

Schedule 2.2(a)(ii)

Schedule 2.2(a)(ii)^s

via email: Schedule 2.2(a)(ii)

Dear Schedule 2.2(a)(ii)

FREEDOM OF INFORMATION REQUEST

I refer to your application under section 30 of the *Freedom of Information Act 2016* (the Act), received by Major Projects Canberra (MPC) on 24 January 2023, in which you sought access to:

“Any documents which show the costs and benefits for the Light Rail Stage 2A and Stage 2B to Woden, including the emissions estimates for completing Stages 2A & 2B, and the costs borne by drivers and the community because of traffic disruptions.”

Authority

I am an Information Officer appointed by the Chief Projects Officer under section 18 of the Act to deal with access application made under Part 5 of the Act.

Decision on access

Searches were completed for relevant documents and two (2) documents were identified that fall within the scope of your request.

I have included as **Attachment A** to this decision the schedule of relevant documents. This provides a description of each document that falls within the scope of your request and the access decision for each of those documents.

My decision in relation to the documents relevant to your request is summarised as follows:

- Partial access to one (1) documents;
- One (1) document was identified as currently being publicly available and a link to this document has been provided.

My decision is detailed further in the following statement of reasons.

Statement of Reasons

In making my decision on disclosing government information, I must identify all relevant factors in schedules 1 and 2 of the FOI Act and determine, on balance, where the public interest lies. In reaching my access decision, I have taken the following into account:

Factors favouring disclosure in the public interest (Schedule 2, Section 2.1)

- Section 2.1(a)(i) - promote open discussion of public affairs and enhance the government’s accountability;
- Section 2.1(a)(ii) contribute to positive and informed debate on important issues or matters of public interest; and
- Section 2.1(a)(iv) ensure effective oversight of expenditure of public funds.

The release of this information may possibly help to create positive and informed discussions. I consider that disclosing the contents of the information sought could reasonably contribute to discussion of public affairs. I am satisfied that these are relevant considerations favouring disclosure in this case, and in the interests of enhancing open discussion, I afford them significant weight.

I also note MPC, and the ACT Government more broadly, have proactively released information under our Open Access Information program once Cabinet deliberations and government decisions have been finalised and are able to be announced. A copy of the Canberra Light Rail Stage 2A Business Case is available here [Stage-2A-Light-Rail-Business-Case-redacted.pdf](#), and further Construction, Design, Traffic Disruption and other information is provided by MPC [Home - Light Rail to Woden \(act.gov.au\)](#).

Factors favouring non-disclosure in the public interest (Schedule 2, Section 2.2)

- Section 2.2(a)(ii) prejudice the protection of an individual's right to privacy or any other right under the *Human Rights Act 2004*;

The document, City to Commonwealth Park Light Rail Economic Appraisal Report, contains personal information and I place significant weight on the right to privacy of individuals and their right to have their personal information protected. Accordingly, I have withheld access to and redacted the personal information contained in the document.

- Section 2.2(a)(xi) prejudice trade secrets, business affairs or research of an agency or person

I have also considered the impact of disclosing information, which relates to business affairs. In the case of *Re Mangan and The Treasury [2005] AATA 898* the term 'business affairs' was interpreted as meaning 'the totality of the money-making affairs of an organisation or undertaking as distinct from its private or internal affairs'. Schedule 2 section 2.2(a)(xi) allows for government information to be withheld from release if disclosure of the information could reasonably be expected to prejudice the trade secrets, business affairs or research of an agency or person.

The document, City to Commonwealth Park Light Rail Economic Appraisal Report, was identified as relevant to your request. This document was prepared to advise on and assist the drafting of the [Stage-2A-Light-Rail-Business-Case-redacted.pdf](#). I note the document is marked draft, as it was considered a working paper as part of the preparation of the business case which was then presented to Cabinet.

As this document was prepared by MPC's consultant EY, section 5 Methodology contains EY methodologies developed over time as a result of significant investment using specialists across a range of disciplines, as well as drawing on knowledge and expertise acquired from previous economic appraisal engagements. I give the protection of our consultant's trade secrets, business affairs and research significant weight and consequently have redacted Section 5 Methodology in full

Charges

I have decided to waive any charges in relation to this Freedom of Information application.

Online Publishing – Disclosure Log

Under section 28 of the Act, MPC maintains an official online record of access applications called a disclosure log. Your original access application, my decision and documents released to you in response to you access application will be published in the MPC disclosure log three (3) days after

the date of the decision. Your personal contact details will not be published. You may view the MPC disclosure log at <https://www.act.gov.au/majorprojectscanberra>.

Ombudsman Review

My decision on your access request is a reviewable decision as identified in Schedule 3 of the Act. You have the right to seek Ombudsman review of this outcome under section 73 of the Act within 20 working days from the day that my decision is published in the MPC disclosure log, or a longer period allowed by the Ombudsman.

If you wish to request a review of my decision you may write to the Ombudsman at:

The ACT Ombudsman
GPO Box 442
CANBERRA ACT 2601
Via email: actfoi@ombudsman.gov.au

ACT Civil and Administrative Tribunal (ACAT) Review

Under section 84 of the Act, if a decision is made under section 82(1) on an Ombudsman review, you may apply to ACAT for review of the Ombudsman decision. Further information may be obtained from the ACAT at:

ACT Civil and Administrative Tribunal
Level 4, 1 Moore Street
GPO Box 370
CANBERRA CITY ACT 2601
Telephone: (02) 6207 1740
<http://www.acat.act.gov.au>

Should you have any queries in relation to you request, please contact me by telephone on (02) 6205 5288 or email MPCFOI@act.gov.au.

Yours sincerely,

Schedule 2.2(a)(ii)

Damon Hall
Information Officer
Major Projects Canberra

23 March 2023

FREEDOM OF INFORMATION REQUEST SCHEDULE

Please be aware that under the *Freedom of Information Act 2016*, some of the information provided to you will be released to the public through the ACT Government's Open Access Scheme. The Open Access release status column of the table below indicates what documents are intended for release online through open access.

Personal information or business affairs information will not be made available under this policy. If you think the content of your request would contain such information, please inform the contact officer immediately.

Information about what is published on open access is available online at: <https://www.act.gov.au/majorprojectscanberra/home>

FOI Reference Number		Request Details				
MPCFOI2022/18		<i>Any documents which show the costs and benefits for the Light Rail Stage 2A and Stage 2B to Woden, including the emissions estimates for completing Stages 2A & 2B, and the costs borne by drivers and the community because of traffic disruptions..</i>				
Ref No.	No. of Folios	Description	Date	Status	Reason for non-release or partial release	Open Access release status
	-	Stage 2A Light Rail Business Case	August 2019	Withheld	Already Publicly Available - https://www.act.gov.au/data/assets/pdf_file/0010/1758178/Stage-2A-Light-Rail-Business-Case-redacted.pdf	Already Released
	50	City to Commonwealth Park Light Rail Economic Appraisal Report	5 September 2019	Partial	Section 2.2(a)(xi) prejudice trade secrets, business affairs or research of an agency or person & Schedule 2.2(a)(ii) Personal Privacy	Y
Total Number of Documents						
2						

City to Commonwealth Park Light Rail

Economic Appraisal Report

2019

DRAFT

5 September 2019

Mr Damon Hall
Executive Director | Commercial
Major Projects Canberra
Woden ACT 2606
Private and confidential

City to Commonwealth Park Light Rail: Economic Appraisal Report

Dear Damon,

We refer to Service Agreement (executed on 10 October 2017) between Australian Capital Territory (“ACT Government”) and EY (the “contract”), through which EY has been engaged to provide Public Transport Strategic Advisory Services to the ACT Government on the City to Commonwealth Park Light Rail project (the Project).

Attached to this letter are EY’s Economic Appraisal Report (‘the Report’).

The Report may only be relied upon by ACT Government pursuant to the terms referred to in the contract. Any commercial decisions taken by ACT Government are not within the scope of our duty of care and in making such decisions you should take into account the limitations of the scope of our work and other factors, commercial and otherwise, which you should be aware of from sources other than our work.

Our report may not have considered issues relevant to any third parties. Any use such third parties may choose to make of our report is entirely at their own risk and we shall have no responsibility whatsoever in relation to any such use. This report should not be provided to any third parties without our prior approval.

We disclaim all responsibility to any other party for any loss or liability that the other party may suffer or incur arising from or relating to or in any way connected with the contents of this report, the provision of this report to the other party or reliance upon this report by the other party.

Liability is limited by a scheme approved under professional standards legislation.

If you would like to clarify any aspect of this report or discuss other related matters, then please do not hesitate to contact me at lars.rognlien@au.ey.com.

Yours sincerely,

Schedule 2.2(a)(ii)

Associate Partner

Table of contents

1.	Introduction	3
1.1	Purpose of this Report	3
1.2	Overview of the Project	3
1.3	Scope of work and limitations	4
2.	Appraisal results.....	6
2.1	City to Commonwealth Park (Stage 2A)	6
2.2	City to Woden Light Rail (Stage 2A and 2B).....	8
3.	Base and project cases.....	11
3.1	Base Case	11
3.2	City to Commonwealth Park (Stage 2A) Project Case	11
3.3	City to Woden (Stage 2A and 2B) Project Case	14
4.	Modelling inputs	17
4.1	Transport model inputs	17
4.2	Land use assessment	19
4.3	Economic model assumptions	20
5.	Methodology	22
5.1	Transport benefits	24
5.2	City shaping benefits.....	39
5.3	Wider economic benefits	41
5.4	Project costs	44
6.	Other assumptions.....	46
6.1	Parking Charges	46
6.2	Public Transport Cost Parameters	46
6.3	Highway Cost Parameters.....	47

1. Introduction

1.1 Purpose of this Report

This Report provides a description of the economic appraisal methodology, parameters, and results for two projects:

- ▶ Stage 2A City to Commonwealth Park project (Stage 2A), which forms the first stage of the link between the City and Woden; and
- ▶ City to Woden Light Rail (Stage 2A and 2B) under a staged delivery (i.e Stage 2A and 2B delivered separately).

This Report has been prepared with regard to the requirements of the ACT Government's Capital Framework which requires an economic appraisal for projects over \$10 million.

1.2 Overview of the Project

As outlined in Figure 1, Stage 2 of Canberra's light rail network is planned to be delivered in two components; Stage 2A between the City and Commonwealth Park and Stage 2B between Commonwealth Park and Woden.

Figure 1: City to Woden Light Rail (Stage 2A and 2B)



Source: TCCS

The economic appraisal detailed in this Report considers these two options. In addition, results are presented for four scenarios for Stage 2A, as requested by the ACT Government. The options analysed are detailed below.

Stage 2A (City to Commonwealth Park)

The Stage 2A economic appraisal assesses the costs and benefits of the design and construction of light rail between the City and Commonwealth Park, with three associated stops, one bridge, road, signalling, preparatory and other works. It also involves the ongoing operation and maintenance of

that light rail system, including the procurement of 4 light rail vehicles. Interdependencies with the delivery of the Acton Waterfront development were explored through various scenarios, as shown below:

- ▶ **Scenario A** (as presented in the Business Case) assumes that the delivery of Stage 2A will accelerate the development of the Acton Waterfront (i.e. bring forward the development with a more compressed construction period);
- ▶ **Scenario B** assumes that the delivery of Stage 2A will bring forward the planned development of the Acton Waterfront by four years;
- ▶ **Scenario C** assumes the development of the Acton Waterfront will occur regardless of the construction of Stage 2A; and
- ▶ **Scenario D** assumes that the Acton Waterfront development is fully contingent on the delivery of Stage 2A.

Stage 2A and 2B (City to Woden)

The City to Woden Light Rail (Stage 2A and 2B) economic analysis assesses the costs and benefits of the design and construction of light rail between the City and Woden via State Circle East, initially consisting of Stage 2A from City to Commonwealth Park (under Scenario A above), and then later Stage 2B from Commonwealth Park to Woden.

In total (i.e. Stage 2A and 2B), this includes 12 associated stops, structures, depot expansion, road, signalling, preparatory and other works. It also involves the ongoing operation and maintenance of that light rail system, including the procurement of 16 light rail vehicles. Land use around the corridor is activated causing a redistribution of population and employment into the corridor from the rest of the ACT.

More information on each of these options and scenarios is given in the next chapters.

1.3 Scope of work and limitations

EY was engaged by the ACT Government to undertake a full Cost Benefit Analysis (CBA) to determine the economic costs and benefits associated with the implementation of Stage 2A and City to Woden Light Rail (Stage 2A and 2B). The results presented in Chapter 2 are based on inputs provided by the ACT Government and other external providers/sub-contractors. The inputs provided to EY include:

- ▶ **Zenith Strategic Transport Model (Veitch Lister Consulting, VLC)** - transport demand forecasts and incremental benefits (e.g. number of trips, kilometres travelled, hours travelled, externality savings, road accident savings);
- ▶ **Land use and demographics (Arup, City Renewal Authority, and ACT Government)** - population and employment across Canberra in the base and project cases;
- ▶ **Capital expenditure (Turner & Townsend, T&T)** - capital cost estimates including roads and utilities infrastructure costs, rail alignment costs, signalling, rail systems and power, depot and stabling, preliminaries, traffic management costs, design, and construction overheads. P50 contingencies was developed by EY following risk analysis and quantification; and
- ▶ **Operating cost estimate (Turner & Townsend, T&T)** - operating cost estimates including salaries and wages, depot costs, electricity supply, special events and general costs. P50 contingencies was developed by EY following risk analysis and quantification.

EY has also sourced information from publicly available sources, as well as internal knowledge. Sources for all assumptions within the analysis are clearly stated throughout this report. Although the assessment follows official guidelines, it is subject to a number of assumptions and limitations. These relate to:

- ▶ **Inputs by others** - In undertaking the economic appraisal, EY has relied on materials and data provided by the ACT Government and other organisations. We have not independently verified, or accepted any responsibility or liability for independently verifying, any information provided to us by the ACT Government and other organisations or information obtained in the public domain for the purpose of this assessment, nor do we make any representation as to the accuracy or completeness of the information.
- ▶ **Zenith Strategic Transport Model (Veitch Lister Consulting, VLC)** - the strategic transport modelling for the economic appraisal is subject to some key limitations. The transport model is based on strategic assumptions of the Stage 2A and City to Woden Light Rail (Stage 2A and 2B) projects, including the route alignments and service frequency. It does not include any allowance for any other proposed infrastructure upgrades (especially local upgrades) except those included in the project case that may affect patronage, such as shelters, integrated interchanges, lighting, security, signage (knowledge of the PT system), real-time data, smartphone apps or other factors. These effects are not included in the model assumptions.
- ▶ **Project costs** - the cost estimate for construction and operation for both Stage 2A and City to Woden Light Rail (Stage 2A and 2B) is based on a number of assumptions, particularly in relation to the items that are included and excluded from each estimate. More detail on project costs is provided in Chapter 5.4.
- ▶ **Business Case assumptions** - this Report is intended to be read in conjunction with the Business Case prepared for Stage 2A. Information presented in this Report should be interpreted in line with the assumptions and limitations set out in the Business Case document.

2. Appraisal results

2.1 City to Commonwealth Park (Stage 2A)

Four scenarios have been considered in the economic appraisal of Stage 2A, as outlined in Chapter **Error! Reference source not found.** These scenarios were tested to reflect uncertainty over the degree of dependence of the delivery of the Acton Waterfront development on Stage 2A. Further information on the assumptions for the base and project case for each scenario can be found in Chapter 3.

The results of the economic appraisal are shown in Table 1 below. This table includes all transport benefits (first and second round)¹, city shaping benefits and wider economic benefits (WEBs).

Table 1 CBA benefits (real 2019 \$m, PV at 7%)

BENEFIT / COST		SCENARIO A	SCENARIO B	SCENARIO C	SCENARIO D
TRANSPORT BENEFITS					
Public transport user benefits	Travel time savings	11	11	11	13
	Light rail amenity benefits	5	5	5	5
Road user benefits	Travel time savings	12	14	7	39
	Vehicle operating cost savings	8	10	1	16
	Reliability	2	2	1	7
Externalities	Road use externalities	3	4	3	10
	Health benefits	-2	-1	-4	4
	Accident cost savings	4	5	0	11
	Bus operating cost savings	0	0	0	0
Other benefits	PT revenue	10	11	10	10
	Residual value	2	2	2	5
Total transport benefits		55	62	35	120
CITY-SHAPING BENEFITS					
Infrastructure cost savings		6	8	0	25
Land value uplift		41	58	0	178
Total city-shaping benefits		47	66	0	203
WIDER ECONOMIC BENEFITS					
Transport agglomeration		20	21	16	51
Land use agglomeration		28	37	0	113
Total wider economic benefits		48	58	16	164
Total benefits		150	186	51	487

Source: EY analysis, based on VLC inputs

¹ First round transport benefits result from changes to the transport network brought about by the Project. Second round transport benefits stem from land use changes that are brought about by the Project, which drive changes in residents' and workers' travel patterns

Scenarios C and D are book-ends, with the former assuming that the Acton Waterfront development will go ahead regardless of light rail; and the latter assuming that this will only happen with light rail. If there is no dependency of the Acton Waterfront development on Stage 2A (Scenario C) then Stage 2A would realise benefits of \$51 million (PV at 7%, including WEBs). However, if the development were assumed to be fully dependent, Stage 2A would deliver \$487m.

For the two acceleration scenarios, Scenario B has benefits 13% higher than Scenario A, due to the earlier construction period (commencing in FY21 for Scenario B compared to FY23 for Scenario A). This results in the benefits being realised earlier and for longer - since the development is completed earlier under Scenario B, its benefits continue for a greater proportion of the economic appraisal period of 30 years following the completion of light rail construction.

The main drivers of differences between the four scenarios are land value uplift, land use agglomeration and road user benefits. The difference in land value uplift is \$41m for Scenario A, \$58m for Scenario B, \$0 for Scenario C and \$178 for Scenario D.

Table 2 below shows the project cost and the economic performance of each scenario. The economic performance of Stage 2A is presented in the form of net present values (NPVs) and benefit cost ratios (BCRs).

Table 2 CBA results (real 2019 \$m, PV at 7%)

RESULTS	SCENARIO A	SCENARIO B	SCENARIO C	SCENARIO D
BENEFITS				
Total benefits (including WEBs)	150	186	51	487
Total benefits (excluding WEBs)	102	128	35	323
P50 COSTS				
CAPEX	162	162	162	162
OPEX	82	82	82	82
Development costs ²	23	33	0	110
Total costs	268	277	244	354
RESULTS				
NPV (excluding WEBs)	-166	-149	-209	-31
BCR (excluding WEBs)	0.38	0.46	0.14	0.91
NPV (including WEBs)	-118	-91	-193	133
BCR (including WEBs)	0.56	0.67	0.21	1.38

Source: EY analysis, based on inputs from VLC, Arup, T&T and others

The NPV (including WEBs) is -\$118m for Scenario A; -\$91m for Scenario B; -\$193m for Scenario C; and \$133m for Scenario D. The BCRs (including WEBs) for each option are 0.56, 0.67, 0.21 and 1.38 respectively. This means, for every \$1 of total expenditure, Stage 2A is expected to return between \$0.21 and \$1.38 worth of benefits to the ACT economy.

² For Scenario A and Scenario B, this cost is the incremental development cost resulting from the profile of costs occurring earlier than in the base case (i.e. due to discounting). For Scenario C, there is no incremental development cost as the same profile of development is assumed in both the base and project cases. For Scenario D, the full development cost is incurred since the development is assumed to be fully contingent on the construction of Stage 2A.

Differences between the NPV and BCR of each scenario are driven by the benefits (detailed above) and development costs. It is clear that the economic outcomes depend critically on the level of dependence of Acton Waterfront on Stage 2A.

The capex and opex costs for each option are identical, however the development costs for the Action Waterfront vary. Despite the higher costs, Scenario D's NPV and BCR including and excluding WEBs are the highest of the four scenarios, as the benefits associated with the Acton Waterfront development are significant.

2.1.1 Sensitivity results

A number of sensitivities were performed on the economic results to test their robustness to key assumptions and inputs. Sensitivity scenarios for the CBA include:

- ▶ Discount Rate: 4% and 10% (as required by The Capital Framework)
- ▶ Project costs: +/-20%
- ▶ Benefits: +/-20%

As shown in Table 3 below, the NPV and BCRs of each scenario are most sensitive to a change in costs. A 20% increase in costs results in a decrease in NPV of \$53m for Scenario A, \$56m for Scenario B, \$49m for Scenario C and \$70m for Scenario D. A decrease in costs by 20% results in an increase in NPV of \$54m for Scenario A, \$55m for Scenario B, \$49m for Scenario C, and \$71m for Scenario D.

Results for all sensitivities undertaken for the four scenarios are shown in the table below.

Table 3 Sensitivity analysis (real 2019 \$m, PV at 7%)

SENSITIVITY ANALYSIS	SCENARIO A		SCENARIO B		SCENARIO C		SCENARIO D	
	NPV	BCR	NPV	BCR	NPV	BCR	NPV	BCR
Results	-118	0.56	-91	0.67	-193	0.21	133	1.38
DISCOUNT RATES								
4%	-132	0.59	-106	0.68	-216	0.30	327	1.74
10%	-106	0.54	-80	0.67	-173	0.15	35	1.12
COSTS								
+20% costs	-171	0.47	-147	0.56	-242	0.17	63	1.15
-20% costs	-64	0.70	-36	0.84	-144	0.26	204	1.72
BENEFITS								
+20% benefits	-88	0.67	-54	0.81	-183	0.25	231	1.65
-20% benefits	-148	0.45	-128	0.54	-203	0.17	36	1.10

Source: EY analysis, based on inputs from VLC, Arup, T&T and others

2.2 City to Woden Light Rail (Stage 2A and 2B)

The project benefits for each option are presented in the table below. This table includes all transport benefits (first and second round)³, city shaping benefits and wider economic benefits.

Further information on the assumptions for the base and project case for each scenario can be found in Chapter 3.

Table 4 CBA benefits (real 2019 \$m, PV at 7%)

BENEFIT / COST		Value
TRANSPORT BENEFITS		
Public transport user benefits	Travel time savings	27
	Light rail amenity benefits	30
Road user benefits	Travel time savings	74
	Vehicle operating cost savings	33
	Reliability	18
Externalities	Road use externalities	56
	Health benefits	38
	Accident cost savings	67
Other benefits	Bus operating cost savings	1
	PT revenue	-8
	Residual value	15
Total transport benefits		349
CITY-SHAPING BENEFITS		
Infrastructure cost savings		35
Land value uplift		367
Total city-shaping benefits		402
WIDER ECONOMIC BENEFITS		
Transport agglomeration		21
Land use agglomeration		445
Total wider economic benefits		466
Total benefits		1,217

Source: EY analysis, based on inputs from VLC, Arup, T&T and others

The table below shows the project cost and the economic performance of City to Woden Light Rail (Stage 2A and 2B). As is shown in Table 5, the NPV (including WEBs) is \$44m. The BCR is 1.04 (including WEBs). This means, for every \$1 of total expenditure, City to Woden Light Rail is expected to return \$1.04 worth of benefits to the ACT economy.

Table 5 CBA results (real 2019 \$m, PV at 7%)

³ First round transport benefits result from changes to the transport network brought about by the Project. Second round transport benefits stem from land use changes that are brought about by the Project, which drive changes in residents' travel patterns. This Report presents first and second round transport benefits together

RESULTS	Value
BENEFITS	
Total benefits (including WEBs)	1,217
Total benefits (excluding WEBs)	751
P50 COSTS	
CAPEX	960
OPEX	190
Development costs	23
Total costs	1,173
RESULTS	
NPV (excluding WEBs)	-422
BCR (excluding WEBs)	0.64
NPV (including WEBs)	44
BCR (including WEBs)	1.04

Source: EY analysis, based on inputs from VLC, Arup, T&T and others

As the BCR for the City to Woden Light Rail (Stage 2A and 2B) is just greater than 1, it is expected that the project delivers marginally greater benefits than its costs.

2.2.1 Sensitivity results

A number of sensitivities were performed on the economic results to test their robustness to the assumptions and inputs. Sensitivity scenarios for the CBA include:

- ▶ Discount Rate: 4% and 10% (as required by The Capital Framework)
- ▶ Project costs: +/-20%
- ▶ Benefits: +/-20%

Results for City to Woden (Stage 2A and 2B) are most sensitive to the discount rate at 4%, which increases the BCR by 0.5. A 20% decrease in costs also has a large impact on results, increasing the BCR by around 0.3. Results for all sensitivities undertaken are shown in the table below.

Table 6 Sensitivity analysis (real 2019 \$m, PV at 7%)

SENSITIVITY ANALYSIS	NPV	BCR
Results	44	1.0
DISCOUNT RATES		
4%	642	1.5
10%	-222	0.8
COSTS		
+20% costs	-191	0.9
-20% costs	279	1.3
BENEFITS		
+20% benefits	287	1.2
-20% benefits	-200	0.8

Source: EY analysis, based on inputs from VLC, Arup, T&T and others

DRAFT

3. Base and project cases

This chapter outlines the base and project cases that form the foundation of the economic appraisal. The benefits and costs reported for each scenario are the incremental benefits and costs between the project case and the base case.

Further information on the assumptions underlying the transport modelling undertaken for the base and project cases can be found in the Canberra Light Rail Stage 2 Assumptions Report prepared by VLC.

3.1 Base Case

The base case represents a 'business as usual' (BAU) scenario under which light rail is not extended. The base case includes the continuation of existing programmes such as proposed upgrades to the road network, and policy commitments announced by the Territory and the NCA.

Except where otherwise noted, all options and sensitivities are presented relative to this base case.

Table 7 Base case overview

ASSUMPTION	DESCRIPTION
Transport network	<ul style="list-style-type: none"> ▶ Planned road upgrades across the Territory, including a series of road upgrades on and around Parkes Way ▶ London Circuit/Commonwealth Avenue Intersection assumed to be grade separated⁴ ▶ Several park and rides implemented in future years
	<ul style="list-style-type: none"> ▶ City to Gungahlin Light Rail in operation ▶ Stage 2A economic appraisal: Canberra's 2019 bus network, with future updates in line with greenfield developments ▶ Stage 2A and 2B economic appraisal: Bus network as outlined in the Public Transport Service Plan, with future updates in line with greenfield developments ▶ The difference between the two bus networks highlighted above include changes to the R7 and R10 rapid bus routes in the Stage 2A appraisal, the addition of peak express routes 180, 181 and 182 between Tuggeranong and the City in the Stage 2A appraisal, and the removal of other peak express services in the Stage 2A appraisal ▶ Public transport fares remain constant at \$2.67 in real terms
Public transport network	
Land use	<ul style="list-style-type: none"> ▶ Land use in the base case is consistent with the Canberra Strategic Transport Model (CSTM) ▶ The development of the Acton Waterfront precinct occurring between 2025 and 2030 as per land use strategies, which is detailed further below (this is in the base case for all scenarios but Scenario D which assumes the development does not occur)

Source: VLC, TCCS and EY assumptions

3.2 City to Commonwealth Park (Stage 2A) Project Case

Project case assumptions for Stage 2A are shown in Table 8 below.

⁴ Approval for works to raise London Circuit to meet Commonwealth Avenue at a newly formed signalised intersection is being sought as part of a separate Business Case. In this economic analysis, light rail will travel up a ramp between London Circuit and Commonwealth Avenue. However, under an at-grade configuration, light rail would traverse along the median through the intersection, turning right onto Commonwealth Avenue. The costs of construction of the ramp are not included in the Project costs for this economic analysis.

Table 8 Project case overview

ASSUMPTION	DESCRIPTION
Transport network	<p>Everything included in the base case with road modifications necessary to accommodate the Stage 2A route including:</p> <ul style="list-style-type: none"> ▶ Removal of the slip lane from London Circuit (westbound) to Commonwealth Avenue (southbound) ▶ A new bridge is built to accommodate light rail travelling over Parkes Way ▶ The London Circuit/Commonwealth Avenue Intersection is assumed to be grade separated⁵ ▶ Note: these assumptions are made for economic modelling purposes only and are subject to separate consideration by Cabinet
Public transport network	<ul style="list-style-type: none"> ▶ City to Commonwealth Park Light Rail is constructed ▶ Base case bus network. A decision on how the bus network will integrate with the Project once operations commence will be taken in due course ▶ Note: these assumptions are made for economic modelling purposes only and are subject to separate consideration by Cabinet
Land use	<p>Land use in the project case for Stage 2A is consistent with the base case, except for the development of the Acton Waterfront precinct:</p> <ul style="list-style-type: none"> ▶ Under Scenario A, this is assumed to be accelerated i.e. construction is brought forward and have a more compressed period; ▶ Scenario B assumes the Acton Waterfront development will be brought forward by four years; ▶ Scenario C assumes the development will occur regardless of the construction of Stage 2A; and ▶ Scenario D assumes the Acton Waterfront development is fully contingent on the delivery of Stage 2A.

Source: VLC, TCCS and EY assumptions

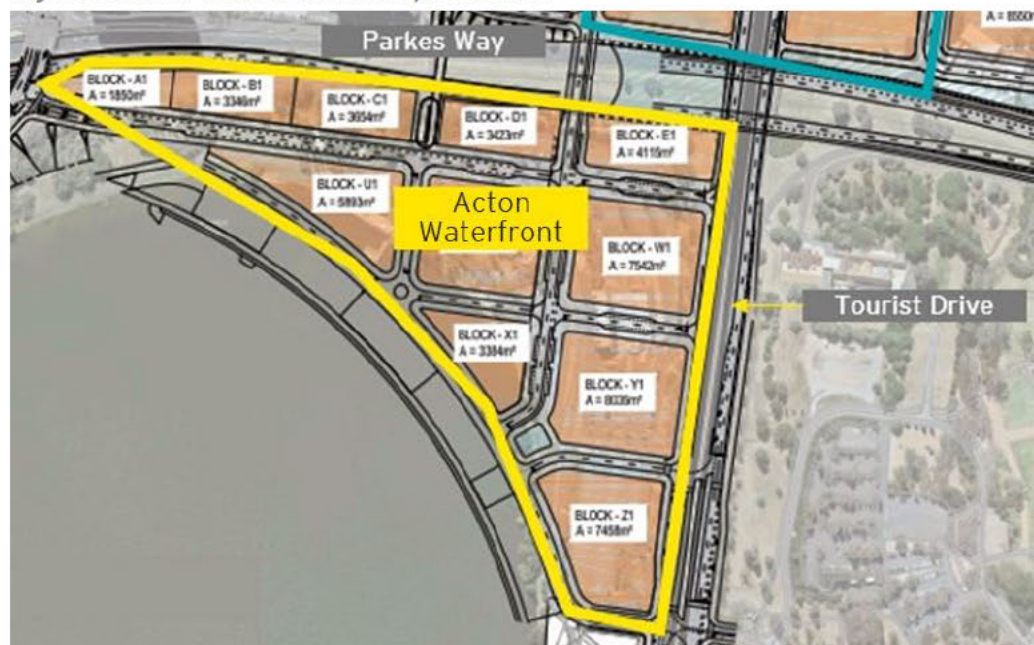
3.2.1 Land use assumptions

The mixed-use development in the Acton Waterfront, assessed in various forms as part of the four scenarios for the City to Commonwealth Park project, involves the release of land and the construction and sale of residential dwellings and commercial floor space in the Acton Waterfront.

Figure 2 depicts the sites proposed to be developed in the Acton Waterfront.

⁵ Approval for works to raise London Circuit to meet Commonwealth Avenue at a newly formed signalised intersection is being sought as part of a separate Business Case. In this economic analysis, light rail will travel up a ramp between London Circuit and Commonwealth Avenue. However, under an at-grade configuration, light rail would traverse along the median through the intersection, turning right onto Commonwealth Avenue. The costs of construction of the ramp are not included in the Project costs for this economic analysis.

Figure 2: Acton Waterfront development sites



The total area of the land planned for release in the Acton Waterfront precinct is 50,494 m², or 244,287 m² of gross floor area (GFA), which consists of:

- ▶ 85% residential dwellings, totalling 207,644 m² GFA. This equates to 2,076 dwellings, assuming 100 m² for each dwelling; and
- ▶ 15% commercial space, totalling 36,643 m² GFA.

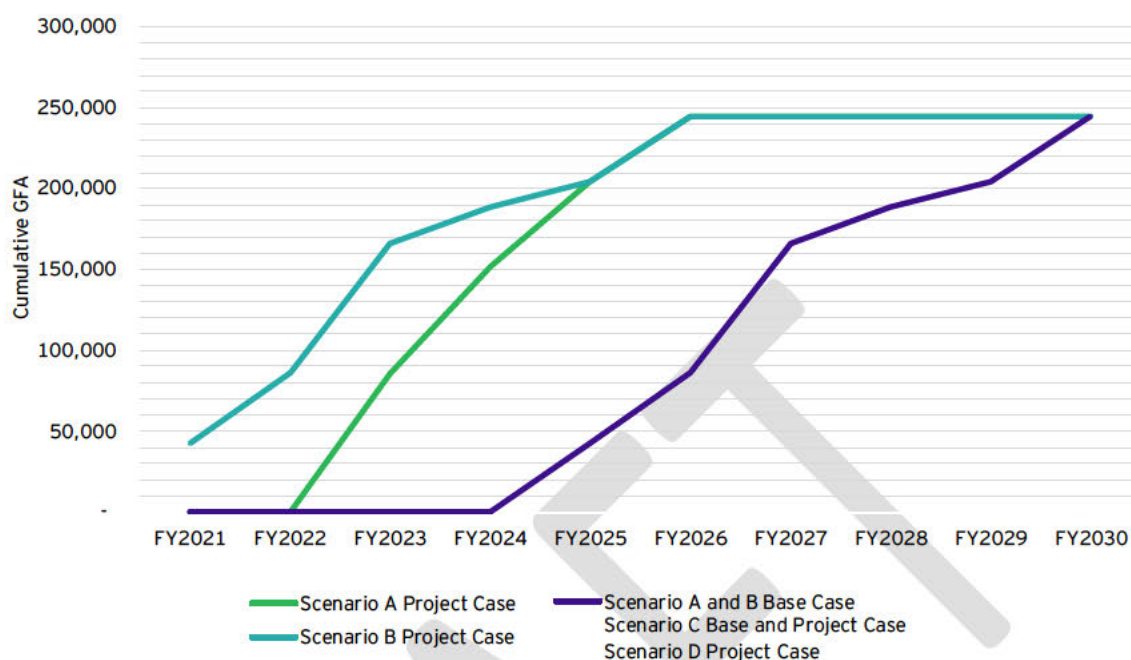
Each of the four scenarios assessed for Stage 2A is based on a different set of assumptions, as detailed in Table 9.

Table 9: Scenarios for City to Commonwealth Park economic assessment

SCENARIO	BASE CASE	PROJECT CASE
Scenario A	Proposed Acton Waterfront development occurs between FY2025 and FY2030	Acton Waterfront development brought forward and accelerated compared to the original profile (i.e. between FY2023 and FY2026)
Scenario B		Acton Waterfront development brought forward by four years ahead of the original profile (i.e. between FY2021 and FY2026)
Scenario C		No change from the base case
Scenario D		Proposed Acton Waterfront developments do not occur

The development profile for the base and project cases in the above scenarios are depicted in Figure 3 below.

Figure 3 Cumulative total GFA (residential and commercial) released at Acton Waterfront



3.3 City to Woden (Stage 2A and 2B) Project Case

The project case includes construction and operation of the City to Woden (Stage 2A and 2B) Light Rail. The assumptions underlying the project case are shown in Table 10.

Table 10 Project case overview

ASSUMPTION	DESCRIPTION
Transport network	<p>As base plus road modifications necessary to accommodate the full route including:</p> <ul style="list-style-type: none"> ▶ Removal of the slip lane from London Circuit (westbound) to Commonwealth Avenue (southbound) ▶ Intersection upgrades on Parkes Way between Kings Avenue and Coranderrk Street ▶ A new infill bridge is built to accommodate light rail travelling over Lake Burley Griffin, noting that further consultation with the NCA will be required on the crossing ▶ The London Circuit/Commonwealth Avenue Intersection is assumed to be grade separated⁶ ▶ Note: these assumptions are made for economic modelling purposes only and are subject to separate consideration by Cabinet
Public transport network	<p>Base case bus network with adaptations to accommodate light rail. These changes to the bus network have been adopted for the purposes of transport modelling only. A decision on how the bus network will integrate with the full route once operations commence will be taken in due course. Bus changes include:</p> <ul style="list-style-type: none"> ▶ R4 altered to operate between Lanyon and Woden via Greenway as a local service ▶ R5 altered to terminate at Russell ▶ Routes 170 and 171 were extended from Erindale to Woden, operating between Calwell and Woden as a rapid service ▶ Other parallel bus-light rail services have been removed from the network to be redeployed as feeder buses to the full route, such as buses from surrounding suburbs to Woden ▶ Other associated bus network assumptions have also been made ▶ Note: these assumptions are made for economic modelling purposes only and are subject to separate consideration by Cabinet

⁶ Approval for works to raise London Circuit to meet Commonwealth Avenue at a newly formed signalised intersection is being sought as part of a separate Business Case. In this economic analysis, light rail will travel up a ramp between London Circuit and Commonwealth Avenue. However, under an at-grade configuration, light rail would travel through the intersection, turning right onto Commonwealth Avenue. The costs of construction of the ramp are not included in the Project costs for this economic analysis.

ASSUMPTION	DESCRIPTION
Land use	<ul style="list-style-type: none"> ▶ Land use in the Project case is consistent with the base case until 2022, with the exception of the development of Acton Waterfront ▶ Following 2022, the Project case assumes that investment in light rail will result in a redistribution of population and employment growth from outside the light rail corridor to the areas surrounding the newly constructed light rail route ▶ The Acton Waterfront development is assumed to be accelerated; i.e. construction is brought forward with a more compressed construction period ▶ Land use assumptions are further outlined below

Source: VLC, TCCS and EY assumptions

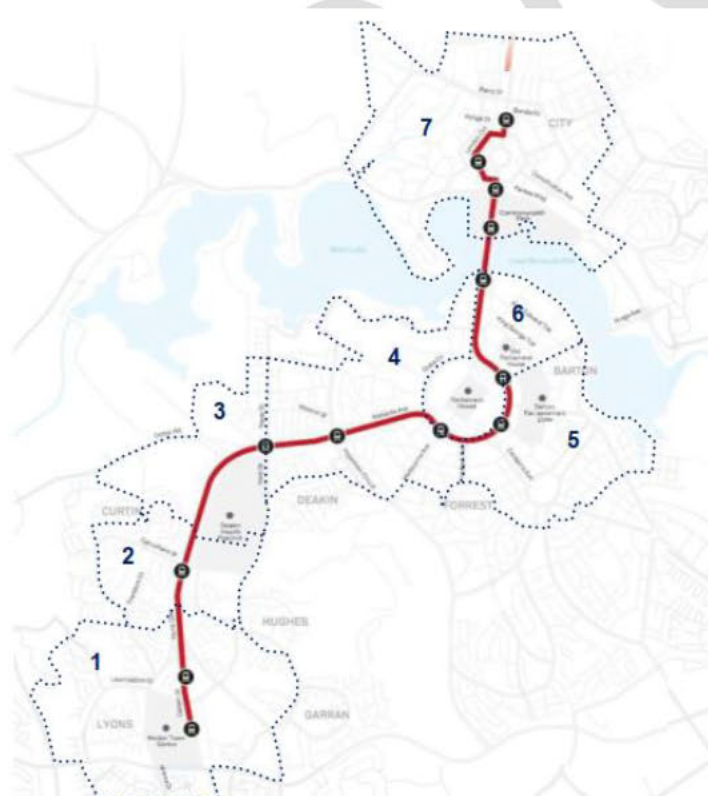
3.3.1 Land use assumptions

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

The area of influence is split into seven precincts expected to be impacted by City to Woden Light Rail as shown in Figure 4. Notable land use changes in the Project case include the Acton Waterfront, North Curtin and increased densification in Woden.

Note that for this analysis, the Acton Waterfront development is assumed to be accelerated, with the same assumptions as Scenario A above.

Figure 4 Route alignment precincts



Source: Arup

Table 11 below details the assumed demographic changes that will occur as a result of the City to Woden Light Rail (Stage 2A and 2B).

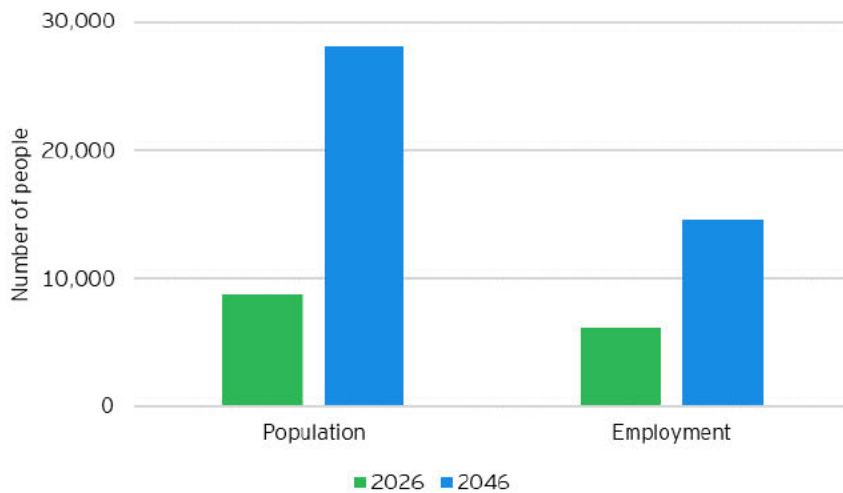
Table 11 2046 assumed precinct demographic changes

PRECINCT	BASE CASE		PROJECT CASE	
	POPULATION	EMPLOYMENT	POPULATION	EMPLOYMENT
1	12,049	26,153	23,002	32,402
2	2,414	1,981	4,918	2,897
3	2,249	5,878	7,043	9,352
4	4,777	2,166	5,986	3,238
5	10,562	25,533	13,314	29,365
6	16	7,508	13	8,955
7	40,428	86,963	46,306	84,603
Total	72,495	156,181	100,582	170,813

Source: Arup

The figure below compares population and employment in the project corridor between the base and project cases, for 2026 and 2046.

Figure 5 Change in population in the City to Woden project corridor, 2026 and 2046, between the base and project case



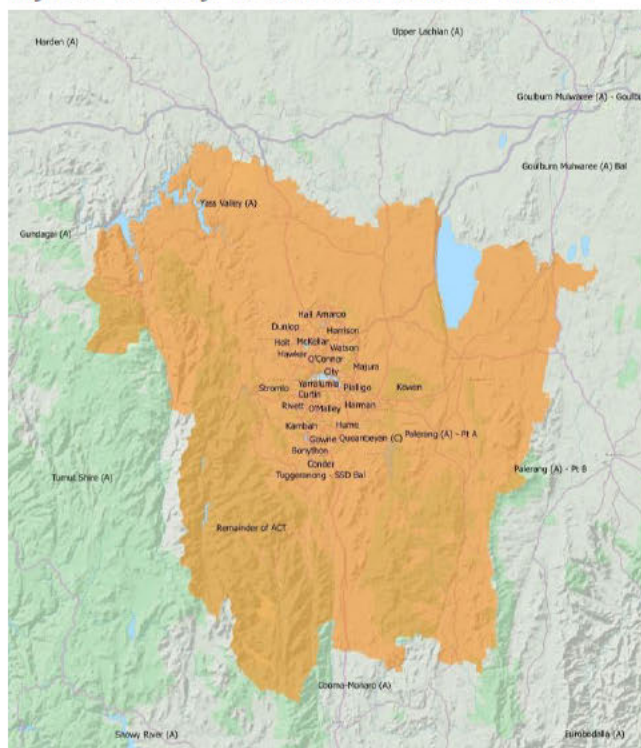
Source: Arup

4. Modelling inputs

4.1 Transport model inputs

The transport modelling for this study was undertaken by VLC using their Canberra Zenith multimodal all-day model. The geographical coverage of the Zenith model of the ACT includes Canberra, Queanbeyan and other surrounding regions. Figure 6 shows the spatial coverage of the model.

Figure 6 Coverage of the Zenith Model of the ACT



Source: VLC

The transport model runs that were provided by VLC to assess the Stage 2A Light Rail are detailed in Table 12.

Table 12 Model runs provided by VLC

CASE	LAND USE ASSUMPTIONS	YEARS MODELLED	SCENARIO USE
Base case, Stage 2A	Acton Waterfront developed from FY2025	2026, 2036, 2046	Base case for Stage 2A Scenarios A, B and D
Base case, Stage 2A	Acton Waterfront undeveloped	2026, 2036, 2046	Base case for Stage 2A Scenario C
Project case, Stage 2A	Acton Waterfront developed from FY2025	2026, 2036, 2046	Project case for all Stage 2A scenarios
Base case, City to Woden	No changes to land use	2026, 2046 ⁷	Base case for City to Woden route

⁷ Year 2036 was estimated as the average of the results for 2026 and 2046. This was done to address inconsistencies in total population and employment between the base and project cases in the runs provided by VLC for 2036.

CASE	LAND USE ASSUMPTIONS	YEARS MODELLED	SCENARIO USE
Project case, City to Woden ^B	Redistributed population and employment growth, no development at Acton Waterfront	2026, 2046 ⁹	Project case for City to Woden route

To quantify transport benefits for each scenario of the Stage 2A project (including all first and second round transport benefits and transport agglomeration benefits), the inputs from the Zenith transport model were utilised with adjustments to reflect the Acton Waterfront development assumptions for each scenario. These adjustments involved re-profiling the second-round transport benefits, to align the timing of benefits with the planned development of Acton Waterfront in each scenario.

The key assumptions used in the transport model are detailed in Table 13 below. Further assumptions are detailed in VLC’s assumptions book.

Table 13 Key transport model assumptions

CATEGORY	DESCRIPTION	PARAMETERS / ASSUMPTIONS	SOURCES
Model years	Years modelled in VLC Zenith Model	<ul style="list-style-type: none"> ▶ 2026 and 2046 (City to Woden) ▶ 2026, 2036 and 2046 (Stage 2A) 	VLC
Parking charges	Assumptions for parking costs throughout Canberra	<ul style="list-style-type: none"> ▶ Assumed growth in parking costs between 2016 and 2026 and 2036 ▶ 19-54% real increase across Canberra in 2026 from 2016 ▶ 39-70% real increase across Canberra in 2036 from 2016 	VLC
Fuel	Fuel price assumption	<ul style="list-style-type: none"> ▶ The fuel price is assumed to be 140c per litre in 2011 and grow every year 	VLC
PT and road cost parameters	Various cost parameters assumed for PT and road users	<ul style="list-style-type: none"> ▶ See Chapter 6 	VLC
Land use	Change in land use over the appraisal period	<ul style="list-style-type: none"> ▶ The treatment of the Acton Waterfront in the Stage 2A runs varies ▶ For the City to Woden model runs, it has been assumed that the demographics along the City to Woden corridor will change 	Arup (corridor land use), TCCS/CRA (Acton Waterfront land use)

The high-level transport model results for each of the model runs detailed above are shown below for the years 2026 and 2046.

Table 14 Stage 2A High level transport model results - Daily number of trips by option, year and mode

	BASE CASE: ACTON WATERFRONT DEVELOPED FROM FY2025		BASE CASE: ACTON WATERFRONT UNDEVELOPED		PROJECT CASE: ACTON WATERFRONT DEVELOPED FROM FY2025	
	2026	2046	2026	2046	2026	2046
Car Person Trips	2,017,427	2,575,645	2,017,921	2,578,609	2,016,820	2,574,926

^B To quantify the benefits of the City to Woden (Stage 2A and 2B) Light Rail, the results for Scenario A for Stage 2A were used until Stage 2B starts operations in FY2025. Following this, the City to Woden project case was utilised. Again, adjustments had to be made to accurately reflect the development timeline of Acton Waterfront.

⁹ Year 2036 was estimated as the average of the results for 2026 and 2046. This was done to address inconsistencies in total population and employment between the base and project cases in the runs provided by VLC for 2036.

	BASE CASE: ACTON WATERFRONT DEVELOPED FROM FY2025		BASE CASE: ACTON WATERFRONT UNDEVELOPED		PROJECT CASE: ACTON WATERFRONT DEVELOPED FROM FY2025	
	2026	2046	2026	2046	2026	2046
PT Trips (incl. School Bus)	105,205	160,420	105,166	160,665	105,993	161,844
Walk only Trips	585,678	783,141	585,272	779,315	585,569	782,708
Cycle only Trips	69,553	105,093	69,516	104,956	69,481	104,829
Walk access -> Walk egress trips	81,381	124,419	81,330	124,645	81,839	125,388
PT mode share	3.3%	3.9%	3.3%	3.9%	3.3%	3.9%
Bus passenger kilometres	857,046	1,368,181	857,754	1,377,562	847,721	1,352,880
Light rail passenger kilometres	96,715	142,368	96,349	142,534	111,235	163,064

Table 15 City to Woden (Stage 2A and 2B) Light Rail high level transport model results

	BASE CASE		PROJECT CASE	
	2026	2046	2026	2046
Car Person Trips	2,016,012	2,561,201	2,013,861	2,547,063
PT Trips (incl. School Bus)	105,765	160,846	104,460	160,040
Walk only Trips	588,455	787,869	595,516	809,981
Cycle only Trips	69,581	104,963	69,749	104,854
Walk access -> Walk egress trips	81,790	124,913	81,824	126,799
PT mode share	3.3%	3.9%	3.3%	3.9%
Bus passenger kilometres	851,813	1,361,565	685,206	1,088,919
Light rail passenger kilometres	97,139	142,152	214,327	328,967

4.2 Land use assessment

An assessment of potential land use changes that will accompany the development of City to Woden Light Rail was been developed by Arup, and the results for each zone in the ACT was provided. It showed the results of the changed employment and population forecasts across the Territory due to an intensification of activity in the City to Woden Light Rail's area of influence. It should be noted that the Territory-wide population and employment forecast, and demographics remain constant between the base and project cases; only the distribution of future growth is assumed to change reflecting the City to Woden Light Rail's city-shaping potential.

The land use assumptions for each economic appraisal are shown in Chapter 3.

4.3 Economic model assumptions

The CBA was undertaken in line with current guidelines, including the Australian Transport Assessment and Planning Guidelines (ATAP 2018) and TfNSW Principles and Guidelines for Economic Appraisal of Transport Investment and Initiatives (released in March 2013, and updated in March 2018). These guidelines provide the framework for the CBA and the parameter values.

The decision criteria that are presented include: Net Present Value (NPV) and Benefit Cost Ratio (BCR). The BCR has been calculated as follows, following Treasury guidelines:

$$BCR = \frac{PV \text{ of Benefits}}{PV \text{ of Capital Costs} + PV \text{ of Change in Recurrent Costs}}$$

The BCRs have been reported with and without WEBS.

The table below summarises some of the key parameters and assumptions that are used in the economic model.

Table 16 Overarching parameters and assumptions

CATEGORY	DESCRIPTION	PARAMETERS / ASSUMPTIONS	SOURCES
Appraisal Period	The appraisal period is the period in which the benefits and costs are realised for a project	<p>City to Commonwealth Park</p> <ul style="list-style-type: none"> The appraisal period includes the period of implementation (FY2021 to FY2024), and 30 years of operation (FY2024 to FY 2053) <p>City to Woden</p> <ul style="list-style-type: none"> The appraisal period includes: <ul style="list-style-type: none"> The period of implementation for Stage 2A (FY2021 to FY2024), and 30 years of operation for the City to Commonwealth Park section The period of implementation for Stage 2B (FY2022 - FY2025) and 30 years of operation for the Commonwealth Park to Woden section 	Assumption
Discount rate	All benefits and costs are discounted to their present value as at the start of the appraisal period	<ul style="list-style-type: none"> The analysis is conducted using a 7% real discount rate. Sensitivity tests have been undertaken based on a 4% and 10% rate 	ACT Gov - The Capital Framework
Constant prices	All values within the analysis are expressed in FY2019 prices with value of time escalation	<ul style="list-style-type: none"> All benefit unit values from the ATAP of TfNSW guidelines and other sources are updated to \$FY2019 values by applying inflation at 2.5% per annum (the midpoint of the Reserve Bank of Australia's annual inflation target) 	Assumption
Benefits realisation / Ramp-up factors	Used to adjust the benefits that are expected to be realised	<p>City to Commonwealth Park</p> <ul style="list-style-type: none"> 8% of the first year of benefits are realised as operations begin in May 2022, part way through FY2023 All further years are 100% realised to 2052 <p>City to Woden</p> <ul style="list-style-type: none"> 58% of the first year of benefits are realised as operations begin in November 2024, part way through FY2025 All further years are 100% realised to 2054 	Assumption
Profiling of benefits	Assumptions for profiling benefits in the base and project cases	<ul style="list-style-type: none"> Benefits are assumed to grow or decline linearly between model years Assumed zero growth in benefits after 2046, aside from real value of time growth (as per TfNSW guidelines) 	Assumption

CATEGORY	DESCRIPTION	PARAMETERS / ASSUMPTIONS	SOURCES
Interchange penalties	Assumptions for transfers and access/egress between PT options	<ul style="list-style-type: none"> ▶ Interchange penalties are consistent with NGTSM Guidelines at 6 minutes for same mode transfers and 10 minutes for different mode transfers ▶ Access and Egress penalties are consistent with NGTSM Guidelines at 0.5 times total access/egress time ▶ Further detail is given in section 6.2 	NGTSM guidelines
Annualisation factors	Used to convert average weekday traffic and benefits to annual traffic	<p>Volume expansion factors:</p> <ul style="list-style-type: none"> ▶ Road - 345 days per year ▶ Bus - 300 days per year <p>Cost/ benefit expansion factor:</p> <ul style="list-style-type: none"> ▶ Road - 336 days per year ▶ Bus (cost/benefit) - 292 days per year <p>Active transport factors:</p> <ul style="list-style-type: none"> ▶ Walk - 300 days per year ▶ Cycle - 300 days per year 	TfNSW guidelines, Table 69
Real escalation rate	Real escalation rate for capex and opex	<ul style="list-style-type: none"> ▶ Real escalation factor applied to capex and opex 	T&T
Value of time escalation	Change in the value of time over the appraisal period	<ul style="list-style-type: none"> ▶ Real increase in value of time applied in analysis (0.75% p.a.) 	TfNSW guidelines

5. Methodology

Schedule 2.2(a)(xi)

Schedule 2.2(a)(xi)

Schedule 2.2(a)(xi)

Schedule 2.2(a)(xi)

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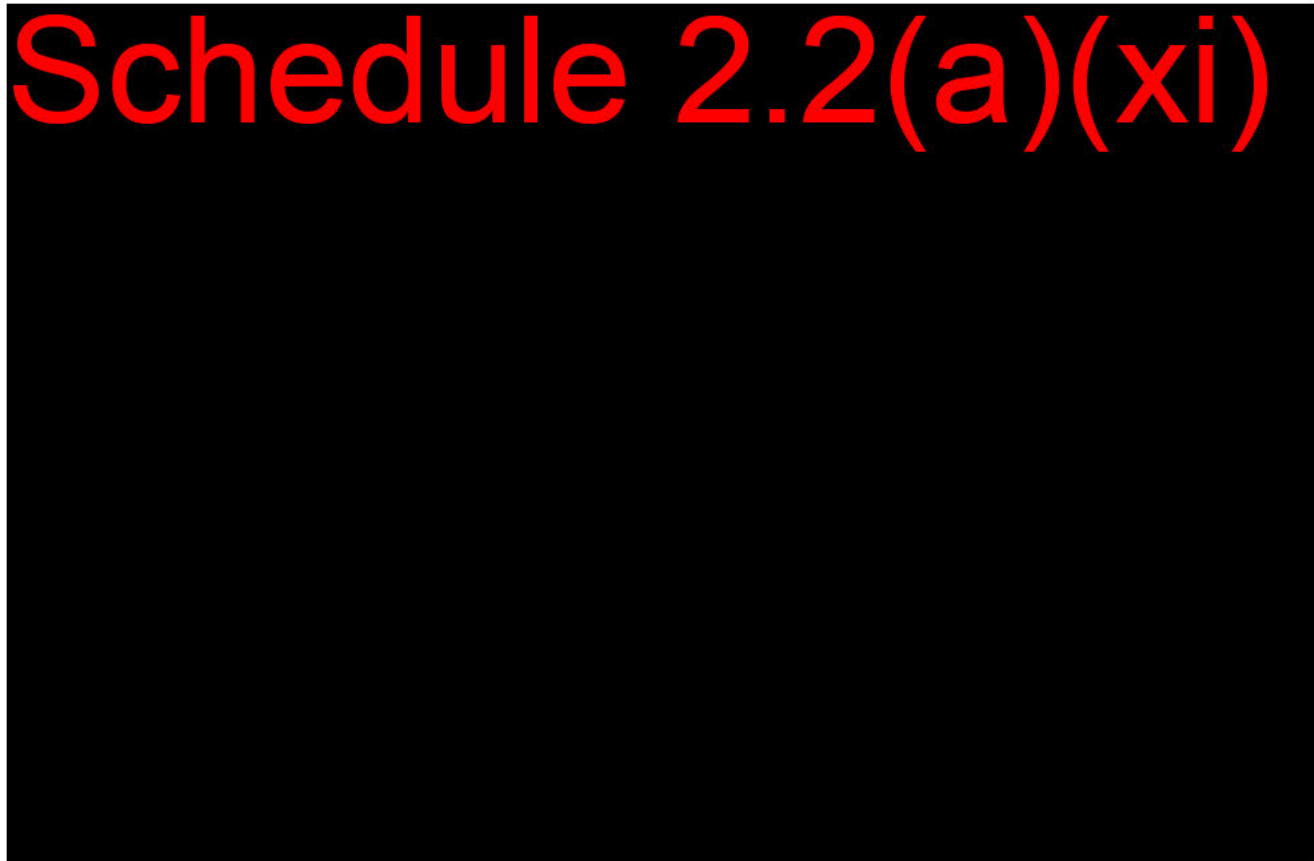
Schedule 2.2(a)(xi)

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Schedule 2.2(a)(xi)

Schedule 2.2(a)(xi)

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Schedule 2.2(a)(xi)

¹¹ For example, mixed use medium and high density apartments

Schedule 2.2(a)(xi)

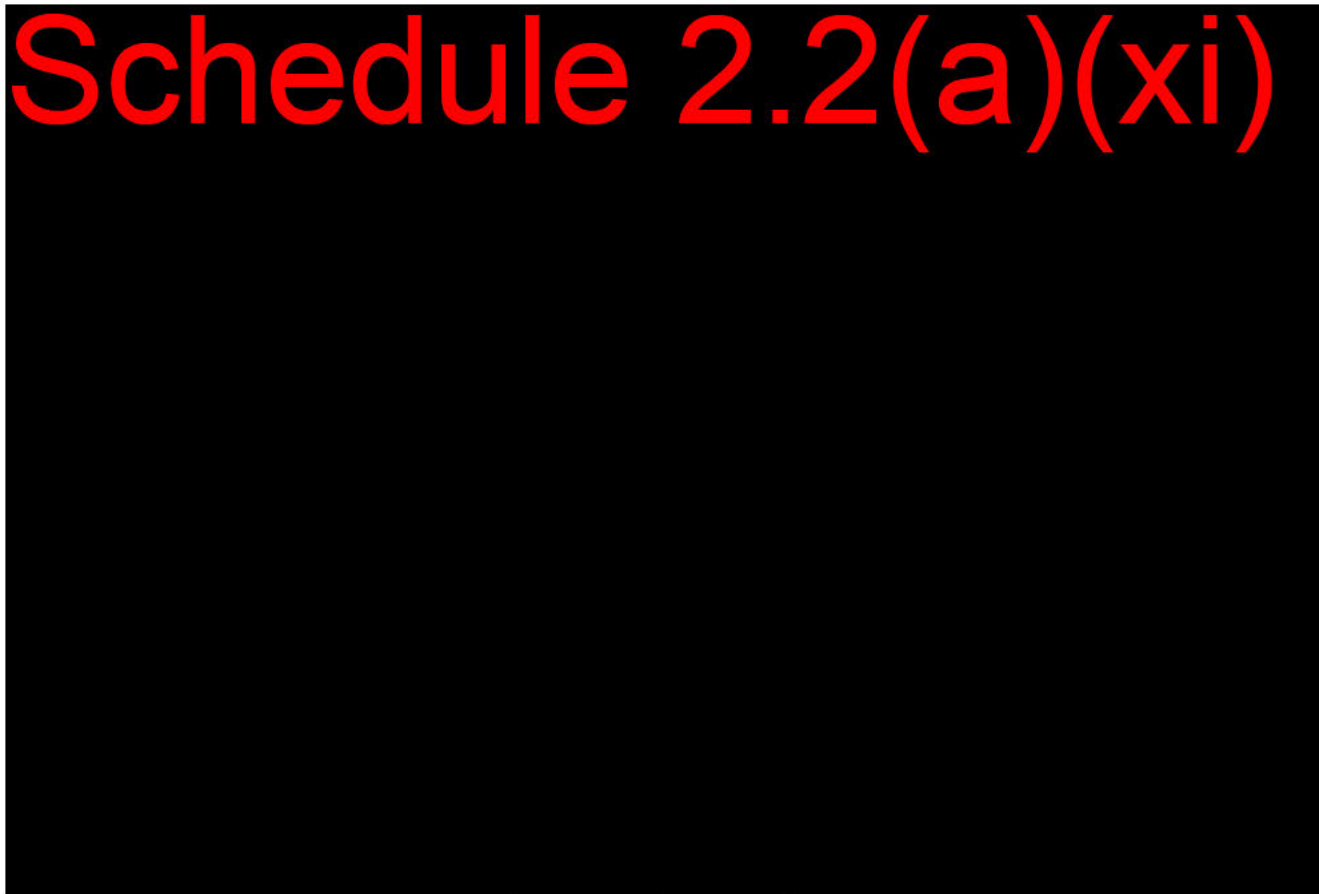
Schedule 2.2(a)(xi)

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6. Other assumptions

6.1 Parking Charges

The VLC transport model relies on assumptions that have been made about parking charges across the city according to policy initiatives and history. The below table shows the assumptions used in this CBA.

After 2036, parking costs are assumed to increase in line with CPI.

Table 44 Parking charges (\$2019)

	2016	2026	% INCREASE FROM 2016	2036	% INCREASE FROM 2016
CBD Core	\$17.59	\$22.12	26%	\$24.43	39%
City Zone B	\$11.72	\$18.01	54%	\$19.89	70%
Belconnen	\$11.72	\$14.94	27%	\$16.46	40%
Woden	\$11.72	\$14.94	27%	\$16.46	40%
Tuggeranong	\$11.72	\$14.94	27%	\$16.46	40%
Gungahlin Zone A	\$0.00	\$14.94	-	\$16.46	-
Gungahlin Zone B	\$0.00	\$13.31	-	\$14.72	-
Dickson	\$10.44	\$13.31	28%	\$14.72	41%
Deakin	\$10.44	\$13.31	28%	\$14.72	41%
Acton	\$11.72	\$15.03	28%	\$16.76	43%
Barton	\$11.72	\$15.03	28%	\$16.76	43%
Russell	\$11.72	\$15.03	28%	\$16.76	43%
Parkes	\$11.72	\$15.03	28%	\$16.76	43%
Australian National University	\$6.38	\$7.56	19%	\$8.78	38%
CIT	\$11.72	\$18.01	54%	\$19.89	70%
University of Canberra	\$2.45	\$3.20	31%	\$3.72	52%

Source: VLC assumptions book, adjusted to \$2019

6.2 Public Transport Cost Parameters

The below table presents the public transport cost parameters allocated in the strategic transport model from VLC.

Table 45 Public Transport Cost Parameters

CATEGORY	ASSUMPTION
Public Transport VOT, 2011 (AUD 2008)	\$12 / hour
Public Transport Fares, 2011 (Flat)	\$2.67
Public Transport Fare Change	CPI

Source: VLC assumptions book

The transfer and access penalties were deemed unsuitable for use in the economic model for the Project. Using the Transport for New South Wales Guidelines (or National Guidelines for Transport

System Management in Australia), an adjustment was created in order to correct the transfer and access penalties. The below table shows the built in transfer and access penalty assumptions and the model assumptions following the adjustment.

Table 46 Transfer and access penalty (minutes)

	VLC ASSUMPTION	MODEL ASSUMPTION
TRANSFER PENALTY		
Light Rail to/from Light Rail	25	N/A
Light Rail to/from Bus	25	10
Bus to/from Bus	30	6
Bus to/from Light Rail	25	10
Peak Bus to/from Bus	35	6
Peak Bus to/from Light Rail	30	10
TRANSFER PENALTY (WODEN ONLY)		
Light Rail to/from Bus	20	10
Bus to/from Light Rail	20	10
ACCESS PENALTY		
Light Rail to/from Walk	25	4
Standard Bus to/from Walk	35	4
Rapid Bus to/from Walk	30	4
Light Rail to/from Car	115	4
Standard Bus to/from Car	195	4

Source: VLC assumptions book and TfNSW Guidelines

6.3 Highway Cost Parameters

Table 47 Road cost parameters

TRANSFER PENALTY	YEAR	ZENITH
Values used in Generalised Cost Car Value of Time (VOT (AUD 2008))	2011	\$12 / hour
Car VOT Change	2012-2046	unchanged
Car Vehicle Operating Costs (VOC) accounted for in fuel price, 2011 (AUD 2008)	2011	140c / litre
Car VOC change	2012-2016	CPI
	2016-2021	2.71% p.a. real terms
	2021-2036	2.26% p.a. real terms
	>2036	CPI

Source: VLC assumptions book

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