

ACT AUDITOR-GENERAL'S REPORT  
**CANBERRA LIGHT RAIL STAGE 2A:  
ECONOMIC ANALYSIS**

REPORT NO. 8 / 2021

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Produced for the Office of the ACT Legislative Assembly by the ACT Audit Office, ACT Government.

ACT Government Homepage address is: <http://www.act.gov.au>

PA 19/09

The Speaker  
ACT Legislative Assembly  
Civic Square, London Circuit  
CANBERRA ACT 2601

Dear Madam Speaker

I am pleased to forward to you a Performance Audit Report titled 'Canberra Light Rail Stage 2a: Economic Analysis' for tabling in the Legislative Assembly pursuant to Subsection 17(5) of the *Auditor-General Act 1996*.

The audit has been conducted in accordance with the requirements of the *Auditor-General Act 1996* and relevant professional standards including *ASAE 3500 – Performance Engagements*.

Yours sincerely



Michael Harris  
Auditor-General  
24 September 2021

*The ACT Audit Office acknowledges the Ngunnawal people as traditional custodians of the ACT and pays respect to the elders; past, present and future. The Office acknowledges and respects their continuing culture and the contribution they make to the life of this city and this region.*



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# SUMMARY

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On 20 April 2019, Light Rail Stage 1 commenced public passenger operations. Light Rail Stage 1 involved the design, construction and subsequent operation of a 12-kilometre light rail route from the City to Gungahlin. It is being delivered through a 20-year Availability Public Private Partnership with Canberra Metro.

Since the decision to proceed with Light Rail Stage 1, the Territory has pursued an intention to extend the network to Woden as part of Stage 2. In September 2019, the ACT Government announced it had decided to split Light Rail Stage 2 into two components:

- Stage 2a – a 1.7-kilometre extension of the existing City to Gungahlin light rail track from the City to Commonwealth Park via London Circuit (West) and Commonwealth Avenue; and
- Stage 2b – a 9-kilometre light rail track from Commonwealth Park to Woden via State Circle (East).

On 10 September 2019, a redacted version of the *City to Woden Light Rail: Stage 2a City to Commonwealth Park Business Case* (Stage 2a Business Case) was made publicly available. It provided details for the design and construction of light rail between the City and Commonwealth Park and the ongoing operation and maintenance of that component of the light rail system. The Stage 2a Business Case also includes information associated with the economic analysis for Light Rail Stage 2a.

The purpose of the audit was to review the effectiveness of the economic analysis for the Light Rail Stage 2a Business Case.

## Conclusions

### PROJECT COST ESTIMATES

For the purpose of the economic appraisal, the September 2019 Stage 2a Business Case identified a present value figure of \$162 million (2019, discounted at 7 percent) for capital costs associated with the construction of Light Rail Stage 2a. However, the capital cost of Light Rail Stage 2a is expected to be higher than what was estimated in the Stage 2a Business Case. Capital cost estimates in the Stage 2a Business Case did not include costs associated with retrofitting the existing light rail vehicle fleet with wire-free technology. This cost was estimated at approximately 17 percent of the estimated capital cost. This is a requirement of Commonwealth approval for Light Rail Stage 2a. At the time of the preparation of the Stage 2a Business Case there was a very strong likelihood that wire-free technology would be required for any extensions towards and through the Parliamentary Zone but this cost, and other costs associated with urban design finishes, were not explicitly included in the capital cost estimate for Light Rail Stage 2a.

For the purpose of the economic appraisal, the Stage 2a Business Case identified a present value figure of \$23 million (2019, discounted at 7 percent) for development costs associated with the accelerated development of the Acton Waterfront. A nominal capital cost estimate for this figure was not identified in the Stage 2a Business Case. Inadequate information was provided in the Stage 2a Business Case in relation to the development costs, the methodology for quantification and the assumptions underpinning the estimate.

The expected costs associated with Light Rail Stage 2a, including costs associated with the accelerated development of the Acton Waterfront, should be updated in revised, publicly available documents.

### **PROJECT BENEFIT ESTIMATES**

For the purpose of the economic appraisal, the Stage 2a Business Case identified a present value figure of \$150 million (2019, discounted at 7 percent) in benefits associated with Light Rail Stage 2a. This compared with a present value figure of \$268 million (2019, discounted at 7 percent) of estimated costs for the project.

A significant amount of the benefits identified for Light Rail Stage 2a are predicated on the project being a catalyst for the acceleration of development of the Acton Waterfront. Neither the Stage 2a Business Case or Economic Appraisal Report provides information or evidence on how Light Rail Stage 2a is expected to accelerate development at the site. Should the Acton Waterfront not be developed as fast as is hoped, then the timing and quantification of the expected benefits of Light Rail Stage 2a are at risk.

The economic appraisal was developed in the context of a series of ‘transformational projects’ and revitalisation activities. As well as the Acton Waterfront Development, these other projects include: raising London Circuit to be at-grade with Commonwealth Avenue; and a National Capital Authority proposal to reconfigure Kings and Commonwealth Avenues as grand boulevards and the development of Section 100 (formerly Section 63) at City Hill. The implementation of Light Rail Stage 2a is dependent on the raising of London Circuit and will be influenced by the National Capital Authority’s plans for the Commonwealth Avenue Bridge. Any failure to implement these projects on a timely basis will have a negative impact on the expected benefits of Light Rail Stage 2a.

### **BENEFITS MANAGEMENT**

The Stage 2a Business Case identified a commitment to the development of a Benefits Realisation Plan for Light Rail Stage 2a. This has not occurred. Benefits management activities should be undertaken at the earliest possible stages of a project to ‘ensure that a mindset of accountability and structured approach towards achieving set benefits is embedded from the early stages of planning’. Benefits management activities should include the development and implementation of a Benefits Realisation Plan; the 2016 *Australian Transport Assessment and Planning Guidelines*



envisages that benefits planning occur when options for the transport initiative are being considered and the business case is being developed.

## Key findings

### PROJECT COST ESTIMATES

#### Paragraph

For the purpose of the economic appraisal, the Stage 2a Business Case identified a present value figure of \$162 million (2019, discounted at 7 percent) for capital costs associated with the construction of Light Rail Stage 2a. The Stage 2a Business Case also identifies a nominal capital cost estimate (i.e. not discounted) for Light Rail Stage 2a. The capital cost estimate includes expected construction costs, expected 'rolling stock' cost (the cost of the light rail vehicles), escalation costs (the expected rate at which costs for the project will increase over the life of the project/construction), and a contingency cost. The contingency cost represents a provision for probable cost increases during project implementation for capital costs. The Stage 2a Business Case acknowledges the complexity of the project as a key project risk and notes 'the project has a larger proportional contingency when compared to City-Gungahlin'.

2.24

The Stage 2a Business Case identified that the project's contingency figure was predominantly driven by risks associated with Commonwealth planning approvals and environmental approvals for the project and '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'. Since the development of the Stage 2a Business Case in September 2019, it has become apparent that the Australian Government has confirmed the need for Light Rail Stage 2a (and any other extensions through the Parliamentary Triangle) will need to be wire-free, i.e. this risk has materialised. In light of this, it is appropriate for the capital cost estimates for the project to be reviewed and published.

2.25

The Stage 2a Business Case identified that there were other costs that were excluded from the capital cost estimate, including the cost of retrofitting the existing light rail vehicle fleet with wire-free technology. The estimated cost of retrofitting the existing light rail vehicle fleet with wire-free technology equates to approximately 17 percent of the estimated capital cost of Light Rail Stage 2a. At the time of the preparation of the Stage 2a Business Case there was a very strong likelihood that wire-free technology would be required for Light Rail Stage 2a and that to use the existing light rail vehicles on the additional 1.7-kilometre extension, wire-free technology would need to be retrospectively fitted. For example, on 22 October 2018, the Joint Standing Committee on the National Capital and External Territories produced its report of an inquiry into Commonwealth and Parliamentary approvals for the proposed Light Rail Stage 2 and recommendations from the inquiry determined that wire-free technology, visual amenity and urban design considerations were mandatory for the project. These recommendations were agreed-in-principle by the Australian Government. Notwithstanding the strong likelihood that costs associated with wire-free running and urban design finishes would be a requirement of

2.37

Commonwealth approval for Light Rail Stage 2a (and any other light rail routes entering into the Parliamentary Triangle), they were not included in the Light Rail Stage 2a cost estimate. Explicitly identifying these costs would have provided greater accuracy and transparency in the economic appraisal and Cost Benefit Analysis for Light Rail Stage 2a.

Disruption costs relate to disruption during the construction period on road users', pedestrians, residents and businesses. Consistent with the approach taken for the Stage 1 Business Case, the Stage 2a Business Case did not include any potential disruption costs associated with the delivery of Light Rail Stage 2a. Business owners located near where the Gungahlin terminus is now located asserted that Light Rail Stage 1 had caused major road closures and general noise and disturbance in the area and that this had led to a drop in foot traffic and subsequent revenue decline. Given the construction complexities of Light Rail Stage 2a, it could be reasonably expected that there will be disruption costs associated with the project. Douglas Economics advised 'an estimate should be included in the [cost-benefit analysis]. This would be best included as a negative benefit (i.e. with project benefits rather than costs)'. 2.50

For the purpose of the economic appraisal, the Stage 2a Business Case identified a present value figure of \$82 million (2019, discounted at 7 percent) for operating, maintenance and lifecycle costs associated with Light Rail Stage 2a. The Stage 2a Business Case also identifies a nominal operating, maintenance and lifecycle cost estimate (i.e. not discounted) for Light Rail Stage 2a. The cost estimate includes operating costs, maintenance costs, lifecycle costs and a contingency cost. The operating, maintenance and lifecycle costs for Light Rail Stage 2a are calculated over a 14-year operation period, coinciding with the conclusion of the Public Private Partnership that is currently in place with Canberra Metro for Light Rail Stage 1. A review of the operating, maintenance and lifecycle costs for Light Rail Stage 2a against other light rail operations (e.g. the Gold Coast Light Rail and Sydney Inner West Light Rail (Dulwich Hill Line)) shows the estimated unit cost per service and unit cost per passenger compares favourably to other operations, but the unit cost per kilometre is considerably higher. 2.55

For the purpose of the economic appraisal, the Stage 2a Business Case identifies a present value figure of \$23 million for accelerated development costs. No further information is provided in the Stage 2a Business Case in relation to the different components of the development costs and their timing. A nominal value of the development costs is not identified in the Stage 2a Business Case. No further information is provided in the draft Economic Appraisal Report in relation to the development costs, the methodology for quantification and the assumptions underpinning the calculation. 2.61

**PROJECT BENEFIT ESTIMATES**

Paragraph

A consultant was engaged to develop patronage and demand forecasts (light rail passenger kilometres, car vehicle kilometres etc), which were then used for the purpose of the economic appraisal. A proprietary model was used to develop the patronage and demand forecasts, which was based on Household Travel Survey data from South East Queensland, Sydney and Melbourne; ideally Canberra-based data 3.22

would have been used for the purpose of forecasting. The patronage and demand forecasts were developed in June 2019, which was before the availability of patronage figures for Light Rail Stage 1. Accordingly, the Economic Analysis Report makes no reference to patronage, construction or operational details of Light Rail Stage 1, which commenced operations in April 2019. Douglas Economics advised 'it would be opportune to revisit the demand model and revise the forecasts in light of the performance of Stage 1'.

In June 2019 the population, employment, land use and car park pricing assumptions for Light Rail Stage 2 were documented. The report documented the assumptions for twelve scenarios including four light rail alignments for three forecasted years (2026, 2036 and 2046). The alignments included Light Rail Stage 1 and three Light Rail Stage 2 alignment options that extended Stage 1 from Alinga St to Woden via: State Circle, Capital Circle and Barton. However, the June 2019 report did not include the Light Rail Stage 2a alignment presented in the Stage 2a Business Case as a discrete stand-alone option, indicating that it was not separately and explicitly considered. Since the documentation of the assumptions and the development of the Stage 2a Business Case, the COVID-19 pandemic has had an impact on working practices and transport. Notwithstanding the immediate and severe impact on public transport usage in 2020, a 'new normal' for working practices and transport in the ACT may become apparent, with more people working in professional services industries becoming accustomed to 'remote' working and virtual meetings.

The Stage 2a Business Case was developed in the context of a series of 'transformational projects' and revitalisation activities that influenced the economic appraisal of the Light Rail Stage 2a project. The Stage 2a Business Case notes that Light Rail Stage 2a 'has been carefully designed to optimise and integrate with planned urban renewal activities and other projects in the precinct'. These interdependent projects include the Acton Waterfront development at West Basin, raising London Circuit to be at-grade with Commonwealth Avenue, a National Capital Authority proposal to reconfigure Kings and Commonwealth Avenues as grand boulevards and the development of Section 100 (formerly Section 63) at City Hill. Should there be any risk to the implementation of these projects, then the expected benefits of Light Rail Stage 2a and the timing of those benefits are at risk.

A Cost Benefit Analysis methodology was used to undertake the economic appraisal of Light Rail Stage 2a. Cost Benefit Analysis is considered an appropriate technique and is widely used for assessing the economic merits of new transport infrastructure. In September 2019, as part of the Cost Benefit Analysis evaluation, EY provided an Economic Appraisal Report for Light Rail Stage 2a. The purpose of the Economic Appraisal Report was to provide 'a description of the economic appraisal methodology, parameters and results' for Light Rail Stage 2 and Light Rail Stage 2a. However, Major Projects Canberra did not receive or request spreadsheets demonstrating the assumptions or calculations supporting the components of the Cost Benefit Analysis, or an economic model, similar to one that was produced for the purpose of Light Rail Stage 1. In relation to what processes Major Projects Canberra had in place to oversight and seek assurance as to the economic analysis that was conducted, Major Projects Canberra advised that it undertook quality assurance activities through its review of draft reports from EY (and the other specialist models and reports) but that its methodology and processes for quality

assurance of the Cost Benefit Analysis were not documented. The lack of documented methodology and processes for quality assurance of the Cost Benefit Analysis, combined with the absence of spreadsheets demonstrating the calculations or an economic model, impairs Major Projects Canberra’s ability to demonstrate the accuracy and appropriateness of the economic appraisal of Light Rail Stage 2a.

The Benefit Cost Ratio for Light Rail Stage 2a, calculated to two decimal places, was 0.38 excluding Wider Economic Benefits and 0.56 including Wider Economic Benefits. These were rounded up to 0.4 and 0.6 respectively for the Stage 2a Business Case. The Stage 2a Business Case also includes a ‘blended indicative Benefit Cost Ratio’ for: Gungahlin to Woden (Stage 1 and Stage 2 combined); and Gungahlin to Commonwealth Park (Stage 1 and Stage 2a combined). The ‘blended indicative Benefit Cost Ratio’ for both routes was calculated at 1.20 (rounded up from 1.18). The ‘blended indicative Benefit Cost Ratio’ was calculated by Major Projects Canberra independently of EY as its economic advisor. Douglas Economics advised that the ‘blended BCR is novel; no example of blending the result of a past investment with a future investment is known’ and also noted it ‘has no relevance to the [Light Rail Stage 2a] investment decision because the Stage 1 costs are ‘sunk’, i.e. cannot be recovered’.

3.72

For the purpose of the economic appraisal, four scenarios were considered. Each scenario was tested to reflect assumptions over the degree of dependence of the delivery of the Acton Waterfront development on Light Rail Stage 2a. Scenario A was selected as the basis for the Stage 2a Business Case, which assumes that the delivery of Light Rail Stage 2a will accelerate the development of the Acton Waterfront (i.e. bring forward the development with a more compressed construction period) by two years. This resulted in the Benefit Cost Ratio of 0.56 (including land use and wider economic benefits). Scenario C, which assumed that the development of the Acton Waterfront will occur regardless of the construction of Light Rail Stage 2a, resulted in a Benefit Cost Ratio of 0.21 (including land use and wider economic benefits). Under Scenario A, the \$23 million cost of the Acton Waterfront development acceleration compares with an estimated acceleration benefit of \$99 million when compared to Scenario C. \$79 million of the advancement benefit of \$99 million (79.8 percent) relates to city shaping benefits and wider economic benefits; this is a high proportion of the benefits associated with Light Rail Stage 2a.

3.84

A significant amount of the benefits identified for Light Rail Stage 2a are predicated on it being a catalyst for acceleration of development of the Acton Waterfront. Neither the Stage 2a Business Case or Economic Appraisal Report provides information or evidence on how Light Rail Stage 2a is expected to accelerate development at the site. Should the Acton Waterfront not be developed as fast as is hoped, then the expected benefits of Light Rail Stage 2a and the timing of those benefits are at risk. As city shaping benefits and wider economic benefits comprise the majority of the benefits associated with the project, any risks to the accelerated development of the Acton Waterfront will have a significant impact.

3.91

The wider economic benefits for Light Rail Stage 2a are estimated at \$48 million (2019, present value, discounted at 7 percent), which equates to 32 percent of the total value of benefits. Neither the Stage 2a Business Case or Economic Appraisal Report provides any narrative that describes, explains or supports the estimates of

3.103

wider economic benefits. In relation to the use of wider economic benefits for Light Rail Stage 2a, Douglas Economics advised ‘despite two decades of [wider economic benefits] being part of the [cost-benefit analysis] lexicon in the UK, NZ and Australia, debate continues over whether or not [wider economic benefits] have merit. For Australia, the estimation of meaningful agglomeration elasticities has proved elusive with no believable elasticities estimated for Canberra’. Elasticities are economic measures of how sensitive one economic factor is to another.

## BENEFITS MANAGEMENT

Paragraph

A draft Benefits Realisation Plan for Light Rail Stage 2 was developed in October 2019. The draft Benefits Realisation Plan was prepared by the Transport Canberra and City Services Directorate and the Chief Minister, Treasury and Economic Development Directorate. The draft Benefits Realisation Plan for Light Rail Stage 2 was ‘developed alongside the Business Case for the Project’ and noted that ‘as the Project moves into the next stages of detailed design, it is recommended that the BRP be updated accordingly’. The draft Benefits Realisation Plan for Light Rail Stage 2 identified, amongst other things, strategic enablers across a range of Territory directorates noting that ‘realising the full suite of benefits requires a number of Territory directorates to institute a range of policies and strategic enablers’.

4.36

The draft Benefits Realisation Plan for Light Rail Stage 2 included a section for the identification and articulation of benefit metric profiles, which was intended to provide ‘further details for each benefit and dis-benefit metric identified and tracked as part of this [Benefits Realisation Plan]’. The draft Benefits Realisation Plan had many features and details which, if considered and completed rigorously, could have assisted in the effective management of benefits associated with Light Rail Stage 2. However, because of the decision to proceed with Light Rail Stage 2a, the business case for Light Rail Stage 2 and the draft Benefits Realisation Plan for Light Rail Stage 2 was not finalised.

4.37

Benefits management is outlined in the 2016 *Australian Transport Assessment and Planning Guidelines* as an ‘end-to-end’ process that spans across the whole lifecycle of a project. Benefits management activities should be undertaken prior to commencing delivery and also from delivery to the end of an initiative’s lifecycle. The 2016 *Australian Transport Assessment and Planning Guidelines* also outlines the reasoning for embedding and undertaking the benefits management process at the earliest possible stage to ‘ensure that a mindset of accountability and structured approach towards achieving set benefits is embedded from the early stages of planning’. Notwithstanding the commitment to do so in the Stage 2a Business Case, a Benefits Realisation Plan has not been developed for Light Rail Stage 2a. Major Projects Canberra has advised that a Plan is not required under the ACT Government’s Capital Framework and could not be expected to be developed for ‘a short 1.7 km extension to the 12 km Stage 1 alignment’.

4.50

## Recommendations

### RECOMMENDATION 1 ECONOMIC ANALYSIS

Major Projects Canberra should review and update the economic analysis associated with Light Rail Stage 2a. In doing so, Major Projects Canberra should:

- a) review the assumptions underpinning the economic analysis, including the identified costs and benefits associated with Light Rail Stage 2a, since the publication of the redacted Stage 2a Business Case in September 2019; and
- b) make publicly available the revised and updated economic analysis in an updated Stage 2a Business Case.

### RECOMMENDATION 2 DEVELOPMENT COSTS AND BENEFITS

As part of the revised and updated and publicly available economic analysis for Light Rail Stage 2a, Major Projects Canberra should explicitly identify the nature of the development costs and benefits associated with the project. This should include detailed identification of:

- a) the different components of the development costs and their timing, the methodology for quantification and the assumptions underpinning the calculation; and
- b) the different components of the land use and city shaping benefits to be derived from Light Rail Stage 2a and their relationship to the development of the Acton Waterfront.

### RECOMMENDATION 3 BENEFITS REALISATION PLAN

The Chief Minister, Treasury and Economic Development Directorate (ACT Treasury), in cooperation with Major Projects Canberra and the Transport Canberra and City Services Directorate, should develop a Benefits Realisation Plan for Light Rail Stage 2a.

## Agencies' responses

In accordance with subsection 18(2) of the *Auditor-General Act 1996*, Major Projects Canberra was provided with:

- a draft proposed report for comment. All comments were considered and required changes were reflected in the second draft proposed report;
- a second draft proposed report for further comment. All comments were considered and required changes were reflected in the final proposed report; and
- a final proposed report for further comment.

In accordance with subsection 18(3) of the *Auditor-General Act 1996* the Chief Minister, Treasury and Economic Development Directorate (ACT Treasury) was also provided with an extract of the draft proposed report, second draft proposed report and final proposed report.

As part of the final proposed report process, Major Projects Canberra and the Chief Minister, Treasury and Economic Development Directorate (ACT Treasury) were also asked to provide comments for inclusion in the final report in the Summary chapter. No comments were provided for inclusion in this Summary chapter.





# 1 INTRODUCTION

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## Light Rail in the ACT

### Government transport policy

- 1.1 In March 2012, the ACT Government released *Transport for Canberra 2012-2031*, a major policy document that sought to set the policy direction for transport to 2031. *Transport for Canberra 2012-2031* identified 34 different Actions to be undertaken across a range of policy areas, including the commencement of the delivery of a light rail network for Canberra.
- 1.2 Since the development of *Transport for Canberra 2012-2031*, the ACT Government has released the *ACT Transport Strategy 2020*. The *ACT Transport Strategy 2020*, which was prepared after the completion of Light Rail Stage 1 from the City to Gungahlin, re-affirmed the Government's intention to implement a light rail network for Canberra. The Strategy noted 'the ACT Government is now progressing with the second stage of building light rail to Woden. Connecting light rail to Woden is occurring in two stages – City to Commonwealth Park (Stage 2a) and Commonwealth Park to Woden (Stage 2b)'. The *ACT Transport Strategy 2020* also notes that in relation to the light rail network 'future stages will be developed in accordance with the Light Rail Network Plan'. The *Light Rail Network Plan* provides details of the planned future stages of the Canberra light rail network.

### Parliamentary Agreements

- 1.3 Following the 2012 ACT election for the 8<sup>th</sup> Legislative Assembly, a Parliamentary Agreement was made between the Leader of the ACT Labor Party and the ACT Greens Member for Molonglo to progress the development of a light rail network for Canberra.
- 1.4 This commitment was continued in October 2016 (9<sup>th</sup> Legislative Assembly), with the Parliamentary Agreement including the following statement in relation to Light Rail Stage 2:

ACT Labor and the ACT Greens recognise that Canberrans support an integrated transport network comprising buses, light rail, roads, rideshare, taxis, cycling and walking. To achieve this strong network, the parties agree to:

  1. Immediately commence community consultation, scoping and design work of Stage 2 of the light rail network, to progress the Woden Stage 2 extension to the procurement stage and contract signing in this term.

- 1.5 In October 2020, the Parliamentary Agreement for the 10<sup>th</sup> Legislative Assembly also continued this commitment and included the following statement in relation to Light Rail Stage 2:

The ACT Labor and Greens Government commits to build Light Rail Stage 2 to Woden. As part of this city-transforming project, we agree to:

1. Proceed to procure the design and construction of Light Rail Stage 2 as soon as possible following assessment of infrastructure procurement options.
2. Assess the viability and benefits of extending light rail to Mawson as part of the Stage 2B business case.
3. Without setting back planning, design and construction of the Stage 2 project, conduct an examination of the feasibility and cost of introducing express light rail services in peak periods.

## Light Rail Stage 1

- 1.6 On 1 July 2013, the Capital Metro Authority was established to plan and deliver Light Rail Stage 1 from the City to Gungahlin.
- 1.7 Stage 1 of the light rail network comprised the design, construction and subsequent operation of a 12-kilometre light rail route from the City to Gungahlin. The project involved the construction and delivery of 14 light rail vehicles, 13 stops and one maintenance depot, as well as associated stop, road, signalling and ancillary works.
- 1.8 The project is being delivered under a 20-year Availability Public Private Partnership with Canberra Metro, which includes the design, construction, finance, operations and maintenance of the light rail system. The Territory entered into the Public Private Partnership on 17 May 2016. Light Rail Stage 1 commenced public passenger operations on 20 April 2019.

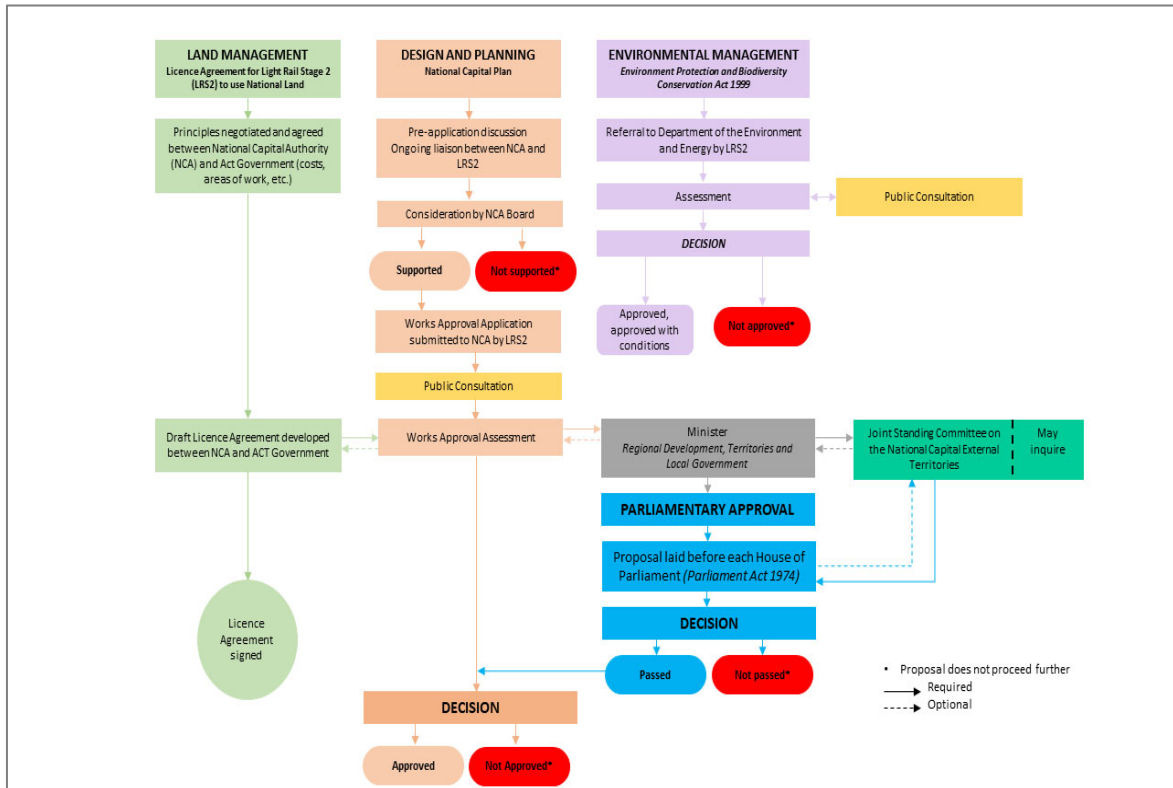
## Light Rail Stage 2

- 1.9 Since the decision to proceed with Light Rail Stage 1, the Territory has pursued an intention to extend the network to Woden as part of Stage 2. Light Rail Stage 2 involves complexities arising from its route through the Parliamentary Triangle and associated Commonwealth land.

## Commonwealth approval requirements

- 1.10 The Commonwealth Government approval process that must be followed for Light Rail Stage 2 is complex. It involves approvals from Parliament and various Commonwealth departments and committees. A workflow diagram of the Commonwealth approval process is shown at Figure 1-1.

Figure 1-1 Commonwealth approval process



Source: Reproduced from the National Capital Authority. Submission 22 to the Joint Standing Committee on National and Capital External Territories inquiry into *Commonwealth and Parliamentary approvals for the proposed stage 2 of the ACT light rail project*.

## Joint Steering Committee inquiry

- 1.11 On 10 May 2018, the Commonwealth Government Joint Standing Committee on National and Capital External Territories (the Joint Standing Committee) commenced an inquiry into the Commonwealth approvals required for Light Rail Stage 2.
- 1.12 In October 2018, the Joint Standing Committee inquiry reported on the legislated protections and approvals process under the Commonwealth's jurisdiction, the proposed route alignment against the National Capital Plan and the consultation undertaken by the ACT Government and National Capital Authority to examine the potential heritage impacts of Light Rail Stage 2.
- 1.13 The Joint Standing Committee made six recommendations, of which the Australian Government agreed to three and agreed-in-principle to the other three. Recommendations of specific relevance, which were agreed-in-principle, included:

### Recommendation 4

The committee recommends that the Parliament require 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, be wire-free.

**Recommendation 5**

The committee recommends that Parliament require the placement and appearance of light rail stops, landscaping, and signage to be unobtrusive and complementary to the heritage value of nearby buildings, views of Parliament, and the character of the Central National Area and Parliamentary Zone.

**Recommendation 6**

The committee recommends that Parliament require that the removal of any trees with heritage value, such as the Weston plantings, be met with an appropriate replanting and landscaping strategy that maintains heritage values in the Central National Area and the Parliamentary Zone.

## Light Rail Stage 2a

1.14 In September 2019 the ACT Government announced the decision to split Light Rail Stage 2 into two components:

- Stage 2a – a 1.7-kilometre extension of the existing City to Gungahlin light rail track from the City to Commonwealth Park via London Circuit (West) and Commonwealth Avenue; and
- Stage 2b – a 9-kilometre light rail track from Commonwealth Park to Woden via State Circle (East).

1.15 A 10 September 2019 ACT Government media release noted:

By starting the work on stage 2A now, the Government is capitalising on the jobs and expertise developed through the stage one construction phase as we continue to work with the Commonwealth Government on the necessary approvals for light rail to progress through the Parliamentary Triangle to Woden.

## Stage 2a Business Case

1.16 On 10 September 2019, a redacted version of the *City to Woden Light Rail: Stage 2a City to Commonwealth Park Business Case* (Stage 2a Business Case) was made publicly available. It provided details for:

- the design and construction of light rail between the City and Commonwealth Park (on Commonwealth Avenue), with associated stops, track, structures, depot, road, signalling, preparatory and other works required for its completion; and
- the ongoing operation and maintenance of that component of the light rail system.

1.17 The purpose of the Stage 2a Business Case was to:

- seek approval to enter into a procurement process and undertake associated activities for the delivery of the projects; and
- provide an analysis of the options, benefits, risks and procurement approach for the Project.

1.18 The Stage 2a Business Case provides details such as:

- an overview of the project including the proposed route, the location of stops and other civil works required;
- a needs analysis undertaken to identify key problems which would be addressed by the project and an outline of what benefits could be achieved;
- estimated capital delivery costs and project contingencies;
- a cost-benefit analysis for the project;
- delivery model analysis including options for delivering the project; and
- project governance, including the role of the Light Rail Project Board, relevant ACT Government agencies, Chief Projects Officer (Major Projects Canberra) and Project Director (Major Projects Canberra).

#### *Stage 2a Business Case assumptions*

1.19 The Stage 2a Business Case notes:

This Business Case has been developed on the basis that light rail is recommended to be delivered between the City and Woden as soon as possible. Recognising, however, that complex Commonwealth planning approval processes exist which will take some time to resolve, this Business Case recommends that the procurement and delivery of Stage 2A, the first component of the route from the City to Commonwealth Park (on Commonwealth Avenue) commence upon approval of this Business Case. It is expected that this first component, while still technically complex, and also subject to Commonwealth Government planning approvals, will be capable of procurement and the commencement of delivery ahead of Stage 2B (from Commonwealth Park to Woden) receiving relevant approvals.

1.20 The Stage 2a Business Case further notes:

Importantly, even in a worst-case scenario where Commonwealth approvals are not obtained for Stage 2B, the Project stands on its own merits and represents an important expansion of Canberra's light rail network.

#### *Stage 2a Business Case recommendation*

1.21 The Stage 2a Business Case recommended:

... that the ACT Government:

1. Approve the Project ... to extend light rail from the existing terminus at Alinga Street, south along Northbourne Avenue, around the western side of London Circuit to Commonwealth Avenue, terminating at Commonwealth Park, as the first component of light rail to be delivered between the City and Woden;

2. Continue with planning, design and other associated activities for the “State Circle East” alignment as the preferred route to connect light rail to Woden, with the alignment extending from the terminus at Commonwealth Park, across Lake Burley Griffin and onward to State Circle where it will travel around the eastern side of Parliament House until it reaches Adelaide Avenue, travelling south to Woden and terminating at Callam Street at a new bus/light rail interchange;
3. Proceed with procurement for the design, construction and operation of the Project on the basis of a sole source procurement with the Canberra Metro consortium. The form of the contract for the main works will be subject to future approvals to be sought from Cabinet; and
4. Implement all other associated matters as outlined in this Business Case.

### Light Rail Stage 2a route alignment

1.22 The Stage 2a Business Case identified that the extension of the light rail network from the Alinga Street terminus to Commonwealth Park is intended to improve public transport connectivity between the northern side of Lake Burley Griffin and the City. The route alignment of Light Rail Stage 2a is shown at Figure 1-2.

Figure 1-2 City to Commonwealth Park (Stage 2a) route alignment



Source: Transport Canberra, *Light Rail Factsheet Stage 2a City to Commonwealth Park*.

### Light Rail Stage 2a costs

1.23 The Stage 2a Business Case provides a breakdown of the estimated capital, operation and maintenance and development costs of Light Rail Stage 2a and Light Rail Stage 2 (Stages 2a and 2b combined). The estimated costs are shown in Table 1-1.

**Table 1-1 Light Rail Stage 2a costs (present value as at 2019, discounted at 7%)**

Cost Item	Stage 2a (\$million)	Stage 2a and 2b combined (\$million)
Capital cost	162	960
Operation and maintenance costs	82	190
Development costs	23	23
<b>Total project cost</b>	<b>268</b>	<b>1,173</b>

Source: City to Woden Light Rail: Stage 2a City to Commonwealth Park Business Case, Page 21.

1.24 Major Projects Canberra advised that although estimates were developed for Light Rail Stage 2a and Light Rail Stage 2 (Stages 2a and 2b combined), estimates have not been developed for Light Rail Stage 2b (i.e. Commonwealth Park to Woden) as a stand-alone project.

#### *Light Rail Stage 2a benefits*

1.25 The Stage 2a Business Case provides a breakdown of the expected economic benefits of Light Rail Stage 2a and Light Rail Stage 2 (Stages 2a and 2b combined). The expected benefits are shown in Table 1-2.

**Table 1-2 Light Rail Stage 2a benefits (present value as at 2019, discounted at 7%)**

Cost Item	Stage 2a (\$million)	Stage 2a and 2b combined (\$million)
Transport benefits	55	349
City shaping benefits	47	402
Wider economic benefits	48	466
<b>Total project benefit</b>	<b>150</b>	<b>1,217</b>

Source: City to Woden Light Rail: Stage 2a City to Commonwealth Park Business Case, Page 21.

#### *Light Rail Stage 2a Benefit Cost Ratios*

1.26 The Stage 2a Business Case identified Benefit Cost Ratios for various components of the project. This is shown at Table 1-3. The analysis includes an assessment of the economic merits of both Light Rail Stage 2a and Light Rail Stage 2 (Stages 2a and 2b combined) on urban development and revitalisation along the light rail corridors.

**Table 1-3 Benefit Cost Ratios**

Benefit Category	Stage 2a	Stage 2a and 2b combined
Benefit Cost Ratio (excluding WEBs)	0.4	0.6
Benefit Cost Ratio (including WEBs)	0.6	1.0

Source: City to Woden Light Rail: Stage 2a City to Commonwealth Park Business Case, Page 21.

### *Australian Government funding*

- 1.27 On 24 February 2021 the Australian Government announced it would provide \$132.5 million in funding for Light Rail Stage 2a.

## **Roles and responsibilities for Light Rail Stage 2a**

### *Major Projects Canberra*

- 1.28 On 1 July 2019, Major Projects Canberra was established and tasked with, amongst other things, the delivery of Light Rail Stage 2.
- 1.29 Major Projects Canberra is led by the Chief Projects Officer, who reports directly to the Head of Service and is accountable directly to the Treasurer and relevant Ministers.

### *Light Rail Project Board*

- 1.30 The Light Rail Project Board was established to provide strategic decision making in relation to the light rail projects and broader light rail network development. It provides advice to the ACT Government with respect to the planning, procurement and delivery of light rail transport.
- 1.31 The Light Rail Project Board is made up of an independent chair, an independent member, and five senior executive level staff from several directorates whose operations intersect in some way with the introduction of light rail.

## **Audit objective and scope**

### **Audit objective**

- 1.32 The objective of this audit was to provide an independent opinion to the Legislative Assembly on the effectiveness of the economic analysis for the Light Rail Stage 2a Business Case.

### **Audit scope**

- 1.33 The scope of the audit included an examination and consideration of:
- Major Projects Canberra's methodology and processes for the economic analysis of Stage 2a;
  - the independent economic advice that was provided to Major Projects Canberra in relation to Stage 2a;
  - the critical dependencies of Stage 2a, including those that are not directly managed by Major Projects Canberra; and



- recommendations arising from the Audit Office's Report No.5/2016 *Initiation of the Light Rail Project*.

## Audit criteria, approach and method

### Audit criteria

1.34 To form a conclusion against the objective, the following criteria were used:

- **Criterion 1:** Is the methodology and assumptions underpinning the **cost** estimate of the Canberra Light Rail Stage 2a sound and transparent?
- **Criterion 2:** Is the methodology and assumptions underpinning the estimated **benefits** of the Canberra Light Rail Stage 2a sound and transparent?

### Audit approach and method

1.35 The audit approach and method consisted of:

- reviewing relevant literature, and work undertaken on this subject by other jurisdictions to identify better practices;
- identifying and reviewing relevant information and documentation including the governance and accountability framework and related policy and procedures, research documents, and relevant reports;
- identifying and documenting internal controls and procedures used to give effect to the policies and guidelines and to ensure compliance and evaluating the effectiveness of these controls;
- interviews and discussion with key staff at the selected agencies and departments and other stakeholders;
- consultation with the Chief Minister on the use of 'deliberative information' in the audit report;
- consideration of the recommendations provided in the Audit Office's 'Initiation of the Light Rail Project' performance audit report (Report No.5/2016); and
- an engagement quality control review.

1.36 Douglas Economics was engaged to provide subject matter expertise for the purpose of the audit. In doing so Douglas Economics:

- reviewed the Stage 2a Business Case;
- reviewed other documentation in relation to the economic analysis of Light Rail Stage 2a;
- conducted interviews with various stakeholders; and

- provided an assessment of the documented project cost and benefit estimates in consideration of industry best practice and established standards.
- 1.37 The audit was performed in accordance with *ASAE 3500 – Performance Engagements*. The audit adopted the policy and practice statements outlined in the Audit Office's *Performance Audit Methods and Practices (PAMPr)* which is designed to comply with the requirements of the *Auditor-General Act 1996* and *ASAE 3500 – Performance Engagements*.
- 1.38 In the conduct of this performance audit the ACT Audit Office complied with the independence and other relevant ethical requirements related to assurance engagements.

### Disclosure of deliberative information

- 1.39 Section 20 of the *Auditor-General Act 1996* (the Act) relates to the disclosure of 'deliberative information' in Audit Office reports. Section 20 provides that the Auditor-General may only include 'deliberative information' in a report:
- if the Auditor-General considers that it is in the 'public interest' to do so; and
  - after consulting with the Chief Minister.
- 1.40 'Deliberative information' is defined in the Act as 'information that discloses a deliberation or decision of the Executive'.

### Report references to Cabinet material

- 1.41 The audit report refers to, and includes information from, Cabinet material. The material is included to provide information on the advice provided to Cabinet with regards to the Stage 2a Business Case and the National Capital Authority requirement for wire-free running.

### Consultation with the Chief Minister

- 1.42 The Chief Minister was consulted regarding information to be included in the report. On 6 September 2021, the Chief Minister was provided with the final proposed report that included the Cabinet material.
- 1.43 On 16 September 2021, the Chief Minister advised that they did not have any specific concerns or objection in relation to the use of the material in the audit report.

## 2 PROJECT COST ESTIMATES

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- 2.1 This chapter discusses the cost estimates for Light Rail Stage 2a, as identified in the Stage 2a Business Case. The chapter considers the estimated capital, operating and development costs and discusses the appropriateness of the assumptions that underpin the estimated costs of the project.

### Summary

### Conclusion

For the purpose of the economic appraisal, the September 2019 Stage 2a Business Case identified a present value figure of \$162 million (2019, discounted at 7 percent) for capital costs associated with the construction of Light Rail Stage 2a. However, the capital cost of Light Rail Stage 2a is expected to be higher than what was estimated in the Stage 2a Business Case. Capital cost estimates in the Stage 2a Business Case did not include costs associated with retrofitting the existing light rail vehicle fleet with wire-free technology. This cost was estimated at approximately 17 percent of the estimated capital cost. This is a requirement of Commonwealth approval for Light Rail Stage 2a. At the time of the preparation of the Stage 2a Business Case there was a very strong likelihood that wire-free technology would be required for any extensions towards and through the Parliamentary Zone but this cost, and other costs associated with urban design finishes, were not explicitly included in the capital cost estimate for Light Rail Stage 2a.

For the purpose of the economic appraisal, the Stage 2a Business Case identified a present value figure of \$23 million (2019, discounted at 7 percent) for development costs associated with the accelerated development of the Acton Waterfront. A nominal capital cost estimate for this figure was not identified in the Stage 2a Business Case. Inadequate information was provided in the Stage 2a Business Case in relation to the development costs, the methodology for quantification and the assumptions underpinning the estimate.

The expected costs associated with Light Rail Stage 2a, including costs associated with the accelerated development of the Acton Waterfront, should be updated in revised, publicly available documents.

### Key findings

#### Paragraph

For the purpose of the economic appraisal, the Stage 2a Business Case identified a present value figure of \$162 million (2019, discounted at 7 percent) for capital costs associated with the construction of Light Rail Stage 2a. The Stage 2a Business Case also identifies a nominal capital cost estimate (i.e. not discounted) for Light Rail Stage 2a. The capital cost estimate includes expected construction costs, expected

2.24

‘rolling stock’ cost (the cost of the light rail vehicles), escalation costs (the expected rate at which costs for the project will increase over the life of the project/construction), and a contingency cost. The contingency cost represents a provision for probable cost increases during project implementation for capital costs. The Stage 2a Business Case acknowledges the complexity of the project as a key project risk and notes ‘the project has a larger proportional contingency when compared to City-Gungahlin’.

The Stage 2a Business Case identified that the project’s contingency figure was predominantly driven by risks associated with Commonwealth planning approvals and environmental approvals for the project and ‘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’. Since the development of the Stage 2a Business Case in September 2019, it has become apparent that the Australian Government has confirmed the need for Light Rail Stage 2a (and any other extensions through the Parliamentary Triangle) will need to be wire-free, i.e. this risk has materialised. In light of this, it is appropriate for the capital cost estimates for the project to be reviewed and published. 2.25

The Stage 2a Business Case identified that there were other costs that were excluded from the capital cost estimate, including the cost of retrofitting the existing light rail vehicle fleet with wire-free technology. The estimated cost of retrofitting the existing light rail vehicle fleet with wire-free technology equates to approximately 17 percent of the estimated capital cost of Light Rail Stage 2a. At the time of the preparation of the Stage 2a Business Case there was a very strong likelihood that wire-free technology would be required for Light Rail Stage 2a and that to use the existing light rail vehicles on the additional 1.7-kilometre extension, wire-free technology would need to be retrospectively fitted. For example, on 22 October 2018, the Joint Standing Committee on the National Capital and External Territories produced its report of an inquiry into Commonwealth and Parliamentary approvals for the proposed Light Rail Stage 2 and recommendations from the inquiry determined that wire-free technology, visual amenity and urban design considerations were mandatory for the project. These recommendations were agreed-in-principle by the Australian Government. Notwithstanding the strong likelihood that costs associated with wire-free running and urban design finishes would be a requirement of Commonwealth approval for Light Rail Stage 2a (and any other light rail routes entering into the Parliamentary Triangle), they were not included in the Light Rail Stage 2a cost estimate. Explicitly identifying these costs would have provided greater accuracy and transparency in the economic appraisal and Cost Benefit Analysis for Light Rail Stage 2a. 2.37

Disruption costs relate to disruption during the construction period on road users’, pedestrians, residents and businesses. Consistent with the approach taken for the Stage 1 Business Case, the Stage 2a Business Case did not include any potential disruption costs associated with the delivery of Light Rail Stage 2a. Business owners located near where the Gungahlin terminus is now located asserted that Light Rail Stage 1 had caused major road closures and general noise and disturbance in the area and that this had led to a drop in foot traffic and subsequent revenue decline. 2.50

Given the construction complexities of Light Rail Stage 2a, it could be reasonably expected that there will be disruption costs associated with the project. Douglas Economics advised ‘an estimate should be included in the [cost-benefit analysis]. This would be best included as a negative benefit (i.e. with project benefits rather than costs)’.

For the purpose of the economic appraisal, the Stage 2a Business Case identified a present value figure of \$82 million (2019, discounted at 7 percent) for operating, maintenance and lifecycle costs associated with Light Rail Stage 2a. The Stage 2a Business Case also identifies a nominal operating, maintenance and lifecycle cost estimate (i.e. not discounted) for Light Rail Stage 2a. The cost estimate includes operating costs, maintenance costs, lifecycle costs and a contingency cost. The operating, maintenance and lifecycle costs for Light Rail Stage 2a are calculated over a 14-year operation period, coinciding with the conclusion of the Public Private Partnership that is currently in place with Canberra Metro for Light Rail Stage 1. A review of the operating, maintenance and lifecycle costs for Light Rail Stage 2a against other light rail operations (e.g. the Gold Coast Light Rail and Sydney Inner West Light Rail (Dulwich Hill Line)) shows the estimated unit cost per service and unit cost per passenger compares favourably to other operations, but the unit cost per kilometre is considerably higher. 2.55

For the purpose of the economic appraisal, the Stage 2a Business Case identifies a present value figure of \$23 million for accelerated development costs. No further information is provided in the Stage 2a Business Case in relation to the different components of the development costs and their timing. A nominal value of the development costs is not identified in the Stage 2a Business Case. No further information is provided in the draft Economic Appraisal Report in relation to the development costs, the methodology for quantification and the assumptions underpinning the calculation. 2.61

## Economic appraisal

- 2.2 The Stage 2a Business Case included economic analysis that identified the costs associated with the project and the value of the expected benefits from the project. The economic analysis was undertaken by EY, as Major Projects Canberra’s economic advisor for Light Rail Stage 2a.
- 2.3 The economic analysis was embodied in a draft *City to Commonwealth Park Light Rail Economic Appraisal Report 2019* (Economic Appraisal Report) from EY. At the time of conducting audit fieldwork in September 2020 the report had not been finalised.
- 2.4 For the purpose of the economic appraisal, project costs were identified in three categories:
- capital costs;
  - operation and maintenance costs; and
  - development costs.

- 2.5 Table 2-1 shows the estimated project costs of Light Rail Stage 2a against the three categories. The summary of project costs is shown as present value as at 2019, discounted at 7 percent.

**Table 2-1 Summary of project costs (present value as at 2019, discounted at 7%)**

Cost Item	Stage 2a (\$million)
Capital cost	162
Operation and maintenance costs	82
Development costs	23
<b>Total project cost</b>	<b>268</b>

Source: City to Woden Light Rail: Stage 2a City to Commonwealth Park Business Case, Page 138.

### *Capital costs*

- 2.6 Capital costs refer to the costs associated with constructing Light Rail Stage 2a. This includes the construction of stops and precincts, roads and utilities infrastructure and the purchase of four light rail vehicles.

### *Operation and maintenance costs*

- 2.7 Operation and maintenance costs refer to the costs associated with the operation of Light Rail Stage 2a. It includes salaries and vehicle and infrastructure maintenance.

### *Development costs*

- 2.8 Development costs refer to the costs associated with the accelerated development of the Acton Waterfront. The Stage 2a Business Case states:

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).

- 2.9 The inclusion of capital and operating and maintenance costs are standard cost items for the economic appraisal of transport-related projects. Land development costs are not standard costs in transport-related project appraisals.

### **Discount rate**

- 2.10 For the purpose of the Stage 2a Business Case, the estimated project costs are shown with reference to a discount rate. The discount rate recognises the well-established preference for present consumption as opposed to future consumption. As such, costs and benefits are discounted to attach less weight to them the later the year in which they accrue.

- 2.11 As at February 2020, the discount rate adopted for the purpose of the ACT Government's Capital Framework is 7 percent.<sup>1</sup> This accords with guidance from Infrastructure Australia, and has been general practice in Australia for over two decades. Similarly, Transport for New South Wales adopts a 7 per cent discount rate for the purpose of cost-benefit analysis of initiatives.
- 2.12 In advice to the Audit Office for the purpose of the audit, Douglas Economics advised that the discount rate was 'high by international standards'. All things being equal the higher the discount rate, the lower the Benefit Cost Ratio.

## Capital costs

- 2.13 The Transport Canberra and City Services Directorate, which was managing the Light Rail Project prior to the creation of Major Projects Canberra, engaged Turner and Townsend to provide cost estimates for Light Rail Stage 2a and Light Rail Stage 2 (Stages 2a and 2b combined). These estimates were presented in the Stage 2a Business Case. The estimate was used by EY, as the economic advisor, for the purpose of developing the Economic Appraisal Report and Major Projects Canberra for the purpose of developing the Benefit Cost Ratio for the project.
- 2.14 The Stage 2a Business Case provides a breakdown of the estimated costs of the project. In doing so, however, the Stage 2a Business Case states:
- 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).
- 2.15 The Stage 2a Business Case identifies a nominal capital cost estimate (i.e. not discounted) for Light Rail Stage 2a.
- 2.16 The nominal capital cost estimate for Light Rail Stage 2a, as per the Stage 2a Business Case, includes:
- expected construction costs;
  - expected 'rolling stock' cost, representing the cost of the light rail vehicles;
  - escalation costs, representing the expected rate at which costs for the project will increase over the life of the project/construction; and
  - a contingency cost, representing a provision for probable cost increases during project implementation for capital costs.

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<sup>1</sup> The Capital Framework assists in the assessment of capital works funding proposals from ACT Government agencies. It provides 'a seven-stage guide to planning, appraisal and evaluation of investments, commencing at an investment concept through to the beneficial delivery of an investment'. It seeks to enhance 'upfront rigor in needs analysis, identification of risks and delivery model assessment driving improved value for money outcomes in the Territory'.

- 2.17 The capital cost estimate is presented as a P75 figure. P75 means that the probability of the estimated cost being exceeded is estimated to be less than 25 percent.

## Contingency

- 2.18 When estimating the cost of a project, uncertainties are generally noted as risks to the project. The estimated costs of these risks are referred to by cost estimators as cost contingency and are represented as a percentage of the estimated project cost. A contingency figure was identified for the purpose of the capital cost estimate.

- 2.19 The Economic Appraisal Report prepared by EY as the Territory's economic advisor noted that it generated contingency estimates, based upon the work of Turner and Townsend as the project's cost estimator:

Project costs have been provided by the cost estimator ... with contingency (risk) amounts generated.

...

Contingencies have been generated on a proportional basis and are not based on a bottom-up analysis.

- 2.20 Douglas Economics noted that Light Rail Stage 2a could be expected to be more complex than Light Rail Stage 1:

Stage 2a is more complex than Stage 1 as it involves an over-bridge, street utility diversions and associated traffic management. By comparison, Stage 1 was largely along a wide median strip.

- 2.21 The Stage 2a Business Case acknowledges the complexity of the project as a key project risk and notes 'the project has a larger proportional contingency when compared to [Light Rail Stage 1]'. The Stage 2a Business Case also notes the contingency 'is indicative and should be subject to further analysis'.

- 2.22 The Stage 2a Business Case identified that the project's contingency figure was predominantly driven by the following risks:

Risks associated with Commonwealth planning approvals and environmental approvals for the project; and

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.

- 2.23 Since the development of the Stage 2a Business Case in September 2019, it has become apparent that the Australian Government has confirmed the need for Light Rail Stage 2a (and any other extensions through the Parliamentary Triangle) to be wire-free. In light of this, and that some of the risks documented in the Stage 2a Business Case have materialised (specifically with respect to 'Commonwealth planning approvals and environmental approvals for the project') it is appropriate for the capital cost estimates for the project to be reviewed and published.



- 2.24 For the purpose of the economic appraisal, the Stage 2a Business Case identified a present value figure of \$162 million (2019, discounted at 7 percent) for capital costs associated with the construction of Light Rail Stage 2a. The Stage 2a Business Case also identifies a nominal capital cost estimate (i.e. not discounted) for Light Rail Stage 2a. The capital cost estimate includes expected construction costs, expected 'rolling stock' cost (the cost of the light rail vehicles), escalation costs (the expected rate at which costs for the project will increase over the life of the project/construction), and a contingency cost. The contingency cost represents a provision for probable cost increases during project implementation for capital costs. The Stage 2a Business Case acknowledges the complexity of the project as a key project risk and notes 'the project has a larger proportional contingency when compared to City-Gungahlin'.
- 2.25 The Stage 2a Business Case identified that the project's contingency figure was predominantly driven by risks associated with Commonwealth planning approvals and environmental approvals for the project and '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'. Since the development of the Stage 2a Business Case in September 2019, it has become apparent that the Australian Government has confirmed the need for Light Rail Stage 2a (and any other extensions through the Parliamentary Triangle) will need to be wire-free, i.e. this risk has materialised. In light of this, it is appropriate for the capital cost estimates for the project to be reviewed and published.

### Additional capital cost elements

- 2.26 The Stage 2a Business Case stated that the 'capital costs do not include Major Projects Canberra agency costs or Independent Certifier costs, cost associated with delivering [Light Rail Stage 2b], or costs associated with progressing design, planning and early contractor involvement for [Light Rail Stage 2b]'.
- 2.27 The Stage 2a Business Case also identified that there were other costs that were excluded from the cost estimate and economic analysis. These included 'items outside the project scope, such as an expansion of the Mitchell Depot, the cost of retrofitting the existing fleet with wire-free technology, a Sandford Street stop in Mitchell and environmental offsets'.

### Out of scope items

- 2.28 In relation to the 'items outside the project scope' the Stage 2a Business Case identifies that these are considered to be:
- 'not strictly necessary' for the operation of Stage 2a;
  - attributable to the City to Gungahlin route alignment; or
  - possibly required following further project development or consultation.

- 2.29 Three key items identified in the Stage 2a Business Case relating to ‘items outside the project scope’ are:
- wire-free running and urban design finishes;
  - the purchase of up to four additional light rail vehicles; and
  - an expansion of the Mitchell depot.

#### *Wire-free running*

- 2.30 On 22 October 2018, the Joint Standing Committee on the National Capital and External Territories produced its report of an inquiry into Commonwealth and Parliamentary approvals for the proposed Light Rail Stage 2. Recommendations from the inquiry determined that wire-free technology, visual amenity and urban design considerations were mandatory for the project. These recommendations were agreed-in-principle by the Australian Government.
- 2.31 Notwithstanding the strong likelihood that costs associated with wire-free running and urban design finishes would be a requirement of Commonwealth approval for Light Rail Stage 2a (and any other light rail routes entering into the Parliamentary Triangle), they were not included in the cost estimates and economic analysis for Light Rail Stage 2a. The Stage 2a Business Case identifies estimated costs of wire-free running and urban design finishes that equate to approximately 17 percent of the estimated capital cost of Light Rail Stage 2a.
- 2.32 On 26 August 2019, the same day that the Stage 2a Business Case was considered by Cabinet, the Chief Minister wrote to the Prime Minister requesting support in, amongst other things:
- Ensuring Commonwealth conditions do not unreasonably add to project costs and efficiency. For example, the ACT Government is seeking to deliver both ‘Stage 2a’ and ‘Stage 2b’ with an overhead wired power system to deliver faster travel times. Wire-free running adds additional capital costs to the entire light rail network.
- 2.33 On 20 September 2019, the Chief Minister again wrote to the Prime Minister advising that:
- ... the ACT Government received correspondence from the National Capital Authority which I also attach for your information. The relevant section of the letter states (emphasis added):
- “As you move into the next important procurement phase of the project for accurate costing purposes, I wanted to confirm with you the NCA’s minimum design and project expectations. You would appreciate that Light Rail Stage 2a needs to be consistent in quality and standard to Stage 2b as both pass along Commonwealth Avenue, through the National Triangle, and both will require to the NCA’s approval. These requirements include wire (catenary) free light rail vehicles as the NCA understands this is technically viable along the Commonwealth Avenue section of the route.”

- 2.34 On 30 September 2019, the Prime Minister wrote to the Chief Minister acknowledging the importance of providing an efficient public transport network for the Territory and advising that:
- As you would be aware, the JSCNCET recommended the system be wire free. The Commonwealth Government agreed in principle to this recommendation, subject to further information about the viability of a wire free route.
- 2.35 On 15 October 2019, the National Capital Authority advised Major Projects Canberra that:
- The NCA took the opportunity to review the design material presented today. Images presented displayed a light rail system whose power source was poles and wires. This proposal is not supported by the NCA. It is a requirement of the NCA that the Stage 2a light rail system be wire free in designated areas.
- 2.36 On 18 October 2019, Cabinet was advised to agree to Light Rail Stage 2a being progressed on the basis of wire-free operations along the entirety of its route from Alinga Street to Commonwealth Park. The Cabinet Submission advised that the letters from both the National Capital Authority and the Prime Minister were consistent with previous formal and informal communications from the Commonwealth Government that wired operations of Commonwealth Avenue and/or designated areas would not be approved by the Commonwealth Government. This included details of communications from the National Capital Authority dated as early as April 2018.
- 2.37 The Stage 2a Business Case identified that there were other costs that were excluded from the capital cost estimate, including the cost of retrofitting the existing light rail vehicle fleet with wire-free technology. The estimated cost of retrofitting the existing light rail vehicle fleet with wire-free technology equates to approximately 17 percent of the estimated capital cost of Light Rail Stage 2a. At the time of the preparation of the Stage 2a Business Case there was a very strong likelihood that wire-free technology would be required for Light Rail Stage 2a and that to use the existing light rail vehicles on the additional 1.7-kilometre extension, wire-free technology would need to be retrospectively fitted. For example, on 22 October 2018, the Joint Standing Committee on the National Capital and External Territories produced its report of an inquiry into Commonwealth and Parliamentary approvals for the proposed Light Rail Stage 2 and recommendations from the inquiry determined that wire-free technology, visual amenity and urban design considerations were mandatory for the project. These recommendations were agreed-in-principle by the Australian Government. Notwithstanding the strong likelihood that costs associated with wire-free running and urban design finishes would be a requirement of Commonwealth approval for Light Rail Stage 2a (and any other light rail routes entering into the Parliamentary Triangle), they were not included in the Light Rail Stage 2a cost estimate. Explicitly identifying these costs would have provided greater accuracy and transparency in the economic appraisal and Cost Benefit Analysis for Light Rail Stage 2a.

### *Additional light rail vehicles*

- 2.38 The Stage 2a Business Case identifies that an additional four light rail vehicles could be procured as part of the Light Rail Stage 2a project. The Stage 2a Business Case identifies that the procurement of an additional four light rail vehicles ‘may provide opportunities for cost efficiencies and economies of scale in the production run, leading to a lower cost per vehicle’ and ‘assist in minimising impacts on City to Gungahlin Light Rail should wire-free running be required by the [National Capital Authority] to obtain planning approvals ...’. The Stage 2a Business Case identifies an estimated cost of purchasing the additional light rail vehicles.
- 2.39 These four light rail vehicles may be in addition to the four light rail vehicles required, and costed, for the operation of Light Rail Stage 2a. As a consequence, up to eight additional light rail vehicles could be purchased.

### *Expansion of the Mitchell depot*

- 2.40 The Stage 2a Business Case identifies that an expansion of the Mitchell depot could be undertaken to ‘provide flexibility to accommodate any additional fleet purchased by the ACT Government’. The Stage 2a Business Case identifies an estimated cost of the depot expansion.

## **Disruption costs**

- 2.41 Disruption costs relate to disruption during the construction period on road users, pedestrians, residents and businesses (e.g. through reduced visitor spending). Disruption costs are primarily borne by parties external to the project, i.e. not the Territory, although any costs incurred by the Territory in mitigating the impacts of disruption costs should be recognised. It is noted that a class-action lawsuit has been initiated against the New South Wales Government by businesses adversely affected by the construction of the Sydney CBD Light Rail Project and, if successful, will result in further costs for the project.
- 2.42 The Stage 2a Business Case did not include any potential disruption costs associated with the delivery of Light Rail Stage 2a. This is consistent with the approach taken for the Stage 1 Business Case.

### *Light Rail Stage 1 disruption costs*

- 2.43 In a number of media reports, business owners near where the Gungahlin terminus is now located asserted that the construction of Light Rail Stage 1 had caused major road closures and general noise and disturbance in the area and that this caused a subsequent drop in foot traffic and this in turn led to revenue decline.
- 2.44 On 6 June 2018, an Assembly Resolution was passed in the Legislative Assembly which called for the ACT Government to undertake an assessment of the impact of all ACT Government

led construction activities on local business in the Gungahlin Town Centre. In September 2018, the ACT Government provided a response to the Assembly Resolution.

- 2.45 As part of the ACT Government’s assessment on the impact of construction activities on local business, Gungahlin businesses completed three surveys that sought to identify the decrease in revenue during the construction of Light Rail Stage 1. The response to the Assembly Resolution noted:

As might be expected many businesses had experienced a reduction in actual and forecast revenue. Qualitative feedback suggests those businesses directly fronting affected streets perceived the largest reductions while those within the shopping centres and on periphery streets were less impacted (though only marginally in some instances).

...

The most common impact indicated by businesses related to footfall (customers through door), parking, revenues, visibility, access and noise with 69% reporting a significant deterioration in footfall and an average perceived revenue decrease of 31.75% during the April to December 2017 period. For the second reporting horizon (January to July 2018) businesses reported greater impacts across all areas with 78% and 73% reporting a significant deterioration in footfall and revenue respectively. For this same period the average perceived revenue decreases across respondents was 32.17%.

- 2.46 The *City to Gungahlin Light Rail Project Delivery Report* (June 2019) stated that ‘the Project (Light Rail Stage 1) undoubtedly resulted in disruption to local businesses during its construction phase. However, the exact influence attributable to the Project is difficult to discern in the context of other projects in the vicinity, the expansion of other shopping districts in the region and general business conditions and individual business strategies’.
- 2.47 In response to the draft proposed report Major Projects Canberra advised it was not aware of these assertions from business owners. Nevertheless, Major Projects Canberra advised that ‘business disruption during that period may potentially be attributed to a host of factors, including unrelated traffic projects, the development of other shopping districts in the region, and business-specific factors’ and that ‘construction activities also brought other benefits along the Stage 1 alignment, including business benefits from an increased construction workforce along the alignment utilising local services’.

#### *Light Rail Stage 2a disruption costs*

- 2.48 Major Projects Canberra advised that as there were no disruption costs in the Stage 1 Business Case, there was no precedent to include disruption costs in the Stage 2a Business Case. While it was acknowledged that there were costs to businesses in the construction of Light Rail Stage 1, there was no precedent from Light Rail Stage 1 for compensation to be paid. Accordingly, no compensation will be paid to businesses affected by the construction of Light Rail Stage 2a. Major Projects Canberra acknowledged that disruption and associated costs cannot be avoided but only mitigated.

2.49 The Stage 2a Business Case does not identify disruption costs or otherwise set out how disruption costs will be mitigated while construction is underway. Douglas Economics advised:

Given the construction complexities of [Light Rail Stage 2a], there will be disruption costs and an estimate should be included in the [cost-benefit analysis]. This would be best included as a negative benefit (i.e. with project benefits rather than costs).

2.50 Disruption costs relate to disruption during the construction period on road users', pedestrians, residents and businesses. Consistent with the approach taken for the Stage 1 Business Case, the Stage 2a Business Case did not include any potential disruption costs associated with the delivery of Light Rail Stage 2a. Business owners located near where the Gungahlin terminus is now located asserted that Light Rail Stage 1 had caused major road closures and general noise and disturbance in the area and that this had led to a drop in foot traffic and subsequent revenue decline. Given the construction complexities of Light Rail Stage 2a, it could be reasonably expected that there will be disruption costs associated with the project. Douglas Economics advised 'an estimate should be included in the [cost-benefit analysis]. This would be best included as a negative benefit (i.e. with project benefits rather than costs)'.

## Operating, maintenance and lifecycle costs

2.51 In addition to the capital cost estimates, Turner and Townsend provided operating, maintenance and lifecycle cost estimates for Light Rail Stage 2a and Light Rail Stage 2 (Stages 2a and 2b combined). The estimates were presented in the Light Rail Stage 2a Business Case and were used by EY, as the economic advisor, for the purpose of developing the Economic Appraisal Report and Major Projects Canberra for the purpose of developing the Benefit Cost Ratio of the project.

2.52 The operating, maintenance and lifecycle costs for Light Rail Stage 2a are calculated over a 14-year operation period, coinciding with the conclusion of the Public Private Partnership that is currently in place with Canberra Metro for Light Rail Stage 1.

### *Comparison with other light rail operations*

2.53 Douglas Economics compared the operating, maintenance and lifecycle costs for Light Rail Stage 2a against other light rail operations in Australia. The proposed light rail unit costs per service, passenger, kilometre and hour were compared to Light Rail Stage 1, the Gold Coast Light Rail and the Sydney Inner West Light Rail (Dulwich Hill Line). A review of the operating, maintenance and lifecycle costs for Light Rail Stage 2a against other light rail operations shows:

- the unit cost per service compared favourably to the other operations' estimated costs;
- the unit cost per passenger compared favourably to the other operations' estimated costs;

- the unit cost per kilometre is considerably higher than the other operations' estimated costs; and
- with the exception of the Sydney Inner West Light Rail (Dulwich Hill Line), the unit cost per hour is considerably higher than the other operations' estimated costs.

### *Cost of wire-free running*

2.54 In reviewing the operating, maintenance and lifecycle costs for Light Rail Stage 2a it is noted that the figure does not account for the cost of wire-free running. Douglas Economics advised lifecycle costs associated with the operation of the light rail vehicles are likely to increase:

Operating dual energy (overhead power on Stage 1 and wire free on Stage 2a) is probably likely to increase the lifecycle costs due to the need to replace the storage batteries on all 18 [light rail vehicles] every 10 to 15 years.

2.55 For the purpose of the economic appraisal, the Stage 2a Business Case identified a present value figure of \$82 million (2019, discounted at 7 percent) for operating, maintenance and lifecycle costs associated with Light Rail Stage 2a. The Stage 2a Business Case also identifies a nominal operating, maintenance and lifecycle cost estimate (i.e. not discounted) for Light Rail Stage 2a. The cost estimate includes operating costs, maintenance costs, lifecycle costs and a contingency cost. The operating, maintenance and lifecycle costs for Light Rail Stage 2a are calculated over a 14-year operation period, coinciding with the conclusion of the Public Private Partnership that is currently in place with Canberra Metro for Light Rail Stage 1. A review of the operating, maintenance and lifecycle costs for Light Rail Stage 2a against other light rail operations (e.g. the Gold Coast Light Rail and Sydney Inner West Light Rail (Dulwich Hill Line)) shows the estimated unit cost per service and unit cost per passenger compares favourably to other operations, but the unit cost per kilometre is considerably higher.

## Development costs

2.56 A key component of the estimated costs associated with Light Rail Stage 2a are costs associated with the accelerated development of the Acton Waterfront. For the purpose of the economic appraisal, the Stage 2a Business Case identifies a present value figure of \$23 million for accelerated development costs. The Stage 2a Business Case states:

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).

2.57 The Stage 2a Business Case also identifies:

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.

- 2.58 No further information is provided in the Stage 2a Business Case in relation to the different components of the development costs and their timing. A nominal value of the development costs is not identified in the Stage 2a Business Case. No further information is provided in the Economic Appraisal Report in relation to the development costs, the methodology for quantification and the assumptions underpinning the calculation.
- 2.59 The Stage 2a Business Case advises:
- 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.
- 2.60 The Economic Appraisal Report completed by the economic advisor assessed four scenarios describing the relationship between Stage 2a and development of the Acton Waterfront. Details of these scenarios and the impact of the Acton Waterfront on the Benefit Cost Ratio of the project are provided in Chapter 3.
- 2.61 For the purpose of the economic appraisal, the Stage 2a Business Case identifies a present value figure of \$23 million for accelerated development costs. No further information is provided in the Stage 2a Business Case in relation to the different components of the development costs and their timing. A nominal value of the development costs is not identified in the Stage 2a Business Case. No further information is provided in the draft Economic Appraisal Report in relation to the development costs, the methodology for quantification and the assumptions underpinning the calculation.



## 3 PROJECT BENEFIT ESTIMATES

- 3.1 This chapter discusses the estimated benefits for Light Rail Stage 2a, as identified in the Stage 2a Business Case. The chapter considers the estimated benefits associated with the project and discusses the appropriateness of the assumptions that underpin the estimated costs of the project.

### Summary

#### Conclusion

For the purpose of the economic appraisal, the Stage 2a Business Case identified a present value figure of \$150 million (2019, discounted at 7 percent) in benefits associated with Light Rail Stage 2a. This compared with a present value figure of \$268 million (2019, discounted at 7 percent) of estimated costs for the project.

A significant amount of the benefits identified for Light Rail Stage 2a are predicated on the project being a catalyst for the acceleration of development of the Acton Waterfront. Neither the Stage 2a Business Case or Economic Appraisal Report provides information or evidence on how Light Rail Stage 2a is expected to accelerate development at the site. Should the Acton Waterfront not be developed as fast as is hoped, then the timing and quantification of the expected benefits of Light Rail Stage 2a are at risk.

The economic appraisal was developed in the context of a series of ‘transformational projects’ and revitalisation activities. As well as the Acton Waterfront Development, these other projects include: raising London Circuit to be at-grade with Commonwealth Avenue; and a National Capital Authority proposal to reconfigure Kings and Commonwealth Avenues as grand boulevards and the development of Section 100 (formerly Section 63) at City Hill. The implementation of Light Rail Stage 2a is dependent on the raising of London Circuit and will be influenced by the National Capital Authority’s plans for the Commonwealth Avenue Bridge. Any failure to implement these projects on a timely basis will have a negative impact on the expected benefits of Light Rail Stage 2a.

#### Key findings

A consultant was engaged to develop patronage and demand forecasts (light rail passenger kilometres, car vehicle kilometres etc), which were then used for the purpose of the economic appraisal. A proprietary model was used to develop the patronage and demand forecasts, which was based on Household Travel Survey data from South East Queensland, Sydney and Melbourne; ideally Canberra-based data would have been used for the purpose of forecasting. The patronage and demand forecasts were developed in June 2019, which was before the availability of

Paragraph

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patronage figures for Light Rail Stage 1. Accordingly, the Economic Analysis Report makes no reference to patronage, construction or operational details of Light Rail Stage 1, which commenced operations in April 2019. Douglas Economics advised 'it would be opportune to revisit the demand model and revise the forecasts in light of the performance of Stage 1'.

In June 2019 the population, employment, land use and car park pricing assumptions for Light Rail Stage 2 were documented. The report documented the assumptions for twelve scenarios including four light rail alignments for three forecasted years (2026, 2036 and 2046). The alignments included Light Rail Stage 1 and three Light Rail Stage 2 alignment options that extended Stage 1 from Alinga St to Woden via: State Circle, Capital Circle and Barton. However, the June 2019 report did not include the Light Rail Stage 2a alignment presented in the Stage 2a Business Case as a discrete stand-alone option, indicating that it was not separately and explicitly considered. Since the documentation of the assumptions and the development of the Stage 2a Business Case, the COVID-19 pandemic has had an impact on working practices and transport. Notwithstanding the immediate and severe impact on public transport usage in 2020, a 'new normal' for working practices and transport in the ACT may become apparent, with more people working in professional services industries becoming accustomed to 'remote' working and virtual meetings. 3.28

The Stage 2a Business Case was developed in the context of a series of 'transformational projects' and revitalisation activities that influenced the economic appraisal of the Light Rail Stage 2a project. The Stage 2a Business Case notes that Light Rail Stage 2a 'has been carefully designed to optimise and integrate with planned urban renewal activities and other projects in the precinct'. These interdependent projects include the Acton Waterfront development at West Basin, raising London Circuit to be at-grade with Commonwealth Avenue, a National Capital Authority proposal to reconfigure Kings and Commonwealth Avenues as grand boulevards and the development of Section 100 (formerly Section 63) at City Hill. Should there be any risk to the implementation of these projects, then the expected benefits of Light Rail Stage 2a and the timing of those benefits are at risk. 3.44

A Cost Benefit Analysis methodology was used to undertake the economic appraisal of Light Rail Stage 2a. Cost Benefit Analysis is considered an appropriate technique and is widely used for assessing the economic merits of new transport infrastructure. In September 2019, as part of the Cost Benefit Analysis evaluation, EY provided an Economic Appraisal Report for Light Rail Stage 2a. The purpose of the Economic Appraisal Report was to provide 'a description of the economic appraisal methodology, parameters and results' for Light Rail Stage 2 and Light Rail Stage 2a. However, Major Projects Canberra did not receive or request spreadsheets demonstrating the assumptions or calculations supporting the components of the Cost Benefit Analysis, or an economic model, similar to one that was produced for the purpose of Light Rail Stage 1. In relation to what processes Major Projects Canberra had in place to oversight and seek assurance as to the economic analysis that was conducted, Major Projects Canberra advised that it undertook quality assurance activities through its review of draft reports from EY (and the other specialist models and reports) but that its methodology and processes for quality assurance of the Cost Benefit Analysis were not documented. The lack of 3.56

documented methodology and processes for quality assurance of the Cost Benefit Analysis, combined with the absence of spreadsheets demonstrating the calculations or an economic model, impairs Major Projects Canberra's ability to demonstrate the accuracy and appropriateness of the economic appraisal of Light Rail Stage 2a.

The Benefit Cost Ratio for Light Rail Stage 2a, calculated to two decimal places, was 0.38 excluding Wider Economic Benefits and 0.56 including Wider Economic Benefits. These were rounded up to 0.4 and 0.6 respectively for the Stage 2a Business Case. The Stage 2a Business Case also includes a 'blended indicative Benefit Cost Ratio' for: Gungahlin to Woden (Stage 1 and Stage 2 combined); and Gungahlin to Commonwealth Park (Stage 1 and Stage 2a combined). The 'blended indicative Benefit Cost Ratio' for both routes was calculated at 1.20 (rounded up from 1.18). The 'blended indicative Benefit Cost Ratio' was calculated by Major Projects Canberra independently of EY as its economic advisor. Douglas Economics advised that the 'blended BCR is novel; no example of blending the result of a past investment with a future investment is known' and also noted it 'has no relevance to the [Light Rail Stage 2a] investment decision because the Stage 1 costs are 'sunk', i.e. cannot be recovered'.

3.72

For the purpose of the economic appraisal, four scenarios were considered. Each scenario was tested to reflect assumptions over the degree of dependence of the delivery of the Acton Waterfront development on Light Rail Stage 2a. Scenario A was selected as the basis for the Stage 2a Business Case, which assumes that the delivery of Light Rail Stage 2a will accelerate the development of the Acton Waterfront (i.e. bring forward the development with a more compressed construction period) by two years. This resulted in the Benefit Cost Ratio of 0.56 (including land use and wider economic benefits). Scenario C, which assumed that the development of the Acton Waterfront will occur regardless of the construction of Light Rail Stage 2a, resulted in a Benefit Cost Ratio of 0.21 (including land use and wider economic benefits). Under Scenario A, the \$23 million cost of the Acton Waterfront development acceleration compares with an estimated acceleration benefit of \$99 million when compared to Scenario C. \$79 million of the advancement benefit of \$99 million (79.8 percent) relates to city shaping benefits and wider economic benefits; this is a high proportion of the benefits associated with Light Rail Stage 2a.

3.84

A significant amount of the benefits identified for Light Rail Stage 2a are predicated on it being a catalyst for acceleration of development of the Acton Waterfront. Neither the Stage 2a Business Case or Economic Appraisal Report provides information or evidence on how Light Rail Stage 2a is expected to accelerate development at the site. Should the Acton Waterfront not be developed as fast as is hoped, then the expected benefits of Light Rail Stage 2a and the timing of those benefits are at risk. As city shaping benefits and wider economic benefits comprise the majority of the benefits associated with the project, any risks to the accelerated development of the Acton Waterfront will have a significant impact.

3.91

The wider economic benefits for Light Rail Stage 2a are estimated at \$48 million (2019, present value, discounted at 7 percent), which equates to 32 percent of the total value of benefits. Neither the Stage 2a Business Case or Economic Appraisal Report provides any narrative that describes, explains or supports the estimates of wider economic benefits. In relation to the use of wider economic benefits for Light

3.103

Rail Stage 2a, Douglas Economics advised ‘despite two decades of [wider economic benefits] being part of the [cost-benefit analysis] lexicon in the UK, NZ and Australia, debate continues over whether or not [wider economic benefits] have merit. For Australia, the estimation of meaningful agglomeration elasticities has proved elusive with no believable elasticities estimated for Canberra’. Elasticities are economic measures of how sensitive one economic factor is to another.

## Benefits identification

### Project benefits

3.2 The Stage 2a Business Case identified ‘four main benefits that are expected to be realised by City to Woden Light Rail’ and that these were ‘equally applicable to [Light Rail Stage 2a] as the initial stage in extending light rail south to Woden’. These are:

- reduced congestion;
- connected and compact city;
- improved access to employment and services; and
- increased economic growth and diversification.

3.3 The Stage 2a Business Case showed the expected benefits and their value. This is shown in Table 3-1.

**Table 3-1 Light Rail Stage 2 benefits**

Expected benefit	Value of benefit
Increased economic growth and diversification of employment	<ul style="list-style-type: none"> <li>• Job creation along the light rail corridor.</li> <li>• Agglomeration benefits.</li> <li>• Diversification of jobs in Canberra, reducing reliance on Commonwealth Government employment and expenditure (which will also have positive implications for ACT tax revenues).</li> <li>• As light rail generates revenue and unlocks value along the corridor, this benefit can be realised in the form of increased tax revenue on land (including both higher value land and better utilised land).</li> </ul>
A connected and compact city	<ul style="list-style-type: none"> <li>• Infrastructure cost savings associated with infill development (relative to development along the urban fringe).</li> <li>• Wider economic benefits achieved due to land use change.</li> <li>• Higher levels of productivity due to an increase in density and agglomeration.</li> <li>• Reduced urban sprawl.</li> <li>• In addition to planned urban renewal, light rail will be a catalyst for further private development in the area – providing ongoing revenues to the ACT Government.</li> </ul>

Expected benefit	Value of benefit
Improved access to employment and services	<ul style="list-style-type: none"> <li>Supporting the unlocking of commercial and retail space will increase the number of accessible jobs in Canberra.</li> <li>Better access to employment will increase productivity and ultimately the economic output of the City.</li> </ul>
Reduced congestion	<ul style="list-style-type: none"> <li>Increased public transport use, leading to a reduction in car use and associated congestion and pollution.</li> <li>Travel time savings equivalent to \$11 million over the first 30-years of operations.</li> <li>Estimated net externality benefits at \$3 million over a 30-year appraisal period. This estimate includes reductions in emissions, noise, water pollution and impacts on nature and landscape.</li> </ul>

Source: City to Woden Light Rail: Stage 2a City to Commonwealth Park Business Case, Page 65.

### Economic appraisal benefits

3.4 For the purpose of the economic appraisal, the project benefits were identified against three categories:

- transport benefits;
- city shaping benefits; and
- wider economic benefits.

3.5 The Stage 2a Business Case showed the relationship between the Light Rail Stage 2 project benefits and the economic benefits. This is shown in Table 3-2.

**Table 3-2 Relationship between project benefits and economic benefits**

	Need for investment			
	Economic diversification	Competitive and compact city	Accessibility	Reduced congestion
Travel time savings	✓		✓	✓
Reliability benefits	✓		✓	✓
Vehicle operating costs	✓		✓	✓
Net externalities	✓		✓	✓
Accident costs	✓		✓	✓
Public transport revenue	✓		✓	
Bus operation cost savings			✓	
Health benefits	✓		✓	
Light rail amenity benefits			✓	
Residual value			✓	
Second round transport benefits		✓	✓	✓

	Need for investment			
	Economic diversification	Competitive and compact city	Accessibility	Reduced congestion
Land value uplift		✓		
Infrastructure cost savings		✓		
Transport agglomeration	✓			
Land use agglomeration		✓		

Source: City to Woden Light Rail: Stage 2a City to Commonwealth Park Business Case, Page 66.

3.6 Table 3-3 shows the estimated benefits of Light Rail Stage 2a against the three benefit categories. The estimated benefits are shown as present value (2019, i.e. discounted at 7 percent). A nominal value of the project's expected benefits is not shown in the Stage 2a Business Case.

**Table 3-3 Summary of project benefits (present value as at 2019, discounted at 7%)**

Cost Item	Stage 2a (\$million)
Transport benefits	55
City shaping benefits	47
Wider economic benefits	48
<b>Total project cost</b>	<b>150</b>

Source: City to Woden Light Rail: Stage 2a City to Commonwealth Park Business Case, Page 138.

#### *Transport benefits*

3.7 According to the Stage 2a Business Case, transport benefits arise 'from both the change in transport provision and change in land use'. They are categorised as direct benefits on users of the Light Rail Stage 2a (e.g. travel time savings, savings in vehicle operating costs and health and amenity benefits) and savings to the wider Canberra community through external benefits (e.g. reduction in road accident costs and bus operation savings).

#### *City-shaping benefits*

3.8 Two city-shaping benefits are described: land use benefits and infrastructure cost savings. With respect to land use benefits, the Stage 2a Business Case notes that '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'. The Stage 2a Business Case states:

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.

- 3.9 The Stage 2a Business Case goes on to say, ‘the land use benefits ... relate to the acceleration of the development timeline for the Acton Waterfront’.

#### *Wider economic benefits*

- 3.10 According to the Stage 2a Business Case wider economic benefits refers to ‘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.

## Benefits quantification

### Inputs into benefits quantification

- 3.11 Key inputs into the identification and quantification of benefits associated with Light Rail Stage 2a include:
- patronage and demand forecasts; and
  - population and employment growth assumptions.

### Patronage and demand

- 3.12 Veitch Lister Consulting (VLC) was engaged to develop patronage and demand forecasts (light rail passenger kilometres, car vehicle kilometres etc). These patronage and demand forecasts were used by EY for the purpose of the economic appraisal.

- 3.13 VLC used its proprietary ‘Zenith’ model to develop the patronage and demand forecasts for Light Rail Stage 2 (and Light Rail Stage 2a) in June 2019. In addition to Canberra, the Zenith model has been used across six capital cities of Australia (Darwin being the exception). Douglas Economics noted:

The Zenith parameters that model the demand response to changes in transport and demographic changes were estimated on Household Travel Surveys (HTS) undertaken in South East Queensland (2007-12), Sydney (2007-10) and Melbourne (2007-15).

- 3.14 Douglas Economics noted the absence of Canberra-specific data and identified that there was some risk in not having this:

Ideally, [Household Travel Surveys] data for Canberra would have been available for VLC to estimate a set of ‘local’ parameters for Canberra rather than surveys undertaken in Australia’s three ‘biggest cities’ where traffic congestion is greater, rail and ferry services are available, city centre parking is more constrained and where some roads are tolled.

### Actual Patronage of Stage 1

3.15 In the absence of Canberra-specific data for the purpose of patronage and demand forecasting for Light Rail Stage 2 (and therefore Light Rail Stage 2a), actual patronage figures for Light Rail Stage 1 could have assisted. However, the demand forecasts for Light Rail Stage 2 were undertaken prior to the availability of patronage figures for Light Rail Stage 1. Accordingly, the Economic Analysis Report makes no reference to patronage, construction or operational details of Light Rail Stage 1, which commenced operations in April 2019. Douglas Economics advised ‘it would be opportune to revisit the demand model and revise the forecasts in light of the performance of Stage 1’. In this respect Douglas Economics noted:

Given that Stage 1 has been operational from April 2019, there has been the opportunity to pivot the forecasts of Stage 2a demand off existing Stage 1 demand using ticketing data supplemented by origin destination and, possibly Stated Preference surveys. TfNSW has used incremental demand forecasting for CBD-SE LRT and other public transport projects. Incremental forecasting that uses as much up to date local data as possible is considered best practice. Unfortunately, this had not yet been done for Canberra.

3.16 Nevertheless, a Benefit Realisation Snapshot was undertaken in May 2020 for Light Rail Stage 1, which included patronage figures for the first year of Light Rail Stage 1 operations. This was one year after Light Rail Stage 2 patronage forecasts were developed. Douglas Economics noted:

Actual patronage reported in the BRS was reasonably close to the VLC Stage 1 forecast which, prima facie, provides evidential support for the VLC Zenith forecasts ... [but that] there are some differences in the composition of forecast demand.

### Stage 2 patronage forecasts

3.17 In June 2019, VLC delivered a *Stage 2 Patronage Report* that provided patronage forecasts for Light Rail Stage 2. Most of this report presents forecasts for the full route from Alinga St to Woden. Two demographic scenarios are presented for Light Rail Stage 2a:

- ‘Business as Usual’; and
- a West Basin land use scenario.

3.18 It is unclear how the scenarios relate to the four Acton Waterfront development scenarios in the Economic Appraisal Report, or whether Scenario C adopted in the Stage 2a Business Case was used in the forecasts. Table 3-4 shows the patronage forecasts represented in the Stage 2a Business Case.

**Table 3-4 Patronage forecasts presented in the Stage 2a Business Case**

Assumption	City to Commonwealth Park	City to Woden
Estimated travel time (minutes)	6	25-30
Estimated additional daily patronage (2026)	2,500	13,900
Estimated additional daily patronage (2046)	4,300	23,000

Source: City to Woden Light Rail: Stage 2a City to Commonwealth Park Business Case, Table 1.1, Section 1.7.



3.19 Individual patronage forecasts for the three new Light Rail Stage 2a stops: City South, City West and Commonwealth Park and the impact on Alinga Street stop, which changes from a terminus to a through running stop, are also not provided in the Economic Appraisal Report or the Stage 2a Business Case. Douglas Economics further notes:

Neither is there reporting of (i) the number of 'new' trips on the 1.7km extension ('intra' trips); (ii) the number of 'existing' trips on southbound 'Stage 1' services that stay on after Alinga St and on northbound 'Stage 1' services that get on before Alinga St. It is considered that 'best practice' [cost-benefit analysis] provide a description of the demand to help understand the size of benefit.

3.20 Douglas Economics further notes:

Apart from passenger kilometre graphs by mode ... there is no assessment of the 'source' of Stage 2a trips showing how many passengers divert from car, bus and walk/cycle and how many are 'new' (i.e. not made with Stage 1 operational). Best practice would be to report these figures so readers can understand the patronage effects of the project.

3.21 As an alternative the Veitch Lister Consulting *Stage 2 Patronage Report* could be made public with the relevant forecasts referenced in the Business Case.

3.22 A consultant was engaged to develop patronage and demand forecasts (light rail passenger kilometres, car vehicle kilometres etc), which were then used for the purpose of the economic appraisal. A proprietary model was used to develop the patronage and demand forecasts, which was based on Household Travel Survey data from South East Queensland, Sydney and Melbourne; ideally Canberra-based data would have been used for the purpose of forecasting. The patronage and demand forecasts were developed in June 2019, which was before the availability of patronage figures for Light Rail Stage 1. Accordingly, the Economic Analysis Report makes no reference to patronage, construction or operational details of Light Rail Stage 1, which commenced operations in April 2019. Douglas Economics advised 'it would be opportune to revisit the demand model and revise the forecasts in light of the performance of Stage 1'.

## Population and employment

3.23 In June 2019, VLC published a *Model Assumptions Report* that documented the population, employment, land use and car park pricing assumptions for Light Rail Stage 2. The report documented the assumptions for twelve scenarios including four light rail alignments for three forecasted years (2026, 2036 and 2046). The alignments included Light Rail Stage 1 and three Light Rail Stage 2 alignments that extended Stage 1 from Alinga St to Woden via: State Circle, Capital Circle and Barton. There was no documentation of the Light Rail Stage 2a alignment as a discrete, stand-alone option in the June 2019 report.

### COVID-19 impact

3.24 The Stage 2a Business Case was published in September 2019 before the impact of the COVID-19 pandemic, which became apparent in March 2020. COVID-19 contributed to a significant drop in public transport usage in the ACT in 2020. Public transport usage has since recovered, but not to levels seen prior to the impact of COVID-19.

- 3.25 Douglas Economics has noted the impact of COVID-19 and what may become a ‘new normal’ for working practices and transport, noting that people working in professional services industries ‘have become accustomed to ‘remote’ working and virtual meetings’.
- 3.26 If working from home continues to be accessible and acceptable to people working in professional services employment, then the patronage projections for Light Rail Stage 2a (and Light Rail Stage 2), as identified in September 2019 will be over-estimated. While it is noted that interstate and international tourism to the ACT has also been impacted by the COVID-19 pandemic, and this is also likely to have impacted public transport usage figures, this is expected to be overcome in time.
- 3.27 In response to the draft proposed report, Major Projects Canberra advised:
- The economic analysis within the Business Case is undertaken over a 30-year assessment period, including construction and operations.
- The predominant employer within the National Capital Area is the Commonwealth Government and consultants and contractors engaged by the Commonwealth Government.
- APS Circular 2020/9: Returning to Usual Workplaces* provides that where there is limited or no community transmission of COVID-19, employees should return to their usual workplaces, where it is safe to do so.
- 3.28 In June 2019 the population, employment, land use and car park pricing assumptions for Light Rail Stage 2 were documented. The report documented the assumptions for twelve scenarios including four light rail alignments for three forecasted years (2026, 2036 and 2046). The alignments included Light Rail Stage 1 and three Light Rail Stage 2 alignment options that extended Stage 1 from Alinga St to Woden via: State Circle, Capital Circle and Barton. However, the June 2019 report did not include the Light Rail Stage 2a alignment presented in the Stage 2a Business Case as a discrete stand-alone option, indicating that it was not separately and explicitly considered. Since the documentation of the assumptions and the development of the Stage 2a Business Case, the COVID-19 pandemic has had an impact on working practices and transport. Notwithstanding the immediate and severe impact on public transport usage in 2020, a ‘new normal’ for working practices and transport in the ACT may become apparent, with more people working in professional services industries becoming accustomed to ‘remote’ working and virtual meetings.

## Interdependent projects

- 3.29 Light Rail Stage 2a is expected to improve public transport connectivity between the northern side of Lake Burley Griffin and the City. In addition, Light Rail Stage 2a is expected to support revitalisation activities that are planned, or underway, in City Hill, City West and the Acton Waterfront.
- 3.30 The Stage 2a Business Case states:
- The Project has been developed in the context of a series of transformational projects in and around the City Centre. It has been carefully designed to optimise and integrate with planned urban renewal activities and other projects in the precinct to provide a high-quality urban realm that enhances accessibility and broader place making initiatives.

- 3.31 These are projects that Light Rail Stage 2a has infrastructure dependencies with, or projects that have influenced the benefit and cost streams, and thus influenced the Benefit Cost Ratio of the project.

## City Renewal Projects

### *Acton Waterfront development at West Basin*

- 3.32 The Stage 2a Business Case states:

Planning and development is underway to revitalise currently unutilised and underutilised land around the Acton Waterfront, City Hill and Commonwealth Park and transform the area into a more vibrant, liveable and attractive destination. Future developments could potentially include a range of commercial, residential, recreational, entertainment and urban amenity projects.

The ACT Government is progressing the development of the Acton Waterfront, in line with the National Capital Plan (NCP), to bring the everyday life of the City to the foreshores of Lake Burley Griffin.

- 3.33 The development of the Acton Waterfront at West Basin is derived from the former City to the Lake Project. The City to the Lake Project 'was originally created to outline the framework for the development of the southern parts of the CBD'. It was 'originally to include a new convention and exhibition centre, a city stadium, the realignment of Parkes Way to facilitate enhanced public access to West Basin and Commonwealth Park, and the creation of homes for 15,000 new residents'. However, 'since 2006, City to the Lake priorities have shifted with focus now on the creation of the West Basin Waterfront development [i.e. the Acton Waterfront] and activating the city'. There are currently multiple projects in planning, or that are progressing to completion, related to the development of the Acton Waterfront at West Basin. These include:

- Stage One - creation of Henry Rolland Park and the first 150 metres of a lakeside boardwalk. The area is now open to the public;
- Stage Two – completion of the final 500 metres of boardwalk and the lake wall, reclamation of part of the lake to provide for a waterfront urban park and construction of two public jetties (pending National Capital Authority approval); and
- Stage Three – completion of a lakeside public space 'prior to starting work on mixed-use development precincts that will bring the City Centre across Parkes Way'.

- 3.34 In August 2020, the *Acton Waterfront Place Plan* was released:

The place plan considers and acknowledges the underlying project parameters and assumptions which have evolved since the completion of the earlier City to Lake plan, including planning for Stage 2 of Canberra's light rail network.

- 3.35 The Stage 2a Business Case states that the new development at West Basin is anticipated to create homes for approximately 15,000 new residents over the next 20 years and includes plans for open space improvements on the waterfront and other public infrastructure.

### *London Circuit/Commonwealth Avenue Intersection*

3.36 The Stage 2a Business Case states:

The City Renewal Authority has undertaken planning, design, economic and financial analysis on raising London Circuit to be at-grade with Commonwealth Avenue with a signalised traffic intersection formed with the intent to improve travel connectivity between the City and the Lake and align the road network with the future land release program.

3.37 The Stage 2a Business Case assumes that London Circuit is raised to meet Commonwealth Avenue. The Stage 2a Business Case further states:

The London Circuit project is designed to improve active travel connectivity between the City and the Lake, provide a more attractive urban realm and align the road network with the future land release program.

3.38 The *Stage 2 of Light Rail – Building Light Rail to Woden* document advises that:

... to minimise disruption and provide construction efficiencies, the London Circuit project is proposed to be delivered by Canberra Metro in conjunction with the extension of light rail to Commonwealth Park. Canberra Metro will be asked to provide costing to design and construct a raised London Circuit so that work can happen in parallel with the extension of light rail to Commonwealth Park. This will minimise disruption for the community as the work can be undertaken together.

3.39 On 3 February 2021, the ACT Government announced that it will invest \$2.1 million on early works design to raise London Circuit with construction to commence as early as the 2021-22 financial year and acknowledges that raising London Circuit is a crucial enabling project for Light Rail Stage 2a.

### *Kings and Commonwealth Avenues*

3.40 In May 2017, the National Capital Authority commenced community consultation in relation to reconfiguring Kings and Commonwealth Avenues as grand boulevards. The Stage 2a Business Case states:

The NCA's plans for Commonwealth Avenue Bridge will influence the development of the Project, as well as the extension further south to Woden, with design integration and close cooperation vital.

3.41 The National Capital Authority has also considered upgrading or replacing the Commonwealth Avenue Bridge over Lake Burley Griffin. Decisions made on this work may considerably impact Light Rail Stage 2.

3.42 In March 2020, Infrastructure Australia announced that it was evaluating the business case to upgrade the Commonwealth Avenue Bridge. Infrastructure Australia included the upgrade of Commonwealth Avenue Bridge on its Infrastructure Priority List in late 2020.

3.43 On 27 January 2021, the Australian Government announced a \$137 million investment to upgrade the Commonwealth Avenue Bridge to extend its life by another 50 years.

3.44 The Stage 2a Business Case was developed in the context of a series of ‘transformational projects’ and revitalisation activities that influenced the economic appraisal of the Light Rail Stage 2a project. The Stage 2a Business Case notes that Light Rail Stage 2a ‘has been carefully designed to optimise and integrate with planned urban renewal activities and other projects in the precinct’. These interdependent projects include the Acton Waterfront development at West Basin, raising London Circuit to be at-grade with Commonwealth Avenue, a National Capital Authority proposal to reconfigure Kings and Commonwealth Avenues as grand boulevards and the development of Section 100 (formerly Section 63) at City Hill. Should there be any risk to the implementation of these projects, then the expected benefits of Light Rail Stage 2a and the timing of those benefits are at risk.

## Light Rail Stage 2a Economic Appraisal

3.45 In October 2017, the Transport Canberra and City Services Directorate engaged EY to undertake an economic appraisal to determine the estimated benefits associated with the implementation of Light Rail Stage 2 relevant to the estimated costs of the project.

### Methodology

3.46 EY used a Cost Benefit Analysis methodology to undertake the appraisal of Light Rail Stage 2a. Cost Benefit Analysis is considered an appropriate technique and is widely used for assessing the economic merits of new transport infrastructure. The 2016 *Australian Transport Assessment and Planning Guidelines* support the use of Cost Benefit Analysis for transport infrastructure appraisals. The Guidelines consider Cost Benefit Analysis to be:

A rigorous, transparent, quantitative method that measures the degree to which individual initiatives generate net benefits (benefits minus costs) across Australia and allows comparison and ranking of options and initiatives. Cost Benefit Analysis is a standard technique used all over the world and can be applied to a wide range of initiatives in a defensible, comprehensive, transparent and rigorous way.

3.47 In September 2019, as part of the Cost Benefit Analysis evaluation, EY provided an Economic Appraisal Report for Light Rail Stage 2a. The purpose of the Economic Appraisal Report was to provide ‘a description of the economic appraisal methodology, parameters and results’ for Light Rail Stage 2 and Light Rail Stage 2a.

3.48 The Economic Appraisal Report discussed the costs and benefits of the design, construction, ongoing operation, maintenance and the procurement of additional vehicles for both Light Rail Stage 2 and Light Rail Stage 2a.

3.49 The Economic Appraisal Report also considered interdependencies for Light Rail Stage 2a, including the consideration of various scenarios, and calculated a Benefit Cost Ratio.

### Supporting information and assurance

3.50 Similar to Light Rail Stage 2a, EY was engaged to undertake the economic appraisal, and assist in the preparation of the Business Case, for Light Rail Stage 1. In doing so, EY produced

an economic model. The Audit Office's 2016 performance audit report *Initiation of the Light Rail Project* (Report No. 5/2016) noted:

The model is an Excel workbook comprising input sheets for data, calculation sheets and output sheets including summary results. The output of the model, i.e. various calculations of costs and benefits, was put into the *Full Business Case*.

3.51 The Audit Office understands a similar economic model, including input sheets for data and calculation sheets, was not provided for the purpose of the Light Rail Stage 2a Cost Benefit Analysis. However, spreadsheets showing the results of the analysis were provided. Major Projects Canberra advised:

No spreadsheets were provided to MPC by EY for the CBA. An Economic Appraisal Report and draft Business Case were developed by EY and the figures within those documents supported the cost-benefit calculations ...

3.52 While Major Projects Canberra advised that it did not receive or request spreadsheets demonstrating the calculations supporting the components of the Cost Benefit Analysis, Major Projects Canberra advised it had an opportunity to:

- review and provide feedback on assumptions, parameters and methodology underpinning the calculations;
- review and provide feedback on draft reports from EY showing the Cost Benefit Analysis calculations; and
- review the models and data underpinning the Cost Benefit Analysis, including the Veitch Lister Consulting transport model, the Turner and Townsend cost model and the Arup land use model.

3.53 In the absence of the economic model (or similar spreadsheet), Major Projects Canberra confirmed that it is not in a position to re-perform the economic appraisal calculations.

3.54 Information was sought as to what processes Major Projects Canberra had in place to oversight and seek assurance as to the economic analysis that was conducted by EY and the outputs that were produced. Major Projects Canberra advised that it undertook quality assurance activity through its review of draft reports from EY (and the other specialist models and reports) but that its methodology and processes for quality assurance of the Cost Benefit Analysis were not documented.

3.55 In response to the draft proposed report, Major Projects Canberra advised:

Methodologies for the [Cost Benefit Analysis] are established within the Capital Framework at the whole of government level.

Processes for the development of the [Cost Benefit Analysis] included review and endorsement by the Projects Advisory Board responsible including representatives across Treasury, TCCS and EPSDD.

3.56 A Cost Benefit Analysis methodology was used to undertake the economic appraisal of Light Rail Stage 2a. Cost Benefit Analysis is considered an appropriate technique and is widely used for assessing the economic merits of new transport infrastructure. In September 2019,

as part of the Cost Benefit Analysis evaluation, EY provided an Economic Appraisal Report for Light Rail Stage 2a. The purpose of the Economic Appraisal Report was to provide ‘a description of the economic appraisal methodology, parameters and results’ for Light Rail Stage 2 and Light Rail Stage 2a. However, Major Projects Canberra did not receive or request spreadsheets demonstrating the assumptions or calculations supporting the components of the Cost Benefit Analysis, or an economic model, similar to one that was produced for the purpose of Light Rail Stage 1. In relation to what processes Major Projects Canberra had in place to oversight and seek assurance as to the economic analysis that was conducted, Major Projects Canberra advised that it undertook quality assurance activities through its review of draft reports from EY (and the other specialist models and reports) but that its methodology and processes for quality assurance of the Cost Benefit Analysis were not documented. The lack of documented methodology and processes for quality assurance of the Cost Benefit Analysis, combined with the absence of spreadsheets demonstrating the calculations or an economic model, impairs Major Projects Canberra’s ability to demonstrate the accuracy and appropriateness of the economic appraisal of Light Rail Stage 2a.

## Benefit Cost Ratio

3.57 A Benefit Cost Ratio is a measure that expresses the ratio of monetised benefits over monetised costs over an evaluation period. To take account of a well-established preference for present consumption to future consumption, costs and benefits are discounted to attach less weight to them the later the year in which they accrue.

### Light Rail Stage 2a Benefit Cost Ratio

3.58 The Stage 2a Business Case identified Benefit Cost Ratios for various components of the project. The Benefit Cost Ratios for Light Rail Stage 2a and Light Rail Stage 2 (Stage 2a and 2b combined) are shown in Table 3-5.

**Table 3-5 Benefit Cost Ratio (present value as at 2019, discounted at 7%)**

Benefit Category	Stage 2a	Stage 2
<b>Project benefits (\$million)</b>		
Transport benefits	55	349
City shaping benefits	47	402
Wider economic benefits	48	466
<b>Total Project benefits</b>	<b>150</b>	<b>1,217</b>
<b>Project costs (\$million)</b>		
Project capital costs	162	960
Operating costs	82	190
Development costs	23	23
<b>Total Project costs</b>	<b>268</b>	<b>1,173</b>

Benefit Category	Stage 2a	Stage 2
<b>Results</b>		
NPV (excluding WEBs)	-166	-422
NPV (including WEBs)	-118	44
BCR (excluding WEBs)	0.4	0.6
BCR (including WEBs)	0.6	1.0

Source: City to Woden Light Rail: Stage 2a City to Commonwealth Park Business Case, Page 21.

3.59 The Benefit Cost Ratio for Light Rail Stage 2a, calculated to two decimal places, was 0.38 excluding Wider Economic Benefits and 0.56 including Wider Economic Benefits. These were rounded up to 0.4 and 0.6 respectively for the Stage 2a Business Case.

### Indicative blended Benefit Cost Ratios

3.60 The Stage 2a Business Case also includes a 'blended indicative Benefit Cost Ratio' for:

- Gungahlin to Woden (Stage 1 and Stage 2 combined); and
- Gungahlin to Commonwealth Park (Stage 1 and Stage 2a combined).

3.61 The 'blended indicative Benefit Cost Ratio' for both routes was calculated at 1.20 (rounded up from 1.18). The Stage 2a Business Case notes that the 'blended indicative Benefit Cost Ratio' was calculated by Major Projects Canberra independently of EY as its economic advisor.

3.62 The Stage 2a Business Case states it is based on:

- Light Rail Stage 1 benefits, as identified in the Light Rail Stage 1 Business Case (September 2014);
- actual Light Rail Stage 1 project costs as presented in the June 2019 Project Delivery Report (adjusted to \$2019 net present value); and
- Light Rail Stage 2 and Light Rail Stage 2a analysis as set out in the Stage 2a Business Case.

3.63 The Stage 2a Business Case states the approach used for 'blended indicative Benefit Cost Ratio' for both routes 'has not been created using new analysis or under the same process' as the Light Rail Stage 2a or Light Rail Stage 2 Benefit Cost Ratios and as a result 'underlying assumptions from the [Light Rail Stage 1 Benefit Cost Ratio] may not be relevant and not provide the same outcome when viewed on a City to Woden basis'. Furthermore:

The City to Gungahlin results are based on assumptions, estimates, modelling and forecasts believed to be reasonable at the time of the 2014 Business Case. They do not reflect any changes in scope, costs or economic reality since then, and as such do not represent the realised costs and benefits from the project'.



## 3.64 The Stage 2a Business Case notes:

When considered in conjunction with the BCR for the City to Gungahlin (Stage 1), the benefits of light rail across the north-south corridor between Gungahlin and Woden via the City, inclusive of wider economic benefits, exceed the costs.

## 3.65 Douglas Economics advised that 'a blended BCR is novel; no example of blending the result of a past investment with a future investment is known'. Furthermore, Douglas Economics noted:

The blended result has no relevance to the [Light Rail Stage 2a] investment decision because the Stage 1 costs are 'sunk', i.e. cannot be recovered.

## 3.66 Douglas Economics notes that revisiting Cost Benefit Analysis has merit as part of post implementation reviews, and there are examples of 'hindsight CBAs' undertaken as part of post implementation reviews for different projects. Furthermore, 'updating CBAs to take account of revised costs and benefits is more commonplace [and] is a recommended part of the Business Case process':

A 'rapid' preliminary CBA should be followed by more rigorous CBAs as project planning proceeds and cost and demand estimates are refined. In theory, project managers and decision makers should remain receptive to revisiting, revising and, if necessary, revoking the decision if costs increase too much or if forecast demand and therefore consequent benefit reduces too much.

*Methodology*

## 3.67 The blended Benefit Cost Ratios were achieved after reducing Light Rail Stage 1 capital costs to take account the actual costs being lower than in the Stage 1 Business Case and taking account of the difference in the base years of the Light Rail Stage 1 (with a base date of 2014) and Light Rail Stage 2a (with a base date of 2019) Business Cases. The Light Rail Stage 1 benefits and costs were increased by 40 percent by multiplying by the 7 percent discount factor compounded over 5 years to reflect the five-year difference in the base years of the evaluation. Douglas Economics noted this approach was unusual and no other example could be found of this approach.

## 3.68 Douglas Economics notes the 40 percent 'discount rate' factor 'multiplied costs and benefits by the same amount which means the [Benefit Cost Ratio] for [Light Rail Stage 1] would have remained the same had capital costs not been reduced'. However, the net present value:

... is an absolute measure so applying the same factor to both benefits and costs widens the result. [Net Present Value] becomes bigger if the original NPV is positive and worse (more negative) if the original [Net Present Value] is negative.

## 3.69 Douglas Economics also noted, 'the discount rate factor increased the weight of the Stage 1 results relative to Stage 2 ... consequently, the blended results look more like Stage 1 than Stage 2'.

## 3.70 Douglas Economics also noted 'the blended [Cost Benefit Analysis] not only blended the benefits and costs but blended quite different assumptions, methods and results for the

Stage 1 and Stage 2a and Stage 2 [Cost Benefit Analyses]’. However, such an evaluation ‘does not provide the relevant figures to assess the economic merit of extending the LRT; these figures are provided by the Stage 2a CBA alone’.

3.71 In response to the draft proposed report Major Projects Canberra advised:

The Blended [Benefit Cost Ratio] was clearly intended as supplementary information for decision makers to inform how an extension to an existing project would perform as a network. This was particularly pertinent given Stage 2a will only operate with Stage 1 and not in isolation as a standalone project.

3.72 The Benefit Cost Ratio for Light Rail Stage 2a, calculated to two decimal places, was 0.38 excluding Wider Economic Benefits and 0.56 including Wider Economic Benefits. These were rounded up to 0.4 and 0.6 respectively for the Stage 2a Business Case. The Stage 2a Business Case also includes a ‘blended indicative Benefit Cost Ratio’ for: Gungahlin to Woden (Stage 1 and Stage 2 combined); and Gungahlin to Commonwealth Park (Stage 1 and Stage 2a combined). The ‘blended indicative Benefit Cost Ratio’ for both routes was calculated at 1.20 (rounded up from 1.18). The ‘blended indicative Benefit Cost Ratio’ was calculated by Major Projects Canberra independently of EY as its economic advisor. Douglas Economics advised that the ‘blended BCR is novel; no example of blending the result of a past investment with a future investment is known’ and also noted it ‘has no relevance to the [Light Rail Stage 2a] investment decision because the Stage 1 costs are ‘sunk’, i.e. cannot be recovered’.

## Acton Waterfront development

3.73 For the purpose of the economic appraisal, four scenarios were considered. Each scenario was tested to reflect assumptions over the degree of dependence of the delivery of the Acton Waterfront development on Light Rail Stage 2a. The four scenarios considered are shown at Table 3-6.

**Table 3-6 Acton Waterfront development scenarios**

Scenario	Description
A	Assumes that the delivery of Stage 2a will accelerate the development of the Acton Waterfront (i.e. bring forward the development with a more compressed construction period) by two years. <b>Scenario A was adopted for the Stage 2a Business Case.</b>
B	Assumes that the delivery of Stage 2a will bring forward the planned development of the Acton Waterfront by four years.
C	Assumes the development of the Acton Waterfront will occur regardless of the construction of Stage 2A.
D	Assumes that the Acton Waterfront development is fully contingent on the delivery of Stage 2a.

Source: Economic Appraisal Report, Page 4.

3.74 In response to the draft proposed report, Major Projects Canberra advised that ‘the difference between the scenarios is the timing and attribution of [the Acton Waterfront development] to Light Rail Stage 2a’.

3.75 The project cost and economic analysis for each scenario that was considered is shown in Table 3-7.

**Table 3-7 Cost Benefit Analysis results (present value as at 2019, discounted at 7%)**

RESULTS	SCENARIO A	SCENARIO B	SCENARIO C	SCENARIO D
<b>BENEFITS (\$million)</b>				
Total benefits (including WEBs)	150	186	51	487
Total benefits (excluding WEBs)	102	128	35	323
<b>P50 COSTS (\$million)</b>				
CAPEX	162	162	162	162
OPEX	82	82	82	82
Development Costs	23	33	0	110
<b>Total costs</b>	<b>268</b>	<b>277</b>	<b>244</b>	<b>354</b>
<b>RESULTS</b>				
NPV (excluding WEBs)	-166	-149	-209	-31
BCR (excluding WEBs)	0.38	0.46	0.14	0.91
NPV (including WEBs)	-118	-91	-193	133
BCR (including WEBs)	0.56	0.67	0.21	1.38

Source: Economic Analysis Report, Cost Benefit Analysis Table 2, Page 7.

### Scenario C

3.76 Scenario C, which assumes that the Acton Waterfront development will occur regardless of Light Rail Stage 2a, has not identified any development costs, and has only identified the following costs for the project:

- capital costs; and
- operating, maintenance and lifecycle costs.

### Scenario D

3.77 Scenario D assumes that the Acton Waterfront development will only go ahead because of the construction of Light Rail Stage 2a. This is not a useful analysis because, for the reasons outlined in paragraph 3.33, the development of the Acton Waterfront had been envisaged in various planning initiatives from as early as 2006.

### *Scenario A*

3.78 Scenario A was adopted in the Stage 2a Business Case as the 'central case'. It includes the capital costs and operating, maintenance and lifecycle costs identified across all the scenarios, and also includes development costs.

3.79 The cost of the Acton Waterfront development advancement in Scenario A was \$23 million (present value). As discussed in paragraphs 2.8 to 2.9, the development costs are described as:

... 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).

3.80 However, there is no further information or explanation as to how these were identified or calculated.

3.81 Under Scenario A, the \$23 million cost of the Acton Waterfront development acceleration compares with an estimated acceleration benefit of \$99 million, when compared to Scenario C, which assumes that the development of the Acton Waterfront will occur regardless of the construction of Light Rail Stage 2a. The majority of the benefits (79.8 percent) relate to city shaping benefits and wider economic benefits:

- transport benefits of \$20 million;
- city shaping benefits of \$47 million (value uplift worth of \$41 million and infrastructure cost savings of \$6 million); and
- wider economic benefits of \$32 million.

### *Sensitivity analysis*

3.82 Sensitivity analysis was also applied to the economic appraisal results in the Economic Appraisal Report 'to test their robustness to key assumptions and inputs'. Sensitivities that were applied to each scenario included:

- a change in the discount rate to 4 percent and 10 percent (from 7 percent) ;
- a change to the project costs (+/- 20 percent); and
- a change to the project benefits (+/- 20 percent).

3.83 The Economic Appraisal Report identified that for Scenario A, a 20 percent increase in costs resulted in a Benefit Cost Ratio of 0.47 and a 20 percent decrease in costs resulted in a Benefit Cost Ratio of 0.70. A 20 percent increase in benefits resulted in a Benefit Cost Ratio of 0.67 and a 20 percent decrease in benefits resulted in a Benefit Cost Ratio of 0.45. Changes in the discount rate resulted in minor changes to Benefit Cost Ratio of 0.59 (change to 4 percent) and 0.54 (change to 10 percent).

3.84 For the purpose of the economic appraisal, four scenarios were considered. Each scenario was tested to reflect assumptions over the degree of dependence of the delivery of the Acton Waterfront development on Light Rail Stage 2a. Scenario A was selected as the basis for the Stage 2a Business Case, which assumes that the delivery of Light Rail Stage 2a will accelerate the development of the Acton Waterfront (i.e. bring forward the development with a more compressed construction period) by two years. This resulted in the Benefit Cost Ratio of 0.56 (including land use and wider economic benefits). Scenario C, which assumed that the development of the Acton Waterfront will occur regardless of the construction of Light Rail Stage 2a, resulted in a Benefit Cost Ratio of 0.21 (including land use and wider economic benefits). Under Scenario A, the \$23 million cost of the Acton Waterfront development acceleration compares with an estimated acceleration benefit of \$99 million when compared to Scenario C. \$79 million of the advancement benefit of \$99 million (79.8 percent) relates to city shaping benefits and wider economic benefits; this is a high proportion of the benefits associated with Light Rail Stage 2a.

### Transport benefits

3.85 The first category of benefit included in the economic analysis relates to transport-related benefits. The Economic Appraisal Report describes the transport benefit stream as benefits relating to journey time and reliability improvements for public transport users.

3.86 Eleven transport benefits were identified and quantified as part of the economic appraisal, producing a present value benefit of \$55 million over the evaluation period discounted at 7 percent per year. This equates to 36.7 percent of the total value of the benefits.

### Land use and city shaping benefits

3.87 The second category of benefit included in the economic analysis relates to land use and city shaping benefits comprising:

- infrastructure cost savings (to government) from the Acton Waterfront development (as opposed to peripheral development which would happen without light rail); and
- land value uplift attributed to light rail from land use uplifts, as well as the net incremental increase in GST on residential sales and stamp duty paid.

3.88 For Scenario A (the scenario adopted in the Stage 2a Business Case), Light Rail Stage 2a is assumed to advance the Acton Waterfront development by two years. It is the two-year acceleration that is calculated as producing \$47 million in benefit (2019, present value, discounted at 7 percent), which equates to 31.3 percent of the total value of the benefits.

### *Acton Waterfront development planning*

3.89 A significant amount of the benefits identified for Light Rail Stage 2a are predicated on it being a catalyst for acceleration of development of the Acton Waterfront site. Neither the Stage 2a Business Case or Economic Appraisal Report provides information or evidence on how Light Rail Stage 2a is expected to accelerate development at the site.

- 3.90 It is noted that plans for the development of the Acton Waterfront date back to at least 2006, when the National Capital Authority amended the National Capital Plan to allow a connection between the city centre and West Basin. More recently, from approximately 2012, development at the site was envisaged as part of the City to the Lake Project. While it is apparent that the development of the Acton Waterfront is not conditional on Light Rail Stage 2a, no further information or advice is provided in relation to how it is expected to be a catalyst for earlier and accelerated development. No information is provided on assumptions underpinning this assertion.
- 3.91 A significant amount of the benefits identified for Light Rail Stage 2a are predicated on it being a catalyst for acceleration of development of the Acton Waterfront. Neither the Stage 2a Business Case or Economic Appraisal Report provides information or evidence on how Light Rail Stage 2a is expected to accelerate development at the site. Should the Acton Waterfront not be developed as fast as is hoped, then the expected benefits of Light Rail Stage 2a and the timing of those benefits are at risk. As city shaping benefits and wider economic benefits comprise the majority of the benefits associated with the project, any risks to the accelerated development of the Acton Waterfront will have a significant impact.

### Wider economic benefits

- 3.92 The third category of benefits included in the economic analysis relates to wider economic benefits. Wider economic benefits are defined as the value of the increase in productivity from improved business to business and workforce to business connectivity based on transport and land use changes and are usually included in large transport economic appraisals.
- 3.93 The wider economic benefits for Light Rail Stage 2a are estimated at \$48 million (2019, present value, discounted at 7 percent), which equates to 32 percent of the total value of benefits.

#### *Wider economic benefits as a proportion of transport benefits*

- 3.94 As shown in Table 3-8, wider economic benefits as a proportion of transport benefits for Light Rail Stage 2a is 87 percent. This is high and compares with a figure of 49 percent for Light Rail Stage 1. Per trip, the wider economic benefits for Light Rail Stage 2a calculates to \$5.70. This compares to \$3.90 for Light Rail Stage 1.
- 3.95 In response to the draft report, Major Projects Canberra advised that:

[The] relatively lower proportion of transport and land use benefits is not unexpected given the Stage 2a project is for a short 1.7km extension to the 12km Stage 1 alignment.

**Table 3-8 Estimated wider economic benefits (present value as at 2019, discounted at 7 percent)**

Item	Stage 1	Stage 2a
WEB 1 – Static agglomeration \$million	165	20
WEB2 – Output change in imperfect markets \$million	2	? <sup>2</sup>
WEB3 – Tax Revenue – Labour supply \$million	31	-
Land use agglomeration \$million	-	28
<b>Total WEBs \$m</b>	<b>198</b>	<b>48</b>
Transport benefits \$million	406	55
WEBs share of Transport Benefit (%)	49%	87%
PV light rail patronage – number of boardings	50.6	8.4
WEBs/boardings \$/boarding	3.9	5.7

Source: Douglas Economics analysis.

3.96 Neither the Stage 2a Business Case or Economic Appraisal Report provides any narrative that describes, explains or supports the estimates of wider economic benefits. The Stage 2a Business Case simply states:

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 [wider economic benefits] are driven by accessibility, the improved connectivity delivered by the Project and land use densification along the corridor both support increased agglomeration benefits.

3.97 The Economic Appraisal Report provides information on static agglomeration benefits (WEB1) including a formula for the calculation of the benefits but does not mention or provide further information on the other benefits (output change in imperfect markets (WEB 2) and tax revenue (WEB 3)).

3.98 In relation to static agglomeration benefits Douglas Economics notes:

The calculation of WEB1 is formulaic aggregating very many small 'effects' across the zones of a study area. For each zone, WEB1 involves multiplying the change in 'effective density' (a weighted travel time measure for each zone to all other zones) by a 'productivity elasticity' which varies by location and industry and which decays with distance at an assumed rate.

3.99 However, Douglas Economics notes 'the theoretical foundation behind [static agglomeration benefits] is far from universally accepted'. Douglas Economics notes:

Seven arguments against the concept of static agglomeration are listed below:

- there is the arbitrariness of the geographical units (zones) that underpin the estimation of effects;
- prices vary spatially for a myriad of reasons which makes valuing output and the role of 'accessibility' in explaining differences difficult if not impossible.

<sup>2</sup> WEB2 estimate not included in the Economic Appraisal Report for Stage 2a

- Differences in transport costs are in any event already accounted for in Cost Benefit Analysis, therefore any additional productivity effects from ‘something in the air’ agglomeration externalities are difficult to substantiate.
- Many industries and firms are heterogeneous with density effects measuring other factors such as internal economies of scale.
- Inter-relationships between industries rather than intra-industry relationships are important and different functions within an industry.
- telecommunication and computing improvements (virtual ‘Zoom’ meetings) have enabled remote working with instantaneous virtual ‘agglomeration’.

3.100 In addition to the arguable theoretical issues with static agglomeration benefits, Douglas Economics also notes there are empirical difficulties in estimating the agglomeration elasticities. Elasticities are economic measures of how sensitive one economic factor is to another. Douglas Economics notes:

In 2017, the Australian Bureau of Statistics undertook an econometric study to estimate agglomeration elasticities using data from Australian cities including Canberra. Of the 152 estimates, 38 percent were insignificant, and 29 percent were negative.

3.101 In relation to the use of wider economic benefits for Light Rail Stage 2a, Douglas Economics advised:

Despite two decades of WEBs being part of the CBA lexicon in the UK, NZ and Australia, debate continues over whether or not WEBs have merit. For Australia, the estimation of meaningful agglomeration elasticities has proved elusive with no believable elasticities estimated for Canberra.

3.102 The current Australian Transport and Planning Guidelines state that practitioners should follow Infrastructure Australia’s advice which is that:

Proponents seeking to calculate Wider Economic Benefits should consult with Infrastructure Australia to discuss the justification for including Wider Economic Benefits in the context of the initiative’s strategic objectives, and its impacts upon the transport and labour markets. Economic results should firstly be presented without Wider Economic Benefits. If measuring Wider Economic Benefits is justified, then the results of each project option should be presented with Wider Economic Benefits as a supplementary result.

3.103 The wider economic benefits for Light Rail Stage 2a are estimated at \$48 million (2019, present value, discounted at 7 percent), which equates to 32 percent of the total value of benefits. Neither the Stage 2a Business Case or Economic Appraisal Report provides any narrative that describes, explains or supports the estimates of wider economic benefits. In relation to the use of wider economic benefits for Light Rail Stage 2a, Douglas Economics advised ‘despite two decades of [wider economic benefits] being part of the [cost-benefit analysis] lexicon in the UK, NZ and Australia, debate continues over whether or not [wider economic benefits] have merit. For Australia, the estimation of meaningful agglomeration elasticities has proved elusive with no believable elasticities estimated for Canberra’. Elasticities are economic measures of how sensitive one economic factor is to another.



**RECOMMENDATION 1      ECONOMIC ANALYSIS**

Major Projects Canberra should review and update the economic analysis associated with Light Rail Stage 2a. In doing so, Major Projects Canberra should:

- a) review the assumptions underpinning the economic analysis, including the identified costs and benefits associated with Light Rail Stage 2a, since the publication of the redacted Stage 2a Business Case in September 2019; and
- b) make publicly available the revised and updated economic analysis in an updated Stage 2a Business Case.

**RECOMMENDATION 2      DEVELOPMENT COSTS AND BENEFITS**

As part of the revised and updated and publicly available economic analysis for Light Rail Stage 2a, Major Projects Canberra should explicitly identify the nature of the development costs and benefits associated with the project. This should include detailed identification of:

- a) the different components of the development costs and their timing, the methodology for quantification and the assumptions underpinning the calculation; and
- b) the different components of the land use and city shaping benefits to be derived from Light Rail Stage 2a and their relationship to the development of the Acton Waterfront.



## 4 BENEFITS MANAGEMENT

- 4.1 This chapter considers ACT Government agencies' approach to identifying, planning and managing the realisation of the benefits of Light Rail Stage 2a.

### Summary

### Conclusion

The Stage 2a Business Case identified a commitment to the development of a Benefits Realisation Plan for Light Rail Stage 2a. This has not occurred. Benefits management activities should be undertaken at the earliest possible stages of a project to 'ensure that a mindset of accountability and structured approach towards achieving set benefits is embedded from the early stages of planning'. Benefits management activities should include the development and implementation of a Benefits Realisation Plan; the 2016 *Australian Transport Assessment and Planning Guidelines* envisages that benefits planning occur when options for the transport initiative are being considered and the business case is being developed.

### Key findings

A draft Benefits Realisation Plan for Light Rail Stage 2 was developed in October 2019. The draft Benefits Realisation Plan was prepared by the Transport Canberra and City Services Directorate and the Chief Minister, Treasury and Economic Development Directorate. The draft Benefits Realisation Plan for Light Rail Stage 2 was 'developed alongside the Business Case for the Project' and noted that 'as the Project moves into the next stages of detailed design, it is recommended that the BRP be updated accordingly'. The draft Benefits Realisation Plan for Light Rail Stage 2 identified, amongst other things, strategic enablers across a range of Territory directorates noting that 'realising the full suite of benefits requires a number of Territory directorates to institute a range of policies and strategic enablers'.

Paragraph

4.36

The draft Benefits Realisation Plan for Light Rail Stage 2 included a section for the identification and articulation of benefit metric profiles, which was intended to provide 'further details for each benefit and dis-benefit metric identified and tracked as part of this [Benefits Realisation Plan]'. The draft Benefits Realisation Plan had many features and details which, if considered and completed rigorously, could have assisted in the effective management of benefits associated with Light Rail Stage 2. However, because of the decision to proceed with Light Rail Stage 2a, the business case for Light Rail Stage 2 and the draft Benefits Realisation Plan for Light Rail Stage 2 was not finalised.

4.37

Benefits management is outlined in the 2016 *Australian Transport Assessment and Planning Guidelines* as an ‘end-to-end’ process that spans across the whole lifecycle of a project. Benefits management activities should be undertaken prior to commencing delivery and also from delivery to the end of an initiative’s lifecycle. The 2016 *Australian Transport Assessment and Planning Guidelines* also outlines the reasoning for embedding and undertaking the benefits management process at the earliest possible stage to ‘ensure that a mindset of accountability and structured approach towards achieving set benefits is embedded from the early stages of planning’. Notwithstanding the commitment to do so in the Stage 2a Business Case, a Benefits Realisation Plan has not been developed for Light Rail Stage 2a. Major Projects Canberra has advised that a Plan is not required under the ACT Government’s Capital Framework and could not be expected to be developed for ‘a short 1.7 km extension to the 12 km Stage 1 alignment’.

4.50

## Benefits management guidance

4.2 A traditional approach to project management considered that projects were successful if the specified output was produced within an acceptable timeframe and at an acceptable cost. However, awareness has grown that major projects are not undertaken to produce outputs, assets or capabilities, but are undertaken to produce beneficial outcomes, i.e. benefits.

4.3 In relation to the identification of benefits as a means by which to guide decision-makers, the Victorian Government’s *Investment Management Standard* (a suite of guidance to assist agencies in making investment decisions) states:

The only reason an organisation makes an investment is to obtain some benefit. This is therefore the prime consideration of investment decision-makers when considering an investment proposal. For this reason people seeking new funding for their proposed investment must articulate the benefits the investment is expecting to deliver. Once funded, with the inevitable challenges and stresses that occur as the investment is implemented, the focus on benefits is often lost.

4.4 The Australian Government Department of Finance has produced guidance with respect to benefits management as a project management discipline. The guidance highlights the importance of identifying benefits early and referring to the identified benefits to help guide the management of a project or program. The Australian Government Department of Finance’s *Assurance Review Process - Lessons Learned - Benefits Realisation Management* guidance states:

During the delivery stage of a program, a clear understanding of the expected benefits helps focus on the delivery of the important things – the activities that will achieve the expected benefits. Some interim benefits may be achieved during this stage, which provide an excellent indicator for the ongoing viability of the program.

In addition, if changes occur that affect the scope of the program, any impact can be assessed against the existing benefits and the extent to which they are still likely to be achieved. This information can be used to inform an updated Business Case. This approach provides

governance bodies with an excellent tool to manage and monitor programs, particularly those programs that are in the delivery stage for a number of years.

### Australian Transport Assessment and Planning (ATAP) Guidelines

4.5 In 2016 *Australian Transport Assessment and Planning Guidelines* were approved by the Transport Infrastructure Senior Officials' Committee. The Guidelines are an infrastructure planning and decision-support framework applied to transport, which outline best practice for transport planning and assessment in Australia. They are endorsed by all Australian jurisdictions and are published by the Transport and Infrastructure Council. In relation to benefits management the Guidelines state:

Benefits management is the process of properly identifying, defining, measuring, evaluating and reporting benefits in order to determine whether an initiative has achieved its intended outcomes and objectives once it is delivered. It is an end-to-end process that spans across the whole lifecycle of an initiative. It is a process to ensure that outcomes from an initiative are defined, aligned to transport system objectives and managed through to their achievement or realisation. It provides learnings to ensure continuous improvements in transport system benefit management processes.

4.6 The 2016 *Australian Transport Assessment and Planning Guidelines* identify benefits management occurring as follows:

- benefits identification (occurring during problems identification and options appraisal);
- benefits planning (occurring during options appraisal and Business Case development);
- ongoing benefits monitoring; and
- benefits evaluation following delivery of an initiative.

4.7 For the purpose of the audit, and in recognition of the status of Light Rail Stage 2a, discussion is focused on benefits identification and benefits planning.

### Benefits identification

4.8 According to the 2016 *Australian Transport Assessment and Planning Guidelines* benefits identification is:

... an initial activity that is common to both appraisal and benefits management. It seeks to identify and define potential benefits arising from addressing an identified problem (which in turn is preventing transport system objectives and targets from being achieved). The role of benefits identification is to create a culture of accountability and transparency with benefits achievement at the forefront.

A benefit is a measurable improvement in an outcome, perceived as positive by stakeholders, and contributes towards one or more transport system objectives.

4.9 The 2016 *Australian Transport Assessment and Planning Guidelines* note that as a result of benefits identification processes 'the result is that benefits are identified as part of early

assessment and documentation, leading to a list of benefits to be fully modelled for appraisal’.

4.10 The benefits identified for Light Rail Stage 2a were identified and discussed in Chapter 3.

## Benefits planning

4.11 According to the 2016 *Australian Transport Assessment and Planning Guidelines* benefits planning ‘lays the groundwork for the monitoring and evaluation of benefits and specific outcomes from a proposed initiative’ and consists of:

- developing benefits profiles; and
- establishing a governance process for benefits evaluation.

4.12 The 2016 *Australian Transport Assessment and Planning Guidelines* go on to state that ‘the outputs of benefits identification and planning consist of Benefits Profiles, a Benefits Register and a Benefits Management Plan’.

### *Benefits profiles*

4.13 The 2016 *Australian Transport Assessment and Planning Guidelines* identify that benefits profiling requires benefits classification and benefits measurement.

4.14 As part of benefits classification benefit measures ‘are classified to demonstrate the strategic alignment of initiatives and to aid the aggregation of benefits performance from initiative to program to portfolio’. Furthermore, ‘the benefits classification approach should be linked with a system of key performance indicators [that] enables benefit measures to be consistently identified and outcomes to be fairly compared and assessed, based on agreed and available key performance indicators’.

4.15 As part of benefits measurement ‘benefits are measured to prevent any bias from overstating what can be achieved from a proposed solution’. ‘Benefits must be evidence-based. Baseline and actual measures should be captured to provide a clear comparison of performance improvement between when a problem is identified and after a solution has been delivered’. Benefits measurement involves:

- confirming key performance indicators;
- determining benefit metrics;
- measuring baseline performance;
- setting target measures; and
- confirming and validating measures.

### *Governance processes for benefits evaluation*

4.16 In relation to governance processes for benefits evaluation the 2016 *Australian Transport Assessment and Planning Guidelines* discuss the importance of:

- determining roles and responsibilities in conducting benefits evaluation;
- refining the target audience for presenting benefits evaluation findings;
- determining the timing to conduct benefits evaluation and reporting;
- using the same approach for data collection, measuring, evaluation and reporting;
- validating data collection, performance measurement and evaluation;
- reporting content and structure; and
- developing a succession plan to handover the Benefits Management Plan and responsibilities to benefits owners.

### **2016 ACT Audit Office report findings**

4.17 On 16 June 2016, the Audit Office's *Initiation of the Light Rail Project* performance audit report (Report No.5/2016) was tabled in the ACT Legislative Assembly. The report made several conclusions relevant to the management of benefits for Light Rail Stage 1:

The achievement of a significant proportion of the benefits identified for the Capital Metro Light Rail Project is predicated on two key assumptions: the implementation of the light rail will be the catalyst for economic activity (including land use benefits); and action will be taken by 'current and future Governments to ensure stated benefits are realised and maximised'. In relation to the former, the economic analysis that underpinned the Full Business Case assumed a 'do nothing' base case scenario, including assumptions that 'only already approved and planned changes to road and bus networks occur' and that 'land development activity is concentrated on sites currently controlled or owned by the ACT Government, with no effort to acquire other sites in order to aggregate into precincts or zones'. These actions may have occurred, and benefits may have been achieved, irrespective of the Capital Metro Light Rail Project.

4.18 In relation to benefits management, the Audit Office's *Initiation of the Light Rail Project* performance audit report (Report No.5/2016) also concluded:

... it is imperative that there be a concerted whole-of-government approach to the management of benefits associated with the Capital Metro Light Rail Project, to ensure that the benefits are realised. A range of actions need to be implemented relating to 'land development decisions undertaken by ACT Government; ticketing and fare setting; bus and park & ride integration; parking charges; value capture activities; signalling priorities; the location of ACT Government staff in the corridor; and other undertakings to promote economic activity in the ACT'.

4.19 The Audit Office's *Initiation of the Light Rail Project* performance audit report (Report No.5/2016) made one recommendation relating to benefits management:

The Chief Minister, Treasury and Economic Development Directorate should, as a priority, take a lead role in implementing benefits management, including developing a whole-of-government Benefits Realisation Plan and associated documentation. This plan should identify

and document the benefits to be realised by the project, their timing, ownership, critical dependencies for the achievement of the benefits and associated key performance indicators.

4.20 In 2016, the ACT Government response to the audit report, which was prepared by the Transport and City Services Directorate, stated:

The Government agrees-in-principle to developing a Benefits Realisation Plan for the Project, with Treasury taking the responsibility for developing it.

Lessons learned about benefits realisation in Stage 1 Light Rail will assist in the rollout of future stages of the Light Rail Network, through the preparation of various project scoping documents such as business cases. Furthermore, the intended Benefits Realisation plan for the Project could serve as a robust point of reference for assessing benefits realisation relating to future projects by both the private and public sector within the ACT.

## Stage 2a Business Case

4.21 The Stage 2a Business Case identified that a benefits realisation plan was to be developed for the project and managed by ACT Treasury:

Noting the findings and recommendations of the Auditor-General's performance audit into Light Rail Stage 1, a Benefits Realisation Plan is proposed to be developed for the Project. The Benefits Realisation Plan will be managed 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.

4.22 The Stage 2a Business Case notes that the Stage 2a 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;
- updates or revisions to the Benefits Realisation Plan can be made at any time with agreement of the Project Board.



## Light Rail Stage 2a benefits realisation planning

### Light Rail Stage 2 Benefits Realisation Plan

- 4.23 A draft Benefits Realisation Plan for Light Rail Stage 2 was developed in October 2019. The draft Benefits Realisation Plan was prepared by the Transport Canberra and City Services Directorate and the Chief Minister, Treasury and Economic Development Directorate.
- 4.24 Benefits for light rail are managed through the Light Rail Advisory Board, which includes representatives from the Chief Minister, Treasury and Economic Development Directorate (Treasury), Transport Canberra and City Services Directorate, Environment, Planning and Sustainable Development Directorate and City Renewal Authority.

#### *Purpose and intent of the draft Benefits Realisation Plan*

- 4.25 The draft Benefits Realisation Plan for Light Rail Stage 2 stated that its purpose was to:
- ... describe how benefits will be managed and realised from the delivery and ongoing operation of the City to Woden Light Rail project (the “Project”). This BRP describes:
- The identified benefits of the Project, including how benefits will materialise;
  - Who will be responsible for the benefits; and
  - How they will be measured and tracked.
- 4.26 The draft Benefits Realisation Plan for Light Rail Stage 2 notes that it has been ‘developed alongside the Business Case for the Project’ and that:
- As the Project moves into the next stages of detailed design, it is recommended that the BRP be updated accordingly, if any element of the design (such as the timeline for commencement of operations) is likely to affect the realisation of benefits. This will confirm that benefits remain aligned to the outcomes of the Project.
- 4.27 The draft Benefits Realisation Plan for Light Rail Stage 2 acknowledges that there are interdependencies for the project and therefore:
- ... outlines a number of strategic directions or projects that will be required in order to ensure the Project’s benefits are enabled and can be fully realised by the Territory. Namely, without the implementation of these enabling projects, the benefits of this city shaping Light Rail project will not be maximised. These enablers include transport, active travel and land use policies and strategies ...
- 4.28 The draft Benefits Realisation Plan for Light Rail Stage 2 acknowledges that:
- The use of benefits realisation planning drives more benefits from a funded investment, validates the success of a completed investment, generates performance information and provides lessons that will inform the shaping of future investments and support better decision making.

4.29 The draft Benefits Realisation Plan for Light Rail Stage 2 also acknowledges the features and purpose of the plan and that it:

- Considers benefits in both positive and negative form (that is, benefits and disbenefits or costs) as it is imperative to actively manage costs to ensure they do not diminish any significant value from the Project;
- Requires that benefits are identified and defined clearly at the outset and aligned to the Project vision and strategic objectives;
- Acknowledges and outlines strategic directions and projects required to ensure the benefits of the Project are fully realised;
- Ensures business areas are committed to realising their defined benefits with assigned ownership and responsibility for adding value through the realisation process;
- Drives the process of realising benefits, involving benefit measurement, tracking and recording of benefits as they are realised; and
- Uses the defined, expected benefits as a roadmap for the Project, providing a focus for delivering change.

#### *Identification and measurement of benefits*

4.30 The draft Benefits Realisation Plan for Light Rail Stage 2 identified three categories of benefits 'in line with the three benefit categories outlined in the Business Case':

- transport benefits;
- city-shaping (or land use benefits); and
- wider economic benefits.

4.31 The draft Benefits Realisation Plan for Light Rail Stage 2 identified:

- strategic enablers across a range of Territory directorates noting that 'realising the full suite of benefits requires a number of Territory directorates to institute a range of policies and strategic enablers';
- assumptions and constraints in relation to the identification of benefits and the Benefits Realisation Plan; and
- the relationship between economic benefits and the benefit measures.

4.32 The draft Benefits Realisation Plan for Light Rail Stage 2 included a section for the identification and articulation of benefit metric profiles, which was intended to provide 'further details for each benefit and dis-benefit metric identified and tracked as part of this [Benefits Realisation Plan]'. Information to be prepared included:

- Description of the project benefit/dis-benefit;
- Description and source of the relevant metric;
- Baseline status of metric;
- Target status of metric as a result of the Project;
- Reporting start date, periodicity and end date;

- Dependencies on actions outside of the purview of the Project; and
- Agency or individual responsible for measurement of the benefit (benefit owner).

4.33 One benefit metric profile had been identified and populated and it was acknowledged that '[this] will be replicated for all metrics once agreed'.

#### *Transitioning to the Stage 2a business case*

4.34 On 10 September 2019, the Chief Minister and Minister for Transport announced that the ACT Government had formally approved the Business Case for Light Rail Stage 2a from Alinga Street to Commonwealth Park.

4.35 The Audit Office was advised that, because of the decision to proceed with Light Rail Stage 2a, the business case for Light Rail Stage 2 and the draft Benefits Realisation Plan for Light Rail Stage 2 was not finalised. In response to the draft proposed report Major Projects Canberra noted that the Benefits Realisation Plan for Light Rail Stage 2 'will not be finalised until such time as the Business Case for that part of the corridor from Commonwealth Park to Woden is considered and approved'.

4.36 A draft Benefits Realisation Plan for Light Rail Stage 2 was developed in October 2019. The draft Benefits Realisation Plan was prepared by the Transport Canberra and City Services Directorate and the Chief Minister, Treasury and Economic Development Directorate. The draft Benefits Realisation Plan for Light Rail Stage 2 was 'developed alongside the Business Case for the Project' and noted that 'as the Project moves into the next stages of detailed design, it is recommended that the BRP be updated accordingly'. The draft Benefits Realisation Plan for Light Rail Stage 2 identified, amongst other things, strategic enablers across a range of Territory directorates noting that 'realising the full suite of benefits requires a number of Territory directorates to institute a range of policies and strategic enablers'.

4.37 The draft Benefits Realisation Plan for Light Rail Stage 2 included a section for the identification and articulation of benefit metric profiles, which was intended to provide 'further details for each benefit and dis-benefit metric identified and tracked as part of this [Benefits Realisation Plan]'. The draft Benefits Realisation Plan had many features and details which, if considered and completed rigorously, could have assisted in the effective management of benefits associated with Light Rail Stage 2. However, because of the decision to proceed with Light Rail Stage 2a, the business case for Light Rail Stage 2 and the draft Benefits Realisation Plan for Light Rail Stage 2 was not finalised.

## **Light Rail Stage 2a Benefits Realisation Plan**

4.38 The Stage 2a Business Case identified that a benefits realisation plan was to be managed by ACT Treasury:

The Benefits Realisation Plan will be managed 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.

4.39 The Infrastructure & Reform Division within ACT Treasury advised that it had been involved with developing a benefits realisation plan for Light Rail Stage 2a since May 2018 and that it expects to 'manage the process of developing the BRP (benefits realisation plan), together with the Project Director, under the governance of the Light Rail Project Board'. However, in December 2020 the Infrastructure & Reform Division also advised:

At the current time, it is no longer clear that Stage 2a will proceed as an independent project. However, were it to do so, IFR would have ultimate responsibility for developing the BRP for Stage 2a and collating regular reports on benefits realisation. At this point, in view of the ongoing and significant changes to the overall Stage 2 project, it has not been appropriate to complete the development of a BRP.

4.40 In advice to the Audit Office, Major Projects Canberra advised:

... a [Benefits Realisation Plan] is not required under the ACT Government's Capital Framework and I wouldn't expect one to be developed for a short 1.7km extension to the 12 km Stage 1 alignment.

### Absence of a Benefits Realisation Plan

4.41 A significant proportion of the benefits associated with Light Rail Stage 2a relate to the nature of the project as an urban transformation project. As discussed in Chapter 3 of the report, city shaping benefits have been identified as \$47 million out of the total \$150 million in benefits (2019, discounted at 7 percent) outlined in the Stage 2a Business Case. The \$47 million consists of \$6 million linked to 'Infrastructure cost savings' and \$41 million linked to 'land value uplift'. The land value uplift is described as the accelerated development of the Acton Waterfront. As discussed in Chapter 3 of the report there is considerable risk associated with the achievement of the city-shaping benefits, arising from the interdependencies of Light Rail Stage 2a, and the extent to which the project can effectively accelerate the development of the Acton Waterfront.

4.42 The achievement of the expected benefits associated with Light Rail Stage 2a, including the land use benefits and wider economic benefits are predicated on a number of assumptions including alignment of ACT Government policies and the intensity of the Acton Waterfront development. A structured, disciplined benefits management approach throughout the project lifecycle is needed if the project's benefits of \$150 million (2019, discounted at 7 percent) are to be achieved and optimised and demonstrated.

4.43 The absence of a benefits realisation plan, which identifies ownership of the listed benefits and how the benefits are to be measured, compromises the ability of Major Projects Canberra to:

- manage the project to maximise the achievement of the expected benefits; and
- adequately demonstrate the value of the project against its expected benefits.

4.44 In response to the draft proposed report, Major Projects Canberra advised:

It is unreasonable to expect that a Benefits Realisation Plan would have been drafted at this stage ahead of the ACT Government having given approval to enter into a construction contract for the project.

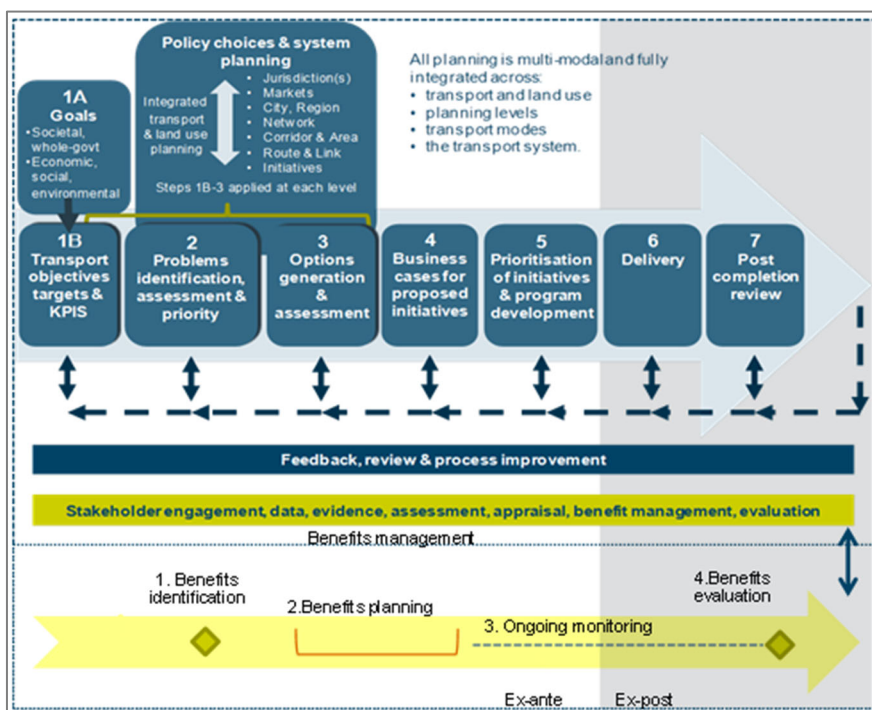
A Benefits Realisation Plan will be most accurate once the final contours of the project are definitively known, a point in which will be reached once design and procurement activities are complete. The project has not reached that stage.

- 4.45 In its response to the draft proposed report Major Projects Canberra also advised that ‘no commitment was made to develop a Benefits Realisation Plan at this early stage of the project’.
- 4.46 This approach is not consistent with the 2016 *Australian Transport Assessment and Planning Guidelines*.

#### *Embedding benefits realisation planning early in a project*

- 4.47 Benefits management is outlined in the 2016 *Australian Transport Assessment and Planning Guidelines* as an ‘end-to-end’ process that spans across the whole lifecycle of a project. Benefits management activities should be undertaken ex-ante (prior to commencing delivery) and ex-post (from delivery to end of an initiative’s lifecycle). Figure 4-1 shows benefits management, as outlined in the 2016 *Australian Transport Assessment and Planning Guidelines*.

**Figure 4-1 ATAP Framework and Benefits Management**



Source: 2016 Australian Transport Assessment and Planning Guidelines.

- 4.48 The 2016 *Australian Transport Assessment and Planning Guidelines* outlines the reasoning for embedding and undertaking the benefits management process at the earliest possible stage to 'ensure that a mindset of accountability and structured approach towards achieving set benefits is embedded from the early stages of planning'.
- 4.49 The 2016 *Australian Transport Assessment and Planning Guidelines* approach to benefits management also shows that it should be a continual process as opposed to identifying static benefits and hoping that these benefits materialise. Introducing benefits management processes at an early stage in the process allows for:
- identifying the metrics which the benefit will be measured by;
  - identifying the key performance indicators against which the forecast benefits are to be assessed;
  - allocation of the 'ownership' of the benefit to a responsible body;
  - setting up a governance structure that has oversight for monitoring the collective benefits of a project.
- 4.50 Benefits management is outlined in the 2016 *Australian Transport Assessment and Planning Guidelines* as an 'end-to-end' process that spans across the whole lifecycle of a project. Benefits management activities should be undertaken prior to commencing delivery and also from delivery to the end of an initiative's lifecycle. The 2016 *Australian Transport Assessment and Planning Guidelines* also outlines the reasoning for embedding and undertaking the benefits management process at the earliest possible stage to 'ensure that a mindset of accountability and structured approach towards achieving set benefits is embedded from the early stages of planning'. Notwithstanding the commitment to do so in the Stage 2a Business Case, a Benefits Realisation Plan has not been developed for Light Rail Stage 2a. Major Projects Canberra has advised that a Plan is not required under the ACT Government's Capital Framework and could not be expected to be developed for 'a short 1.7 km extension to the 12 km Stage 1 alignment'.

### RECOMMENDATION 3

### BENEFITS REALISATION PLAN

The Chief Minister, Treasury and Economic Development Directorate (ACT Treasury), in cooperation with Major Projects Canberra and the Transport Canberra and City Services Directorate, should develop a Benefits Realisation Plan for Light Rail Stage 2a.

## Audit reports

<b>Reports Published in 2020-21</b>	
Report No. 07 – 2021	Procurement Exemptions and Value for Money
Report No. 06 – 2021	Teaching Quality in ACT Public Schools
Report No. 05 – 2021	Management of Closed-Circuit Television Systems
Report No. 04 – 2021	ACT Government's vehicle emissions reduction activities
Report No. 03 – 2021	Court Transport Unit Vehicle – Romeo 5
Report No. 02 – 2021	Total Facilities Management Contract Implementation
Report No. 01 – 2021	Land Management Agreements
Report No. 10 – 2020	2019-20 Financial Audit – Financial Results and Audit Findings
Report No. 09 – 2020	2019-20 Financial Audits Overview
Report No. 08 – 2020	Annual Report 2019-20
Report No. 07 – 2020	Management of care of people living with serious and continuing illness
<b>Reports Published in 2019-20</b>	
Report No. 06 – 2020	Transfer of workers' compensation arrangements from Comcare
Report No. 05 – 2020	Management of household waste services
Report No. 04 – 2020	Residential Land Supply and Release
Report No. 03 – 2020	Data Security
Report No. 02 – 2020	2018-19- Financial Audits – Computer Information Systems
Report No. 01 – 2020	Shared Services Delivery of HR and Finance Services
Report No. 11 – 2019	Maintenance of ACT Government School Infrastructure
Report No. 10 – 2019	2018-19 Financial Audits – Financial Results and Audit Findings
Report No. 09 – 2019	2018-19 Financial Audits – Overview
Report No. 08 – 2019	Annual Report 2018-19

These and earlier reports can be obtained from the ACT Audit Office's website at <http://www.audit.act.gov.au>.