ACT Government

Single Assessment Framework (SAF)

Business Case

Tier 1 (High Risk)

Project Name:	**London Circuit / Commonwealth Avenue Intersection**
Total Project Value (estimated):	**$ m (nominal, P90)**
Capital Appropriation Requested:	**Project cost – $ m (nominal, P90)**
Project Stage:	**Business Case**
Project Value:	**$ m (nominal, P90)**
Risk Assessment (high/med/low):	**Medium to High**
Proposed Delivery Model:	**D&C or integrated as part of C2WLR**
Requesting Directorate:	**City Renewal Authority**
Requesting Minister:	**Chief Minister**
Business Case Advisors:	**Internal: Treasury, IFCW, Transport Canberra and City Services External: EY, RLB**

NOTE: This template should be completed using the accompanying SAF Business Case Guidance Notes.

Contact Officers

Contact Officer, Requesting Directorate	
Reviewing Officer, Infrastructure Finance and Reform Group:	
Reviewing Officer, Treasury:	

Sign Offs

Requesting Directorate:	*Document in order to proceed*
Infrastructure Finance and Reform Group:	*Document in order to proceed – Sign-offs complete*
Treasury:	Document in order to proceed – Sign-offs complete

Contents

Executive Summary

1.1 Project description

The London Circuit and Commonwealth Avenue Intersection Project (the Project) outlined in this Business Case entails raising the southern portion of London Circuit so that it and Commonwealth Avenue are at-grade, and a signalised traffic intersection is formed.

Raising London Circuit to be at-grade with Commonwealth Avenue will change the road network in Canberra City. In doing so, the Project will align the road network with strategic transport and land use planning for the City, improve urban amenity and support the revitalisation of the City precinct.

Currently, London Circuit and Commonwealth Avenue are grade separated with cloverleaf ramps connecting these two roads, as well as Parkes Way, as outlined in Figure 1.

Figure 1 Current intersection configuration

1.2 Purpose and recommendation

The purpose of this Business Case is to provide a robust analysis of the benefits, costs, risks and delivery options for the Project. In turn, this Business Case is designed to support the ACT Government in its investment decision deliberations. It has been prepared in accordance with The Capital Framework Guidance.

It is recommended that the ACT Government:

1. Proceed with design, planning and procurement activities for the at-grade London Circuit and Commonwealth Avenue intersection

2. Invest $ ($m, nominal, P90) in the procurement and construction of the at-grade intersection

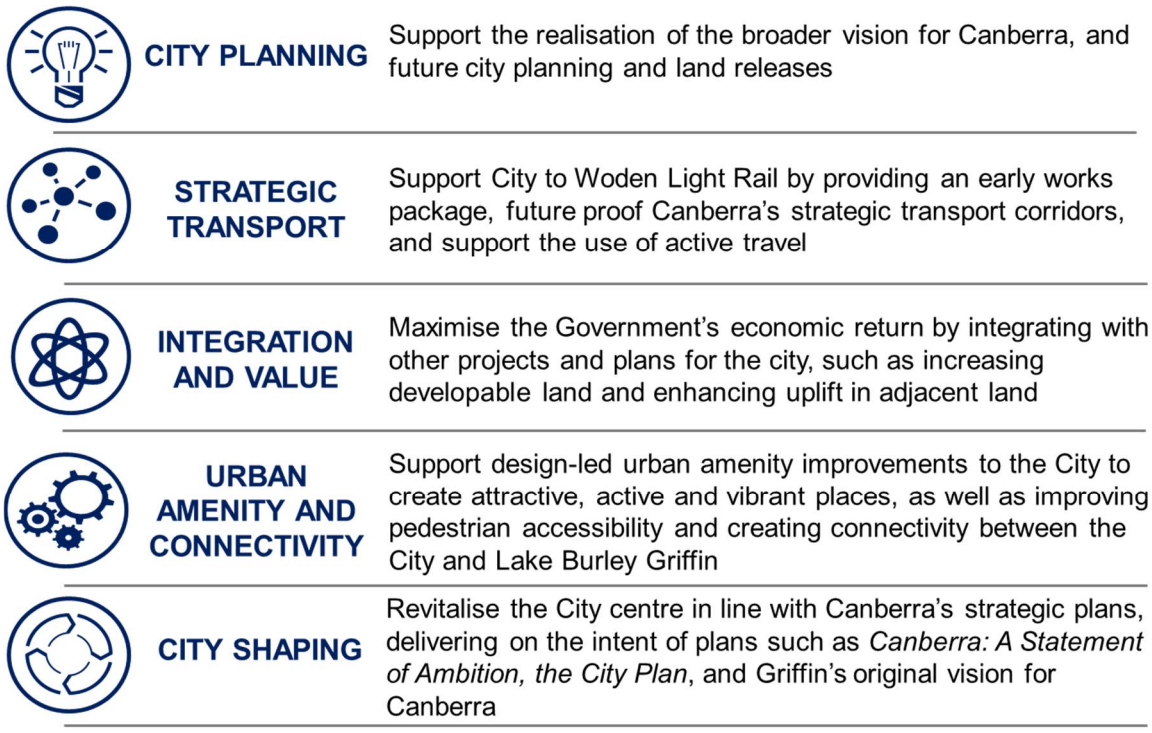
1.3 Project Vision and Objectives

The vision for the Project is:

> *To improve connectivity and support city planning by integrating strategic transport and land use initiatives to shape future development and create attractive, design-led, people focused places.*

Five project objectives have been adopted for the Project as set out below.

Figure 2 Project objectives



These project objectives are aligned with the five goals outlined in the City Renewal Authority's (CRA) 2025 Strategic Plan Goals and Objectives.

1.4 Need for Investment

This Project provides an opportunity to address three key challenges identified in an Investment Logic Mapping (ILM) workshop that was undertaken in November 2018 and refined through further stakeholder consultation and Project development.

Challenge 1: Inability to define ideal timing and sequencing of investments will result in poor place outcomes and reduced development revenue

There are numerous major infrastructure projects and developments underway or being planned for delivery across the City as outlined in Figure 6. These include Section 100, Section 63, City to Woden Light Rail (C2WLR), stormwater augmentation, Edinburgh Avenue extension, Commonwealth Avenue / Vernon Circle signalisation, Parkes Way, West Basin, and Commonwealth Avenue Bridge (National Capital Authority (NCA) project).

The significant interdependencies between these projects will create additional planning, design and delivery complexities for the Territory. For example, if the C2WLR project proceeds and London Circuit remains grade separated, the proposed ramp for C2WLR will use 1,400-1500m^2 of the block to the south-west of the intersection. Appropriate timing and sequencing of C2WLR and other projects will be essential to future proof the road network, maximise development revenue for the Territory and ensure the vision for the City is realised.

Whilst there are many developments occurring in the City precinct area, there are two projects – Section 63 and C2WLR – that have a direct interface and impact on the London Circuit and Commonwealth Avenue intersection. As part of Section 63, the north-west cloverleaf that connects London Circuit and Commonwealth Avenue will be closed to traffic, and there are plans for the C2WLR to traverse the London Circuit and Commonwealth Avenue intersection. As a result, the road configuration needs to be addressed now, before these projects are completed. After this time, it will not be viable to raise London Circuit.

An at-grade intersection at London Circuit and Commonwealth Avenue will:

- Support C2WLR and other major infrastructure projects which are underway or being planned for deliver across the city
- Future proof the road network

Challenge 2: Future population growth and development will result in ineffective accessibility to and around the City

Future developments in the City, and a shift in land use planning policies to increase densification and create a more compact Canberra[1] will result in ineffective accessibility to and around the City if the configuration of London Circuit and Commonwealth Avenue intersection remains grade separated.

With the development of C2WLR, a ramp will be constructed between London Circuit and Commonwealth Avenue on the site of the existing slip lane. As part of C2WLR, the existing south-west cloverleaf will be realigned to continue to provide a connection between Commonwealth Avenue and Parkes Way. However, when the south-west cloverleaf is closed to allow for mixed use development as part of the long term land release plan, northbound traffic travelling east and west would need to re-route (see Figure 3 and Figure 4). Traffic would need to re-route via Vernon Circle to travel from A to D and from A to C, as outlined in Figure 3 and Figure 4.

With an at-grade intersection, traffic takes a left turn at the intersection for the A to D journey (taking pressure off Vernon Circle), shown in Figure 5. The A to C journey would be the same as for Figure 5 below, as northbound traffic would not be able to turn right at the London Circuit / Commonwealth Avenue intersection with light rail.

[1] *See for example Canberra: A Statement of Ambition*

Figure 3 Route map with current configuration of London Circuit, grade separated

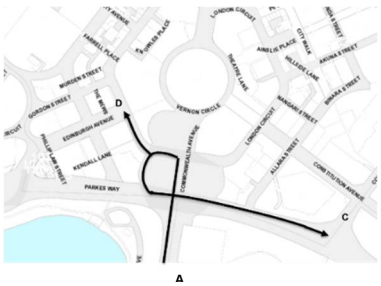


Figure 4 Future configuration, grade separated, following development of south-west cloverleaf

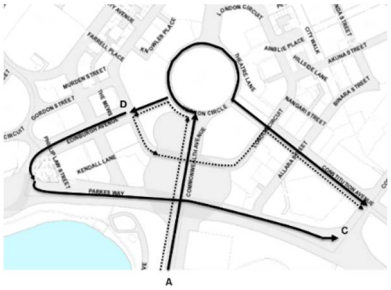
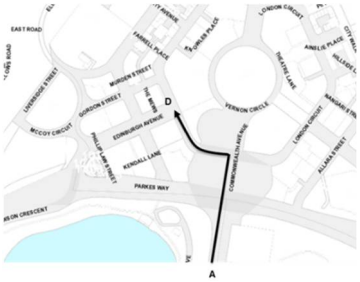


Figure 5 Future configuration, at-grade, following development of C2WLR



Accordingly, as Canberra's population grows and traffic increases, the current road configuration is anticipated to lead to congestion on some roads, while other roads in the City Centre remain underutilised.

An at-grade intersection at London Circuit and Commonwealth Avenue will:

- Redistribute traffic
- Align with land use planning policies and proposed land release activities
- Provide a road network that considers future land use

Challenge 3: Current configuration of London Circuit is a poor urban design outcome, impacting the ability to realise the City's future vision

London Circuit and Commonwealth Avenue are of significant importance to the realisation of the visions for Canberra as set out in various strategic documents, such as The *National Capital Plan, The Griffin Legacy, The City Plan* and *Canberra: A Statement of Ambition*. *The City Plan* notes that supporting local traffic movement at-grade will enable vehicle and pedestrian access to the Lake and open investment opportunities for residential and other development in West Basin. The current configuration of the London Circuit and Commonwealth Avenue intersection is not conducive to realising these visions, and inhibits active travel, the connection between the City and the Lake, and the development of vibrant places.

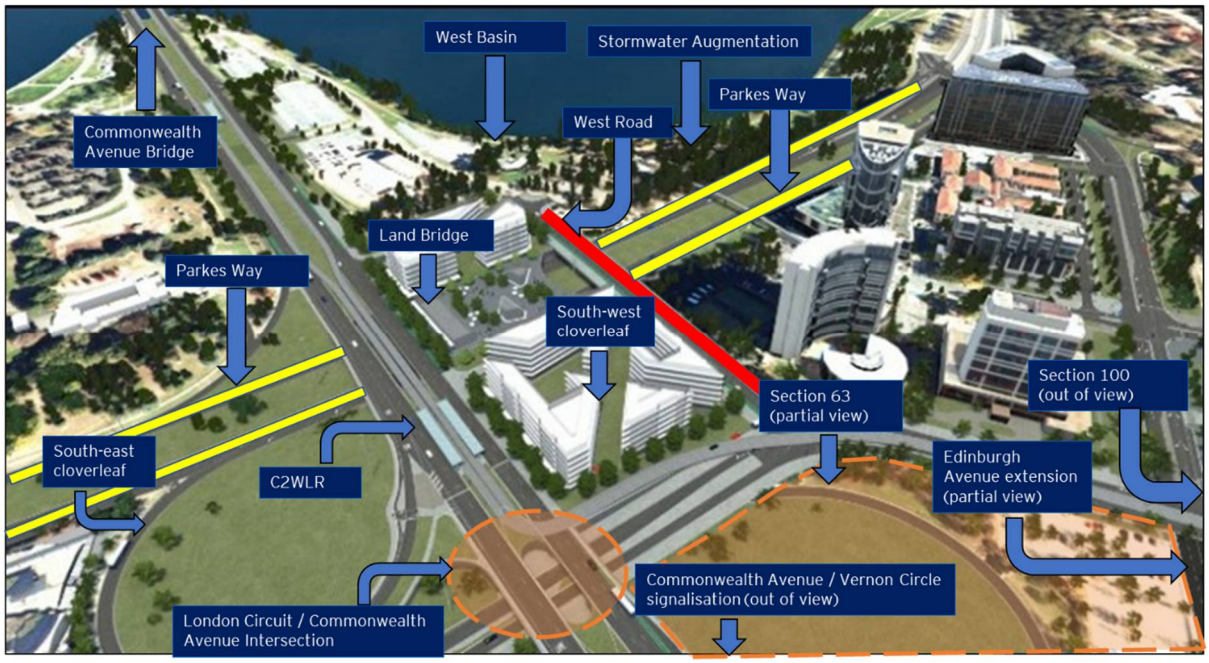
An at-grade intersection at London Circuit and Commonwealth Avenue will:

- Provide a superior urban design outcome by creating an attractive and active street frontage, improving the pedestrian experience with better accessibility in the public realm, and improving connectivity between the City and the Lake
- Revitalise the City Centre by delivering the planning intent and vision for central Canberra

1.5 Options Analysis

There are significant interdependencies and synergies with future infrastructure projects and developments in the area, including Section 100, Section 63, C2WLR, stormwater augmentation, Edinburgh Avenue extension, Commonwealth Avenue / Vernon Circle signalisation, Parkes Way, West Basin, and Commonwealth Avenue Bridge (Figure 6).

Figure 6 Projects in planning or development in the area



These projects should be considered holistically from a city planning perspective so that the needs of the entire area are effectively addressed. The appropriate timing and sequencing of investments will be critical in optimising City planning and strategic transport outcomes while maximising the economic return to Government.

Consequently, the Project and the land developments it activates should be pursued as a priority, with particular consideration given to the interaction with Section 63 and C2WLR from a design and timing perspective. After the release of Section 63 land and construction of C2WLR (within the Project area), raising London Circuit to be at-grade with Commonwealth Avenue will no longer be viable.

As such, the Project solutions explored in this Business Case are:

- **Business as usual (BAU):** London Circuit and Commonwealth Avenue remain grade separated
- **At-grade:** the London Circuit and Commonwealth Avenue intersection is made at-grade

Comparative analysis of the two options resulted in the at-grade solution being the preferred option. Proceeding with the at-grade option will mean that there will be a clearer road hierarchy and a more legible network in the City Centre. In contrast, maintaining a grade separated intersection will mean challenges in deciphering the road network.

Proceeding with an at-grade intersection would also support the various land releases and projects underway or planned in the area. If the developable sites currently occupied by the south-west and south-east cloverleaves are released in the future, the developable area of those blocks will be maximised with an at-grade intersection. In contrast, under BAU the development site currently occupied by the south-west

cloverleaf will still be able to be released in the future with C2WLR, but the developable area will not be as large.

Furthermore, an at-grade intersection will mean that strong active frontages can be created, while under BAU the retaining wall on London Circuit for C2WLR will create sterile frontages for blocks located in the area.

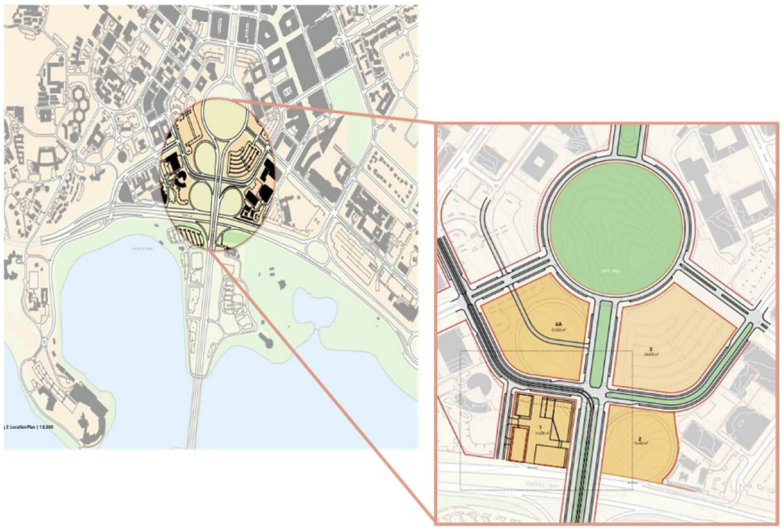
In light of these factors, this Business Case recommends that the Project proceed.

1.6 Project Outline

The Project is comprised of a series of works to raise London Circuit to become at-grade with Commonwealth Avenue. Figure 1 provides an overview of the existing configuration of the intersection.

The Project will support the current and future City shaping projects and permit the delivery of a high-quality public realm along these streets. Figure 7 shows the configuration of the London Circuit and Commonwealth Avenue intersection when London Circuit is raised.

Figure 7 Raised London Circuit



The scope of works and scope of services for the Project are summarised below.

The scope of works includes:

- **Traffic management works:** Temporary roads for diversions and concrete barriers
- **Landscaping – general:** Dryland grassing to banks, including topsoil from stockpiles
- **Traffic signals:** Four-way signalised intersection (London Circuit and Commonwealth Avenue) and three-way signalised intersection (West Road and London Circuit)
- **Street lighting:** Road light pole, including conduit / cable allowed at 30 m intervals
- **Utilities:** Utilities provision and relocation
- **Civil works:** Removal and demolition works, pavements, pavement drainage kerbs, retaining walls and road furniture
- **Planning and design:** Planning and design activities for the intersection, as well as West and East Roads

Staging of works within the Project

To minimise traffic impacts and support appropriate traffic management activities, the Project will be carefully planned and staged. In the detailed design stage, an analysis of the optimal sequencing of works will be undertaken to understand and mitigate impacts.

The scope of services includes:

- **Operations:** this includes operation of traffic lights and street lights
- **Maintenance:** this includes landscape maintenance, hard facilities management (for example, pavement replacement and repair), and soft facilities management (for example, road cleaning, furniture cleaning)

1.7 Cost, Contingency and Funding Analysis

Note: all years expressed are financial years

1.7.1 Project outturn costs

The total estimated Project outturn costs at a P90 level are $ m. This is shown in Table 1.

Table 1 Projected total outturn Project cost ($'000, nominal, P90)

Key exclusions and limitations associated with this estimate are outlined in Chapter 7 of this Business Case.

Verge works have not been included in this financial analysis as they are expected to be delivered by the developer of neighbouring sites in the form of offsite works. However, if they were to be delivered by the Territory, the estimated cost of undertaking these works verge works would total approximately $ m^2 (nominal, raw).

1.7.2 Operations and maintenance costs

In line with similar road projects in the Territory and Treasury guidance, the operations and maintenance cost has been calculated at 2% of the raw construction cost (nominal) per annum, ramping up over the first 2 years of operation – 0% in the first year of operations, 1% in the second and 2% each year thereafter. Operations and maintenance costs are estimated at $ m (nominal) over 20 years[3].

It should be noted that while the Project includes an operations and maintenance component for the intersection, it will also result in the removal of sections of road and as such, there may not be a net increase in overall road maintenance costs for the Territory. Consequently, this approach is a conservative inclusion for the purposes of this Business Case.

The following chart highlights the projected cost and timing of maintenance per annum.

2

3

Figure 8 Projected operations and maintenance costs ($'000, nominal)

1.7.3 Agency Costs

Territory procurement costs were calculated to reflect the true capital cost of delivering the Project in line with The Capital Framework guidance, including:

- Procurement fees – calculated at 4% of the total Project appropriation (comprised of Project outturn cost (nominal, P90) and total agency costs)
- Australian Capital Territory Insurance Authority (ACTIA) – calculated at 1% of the total Project appropriation
- Government Solicitors Office (GSO) – calculated at 1% of the total Project appropriation. These costs are anticipated to be required due to complexities associated with the Project's procurement and its interfaces with other surrounding projects, particularly light rail

The estimated costs associated with each of these items are shown in Table 2 below.

Table 2 Agency costs ($'000, nominal)

1.7.4 Cash flow impact

The Project's impact on the ACT Budget will be a payment over the construction period for the agency and Project outturn costs as per the D&C contracts (see Chapter 8).

Given split land ownership in the Project area between the Commonwealth and the Territory, it has been indicatively assumed for the purposes of this Business Case that 30% of the Project will be a Commonwealth asset, with 70% a Territory asset. This is based on high level assumptions and a spatial assessment of the Project. A thorough assessment of the asset ownership implications will be undertaken as part of the detailed design phase.

In line with the above assumptions, 30% of Project outturn cost to complete the Project, and 100% of the operational and agency costs, have been itemised as recurrent expenditure for the purposes of the anticipated budget impact, with the remaining 70% of the Project outturn cost itemised as capital expenditure. Consequently, depreciation only occurs on the 70% of Project costs which are capitalised.

Costs associated with operations and maintenance of the Project have been excluded from the table below.

The table below provides an overview of the estimated budget impact of the Project and the indicative estimated revenue due to the sale of the land released for development as part of the Project.

Table 3 Preliminary financial impacts summary ($'000, P90, nominal)

1.7.5 Funding

In considering funding for the Project, the following should be considered:

[4] *Comprised of internal agency costs and ongoing operational and maintenance funding requirements*

[5] *Depreciation has been calculated using the straight line method for the capitalised portion of the asset. An asset life of 30 years has been assumed, with a nil residual value. Only capital is depreciated*

[6] *This is the net incremental value of the land that is released in 2023 as a direct result of this investment. Whilst a portion of the land locked by the south-west cloverleaf is planned to be released irrespective of the Project, there is a net additional 11,250 GFA that can be released in 2023-24 as a direct result of this Project*

[7] *Anticipated recurrent, capital payments and depreciation, plus available offsets*

- The Project will release a parcel of land that, assuming C2WLR is constructed, would be lost under the current configuration as it would be occupied by the light rail ramp. The total land released by the Project will be 11,250 GFA over time, when the development sites are assumed to be sold. In accordance with existing processes, this revenue will be returned to the Territory as a dividend, however the revenue received from these land sales presents an opportunity to provide offsetting funding

- This Project may also result in savings to the funding required for the C2WLR project, as the ramp would no longer be necessary to allow the light rail to travel from the median of London Circuit to the median of Commonwealth Avenue

- This Project will also provide a more attractive street frontage for surrounding development sites, which may provide land value uplift to surrounding areas, such as Section 63, providing additional revenue for the Territory when these sites are sold. The land value uplift to the Section 63 and south-west and south-east cloverleaf sites is estimated to be $ m (real, 2019)

CRA will explore these opportunities with TCCS and Treasury following consideration of this Business Case. Further funding strategies can be found in Chapter 6.

1.8 Economic Analysis

A Cost Benefit Analysis (CBA) has been undertaken for the Project, assessing the range of costs and benefits accruing to transport users, operators, the government, land owners and the general community as a result of the Project. The benefits presented are split into two categories:

- **City-shaping** – benefits delivered by improving city shaping outcomes, this includes development of well-connected residential and commercial structures and urban amenity improvements/vitalisation

- **Transport** – benefits delivered as a result of changes to or impacts on the transport system, they can include direct benefits to transport users and indirect benefits such as environmental externalities

The CBA has been conducted assuming that the City to Woden Light Rail project proceeds.

1.8.1 Results

The results of the economic appraisal are shown in Table 4.

Table 4 Economic appraisal results ($m, discounted at 7%)

Results	Value
Benefits	
City shaping benefits	
Transport benefits	
Total benefits	
Costs	
Total costs (P50)	
Economic Performance	

[8] *The total revenue from the land released in 2023 due to the removal of the south-west cloverleaf*

Results	Value
NPV	
BCR	1.7

The assumptions and limitations relating to these results are described in Chapter 7 of this Business Case.

The results of the CBA shows that the Project, assuming that C2WLR is constructed, will deliver positive economic value. It has a benefit-cost ratio (BCR) significantly above 1.0 (BCR of 1.7 and NPV of $ m).

It should be noted that the land value uplift that is expected due to the presence of C2WLR in the area has not been quantified.

Important note:

In considering the BCR outlined above, it should be noted that while traffic modelling has been used where available, traffic modelling that demonstrated the anticipated traffic impact of the Project in its entirety was not available. As such, some high-level assumptions have been made regarding anticipated travel time delays and traffic counts for certain traffic changes as a result of the Project. Consequently, these results should be interpreted as indicative. Further information is outlined in Chapter 7.

1.9 Delivery Model Analysis

An extensive process was undertaken to develop the packaging and delivery model approach for the Project. This analysis included the development of packaging drivers and evaluation criteria, workshops with key Project stakeholders and an assessment of key Project benefits, risks and constraints.

Based on this analysis, the recommended packaging approach for the Project is:

- **Package 1:** utilities relocation early works package based on the Territory preparing a utilities design and implementation plan ahead of procurement
- **Package 2:** main civil works package, including design for East and West Roads
- **Package 3:** operations and maintenance package

The key drivers for this decision were to de-risk the main civil works package by 'ring-fencing' utilities risks, create a packaging solution that is attractive for the market, as well as allowing the Territory to incorporate operations and maintenance requirements into existing network-wide arrangements.

The recommended delivery model is:

- **Package 1:** a separate design package (the utilities design and implementation plan), with a separate Design and Construct (D&C) or construct only package, depending on the extent of the initial design package, for the utilities relocation early works package
- **Package 2:** a combined D&C approach for the main civil works package as it allows for more appropriate risk allocation and transfer and speed of delivery, while maintaining some flexibility for the Territory
- **Package 3:** integration of operations and maintenance activities into existing contracting and procurement arrangements for the road network

If closely related projects' packaging, delivery model approaches and timing allow for integration, the Project should be packaged with C2WLR and/or Parkes Way to:

- Enhance integrated land use and transport network planning opportunities

- Reduce interface risks, particularly with respect to traffic management
- In the case of Parkes Way, potentially facilitate economies of scale given the synergies between the characteristics of the scope of works for the two projects

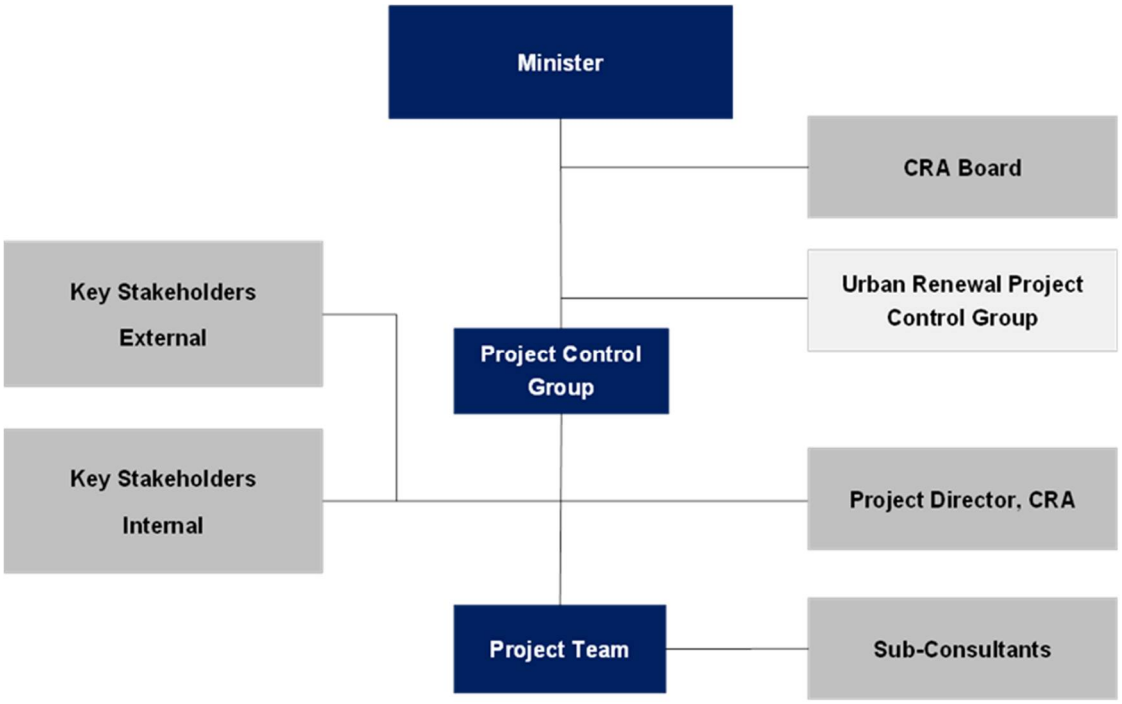
1.10 Project Governance

The Project Business Case has been prepared in accordance with a governance framework that includes the CRA Board with independent members (including the Chair).

Should Cabinet decide to proceed, it is anticipated that the Project will be delivered in line with standard governance frameworks for a project of this size and complexity, with a cross-directorate Project Control Group formed that includes representatives of CRA, Transport Canberra and City Services (TCCS), Major Projects Canberra and Treasury. The Urban Renewal Project Control Group will provide strategic leadership and advice. The role of the NCA as a key approver for the Project will form a critical part in ensuring the Project's successful planning, approval and delivery.

The figure below provides a high-level overview of the governance structure. Procurement governance arrangements are indicative and subject to change following further consideration by Cabinet.

Figure 9 Indicative governance structure



1.11 Stakeholder Management

The Project will be delivered in a collaborative and consultative way. Significant consultation has already occurred for surrounding city renewal projects with the community and key stakeholders. The Territory will continue to have a rigorous focus on community involvement in the Project going forward.

The Project is complex, with a significant number of stakeholders, ranging from corporations, institutions and Commonwealth agencies, through to businesses and local community residents. Ongoing consultation and collaboration with the NCA will be a key part of the Project's ongoing communications and engagement strategy.

A tailored communications and stakeholder engagement approach, which adopts the right mix of engagement techniques across the staged construction schedule of the Project, will be critical to its success.

Additionally, coordination, collaboration and integration with the stakeholder and community engagement activities for surrounding transport and land development projects is vital to ensure consistent and clear messaging and may also produce efficiencies in delivery. Should consultation, planning and delivery timeframes align, there would be benefit in integrating the Project's community engagement with C2WLR, Parkes Way and/or West Basin.

1.12 Advisor Engagement Plan

A variety of external advisors have been appointed in accordance with ACT Government processes to assist the Territory to develop this Business Case. Should the Territory decide to proceed with the Project, ongoing support from external advisors may be required to progress the procurement and delivery of the Project. The proposed advisors could include:

- Commercial, financial and economics
- Legal (General Solicitors Office)
- Technical
- Cost estimation

1.13 Project Timeline

It is anticipated that the Project will be completed in multiple stages in line with its recommended packaging and delivery model approach.

It should be noted that all dates are indicative and subject to a number of factors including Cabinet decisions regarding the Business Case.

Indicative timings have been determined based upon initial technical analysis and information available at the time of this Business Case. The Parkes Way project, C2WLR project and surrounding land development projects may have a material impact on the timing and scope of the proposed intersection upgrade.

An overview of the anticipated timeline for the Project is outlined in the table below.

Table 5 Anticipated key milestones

Utilities Package	**Anticipated Timeline**
Pre-planning and procurement Utilities Relocation	*March 2020 – May 2020*
Design Utilities Identification and Relocation	*May 2020 – August 2020*
Works Approval Utilities Relocation	*August 2020 – November 2020*
Procurement Construction Utilities Relocation	*September 2020 – November 2020*
Utilities Relocation Works	*December 2020 – May 2021*
Main D&C Package	**Anticipated Timeline**
Pre-planning and procurement	*March 2020 – May 2020*
Design	*June 2020 – January 2021*
Works Approval Main	*January 2021 – May 2021*
Construction Main	*June 2021 – December 2022*

Actual timing will be subject to the completion of the procurement process, planning and environmental approvals and other risks. Furthermore, it is important to note that:

- All dates are indicative and subject to a number of factors, including Cabinet decisions regarding the Business Case
- Indicative timing has been determined based upon the initial technical analysis and information available at the time of the Business Case
- Actual timing will be subject to the completion of the procurement process, planning and environmental approvals and other risks
- If the Project is packaged and procured as part of associated works (C2WLR or Parkes Way) these timings may be subject to material change
- A traffic management assessment will be undertaken by the ACT Government after the completion of this Business Case to consider the impacts of this, and other complementary projects, in the City precinct. The results of this could impact timing for delivery
- There is an Indicative Land Release Program for 2018-19 to 2021-22. Material changes to this program may impact on Project delivery timing

2 Introduction

Key messages

- The London Circuit and Commonwealth Avenue intersection project (the Project) will raise London Circuit so that London Circuit and Commonwealth Avenue are at-grade and a signalised traffic intersection of the Circuit and the Avenue is formed
- The Project aims to support City to Woden Light Rail (C2WLR), and increase the economic return to Government, while delivering on the planning intent for Canberra as set out in *The Griffin Legacy, The National Capital Plan, The City Plan* and *Canberra: A Statement of Ambition*
- The development of this Business Case has been informed by the ACT and Commonwealth Government's broader policies, legislation and plans, including the key strategic plans outlined above. This Business Case considers previous activities undertaken including the London Circuit Design Review, the Investment Logic Map completed in November 2018, traffic modelling and the Concept Estimate
- The purpose of this Business Case is to provide a robust analysis of benefits, costs, risks and delivery options for the Project. In turn this Business Case is designed to support the ACT Government in its investment decision deliberations in connection with the Project. It has been prepared in accordance with The Capital Framework Guidance. It is recommended that the ACT Government through the CRA:
    - Proceed with design, planning and procurement activities for the at-grade London Circuit and Commonwealth Avenue intersection
    - Invest $ m (nominal, P90) in the procurement and construction of the at-grade intersection

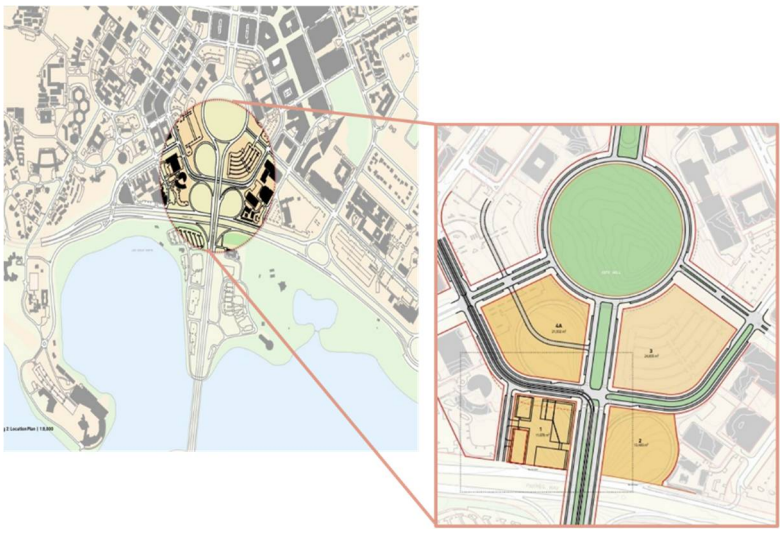
2.1 Purpose and recommendation

The purpose of this Business Case is to provide a robust analysis of the benefits, costs, risks and delivery options for the Project. In turn, this Business Case is designed to support the ACT Government in its investment decision deliberations. It has been prepared in accordance with The Capital Framework Guidance.

It is recommended that the ACT Government:

1. Proceed with design, planning and procurement activities for the at-grade London Circuit and Commonwealth Avenue intersection as outlined in Figure 10
2. Invest $ m (nominal, P90) in the procurement and construction of the at-grade intersection

Figure 10 Raised London Circuit



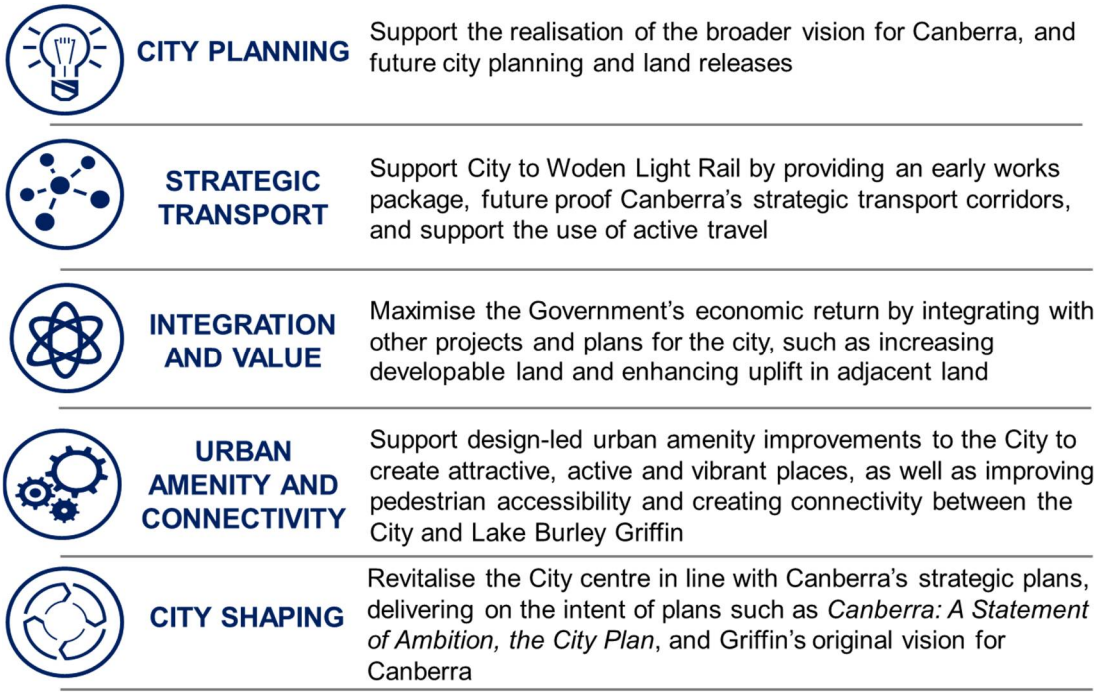
2.2 Project vision and objectives

Reflecting the ACT Government's ambitions for Canberra, the vision for the Project is:

> *To improve connectivity and support city planning by integrating strategic transport and land use initiatives to shape future development and create attractive, design-led, people focused places.*

Five Project objectives have been adopted for the Project as set out below.

Figure 11 Project Objectives



The Project objectives are aligned with the goals set out in the CRA's *2025 Strategic Plan Goals* and Objectives.

2.3 Background and Context

The Project will raise the southern portion of London Circuit so that it is at-grade with Commonwealth Avenue and a signalised traffic intersection of the Circuit and the Avenue is formed.

2.3.1 The original vision and planning intent for Canberra

There are a number of documents that set out the vision and planning and development strategies for the Territory. The *National Capital Plan* provides the overarching strategy for the planning and development of Canberra and the Territory, ensuring that 'Canberra and the Territory are planned and developed in accordance with their national significance'.[9]

The Griffin Legacy was developed to provide a blueprint for the future development of Canberra's central areas. As set out in the blueprint, implementing *The Griffin Legacy* will deliver significant benefits, including the releasing of sites for new development for government and private sector investment.

More recently, the planning intent for Canberra is outlined in *Canberra: A Statement of Ambition* and *The City Plan*. These plans imagine London Circuit as the City's high street with generous verges, street trees and activated street frontages underpinned by a mix of residential, commercial and retail activity.

London Circuit and Commonwealth Avenue are of critical importance in helping to realise the Territory's vision. In particular, Commonwealth Avenue is one of Canberra's most important boulevards and represents one of the sides of the National Triangle, a core element of the *Griffin Plan*.

2.3.2 Commonwealth Avenue and London Circuit intersection

The Commonwealth Avenue and London Circuit intersection is a key intersection between Canberra City and Lake Burley Griffin, forming the entry and exit points for travellers to and from the City heading north and south along Commonwealth Avenue and east and west onto Parkes Way.

The road connects the City Centre with South Canberra, running between City Hill and Capital Hill, and connects with Parkes Way by way of access ramps. As shown in Figure 12 below, London Circuit, which surrounds City Hill in the City Centre, intersects with Commonwealth Avenue to the south of City Hill.

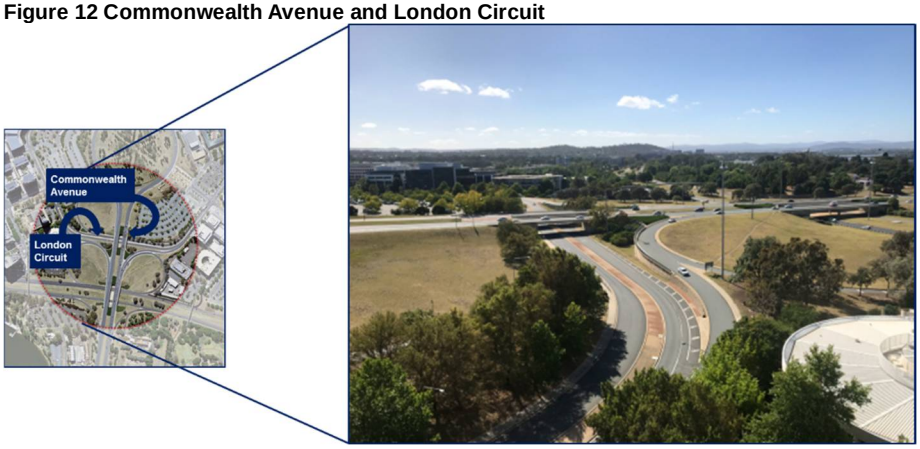
There are four large development sites centred on the intersection slated for redevelopment as part of the long-term land release plan and other projects[10]. Large areas of this unutilised land, that could otherwise be developed, are currently locked up in the cloverleaf entry and exit ramps to the south-west and south-east of the intersection. While these sites are not directly released by the Project, an at-grade intersection increases the value of these sites by providing a more attractive street frontage and increasing the footprint of one site (south-western cloverleaf). This is further outlined in Chapters 5 and 7.

The Project will play an integral part in providing a seamless connection between the City and the lake, interfacing with other high-profile developments in the area, such as West Basin, the Parkes Way redevelopment and land bridges, C2WLR and the redevelopment of the land on London Circuit surrounding City Hill and Vernon Circle.

[9] *NCA Background and Issues Paper for the Renewal of Kings and Commonwealth Avenue*

[10] *The north-eastern site is the proposed Australia Forum site*

Figure 12 Commonwealth Avenue and London Circuit



2.3.3 Guiding policies and transport planning

The development of the Business Case has been informed by relevant ACT and Commonwealth Government broader policies, priorities and plans. The current vision for the inner City, City Hill, and West Basin is defined through two documents prepared by the NCA. These are:

- *The Griffin Legacy*, 2006
- *The National Capital Plan*, 2016

These reports build on the 1918 *Griffin Plan* for Canberra and seek to reinforce the plan as part of the future growth of the area. Relevant ACT Government policies and plans that have informed the development of this Business Case include (see Appendix A for further detail):

- *Canberra: A Statement of Ambition*
- *The City Plan*
- *Moving Canberra 2019-2045 (currently in draft),*
- *Transport for Canberra: Transport for a sustainable city 2012-2031*
- *King and Commonwealth Avenues Draft Design Strategy*
- *Infrastructure Plan Update 2018-19*
- *The Territory Plan*
- *ACT Planning Strategy 2018*
- *City Renewal Authority 2025 Strategic Plan*
- *City Renewal Authority Sustainability Strategy 2018*
- *City to the Lake - Strategic Urban Design Framework 2015*
- *City and Gateway – Draft Urban Design Framework 2018*

Additionally, planning and development is underway to improve transport outcomes along Commonwealth Avenue, Kings Avenue and Parkes Way. Furthermore, City to Gungahlin Light Rail (C2GLR) has been operational since April 2019, and the extension of light rail to Woden (C2WLR) is also being progressed.

These transport projects will deliver better transport connections, improving access to the City Centre for pedestrians and active travel users, and encourage urban renewal.

2.3.4 Previous activities undertaken

This Business Case considers previous activities undertaken including:

2.4 Related projects

The Project's development will be influenced by a number of other ACT Government projects.

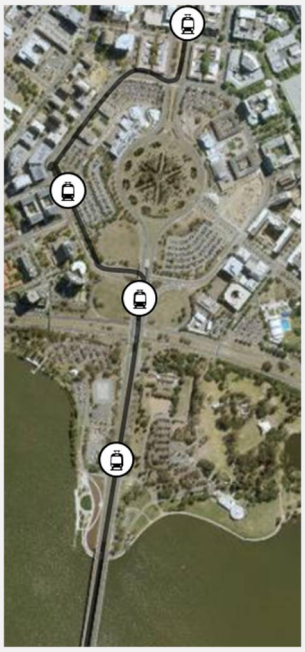
2.4.1 Light rail network

The ACT Government has announced plans to develop a Territory-wide light rail network over the coming years across seven corridors. Construction of the 12km City to Gungahlin stage has been completed, and has been operational since April 2019. The C2WLR corridor has been announced to be developed as the next stage of the network.

The Project is closely interrelated with C2WLR. C2WLR's proposed route alignment commences at the current C2GLR terminus at Alinga Street and travels south along Northbourne Avenue, around the west side of London Circuit and onto Commonwealth Avenue. With the London Circuit in its current configuration, C2WLR will ascend a ramp from London Circuit before turning right onto Commonwealth Avenue before continuing across Lake Burley Griffin via the Commonwealth Avenue Bridge. With an at-grade intersection C2WLR will continue on London Circuit until it reaches the new signalised intersection where it will turn right onto Commonwealth Avenue.

While stop locations are the subject of further analysis by TCCS, there are three stops planned in close proximity south of the existing Alinga Street terminus (marked as the northernmost stop below) as shown in Table 6.

Table 6 C2WLR proposed stop location

Context	Stop	Location
	**City West** 	It is anticipated that the stop will be located at London Circuit, south of Gordon Street. Due to the concentration of commercial buildings in the vicinity, it is anticipated that the stop would primarily serve the CBD, West Acton and the Australian National University.
	West Basin 	It is anticipated that the stop will be located at Commonwealth Avenue, north of Parkes Way, as the light rail route turns from London Circuit (southbound). It is anticipated that this stop will be the key stop for future developments in this area.
	Commonwealth Park 	It is anticipated that the stop will be located at Commonwealth Avenue, near Albert Street, Commonwealth Park and the planned West Basin precinct to the west.

In 2018, the Joint Standing Committee on the National Capital and External Territories (JSC) conducted an inquiry into Commonwealth and Parliamentary approvals for the proposed C2WLR project. The Inquiry Report was released in October 2018 and proposed six recommendations.

Overall, the JSC recommended that "the ACT the ACT Government should work with the NCA to ensure Commonwealth approval of the route, by amending the National Capital Plan. This should be done before undertaking the full Works Approval application and other Commonwealth approval processes."[11]

Planning and design development is currently underway for C2WLR. Given the significant interfaces between C2WLR and the Project, TCCS has been closely consulted in the preparation of this Business Case.

2.4.2 Section 63 and Section 100

CRA are investigating the development of Section 63 near City Hill, which is currently occupied by a surface carpark and the north-west cloverleaf that facilitates the movement of traffic from Commonwealth Avenue northbound to London Circuit eastbound.

The Section 100 development is a redevelopment of the land currently occupied by a surface car park, which is accessed by the intersection at London Circuit and Gordon Street. The proposed development will provide publicly accessible parking to replace the existing surface parking available at the site. It will be accessible via both Knowles Place and the Edinburgh Avenue extension.

[11] *Parliament of Australia (2018) Commonwealth approvals for ACT light rail, media release, 22 October 2018, https://www.aph.gov.au/Parliamentary_Business/Committees/Joint/National_Capital_and_External_Territories/Lightrail/Media_Releases*

2.4.3 Parkes Way

There are a number of upgrades planned to the roads and active transport network in and around Parkes Way to cater for increased traffic demand. In the short term, it is anticipated that these works will involve land realignment and signalisation of Coranderrk Street / Parkes Way, including the relocation of the water quality pond.

2.4.4 West Basin

The ACT Government is progressing the development of West Basin, in line with the *National Capital Plan*, to bring the everyday life of the City to the Lake. This includes:

- **Stage One** of construction was the creation of Henry Rolland Park and the first 150 metres of boardwalk. It started in November 2016 and is now open to the public.
- **Stage Two** of construction includes the completion of a concrete boardwalk and a lake wall, generous waterfront urban park, and construction of two public jetties.
- **Stage Three** of the development is the ACT Government's intention to complete the lakeside public spaces prior to starting work on any mixed-use development precincts that will bring the City Centre across Parkes Way.

The West Basin precinct is anticipated to create accommodation for approximately 15,000 people over 20 years. It includes plans for open space improvements on the waterfront, and other public infrastructure. The development will improve accessibility between the City and the Lake and create a more vibrant lakefront in line with Griffin's original vision for Canberra.

2.4.5 NCA Plans for Commonwealth and Kings Avenues

The NCA's *Kings and Commonwealth Avenues Draft Design Strategy* (in draft) includes key proposals such as reconfiguring the roadways to better integrate existing and future public transport systems, renewing the streetscape character of the avenues, and widening and enhancing pedestrian and cycle connections.

In relation to Commonwealth Avenue more specifically, the *Draft Design Strategy* states that "by reconfiguring the road intersections north of the Lake to remove the existing high-speed free-left turns and replace them with signalised intersections, the avenue template will be established along the northern section of Commonwealth Avenue. Pedestrian and cycle use will be greatly improved, and new sites for mixed-use development within."

Recently, the NCA has announced it is considering replacing Commonwealth Avenue Bridge with a new bridge. The new bridge will likely be wider, stronger and have improved access for pedestrians and cyclists. It may also allow for C2WLR to cross over it.

2.4.6 Other priority projects

Further priority projects include stormwater augmentation in the area, the Edinburgh Avenue extension, Commonwealth Avenue / Vernon Circle signalisation, and the construction of a new bridge across Parkes Way (West Road) connecting the City to West Basin.

2.5 Other important notes

2.5.1 The Capital Framework

This Business Case has been prepared with reference to The Capital Framework adopted by the ACT Government for assessing capital works funding proposals. Adherence to The Capital Framework is designed to enhance the rigour of the needs analysis, the identification of risks and the assessment of potential delivery models, delivering improved value for money outcomes for the ACT Government.

The level of analysis undertaken for the Business Case is in accordance with the Single Assessment Framework Business Case Tier 1 Template and associated guidance material.

2.5.2 Information sources

This Business Case uses information and analysis from a variety of sources, including information provided by the CRA and a number of ACT Government agencies including TCCS and other third-party materials, including transport modelling and cost estimates.

The Capital Framework

The Capital Framework is used by ACT Government Directorates to develop and assess funding proposals for medium to large infrastructure projects. The Framework helps to ensure that ACT Government investments provide maximum benefits to the ACT Government by addressing the right problems, choosing the best value for money investments, delivering investments as planned and realising the benefits the investment sets out to achieve.

The seven-stage Framework includes a 'conceptualise' stage (represented by the ILM) and a 'prove' stage (represented by this Business Case). Other stages relate to the 'procurement', 'implementation' and 'measurement' phases of a project.

The level of analysis undertaken for this Business Case is in accordance with the Single Assessment Framework Business Case Tier 1 Template. In accordance with this template and The Capital Framework, this Business Case conducts a thorough and rigorous assessment of the intersection to enable the Government to make an informed decision about the proposed Project.

3 Need for Investment

Key messages

- This Project provides an opportunity to address three key challenges identified in an Investment Logic Mapping (ILM) workshop that was undertaken in November 2018 and refined through further stakeholder consultation and Project development:
    - **Challenge 1:** Inability to define ideal timing and sequencing of investments will result in poor place outcomes
    - **Challenge 2:** Future population growth and development will result in ineffective accessibility to and around the city
    - **Challenge 3:** Current configuration of London Circuit is a poor urban design outcome, impacting the ability to realise the city's future vision
- Addressing these challenges will deliver significant benefits to the Canberra community. The key benefits to be delivered by the project include:
    - Improved planning outcomes
    - Increased connectivity and urban amenity

3.1 Key challenges

3.1.1 Overview

This Project provides an opportunity to address three key challenges identified in an Investment Logic Mapping (ILM) workshop that was undertaken in November 2018 and refined through further stakeholder consultation and Project development:

- **Challenge 1:** Inability to define ideal timing and sequencing of investments will result in poor place outcomes
- **Challenge 2:** Future population growth and development will result in ineffective accessibility to and around the City
- **Challenge 3:** Current configuration of London Circuit is a poor urban design outcome, impacting the ability to realise the City's future vision

The results of the ILM are outlined in Appendix F.

3.1.2 Challenge 1: Inability to define ideal timing and sequencing of investments will result in poor place outcomes and reduced development revenue

What is the challenge?

There are a large number of major infrastructure projects and developments which are underway or being planned for delivery in the area (see Figure 6). These include Section 100, Section 63, C2WLR, stormwater augmentation, Edinburgh Avenue extension, Commonwealth Avenue / Vernon Circle signalisation, Parkes Way, West Basin, West Road and Commonwealth Avenue Bridge.

There are significant interdependencies between these projects which will create additional planning, design and delivery complexities for the Territory. Appropriate timing and sequencing of these projects will be essential to future proof the road network, maximise development revenue for the Territory and ensure the vision for the City is realised.

Why now?

The development of infrastructure in areas surrounding the London Circuit and Commonwealth Avenue intersection mean there is a limited timeframe in which the intersection can be made at-grade. After the construction of these projects – particularly Section 63 and C2WLR – changing the configuration of the intersection will not be possible. The timing of surrounding infrastructure projects will impact not only the viability of this Project, but also the revenue that can be received from the development of each surrounding site. As a result, a decision to proceed with the Project needs to be made as a priority.

Interdependencies between projects need to be effectively planned and managed to optimise outcomes

It will be too late to change the road configuration after the completion of Section 63 and C2WLR

The London Circuit and Commonwealth Avenue connection will impact on the site boundary for Section 63, as well as the verge layout designs and grading levels at the intersection. This will have an impact on road grading and verge layout construction, cause delays and additional works, design rework and site area changes. To mitigate this risk, the City Hill Development Plan suggests designing / constructing the intersection works prior to the development of Section 63, Block 20 (the Site) and ensuring the proposed road and verge layout design matches into the site infrastructure works

Furthermore, should an at-grade intersection be constructed, the C2WLR route alignment would need to be amended to allow light rail vehicles to travel along the median of London Circuit, to the median of Commonwealth Avenue through the at-grade intersection (as opposed to ascending a ramp to Commonwealth Avenue).

The road configuration needs to be addressed now before these projects are completed. After their completion, it will be too late to change the road configuration for the London Circuit and Commonwealth Avenue intersection.

Major infrastructure projects in the area need to be planned and managed effectively to optimise place outcomes

The intersection needs to be addressed now to future proof the City and allow for the anticipated build of large infrastructure projects in the area. This will ensure that all projects integrate effectively and place outcomes are optimised. The key infrastructure projects which are underway or being planned are set out in the table below.

Table 7 Major infrastructure projects in the area

Project	Description
South-east cloverleaf site	The south-east cloverleaf site will unlock approximately 57,000m^2 of land for development for residential and commercial use. The development will result in the closure of the south-east cloverleaf, and will complement other developments in the City Centre area, improve access between the City and Lake, create active street frontages and increase urban amenity
South-west cloverleaf site	The south-west cloverleaf development will close the south-west cloverleaf to traffic and release over 57,000m^2 of land to be used for mixed-use development. The development will complement other developments in the City Centre area,

Project	Description
	and improve access between the City and Lake, create active street frontages and increase urban amenity
Section 63	CRA plan to development Section 63 near City Hill, which is currently occupied by a surface carpark and the north-west cloverleaf that facilitates the movement of traffic from Commonwealth Avenue northbound to London Circuit eastbound
C2WLR	The Light Rail Network is a vital part of the ACT Government's plan to grow Canberra's public transport system. It will provide greater public transport choice, shape settlement patterns and improve employment opportunities. C2WLR will aim to link Woden to the City and onward to Gungahlin as a single seat journey, creating a north-south public transport spine
Section 100 – The Barracks – Morris Property Group	Section 100 is currently occupied by the Wilson Car Park and being developed by Morris Property Group. Construction of a residential building comprising of 313 apartments was expected by February 2019 The remaining phases 2 and 3 are expected to be completed over the next 5 years with phase 1 settlement expected in early 2021
Stormwater Augmentation	Stormwater augmentation is necessary for the West Basin project. The augmentation will involve constructing an underground stormwater diversion at Parkes Way, and directing stormwater to the west of the West Basin project to flow into Lake Burley Griffin. The low point of the augmentation is located near the London Circuit and Commonwealth Avenue intersection The augmentation will be constructed in a way that will allow for future road widening of Parkes Way
Edinburgh Avenue	Morris Property Group is delivering the extension of Edinburgh Avenue to connect with Vernon Circle. The extension is required before the off ramp from Commonwealth Avenue may be degazetted. Edinburgh Avenue will also provide access to Knowles Lane and site access to the surrounding land development sites Under the terms of the deed for sale for Section 100 to Morris Property Group development (adjoining neighbouring site), there is a requirement for them to complete the Edinburgh Avenue extension by June 2020
Commonwealth Avenue / Vernon Circle signalisation	There is a proposed upgrade to a signalised intersection including works to straighten the verge on the corner of Commonwealth Avenue and Vernon Circle.
Parkes Way	The initial stage of the Parkes Way project currently includes: · Coranderrk Street / Parkes Way land realignment · Signalisation of Coranderrk Street / Parkes Way, including relocation of the water quality pond

Project	Description
	It is anticipated that TCCS will undertake further works on Parkes Way in the longer term to help manage traffic growth
West Basin	New development in 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. The development will also improve accessibility between the City and the waterfront. The development of West Basin features three stages: · Stage One was the creation of Henry Rolland Park which is now open to the public · Stage Two is the completion of the concrete boardwalk and Lake wall; waterfront urban park; and construction of two public jetties · Stage Three will complete the lakeside public spaces prior to the commencement of work on any mixed-used development precincts that will bring the City Centre across Parkes Way The feasibility and final development yield/design for the master plan in this area is under consideration
West Road	There are plans for the potential construction of a new bridge across Parkes Way (West Road) in the future to connect the City to West Basin
Commonwealth Avenue Bridge	There are potential developments being considered to enhance the prominence of Kings and Commonwealth Avenues as grand boulevards with reduced travel speeds that encourage public transport use[12] The Commonwealth Government has committed to investing $14 million over the next 3 years to help the NCA deliver upgrades to key infrastructure, including strengthening of the Commonwealth Avenue Bridge. The funding provides for a business case to be prepared to consider strengthening, widening and safety barrier replacement works to ensure the continued safety of the bridge for the next 50 years

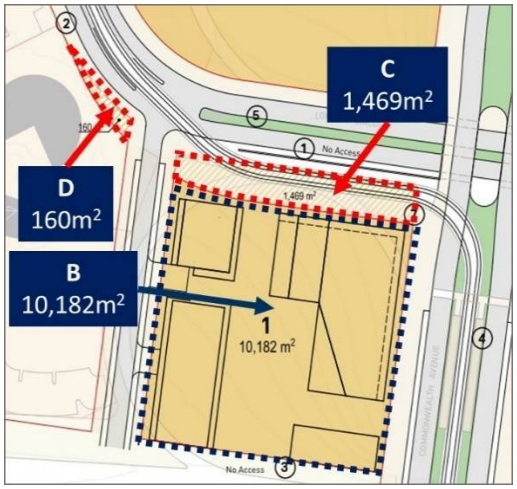
Timing and sequencing of investments will impact on development revenue

The C2WLR sees an extension of the light rail network from the City to Woden via London Circuit and Commonwealth Avenue, traversing the intersection. A stop has been proposed on Commonwealth Avenue south of the junction with London Circuit, with two further stops proposed in close proximity (see Table 6 above). C2WLR will provide significant benefits for CRA controlled land releases around City Hill and will provide improved public transport accessibility for West Basin. However, C2WLR will have an impact on the urban design, development yield and commercial feasibility of the land releases located at the London Circuit and Commonwealth Avenue intersection if it remains in its current configuration.

[12] *National Capital Authority (2017) Kings & Commonwealth Avenues Draft Design Strategy, https://www.nca.gov.au/sites/g/files/net791/f/consultation/Kings%20and%20Commonwealth%20Avenues%20Design%20Strategy_Final%20LR.pdf*

The design for C2WLR requires using 1,429m^2 of Block 1 (as shown in Figure 13), limiting the available frontage to Commonwealth avenue, if London Circuit remains grade-separated. Although the land taken for light rail is around 12.5% of the Block, the reduction in frontage on Commonwealth Avenue will likely lead to fitting one large commercial building in the Block, rather than two larger footprint commercial buildings that could fit without the loss of 1,429m^2 that results from the current design of C2WLR. As part of the economic appraisal for the Project, it has been estimated that this would result in a $7.4m reduction in land value based on a land valuation undertaken by Knight Frank in early 2019 (see Chapter 7). The lower quality public realm is also anticipated to impact the land value of surrounding sites, when compared to an at-grade solution that provides enhanced street access and walkability.

Figure 13 Difference in block size based on current design reference for C2WLR [13]

London Circuit Raised	London Circuit Unchanged
	
If London Circuit is at-grade, it would result in a total available area of 11,678 m^2 (A) for the Block to the South-West of the Commonwealth Avenue and London Circuit intersection	If London Circuit is unchanged, it would result in a total available area of 10,182m^2 (B) as the block would be reduced by 1,400-1,500m^2 (C and D)

3.1.3 Challenge 2: Future population growth and development will result in ineffective accessibility to and around the City

What is the challenge?

Future developments in the city, and a shift in land use planning policies to increase densification and create a more compact Canberra[14], need to be considered in the context of the London Circuit and Commonwealth Avenue intersection and future proofing the road network. This is vital for an intersection located at the heart of the city where urban infill and traffic are expected to increase in line with land use planning policies.

The blocks of land surrounding the intersection are expected to be progressively released in the future, resulting in the removal of the cloverleaves and their closure to traffic over time. It is anticipated that in the short term the north-west cloverleaf (Section 63) will be closed to traffic and developed, followed by the

[13] *AECOM (2018) London Circuit Design Review, prepared for City Renewal Authority, January 2018*

[14] *See for example Canberra: A Statement of Ambition*

south-west cloverleaf and the south-east cloverleaf in the longer term. Without modifying the intersection to be at-grade ahead of these developments, progressively more journeys will be diverted via Vernon Circle.

In this way the Project will help to distribute traffic into other part of the City (refer to the Why now section below for examples of how the road network will change with the future release of the south-east and south-west blocks, and how an at-grade intersection take pressure off Vernon Circle for some journeys).

It should be noted that with the development of C2WLR, right turns off Commonwealth Avenue northbound will not be possible and therefore, while east bound and south bound journeys will not have to rely on Vernon Circle, the journey to the east of the city would rely on the use of Vernon Circle as per the journey with a grade separated intersection.

In addition, Canberra's population is growing rapidly and, as a result, an increase in the use of City roads is expected. Traffic modelling has shown that with the current grade-separated configuration of London Circuit and Commonwealth Avenue, London Circuit, Commonwealth Avenue and Parkes Way are likely to become congested by 2026, whilst surrounding roads are under-utilised.

Why now?

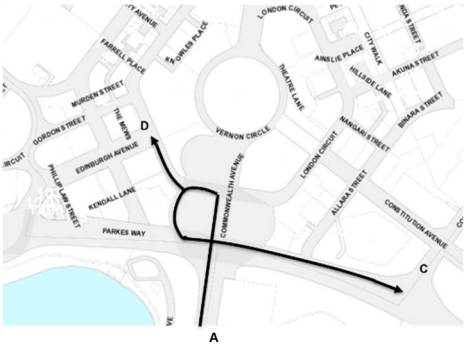
The release of the blocks of land surrounding the London Circuit and Commonwealth Avenue intersection (Section 63), and the planned future release of the south-west and south-east blocks as part of the Territory's land release program, will increase the complexity of journeys in the area based on the current configuration of the grade-separated intersection. If London Circuit is not made at-grade with Commonwealth Avenue now, future journeys utilising both London Circuit and Commonwealth Avenue will become more complicated, potentially contributing to worsening congestion in the City.

The planned future release of cloverleaf blocks will increase the complexity of journeys in the area

South-west block

With the development of C2WLR, a ramp will be constructed between London Circuit and Commonwealth Avenue on the site of the existing slip lane. As part of C2WLR, the existing south-west cloverleaf will be realigned to continue to provide a connection between Commonwealth Avenue and Parkes Way. However, when the south-west cloverleaf is closed to allow for mixed use development as part of the long term land release plan, northbound traffic travelling east and west would need to re-route.

The table below illustrates the route for the current configuration of London Circuit compared with the future configuration of London Circuit (remaining grade separated) following the removal of the south-west cloverleaf. Again, traffic would need to re-route via Vernon Circle to travel from A to D and from A to C.

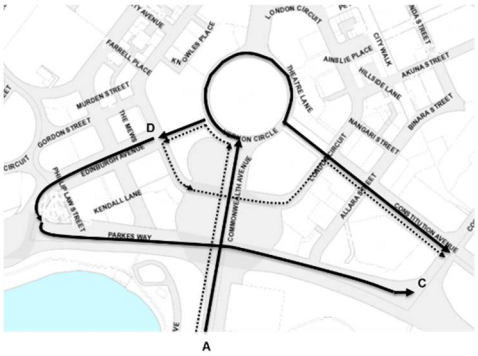
Current configuration of London Circuit The south-west cloverleaf will be removed as part of the long term land release plan. This will affect northbound traffic on Commonwealth Avenue wanting to travel east on Parkes Way (A to C in Figure 9). If the slip road to London Circuit is also removed, traffic wanting to travel west on London Circuit (A to D in Figure 9) will also be affected.	**Figure 9 Route map current configuration of London Circuit** 

Future configuration of London Circuit (grade separated)

If London Circuit remains grade-separated, as shown in Figure 10, the re-routing of the A to D journey is straightforward (i.e. via Vernon Circle and the Edinburgh Avenue extension). However, for the A to C journey traffic either travels via Vernon Circle and onto either Constitution Avenue or Edinburgh Avenue and Parkes Way. Traffic will rely more heavily on the use of Vernon Circle.

There are also longer distance alternatives via Kings Avenue or Tuggeranong Parkway and Parkes Way.

Figure 10 Route map with future configuration of London Circuit: London Circuit remains grade separated



Future configuration of London Circuit (at-grade, with light rail)

The A to C journey would be the same as for Figure 10 above, as northbound traffic would not be able to turn right at the London Circuit / Commonwealth Avenue intersection with light rail.

However, for the A to D journey, traffic takes a left turn at the intersection (taking pressure off Vernon Circle), shown in the figure to the right.

Figure 11 Route map with future configuration of London Circuit: London Circuit at-grade, with light rail

South-east block

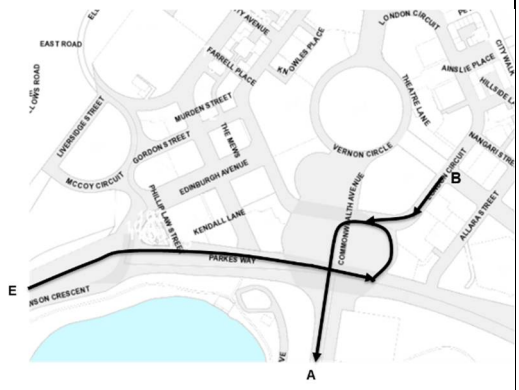
There are plans to release the south-east block in the medium term, and therefore close the south-east cloverleaf to traffic. This will add further complexity to the route if the block is released and the intersection remains at-grade.

The figure below illustrates the route for the current configuration of London Circuit compared with the future configuration of London Circuit (remaining grade separated) following the future release of the south-east block. Again, traffic would need to re-route via Vernon Circle to travel from B to A. To travel from E to A, traffic would either need to re-route via Coranderrk Street, Constitution Avenue and Vernon Circle, or via Edinburgh Avenue and Vernon Circle / London Circuit.

Current configuration of London Circuit

The CRA plans to release the south-east block in the medium term. The release of land will include the removal of the south-east cloverleaf, affecting eastbound traffic on Parkes Way travelling south on Commonwealth Avenue (E to A in Figure 12). If the slip road from London Circuit is also removed, traffic travelling from London Circuit to Commonwealth Avenue (B to A in Figure 12) will also be affected.

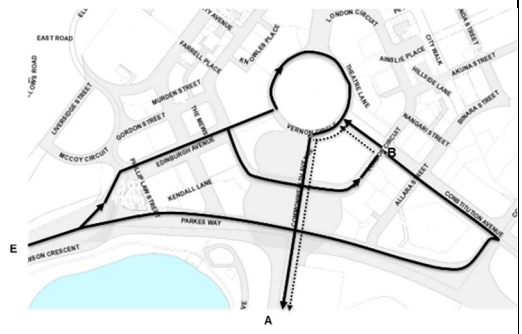
Figure 12 Route map with current configuration of London Circuit



Future configuration of London Circuit (grade separated)

If London Circuit remains grade-separated, the rerouting of the B to A journey is straightforward (i.e. via the existing Constitution Avenue extension and Vernon Circle, shown in Figure 13). However, for the E to A journey traffic either travels via Coranderrk Street, Constitution Avenue and Vernon Circle, or via Edinburgh Avenue and either London Circuit or Vernon Circle (refer to Figure 13). There are also longer distance alternatives via Kings Avenue or Tuggeranong Parkway.

Figure 13 Route map with future configuration of London Circuit: London Circuit remains grade separated

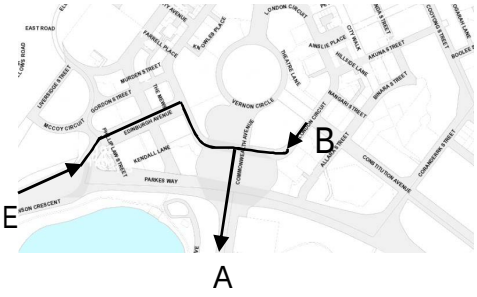


Future configuration of London Circuit (at-grade)

The re-routing becomes simpler with an at-grade intersection, as shown in Figure 14, and takes the pressure of Vernon Circle. Travelling from B to A will require a left turn at the intersection. Traffic travelling from E to A could go along Edinburgh Avenue, turn right onto London Circuit, and turn right onto Commonwealth Avenue.

An at-grade intersection would therefore help to future proof the road network if the south-east block is removed in the future.

Figure 14 Route map with future configuration of London Circuit: London Circuit at-grade



Congestion in the City is anticipated to grow as the population increases and becomes more centred in the City

The ACT's population is projected to reach around 450,000 people by 2022, an increase of 40,000 compared with 30 June 2017[15] (refer Appendix D for further information). By 2058, an estimated 700,000 people will call the ACT home[16]. To support sustainable urban growth, the ACT Planning Strategy seeks to deliver up to 70% of new housing as infill development (and 30% of new housing as greenfield development). The new target for infill development is in response to the success of the 2012 strategy which saw an average of 63% of all new housing achieved through infill development between 2011-12 and 2016-17 (compared to a target of 50% or more for the 2012 strategy)[17].

With the urban densification priorities announced by government, a lot of this growth is anticipated to occur in the City Centre and near transit corridors (refer Appendix E for further information)[18]. This may result in a growing number of vehicles travelling to and around the City. The Territory is seeking to try to change travel patterns by improving public transport, such as with the light rail and new bus network. In the areas of City Hill, Parkes Way and Commonwealth Avenue congestion is expected to increase as the population of Canberra grows and becomes more compact in the City (refer pop out box below for example), with the avoidable social costs of congestion expected to be between $334m and $419m in Canberra by 2030[19].

[15] *ACT Government (2019) ACT Population Projections – 2018 to 2058, https://apps.treasury.act.gov.au/__data/assets/pdf_file/0005/1305581/ACT-Population-Projections-Paper-FINAL.pdf*

[16] *Ibid*

[17] *ACT Planning Strategy 2018*

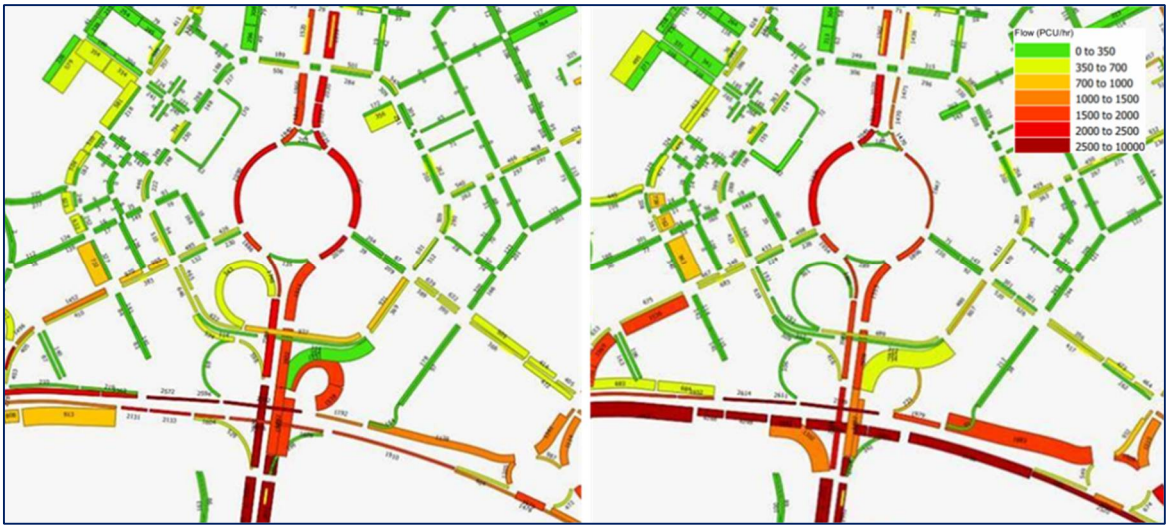
[18] *Canberra is currently less densely populated than other Australian capital cities and comparable international cities (refer Appendix B for further information).*

[19] *Traffic and congestion cost trends for Australian capital cities, BITRE, 2015*

By 2031, with the Section 100 development, it is anticipated that in the PM peak period the western (northbound) section of Vernon Circle will operate over capacity, as do parts of Knowles Place and Knowles Place extension. Edinburgh Avenue and London Circuit generally operate below 85% of capacity (the pop out box below provides further information in relation to the impact the Section 100 development is likely to have on traffic flow in 2031).

Increased traffic movement in the area presents a challenge for the intersection which is located at the heart of the street grid for the City. Figure 15 shows the high number of cars that are expected to utilise the junction between London Circuit and Commonwealth Avenue, and along Parkes Way, during the AM and PM peak in 2026. At the same time, there are other areas around the intersection which are underutilised. This congestion will need to be redistributed in order for traffic flow to be more efficient and productive in the City, and reduce pressure on Vernon Circle.

Figure 15 Absolute flow of vehicles in the area in 2026 during AM peak (left image) and PM peak (right image)[20]



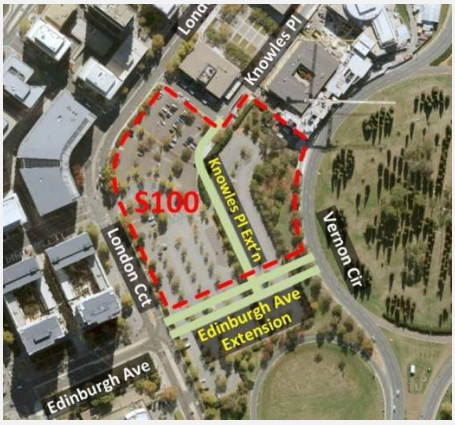
[20] *Arup*

Section 100

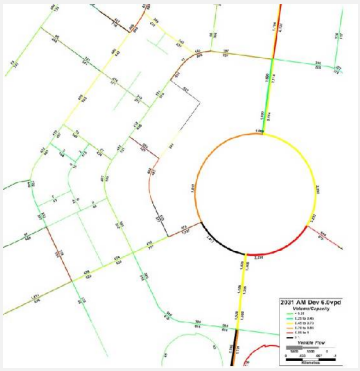
The Section 100 development is a redevelopment of the land currently occupied by a surface car park, which is accessible by the intersection at London Circuit and Gordon Street. Construction of a residential building comprising 313 apartments is anticipated to occur in the short term. The remaining phases 2 & 3 are expected to be completed over the next 5 years with phase 1 settlement expected in early 2021.

An assessment of the impact on the road network of traffic generated by a proposed development on Section 100 undertaken by SMEC showed that increased traffic would cause the western part of Vernon Circle and the Knowles Place extension to operate over capacity.

The 2031 Section 100 scenario includes the extension of Knowles Place to intersect the Edinburgh Avenue extension and converts the existing southern part of Knowles Place to two-way operation.

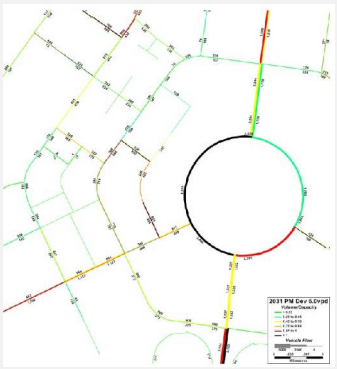


2031 with Section 100 AM Hourly Flow and V/C



By 2031 with the Section 100 development, in the AM peak period, shown above, there is an increase in congestion around the area. Knowles Place and Knowles Place extension both operate over capacity. Congestion on the eastern side of Vernon Circle (southbound) has decreased but the section between Commonwealth Avenue and Edinburgh Avenue extension operates over capacity. Edinburgh Avenue extension, between Vernon Circle and Knowles Place extension operates above 85% of capacity.

2031 With Section 100 PM Hourly Flow and V/C



By 2031 with the Section 100 development, in the PM peak period, shown above, the western (northbound) section of Vernon Circle operates over capacity, as do parts of Knowles Place and Knowles Place extension. Edinburgh Avenue and London Circuit generally operate below 85% of capacity.

Source: SMEC (2018) Traffic Report – City Section 100 Traffic Study, prepared for Spiire, 13 September 2018

3.1.4 Challenge 3: Current configuration of London Circuit is a poor urban design outcome, impacting the ability to realise the city's future vision

What is the challenge?

London Circuit and Commonwealth Avenue are of critical importance in helping to realise the vision and goals for Canberra City as set out in *The National Capital Plan, The Griffin Legacy, The City Plan* and *Canberra: A Statement of Ambition*. The current configuration of the London Circuit and Commonwealth

Avenue intersection is not conducive to active travel[21], vibrant use, or connection between the City and Lake.

Why now?

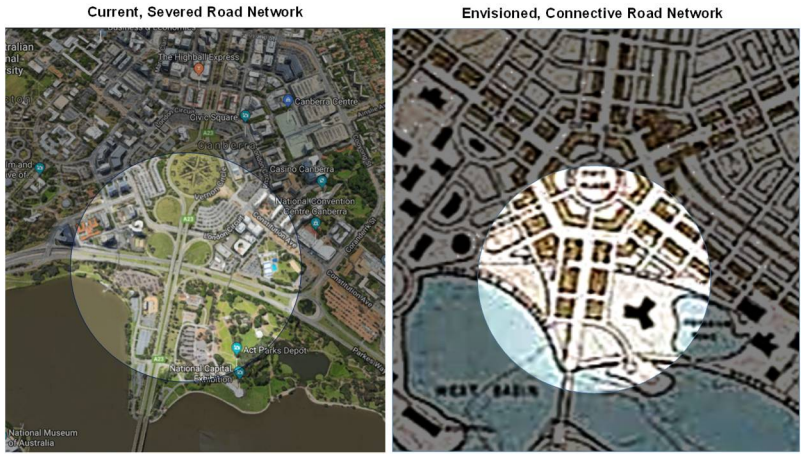
The current configuration of the intersection limits the Territory's abilty to achieve its vision and goals for Canberra city.[22] As set out in the *Kings and Commonwealth Avenues Draft Design Strategy* (in draft) this is in part due to Commonwealth Avenue's fragmented landscape, dominance of cars, accessibility issues and unfriendly environment for pedestrians and cyclists.[23] This challenge needs to be addressd now to deliver the planning intent and vision for City Hill, West Basin, and City East and West.

The configuration of the existing road network does not support the long-term vision for Canberra

National Capital Plan

The *National Capital Plan* provides the overarching strategy for the planning and development of Canberra and the Territory, ensuring that 'Canberra and the Territory are planned and developed in accordance with their national significance'. It states that a key matter of national significance for Canberra includes the respect for key elements of Walter Burley Griffin's adopted plan for Canberra.

Figure 16 Current road network, Walter Burley Griffin's envisaged road network



The *National Capital Plan's* proposal is for London Circuit to serve as a gateway, providing a transition between the boulevard character of the avenues and the urban scale of the inner-City Hill Precinct.

It states that the transition should be achieved using urban design and traffic engineering treatments that serve to physically divert traffic from the avenues onto London Circuit, thereby limiting access to the inner-City Hill Precinct to predominantly local traffic.

The Plan also suggests London Circuit should operate as the main public transport circuit for Canberra Central, saying that buildings must be set back from London Circuit a sufficient distance to establish a tree-lined boulevard character (two rows of trees and wide pavements). Furthermore, new buildings fronting London Circuit must have active frontages.

[21] *Refer to Appendix C for information on the use of active travel to get to work in the Territory*

[22] *AECOM (2018) London Circuit Design Review, prepared for City Renewal Authority, January 2018*

[23] *National Capital Authority (2017) Kings & Commonwealth Avenues Draft Design Strategy, https://www.nca.gov.au/sites/g/files/net791/f/consultation/Kings%20and%20Commonwealth%20Avenues%20Design%20Strategy_Final%20LR.pdf*

The Griffin Legacy

The *Griffin Legacy* project was undertaken by the NCA to provide a strategic framework to accommodate the best of contemporary urban development in keeping with Walter Burley Griffin's original plan for the City. It established a range of objectives of particular relevance to Griffin's plan, including protecting and building on the Griffin Legacy, linking the City to the Central National Area, extending the City to the Lake, and reinforcing the main avenues.

The Griffin Legacy provides for the transformation of West Basin into a vibrant and spacious lakeside promenade, realising City Hill as the heart of the City Centre and Constitution Avenue becoming a grand boulevard linking the educational centres. It proposes releasing sites for new development for government and private sector investment.

The first step towards providing a statutory planning framework for the full implementation of *The Griffin Legacy* was through the preparation of four Amendments to the *National Capital Plan*. These Amendments provide strategic directions regarding City Hill, Constitution Avenue and West Basin. Future development in these locations are subject to the planning provisions of these amendments.

Amendment 59 (City Hill Precinct) sees the City Hill area as the municipal and geographic heart of the City Centre, completing the National Triangle, acting as a gateway to the Central National Area and as a hub, connecting significant main avenues and vistas. A key feature of the Amendment is to modify London Circuit to become an urban boulevard operating as the main public transport circuit for Canberra Central and as the by-pass to City Hill Park. It states that the 'intersection of Commonwealth Avenue and London Circuit should be redesigned to encourage the diversion of northbound traffic onto London Circuit and improve pedestrian access and safety.'

The City Plan

The City Plan sets a vision and framework for future development in the City Centre. It provides a single, overarching framework for the City Centre's spatial planning and development in the shorter to medium terms, as a foundation to take it to 2030 and beyond.

In particular, *The City Plan* states that 'the existing streetscape of London Circuit does not reflect its role as the premier business address' and aims to 'establish London Circuit as a premier address for business and as the main vehicular route for local City traffic.' It refers to London Circuit being 'reconfigured to take on main collector route role and distribute destination traffic within the City Centre', and recommends that supporting local traffic movement at-grade will enable vehicle and pedestrian access to the Lake and open investment opportunities for residential and other development in West Basin.

Canberra: A Statement of Ambition

The ACT Government's *Canberra: A Statement of Ambition* sets out the vision for Canberra as one of the world's most liveable and competitive cities that is welcoming to all. Realising this vision will require focus on ensuring design is well planned and managed across Canberra, especially in growth areas, with consideration of the urban form and character of the City. London Circuit and Commonwealth Avenue are of critical importance in helping to realise the Territory's vision.

The poor urban design outcome of London Circuit is impacting the street frontage, pedestrian experience and connectivity between the City and the Lake

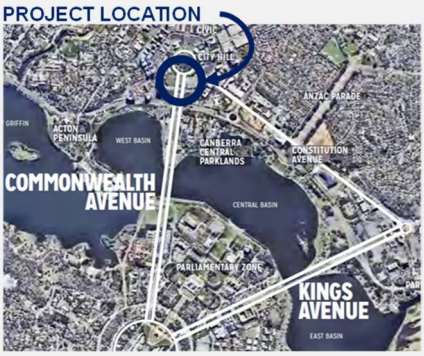
Street frontage

London Circuit should be designed to provide a high-quality landscape and public realm, capable of encouraging pedestrian access, active street use and vibrant adjacent uses. However, the existing streetscape of London Circuit does not reflect its role as a premier business address in Canberra and may not optimise the land value of surrounding areas, such as Section 63. This may reduce the amount of revenue the Territory will receive when the site is sold.

The *Kings and Commonwealth Avenues Draft Design Strategy 2017* (in draft) sets out a number of issues with the existing streetscape as outlined in the box below.

Kings and Commonwealth Avenues Draft Design Strategy 2017 (in draft)

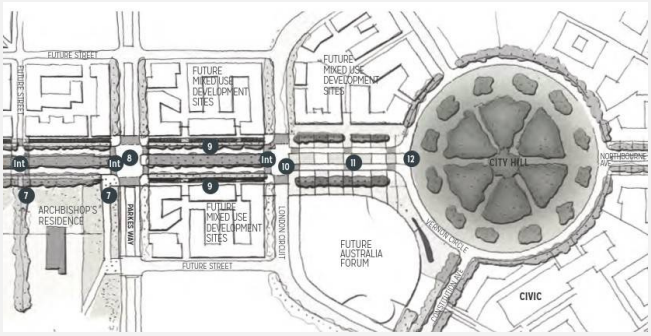
The current state of the roads does not reflect their crucial role as ceremonial and symbolic roads. The landscape is fragmented, and the character of the streets has been eroded by the dominance of cars.



The avenues are lacklustre and run down in appearance, and provide little support either for the buildings fronting them or for the uses to which these spaces are put. They act as a barrier rather than as a connector between the national triangle and its surrounding uses, as stated in the report.

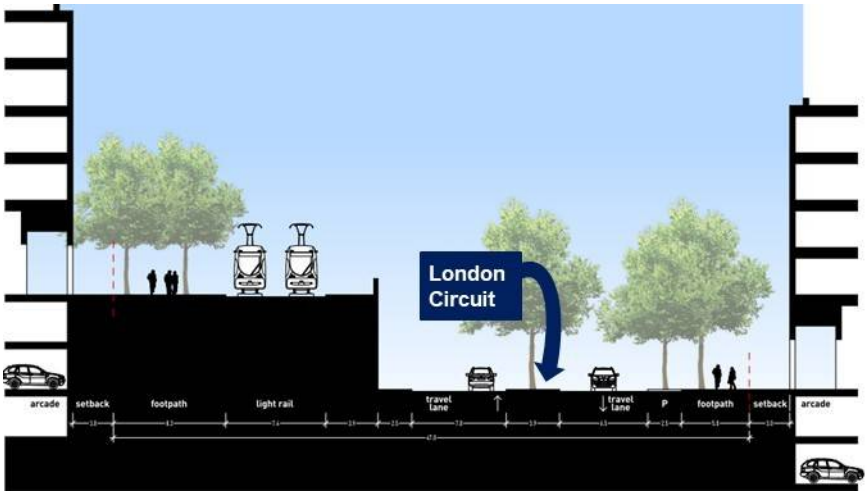
Large sections are missing from tree plantings and the avenues are difficult to cross, and are not pedestrian or cyclist friendly.

By reconfiguring the road intersections north of the lake to remove the existing high-speed free-left turns and replace them with signalised intersections, the avenue template will be established along the northern section of Commonwealth Avenue. Pedestrian and cycle use will be greatly improved, and new sites for mixed-use development within West Basin will be made possible. This includes London Circuit being raised, and a new signalised intersection being introduced (refer number 10 in figure below).



In addition, if London Circuit is not made at-grade with Commonwealth Avenue, the development of C2WLR will have an impact on the streetscape and urban amenity outcomes. Should C2WLR proceed with a grade-separated intersection, London Circuit will require an 80 to 100-metre-long retaining wall rising to over 7 metres high. This will create sterile frontages for blocks located in this area which will in turn limit development use and viability (refer Figure 17).

Figure 17 Current configuration of London Circuit with C2WLR



Pedestrian experience and connectivity between the City and the Lake

The long-term development and fast growth in the City Centre will rely upon a robust street network readily accessible and safe for pedestrians, bikes and vehicles.

The current road configuration prioritises vehicles above active travel, with the area south of London Circuit experiencing stunted levels of pedestrian activity despite being in the City Centre near employers and residential dwellings (Figure 18 (left image)). Although vehicles are prioritised, the road layout around the Project area is not easily legible. *The City Plan* suggests that the hierarchy of streets is not clear due to factors such as traffic volumes and the location of active areas.

One of the largest deterrents for active travel is the perception that an area is unsafe, due to reasons ranging from poor street lighting to inaccessible crossings[24]. Inadequate crossings in the area make it unsafe for pedestrians and cyclists to travel between the City and the Lake (refer Figure 18 (middle image)). Active travel crashes have been on the rise in Canberra[25]. The majority of Canberra's active travel crashes occur in the City, with 6% of Canberra's total pedestrian crashes and 15% of cyclist accidents since 2012 involving London Circuit[26].

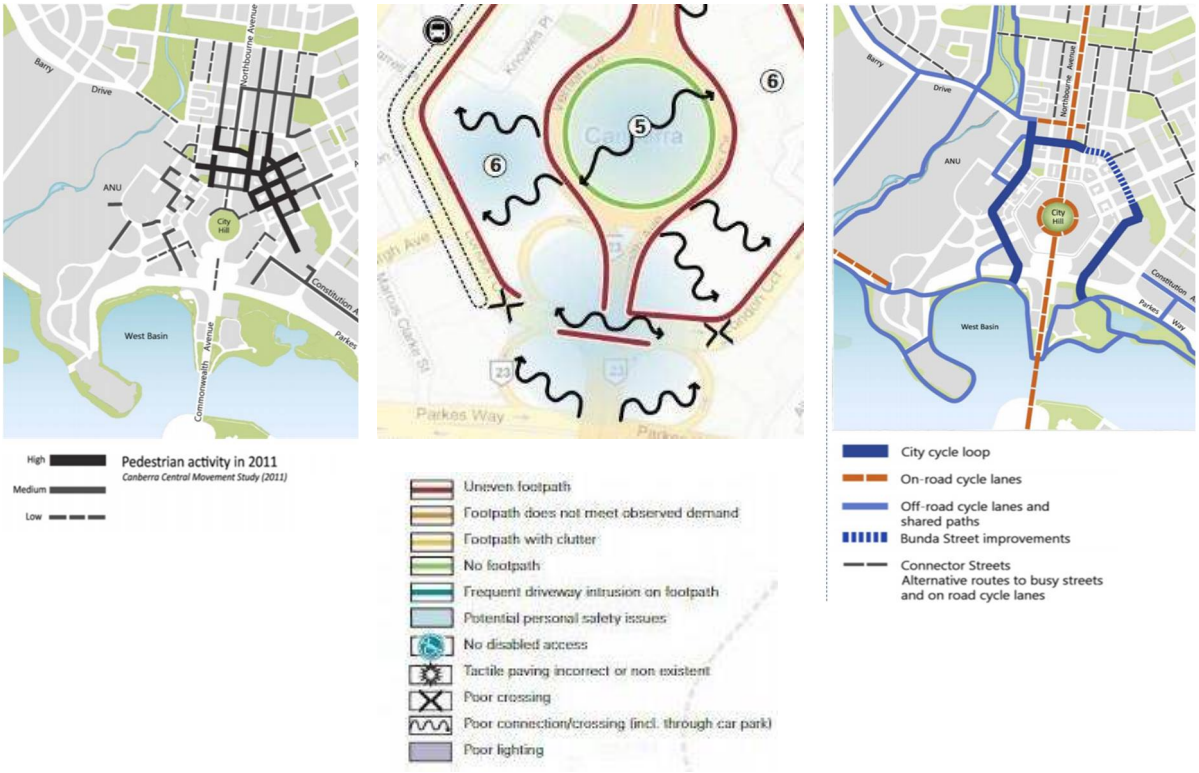
Furthermore, there are no off-road cycle lanes or shared paths around the intersection area (Figure 18 (right image)).

[24] *http://www.bbc.com/future/story/20131018-walk-to-work-transform-your-city*

[25] *216 ACT Road Crash Report*

[26] *Department of Justice Safety and Emergency*

Figure 18 Pedestrian activity (left image), connectivity (middle image) and active travel pathways (right image) [27]



To enhance connectivity for pedestrians and cyclists, and create a safe and harmonised environment, a more accessible road network in the southern part of London Circuit is needed.

[27] *ACT Government (2014) The City Plan and ACT Cycling and Pedestrian Network February 2011*

4 Options Analysis

Key messages

- There are significant interdependencies and synergies with future infrastructure projects and developments in the city precinct, including Section 63, C2WLR, Section 100, Stormwater Augmentation, Edinburgh Avenue, Commonwealth Avenue / Vernon Avenue Circle signalisation, Parkes Way, West Basin, West Road and Commonwealth Avenue Bridge, as well as the planned development of the south-west and south-east cloverleaves
- Together, these projects will help to solve the current and future challenges for the area and help the Territory to deliver the planning intent and vision for Canberra as outlined in *Canberra: A Statement of Ambition, The City Plan, The National Capital Plan* and *The Griffin Legacy*
- As such, it is essential that these projects are considered holistically from a city planning perspective so that the needs of the entire area are effectively addressed. The appropriate timing and sequencing of investments will be critical in optimising city planning and strategic transport outcomes while maximising the economic return to Government. In this context, it is imperative that future infrastructure projects are implemented using a staged approach with certain projects activating others
- Proceeding with this Project now is necessary to coincide with changes to the public transport system, land release priorities, and City Hill and West Basin developments. This Business Case emphasises that the only opportunity to develop an at-grade intersection will be prior to the release of Section 63 land and construction of C2WLR as:
    - **Section 63:** The London Circuit and Commonwealth Avenue connection will impact on the site boundary for Section 63 as well as the verge layout designs and grading levels at the intersection. The consequence being changing road grading and verge layout construction, delays and additional works, design rework and site area changes. To mitigate this risk, the City Hill Development Plan suggests designing / constructing these works prior to the development of Section 63, Block 20 (the Site) and ensuring the proposed road and verge layout design matches into the Site Infrastructure works
    - **C2WLR:** Should an at-grade intersection be constructed, the C2WLR route alignment would need to be amended to allow light rail vehicles to travel along the median of London Circuit, to the median of Commonwealth Avenue through the at-grade intersection (as opposed to ascending a ramp to Commonwealth Avenue). Following the construction of C2WLR (within the Project area), developing an at-grade intersection between London Circuit and Commonwealth Avenue will not be viable
- The Project should be pursued as a priority, with consideration given to the interaction with Section 63 and C2WLR from a design and timing perspective.
- This Business Case recommends that the Project, as outlined in Chapter 5, proceed.

4.1 Strategic Solutions Analysis

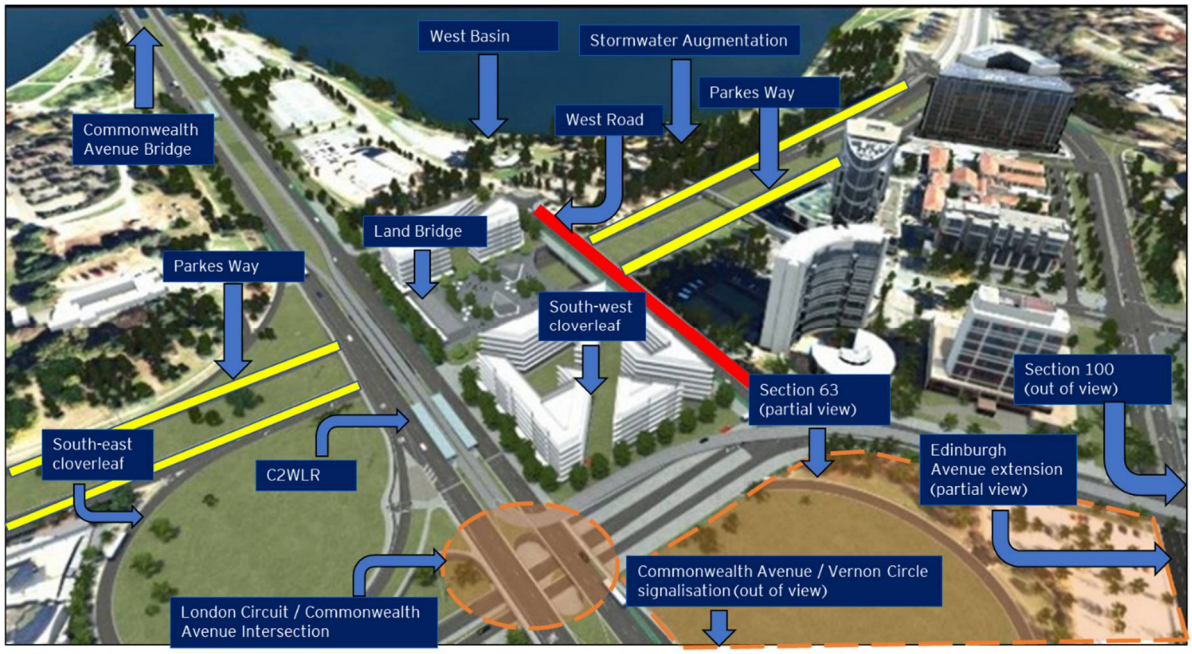
There are various strategic plans, detailed below, that outline the vision for Canberra that may be delivered through infrastructure projects around the City Centre. These projects – including Section 63, C2WLR, Section 100, stormwater augmentation, and projects involving Canberra's key transport avenues and the planned release of the south-west and south-east cloverleaf sites – are all interdependent and need to be considered in a holistic manner to ensure their sequencing is optimal to meet strategic outcomes, maximise Government revenue and minimise any impacts on the community during construction.

Significant interdependencies and synergies with future projects in the area

The ACT Government has made a clear commitment to improve transport and movement in the City Centre and to revitalise the City area. The current infrastructure investment priorities for the ACT road network in the area coincide with planning and development which is underway to revitalise currently unutilised and underutilised land around West Basin and City Hill (refer Figure 19).

These projects include Section 63, C2WLR, Section 100, Stormwater Augmentation, Edinburgh Avenue, Commonwealth Avenue / Vernon Avenue Circle signalisation, Parkes Way, West Basin and Commonwealth Avenue Bridge, as well as the planned development of the south-west and south-east cloverleaf sites (refer Figure 19).

Figure 19 Projects in planning or development in and around West Basin and City Hill



These projects are described in more detail in Chapter 2. Table 8 provides further detail around linkages with the London Circuit and Commonwealth Avenue intersection and highlights key interdependencies.

Table 8 Key infrastructure projects impacting the London Circuit and Commonwealth Avenue intersection

Project	Key considerations
South-east cloverleaf development site	The south-east cloverleaf site faces London Circuit and Commonwealth Avenue and is planned for future mixed use development as part of the land release program. It has a direct interface with the Project. Without an at-grade intersection, the frontage between the south-east block and London Circuit will be sterile, and active travel and urban amenity will be reduced.
South-west cloverleaf development site	The south-west cloverleaf site faces London Circuit and Commonwealth Avenue and is planned for future mixed use development as part of the land release program. It has a direct interface with the Project. If London Circuit is not at-grade with Commonwealth Avenue, part of the south-west block will be utilised for a ramp for C2WLR, resulting in a decrease in developable land area of 1,400 – 1,500m^2. In addition, C2WLR will construct a retaining wall along London Circuit if the intersection with Commonwealth Avenue is not at grade, resulting in a sterile street frontage with the south-west block.
Section 63	The London Circuit and Commonwealth Avenue connection will impact on the site boundary for Section 63 as well as the verge layout designs and grading levels at the intersection. The consequence being changing road grading and verge layout construction, delays and additional works, design rework and site area changes. To mitigate this risk, the City Hill Development Plan suggests designing / constructing these works prior to the development of Section 63, Block 20 (the Site) and ensuring the proposed road and verge layout design matches into the Site Infrastructure works.

Project	Key considerations
C2WLR	This Project is being considered for possible integration with C2WLR (in the Project area). Should an at-grade intersection be constructed, Project works could include elements such as the appropriate sub-grade to support light rail tracks within the median, conduits for services, and temporary landscaping. If an at-grade intersection is constructed, the C2WLR route alignment would need to be amended to allow LRVs to travel along the median of London Circuit, to the median of Commonwealth Avenue through the at-grade intersection (as opposed to ascending the existing ramp to Commonwealth Avenue). If an at-grade intersection is not constructed, following the construction of C2WLR (within the Project area), developing an at-grade intersection between London Circuit and Commonwealth Avenue will not be viable.
Section 100	An assessment of the impact on the road network of traffic generated by a proposed development on Section 100 undertaken by SMEC showed that increased traffic would cause the western part of Vernon Circle and the Knowles Place extension to operate over capacity by 2031.[28]
Stormwater Augmentation	The proposed augmentation to stormwater drains will require works on Parkes Way and will constrain future works on the south-west cloverleaf when they occur.
Edinburgh Avenue	Under the terms of the deed for sale for Section 100 to Morris Property Group development (adjoining neighbouring site), there is a requirement for them to complete the Edinburgh Avenue extension by June 2020.
Commonwealth Avenue / Vernon Avenue Circle signalisation	Proposed upgrade to a signalised intersection including works to straighten the verge on the corner of Commonwealth Avenue and Vernon Circle.
Parkes Way	Current scope includes Coranderrk Street / Parkes Way land realignment and signalisation in the short term, with further projects anticipated to be required to cater for traffic growth in the longer term.
West Road	With the planned future developments of the south-west and south-east cloverleaves, secondary access to West Road will be convoluted and circuitous as there will be blockages to movement and difficulties in deciphering the road network. It is anticipated that there will be additional costs associated with connecting the south-west cloverleaf development site from West Road if the Parkes Way project proceeds and the grade separated intersection remains. **Figure 20 Image of West Road** 

[28] *SMEC (2018) Traffic Report – City Section 100 Traffic Study, prepared for Spiire, 13 September 2018*

Project	Key considerations
West Basin	The development will also improve accessibility between the City and the waterfront. However, the benefits of the Parkes Way project, which include helping to improve the connectivity between the City and West Basin, will not be fully realised if the existing barrier at the intersection is not addressed.
Commonwealth Avenue Bridge	Potential developments planned which enhance the prominence of Kings and Commonwealth Avenues as grand boulevards with reduced travel speeds that encourage public transport use[29].

Summary

As this Business Case demonstrates, there are significant interdependencies and synergies with future infrastructure projects and developments in and around the Project area. Together, these projects will help to solve the current and future challenges facing the City precinct and help the Territory to future proof the City. The projects will also deliver the planning intent and vision for Canberra as outlined in *Canberra: A Statement of Ambition*, *The City Plan*, *The National Capital Plan* and *The Griffin Legacy*.

As such, it is essential that these projects are considered holistically from a city planning perspective so that the needs of the entire area are effectively addressed and the vision for central Canberra is realised. The appropriate timing and sequencing of investments will be critical in optimising city planning and strategic transport outcomes while maximising the economic return to Government. In this context, it is imperative that future infrastructure projects are implemented using a staged approach with certain projects activating others.

4.2 Recommended Strategic Solution

As described throughout this Business Case, the Project will raise the southern portion of London Circuit, so that London Circuit and Commonwealth Avenue are at-grade and a signalised traffic intersection of the Circuit and the Avenue is formed. Proceeding with this Project now is necessary to coincide with changes to the public transport system, land release priorities and Hill and West Basin development. This Business Case emphasises that raising London Circuit to be at-grade with Commonwealth Avenue will no longer be a viable option after the release of Section 63 land and construction of C2WLR (specifically within the Project area).

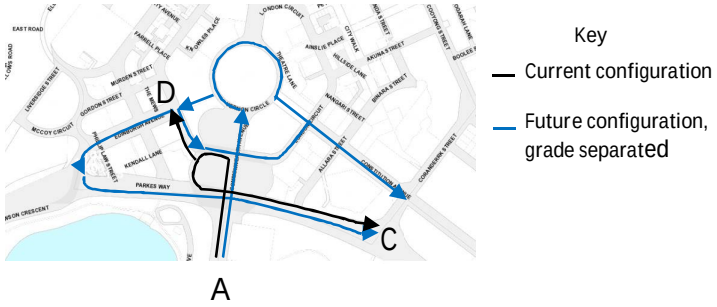
4.3 Project Solutions Analysis

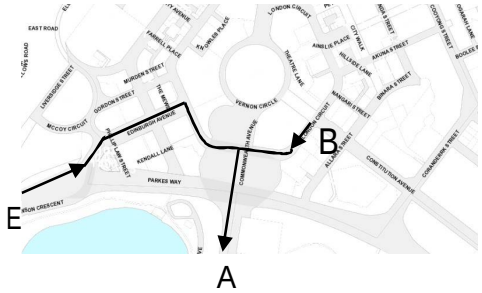
This Business Case has considered two project options:

- **Business as usual (BAU):** the London Circuit and Commonwealth Avenue intersection remains grade separated
- **At-grade:** the London Circuit and Commonwealth Avenue intersection is made at-grade

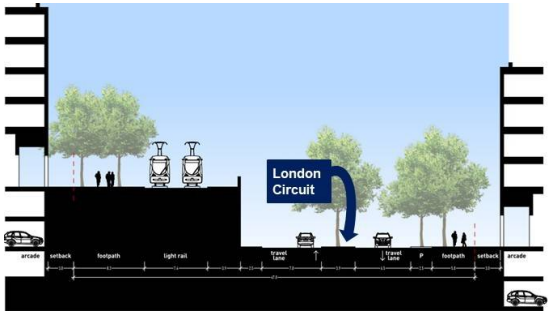
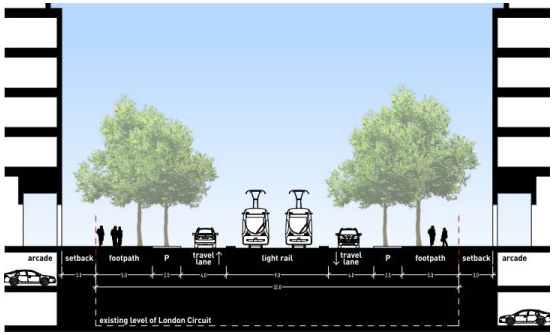
The following section provides a relative analysis of the two project options considered. Comparable case studies are outlined in Appendix G.

[29] *National Capital Authority (2017) Kings & Commonwealth Avenues Draft Design Strategy, https://www.nca.gov.au/sites/g/files/net791/f/consultation/Kings%20and%20Commonwealth%20Avenues%20Design%20Strategy_Final%20LR.pdf*

	BAU	At-Grade
Future proofing the road network	**South-west block:** With the south-west cloverleaf in place, the journeys between points A and D, and points A and C are simple. However, if the south-west block is released in the future, and the south-west cloverleaf removed, the re-routing of traffic from A to D and A to C will rely more heavily on the use of Vernon Circle with a grade-separated intersection. **Figure 21 London Circuit grade separated** 	**South-west block:** With an at-grade intersection, shown in Figure 22, traffic takes a left turn at the intersection for the A to D journey (rather than using Vernon Circle). The A to C journey would be the same as for BAU, as northbound traffic would not be able to turn right at the London Circuit / Commonwealth Avenue intersection. **Figure 22 London Circuit at-grade** 

BAU	At-Grade
South-east block: The current journey between points E and A and B and A is simple, as the south-east cloverleaf is in place. If the south-east block is released in the future and the south-east cloverleaf is removed, as **Figure 23**shows, with London Circuit remaining grade separated, the re-routing of traffic from B to A will be straightforward, but the E to A journey will become complex and, again, require the use of Vernon Circle. **Figure 23 London Circuit grade separated**  	**South-east block:** The re-routing becomes simpler with an at-grade intersection, as shown in Figure 24 below. Travelling from B to A will require a left turn at the intersection. Traffic travelling from E to A could go along Edinburgh Avenue, turn right onto London Circuit, and turn right onto Commonwealth Avenue. An at-grade intersection would therefore help to future proof the road network if the south-east block is removed in the future. **Figure 24 London Circuit at grade** 

	BAU	At-Grade
Land use planning	There are plans for the C2WLR to traverse the London Circuit and Commonwealth Avenue intersection, resulting in the realignment of the south-west cloverleaf if the London Circuit and Commonwealth Avenue intersection is grade separated and the closure to traffic of the slip lane between Commonwealth Avenue northbound and London Circuit westbound. The development site currently occupied by the south-west cloverleaf is expected to be released as part of the long term land release program, but the developable area will not be as large if the ramp is built to accommodate C2WLR. The south-east cloverleaf would either not be released or be released at a much later date, delaying the realisation of associated benefits. If the C2WLR project proceeds and London Circuit remains grade separated, the proposed ramp for C2WLR will use 1,400-1500m^2 of the block to the south-west of the intersection.	The Territory's broader plan includes the phased removal of the south-west cloverleaf to open land up for development, improve urban amenity outcomes and enhance the connection between the City and the Lake. Proceeding with the development of an at-grade intersection would support future land releases and projects underway, or planned for in the future, to develop the area. If the south-west and south-east cloverleaves are removed in the future, the developable area of those blocks will be maximised with an at-grade intersection. It is anticipated that the additional 1,429m^2 will be able to be released (currently anticipated to be unable to be released due to of C2WLR). As part of the economic appraisal for the Project, it has been estimated that this would result in a $7.4m reduction in land value based on a land valuation undertaken by Knight Frank in early 2019 (see Chapter 7). This aligns with The Griffin Legacy which proposes releasing sites for new development for government and private sector investment, including land currently locked up in over-scaled road reservations and cloverleaf intersections.

	BAU	At-Grade
Placemaking and urban realm	Pedestrian and cyclist access between the City and the Lake will continue to be constrained. Pedestrians will be required to negotiate a complex route to connect between the west and eastern sides of London Circuit. This will impact on active travel, a key priority for the Territory[30]. Secondary access to blocks is convoluted and circuitous. Given the poor accessibility to development sites, other NCA planning approvals will be challenging to obtain for the underutilised sites in West Basin. Developments undertaken in the area, including West Basin and City Hill, would fail to realise their full benefits as urban amenity outcomes will be significantly compromised. For example, with the C2WLR London Circuit will require an 80 to 100-metre-long retaining wall rising to over 7 metres high, creating sterile frontages for blocks located in this area. This will in turn limit development use and viability (refer Figure 25 below). **Figure 25 BAU London Circuit with C2WLR** 	By creating an at-grade intersection between London Circuit and Commonwealth Avenue, the understanding of the network is legible and clear. Access to secondary entrances on blocks can be easily understood. Strong active frontages can be created for both London Circuit and Commonwealth Avenue. Furthermore, the active frontages are continuous and can readily link with the east and west city precincts. It is anticipated that this improved urban amenity outcome will result in additional value for the surrounding sites, as outlined in the Project's economic appraisal in Chapter 7. This aligns with the planning intent for Canberra as outlined in *Canberra: A statement of Ambition* and the *City Plan* which imagines London Circuit as the City's high street with activated street frontages. **Figure 26 At-grade London Circuit with C2WLR** 

[30] *ACT Government (2015) Building an integrated transport network – active travel, https://www.transport.act.gov.au/__data/assets/pdf_file/0006/1247064/Active-Travel-framework-ACCESS.pdf*

Summary

The comparative analysis of the two project options, BAU and at-grade, demonstrate that the at-grade option is the preferred option. Proceeding with the at-grade option will mean that future journeys will be redistributed from Vernon Circle, with a clearer road hierarchy and more legible network in the City Centre. Proceeding with an at-grade intersection would also complement the various land releases and projects underway or planned for the future, providing additional developable area in the case of the south-west cloverleaf site.

Furthermore, an at-grade intersection will mean that strong active frontages can be created, while under BAU the retaining wall on London Circuit for C2WLR will create sterile frontages for blocks located in the area. This has been estimated to have a positive impact on land values in the surrounding sites (see Chapter 7).

4.3.1 Recommended Project Solution

This Business Case recommends that the Project, as outlined in Chapter 5, proceed.

Proceeding with the at-grade option will provide a clearer road hierarchy and more legible network in the City Centre. An at-grade intersection would also complement the various land releases and city shaping projects underway or earmarked for the future.

Furthermore, an at-grade intersection will mean that strong active frontages can be created. The active frontages will be continuous and will be able to readily link with the east and west City precincts.

4.4 Treasury review – needs and options analysis

Treasury directorate to sign off that a case for the project is present in the Business Case.
Review 2 (Treasury) Officer Name: _____
Signature: _____
Date: _____

5 Project Outline

Key messages

- The Project raises London Circuit to be at-grade with Commonwealth Avenue
- In making the London Circuit and Commonwealth intersection at-grade the transport network will be better aligned with future intended land release activities, developable area will be maximised when surrounding areas are developed, and an attractive, people-focused and high quality public realm will be created
- The Project will enhance connectivity for cyclists and pedestrians between the city and the Lake by removing the grade separated barrier and improving legibility
- The scope of works includes:
    - **Traffic management works:** Temporary roads for diversions and concrete barriers
    - **Landscaping – general:** Dryland grassing to banks including topsoil from stockpiles
    - **Traffic signals:** Four-way signalised intersection (London Circuit and Commonwealth Avenue) and three-way signalised intersection (West Street and London Circuit)
    - **Street lighting:** Road light pole including conduit / cable allowed at 30 m centres
    - **Utilities:** Utilities provision and relocation
    - **Civil works:** Removal and demolition works, pavements, pavement drainage kerbs and road furniture
    - **Planning and design:** planning and design activities for the at-grade intersection, as well as West Road and East Road due to their significant interface with the land development sites released by the Project
    - **Verge works:** verge works of approximately 4m in width and 890m in length (not included in Project outturn cost)
- The scope of services includes:
    - **Operations:** this includes operation of traffic lights and street lights
    - **Maintenance:** this includes landscape maintenance, hard facilities management (for example, pavement replacement and repair), and soft facilities management (for example, road cleaning, furniture cleaning)
- To minimise traffic impacts and support appropriate traffic management activities, the Project will be carefully planned and staged. In the detailed design stage, an analysis of the optimal sequencing of works will be undertaken to understand and mitigate impacts

5.1 Project overview and impact

The Project is comprised of a series of works to raise London Circuit to be at-grade with Commonwealth Avenue. The Project will indirectly support the development of two parcels of land on the south-west and south-east corners of London Circuit and Commonwealth Avenue and permit the delivery of a high-quality public realm along these streets, adding value to surrounding sites.

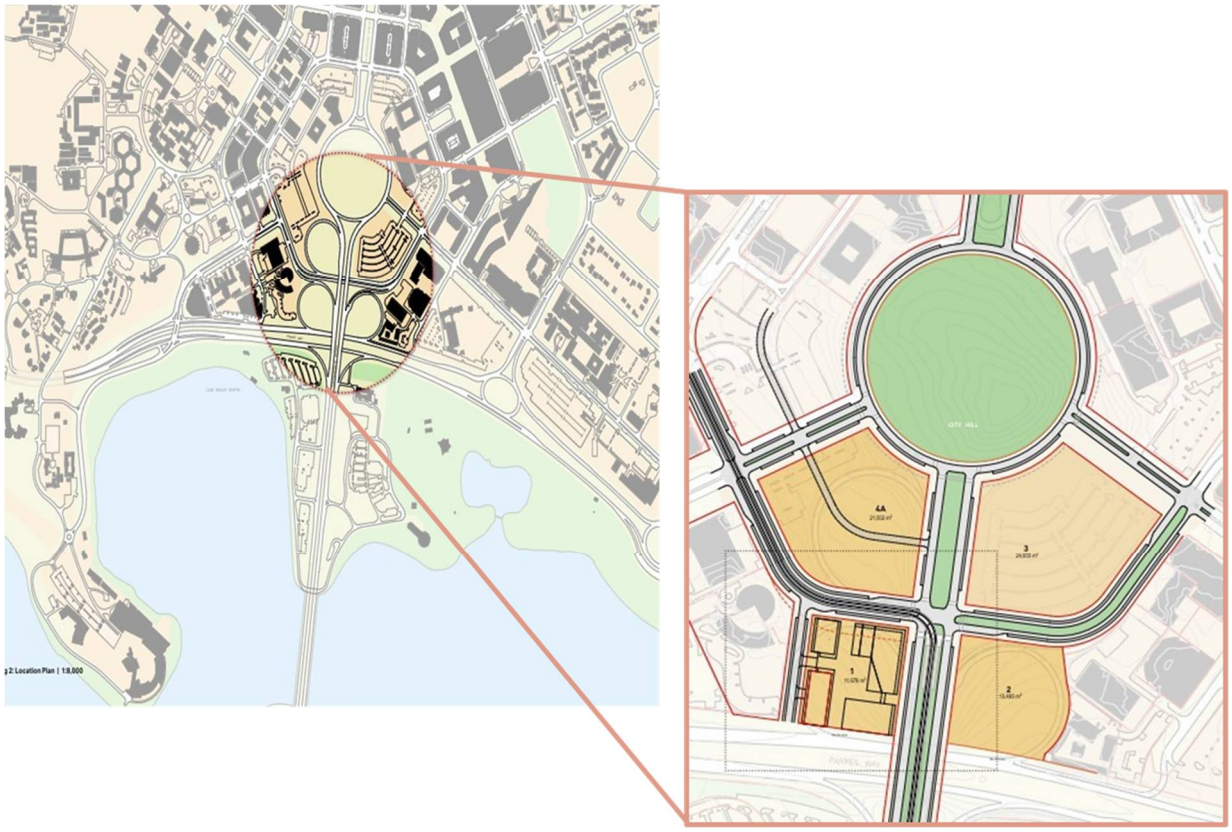
Key elements of the Project include:

- Raising the southern portion of London Circuit from the QT Hotel in the west to 255 London Circuit in the east, the objective being to make London Circuit to be the same level as Commonwealth Avenue and to form a signalised traffic intersection of the Circuit and the Avenue
- Temporary roadworks to create diversions during construction

- The demolition and removal of the bridge portion of Commonwealth Avenue that is currently grade separated from London Circuit, retaining walls, all existing roads, medians and sidewalks
- The relocation of utilities currently under London Circuit
- Re-grading with imported fill of the new road, median and sidewalks
- The creation of a retaining wall to the south of London Circuit, west of Commonwealth Avenue
- Construction of sidewalks to be limited to 1.5m wide and to be standard finished concrete[31]
- Earth batters from the roadway into the potential new development sites resulting from the imported fill to be at 1:4 batters
- Planning and design works for East Road and West Road due to their significant interface with the land development sites released by the intersection

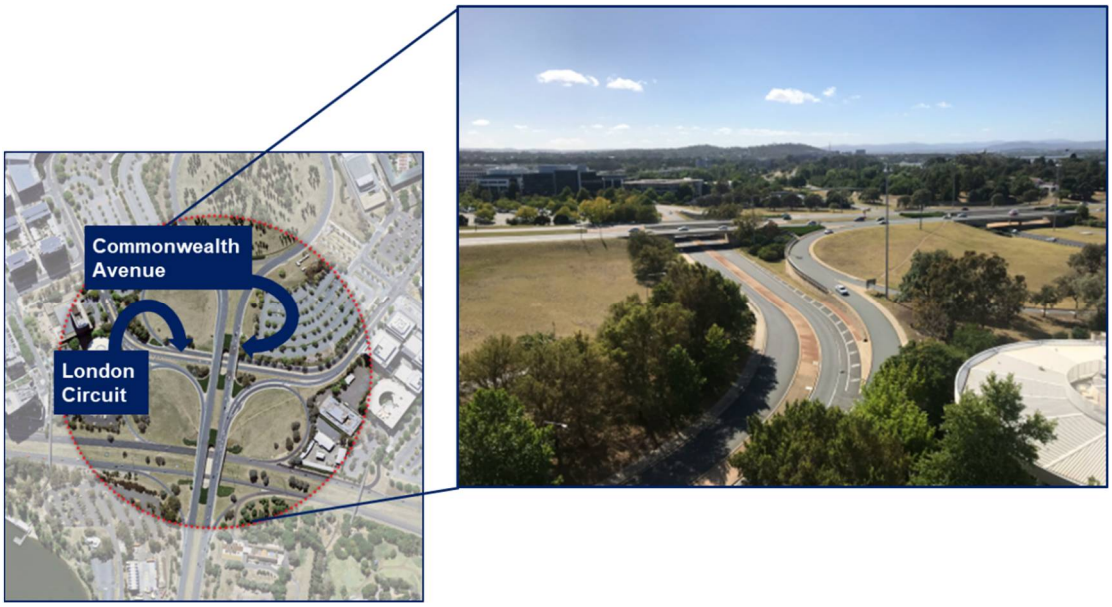
Figure 27 and Figure 28 below provide a high level overview of the works to be undertaken as part of the Project, including the current configuration of the intersection.

Figure 27 Raised London Circuit



[31] *It is anticipated that landscaped and bespoke sidewalks will be required to be constructed by future land developers*

Figure 28 Project overview



The scope of works and scope of services for this Project are summarised below. Further detail on the scope of works and services is provided in the subsequent sections of this Chapter.

- The scope of works includes:
    - **Traffic management works:** Temporary roads for diversions and concrete barriers
    - **Landscaping – general:** Dryland grassing to banks including topsoil from stockpiles
    - **Traffic signals:** Four-way signalised intersection (London Circuit and Commonwealth Avenue) and three-way signalised intersection (West Street and London Circuit)
    - **Street lighting:** Road light pole including conduit / cable allowed at 30 m intervals
    - **Utilities:** Utilities provision and relocation
    - **Civil works:** Removal and demolition works, pavements, pavement drainage kerbs retaining walls and road furniture
    - **Planning and design:** planning and design activities for the at-grade intersection, as well as West Road and East Road
- The scope of services includes:
    - **Operations and maintenance:** this includes operation of traffic lights and street lights
    - **Maintenance:** this includes landscape maintenance, hard facilities management (for example, pavement replacement and repair), and soft facilities management (for example, road cleaning, furniture cleaning)

5.1.1 Land release and development

The Project aligns with surrounding land releases in the precinct as outlined in the Indicative Land Release Program for 2018-19 to 2021-22. There are four large development sites at each corner of the intersection – north-west cloverleaf (Section 63), south-west cloverleaf, south-east cloverleaf and the proposed Australia Forum site to the north-east – each slated for redevelopment as part of the long-term development outlined in *The City Plan* and in the *National Capital Plan*.

This Project would support the future development of these sites, particularly the existing sites of the south-west and south-east cloverleaves.

The Project will provide extra frontage on Commonwealth Avenue which includes 1,400-1,500m^2 in additional developable land on the south-west cloverleaf site which otherwise will be required for C2WLR (if it proceeds) and London Circuit's configuration remains unchanged.

5.1.2 Traffic changes

The Project will have a significant impact on the way that Canberrans travel to and through the City Centre as major changes occur to inner City traffic conditions.

This Project will create a new traffic light intersection on Commonwealth Avenue and consequently will divert some traffic to other routes and corridors, such as Kings Avenue. While this may incur travel time delays for some vehicles, the precise impact of this is unclear as there is the potential for travel time reductions. This is due to drivers being forced to re-evaluate the routes that they take, potentially finding a more efficient route.

Possible traffic implications of each specific component of the Project are as follows:

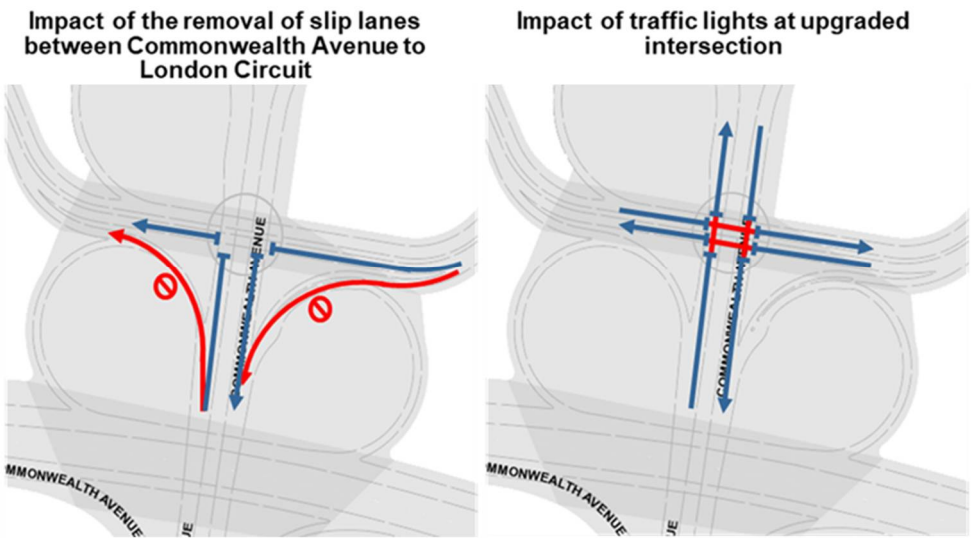
- **Traffic light introduction at intersection:** The Project will introduce traffic lights at the London Circuit and Commonwealth Avenue intersection. This will impact the currently free flowing traffic which travels north and south along Commonwealth Avenue and east and west along London Circuit as vehicles will be required to stop at the intersection. This may lead to an indicative increase in travel time of approximately 0-1 minute delay for each vehicle

- **Removal of slip lanes:** The Project will remove the slip lane that joins London Circuit eastbound with Commonwealth Avenue southbound and the slip lane that joins Commonwealth Avenue northbound to London Circuit westbound[32]. Vehicles will instead be required to travel up to the intersection through traffic lights, which may lead to an indicative travel time delay of approximately 1 minute in each direction

The traffic movement changes are outlined in Figure 29.

[32] This slip lane is anticipated to be removed by C2WLR as it will be occupied by light rail ascending from London Circuit to Commonwealth Avenue

Figure 29 Traffic implications of making London Circuit at grade with Commonwealth Avenue (without C2WLR)



Traffic modelling for 2026 indicates that maintaining the existing grade-separated crossing and removing the access ramps will mean that Vernon Circle will exceed optimal peak hour capacity, while London Circuit will be below 25% in its current configuration[33]. In contrast to removing the access ramps and keeping the intersection grade-separated in the future, by lifting London Circuit and creating a new at-grade intersection between the two roads, traffic access into City West will be enhanced, and utilisation of London Circuit increased.

The Project also provides the opportunity for parking to better service surrounding land uses, the potential for a more active street frontage and better connectivity for pedestrians and cyclists.

Staging of works within the Project
To minimise traffic impacts and support appropriate traffic management activities, the Project will be carefully planned and staged. In the detailed design stage, an analysis of the optimal sequencing of works will be undertaken to understand and mitigate impacts.

5.1.3 City to Woden Light Rail

The Project is designed to be compatible with the future development of C2WLR and is designed to ensure that the Project makes appropriate provision for the route alignment. As part of the design for this Project, C2WLR would maintain a median alignment along London Circuit which is ramped up to meet the existing level of Commonwealth Avenue, with the slope starting from the eastern edge of the QT Hotel at a gradient suitable for light rail vehicles to traverse, particularly noting that C2WLR is likely to be wire-free in that section.

The Project will maintain the route for C2WLR within the road reserve and preserves the capacity for future expansion of the light rail network to the east towards Constitution Avenue if required following future light rail network planning.

[33] AECOM (2018) London Circuit Design Review, prepared for City Renewal Authority, January 2018

It is anticipated that following further design and a constructability assessment, the Project design may be expanded to include further enabling works required for light rail, such as the subgrade infrastructure, conduits and temporary landscaping works.

5.2 Scope of works

The scope of works for this project includes traffic management works, landscaping, traffic signals, street lighting, utilities and civil works. These are outlined in more detail in Table 9 below.

Table 9 Scope of works

Component	Description
Traffic Management Works	· Temporary roads for diversions and concrete barriers
Landscaping - General	· Dryland grassing to banks including topsoil from stockpiles
Traffic Signals	· Four-way signalised intersection (London Circuit and Commonwealth Avenue) · Three-way signalised intersection (West Street and London Circuit)
Street Lighting	· Road light pole including conduit / cable allowed at 30 m intervals
Utilities	· Utilities provision and relocation, including: o Relocation of existing 150 mm DICL diameter water main including trenching and backfill o Relocation of existing set of 7x 100 mm HD uPVC diameter cable ducting for electrical and communication cables including trenching and backfill o Communication cables within conduit including connections o Electrical LV cables within conduit including connections o Connections to existing water supply o Cable pits and chambers o Relocation of Department of Finance ICON cables o Stormwater drainage
Civil Works	· **Removal / demolition:** o Demolition of existing road pavements and footpaths o Demolition of lights, barriers and road signs o Removal of existing trees o Earthworks o Compacted imported road fill o Proof roll subgrade prior to placing pavements · **Pavements:**

Component	Description
	o Asphalt pavements and surfacing o Concrete median strip/island o Footpath and pavement line marking-lanes, arrows, lines etc. · **Road furniture:** o W-beam guard rails and road signs
Planning and design	· **Planning and design for:** o The at-grade intersection o East Road o West Road
Verges *(not included in Project outturn cost)*	· **Verge works:** o Verge works of approximately 4m in width and 890m in length

5.3 Scope of services

The scope of services for this Project includes operations and maintenance, including operation of traffic and street lights, landscaping and maintenance, and facilities management. These are outlined in more detail in Table 10 below.

Table 10 Scope of services

Component	Description
Operations and Maintenance	· Operation of traffic lights · Operation of street lights
Maintenance	· Landscaping and maintenance · Hard facilities management (for example, pavement replacement and repair) · Soft facilities management (for example, road cleaning and furniture cleaning)

5.4 Review – Status of Functional Brief / Output Specification

Sign off that the functional brief/output specifications are sufficiently progressed in order to go to market under the delivery model selected and within the procurement timeline outlined in the Business Case.

Review 1 (Major Projects Canberra) Officer Name: _____

Signature: _____

Date: _____

6 Cost, Contingency and Funding Analysis

Key messages

- Total Project outturn costs (nominal, P90) are estimated to be $ m comprising:
  - $ m for the utilities package (excluding contingency), including $ m direct and $ m indirect costs
  - $ m for the D&C package (excluding contingency), including $ direct and $ m indirect costs
  - $ m in P90 contingency
- Total agency costs are estimated to be $ m (nominal) comprising procurement fees, ACTIA fees and GCO fees
- In line with other similar road projects in the Territory, the operations and maintenance cost has been calculated at 2% of the raw construction costs (nominal) per annum, ramping up over the first 2 years of operation – 0% for the first year of operations, 1% for the second year and 2% each year thereafter. Operations and maintenance costs are estimated at $ m (nominal) over 20 years
- It should be noted that while the Project includes an operations and maintenance component for the intersection, it will also result in the removal of sections of road and as such, there may not be a net increase in overall road maintenance costs for the Territory. Consequently, this approach is a conservative inclusion for the purposes of this Business Case
- The cost estimations contained in this Chapter do not represent a Project budget

6.1 Introductory notes

This Chapter outlines the cost estimate for the Project as described in Chapter 5. 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. Ultimately it is the market – not CRA – that will determine the cost of the Project through the procurement process. The cost associated with the Project will be a function of a number of factors, including:

- Final Project scope and the ACT Government's Project requirements during the procurement process, including the level of future proofing works for C2WLR that are incorporated into the scope
- Competitive tension within the bidding process
- The allocation of risk between the Territory and the private sector, and the realisation (or otherwise) of such risks

Changes to Project timing may also have a material impact on the cost estimates presented in this Chapter.

All years expressed in this Chapter are financial years.

6.2 Project outturn cost estimate

6.2.1 Methodology

The estimated Project outturn cost in delivering the Project was calculated in two stages:

1. CRA engaged an expert and well-regarded cost estimation firm with Australia-wide and ACT specific experience to calculate a non-risk-adjusted base capital cost estimate. That cost estimation firm calculated its estimate based upon:

   · Scoping design generated by TCCS' technical advisors as part of C2WLR

   · Discussions with Project stakeholders

   · Its market knowledge regarding costs

   The cost estimator has highlighted that the costs underlying this Business Case remain subject to revision due to the preliminary level of design provided for the Project. A copy of the capital cost estimate is contained in Appendix G.

2. A risk (contingency) figure was generated by CRA's commercial advisors following:

   · The receipt of inherent risk percentage ranges to reflect cost estimation risk supplied by the cost estimator

   · Contingent risk identification, allocation and quantification workshops conducted in conjunction with CRA and its advisors

   · Monte Carlo analysis conducted on risk figures (contingent and inherent) generated during the foregoing workshops (see Section 6.4)

6.2.2 Cost estimate

The total Project outturn cost is comprised of:

- **Direct cost:** costs related to construction, including traffic provision, demolition, earthworks, pavements, structures, road furniture, landscaping, drainage, street lighting and traffic lights, stormwater drainage and services relocation and/or protection
- **Indirect costs:** costs that are included as percentage allowances, including preliminaries, traffic management, contractor's design, insurance and bonds, contractor's overheads and profit
- **Escalation:** costs assume a base date of 30 June 2019. These costs are escalated annually at a rate of 2.5% (CPI)
- **Contingency:** contingency at a P90 level

The total Project outturn cost is estimated to be $ m (nominal, P90).

A breakdown of the total Project outturn cost by package is outlined in the table below.

Table 11 Projected total outturn Project cost ($'000, nominal, P90)

The main civil works D&C package is the larger package; representing % of raw (without contingency) construction costs. It includes $ m (real) in design fees to construct West and East roads, which are key future developments that have a significant interface with the land development sites released as part of this Project.

The Project outturn cost is made up of:

- % direct costs; of which the most significant contributor is the earthworks required for the Project, which make up % of the direct costs

- % indirect costs; of which the most significant contributor is contractor's preliminaries, insurances, security and supervision
- % contingency. This is discussed in further detail below

Verge works have not been included in this financial analysis as they are expected to be delivered by the developer of neighbouring sites in the form of offsite works. However, if they were to be delivered by the Territory, the estimated cost of undertaking these works verge works would total approximately $ m[34] (nominal, raw).

Further detail on the cost estimate and the Project outturn cost table above is outlined in Appendix H and Appendix I.

6.2.3 Profile of Project outturn cost

For the purposes of this Business Case, the design and construction of the Project is assumed to commence in May 2020 with practical completion in December 2022 and completion in January 2023. For the purposes of this Chapter, the projected construction timing is as presented in the table below. Information on the indicative Project timeline is outlined in Chapter 12.

Table 12 Assumed timeline of costs

Stage	Assumed Start	Assumed end
Design	May 2020	January 2023
Construction	December 2020	January 2023
Operation	February 2023	Ongoing[35]

CRA's cost estimator provided an indicative construction s-curve which was revised by the CRA to reflect updated anticipated delivery timings as outlined in the following chart which breaks down the cost estimate over the design and construction period into components.

[34] *This is the cost at June 2019 assuming $ per m² for 890m of verge works.*

[35] *While O&M costs are ongoing, a 20 year O&M period is analysed for the purposes of this Business Case*

Figure 30 Profile of the Project outturn cost ($m, nominal, P90)

The figure above highlights the following:

- Construction expenditure is expected to peak in 2022 at $ m (nominal, P90), which makes up % of the Project outturn cost
- Earthworks represent the most significant component of construction works for both packages, making up % of the nominal raw (without contingency) capital cost

6.2.4 Project outturn cost estimate notes

The following is noted regarding the Project outturn cost estimate:

- The tables above do not represent a Project budget. They represent an estimate of capital costs only. As noted in Section 6.1, a Project budget shall only be finalised following completion of the Project's procurement process
- There exist a number of risks and mitigation strategies associated with the Project which may impact upon the ultimate Project outturn cost (see Section 8.2)
- The expected Project outturn cost incorporates a P90 risk adjustment. This has regard to the work undertaken to date. The full anticipated risk profile associated with the Project is summarised in Section 6.4. The risk, mitigation and allocations are outlined in the Risk Register (see Appendices)

- The P90 risk estimate presented in this chapter was estimated based on this Project combined with the removal of the south-west cloverleaf between Commonwealth Avenue, London Circuit and Parkes Way. Therefore, there may be minor discrepancy in the risk quantification, predominantly due to the following risks:
    - Risks associated with traffic management in the area
    - Risks associated with design
    - Risks associated with access to development sites
- Any apparent errors in summation are due to rounding
- All years in tables and charts are expressed in financial years

6.3 Operations and maintenance costs

6.3.1 Methodology

To develop an indicative estimate of the operations and maintenance (O&M) costs for the Project, assumptions were made that aligned with the methodology used to develop O&M costings for other road projects in the Territory and in line with Treasury guidance.

O&M costs are projected to be 0% of the total nominal raw construction costs per annum in the first year, 1% in the second year, and 2% from the third year of operations onwards. This is shown in Table 13.

Table 13 Maintenance cost assumptions

Year	Start	End	Proportion of raw construction cost
1	1 February 2023 (FY 2022)	31 January 2024 (FY 2024)	0%
2	1 February 2024 (FY 2024)	31 January 2025 (FY 2025)	1%
3 onwards	1 February 2025 (FY 2025)	31 January 2043 (FY 2043)[38]	2%

The escalation rate of O&M maintenance costs is assumed to be 2.5%, based on CPI.

In considering O&M costs for the Project, it should be noted that while the Project includes an O&M estimate for the intersection, it will also result in the removal of sections of road and as such, there may not be a net increase in overall road maintenance costs for the Territory.

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6.3.2 O&M cost estimate

The following chart highlights the projected cost and timing of O&M per annum up to February 2043. These total $ m (nominal).

Figure 31 Projected maintenance costs (nominal, P90)

In considering this chart it should be noted that:

- The 20-year O&M period assessed in this Business Case commences in February 2023 as construction is assumed to conclude in January 2023. The O&M period considered in this Business Case concludes in 2043 (see Table 12)
- This means:
    - O&M costs commence in the second year of operations (at 1% of the total nominal cost) in February 2024, resulting in a small O&M cost in the 2024 financial year, for operations in the months of February to June 2024.
    - The analysis only includes O&M costs for 7 months of the 2043 financial year (July 2042 to start of February 2043), resulting in a slight reduction in the overall figure which would not be experienced in a practical sense as O&M costs will be ongoing

The cumulative maintenance costs to end January 2043 equate to approximately % of the total Project outturn cost (nominal, P90, excluding maintenance).

The table below outlines the projected maintenance costs per annum.

Table 14 Maintenance cost for a number of years between 2023 and 2043 ($'000, nominal)

Results	First 4 financial years				Other years from 2030 - 2043				Total
	2023	2024	2025	2026	2030	2035	2040	2043	
Total cost									

6.3.3 O&M cost estimate notes

The following is noted regarding the O&M cost estimate:

- Any apparent errors in summation are due to rounding
- All years in tables and charts are expressed in financial years
- Lifecycle costs are not included in this estimate

6.4 Contingency

6.4.1 Introduction

The Project contingency included in the Project outturn cost is made up of:

- **Inherent risks:** these are risks which are considered to have a 100% chance of occurring. These were provided by the cost estimator as a range for each component of the Project costs
- **Contingent risks:** these are risks that have a less than 100% chance of occurring. These are evaluated in a separate process to the Project costs due to their unknown nature. The process for calculating contingent risks is outlined below

6.4.2 Interpretation

In this section, P50, P75 and P90 contingency will be presented. In this regard:

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

6.4.3 Methodology

During December 2018 and January 2019, CRA hosted a series of risk allocation and quantification workshops and meetings.

The first, a risk identification and allocation workshop was chaired by CRA's commercial advisor and attended by various Territory Directorates including TCCS, IFCW and Treasury. The purpose of this workshop was to identify Project risks and potential mitigation measures.

Subsequently, risk quantification workshops and meetings chaired by CRA's commercial advisors were held. Those meetings sought attendee input into:

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

The risk quantification workshops resulted in the identification and costing, in real terms, of the Project's key construction risks. Following those workshops, the Project's commercial advisors performed Monte Carlo simulations to estimate the uncertainty levels and probability distributions associated with the Project.

Further discussions with Project stakeholders and benchmarking against other Territory projects was undertaken to refine Project risks.

The aforementioned process resulted in the determination of the Project's P50, P75 and P90 construction risk estimates. This produced the P50, P75 and P90 Project outturn cost estimates as outlined in Table 16 below.

6.4.4 Contingency results

The table below presents the results of the risk quantification process in P50, P75 and P90 terms. It includes both inherent and contingent risks.

The proportions shown in the table below are presented for the purposes of understanding the quantum of contingency and for benchmarking with other projects. It is based on the contingency calculated through the method discussed earlier in this Chapter.

Table 15 Project contingency and total Project outturn cost ($'000, nominal)

Results	P50	P75	P90
Raw construction cost			
Contingency			
Total Project outturn cost			
Contingency % of raw construction cost			
Contingency % of total Project outturn cost			

The P90 figure is included in the final Project outturn cost, at % of the total. The presentation of the P90 figure (as opposed to a P75, P50 or another figure) followed consideration of a range of factors, including

works performed to date in developing this Business Case, an assessment of the anticipated approach of bidders to the procurement process, the uncertainty surrounding further development opportunities around the site and industry Business Case norms.

Figure 32 Split of construction cost and Project contingency ($'000, nominal)

The Project contingency is predominantly driven by the following risks, which make up approximately % of the total contingency:

- The risk associated with utilities, and in ground services, including:
    - The risk that more utilities are identified requiring relocation or modification
    - The risk that regular utility upgrades are required (due to the downstream location)
    - The risk that there is a lack of integration of utilities designs, timelines and objectives between developers, stakeholders and service providers
- The risk associated with uncertainties surrounding the required future capability of stormwater assets at the intersection due to its physical location as downstream in the overall stormwater network
- The risk that the market has insufficient capacity or interest to deliver / construct the Project due to the large pipeline of existing projects in planning, procurement or delivery and the multiple projects in the area. This includes the risk that an inexperienced contractor is selected leading to performance issues

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

Figure 33 P50, P75 and P90 risks ($m, real) (left graph – inherent, right graph – contingent)

The inherent risk distribution is relatively normal around the mean. The contingent risk distribution is asymmetrical and right skewed. This shows how a low number of key risks contribute to the P90 estimate. These risks are detailed above.

6.4.5 Risk allocation

The risk allocation between 'transferred' (to the private sector) and 'retained' (by ACT Government) risk has been based on the outputs from the aforementioned risk identification, allocation and quantification exercises. The risk allocation exercise resulted in a percentage allocation of each risk as 'retained' or 'transferred' such that 100% of the risk was allocated. This percentage was weighted using the average cost and delay impact of the corresponding risk, which then made up the overall allocation percentage seen in the tables below.

Table 16 Retained and transferred allocations ($'000, nominal, P50, P75, P90)

Results	Proportion	P50	P75	P90
Retained				
Transferred				
Total				

There are several factors which have influenced the contingency needed and the amount which can be transferred. As shown in the table above, the majority of risk is retained, which is partially due to the following:

- Although the recommended delivery model affords some level of risk transfer from Government to the private sector, it does not involve the transfer of all risks to the private sector
- The retained risks shown are the indicative totals of risk to the ACT Government after mitigation strategies have been taken to minimise risk. See Appendix H for potential mitigation strategies for each risk

6.4.6 Agency Costs

Territory procurement costs were calculated to reflect the true capital cost of delivering the Project in line with The Capital Framework guidance, including:

- Procurement fees – calculated at 4% of total Project appropriation (comprised of Project outturn cost (nominal, P90) and total agency costs)
- Australian Capital Territory Insurance Authority (ACTIA) – calculated as 1% of total Project appropriation
- Government Solicitors Office (GSO) – calculated at 1% of total Project appropriation. These costs are anticipated to be required due to complexities associated with the Project's procurement and its interfaces with other surrounding projects, particularly light rail

The costs associated with each of these costs are shown in the table below.

Table 17 Agency costs ($'000, nominal)

Results	Total
Procurement fees	
ACTIA costs	
GCO costs	
Total agency costs	

6.5 Cash flow impact and funding strategy

6.5.1 Cash flow impact

The Project's impact on the ACT Budget will be a payment over the construction period for the agency and Project outturn costs as per the D&C contracts (see Chapter 8).

Given split land ownership in the Project area between the Commonwealth and the Territory, it has been indicatively assumed for the purposes of this Business Case that 30% of the Project will be a Commonwealth asset, with 70% a Territory asset. This is based on high level assumptions and a spatial assessment of the Project. A thorough assessment of the asset ownership implications will be undertaken as part of the detailed design phase.

In line with the above assumptions, 30% of Project outturn cost to complete the Project, and 100% of the operational and agency costs, have been itemised as recurrent expenditure for the purposes of the anticipated budget impact, with the remaining 70% of the Project outturn cost itemised as capital expenditure. Consequently, depreciation only occurs on the 70% of Project costs which are capitalised.

Costs associated with operations and maintenance of the Project have been excluded from the table below.

The table below provides an overview of the estimated budget impact of the Project and estimated revenue projections. Further detail on the budget impact by package is outlined in Appendix J.

Table 18 Preliminary financial impacts summary ($'000, P90, nominal)

6.5.2 Funding strategy

In considering funding for the Project, the following should be considered:

- The Project will release a parcel of land that, assuming C2WLR is constructed, would be lost under the current configuration. The release of this land, otherwise required for a ramp for light rail between London Circuit and Commonwealth Avenue, will accelerate land release according to internal long-term Territory land release planning. The total land released will be 11,250 GFA over time, worth $ [42] in 2023-24, when the development sites are assumed to be sold. In accordance with existing processes, this revenue will be returned to the Territory as a dividend, however the revenue received from these land sales presents an opportunity to provide offsetting funding.

- This Project will also result in savings to the funding required for the C2WLR project, as the ramp would no longer be necessary to allow the light rail to travel from the median of London Circuit to the median of Commonwealth Avenue

- This Project will also provide a more attractive street frontage for surrounding development sites, which may provide land value uplift to surrounding areas, such as Section 63, providing additional revenue for the Territory when these sites are sold. The land value uplift to the Section 63 and south-west and south-east cloverleaf sites is estimated to be $ m (real, 2019)

[39] *Depreciation has been calculated using the straight line method for the capitalised portion of the asset. An asset life of 30 years has been assumed, with a nil residual value. Only capital is depreciated*

[40] *This is the net incremental value of the land that is released in 2023 as a direct result of this investment. Whilst a portion of the land locked by the south-west cloverleaf is planned to be released irrespective of the Project, there is a net additional 11,250 GFA that can be released in 2023 as a direct result of this Project*

[41] *Anticipated recurrent, capital payments and depreciation, plus available offsets*

[42] *The total revenue from the land released in 2023 due to the removal of the south-west cloverleaf is $ m. Whilst a portion of this land is planned to be released irrespective of the Project, there is a net additional 11,250 GFA that can be released in 2023-24 as a direct result of this Project, totalling $ m in revenue directly attributable to this Project.*

- Given the Project is partially a Commonwealth asset and its city-building and strategic position on one of the capital's key boulevards, the Territory could pursue Commonwealth Government funding opportunities for the Project through the Infrastructure Investment Program

- The Project's recommended delivery model (see Chapter 8) notes options for integration with other projects, such as C2WLR and Parkes Way, should the delivery timing, packaging and procurement approaches for those projects allow for integration. If integration is pursued, an overall funding and financing strategy for the broader package of works should be developed that considers these projects' financing approaches to ensure successful integration.

CRA will explore these opportunities with TCCS and Treasury following consideration of this Business Case.

6.5.3 Other costs

The Project's delivery authority, CRA, will or may incur Project related costs which will not be included in the contracted amounts. In this regard:

- Per the discussion above, a P90 'retained risk' of $ m (nominal) is not transferred by the Territory to the private parties under the recommended delivery model. Please also refer to the discussion regarding retained risks in Section 8.2 (an outline of key risks, including proposed allocation, and summary of the value of retained risk)
- The delivery authority will incur costs during the procurement, construction and operational phases of the Project which are not passed to third parties (for example, costs associated with independently certifying construction works). Actual costs will be:
    - In part influenced by commercial principles adopted during the procurement process
    - Subject to the realisation or otherwise of risk events during the procurement and delivery process
    - A function of ordinary budget discussions from year to year. The is subject to future assessment

7 Economic Analysis

Key messages

- The Project is an urban renewal project that modifies the road configuration in the heart of Canberra and provides urban amenity benefits through improvements to street frontage along London Circuit and Commonwealth Avenue
- Economic analysis has been undertaken in accordance with Treasury guidelines. Given interdependencies with C2WLR, and the ACT Government's longstanding commitment to its construction, the assessment has been undertaken assuming that C2WLR is constructed. The results demonstrate the Project's potential to generate economic value for the Territory
- While traffic modelling has been used where available, the economic results are based on high-level assumptions and inputs regarding travel time delays and traffic counts and therefore should be interpreted as indicative. The analysis does not capture the full set of indirect impacts that the Project will have on road users
- As an urban renewal project, the main driver of the Project's economic benefits are city shaping benefits. These include land value uplift, as well as urban renewal and densification benefits
- This economic appraisal finds that the Project has an NPV of $ m and a BCR of 1.7

7.1 Introduction

This Chapter presents the results of the economic appraisal, setting out the potential benefits and economic outcomes that are delivered by the Project.

As agreed with Treasury, a CBA of the Project has been undertaken assuming that C2WLR goes ahead. This approach was agreed as a consequence of:

- The ACT Government's public commitment to the extension of light rail south from the city to Woden as part of its plan for a city-wide Light Rail Network for Canberra
- The significant interdependencies between C2WLR and the Project due to C2WLR traversing from the median of London Circuit to the median of Commonwealth Avenue, through the currently grade separated intersection

The Project will deliver both land use and transport benefits to Canberra's central precinct, addressing the challenges highlighted in Chapter 3. As outlined in Section 7.5, the aim of the project is to deliver the following overarching benefits for the Canberra region:

- Improved planning outcomes
- Increased connectivity and urban amenity
- A transport network that supports desired land use outcomes

The CBA assesses a range of costs and benefits accruing to transport users, operators, the government, land owners and the general community as a result of the project. The benefits presented are split into two categories:

- **City-shaping** – benefits delivered by improving city shaping outcomes, including enabling the development of well-connected residential and commercial structures and urban amenity improvements/vitalisation
- **Transport**[43] – benefits delivered as a result of changes to, or impacts on, the transport system, including direct benefits to transport users and indirect benefits such as environmental externalities

The assumptions underlying this analysis are discussed in Table 19.

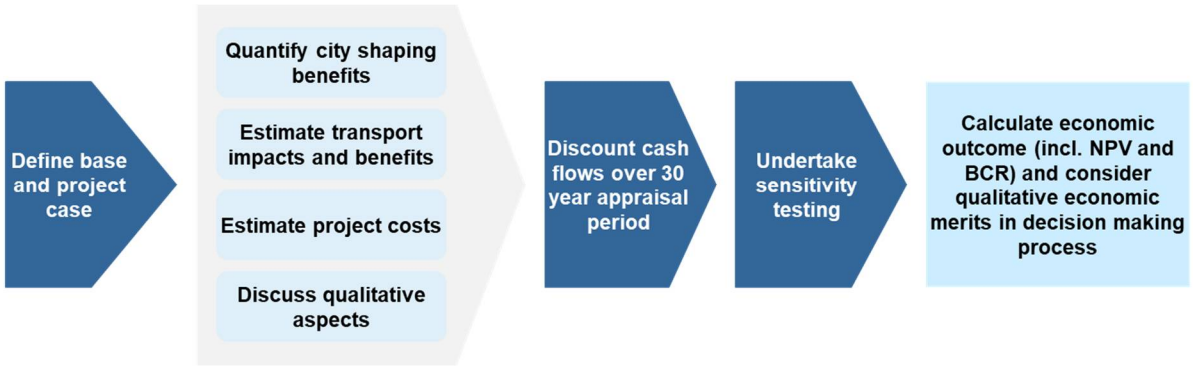
Any apparent errors in summation are due to rounding.

7.2 Methodology

The economic appraisal has been conducted in line with current guidelines, including the Australian Transport Assessment and Planning (ATAP 2018) and TfNSW Principles and Guidelines for Economic Appraisal of Transport Investment and Initiatives (updated in July 2018).

A high-level approach adopted for this economic appraisal is shown in Figure 34.

Figure 34 High-level economic methodology



Important note:

In considering the BCR outlined in this Chapter it should be noted that, while traffic modelling has been used to inform the analysis, some high-level assumptions have been made regarding anticipated travel time delays and traffic counts for certain road changes that were not included in the traffic modelling available for this assessment. Consequently, these results should be interpreted as indicative. These assumptions are discussed in more detail in the following sections.

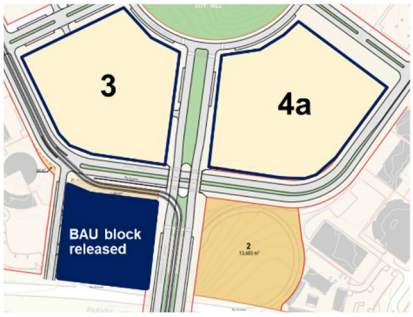
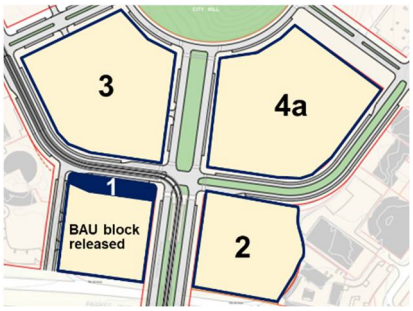
7.3 Project and base cases

The base case represents a 'business as usual' scenario under which the intersection remains grade separated. The base case includes the construction of C2WLR and the continuation of existing programmes, such as proposed upgrades to the road network as outlined in the table below.

[43] *As full traffic modelling was not available, this analysis is a high-level indication of the implications of the Project. Part of the transport impact is based on high-level assumptions regarding traffic counts and traffic light intervals. It does not take the full set of indirect traffic implications into account, such as on fuel consumption, changes in traffic patterns, and implications to users of other areas of the road network. See Appendix K for further information*

The Project case is described in the table below, with further information in Chapter 5.

Table 19 Base case and project case assumptions

	Base Case	Project Case
Land Use	· Land uplift as a result of C2WLR investment · The block highlighted in Figure 35 is released in 2023 **Figure 35 Base case land development sites** 	· Additional land uplift in Blocks 2 and 3 in Figure 36 · Block 1 in Figure 36 is unlocked and released in 2023 **Figure 36 Project case land development sites** 
Road	· A series of planned road upgrades across the Territory including Parkes Way Stage 1 (scope of works at December 2017[44]), which requires the removal of the south-west cloverleaf and the slip lanes joining Commonwealth Avenue to London Circuit · All road modifications necessary to accommodate light rail, including traffic lights on Commonwealth Avenue northbound and London Circuit westbound · London Circuit / Commonwealth Avenue is grade separated (BAU) with a ramp built in order to accommodate light rail	· The London Circuit / Commonwealth Avenue intersection is made to be at-grade · Road modifications required to accommodate the at-grade intersection and to enable development. This includes the introduction of traffic lights at the intersection, and the introduction of some turns between London Circuit and Commonwealth Avenue. For more information refer to Sections 7.4.2 and 5.1.2
Light Rail	· City to Gungahlin Light Rail (C2GLR) is built and in operation · C2WLR is assumed to be approved to be constructed from 2020 to 2023. The route travels alongside London Circuit to the median of Commonwealth Avenue along a ramp (see Figure 35) (route alignment as at April 2018[45])	· The London Circuit / Commonwealth Avenue intersection is made to be at-grade, with light rail travelling through the median

[44] The December 2017 scope of works for Parkes Way Stage 1 has been used for the purposes of this analysis as that is the scope incorporated into the available transport modelling. It should be noted that TCCS have subsequently made material changes to the staging of the Parkes Way project and as such references in this Business Case are not necessarily reflective of the current scope

[45] The C2WLR route alignment as at April 2018 has been used for the purposes of this analysis as that is the alignment incorporated into the available transport modelling. It should be noted that TCCS is continuing to refine the route alignment and as such references in this Business Case are not necessarily reflective of the current alignment

	Base Case	Project Case
Bus	· Canberra bus network implemented in October 2017 with modifications implemented as a result of light rail	· No change
Project timeline	· Any intersection development is assumed to follow the Parkes Way Stage 1 timeline (as at December 2017), which assumes the removal of the south-west cloverleaf and the south-east and west slip lanes between 2019 and 2021	· Timeline in line with C2WLR i.e. intersection constructed between May 2020 and March 2023
Costs	· NA	· · Operating costs have not been modelled, as the incremental difference in opex between the base and project cases will be negligible · Utilise approximate enabling costs based on apportioned Section 63 land development costs, totalling $ m (real)

The results take into account traffic model outputs, as well as adjustments to account for non-permitted right turns at the Commonwealth Avenue / London Circuit intersection; discussed in the next section.

It should be noted that the assumptions above have been used for the purposes of the economic appraisal and transport modelling. Future government decisions may differ from these assumptions and consequently impact on the benefits realised by the Project.

Detailed assumptions underpinning the economic appraisal for the Project are outlined in Appendix K.

7.4 Project Impacts

7.4.1 Land use impacts

In the base case, the removal of the south-west cloverleaf releases a parcel of land in the centre of Canberra for development, dedicated to residential and commercial use. The Project enables the release of a larger portion of this central land, increasing the development area and therefore land value. The estimated GFA enabled in the base and project case is shown in Table 19.

46

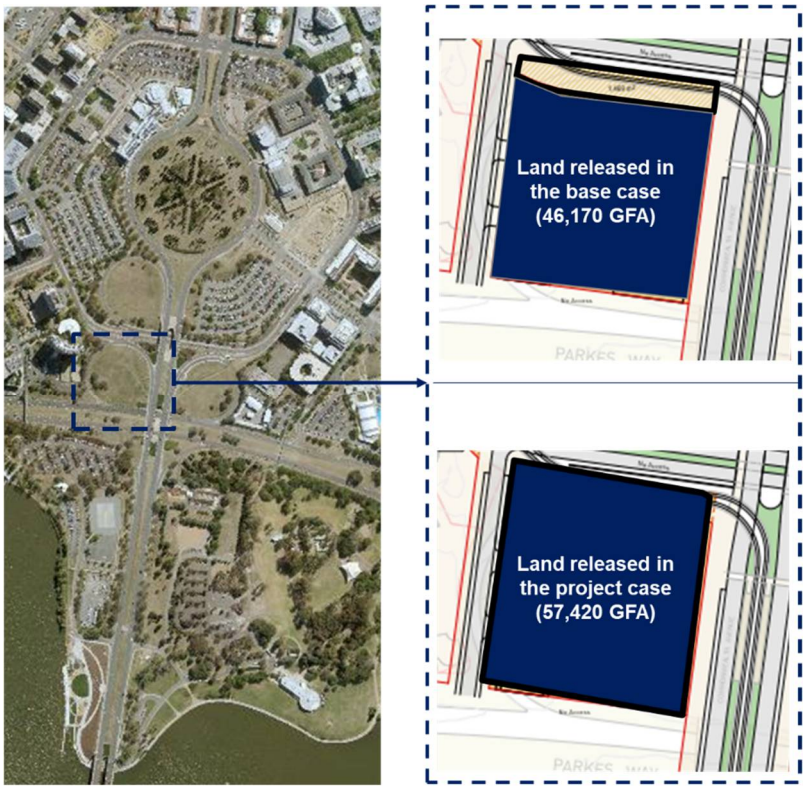
Table 20 Approximate GFA enabled

Scenario	Base Case	Project Case	Incremental land released
Residential dwellings[47]	277	344	67
Commercial GFA	18,468	22,968	4,500
Total GFA	**46,170**	**57,420**	**11,250**

As outlined above, 46,170m^2 of GFA is enabled in the base case as the south-west cloverleaf is removed as part of Parkes Way Stage 1. However, 11,250m^2 remains locked permanently in the base case in order for C2WLR to travel along a ramp between the median of London Circuit and the median of Commonwealth Avenue.

In the project case, light rail can instead travel along the London Circuit median, then cross the at-grade intersection to travel along the median of Commonwealth Avenue. The ramp is no longer required, meaning that an additional 11,250m^2 of GFA is released for development, bringing the total GFA released to 57,420m^2.

Figure 37 Land release in the base and project case



Furthermore, as a result of enabling at-grade street frontage around the intersection, the value of the adjacent sites are likely to increase. This has been quantified in the results through an estimation of the

[47] *Based on an average dwelling size of 100m^2- COX, City Hill yield analysis and urban design study*

benefits derived from better utilisation of retail space at street-level when the intersection is made to be at grade.

7.4.2 Transport Impacts

Establishing an at-grade intersection for London Circuit and Commonwealth Avenue will have a number of impacts on the transport network in the immediate and surrounding local areas.

The removal of the south-west cloverleaf and west and east slip lanes are included in the base case and consequently the impact of these changes is already factored into the base case. The removal of the south-east cloverleaf is subject to further consideration and as such, the impacts of this change are not included in this Business Case.

Further traffic implications are detailed in this section. Traffic modelling was available to model most traffic impacts, but some manual adjustments have been made (detailed below).

The road changes that occur between the base case and project case are:

- The introduction of signalised movements for vehicles travelling eastbound on London Circuit and southbound on Commonwealth Avenue through the intersection. In the base case, vehicles do not have to stop, but in the project case must pass through traffic lights ***(included in traffic modelling)***

- The introduction of further signalised movements for vehicles travelling northbound on Commonwealth Avenue and westbound on London Circuit. In the base case, vehicles must wait for the light rail to travel across the respective lanes. This is not required in the project case, but an intersection with longer intervals will be introduced to allow for the movement of vehicles ***(included in traffic modelling)***

- The introduction of some permitted turns between London Circuit and Commonwealth Avenue (all left turns and limited right turns) through signalised intersections. In the base case, no movements are allowed between London Circuit and Commonwealth Avenue ***(not included in traffic modelling, adjustment made as shown below)***

Non-permitted turns between London Circuit and Commonwealth Avenue

The traffic modelling available for this analysis does not accurately reflect the turns that will and will not be permitted between London Circuit and Commonwealth Avenue in the project case. Therefore, high-level assumptions have been made based on traffic counts and assumed traffic light intervals in order to approximate the transport impacts of the Project. Sensitivities have been undertaken on the penalties described below to test the impact on the results.

The following traffic movements are permitted in the traffic modelling but will not be permitted under the planned intersection design:

- Right turn from Commonwealth Avenue northbound to London Circuit eastbound

- Right turn from London Circuit westbound to Commonwealth Avenue northbound

- Right turn from Commonwealth Avenue southbound to London Circuit westbound

Right turns from London Circuit eastbound to Commonwealth Avenue southbound are permitted both in the traffic modelling and in the intersection design, so no adjustment has been made in relation to this movement.

The assumptions underlying these adjustments can be found in Appendix K.

Right turn from Commonwealth Avenue northbound to London Circuit eastbound

Currently, traffic turning right from Commonwealth Avenue northbound to London Circuit eastbound does so by utilising the north-western cloverleaf. Therefore, traffic counts are available for vehicles making this turn. It is assumed that with the intersection at grade and this right turn movement not permitted, the same number of vehicles now must use an alternative route. A high-level adjustment has been made to account for the additional travel time required to achieve this.

Right turn from London Circuit westbound to Commonwealth Avenue northbound; and right turn from Commonwealth Avenue southbound to London Circuit westbound

While these right turn movements are not permitted at an at grade intersection, the benefits of following such routes for road users are minimal. It is more likely that road users will prefer other routes regardless of whether or not right turns are permitted. As such, it has been assumed that any benefits or disbenefits from not permitting these right turns are negligible, and as such no adjustment has been made.

7.4.3 Summary

Combined, these network impacts will affect individuals' choices and city-wide travel patterns. For example, increased car travel times as a result of the intersection could lead to more people opting to travel by public transport.

Similarly, people may choose other routes, that have a minor impact to travel time or are even faster than their original route. Research conducted in London supports the idea that changes to a transport network may result in commuters or road users choosing better travel routes. The study found that a strike on the London Underground forced commuters to re-asses their travel patterns, experimenting with new routes that often resulted in lasting changes in behaviour; and leading to improved network efficiency[48]. In the context of this Project, it is therefore possible that following changes to the road layout at the intersection, road users will benefit from travel time savings by re-assessing their travel patterns and choosing routes that optimise their travel time.

Transport modelling and a number of adjustments have been used to determine the result of these impacts. The CBA translates these results into the benefits discussed below.

7.5 Economic Appraisal

Benefits assessed in the CBA fall into two broad categories: city-shaping and transport benefits. Each of these categories are mutually exclusive. The components of each category of benefit are detailed in this section.

[48] *Larcom, S., Rauch, F. and Willems, T. (2017): "The benefits of forced experimentation: striking evidence from the London Underground network"*

7.5.1 City-shaping benefits

City shaping benefits that have been estimated for the Project include:

Land value uplift

The release of the section of land otherwise occupied by the light rail ramp will generate an economic benefit. This benefit captures the increase in land value as a benefit as well any net additional transactional taxes, such as the net incremental increase in GST on residential sales and stamp duty paid.

The project is in the heart of Canberra, where land is worth more than other areas of Canberra. It also enables a number of other city shaping projects, such as the West Basin project and other developments in and around City Hill. The project is therefore likely to induce an uplift in land value in the area and surrounding areas, beyond what is captured in the appraisal.

This Project will also provide a more attractive street frontage for surrounding development sites, which will result in land value uplift in surrounding areas, such as Section 63. With improved street frontage and better connectivity to surrounding precincts, these spaces are more likely to be used for retail or similar high-value uses, rather than lower-value options such as car parking. This will generate additional revenue for the Territory when these sites are sold. The land value uplift in the blocks immediately surrounding the intersection has been estimated by assessing the increased value of ground floor space when the street frontage is at grade.

Infrastructure cost savings

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

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

Densification benefits

Development of additional residential and commercial floor space in well-connected infill locations can have a positive impact on individuals travel patterns. Individuals residing in the City Centre opposed to the urban fringe are more likely to opt for public transport or active modes of travel opposed to car travel. This shift generates environmental benefits associated with a reduction in car travel, and health benefits from increased walking and cycle trips.

Urban amenity improvements (not quantified)

The Australian Transport Assessment and Planning Guidelines[49] examine a variety of definitions related to urban amenity and liveability, including the Urban Design Protocol’s definition which considers that urban amenity refers to the “quality of public spaces and streetscapes from a human perspective”[50].

[49] *ATAP (2018) Australian Transport Assessment and Planning Guidelines – Urban Amenity and Liveability, May 2018, https://atap.gov.au/other-guidance/urban-amenity-liveability/files/o3-urban-amenity-liveability.pdf*

[50] *Australian Government (2011) Creating Places for People: An Urban Design Protocol for Australian Cities, http://infrastructureaustralia.gov.au/policy-publications/publications/Creating-Places-for-People-an-urban-design-protocol-for-Australian-cities-2011.aspx*

In line with this, there are benefits resulting from an increase in public open space or improvements to existing public space developed as part of an urban renewal project. The Project delivers significant public amenity as the new intersection will contribute to enhancing the connectivity between open spaces and amenity within Canberra City, including West Basin, City Hill and Lake Burley Griffin, enhancing the liveability and commercial viability of the precinct.

The Project will also allow strong active frontages, which can readily link with the east and west city precinct to be created. A study by Heffernan, Heffernan and Pan[51], which explores the relationship between the quality of active frontages and public perceptions of public spaces, found that the "quality of an active frontage can significantly affect people's perceptions of a public space in terms of its safety, comfort, sociability and liveliness." The authors found that "good quality active frontages can contribute to creating successful public spaces, which can help deliver far-reaching benefits for towns and cities."

Case Study: Auckland, New Zealand

Auckland's urban growth management study is based on two concepts: liveability and a quality compact city. This paper evaluated and reported on key outcomes from 57 face-to-face qualitative interviews with residents living in medium density housing in four Auckland suburbs. Regarding views relating to quality of life and urban amenities, twenty-four interviewees related their perceptions of quality of life to concepts of neighbourhood and the availability and accessibility of urban amenities. When asked about the perceived role of urban amenities in a neighbourhood, all interviewees associated it with quality of life aspects, in particular to notions of accessibility and the convenience this brought to their lives.

Source: Allen, N. (2014) Understanding the Importance of Urban Amenities: A Case Study From Auckland, Buildings 2014, 5, 85-99, The University of Auckland

7.5.2 Transport Benefits

As previously outlined, in considering the transport benefits for the Project, it is important to note that the economic appraisal utilises the transport modelling available, as well as a travel time adjustment to account for permitted and non-permitted turns at the London Circuit / Commonwealth Avenue intersection.

Although development in well-connected infill locations has a positive transport impact on residents and workers, the development of an at-grade intersection will also impact those who use the existing road network.

Travel time impacts

Perceived travel time changes for road and public transport users as a result of changes in road infrastructure. The impact on travel time costs include costs to businesses of the time their employees and vehicles spend on travel, and costs to consumers of personal time spent on travel.

Reliability

[51] *Heffernan, E., Heffernan, T. & Pan, W. (2014). The relationship between the quality of active frontages and public perceptions of public spaces. Urban Design International, 19 (1), 92-102.*

Perceived travel time changes from impacts on travel time variability of road travel as a result of changes in congestion.

Vehicle operating costs (VOC)

A change in vehicle speeds on the network will affect vehicle operating costs, as fuel consumption and other variable vehicle costs are higher in congested than in free-flowing networks.

Health benefits

Changes to walking and cycling can influence an individual's health outcomes and the wider cost burden this outcome places on the health system.

Light rail amenity benefit

Public transport users place value on journey characteristics beyond time and cost savings. These include elements that are particularly relevant to light rail (e.g. compared with the bus), such as network legibility, reliability, comfort, permanency and physical accessibility. These 'amenity' benefits are captured as a 'discount' to the perceived incremental travel time on light rail. This benefit is captured when the Project leads to an increase in C2WLR uptake.

Externalities

Different transport modes result in the production of different environmental emissions, such as air pollution, noise, urban separation and greenhouse gas emissions. Variations in travel patterns will cause changes in these network-wide emissions.

Accident costs

The human and physical costs of accidents on the road network have been estimated for road users (car and bus) as an average cost saving per reduction in vehicle km travelled.

Public transport fare revenue

Additional fare revenue across the public transport network as a result of changes in travel patterns. Public transport fares are transfers (as opposed to true costs or savings). However, since the fares that new public transport users pay are captured as negative user benefits, the incremental revenues from fares received by the operator must be counted as an 'offsetting' benefit.

7.6 Results

7.6.1 City shaping benefits

The land value uplift estimated below includes the release of the land otherwise occupied by the light rail ramp, as well as the estimated increase in value for surrounding sites as a consequence of the more attractive street frontage.

The benefits of this is shown in the table below.

Table 21 City shaping benefits ($m, discounted at 7%)

Benefit Category	Value
Land value uplift	
Infrastructure cost savings	
Densification benefits	
Total city shaping benefit	

In addition to the benefits shown, evidence[52] suggests that the presence of a C2WLR stop in close proximity to the dwellings delivered can have a positive impact on end sales values (approximately 9.5%). This benefit is not quantified in these results.

7.6.2 Transport benefits

The transport benefits delivered by the project are shown below.

Table 22 Transport benefits ($m, discounted at 7%)

Benefit Category	Value
Travel time savings	
Other transport benefits	
Total transport benefit	

Travel time savings are low due to the traffic implications resulting from the project, highlighted in Section 7.4.2. In addition to this, it is important to reiterate the use of an adjustment based on high-level assumptions to quantify the travel time delay due to the structure of the at-grade intersection and the turns that are and are not permitted.

7.6.3 Costs

The project costs have utilised the costs provided to TCCS by T&T.

Table 23 Project costs ($m, discounted at 7%, P50)

Cost	Core scenario
Land development costs	
Construction costs	
Total costs	

7.6.4 Results summary

The results presented above are summarised below.

[52] *BITRE 2015*

Table 24 Results summary ($m, discounted at 7%)

Results	Value
Benefits	
City shaping benefits	
Transport benefits	
Total benefits	
Costs	
Total costs (P50)	
Economic Performance	
NPV	
BCR	1.7

The results of the CBA show that the Project, assuming that C2WLR is constructed, will deliver positive economic value. It has a BCR significantly above 1.0 (BCR of 1.7 and NPV of $ m).

As the intersection is positioned in an important hub of economic activity, employment and investment in the ACT, the Project is in a well-located site for development. This will enable the Territory to unlock additional benefits that would not have otherwise been achieved. This is shown in the results of this CBA. However, there are further unquantified benefits that should be considered; such as the land value uplift that is expected due to the presence of C2WLR in the area.

Further analysis on the sensitivity of these results is presented in the next section.

7.7 Sensitivity Analysis

The table below shows a number of sensitivities testing the impacts of some of the key assumptions underpinning the CBA.

Table 25 Sensitivity results ($m, discounted at 7% unless stated otherwise)

Sensitivity Results	NPV	BCR
Economic results		
Economic results		1.7
Land use		
Land value uplift in surrounding sites excluded		
Land value uplift in surrounding sites halved		
Transport		
Transport penalties assumed doubled		
Costs		

Sensitivity Results	NPV	BCR
Costs + 20%		
Costs – 20%		
Discount Rate		
4% Discount rate		
10% Discount rate		

Under all sensitivity scenarios assessed the BCR is greater than 1 and the NPV is positive, demonstrating the robustness of the Project to changes in key assumptions.

The sensitivities that have the largest impact on the results is a decrease in discount rate or a decrease in cost. A discount rate of 4% compared to 7% increases the NPV to $ m and the BCR to . Decreasing the costs by 20% increases the NPV to $ m and the BCR to

One of the assumptions underlying the CBA is the transport penalties assumed for right turns that are not permitted. When this penalty is doubled, the BCR only reduces by 0.2%, showing the robustness of the positive results.

Another sensitivity tests the robustness of the results when the benefits from land value uplift in sites surrounding the intersection are excluded. In this situation, the BCR only reduces by 0.5%, supporting the positive results of the CBA.

7.8 Interdependencies

As discussed throughout this Business Case, the area surrounding the Project is subject to significant planning and development of other infrastructure projects. These include changes to the public transport system (including C2WLR), land release priorities including Section 63 and Section 100, City Hill and West Basin developments, and road network upgrades such as Edinburgh Avenue extension, and Commonwealth Avenue / Vernon Circle signalisation.

Further potential developments in the area include East Road (connecting London Circuit with Parkes Way) and West Road (connecting London Circuit to the newly developed West Basin). Additionally, temporary access arrangements between Parkes Way and London Circuit to the east of Commonwealth Avenue are also being considered. These projects may improve access to the development sites in this Project and allow for improved travel flow in the city. As such, these projects may provide additional benefits for this Project which have not been quantified.

Given the interconnectivity between all projects in planning or underway in and around the city, the importance of appropriate timing and sequencing of these projects has been emphasised throughout this Business Case. While this Chapter sets out a multitude of benefits associated with this Project, including city shaping and transport benefits, the opportunity to deliver this project and therefore realise these benefits will only be viable before C2WLR and the development of Section 63 proceed. Under these plans, the north-western cloverleaf will be closed to traffic, and a ramp will be built to enable light rail to access Commonwealth Avenue from London Circuit.

Once these works are completed, it will be significantly more challenging to undertake the Project due to additional complexities which ultimately will impact on the Project's cost, risk and timing. The consequence of this is that full realisation of the benefits of other projects may be limited. For example, developments at West Basin will improve urban amenity in the City and West Basin precincts, but without this Project, the benefits realised from this improved land use may be limited.

Consequently, it has been determined that the Project and the land developments it activates should be pursued as a priority, with due consideration given to the interaction with projects including C2WLR and Section 63 from a design and timing perspective.

8 Delivery Model Analysis

Key messages

- The recommended packaging approach for the Project is:
    - **Package 1:** Utilities relocation early works package based on the Territory preparing a utilities design and implementation plan ahead of procurement
    - **Package 2:** Main civil works package, including East Road and West Road design
    - **Package 3:** Operations and maintenance package
- The key drivers for this packaging structure were to:
    - De-risk the main civil works package by creating a separate utilities package
    - Develop a packaging structure that would be attractive to the market
    - Enable the Territory to manage the O&M requirements within existing network-wide arrangements

The recommended delivery model is:

- **Package 1:** for the utilities relocation early works package, a separate design package (the utilities design and implementation plan), with a separate Design and Construct (D&C) or construct only package, depending on the extent of the initial design package
- **Package 2:** a combined D&C approach for the main civil works package as it allows for more appropriate risk allocation and transfer, and speed of delivery, while maintaining some flexibility for the Territory
- **Package 3:** integration of operations and maintenance activities into existing contracting and procurement arrangements for the road network
- If closely related projects' packaging and approaches and timing allow for integration, the Project should be packaged with C2WLR and/or Parkes Way to:
    - Reduce interface risks, particularly with respect to traffic management
    - Enhance integrated land use and transport network planning opportunities
    - In the case of Parkes Way, potentially facilitate economies of scale given the synergies between the physical characteristics of the scope of works for the two projects

8.1 Background and approach

The methodology employed to develop the recommended packaging and delivery model approach for the Project as outlined in this Chapter has taken into account the following considerations:

- The requirements of The Capital Framework with reference to Infrastructure Australia Guidelines
- Assessing on a 'best for project' basis with no preconceived bias in favour of one delivery model over another
- Undertaking a bottom up analysis based on the needs of the Project that takes into account the nature of Project risks
- The timing and construction interfaces with a number of surrounding projects, including C2WLR, Parkes Way and other projects in and around the City Hill precinct, such as Section 63

The approach included consideration of the following information and analysis:

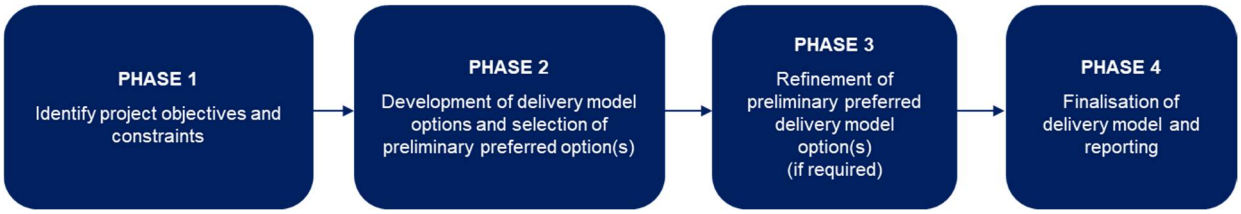
- **Project analysis:** previous analysis undertaken for the Project by TCCS, CRA and their advisors, including:
    - Project objectives
    - Preliminary project designs
    - Project cost estimates prepared by the cost estimator (see Chapter 5)
- **Risk analysis:** risk identification, allocation and quantification work undertaken by CRA, its advisors and other Project stakeholders (see Section 8.2)
- **Packaging assessment:** Project specific assessment of the appropriate packaging solution
- **Delivery model evaluation criteria and assessment:** qualitative assessment of different options against agreed evaluation criteria

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

- CRA
- TCCS, including representatives from C2WLR and ACT Roads
- ACT Treasury
- IFCW

The figure below provides a high level overview of the delivery model development process.

Figure 38 Delivery model approach



8.2 Project risks

Consideration of risk has been a key element of works undertaken by CRA to date. The risk assessment process has involved workshops and discussions with key stakeholder from across the Territory to identify risks, consequences and mitigation measures for the Project.

In preparing this Business Case, CRA has undertaken a risk assessment and quantification process. This process has included:

- Consideration of risks encountered by other similar road projects, and other civil works projects in the Territory
- Conducting risk identification and quantification workshops with key Project stakeholder
- Further risk discussions with CRA and other stakeholders

A Risk Register, including potential mitigation strategies, is included in Appendix H. In addition to supporting the quantification of the Project's contingency (see Section 6.4), it is anticipated that the Risk Register will inform internal risk management process and continue to evolve over time as further technical and other analysis is undertaken and the procurement process progresses.

8.2.1 Key risks

Table 26 provides a selection of key potential risks with a brief description (in no particular order). Mitigation strategies are being separately developed with regard to:

- The party best able to manage and control risks
- Limiting potentially adverse cost and time outcomes for the Project from the realisation of risks

Table 26 Key project risks

Risks	
NCA approvals	· The Project requires the approval of the NCA as it is Designated Land and the Commonwealth Avenue is the NCA's asset. As such, the NCA is a key stakeholder for the Project. This planning approval process increases the risk of delays and costs if approvals take longer than anticipated and/or additional unforeseen conditions are imposed, including with respect to: o Scope creep, with other projects being required to be delivered at the same time o Prescribed or specialist urban design treatments o Additional traffic management activities
Environmental approvals	· The risk that unanticipated conditions are imposed in the Project's environmental approvals under either Commonwealth or Territory requirements
Storm water	· Risks associated with uncertainties surrounding the required future capability of storm water assets at the intersection due to its downstream location in the storm water network
Contamination	· The risk that further land is identified that is contaminated or materials brought onto site are contaminated and remediation costs are higher than anticipated
Land development	· The risk that the design does not facilitate the full realisation of site value with respect to proposed land development activities, or that access arrangements are not sufficient
Traffic network	· The risk that the impact on the traffic network is not appropriately considered in the final design leading to unanticipated impacts on the road network
Design outcome	· The risk that ineffective oversight by the contractor results in a suboptimal design outcome
Construction	· Risks connected with the Project's construction, such as:

Risks	
	o Temporary traffic management fails o Heavy vehicles cause more disruption and/or damage to adjacent assets than anticipated o Consolidation of fill takes longer than anticipated
Sequencing	· As noted elsewhere in this Business Case, a large number of projects are in planning or delivery in and around the Project site. Ineffective project sequencing or management could result in unanticipated impacts on the Project
Utilities	· As noted in Chapter 5, the Project scope includes a series of utilities relocation and construction works, including the relocation of the ICON fibre that runs through the site and is overseen by the Commonwealth Government. Utilities risks include: o More utilities are identified in the development area requiring relocation or modification o Risk that due to the downstream location of the Project, additional unforeseen utilities works are required o Risk that there is a lack of integration of utilities designs, timelines and objectives between contractors, developers, stakeholders and service providers
Stakeholder	· Risks that there are more major events or ceremonies than anticipated around the site that impact on construction, restrict or prevent site access
Market	· There are a large number of projects in planning or delivery on the eastern seaboard. Consequently, there is a risk that the market has insufficient capacity or interest to deliver the project, or that a lack of competition results in an inexperienced contractor being selected leading to performance issues
Industrial relations	· The risk that union or industrial action during construction leads to Project delays
Workplace health and safety	· The risk of significant occupational, health and safety incident arises during construction
Force majeure	· The risk of extreme weather conditions and other events over and above what has been factored into the Project program, including: o Bushfires o Total fire bans o Flooding
Light rail	· The risk that light rail does not go ahead which causes:

Risks	
	o Changes to the design o Changes to the value of the site o Changes to the size of developable land
Bus network	· The risk that the impact on the bus network is more than anticipated during or post construction which results in increased fleet and depot parking requirements to maintain headways, as well as operational costs
Community consultation	· The risk that public support is not received due to: o Cumulative impact of multiple projects being delivered over an extended period in the same area o Lack of focus on urban realm outcomes or active travel access o Noise, vibration and extended traffic disruption
Cost	· Risk that the cost estimate supporting the Business Case is materially different to the final cost estimate due to the preliminary nature of the designs

8.3 Packaging assessment

8.3.1 Packaging drivers

In considering the recommended packaging structure for the Project, the following packaging drivers guided the consideration of different options:

- **Speed of delivery:** what packaging option optimises project delivery timing?
- **Market:** what packages will generate market interest and is there market capacity to deliver a competitive outcome?
- **Benefits:** what packaging option will support the Territory's investment in other transport and city-shaping priorities?
- **Traffic:** what packaging option will minimise and help manage traffic disruption in the area during construction?
- **Interfaces:** are there opportunities to reduce interface risks and consolidate responsibilities by combining packages, particularly across closely related construction packages or to combine, construction, operation and maintenance responsibilities?
- **Risk:** to what extent does the package or number of packages align with the Territory's appetite for risk?

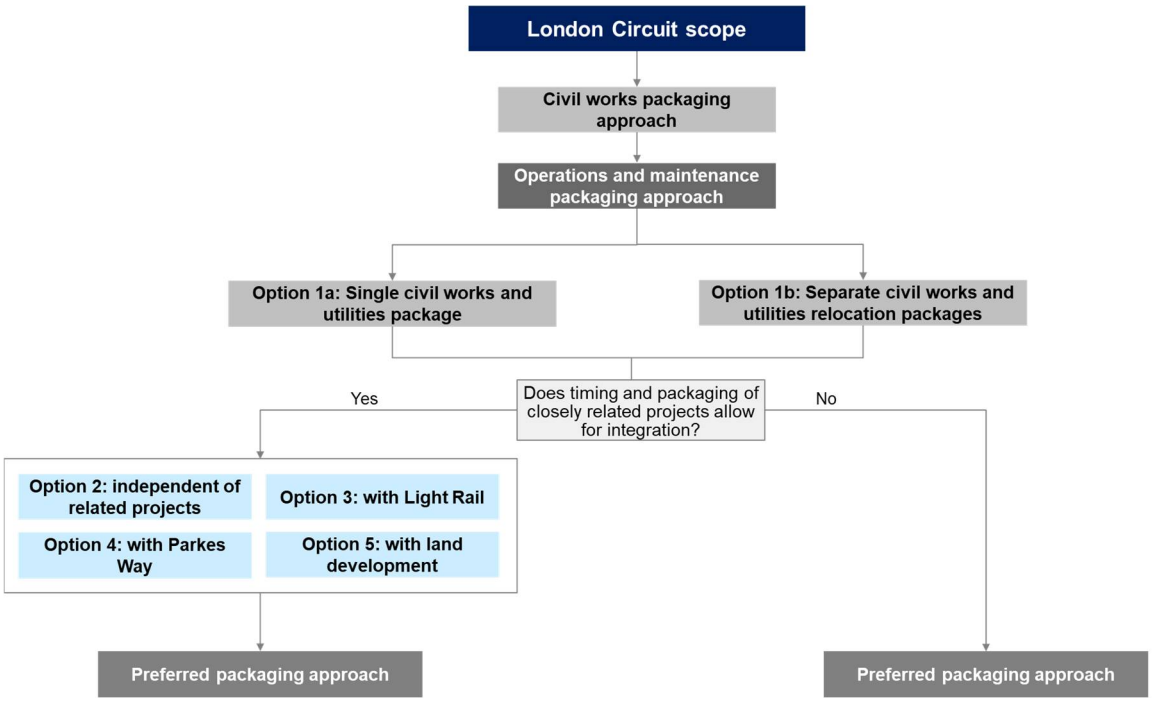
8.3.2 Packaging options

A number of different packaging options were considered for the Project's scope as outlined in Chapter 5. While all aspects of the scope were considered individually, a number of key areas of focus were discussed more than others. This assessment was conducted in four phases:

1. Initial assessment to consider packaging approach for operations and maintenance components
2. Consideration of packaging for Project civil works
3. Determination of whether utilities works should form a standalone package, or be integrated with other civil works
4. Consideration was given to whether civil works should be packaged with closely related projects – C2WLR, Parkes Way and/or land development activities – or independently

The figure below provides an overview of the packaging options assessment process. The outcomes of this process are outlined in subsequent sections.

Figure 39 Packaging options assessment



8.3.3 Operations and maintenance

The O&M components of the Project have a high interface with existing road network operations, such as street lights, traffic light and road pavement maintenance activities. The Territory has existing contractual arrangements in place with a number of different providers to operate and maintain this infrastructure to a required standard, as well as undertaking some activities internally.

Consequently, these have been separated from other civil works components to provide the Territory with the flexibility to integrate them with into existing delivery arrangements. Given the intersection has mixed asset ownership between the Commonwealth and the Territory, it is expected that Territory maintenance

obligations would be overseen by TCCS and the Commonwealth's maintenance obligations would be overseen the Commonwealth in accordance with existing arrangements.

8.3.4 Civil works

It was generally accepted that civil works should be packaged together on the basis that it reduced interface risk, the activities were similar in nature and therefore conducive to the market managing in a single package. The market would also be familiar with this approach.

8.3.5 Utilities

As outlined in Figure 39, two options were considered for utilities packaging works:

- An integrated package in which all utilities works were bundled with all other civil works connected with the Project
- A standalone package in which certain utilities works were separated from the main civil works package

As noted in Chapter 5, the project scope includes the relocation and provision of a number of different types of utilities. Additionally, utilities are considered a significant Project risk (see Table 26). Given these risks, the recommended packaging approach is for a separate utilities relocation package to support a 'ring-fencing' of utilities risks to that package of works. This separation may support a better risk allocation outcome for the main civil works package, in addition to encouraging greater market participation for that package.

However, given the risks associated with utilities and the need to mitigate interface risks between the utilities package and the main civil works package, it is intended that a utilities design and implementation plan is prepared for the Project prior to its procurement to ensure:

- Appropriate integration of utilities and other civil works
- Assis in mitigating utilities risks
- Support scope definition of utilities relation early works package

This approach does expose the Territory to the risk that the utilities works does not fit the requirements of the main works and consequently needs to be redone. This risk was considered but it was deemed that the advantages of de risking the project with utility provides was more prudent approach.

8.3.6 Integration with closely related projects

As noted in Chapters 2 and 5, there are a significant number of works in development in and around the Project site. As such, consideration was given to whether there may be benefits in integrating the Project with other surrounding projects, specifically C2WLR, Parkes Way or land development activities.

However, while consideration was given to these alternative options, this would only be considered for the Project should the timing and packaging approach of these closely related projects align with the intended procurement timeframe for the Project.

While packaging London Circuit independently may have the fastest delivery timeframe, should an integrated approach be feasible, it may offer the following benefits to the Territory:

- Improved traffic management outcomes
- Reduced interface risks
- Opportunities for integrated transport and land use planning
- Potential economies of scale for the Territory, such as reduced procurement costs and project management costs for the Territory
- Greater market interest in the procurement due to the increased scale

C2WLR has a physical interface with the Project, with light rail traversing the intersection and as such integrated packaging would be beneficial. The scope of works planned on Parkes Way has greater synergies with the Project when compared to C2WLR given the similar characteristics of both projects and the more significant traffic management interrelationship.

While integration with land development activities was considered, it was not supported due to the different risk profile of these activities, the potential impact on market participation in the procurement process due to different delivery partners and a longer delivery timeframe.

As such, the recommended packaging approach for the Project is:

- The Project packaged independently if the timing and packaging approach of closely related projects does not support integration
- The Project packaged with C2WLR and/or Parkes Way if the timing and packaging approach of these projects allows for integration

8.3.7 Packaging conclusion

In line with the above analysis, the recommended packaging approach for the Project is:

- **Package 1:** utilities relocation early works package based on the Territory preparing a utilities design and implementation plan ahead of procurement
- **Package 2:** main civil works package, including East Road and West Road design
- **Package 3:** operations and maintenance package

If closely related project packaging approaches and delivery timeframe permits, integration should be pursued.

8.4 Delivery model assessment

8.4.1 Evaluation criteria

Based on the criteria outlined in *The Capital Framework*, the following evaluation criteria were adopted for the project:

1. **Price certainty:** to what extent does the delivery model result in a fixed contract price?
2. **Risk transfer:** to what extent is the delivery model suitable to transfer risk to the contractual counter-party?
3. **Time to deliver:** is the delivery model suitable for rapid procurement?

4. **Flexibility:** is the delivery model flexible and can it easily accommodate uncertainty and variation?
5. **Innovation and incentive:** to what extent does the delivery model drive innovation and incentivise the counter-party?

The table below provides key considerations in relation to each of these evaluation criteria, together with each of the criteria's relative importance which was discussed and agreed in a workshop setting by Project stakeholders. Using these criteria, a multi-criteria analysis approach was used to determine the preferred delivery model approach.

Table 27 Evaluation Criteria

Decision driver	Key issues	Relative importance to project
Price certainty	· Achievement of project objectives within affordability requirements · Size of the project to attract sufficient market interest	High
Risk transfer	· Appropriate allocation of risk to the party best able to manage the risk · Timing Interface risk with the Light Rail and Parkes Way project · The impact of an extensive pipeline of projects may impact on the market's willingness to accept risk · Separation of the utilities relocation as a standalone package may lower the risk profile of the main civil works package · Additional planning requirements given the project will require National Capital Authority (NCA) approval	High
Time to deliver	· Likelihood of the model to best accommodate time constraints · Presence of critical deadlines and interfaces, especially in relation to the Light Rail and the Parkes Way projects · Alignment with the Territory's land release program for development around City Hill and West Basin · Section 63 is due to be released in 2019-20	Medium
Flexibility	· Level of control sought by the ACT Government over design development, particularly given the need to 'future proof' for light rail · The need for the project to fit into the broader road transport network · Number of projects in the area will influence each other in a variety of ways (e.g. design, timing, traffic management and connectivity)	Medium
Innovation and incentive	· The specific design requirements of Light Rail may impact on the ability to incorporate innovation	Low

Decision driver	Key issues	Relative importance to project
	· NCA planning and design requirements may impact opportunities for innovation · Separation of the civil works from operations and maintenance activities may impact on opportunities for whole of life innovation to be incorporated into the civil works package	

8.4.2 Delivery model options

Based on the recommended packaging option, a shortlist of delivery model options was developed from the below long list as outlined in The Capital Framework:

- Design then Construct
- Design and Construct (D&C)
- Managing Contractor
- Design, Construct, Maintain (DCM)
- Design, Construct, Maintain and Operate (DCMO)
- Availability Public Private Partnership (PPP)
- Build, Own, Operate and Transfer (BOOT) PPP
- Project Management Agreement (PMA)
- Alliance

Based on the recommended packaging approach which separates operations and maintenance activities from the civil works activities to allow for integration with the broader road network, DCM, DCMO and PPP options were not shortlisted.

Additionally, given the scale and complexity of the Project, a PMA and alliance approach were not shortlisted.

8.4.3 Delivery model assessment

Shortlisted delivery models were assessed against the evaluation criteria outlined in Section 8.4.1 using the rating scale as outlined in Table 28 below.

Table 28 Delivery model rating scale

Rating	Description	Numeric equivalent
ü ü	Delivery option is very effective in satisfying the requirement of the criterion	2
ü	Delivery option is effective in satisfying the requirement of the criterion	1

Rating	Description	Numeric equivalent
-	Delivery option is neither effective nor ineffective in satisfying the requirement of the criterion	0
x	Delivery option is ineffective in satisfying the requirement of the criterion	-1
xx	Delivery option is very ineffective in satisfying the requirement of the criterion	-2

The table below outlines the assessment of the shortlisted delivery models against the evaluation criteria.

Table 29 Delivery model evaluation

Criteria	Importance	Design then Construct	Design & Construct	Managing Contractor
Price Certainty	**High**	ü ü	ü	x
Time to Deliver	**High**	ü	ü ü	ü ü
Risk Transfer	**High**	xx	ü	x
Flexibility	**Medium**	ü	ü	ü
Innovation and Incentive	**Low**	x	-	-

A summary of the key conclusions from the delivery model assessment are outlined below:

- A D&C approach supports appropriate risk allocation and transfer, as well as speed of delivery, while maintaining some flexibility for the Territory
- A Design then Construct approach may provide greater price certainty and is a model well understood by local contractors. However, this is at the expense of efficient risk allocation and transfer, particularly of design risks, and also the time to delivery
- However, while a Design then Construct approach is not the preferred approach, consideration should be given to the appropriate level of design undertaken prior to procurement and particularly which scope areas would benefit from more advanced designs, such as utilities
- A Managing Contractor approach may provide advantages in terms of speed of delivery, however this is outweighed by the impact on risk transfer and price certainty

8.4.4 Recommended delivery model

Based on the evaluation outlined above, the recommended delivery model for the Project is a D&C contracting approach to better support risk allocation and transfer, as well as speed to delivery.

8.5 Commercial principles and contracting approach

It is expected that the Project will be delivered via a standard contract type used by the relevant contracting party, such as GC21, with special conditions under the contract for specific project requirements and commercial arrangements in line with existing road delivery contractual frameworks.

Major Projects Canberra to sign off that the delivery model selected is appropriate for the project risk profile and value. Review 3 (Major Projects Canberra) Officer Name: _____ Signature: _____ Date: _____

9 Project governance

Key messages

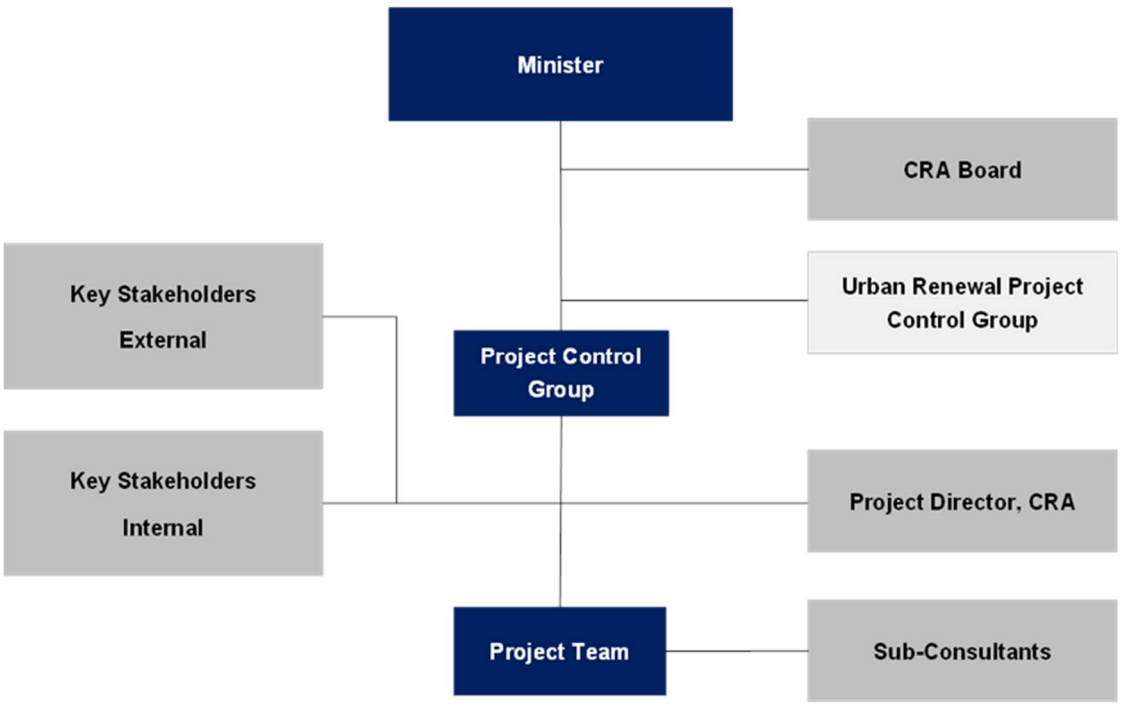
- The Project Business Case has been prepared in accordance with a governance framework which includes the CRA Board with independent members, including the Chair
- Should Cabinet decide to proceed with the Project, it is anticipated that it will be delivered in accordance with the standard governance framework in place for a Project of this size and complexity with a Project Control Group comprised of representatives from relevant Directorates, with the Urban Renewal Project Control Group providing strategic leadership
- The role of the NCA as a key approver in this Project will form a critical part ensuring the Project's successful planning, approval and delivery
- Procurement governance arrangements are indicative and subject to change following further consideration by Cabinet

9.1 Governance Structure

9.1.1 Indicative procurement governance structure

The figure below provides a high-level overview of the governance structure for the Project's procurement. These procurement governance arrangements are subject to change following further consideration by Cabinet.

Figure 40 Indicative governance structure



The anticipated key positions within the governance structure are detailed in the following table.

Table 30 Indicative key positions within the governance structure

Chief Minister
Andrew Barr MLA
Urban Renewal Project Control Group
Chief Executive Officer, City Renewal Authority
Chief Executive Officer, Suburban Land Agency
Under Treasurer, Treasury
Director General, Transport Canberra and City Services
Director General, Environment, Planning and Sustainable Development Directorate
Project Control Group Members
City Renewal Authority (Chair)
Major Projects Canberra
Treasury
Transport Canberra and City Services
Environment, Planning and Sustainable Development Directorate

9.2 Key roles and responsibilities

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

Cabinet

The Cabinet is the peak decision-making body and approver for the Project, including the decision (or otherwise) to proceed with the Project. The general matters to be escalated to this group for approval include:

- Business Case approval, including cost estimates, design and delivery strategy
- Design and delivery strategy
- Cross-government coordination issues (in circumstances of unresolved issues at the Project Control Group level) as required
- Risk oversight

City Renewal Authority

The CRA is charged with leading design-led, people-focused urban renewal and encouraging and promoting social and environmental sustainability. The CRA aims to forge strong and constructive partnerships with the community, industry and all stakeholders to create a place for people to live, explore and enjoy. Some of the responsibilities of the CRA board include[53]:

- Overseeing the operations and discharging the functions of the CRA
- Implementing the Statement of Expectations and Statement of Operational Intent

The CRA will manage the procurement and delivery of the Project.

CRA Chief Executive Officer

The CEO is required to manage the day-to-date operations of the CRA, including:

- Monitoring and reporting to the Board on the performance against their Statement of Expectations
- Ensuring the Board's directions are implemented
- Managing the finances of the CRA
- Developing corporate and operational strategies for approval by the Board

National Capital Authority

The NCA is a key approver and stakeholder for the Project. The NCA is responsible for the *National Capital Plan* through which it seeks to ensure that Canberra and the Territory are planned and developed in acknowledgement of their national significance. Some of the responsibilities of the NCA include[54]:

- Preparing and administering the *National Capital Plan*
- Ensuring that all works within Canberra's Designated Area align with the *National Capital Plan* and enhance the national significant of Canberra before approving
- Providing independent expert design guidance on major projects within Designated Areas, raising the standards of design to respect the Griffin Plan and the future direction of the Capital

Transport Canberra and City Services – ACT Roads

TCCS is a diverse directorate responsible for managing roads, footpaths, street lights, cycle paths, active travel and the public transport network ACTION buses and light rail. Some of its key responsibilities include:

- Managing and maintaining the ACT road network, including roads, bridges and other related infrastructure, as well as the ongoing maintenance of the Project[55]
- Developing a capital works program

[53] https://www.act.gov.au/cityrenewal/about/our-vision

[54] https://www.nca.gov.au/about-the-NCA/what-we-do

[55] *Given the intersection has mixed asset ownership between the Commonwealth and the Territory, it is expected that Territory maintenance obligations would be overseen by TCCS and the Commonwealth's maintenance obligations would be overseen the Commonwealth in accordance with existing arrangements*

- Overseeing the delivery of road infrastructure projects
- Operating the light rail network

Major Projects Canberra

Major Projects Canberra was established on 1 July 2019, and will be responsible for delivering large infrastructure projects across Canberra. This includes C2WLR, the SPIRE project at Canberra Hospital, and projects on the ACT Government's 10-year infrastructure plan, which is to be released in September 2019.

Chief Minister, Treasury and Economic Development Directorate (CMTEDD)

The Infrastructure Finance and Reform Group within the CMTEDD advises on PPP transactions, including procurement. While Major Projects Canberra will support the CRA in the procurement of the Project, CMTEDD will provide strategic advice as necessary.

Urban Renewal Project Control Group

The Urban Renewal Project Control Group will provide senior leadership and a forum for strategic decision making and coordination for the Project. The Urban Renewal Project Control group will:

- Provide strategic oversight for the Project
- Ensure alignment and coordination across related projects and priorities

Project Control Group

The Project Control Group's primary role is to implement the Project in accordance with the CRA's directions and Cabinet decisions. The Project Control Group has the responsibility for governance across the whole Project, including Business Case preparation. Some of its key responsibilities include:

- Providing oversight and governance on all elements of the Project
- Providing a forum for resolving issues that occur during the course of delivering the Project
- Approving the Project scope, setting priorities, establishing planning teams and facilitating consultations and design processes
- Making decisions in line with Government policy
- Informing the CRA CEO, Board and Urban Renewal Project Control Group of progress against key milestones
- Monitoring the Project Team's performance
- Communicating with key strategic stakeholder groups, including the NCA

Project Team

The Project Team reports to the Project Director. Reporting to the CEO of the CRA, the Project Director leads the Project Team and directs and manages the delivery of the Business Case to meet the ACT Government's objectives. The Project Director is responsible for:

- Directing and managing the delivery of the Project and the Business Case to meet Project objectives
- Chairing the Project Control Group
- Attending and participating in CRA Board meetings as required
- Keeping the Project Control Group, CRA Board and CEO informed of key issues and risks
- Managing progress against key milestones
- Taking accountability for the Project's Business Case and all other key documents
- Oversight of the Project budget

Members of the Project Team are responsible for delivering the Business Case according to the Project's Vision under the direction of the Project Director. The team's major responsibilities include:

- Developing key Project documents for consideration by the Project Director and Project Control Group
- Identifying, discussing and escalating strategically important issues and risks to the Project Control Group
- Managing the preparation of Project Control Group updates, papers and other materials

10 Stakeholder management

Key messages

- The communications and consultation approach outlined in this Chapter is founded on the principle that regular engagement will deliver key Project benefits
- The Project will be delivered in a collaborative and consultative way. Significant consultation has already occurred for surrounding city renewal projects with the community and key stakeholders. The Territory will continue to have a rigorous focus on community involvement in the project going forward
- The Project is a complex project with a significant number of stakeholders, ranging from corporations, institutions, commonwealth agencies, through to businesses, local community residents and motorists. A tailored communications and stakeholder engagement approach, which adopts the right mix of engagement techniques across the staged construction schedule of the project, will be critical to the project's success
- Coordination, collaboration and integration with the stakeholder and community engagement activities for surrounding transport and land development projects is critical to ensure consistent and clear messaging and may also produce efficiencies in delivery. Should consultation, planning and delivery timeframes align, there would be benefit in integrating the Project's community engagement with C2WLR, Parkes Way and/or West Basin

10.1 Our stakeholders

The London Circuit and Commonwealth Avenue intersection is a key intersection between Canberra City and Lake Burley Griffin, forming the entry and exit point for travellers to and from the City heading north and south along Commonwealth Avenue and east and west onto Parkes Way and as a result will have broad stakeholder interest. The Project is guided by the objectives outlined in Section 2.1.

Establishing good relationships with internal and external stakeholders, including the broader community, will provide opportunities for Canberrans to have input into shaping key aspects of the Project and to understand the benefits of development and urban renewal around City Hill and West Basin.

10.1.1 External stakeholders

In addition to the local community and Canberra motorists, key external stakeholder groups for the intersection upgrade project include:

- Community councils and resident associations, for example North Canberra Community Council (NCCC) and Canberra City Residents' Association, who represent some of the areas around the Project, including the City and New Acton
- Local businesses, for example QT Hotel is one of Canberra's landmark venues and sits adjacent to the western cloverleaves

Key issues for stakeholder engagement

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

- Close consultation with representatives from the North Canberra Community Council and Canberra City Residents' Association, and the major businesses in the area such as the QT Hotel
- Maintaining a dialogue with the NCA throughout the Project planning, development and construction phases, particularly in light of their role as a key Project approver and the Project's impact on one of Canberra's key boulevards
- Internal consultation with the various ACT Government Directorates involved to maximise synergies with other projects, such as developments along the corridor in West Basin, Parkes Way and City Hill

- Community groups
- Special interest groups
- The Australian Government and its agencies, including the NCA

10.1.2 Internal stakeholders

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

- Chief Minister, Treasury and Economic Development Directorate
- Environment, Planning and Sustainable Development Directorate
- TCCS
- Suburban Land Agency
- ACT Planning & Land Authority

A number of different Directorates have been involved in the preparation of this Business Case, participation in workshops and providing input and analysis as required. The proposed governance structure for the Project's delivery will continue close engagement of key Directorates. Additionally, the CRA has a number of existing forums through which to maintain continuous dialogue with internal stakeholders, such as steering groups and other formal and informal arrangements.

10.2 Communication and consultation

10.2.1 Communication objectives

The communication objectives for the Project are to:

- Build strong stakeholder relationships and foster a sense of transparency around key decisions in line with the CRA's 2025 Strategic Plan Goals and Objectives
- Ensure stakeholders are informed of the latest Project news, key milestones and timings
- Ensure stakeholders are aware of what they can and cannot influence
- Promote the Territory's vision for urban renewal in the City precinct
- Leverage 'good news' opportunities that the Project provides for stakeholders and the community and promote these in a clear, accessible and accurate way
- Anticipate issues that may attract political or media attention and provide strategies for prompt and proactive management of those issues in a coordinated and professional manner
- Ensure stakeholders are informed of traffic diversions and other traffic management activities

10.2.2 Communications approach

The objectives outlined above align with the ACT Government's commitment to engaging effectively with its citizens as outlined in *Engaging Canberrans: A Guide to Community Engagement*[56]. The Guide identifies five key principles to drive engagement best practice:

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

In addition to the above, the ACT Whole of Government Communications and Engagement Strategy 2017-2019 has set out the core activities for communications and engagement with the Canberra community, based on the communication objectives described above. There is a strong emphasis on transparency and clear communication with the community[57]. The CRA's engagement approach and activities are guided by this Strategy.

Furthermore, the CRA has a Communications and Engagement Committee made up of members of the CRA Board. The Committee supports meaningful and effective community engagement activities that enable the Canberra community to directly contribute to the renewal of the city precinct.

10.2.3 Consultation methods

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

- Face-to-face engagement activities – such as drop in sessions, roundtable meetings and community presentations
- Advertising and mass communications activities – such as brochures and newsletters and the Your Say website
- Social media – such as Twitter, Facebook, Instagram, YouTube and Flickr
- Website and collateral development – such as Your Say website and survey

[56] *Engaging Canberrans: A guide to community engagement, https://s3.ap-southeast-2.amazonaws.com/hdp.au.prod.app.act-yoursay.files/2614/6724/4263/communityengagement_FINAL.pdf*

[57] *ACT Whole of Government Communications and Engagement Strategy 2017-2019, https://www.act.gov.au/__data/assets/pdf_file/0004/1163983/ACT_Whole-of-Government-Communications-and-Engagement-Strategy-2017-2019.pdf*

- Media and public relations activities

10.3 Integrated communications approach

As noted elsewhere in this Business Case, the Territory has a number of different Projects in planning or development in close proximity to the Project, particularly C2WLR and Parkes Way, but also West Basin and other land development activities.

10.3.1 Light Rail and Parkes Way

The anticipated route alignment for C2WLR will run through the intersection (refer Figure 41). Similarly, the Parkes Way project lies adjacent to the intersection, which may result in significant interfaces with design and construction should project timing overlap or coincide with the Project, particularly with respect to traffic management activities. As such, execution of these projects will require significant collaboration and interaction with the various stakeholders involved, including the NCA, the Treasury and TCCS.

C2WLR has already undertaken wide ranging consultation on route alignment options, stop locations and other matters. Extensive consultation planning and communications messaging development has been undertaken by TCCS. This provides the opportunity for the Project to be included in future planned consultation.

Figure 41 Possible alignment of C2WLR with the Project[58]

10.3.2 Other development projects

West Basin and other developments in and around City Hill are within close proximity of the Project (see Figure 42), and together will help realise the Territory's vision for the area as an active and people-focused area. As such, coordinated engagement with surrounding projects in City Hill and West Basin will help to ensure that there is consistent messaging with key stakeholders such as the NCA, and improve the community's understanding as to the ultimate vision for the precinct.

[58] *Alignment of Light Rail Stage 2 (potential routes), https://www.transport.act.gov.au/about-us/public-transport-options/light-rail/city-to-woden*

Figure 42 Interface of the West Basin Development with the London Circuit intersection upgrade[59]

10.4 Previous consultation

The CRA recognises that community consultation and engagement across ACT and the Australian Government and their agencies are critical to the successful design, development and delivery of major projects. A number of different community consultation activities have been undertaken by both the Territory, and the NCA in the past as outlined in the table below.

Table 31 Previous consultation

Date	Consultation
2006	Consultation was undertaken on the NCA's Draft Amendment 61 to the National Capital Plan, which included preliminary plans for the development of West Basin, reclamation of the Lake and urban design improvements.
2013	The Land Development Agency sought community feedback on the City to the Lake Proposal
2015	Community consultation was undertaken on the West Basin Foreshore design
2017	Community feedback sought on the *Kings and Commonwealth Avenues Draft Design Strategy*.

Date	Consultation
2018	Community feedback was sought by the CRA to gauge feedback on a range of issues that as part of the City and Gateway Draft Urban Design Framework. Further detail is provided below

The *City and Gateway Draft Urban Design Framework* Engagement Report was published on 19 December 2018. The Report recognised the significant opportunities for urban renewal, growth and investment in the city. Some overarching views from the community engagement process are highlighted in Figure 43[60].

Figure 43 Key highlights from the community engagement process to date[61]

[60] *ACT Government (2018) City and Gateway Draft Urban Design Framework, https://www.yoursay.act.gov.au/city-and-gateway-draft-urban-design-framework*

[61] *ACT Government (2018) City and Gateway Draft Urban Design Framework, https://www.yoursay.act.gov.au/city-and-gateway-draft-urban-design-framework*

11 Advisor engagement plan

Key messages

- A variety of external advisors have been appointed in accordance with ACT Government processes to assist the Territory to develop the Project scope and this Business Case
- Should the Territory decide to proceed with the project, ongoing support from external advisors may be required to progress the procurement and delivery of the project

11.1 Proposed advisor roles

Given the scale and complexity of the intersection upgrade, a variety of external advisors may be appointed to assist in developing various elements of the Project. The appointment of advisors for future stages of the Project's development will be considered by the CRA following consideration of this Business Case, informed by decisions from Cabinet and the Steering Committee in relation to the Project and other related projects.

Advisors may include:

- Commercial, financial and economics
- Legal (General Solicitors' Office)
- Technical
- Cost estimation

A list of key external advisory mandates that may be required for the intersection upgrade project are outlined in Table 32 below. It is noted that this list of advisors is indicative and is likely to change as the project progresses from the Business Case stage, through to procurement and construction.

Table 32 Key external advisors

Key advisory mandates	Potential scope of engagement
Commercial, financial and economics	Commercial and financial services may include: · Market sounding and commercial advice; and · Project procurement and negotiations
Legal (General Solicitors' Office)	Legal advisory services may include: · Project procurement assistance, including drafting and negotiation of project documentation · Legislative requirements such as planning and environmental approvals
Technical	Technical engineering, design and planning advisory services may include: · Technical engineering design · Urban design, planning, architecture and landscaping · Utilities location and geotechnical surveys · Environmental investigations · Hydraulic investigations into stormwater requirements
Cost estimation	Cost estimation advice may include:

Key advisory mandates	Potential scope of engagement
	· Provision of cost estimation works for the Project's capital costs

If the ACT Government proceeds with the Project, additional specialist advisory services may be required in addition to those outlined in the table above. It is anticipated that all required advisory services will be funded from the Territory's budget funding for the as outlined in Chapter 6.

12 Project Timeline

Key messages

- It is anticipated that the pre-planning, procurement, design and construction of the Project will be undertaken between March 2020 and December 2022
- It should be noted that all dates are indicative and subject to a number of factors, including Cabinet decisions regarding the Business Case, the timing of planning and environmental approvals, including approval by the NCA, and the realisation of Project risks
- The Parkes Way project, C2WLR project and surrounding land development projects may have a material impact on the timing and scope of the proposed intersection upgrade

12.1 Project timeline

An overview of the anticipated timeline for upgrade of the London Circuit Intersection is outlined in the table below. A high-level project programme is also outlined in the Appendix L.

Table 33 Key indicative milestones

Utilities Package	**Anticipated Timeline**
Pre-planning and procurement Utilities Relocation	*March 2020 – May 2020*
Design Utilities Identification and Relocation	*May 2020 – August 2020*
Works Approval Utilities Relocation	*August 2020 – November 2020*
Procurement Construction Utilities Relocation	*September 2020 – November 2020*
Utilities Relocation Works	*December 2020 – May 2021*
Main D&C Package	**Anticipated Timeline**
Pre-planning and procurement	*March 2020 – May 2020*
Design	*June 2020 – January 2021*
Works Approval Main	*January 2021 – May 2021*
Construction Main	*June 2021 – December 2022*
Business Case	**Anticipated Timeline**
Ongoing consultation with ACT Government and relevant stakeholders	*September 2018 – February 2019*
Draft and final Business Case	*January 2019 – February 2019*

Actual timing will be subject to the completion of the procurement process, planning and environmental approvals and other risks. Furthermore, it is important to note the following:

- All dates are indicative and subject to a number of factors, including Cabinet decisions regarding the Business Case

- Indicative timing has been determined based upon the initial technical analysis and information available at the time of the Business Case
- Actual timing will be subject to the completion of the procurement process, planning and environmental approvals, including the NCA, among other risks
- If the Project is packaged and procured as part of associated works (C2WLR or Parkes Way) these timings may be subject to material change
- A traffic management assessment will be undertaken by the ACT Government after the completion of this Business Case to consider the impacts of this, and other complementary projects, in the City precinct. The results of this could impact timing for delivery
- There is an Indicative Land Release Program for 2018-19 to 2021-22. Material changes to this program may impact on project delivery timing

12.2 Project constraints and/or deadlines

The primary constraints on the Project's development are the development of C2WLR and the Section 63 development. As noted elsewhere in this Business Case, after these projects are complete, construction of the at-grade intersection will not be possible.

Appendix A Policy context

Appendix B Population density

Appendix C Use of active travel to get to work

Appendix D Population change in Canberra

Appendix E Canberra growth map

Appendix F Investment Logic Map

Appendix G Case studies

Appendix H Capital cost estimate

Appendix I Risk Register

Appendix J Preliminary financial impact

Appendix K Assumptions Book

Appendix L Gantt chart timeline