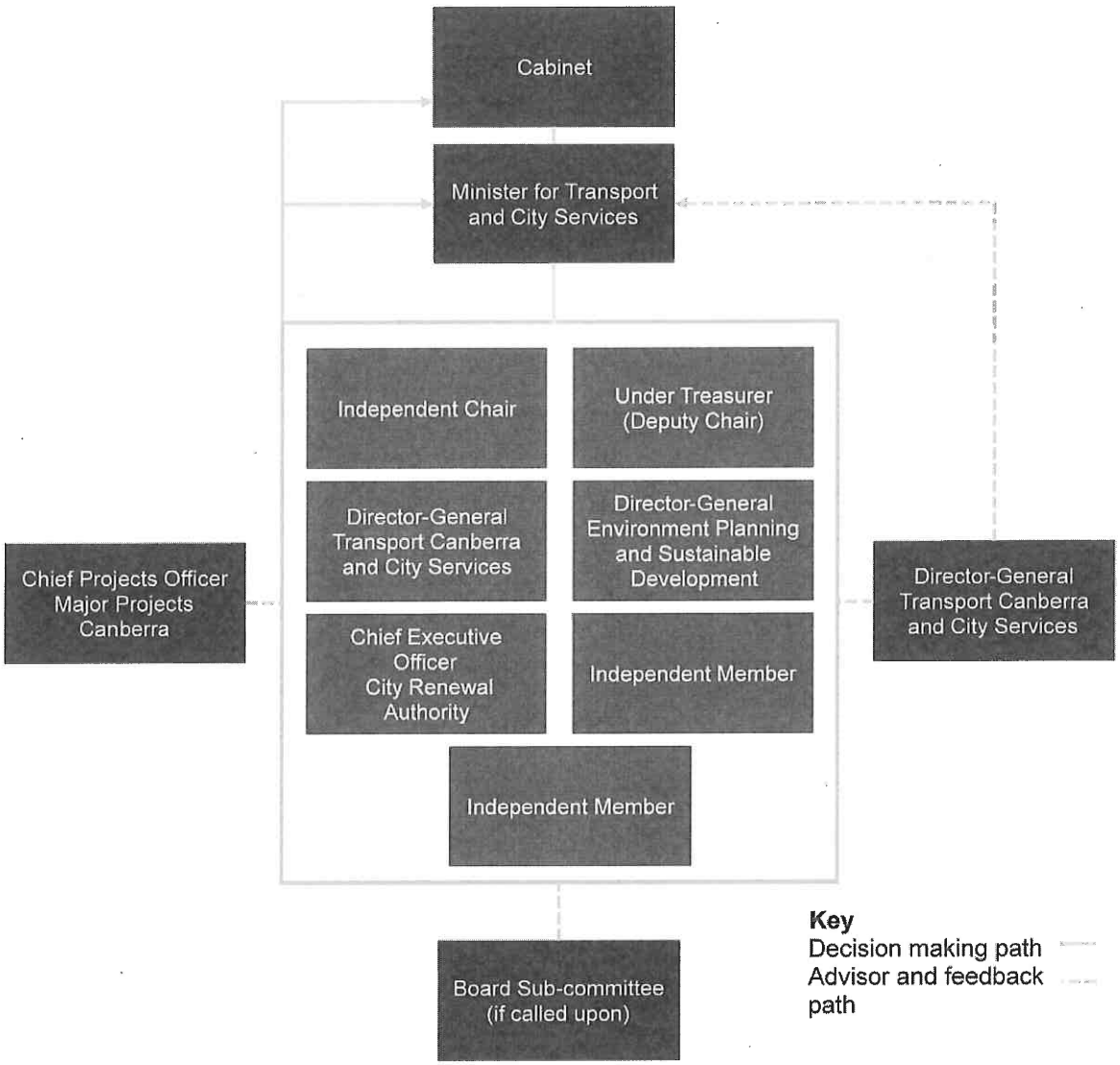
It is anticipated that a consistent governance framework will be used to oversee the delivery of Stage 2B to Woden.

The Project will operate within a governance framework which includes a Light Rail Project Board with independent members, as well as representation from key ACT Government Directorates.

Within Major Projects Canberra, the Project team will report to the Project Director who will in turn report to the Chief Projects Officer. Ministerial responsibility for the Project will be with the Minister for Transport and City Services.

Figure 9-1 provides a high-level overview of the governance structure for the Project. However, these governance arrangements are subject to future decisions of Cabinet.

Figure 9-1: The Project's governance structure



9.2 Key roles and responsibilities

9.2.1 Organisational representation

The governance structure developed ensures adequate ACT Government directorate representation through the Light Rail Project Board which will include independent members. The Project Board will consist of members from relevant ACT Government directorates including:

1. Chief Minister, Treasury and Economic Development Directorate
2. Transport Canberra and City Services
3. Environment, Planning and Sustainable Development Directorate
4. Justice and Community Safety Directorate

In addition to this, the Project Team may also include individuals from the above noted directorates.

9.2.2 Key groups

Each of the key groups involved in the Project have different responsibilities as outlined below.

Cabinet

Cabinet, or any established Cabinet Subcommittee, is the peak decision-making body for the Project, including the decision (or otherwise) to proceed with the Project.

Generally, matters to be escalated to this group for approval include:

- Global capital and operational expenditure cost estimates;
- Design, delivery strategy and Business Case;
- Funding and value capture strategy;
- Project objectives and plan;
- Governance Framework;
- Cross-government coordination issues (in circumstances of unresolved issues at the Project Board level); and
- Risk oversight.

Project Board

The Project Board provides strategic direction and advice to key Project personnel, including the Chief Projects Officer, Project Director and project team.

Major responsibilities of the Project Board include:

- Strategy formulation;
- Endorsements of approvals to be referred to Cabinet;
- Monitoring the Project Team's performance;
- Risk oversight;
- Compliance with relevant legislation and the Territory's policies; and
- Communicating with key strategic stakeholder groups.

Chief Projects Officer

The Chief Project's Officer is accountable for all activities of the Major Projects Canberra Project Team. The Chief Project's Officer is a key interface point between all key decision makers (including the Project Board and Minister), and a key interface between the directorate, and community stakeholders.

The Project Director is responsible for the activities of the Project Team itself, and serves as a key interface between light rail and the Territory's other planning activities such as transport planning activities.

Project Director

The Project Director, reporting to the Chief Projects Officer, leads the project team and directs and manages the delivery of the Project to meet the ACT Government's objectives. The Project Director represents the project team and is a common link between the Project, the City to Woden Light Rail project and the existing light rail network. The Project Director's responsibilities are to:

- Direct and manage the delivery of the Project in accordance with the Project plan to meet the Project objectives;
- Attend and participate in Project Board meetings;
- Establish Working Group(s);

- Keep the Chief Projects Officers and Project Board informed of key issues and risks;
- Take accountability for the Project's Business Case and all other key documents; and
- Oversee the Project budget.

Project Team

The project team focuses primarily on the day-to-day management and operations of the Project. Members are responsible for delivering the Project according to its vision under the direction of the Project Director. They are involved in the detailed outcomes of the Project. A Probity Advisor will also be appointed to assist during the procurement process as needed. The project team's major responsibilities include:

- Implementing the Project Plan;
- Identifying, discussing and escalating strategically important issues and risks to the Project Director, Chief Projects Officer and Project Board;
- Managing the preparation of Project Board papers and material; and
- Endorsing the Monthly Report for escalation to the Project Board for approval.

9.3 Benefits Realisation Plan

Noting the findings and recommendations of the Auditor-General's performance audit into Light Rail Stage 1,[112] a Benefits Realisation Plan is proposed to be developed for the Project. The Benefits Realisation Plan will be prepared by ACT Treasury in consideration of the existing City to Gungahlin Light Rail Benefits Realisation Plan to ensure that a coordinated and consistent approach is adopted.

The Project Benefits Realisation Plan will include the following activities:

- The Project Board will monitor and consider progress throughout the Project lifecycle, or as requested by the Board or Cabinet;
- ACT Treasury will be responsible for collating reports on benefits realisation for the Project Board and providing feedback to responsible agencies on the outcomes of the Project Board's consideration of reports;
- Responsible agencies will provide the following information on both business changes and performance metrics:
    - Progress on business changes;
    - Progress on benefits realisation; and
    - Any updates or revisions required to the Benefits Realisation Plan; and
- Updates or revisions to the Benefits Realisation Plan can be made at any time with agreement of the Project Board.

[112] *ACT Audit Office, 'Initiation of the Light Rail Project: Report No. 5 / 2016', https://www.audit.act.gov.au/__data/assets/pdf_file/0007/1179943/Report-No.-5-of-2016-Initiation-of-the-Light-Rail-Project.pdf, 2016*

10.0 Stakeholder management

Key messages

- The Project will be delivered in a collaborative and consultative way. Given the Project will be co-delivered with the raising of London Circuit (if approved) and noting the range of other proximate projects in the city, coordination of engagement activities will occur with the Environmental, Planning and Sustainable Development Directorate and the City Renewal Authority.
- Consultation has already occurred with the community and key stakeholders on the light rail network and the extension of light rail south to Woden, though substantial ongoing consultation will be required through the Project's procurement and delivery phase. Consultation will focus on the extension to Commonwealth Park as the first component of light rail to be delivered between the City and Woden.
- The communications and consultation approach outlined in this Chapter is founded on the principle that regular engagement will deliver key Project benefits. Further, the approach supports the ACT Government priorities for "enhancing liveability and social inclusion" and "suburban renewal and better transport".
- The Project has a significant number of stakeholders ranging from the Canberra community, Commonwealth agencies and commercial organisations, through to small businesses, residents, unions and public transport customers. A tailored communications and stakeholder engagement approach will be critical to the Project's success, adopting the right mix of engagement techniques across both the delivery and operations phases.
- Given the large number of transport, land development and urban renewal projects in planning or delivery around the route alignment, coordination, collaboration and integration of all stakeholder and community engagement activities is critical to ensure consistent and clear messaging. It may also produce efficiencies for the ACT Government in the delivery of communications activities.

10.1 Our Stakeholders

10.1.1 Our customers

As a city-shaping project for Canberra, the Project will be of interest to all Canberrans – whether they use the light rail network every day, or only occasionally to attend and/or organise special events, such as at Canberra Theatre or in Commonwealth Park. The ACT Government will actively engage with all Canberrans to ensure that the community's views are taken into consideration during the Project's phases, including design development, construction and operations.

A wide range of customers will use the Canberra light rail network from the City to Commonwealth Park including shoppers, young travellers, tertiary students, the elderly, night-time travellers, peak commuters, tourists, business travellers and event attendees.

The ACT Government has adopted a 'customer centric approach' to provide Canberrans with an attractive, convenient, efficient and reliable integrated public transport system.

Key issues for stakeholder engagement

Addressing the following key issues will be vital to the ACT Government's stakeholder engagement strategy:

- Close consultation with Canberrans, particularly those that live, work or study along the corridor in New Acton and City West. Examples include local business patrons, public sector and private employees, and ANU students.
- Internal consultation within ACT Government to maximise synergies with other projects, such as the Acton Waterfront and City Hill development plans;
- Collaboration with Government stakeholders to manage traffic impacts during the Project's development, particularly in light of the large number of projects planned along the route alignment, and ensuring the community is advised of any proposed road closures or diversions;
- Keeping Canberrans informed of progress towards the further extension from Commonwealth Park to Woden;
- Ongoing engagement with Canberra Metro to ensure that the ACT Government's customer objectives are met for the light rail network; and
- Maintaining a dialogue with the NCA, particularly given Works Approvals will be required as the route traverses NCA 'Designated Area'.

Accordingly, the Project is guided by the same customer principles as those of the City to Gungahlin Light Rail:

- **Simplicity:** a simple to understand, use, find and interpret service;
- **Convenience:** a convenient service that offers suitable hours of operation, destinations that make sense, links to other modes of transport, accessibility and bike transport;
- **Smart:** smart access to information about my journey time and service, that is intuitive and easy to stay connected;
- **Seamless:** a seamless experience between the start of my journey through my destination and across the whole light rail network; and
- **Modern:** a service that is modern, professional and contributes to Canberra's positive image.

These customer principles will underpin the operation of the light rail network, supporting broader public transport customer objectives such as reliability, safety, personal security, frequency and efficient journey time.

Establishing good relationships with stakeholders, customers and the community will provide opportunities for Canberrans to have input into shaping key aspects of the Project and to understand its benefits, both in terms of improved public transport accessibility and its contribution to urban revitalisation.

10.1.2 External stakeholders

The external stakeholder landscape is diverse and broad. For instance, between 8,000 and 14,000 stakeholders are estimated to be directly impacted during the construction phases of both Stages 2A and 2B – inclusive of businesses, residents and commuters. In addition to the local community, key external stakeholder groups for the Project include:

- Community councils and resident associations;
- Local businesses;
- Community groups and peak organisations;
- Event organisers and tourist groups;
- Regulatory and approval authorities;
- Educational institutions, including the Australian National University; and
- The Commonwealth Government and its agencies, including the NCA. The importance of collaboration with the Commonwealth Government, including the NCA, cannot be overstated.

To address the views of the external stakeholder audience, a separate Community Engagement Strategy will be developed for the Project to ensure that the Territory's consultation objectives are achieved.

Given the broad range of stakeholders likely to be interested and / or impacted by the Project, an assessment of the appropriate engagement strategy for each phase of consultation will be undertaken. It is recognised that stakeholders and their interests will vary at different phases of the Project's development. Some of the stakeholders will maintain an interest throughout all phases of planning, construction and operation, while others may only have an interest at specific times.

Importantly, the Community Engagement Strategy will set out a detailed account of the proposed engagement and reporting methods for all external stakeholders – arranged by demographic group.

10.1.3 Internal stakeholders

There are a wide range of internal stakeholders for the Project, including Cabinet and many other ACT Government Directorates and agencies such as:

- Chief Minister, Treasury and Economic Development Directorate;
- Major Projects Canberra;
- Transport Canberra and City Services;
- City Renewal Authority;
- Environment, Planning and Sustainable Development Directorate; and
- Education and Training Directorate

Internally within the ACT Government, the Project either impacts or interests every ACT Government Directorate. Accordingly, Cabinet and all ACT Government Directorates have been consulted in the development of this Business Case, and in relation to the Project more generally.

The ACT Government has ongoing forums through which it will maintain a continuous dialogue between internal stakeholders throughout the life of the Project's development, including the Project Board and other formal and informal arrangements.

10.2 Communication and consultation

10.2.1 Communication objectives

The communications approach applied will be multifaceted, open and inclusive. Major Projects Canberra will be responsible for delivering all communications and engagement activities during the procurement and delivery phase. Transport Canberra and City Services will have responsibility for communications activities during the ongoing operational phase.

The overarching communications and engagement objective is:

"To effectively gather, acknowledge, analyse and mitigate community and stakeholder insights, views, experiences and opinions related to the Project"

The communication objectives for the Project are as follows:

- To effectively engage with ACT Government stakeholders, ensuring that they are informed and involved as the Project develops;
- To develop the ACT Government's capacity and capability to undertake effective communication and engagement activities for major transport infrastructure projects;
- To actively create momentum for the Project with key stakeholders and the broader Canberra community through accessible, informative, innovative and clear communications and engagement activities; and
- To provide effective communications and engagement support that strongly positions the Project at key decision-making points and during the formal approval process period.

10.2.2 Communications approach

The communications approach has been informed through extensive internal consultation and through the experiences from the delivery of City to Gungahlin Light Rail, consultation on the new bus network, internal

precinct review processes, piloting of engagement methods in 2018, research by the Next Engagement Project[113] and learnings from other jurisdictions where major infrastructure projects are being delivered.

The objectives outlined in Section 10.2.1 align with the ACT Government's commitment to engaging effectively with its citizens as outlined in Engaging Canberrans: A guide to community engagement. The Guide identifies five key principles to guide engagement practice:

1. **Careful Planning and Preparation** – through adequate and inclusive planning, ensure that the design, organisation and convening of the process serve both a clearly designed purpose and the needs of participants. Tailor the approach to fit the target group. Integrate online engagement and other social media with traditional methods;
2. **Inclusion and Demographic Diversity** – equitably incorporate a diversity of people, voices, ideas and information to lay the groundwork for quality outcomes and demographic legitimacy;
3. **Collaboration and Shared Purpose** – support and encourage participants, government and community groups, and others to work together to advance engagement goals;
4. **Openness and Learning** – help all involved to listen to each other, explore new ideas unconstrained by predetermined outcomes, learn and apply information in ways that generate new options, and rigorously evaluate community engagement activities for effectiveness; and
5. **Transparency and Trust** – be clear and open about the process and its objectives, and how it will feed into decisions or government actions, provide a community record of the organisers, sponsors, outcomes and a range of views and ideas expressed, and feedback to participants.

Given the large number of transport, land development and urban renewal projects in planning or delivery around the route alignment, coordination, collaboration and integration of all stakeholder and community engagement activities is critical to ensure consistent and clear messaging. It may also produce efficiencies for the ACT Government in the delivery of communications activities.

A Communications and Engagement Team will oversee the implementation of the CES (also see Figure 9-1). This team will be responsible for the overall management and coordination of community information, involvement and face-to-face interaction.

10.2.3 Consultation methods

The community will be able to provide ongoing feedback throughout the Project's development. A variety of different consultation methods will be used, including:

- **Face-to-face engagement activities** – shopfront walks, drop in sessions, market stalls, roundtable meetings and community presentations;
- **Market research, advertising and mass communications activities** – brochures and newsletters distributed at market stalls and the Your Say website;
- **Social media** – Twitter and Facebook;
- **Website and collateral development** – Your Say website and surveys; and
- **Media and public relations activities described**.

A wide range of internal consultation methods will also be utilised for the Project. Methods include Ministerial and Executive briefings; staff awareness tours; working groups; workshops; intranet articles and whole-of-government messages.

[113] *The Next Engagement Project was undertaken by the Australian National University*

10.2.4 Consultation undertaken to date

In October 2015, the ACT Government released its Light Rail Plan in which it outlined seven new route alignments to be built over a 25 year period, including the City to Woden corridor. The Project, from Alinga Street to Commonwealth Park, represents the northern portion of the corridor and the initial stage in extending light rail to Woden. The public were invited to submit comments on the plan by December 2015, helping to select the City to Woden route as the next stage of the network to be developed.

Initial consultation on City to Woden Light Rail's design principles, landscape strategy, route alignment, stop locations and items of community or environmental interest occurred in May and June 2017. The community consultation resulted in more than 10,000 individual interactions, ranging from seeking information from the website to in-depth stakeholder discussions. The potential stops in the Project, as part of the full route alignment, were considered during these consultations and have informed the Project's ongoing development.

A summary of the activity after the six-week public consultation period is provided in the table below.

Table 10-1: Summary of six-week consultation activity

Consultation activity	Interactions
Face-to-face consultation	Spoke to 587 individuals
Shopfront walks	7 completed
Roundtable meetings (Community and Business)	3 held with 33 attendees
Presentations to Community Councils/Events	4 held with 146 attendees
Drop in sessions	4 held with 24 attendees
Market stalls	7 held with 384 individual consultations
Brochures and Newsletters distributed	2,990 distributed
Visits to the Your Say website	4,772 visits
Online surveys	1,364 completed
E-mails	150 e-mails sent to organisations and schools
Verbate	1 video contribution
Online interaction map	1,704 visits and 339 contributions
Visioner questionnaire	71 contributions
Twitter	21 tweets with 17,016 impressions
Facebook posts	5 with 22 shares and a reach of 22,381
Media mentions (print, online, radio and television)	63
Written feedback submissions	Received 1,796 items of written feedback

On 10 May 2018, the JSC agreed to inquire and report on Commonwealth and Parliamentary approvals for the City to Woden Light Rail. The JSC accepted written submissions, addressing one or more of the Terms of Reference, which are outlined in Section 2.4.3. The JSC also conducted public hearings on 21 June 2018, 28 June 2018 and 16 August 2018, which heard from 25 witnesses, to gather evidence from stakeholders on one or more of the Terms of Reference.

The JSC received 43 submissions, 11 supplementary submissions and two exhibits. The submissions made included those from:

- Members of the public;

- Commonwealth Government (Department of Infrastructure, Regional Development and Cities, Department of Parliamentary Services, Department of Environment and Energy, NCA, Planning Institute of Australia, Property Council of Australia, Productivity Commission);
- Local Councils (Inner South Canberra Community Council;
- Local resident's groups, Kingston and Barton Residents' Group;
- Other organisations (Australasian Railway Association, Canberra Business Chamber, University of Canberra, Australian Institute of Architects, Smart Canberra Transport, Lake Burley Griffin Guardians, Public Transport Association of Canberra); and
- ACT Government

The JSC's report presented several recommendations for City to Woden Light Rail which were agreed, or agreed in principle by the Commonwealth Government. Where relevant, these have informed the development of the Project as outlined in Section 2.4.3.

11.0 Advisor engagement plan

Key messages

- A variety of external advisors have been appointed in accordance with ACT Government processes to assist the Territory to develop the Project.
- The expertise and support required from advisors will change as the Project progresses and the Territory's needs change.

11.1 Proposed advisor roles

A variety of external advisors are anticipated to be appointed to assist in the development of various elements of the Project. Transport Canberra and City Services has previously worked with Shared Services Procurement (SSP) on advisor engagement matters in accordance with relevant procurement guidelines.

Transport Canberra and City Services appointed a series of advisors to assist in the preparation of this Business Case and provide advice to support Cabinet's deliberations on whether to proceed with the Project. These advisors include:

- Commercial and economics;
- Legal and probity;
- Technical;
- Cost estimation;
- Communications;
- Strategic, meso and micro transport modelling; and
- Public transport integration.

Ongoing engagement of advisors will be dependent upon future ACT Government decisions regarding the progression (or otherwise) of the Project.

A list of key external advisory mandates that may be required for the Project are outlined in Table 11-1. It is noted that this list of advisors is indicative and is likely to change as the Project progresses from the Business Case stage, through to procurement, construction and operations.

11.1.1 Key external advisors

Table 11-1: Key external advisors

Key advisory mandates	Potential scope of engagement
Strategic governance, Project management and advisory support	Project management services may include: • Planning and scheduling for major infrastructure and complex engineering procurements; • Provision of expert assistance on Project risk assessment, Project controls and assurance; • Advice on the preparation of documentation and / or review and clearance processes; and

Key advisory mandates	Potential scope of engagement
	• Governance and construction surveillance services, including bid transactions processes and ICT security and data room management.
Commercial and financial	Commercial and financial services may include: • Commercial advice; and • Project procurement and negotiation assistance.
Technical engineering, design and planning	Technical engineering, design and planning advisory services may include: • Detailed technical design of infrastructure and operating requirements; • Urban design, planning, architecture and landscaping; • Utilities location and geotechnical surveys; and • Environmental investigations and studies and arboriculture.
Legal	Legal advisory services may include: • Project procurement assistance, including drafting and negotiation of Project documentation; • Legislative requirements such as planning and environmental approvals; and • Probity advice.
Cost estimating	Cost estimation advice may include the provision of cost estimation works for the Project's capital and operating costs.
Communications, consultation and strategic relations	Communications, consultation and strategic relations services may include: • Community engagement planning and ongoing consultation on various Project aspects; • Preparation of Project communications materials and reports; and • Advice, coordination and advocacy with respect to the Commonwealth Government, its departments, agencies and authorities.
Operations planning and management	Operations planning and management advisory services may include: • Rail systems requirements; • Systems implementation and integration; • Rolling stock and systems procurement and maintenance; • Network operations, planning and crewing; and • Stop and depot management.

If the ACT Government proceeds with the Project, additional specialist advisory services may be required in addition to those outlined in the table above.

12.0 Timeline

Key messages

- All dates listed in this Business Case are indicative and subject to a number of factors, including Cabinet decisions regarding this Business Case.
- Contract award for the main works design and construction activities anticipated to occur in mid 2020.
- The Project is currently expected be operational in 2024.
- Indicative timing described herein is based upon the definition design and assumptions on construction methodology.
- Actual timing shall be subject to the length of the approvals process, completion of the procurement process and the realisation (or otherwise) of planning and other risks, and Government decisions on related projects.

12.1 Project timeline

12.1.1 Overview

Key indicative Project milestones (assuming London Circuit is raised) are outlined in Table 12-1. These indicative milestones are subject to substantial change, particularly if (i) complication arise in raising London Circuit (if approved) (ii) planning approvals necessitate wire-free running, or (iii) unexpected Commonwealth Government impediments arise.

Table 12-1: Key indicative Project milestones (assuming London Circuit is raised)

Milestone	Anticipated Timeline
Approvals processes (WA, DA and environmental)	Mid-2019 – mid-2020
Early contractor involvement process	Mid-2019 – mid-2020
Main package contract award	Mid-2020
Design and construction	Mid-2020 – 2023 / 2024
Commissioning	Late 2023 / 2024
Operations commencement	2024
Stage 2B ongoing design and planning activities	2019 – until the time of Commonwealth approval

12.1.2 Approvals

The Project will require a series of approvals in order to proceed to the construction phase. These include:

- **Environmental approval:** a draft Environmental Impact Statement (EIS) will be required;
- **Works Approval:** similar to City to Gungahlin Light Rail, the route alignment traverses 'Designated Areas' and as such will require Works Approval from the NCA; and
- **Development Approval:** in line with legislative requirements, Development Approval will be required from EPSDD

These approvals will be progressed in line with the timeline outlined above.

12.1.3 Procurement Phase

The procurement phase timelines outlined above are based on the delivery of the Project through a sole source negotiation with Canberra Metro.

12.1.4 Delivery phase

The overall duration of the construction phase is indicatively expected to be approximately two and a half to three years in duration for the main works package from contract award to the commencement of operations. This leads to an expected start date for operations in 2024.

12.1.5 Timeline flexibility and constraints

The timeline outlined above may be impacted by a number of factors, including:

- Government decisions regarding this Business Case and the delivery of the Project more generally;
- Delays in planning and environmental approvals;
- Government decisions and construction timing on other related projects, such as the raising of London Circuit at Commonwealth Avenue; and
- All other risk factors identified elsewhere in this Business Case.

Assumptions book

Economic values

Valuation year and discount rate

Table 2 Discount and inflation rates

Parameter	Value
Discount rate	7.0%
Inflation	2.5%

Table 3 Appraisal parameters

Parameter	Year
First year of the appraisal period	2019 financial year
Dollar terms	2019 financial year
Operation	2024 financial year as per construction profile
Appraisal period	30 years
Appraisal end year	2054 financial year for Stage 2A analysis and 2055 financial year for City to Woden analysis
Annualisation factor volume – roads	345 days per year
Annualisation factor volume – public transport	300 days per year
Annualisation factor cost – car	336 per year
Annualisation factor cost – public transport	292 per year

Escalation year

Table 4 Escalation years

Parameter	Year
Travel time savings – public transport	2018
Travel time savings – cars	2018
Travel time savings – light commercial vehicles	2018
Travel time savings – heavy commercial vehicles	2018
Reliability benefits – all types	2018
Vehicle operating costs – resource	2007
Vehicle operating costs – fuel	2008
Health benefits	2018
Accident – car	2018

Parameter	Year
Accident – bus	2018
Public transport revenue	2008
Externalities – cars	2018
Externalities – public transport	2018
Wider economic impacts	2017
Infrastructure cost savings	2015
Bus operating cost savings	2018

Travel time

Table 5 Travel modes (assumed occupancy per vehicle of 1)

Main mode	2018 value ($)
Car	16.89 per person
Light commercial vehicle	29.21 per person
Heavy commercial vehicle	58.17 per person

Table 6 Value of time per person hour

Parameter	2018 value ($)
Business value of time	54.78
Private value of time	16.89

Vehicle operating costs

Table 7 Public transport operating costs

Bus	2018
Cost per bus km	$1.65
Cost per bus hour	$53.32
Assumed average speed	30 km/h

Externality impacts

Table 8 Externality benefits (2018 value, cents per km)

Main mode	Car	Light commercial vehicles	Heavy commercial vehicles	Bus	Light rail
Air pollution	3.30	8.02	28.41	37.15	40.63

Main mode	Car	Light commercial vehicles	Heavy commercial vehicles	Bus	Light rail
Greenhouse emissions	2.60	2.50	6.33	15.31	32.07
Noise	1.08	1.37	4.74	2.60	-
Water	0.50	1.20	4.26	5.57	-
Nature and landscape	0.06	0.89	0.46	0.17	-
Urban separation	0.76	1.31	3.16	2.46	-
Total	8.30	15.28	47.37	63.26	72.70

Accident

Table 9 Accident cost ($/vehicle km travelled)

Accident cost	2018 value
Bus	0.01

Health benefits

Table 10 Health benefit of active transport per km

Main mode	2018 value
Walking	1.79
Cycling	1.19

Table 11 Average km per trip

Main mode	2016 value
Walk access to walk egress	1.00
Car access to walk egress	0.50
Walk access to car egress	0.50

Light rail amenity benefit

Table 12 Light rail amenity improvement

Improvement value	Value
Improvement value	10%

Infrastructure efficiency benefits

Table 13 Infrastructure efficiency benefits

Density	$/dwelling
Low density	110,578.00
Medium density	82,631.00
High density	54,684.00

Land use assumptions – Acton Waterfront

Table 14 Acton Waterfront development assumptions (people)

Density	FY25	FY26	FY27	FY28	FY29	FY30	FY31	FY32
Base case employment	-	-	63	66	120	34	24	60
Base case population	-	-	611	632	1,156	327	229	576
Project case employment	128	100	79	60	-	-	-	-
Project case population	1,233	959	763	576	-	-	-	-

Financial analysis cost assumptions

Key assumptions

Table 67 Key assumptions

Cashflow component	Source and notes
Model period	Approximately 18 years, with an approximate 3 year and a half year design and construction period, and an approximate 14 and a half year operating period
Project outturn cost	$225.8 million (nominal, P75), which includes $60.7 million of contingency (nominal, P75)
Operating costs	$97.0 million (nominal) over an approximately 14 year operations period (excludes the period of operator mobilisation)
Maintenance costs	$19.1 million (nominal) over an approximately 14 year operations period
Lifecycle costs	$15.8 million (nominal) over an approximately 14 year operations period
Other assumptions	• Consumer Price Index (CPI) at 2.50% • Wage Price Index (WPI) at 3.50%