ACT Audit Office

AUDITOR-GENERAL AN OFFICER OF THE ACT LEGISLATIVE ASSEMBLY

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Initiation of the Light Rail Project

ACT Auditor-General, Dr Maxine Cooper, today presented a performance audit report on the **Initiation of the Light Rail Project** to the Speaker, for tabling in the ACT Legislative Assembly.

Dr Cooper says 'the Capital Metro Light Rail Project's governance, administrative and project management framework is sound and generally accords with better practice, which positions it to meet the challenges of implementing light rail. However, benefits management needs to be given priority and a whole-of-government Benefits Realisation Plan, and associated documentation, developed and implemented to guide the management and realisation of the project's benefits'.

Benefits management is an important project management practice that identifies, tracks and delivers the measurable improvements generated by projects.

Benefits management is important given that, in considering only the project's transport benefits the benefit-cost ratio is 0.49, with an estimated 49.3 cents in transport benefits gained for every $1 spent; and considering transport benefits and wider economic benefits (including land use benefits), the benefit-cost ratio is 1.20, with an estimated $1.20 in benefits for every $1 spent.

Dr Cooper says 'The benefit-cost ratio of 1.20 needs to be used with caution as there is a lack of an agreed methodology and robust data in Australia for calculating wider economic benefits (including land use benefits). In the 1.20 benefit-cost ratio approximately 60 percent of the project's benefits are not transport-related. This is large compared with other transport infrastructure projects for which information was publicly available'.

'Realising the project's benefits will involve a wide range of activities related to land development decisions undertaken by ACT Government; ticketing and fare setting; bus and park & ride integration; parking charges; value capture activities; signalling priorities; the location of ACT Government staff in the corridor; and other undertakings to promote economic activity in the ACT. While some actions may have commenced to realise benefits, without a Benefits Realisation Plan there is a lack of transparency and accountability' said Dr Cooper.

The Summary of the **Initiation of the Light Rail Project : Report No. 5/2016**, with audit conclusions, key findings and recommendations is attached to this media release.

Copies of the **Initiation of the Light Rail Project : Report No. 5/2016** are available from the ACT Audit Office's website, www.audit.act.gov.au . If you need assistance accessing the report please phone 6207 0833 or go to 11 Moore Street, Canberra City.

Extract of Summary Chapter:

The Capital Metro Light Rail Project's governance, administrative and project management framework is sound and generally accords with better practice. Although improvements can be made, it positions the Capital Metro Agency to be able to meet the challenges of implementing light rail in the ACT. The integrity of the framework will need to be retained under revised 1 July 2016 Administrative Arrangements, whereby functions of the Capital Metro Agency and Territory and Municipal Services Directorate are merged.

Benefits management needs to be given priority and a whole-of-government Benefits Realisation Plan, and associated documentation, developed and implemented to guide the management and realisation of the project's benefits. This is important as considering only the project's transport benefits the benefit-cost ratio is 0.49, with an estimated 49.3 cents in transport benefits gained for every $1 spent[1;] and considering transport benefits and wider economic benefits (including land use benefits), the benefit-cost ratio is 1.20, with an estimated $1.20 in benefits for every $1 spent. However, the benefit-cost ratio of 1.20 needs to be used with caution as there is a lack of an agreed methodology and robust data in Australia for calculating wider economic benefits (including land use benefits). In the 1.20 benefit-cost ratio approximately 60 percent of the project's benefits are not transport-related. This is large compared with other transport infrastructure projects for which information was publicly available.

Although the ACT Government publicly released the *Full Business Case*, even though there was no requirement to do so, providing a discussion and explanation of the limitations of including wider economic benefits (including land use benefits) in the cost-benefit analysis would have provided more comprehensive information. Infrastructure Australia's approach is that wider economic benefits can add 'texture' for certain initiatives but need to be considered separately when considering a project.

Realising the project's benefits will involve a wide range of activities related to 'land development decisions undertaken by ACT Government; ticketing and fare setting; bus and park & ride integration; parking charges; value capture activities; signalling priorities; the location of ACT Government staff in the corridor; and other undertakings to promote economic activity in the ACT'. Accordingly, a Benefits Realisation Plan that captures such activities will require a concerted and sustained whole-of-government approach to be effectively implemented.

While actions may have commenced to realise benefits associated with the Capital Metro Light Rail Project, without a Benefits Realisation Plan there is a lack of transparency and accountability as to what needs to be done, when and by whom. The implementation of the Benefits Realisation Plan needs to be monitored (with benefits and costs clearly articulated and measured) and at key stages evaluated.

[1] Derived by $406.0 million in transport-related benefits divided by $823.0 million in estimated total project costs (as per Table 29 in the Capital Metro *Full Business Case*).

The estimated value of the project's benefits changed between various versions of the *Full Business Case,* including those considered by decision makers and that presented to the ACT community. While changes over time should be expected, the changes that occurred were made in a relatively short period of time, indicating that assumptions on which the benefits were being calculated were changing rather than circumstances associated with the project.

In order to achieve the benefit-cost ratio figures presented for the Capital Metro Light Rail Project, in addition to continuously monitoring and evaluating the expected benefits through a Benefits Realisation Plan, it will be important to ensure that project costs are effectively controlled. The ACT Budget will need to accommodate the expected cost of the Capital Metro Light Project of approximately $939 million (present value, January 2016) or $1.78 billion (nominal value) over 20 years.[2] [3] This does not include ACT Government agency costs for managing the implementation of the project. Revenue from fares will partially offset the costs of the Capital Metro Light Rail Project. The *Full Business Case* identified a total of $81 million in revenue from fares (present value, July 2014) over 20 years.

Chapter conclusions

GOVERNANCE AND PROJECT MANAGEMENT

The governance, administrative and project management framework for the Capital Metro Light Rail Project is sound and generally accord with better practice. While there are some opportunities for improvement, specifically with respect to resource management and project controls procedures, the Capital Metro Agency has established a sound framework for managing the project. The Capital Metro Agency has managed its budget so that spending has been within allocated budgets, which have been publicly reported. As of 1 July 2016 this framework may be affected by functions of the Capital Metro Agency and the Territory and Municipal Services Directorate being merged.

External reviews of the Capital Metro Light Rail Project, which have been identified in key planning documents as forming a part of the governance and oversight of the project, have not been undertaken as planned, or as rigorously as needed for a project of this size and complexity.

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[2] The 2014 cost estimates are the focus in this audit as they were relevant at the time of audit field work and to the audit objective. However, in May 2016, following the signing of a contract with the successful consortium and financial close on the project's procurement phase, the Audit Office obtained updated information from the Capital Metro Agency with respect to expected project costs as at January 2016. This is presented for completeness.

[3] The nominal cost estimate of the project is not discounted, i.e. the time value of money is not reflected. The present value estimate represents the discounted value of the nominal cost estimate of the project and is, in part, dependent on the timing of expenditure and the discount rate applied. The Capital Metro Agency has used a discount rate of 7.52 percent per year to calculate the present value estimate.

One peer review, which was conducted in relation to the *Full Business Case*, was very brief and did not consider key attributes of the project including transport modelling, quantified economic analysis, the benefit-cost ratio, financial analysis or assumptions used in the Public-Private Partnership assessment, or capital construction costs. In contrast, a second peer review, which was well documented, was conducted with a specific focus by subject matter experts over a three day period at the procurement stage.

ADVICE TO DECISION-MAKERS

The Capital Metro Agency has relied heavily on advice and inputs from consultants on a range of aspects associated with the planning and scoping of the project, including the technical and design aspects of the Capital Metro light rail, the estimated costs and benefits of the light rail and the recommended mechanism for the delivery of the light rail. Advice and inputs from consultants during the planning and scoping of the project led to the preparation and presentation of the *Full Business Case* to decision-makers in August and September 2014. The Capital Metro Agency's reliance on external consultants to supplement its own capability and obtain external expertise was necessary and facilitated the planning and scoping of the project.

Between mid August 2014 and mid September 2014, advice presented to decision-makers on the expected value of the benefits to be delivered by the project varied significantly. Furthermore, the value of benefits subsequently presented in the *Full Business Case* provided to the community has also varied from those presented to the decision-makers. Between the August 2014 version of the *Full Business Case pre*sented to the Capital Metro Project Board and the October 2014 version of the *Full Business Case* released to the community, a decrease of 26.0 percent in the expected transport benefits of the project was offset by an increase of 17.2 percent in land use benefits and 16.9 percent in wider economic benefits. While estimated benefits (and costs) should be refined as a project progresses, the changes for the Capital Metro Light Rail Project were significant and occurred over a short period. This indicates that assumptions underpinning the calculation of the benefits associated with the project were still being developed. There was insufficient documentation maintained to explain the differences in the values and the rationale for the changes.

Given the size and scale of the Capital Metro Light Rail Project, and that it represents a significant financial cost to the Territory, it is important that there be transparency over the cost of the project into the future. It will be important that the actual costs of the delivery and implementation of the Capital Metro light rail be transparently and publicly reported in the Transport Canberra and City Services Directorate financial statements. The Capital Metro Agency has estimated the cost to be approximately $939 million (present value, January 2016 using a 7.52 percent per year discount rate, or $1.78 billion nominal over 20 years). However, this figure does not include estimated agency costs associated with the construction and operation of the light rail, i.e. agency costs for managing the successful consortium over a twenty-year period.

The cost of the construction and operation of the light rail will be offset by fare revenue, which has been estimated as $81 million (present value, July 2014) over the twenty years of the concession period. Under an Availability Public-Private Partnership (PPP) the ACT Government will retain patronage and revenue risk, i.e. the risk of low passenger use and associated low revenues, but will have the opportunity to set fares.

REALISING THE BENEFITS OF LIGHT RAIL

Despite its stated intention to do so, the Capital Metro Agency has not yet developed and implemented key documents and processes associated with benefits management, a project management discipline which seeks to provide a framework for the management of a project and decisions to be made for the project. Without a structured, disciplined benefits management approach throughout the project lifecycle there is a risk that the project's benefits will not be optimised. A Benefits Realisation Plan, and associated documentation, is needed as a priority.

The ACT Government has advised that the project is expected to deliver $984 million (present value, July 2014) in benefits, against an expected cost of $823 million (present value, July 2014). Transport-related benefits associated with the project are estimated to be $406 million (present value, July 2014), while wider economic benefits (including land use benefits) associated with the project are estimated to be $579 million (present value, July 2014). The wider economic benefits (including land use benefits) of the project are very significant and form the majority of expected benefits associated with the project: 58.8 percent of the total expected benefits. This is a significantly higher proportion than other transport-related projects (for which publicly available information is available).

The calculation of wider economic benefits (including land use benefits) needs to be treated with caution. Methodologies for the calculation of wider economic benefits (including land use benefits) are continuously evolving, but have not yet reached a stage where they are widely and uniformly accepted and, in Australia, their calculation is hampered by the lack of necessary base data. Australian better practice guidance from Infrastructure Australia and National Guidelines for Transport System Management in Australia Steering Committee has noted that the 'calculation of these impacts is also still in its infancy, both in Australia and internationally' and that there are 'serious measurement difficulties in Australia due to limited data availability'.

There are two benefit-cost ratio figures presented in the Full Business Case; 1.0 (transport and land use benefits) and 1.2 (transport, land use and wider economic benefits). The benefit-cost ratio of 1.2 takes into account traditional transport-related benefits of $406 million (present value, July 2014) and land use and wider economic benefits of $381 million (present value, July 2014) and $198 million (present value, July 2014) respectively. In the Full Business Case and associated documents emphasis is given to the benefit-cost ratio figure of 1.2, without sufficient discussion and explanation of the inherent risks and limitations associated with this figure and its inclusion of wider economic impacts (including land used benefits).

The achievement of a significant proportion of the benefits identified for the Capital Metro Light Rail Project is predicated on two key assumptions: the implementation of the light rail will be the catalyst for economic activity (including land use benefits); and action will be taken by 'current and future Governments to ensure stated benefits are realised and maximised'. In relation to the former, the economic analysis that underpinned the *Full Business Case* assumed a 'do nothing' base case scenario, including assumptions that 'only already approved and planned changes to road and bus networks occur' and that 'land development activity is concentrated on sites currently controlled or owned by the ACT Government, with no effort to acquire other sites in order to aggregate into precincts or zones'. These actions may have occurred, and benefits may have been achieved, irrespective of the Capital Metro Light Rail Project. Regardless of views on this matter, it is imperative that there be a concerted whole-of-government approach to the management of benefits associated with the Capital Metro Light Rail Project, to ensure that the benefits are realised. A range of actions need to be implemented relating to 'land development decisions undertaken by ACT Government; ticketing and fare setting; bus and park & ride integration; parking charges; value capture activities; signalling priorities; the location of ACT Government staff in the corridor; and other undertakings to promote economic activity in the ACT'.

Key findings

GOVERNANCE AND PROJECT MANAGEMENT	Paragraph
The Capital Metro Light Rail Project's *Governance Framework* is comprehensive. The high level governance and management arrangements, including its governance structure and decision-making roles and responsibilities, accord with better practice. The Under Treasurer is identified as the Project Owner, and can provide the requisite financial and economic direction on behalf of the ACT Government.	2.9
The Capital Metro Project Board's responsibilities are well-defined and appropriate. The inclusion of the Directors-General of relevant ACT Government agencies as members of the Board means that issues can readily be considered in the broader whole-of-government context, and decisions made efficiently because the need for members to refer back to their agencies for authority is minimised.	2.18
The Capital Metro Project Board is an important governance mechanism for the Capital Metro Light Rail Project, with a significant workload. Its Charter is comprehensive with Board accountabilities, roles and responsibilities clearly	2.25

defined. ‘Commercial reports’ provided at each month’s Board meeting are comprehensive and informative.

The Capital Metro Agency’s Audit Committee is governed by a comprehensive Audit Committee Charter. The Audit Committee has met five times since its establishment, and has completed two internal audits, in relation to the agency’s financial management and procurement. The Capital Metro Agency intended to undertake a greater number of audits in 2016, with four audits scheduled to be conducted in 2016 covering information management, human resource management, fraud and integrity and risk management. It will be important for the intended internal audit activity for Capital Metro Agency to continue when the functions of the Capital Metro Agency are combined with some of those of the Territory and Municipal Services Directorate to form the Transport Canberra and City Services Directorate, as of 1 July 2016. 2.36

The Capital Metro *Project Plan* is comprehensive. Workstream descriptions have been carefully compiled and are at an appropriate level of detail. Interdependencies between workstreams have been identified and noted. 2.45

In order to supplement its comparatively small workforce, the Capital Metro Agency is heavily reliant on consultants. Many key documents associated with the project, e.g. the Capital Metro Light Rail Project’s *Governance Framework* and the *Full Business Case*, were authored by consultants. 2.48

The Capital Metro Agency has a relatively small number of personnel (approximately 25). In order to progress the Capital Metro Light Rail Project, the Capital Metro Agency has supplemented its comparatively small workforce with consultants. A better practice approach to manage workforce and resource risk for a project the size and scope of the Capital Metro Light Rail Project would be to develop a Resource Management Strategy and associated Resource Management Plan; this has not happened. In July 2015 the Capital Metro Agency did, however, engage EY, its commercial advisor, to develop a resourcing transition plan to assist in managing the transition of the project to the delivery phase. 2.57

The Capital Metro Agency’s stakeholder engagement policies and practices are well-documented. Relevant strategies and plans accord with better practice, and suitable staff are actively engaged in appropriate stakeholder engagement and communications activities. 2.63

The Capital Metro Agency’s risk management policies and procedures are comprehensive and relevant to its activities for the Capital Metro Light Rail Project. The Risk and Change Management Committee is an effective mechanism for the 2.73

oversight of the management of risks associated with the project.

There are appropriate change management procedures in place with respect to the Capital Metro Light Rail Project. The *Change Management Procedure* effectively sets out the protocols to be followed for changes to the project, as well as roles and responsibilities for managing and monitoring changes to the project. 2.80

The Capital Metro Agency has not had a documented Project Controls Procedure, as provided for by the *Project Plan*. This increases the risk that the project's objectives might not be fully achieved, or not achieved as efficiently as they could be. 2.86

The Capital Metro Agency's issues management policies and practices accord with better practice. Suitable arrangements are in place to ensure that issues are identified, captured, managed and closed, and receive adequate Executive attention. 2.94

The Capital Metro Agency's overarching financial management arrangements are in accordance with whole-of-government requirements. The Agency's Director-General Financial Instructions are comprehensive, have been updated, and are readily available to all staff. Financial procedures to be followed have been adequately documented. Financial reporting is in accordance with whole-of-government requirements, and arrangements are in place for the Executive to have oversight of financial matters. 2.111

An analysis of the Capital Metro Agency's operating results against budget for 2013-14 and 2014-15, and the budget for 2015-16 shows: 2.113

- for the three financial years 2013-14 to 2015-16, the total budgeted *Government Payment for Outputs* for the Capital Metro Agency is $34.4 million. That is, the cost of operating the Capital Metro Agency between 2013-14 and 2015-16 is expected be $34.4 million; and
- the significant majority of expenditure relates to supplies and services. Approximately 68.7 percent of all budget expenditure for the three years to 2015-16 relates to supplies and services, compared to 31.3 percent for employee and related expenses.

As the Capital Metro Agency is a comparatively small agency with respect to number of staff it is heavily reliant on contractors for the delivery of the Capital Metro Light Rail Project. This is reflected in the large proportion, $23.7 million (68.7 percent of total expenditure), of the Agency's budget that is attributable to supplies and services expenditure (which includes contractor expenditure). 2.114

The total budgeted amount of Appropriation to the Capital Metro Agency for financial years 2013-14 to 2015-16 is $55.6 million, with $34.4 million *Government Payments for Outputs* and $21.2 million being for *Capital Injections*. 2.120

In 2014-15 almost all of the budgeted appropriation for the Capital Metro Agency was for *Government Payment for Outputs* to deliver the services and objectives outlined in the Agency's budget papers. In 2015-16 a significant proportion of appropriation is identified as *Capital Injections* to be used for the development of the light rail infrastructure. This change is due to the progress of the project being at a stage where in 2015-16 approximately two thirds of the costs associated with the Agency can be directly attributed to the development of the light rail infrastructure.[4] 2.121

An analysis of the Capital Metro Agency's *Supplies and Services* expenditure shows that: 2.123

- there has been a significant increase between 2013-14 and 2014-15 for the majority of the *Supplies and Services* expenditure items, with the total *Supplies and Services* expenditure increasing by 206 percent; and
- the *Contractors and Consultants* expenditure contributes 78 percent of the total *Supplies and Services* expenditure in 2014-15 and 82 percent for 2013-14.

Following the *Contractors and Consultants* expenditure, *Legal Costs* are the second largest *Supplies and Services* expense for the Capital Metro Agency. In 2014-15 *Legal Costs* amounted to approximately 13.0 percent of the Capital Metro Agency's *Supplies and Services* expenditure. In 2013-14 *Legal Costs* represented 5.1 percent. 2.124

Gateway reviews initially planned for the Capital Metro Light Rail Project, which were designed to 'provide for rigorous exploration of the project's readiness to market' did not occur as planned. Three gateway reviews were to be conducted prior to the release of procurement documentation to the market. Instead, two 'peer reviews' were conducted over this period. The first peer review was not conducted in accordance with better practice gateway review practices, had no identified objective, was very brief and did not consider key attributes of the project including transport modelling, quantified economic analysis, the benefit- 2.133

[4] Expenditure that is associated with the purchase or development of an asset can be recognised on the agency's balance sheet once two conditions are met. If it is determined that it is probable that future economic benefits associated with asset will flow to the entity and the cost of the asset can be measured reliably, the expenditure can be capitalised and an asset recorded on the agency's balance sheet.

cost ratio, financial analysis or assumptions used in the Public-Private Partnership assessment, or capital construction costs. The second peer review was conducted with a specific focus by subject matter experts over three days and was well documented. The second review more closely resembles a gateway review than the first, and should be regarded as the minimal level of external scrutiny a major project should receive at a critical control gate.

ADVICE TO DECISION-MAKERS	Paragraph
Different versions of the *Full Business Case* have been prepared. These include: • *CMA Full Business Case – Board Version* (presented to a Board meeting on 15 August 2014); • a version presented to government on 10 September 2014; and • a version subsequently made public on 30 October 2014.	3.15
There is no policy or administrative requirement for the ACT Government to make the *Full Business Case* publicly available. In other jurisdictions some business cases for other major transport infrastructure projects have been made publicly available and some business case have not. The public release of the *Full Business Case* assists with providing information to the community and stakeholders on the details of the project.	3.16
Calculations associated with the benefits of the Capital Metro Light Rail Project, which underpinned the cost-benefit analysis undertaken for the project and advice to decision-makers, were continuing to be worked on during the period between August and October 2014. There were significant changes to specific components of the benefits associated with the project within a short time, indicating that assumptions underpinning the model were changed rather than circumstances affecting the project. With the exception of the project contingency, which was changed at the request of the Capital Metro Project Board, the total estimated costs associated with the Capital Metro Light Rail Project did not change significantly between the different versions of the *Full Business Case*.	3.24

Documentation associated with the Capital Metro Project Board's endorsement of the *Full Business Case* is poor. The meeting through which the Capital Metro Project Board purported to endorse the *Full Business Case* was attended by a minority of its members (although some of these members were represented by their identified proxies). The meeting did not have a quorum, as the Project Owner (or their proxy) or the Senior Supplier (or their proxy) did not attend. While the Project Owner has subsequently advised (January 2016) that they agreed at the time to the *Full Business Case* being presented to ACT Government decision-makers for approval, this was not documented at the time. 3.34

There were four sign-offs of the *Full Business Case* from various business units within the Chief Minister, Treasury and Economic Development Directorate in accordance with the Capital Framework. These sign-offs covered aspects of the financial and economic analysis that underpinned the Full Business Case, the selection of the delivery method for the project and the procurement method for the project. Treasury had a role with respect to reviewing the *Full Business Case*, as a form of quality assurance, including testing and questioning the calculations and assumptions underpinning the analysis. It did this through a desktop review of the *Full Business Case*, discussions with Capital Metro Agency staff, other ACT Government agency staff and the Capital Metro Agency's commercial advisers to assess the reliability and veracity of the financial model. This is consistent with the *ACT Government's Single Assessment Framework Business Case (Tier 3)*, which requires Treasury sign-off 'that the financial analysis has been prepared by an appropriately skilled advisor (Procurement and Capital Works Panel) and that there are no unacceptable assumptions in the analysis (only applicable for [public private partnership / design construct maintain operate] delivery models)'. This does not, however, amount to rigorous analysis or validation of the estimated benefits or costs, or of the Capital Metro Agency's advice on delivery options. 3.41

Reviews were conducted of the Full Business Case between August 2014 and October 2014. A peer review was conducted in August 2014, but this did not include consideration or examination of the economic analysis or the benefit-cost ratio as 'transport modelling was still being finalised'. Two external reviews were also conducted, which did not include 'comment on assumptions in or other inputs to the [*Full Business Case*], nor on detailed analysis, some of which is to be found in supporting technical documents' or 'an audit of the detailed data or values used'. 3.48

The original schedule for the development of the design of the Capital Metro Light Rail Project for incorporation in the *Full Business Case* for presentation to stakeholders for decision-making purposes saw the design stage commencing in mid-2013 and delivering a Definition Design and Refined Business Case (i.e. a *Full* 3.56

Business Case) by November 2013. Following slippage in the project a revised schedule was developed, which had a similar five-month timeframe for the development of the design.

Some technical advice and inputs were not available at the time that the Definition Design report was completed in July 2014, to inform the *Full Business Case* for presentation to stakeholders for decision on the Capital Metro Light Rail Project. These included contamination studies, utility surveys, flooding studies and geotechnical studies. As these studies were not complete at the time of the preparation of the Definition Design report in July 2014 and the presentation of the *Full Business Case* to decision-makers in September 2014, the technical design of the Capital Metro light rail was subject to further refinement as better information was developed. 3.67

The Capital Metro Agency's contract with Arup (the technical advisor for the Capital Metro Light Rail Project) identified a robust process to be followed for the review and acceptance of technical advice provided as part of the development of the Definition Design. This process was modified in practice, and significant reliance was placed on the existence of a Design Comments Register that was prepared, and responded to, for each of the key design deliverables. While this facilitated Capital Metro Agency and other stakeholders' review of the technical advice, it was not as rigorous or robust as originally planned. 3.75

Under an Availability PPP, direct costs of constructing and operating the Capital Metro light rail will be borne by the private sector operator, in return for an ongoing 'availability payment'. 'Availability' refers to the operation of the light rail and its availability for use by patrons. Availability payments are to commence once the Capital Metro light rail is available for use by patrons. 3.84

The *Full Business Case* identifies a nominal capital cost estimate (i.e. not discounted) for the Capital Metro Light Rail Project of $783 million (July 2014). The capital cost estimate is presented as a P75 figure. 'P75' means that the probability of the estimated cost being exceeded is estimated to be less than 25 percent. By way of contrast the P50 nominal capital cost estimate of the project is $759 million (July 2014 estimate) (where the probability of the estimated cost being exceeded is estimated to be less than 50 percent) and the P90 nominal capital cost estimate of the project is $806 million (July 2014 estimate) (where the probability of the estimated cost being exceeded is estimated to be less than 10 percent). 3.94

Turner and Townsend prepared an initial capital cost estimate based on the Definition Design document prepared by Arup, and provided to the Capital Metro Agency on 21 July 2014. This initial capital cost estimate put the total capital cost 3.99

of the Capital Metro Light Rail Project at $1,011,439,147.

In August 2014 Turner and Townsend prepared a revised *Definition Design - Cost Plan Report*, which identified a capital cost estimate for the Capital Metro Light Rail Project (without contingency) of $609,517,600. Key changes to the initial cost estimate prepared by Turner and Townsend (29 July 2014) and the revised *Definition Design - Cost Plan Report* are: 3.103

- the removal of owner's costs of $101,987,000 (and a contingency for owner's costs of $40,795,000);
- the removal of a contingency for the main works of $226,637,000;
- reduction of escalation allowance by $10,789,104; and
- savings of $21,713,443 derived from design revisions derived from a Value Engineering Workshop conducted on 31 July 2014.

With respect to the calculation of the contingency amount, the Audit Office was provided with an undated *Construction Risks Estimates Matrix*, which was produced by EY, which identifies various risks to the Capital Metro Light Rail Project, assesses their impact, and quantifies them in dollar terms. The *Construction Risks Estimates Matrix* provides for a total value of $146.3 million (in real terms). However, there is no documentation of the process by which the quantification was derived. The Capital Metro Agency did not maintain sufficient documentation with respect to the Monte Carlo statistical simulation, used to calculate the expected contingency for the capital cost estimate for the project. This was specifically lacking with respect to the input assumptions (important because different assumptions will produce different results), the algorithm used (important because different algorithms will produce different results) or the number of iterations, or repetitions, performed (important because more iterations will produce more accurate results). 3.107

The Capital Metro Agency does not intend to replace the rolling stock until 2049, i.e. the initial trams are expected to continue operating for 30 years. There are some risks with this approach, as there is evidence that trams in other jurisdictions have been replaced anywhere between 15 to 22 years. There is also evidence that trams in other jurisdictions, e.g. Melbourne, have operated for close to forty years. The Capital Metro Agency has sought to manage this risk through the procurement process, whereby potential bidders 'provided fitness for purpose / residual life warranties with respect to their rolling stock of (at least) 30 years'. 3.116

The *Full Business Case* identifies a nominal operating cost estimate (i.e. not discounted) for the Capital Metro Light Rail Project of $1,289 million (July 2014 estimate). The operating cost estimate is presented as a P75 figure. 'P75' means 3.119

that the probability of the estimated cost being exceeded is estimated to be less than 25 percent.

The Capital Metro Agency's analysis of the Public Sector Comparator and PPP Proxy shows: 3.133

- the total estimated cost of delivery of the project through a public-private partnership was $875 million (present value, July 2014). This includes the present value of estimated availability payments to be made to the successful consortium over the concession period and a contingency amount for the project for the Territory;
- the total estimated cost of delivery of the project through a public-private partnership was estimated to be cheaper than the cost of delivering the project by the public sector, which was estimated to be $970 million (present value, July 2014);
- the *Full Business Case* estimated that the expected cost of availability payments to be made to the successful consortium over the 20 year concession period would be $804 million (present value, July 2014); and
- the Territory-retained risk for the Capital Metro Light Rail Project was estimated to be $71 million (present value, July 2014). (This would be the same irrespective of whether the project was delivered by the public sector or through a public-private partnership). This represents a contingency amount for the project for the Territory.

The *Full Business Case* recommended an Availability PPP for the delivery of the Capital Metro Light Rail Project, which would involve a single vertically integrated package comprising rail infrastructure, rolling stock, maintenance, and operations. In doing so, the *Full Business Case* notes that 'the project is of such size and complexity that any attempt by the ACT Government to undertake the project outside a PPP model would be fraught with acute cost and timing risks'. 3.134

The Capital Metro Agency has advised that the discount rate applied to the Public Sector Comparator is 5.52 percent and the discount rate applied to the PPP Proxy is 7.52 percent as per the calculation methodology in Volume 5 of the *Australian Government National PPP Guidelines*. These were not disclosed in the *Full Business Case*. 3.137

The total nominal capital and operating cost estimate for the Capital Metro Light Rail Project, i.e. not discounted to present value, was $2,072 million (July 2014 estimate). This figure does not include agency costs, i.e. agency costs in managing the operator during both the construction and operational phases. 3.139

The estimated cost of the project, as represented by the PPP Proxy, was $875 million (present value, July 2014). This included $804 million in availability payments (present value, July 2014) and $71 million in Territory-retained risk (present value, July 2014), representing a contingency amount for the project for the Territory. This figure does not include the Capital Metro Agency (or ACT Government) costs associated with the delivery of the project. 3.147

Under an Availability PPP the ACT Government will retain patronage and revenue risk, i.e. the risk of low passenger use and associated low revenues, but will have the opportunity to set fares. The estimated cost of the Capital Metro light rail will be partially offset by income from fares. The *Full Business Case* has not identified a nominal value of estimated 'indicative potential revenues' over 20 years, but has identified a total of $81 million in present value terms (July 2014). 3.152

The Capital Metro Agency advised that the expected nominal cost of the Capital Metro Light Rail Project, following the signing of contracts was approximately $1,779,041,000. This figure comprises: 3.155

- $375,000,000 Territory capital contribution;
- $1,274,352,000 in availability payments to the successful consortium; and
- $129,689,000 Territory-retained risk amount.

The Capital Metro Agency further advised that the present value of the expected cost of the Capital Metro Light Rail Project is $939 million (January 2016, discounted at 7.52 percent). This figure comprises: 3.157

- $305,427,000 Territory capital contribution;
- $519,672,000 in availability payments to the successful consortium; and
- $113,919,000 Territory-retained risk amount.

The $939 million (present value) figure is calculated as at January 2016. It is not directly comparable with the $875 million (present value) figure that was included in the *Full Business Case*, as the latter figure was calculated as at July 2014, approximately 18 months previously. 3.158

The updated cost estimate for the Capital Metro Light Rail Project, following the signing of contracts, of $939 million (present value, January 2016) is less than the estimated cost of the project in the *Full Business Case* (PPP Proxy), which is estimated to be $975 million in January 2016 (discounted at 7.52 percent). The updated cost estimate for the Capital Metro Light Rail Project of $939 million 3.161

(present value, January 2016) is also less than the Public Sector Comparator identified in the *Full Business Case*, which is estimated to be $1,051 million in January 2016 (discounted at 5.52 percent).

Following the signing of contracts, the Territory's retained risk amount for the project has increased from $71 million (present value, July 2014) to $114 million (present value, January 2016). The Territory's retained risk amount represents a contingency amount for the project for the Territory. The Capital Metro Agency advised that the increased amount is due to a reassessment of the value and allocation of risks through the contract between the successful consortium partner and the Territory, including the allocation of certain contamination and other risks, as well as measuring retained risk from a common January 2016 measurement date. 3.162

REALISING THE BENEFITS OF LIGHT RAIL

Paragraph

The *Full Business Case* identified 18 benefits that are intended to be achieved from the Capital Metro Light Rail Project. Benefits are identified with respect to four identified 'problems': 'the need to build future alternative transport capacity', 'a need for sustainable urban re-development and increased urban densification', 'economic challenges' and 'sub-optimal gateway to the Capital'. The *Full Business Case* does not separately value these benefits, or (apart from identifying high-level 'Possible Key Performance Indicators' for eight of the benefits) indicate how they will be measured. 4.19

The breadth of expected benefits associated with the Capital Metro Light Rail Project, including benefits relating to urban redevelopment and densification and the ACT economy, demonstrates that the project is expected to have broader non-transport related benefits. 4.23

For the purpose of the cost-benefit analysis for the Capital Metro Light Rail Project, the *Full Business Case* identified a total of $984 million in project benefits (calculated in July 2014 present value dollar terms), including: 4.26

- $406 million in transport benefits;
- $381 million in land use benefits; and
- $198 million in wider economic benefits.

The land use benefits, specifically the urban densification benefits ($72 million, present value, July 2014) and infrastructure efficiency savings benefits ($140 million, present value, July 2014) are predicated on the achievement of agglomeration and productivity gains from the densification of housing and development in the light rail corridor. In this respect they are akin to wider 4.35

economic benefits. The land value benefits ($168 million, present value, July 2014) represent the benefits that are expected to be derived by land owners and developers due to expected development throughout the light rail corridor.

The *Business Case in Brief* states that 'over 30 years, land use benefits from light rail are estimated to be $765 million'. This figure represents the nominal value of land use benefits over a thirty year period (i.e. the term of the economic appraisal) which, when discounted, equates to a present value of $381 million (July 2014). The *Business Case in Brief* does not identify that this figure is the nominal value and has not been discounted. 4.36

Analysis of the Capital Metro Light Rail Project against other transport infrastructure projects for which there is publicly available information shows wider economic benefits (including land use benefits) i.e. those that are non-transport benefits form a significant component of the overall benefits identified for the Capital Metro Light Rail Project (58.8 percent). 4.38

In guidance published in 2013 (and updated in 2016) Infrastructure Australia urged caution with respect to the calculation of land use benefits and their consideration in the economic appraisal (i.e. cost-benefit analysis) of transport projects. Infrastructure Australia advised that such benefits may 'add texture to the decision making process for certain initiatives' but that it would treat these benefits separately in its consideration of projects. 4.55

In guidance published in 2013 (and updated in 2016) Infrastructure Australia urged caution with respect to the calculation of wider economic benefits and their consideration in the economic appraisal (i.e. cost-benefit analysis) of transport projects. Infrastructure Australia advised that such benefits may 'add texture to the decision making process for certain initiatives' but that it would treat these benefits separately in its consideration of projects. 4.58

The *2015 National Guidelines for Transport System Management in Australia* (the NGTSM Guidelines) published by the Commonwealth Department of Infrastructure and Regional Development advise caution with respect to the use of wider economic benefits and their consideration in the economic appraisal (i.e. cost-benefit analysis) of transport projects. The guidelines note that 'there are serious measurement difficulties, with the availability of Australian specific data needed to calculate WEBs being currently sub-optimal'. 4.62

In advice to the Audit Office in relation to the use of wider economic benefits (including land use benefits) in economic appraisal, Dr Geoffrey Clifton from the University of Sydney advised 'whilst recognised as existing, these wider benefits 4.67

have traditionally been very difficult to accurately measure and have traditionally not been included in economic impact analysis and they are still not uniformly included. The literature suggests that these benefits need to be treated with some caution, given that the way these are measured is still under development'.

The *Full Business Case* identified a benefit-cost ratio for the Capital Metro Light Rail Project of 1.0, based on transport benefits and land use benefits, and a benefit-cost ratio of 1.2, taking into consideration transport benefits, land use benefits and wider economic benefits. 4.69

The *Full Business Case* identified that 'as the [benefit-cost ratio] is greater than one, the economic analysis anticipates the project will deliver a net benefit to the ACT community.' It does not adequately explain the difference in the benefit cost ratio figures of 1.0 (transport benefits and land use benefits) and 1.2 (transport benefits, land use benefits and wider economic benefits). 4.74

It is critical that there be an appropriate understanding, because better practice guidance has highlighted the risks associated with valuing wider economic benefits (including land use benefits). Infrastructure Australia guidance emphasises the importance of traditional cost-benefit analysis, primarily focused on transport-related benefits, as a means to maintain the 'methodological rigour of the appraisal process', while noting that transport and land use and wider economic benefits may be considered separately as a means to add texture. 4.75

There is inadequate documentation associated with the assumptions underpinning the calculation of benefits associated with the economic analysis underpinning the Full Business Case. This is apparent with respect to: 4.93

- discussion / justification for values used in the calculation of benefits; and
- discussion / justification for the recognition of timing of the benefits.

While it would not be expected that the estimates in the *Full Business Case* presented to the Capital Metro Project Board (15 August 2014) would necessarily be final, the magnitude and type of changes between this version of the *Full Business Case* and the version presented to ACT Government decision-makers on 10 September 2014 were significant, given the short time between changes. Changes between the 15 August 2014 and 10 September 2014 versions of the *Full Business Case* included a 31 percent decrease in estimated transport benefits, indicating that assumptions underpinning the economic analysis were insufficiently developed and were still being developed as decision-makers (including the Capital Metro Project Board and the ACT Government) considered the merits of the *Full Business Case*. There was inadequate documentation maintained with respect to 4.104

the changes to the calculation of the benefits, including with respect to identifying the reasons for the changes in the calculation of the benefits.

Benefits management is identified as a key feature of the Capital Metro Light Rail Project in the *Capital Metro Project Board Charter* and the *Governance Framework*. The *Governance Framework* states that the Project Owner (Under Treasurer) will 'ensure the project focuses on benefits realisation throughout its life' and the *Capital Metro Project Board Charter* states that the Project Owner will 'ensure the project team focuses on benefits realisation throughout its life'. 4.114

The *Governance Framework* identified the need to prepare a Benefits Realisation Plan, and the first two iterations of the *Project Plan* (Versions 1.0 and 2.0, dated 30 July 2013 and 4 March 2014 respectively) similarly identified a need to prepare a Benefits Management Plan, as a means by which to 'identify the project's benefits and put the long term management processes in place to ensure they are realised', with a Benefits Realisation Plan to be prepared by July 2014. Better practice benefits management, as documented in APMG International's *Managing Benefits* (2012) guide, includes the preparation of a Benefits Management Strategy, a Benefits Realisation Plan and Benefit Profiles. None of these have been produced for the Capital Metro Light Rail Project. 4.115

Better practice benefits management provides that dis-benefits (i.e. negative side-effects and consequences arising from the project) should be identified, managed, tracked and measured in the same way as benefits. This provides transparency of net benefits against costs in the business case, allows dis-benefits to be minimised, and facilitates ongoing review of the economic viability of a project. The *Full Business Case* does not specifically identify the dis-benefits associated with the Capital Metro Light Rail Project. 4.118

The achievement of the Capital Metro Light Rail Project's benefits, including wider economic benefits (including land use benefits), is predicated on a number of key assumptions associated with the project. Two key overarching assumptions are: 4.122

- the implementation of the light rail will be the catalyst for economic activity (including land use benefits); and
- action will be taken by 'current and future Governments to ensure stated benefits are realised and maximised'.

The Capital Metro Light Rail Project's benefits are calculated on a 'do nothing' base case scenario, including assumptions that 'only already approved and planned changes to road and bus networks occur' and that 'land development activity is concentrated on sites currently controlled or owned by the ACT Government, with no effort to acquire other sites in order to aggregate into precincts or zones'. It is 4.129

noted that these actions may occur irrespective of the Capital Metro Light Rail project.

In various governance and planning documents for the Capital Metro Light Rail Project, including the *Capital Metro Project Board Charter*, *Governance Framework* and Versions 1.0 and 2.0 of the *Project Plan* (dated 30 July 2013 and 4 March 2014 respectively), the Capital Metro Agency identified its intention to practise the project management discipline of benefits management throughout the Capital Metro Light Rail Project. However, there are currently no formal plans to guide benefits management. 4.132

The achievement of the expected benefits associated with the Capital Metro Light Project, including the wider economic benefits (including land use benefits) are predicated on a number of assumptions including alignment of ACT Government policies and the rapid densification of the light rail corridor. It is imperative that there be a concerted whole-of-government approach to the management of benefits associated with the Capital Metro Light Rail Project, to ensure that the benefits are achieved. A structured, disciplined benefits management approach throughout the project lifecycle is needed if the project's benefits ($984 million, present value, July 2014) are to be achieved and optimised. Given this, it would be prudent to implement the practice of benefits management, in accordance with approved supporting plans to guide and integrate needed actions as a high priority. 4.133

The benefits to be realised from the Capital Metro Light Rail Project are significantly dependent on the light rail acting as a catalyst for economic activity (including land use benefits) and actions taken by 'current and future Governments to ensure stated benefits are realised and maximised'. With respect to the latter, current and future ACT Government policy in a range of areas will be important to realise and optimise the benefits from the project. This will require a concerted whole-of-government effort and the development of a Benefits Realisation Plan to guide actions. The Capital Metro Agency has advised that this is a role for the Chief Minister, Treasury and Economic Development Directorate. 4.140

Recommendations

RECOMMENDATION 1	PROJECT CONTROLS PROCEDURE

The Capital Metro Agency (the Transport Canberra and City Services Directorate as of 1 July 2016) should develop and implement a Project Controls Procedure to assist in managing project activities in accordance with the *Project Plan* and its objectives.[5]

RECOMMENDATION 2	EXTERNAL REVIEWS

The Capital Metro Agency (the Transport Canberra and City Services Directorate as of 1 July 2016) should design independent external reviews of the Capital Metro Light Rail Project so that:

a) objectives are defined;

b) appropriately qualified subject matter experts conduct the reviews;

c) sufficient time is allowed for their conduct; and

d) documentation is thorough.

RECOMMENDATION 3	PUBLIC REPORTING OF CAPITAL METRO LIGHT RAIL COSTS

The Capital Metro Agency (the Transport Canberra and City Services Directorate as of 1 July 2016) should accurately and transparently report the actual costs of delivering the Capital Metro Light Rail Project. This should include:

a) public reporting of actual costs compared to published budgets for the Capital Light Rail Project in annual reports of the Transport Canberra and City Services Directorate;

b) availability payments made to the PPP consortium; and

c) Capital Metro Agency costs associated with managing the PPP consortium during the construction of the Capital Metro light rail and for the ongoing operation of the Capital Metro light rail.

[5] During the audit the Capital Metro Agency advised that a Project Controls Procedure was being developed as part of the transition to the delivery phase of the Capital Metro Light Rail Project. On 14 June 2016 the Capital Metro Agency advised that a Project Controls Procedure had been developed for the delivery phase of the project. This has not been audited as to do so would have delayed publication of this report.

RECOMMENDATION 4	BENEFITS MANAGEMENT	HIGH PRIORITY
The Chief Minister, Treasury and Economic Development Directorate should, as a priority, take a lead role in implementing benefits management, including developing a whole-of-government Benefits Realisation Plan and associated documentation. This plan should identify and document the benefits to be realised by the project, their timing, ownership, critical dependencies for the achievement of the benefits and associated key performance indicators.		