



**Review of the Heads of Agreement between
City of Parramatta Council and the NSW
Government to establish an arts and cultural
precinct**

City of Parramatta Council

Thursday, 27 July 2017



Deloitte Financial Advisory Pty Ltd
ACN 611 749 841
Eclipse Tower
60 Station Street
Parramatta
Sydney, NSW, 2150
Australia

Phone: +61 2 9840 7000
www.deloitte.com.au

Thursday, 27 July 2017

Greg Dyer
General Manager
City of Parramatta Council
126 Church Street
Parramatta NSW 2150

Dear Greg

RE: Review of the Heads of Agreement between City of Parramatta Council and the NSW Government to establish an arts and cultural precinct

Deloitte Financial Advisory Pty Ltd ("Deloitte") is pleased to submit this report ("Report") for your consideration.

Please feel free to contact me on 0410 457 172 if you would like to discuss this report further.

Yours sincerely

Theo Psychogios
Partner

Deloitte Financial Advisory Pty Ltd

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Glossary

Acronym	Full name
CBD	Central Business District
CGE	Computable General Equilibrium Model
CoPC	City of Parramatta Council (current Council)
CoPC LGA	The geographical area, also known as the local government area, of the City of Parramatta Council
EDS	Economic Development Strategy
Etc	Etcetera
DPE	Department of Planning & Environment
GPOP	Greater Parramatta and Olympic Peninsula
GRP	Gross Regional Product
GSC	Greater Sydney Commission
HoA	Heads of Agreement
INSW	Infrastructure New South Wales
LGA	Local Government Area
MAAS	Museum of Applied Arts and Sciences
NSW	New South Wales
Parramatta LGA	The geographical area, also known as the local government area, of the Parramatta City Council
PCC	Parramatta City Council (the previous Council)
RJV	Riverside Joint Venture

1 Scope of Report

1.1 Introduction

Deloitte has been engaged by the City of Parramatta Council ("CoPC") to support in the deliberations of a proposed Heads of Agreement ("HoA")¹ between CoPC and the NSW State Government ("State Government") for the delivery of an arts and cultural precinct at the northern end of the Parramatta Central Business District ("CBD") on the Parramatta River.

The HoA between CoPC and the NSW government seeks to deliver the following:

- The relocation of the Museum of Arts and Applied Sciences (MAAS) to the CBD on the site formerly described as "Riverbank"² consistent with the NSW Government's announcement of 11th April, 2016³ and the Parramatta Cultural Plan⁴;
- Subject to a successful business case⁵, the redevelopment and expansion of the Riverside Theatre ("Riverside") on the existing site, consistent with the strategic intent for the theatre, outlined in the Parramatta Cultural Plan⁶;
- Supporting infrastructure to improve connectivity, amenity and pedestrian traffic through the Precinct⁷.

The delivery of these objectives is proposed to be managed through the following structures:

- A signed non-binding HoA between the CoPC and the NSW Government which governs the commercial arrangements for the use and application of lands proposed for the developments and the consideration to be provided in return for such lands;
- The establishment of a joint venture entity ("Riverside Joint Venture" or "RJV") between CoPC and the NSW State Government to guide the future development and manage the ongoing recurring costs for the redeveloped Riverside Theatre.

A detailed description of the proposed arrangements are set out in Chapter 3.

¹ Draft Heads of Agreement – Parramatta Arts and Cultural Precinct, Henry Davis York, received 26/7/2017

² The Riverbank site is also described as the former David Jones site

³ NSW Government Media Release (11 April, 2016), *New home chosen for Powerhouse Museum*

⁴ See City of Parramatta (2017) "Culture and Our City: A Cultural Plan for Parramatta's CBD 2017 – 2022"

⁵ The business case is proposed to be commissioned as part of the HoA arrangement

⁶ See City of Parramatta (2017) "Culture and Our City: A Cultural Plan for Parramatta's CBD 2017 – 2022"

⁷ Supporting infrastructure includes the addition of a pedestrian footbridges to link the MAAS and the Riverside Theatre

1.2 Scope of Deloitte review

Deloitte has been requested by CoPC to provide a report assessing the following:

- The strategic alignment of the HoA to deliver the established vision (both CoPC and the State Government) for a Parramatta Arts and Cultural Precinct;
- The expected economic benefits to the CoPC Local Government Area ("LGA") from the delivery of the MAAS and the expected induced additional tourism;
- The broader economic benefits from the delivery of a Parramatta Arts and Cultural Precinct.

The Deloitte assessment did not include the provision of legal, financial or accounting advice⁸.

⁸ The Deloitte assessment was limited to a review of the draft Heads of Agreement as at 26/7/2017 and publically available documents and disclosures.

2 Background

2.1 The City of Parramatta Council (CoPC)

2.1.1 Background and demographic characteristics

On May 12 2016, CoPC (and the CoPC LGA) was established by Proclamation⁹. This brought together the former Parramatta Council LGA with the neighbouring localities of the City of Auburn, the City of Holroyd and parts of the Hills Shire¹⁰.

According to 2016 Census figures, the LGA of CoPC enjoys a population of approximately 226,000 persons with a median age of 34. Around two thirds of the CoPC LGA have both parents born overseas, with 22% of residents having both parents born in Australia. Couple families with children predominate in CoPC LGA although a greater share of households reside in attached dwellings (i.e. units, apartments or townhouses).

Table 2.1 outlines some of the key demographic features of CoPC including comparisons with Greater Sydney and NSW.

Table 2.1 Key Demographics of CoPC LGA compared to greater Sydney and NSW

	CoPC LGA	Greater Sydney	NSW
Total Persons ('000)	226,149	4,823,991	7,480,228
Median Age (years)	34	36	38
Share of population with both parents born overseas (%)	64	49	37
Couple families with children (% of all families)	52	50	46
Detached dwellings (% of all dwellings)	46	57	66

Source: Australia Bureau of Statistics, 2016 Census

2.1.2 Population growth in CoPC Local Government Area (LGA)

The NSW Department of Planning & Environment (DPE) estimate that over the next five years, CoPC LGA will supply an additional 21,450 dwellings, representing one in ten of all additional dwellings in the Sydney Metropolitan area¹¹.

⁹ See *Local Government (City of Parramatta and Cumberland) Proclamation 2016* accessed at <http://www.legislation.nsw.gov.au/#/view/regulation/2016/241>

¹⁰ See Part 1 Section 4 of the *Local Government (City of Parramatta and Cumberland) Proclamation 2016*

¹¹ Source: NSW Department of Planning & Environment (2016) "Sydney Housing Supply Forecast by Local Government Area"

The population of the CoPC LGA is expected to expand at a greater rate than the overall Sydney population over the next 20 years, with the population estimated to almost double to approximately 420,000 persons.

The table below sets out DPE estimates for the growth in population for CoPC LGA and the greater Sydney Metropolitan area.

Table 2.2 Population Growth for CoPC LGA and Sydney Metropolitan

	CoPC LGA	Sydney Metropolitan	CoPC share (%)
2021	296,450	5,106,450	5.8
2026	338,000	5,537,800	6.1
2031	379,200	5,975,700	6.3
2036	416,750	6,421,950	6.5

Source: NSW Department of Planning & Environment, 2016 NSW State and Local Government Area Population Projections

2.1.3 Strategic Overview

2.1.3.1 The 2017-2021 Parramatta Cultural Plan

Following a period of consultation post the release of a discussion paper on culture and the arts in the Parramatta CBD¹², CoPC has approved a plan for stimulating and enriching the arts and cultures industries in the CBD ("Cultural Plan")¹³. Consultation received during the stakeholder engagement phase of the discussion process indicated an overwhelming support for the Cultural Plan and the direction set by CoPC¹⁴.

The Cultural Plan identifies a number of measures aligned to the objectives contained in the HoA. These include:

- The inclusion of the MAAS in the cultural infrastructure map of the CBD on the Parramatta Riverbank site¹⁵. The Cultural Plan identifies wide community support for MAAS relocating to the Parramatta CBD and proposes to *"link a redeveloped Riverside Theatres with the Powerhouse (MAAS) ¹⁶to create one world-class arts centre to put Parramatta on the map in the same way that MONA has done for Hobart"*.
- A commitment to redevelop of the Riverside Theatre into a performing and artistic centre, *"that will fold out onto the Riverbank, Church Street and Prince Alfred Square"*. The Cultural Plan also expresses an

¹² See City of Parramatta (June 2017) "Culture and our City: A Cultural Discussion Paper for Parramatta's CBD"

¹³ See City of Parramatta (July, 2017) "Culture and Our City: A Cultural Plan for Parramatta's CBD 2017-2022" and City of Parramatta (10 July 2017) "Notice of Council Meeting: Part 1 Item 10.6" and City of Parramatta (10 July 2017) "Minutes of the meeting of City of Parramatta Council held in the Epping Community Centre, 9 Oxford Street, Epping" at page 60

¹⁴ See City of Parramatta (10 July, 2017) "Notice of Council Meeting: Late Items Supplementary Report: Culture and Our City: A Cultural Plan for the Parramatta CBD 2017-2022" [at](#) paragraph 9 page 102

¹⁵ See City of Parramatta (July 2017) "Culture and Our City: A Cultural Plan for Parramatta's CBD 2017-2022" at page 30

¹⁶ For the purposes of this report MAAS and Powerhouse are used interchangeably

understanding of the limitations of the current venue and proposes a “strategic approach to resourcing the redevelopment of Riverside Theatres ...”¹⁷

2.1.3.2 The 2017-2021 Economic development strategy

In July 2017, CoPC adopted the 2017–2021 Economic Development Strategy (“EDS”) for the CoPC LGA. The EDS identified that the CoPC LGA has some 165,000 jobs currently and has set itself a target of 20,000 additional jobs, including 9,500 additional jobs in Parramatta CBD by 2021¹⁸.

The EDS sets out a strategy to improve the attractiveness and liveability of the CBD including expansion of the visitor and cultural economy. A specific measure identified in the EDS is providing support and leveraging established CBD arts and cultural institutions including the Riverside Theatre, the Parramatta Artists’ Studios and the proposed MAAS¹⁹.

2.1.3.3 The 2038 Strategic Plan

The former Parramatta City Council (PCC) completed the 2038 Strategic Plan (“Strategic Plan”) which currently provides the long term vision and direction²⁰. The Strategic Plan identifies the importance of the Parramatta River to the vision for the Parramatta LGA and the significance of developing a cultural precinct that makes use of the river as a place where the arts, entertainment and recreational activities of the Parramatta LGA can agglomerate.

The strategic objectives outlined in the Strategic Plan and relevant to the HoA include:

- A vision to build Parramatta as a centre of high, value adding employment and the engine for new wealth in Western Sydney;
- Making Parramatta a place where people want to be and a place that applies resources to drive energy and cultural richness to improve the quality of life;
- That Parramatta is known as a centre of excellence and the effective capital of Western Sydney characterised by inspirational leadership and good governance²¹.

2.1.3.4 Parramatta City River Strategic Design and Activation Plan and the Parramatta CBD Planning Strategy

The former PCC engaged McGregor Coxal to complete a broad based strategy and plan for the renewal and revitalisation of the Parramatta River. The subsequent City River Strategic Design and Activation Plan²² sets out four distinct “zones” in which to plan the revitalisation of the Parramatta River. The zones were identified as:

- The Kings School precinct incorporating the Kings School site and the Justice precinct;
- The Cultural quarter incorporating the Riverside Theatre, Princess Alfred Square Park and the Riverside Tower;

¹⁷ See City of Parramatta (July 2017) “*ibid*” at page 80

¹⁸ See City of Parramatta “*Economic Development Plan: 2017 – 2021*” at page 44

¹⁹ See City of Parramatta “*Economic Development Plan: 2017-2021*” at pages 34 -35

²⁰. See Parramatta City Council (June 2013) “*Parramatta 2038: Community Strategic Plan*”

²¹ Parramatta City Council (June 2013) “*ibid*” at page 11

²² See Parramatta City Council (2015) “*Parramatta City River Strategy Design and Activation Plan: Volume 01: Detailed Report*” accessed at https://www.cityofparramatta.nsw.gov.au/sites/council/files/___data/assets/pdf_file/0004/164686/River_City_Strategy_Volume_01_Report_Part1.pdf

- The City Quarter (East and West) precinct incorporating the Riverside Terrace, River Square, the Barry Wilde Bridge, a proposed City Beach and North Bank Terrace, bounded by Parramatta Quay to the east and Lennox bridge to the west;
- The Parramatta Quay precinct incorporating the Charles Street Weir and the Ferry interchange through to the Gas Works Bridge.

The broad vision outlined in the McGregor Coxal report is revisited in the PCC CBD Strategy²³ which establishes a vision for Parramatta as *"Australia's next great city, defined by landmark buildings and high quality public spaces with strong connections to regional transport. It will respect its heritage, be an exemplar in design excellence, facilitate job growth and ensure its streets are well activated"*.

The CBD Strategy identified 10 principles²⁴ for guiding development in the CBD including:

- Achieving world's best practice in planning and development including the creation of an attractive and distinctive city skyline;
- The creation of a liveable, active, desirable and engaging city;
- Achieving design excellence and improving the quality of urban design and the public domain.

The PCC CBD Strategy subsequently informed the final approval of the CoPC Planning Proposal to the NSW Department of Planning and Environment for the development of Parramatta's CBD²⁵.

2.1.3.5 Discussion paper on infrastructure planning and funding in the Parramatta CBD

To support the CBD Strategy, CoPC commissioned Aurecon to prepare an analysis of the infrastructure needs for the CBD and the means through which to fund them²⁶ The City of Parramatta Infrastructure Discussion Paper ("Discussion Paper") outlines a draft list of local infrastructure requirements to support CoPC's vision for the CBD and suggests alternative approaches to funding, including a proposal to develop a value sharing mechanism with developers and landowners.

The Discussion Paper outlines the infrastructure needs to support the arts and cultural industries in Parramatta that will assist in promoting the visitor economy. The paper suggests that *"a key major cultural project will be modernising and expanding Riverside Theatres to accompany the public domain river foreshore projects ..."*²⁷

In a report to CoPC on April 10, 2017, Council management reported on consultations with the Parramatta community on funding the infrastructure needs in the Parramatta CBD²⁸. The report indicated that CoPC had

²³ Parramatta City Council (2015) "Parramatta CBD Planning Strategy" accessed at https://www.cityofparramatta.nsw.gov.au/sites/council/files/inline-files/Appendix_2_Parramatta_CBD_Planning_Strategy_0.pdf

²⁴ Parramatta City Council (2015) "ibid" at page 9

²⁵ Parramatta City Council (April, 2016) "Planning Proposal. Parramatta CBD: Amendment to Parramatta LEP 2011" accessed at http://old.parracity.nsw.gov.au/___data/assets/pdf_file/0008/179891/Planning_Proposal_-_Parramatta_CBD_April_2016.pdf

²⁶ See City of Parramatta (March 2017) "Discussion Paper on Infrastructure Planning and Funding in the Parramatta CBD"

²⁷ See City of Parramatta (March 2017) "ibid" at page 11

²⁸ See City of Parramatta (10 April 2017) "Notice of Council Meeting: Public Copy: Item 8.3" at page 79 and City of Parramatta "Minutes of the Meeting of City of

infrastructure needs for the CBD amounting to some \$1 billion, with local government traditional funding sources²⁹ expected to provide some \$449-\$605 million in funding, requiring CoPC to source additional capital from non-traditional sources³⁰. Table 2.2 outlines the infrastructure capital needs of the Parramatta CBD based on the Aurecon analysis.

Table 2.3 Infrastructure needs of Parramatta CBD

Priority Area	Cost Estimate (\$m)
Growth and Transport	\$139.2
Green Spaces & Environment	\$211.0
Recreation & Leisure	\$101.1
Strong economy and City Centre	\$369.4
Community focus	\$79.8
Arts & Culture	\$98.2
Total Expenditure	\$998.7

Source: City of Parramatta Council (April, 2017)

The CoPC report provided specific cost estimates for the following infrastructure needed to support a Riverside Arts and Cultural Precinct including:

- River square project at South Bank between Lennox Bridge and Barry Wilde Bridge estimated at \$54 million;
- New footbridge across the Parramatta River, next to the Barry Wilde Bridge estimated at \$10 million;
- Modernised and expanded performing arts anchor facility, including presentation and production incorporating the new Riverside Theatres estimated at \$77 million.

In response to the report, CoPC resolved³¹ to prepare a Draft Parramatta CBD Infrastructure Strategy for public exhibition with the inclusion of:

- A Draft Section 94A Contributions Plan at the current rate of 3% levy for all developments greater than \$250,000, applying to the area in which the Parramatta CBD Planning Proposal applies and;
- A Draft Development Guideline to introduce a value sharing arrangement for Phase 1 at a rate of 20% (\$150/sqm) and Phase 2 at the rate of 50% (\$375/sqm).

2.1.3.6 2017- 2021 Riverside Theatre Strategy

The Riverside Theatre 2017-2021 Strategy was considered and endorsed by CoPC in June 2017³². The 2017-2021 Strategy follows on from the 2010-

Parramatta Council held in the Epping Community Centre at 9 Oxford Street, Epping on Monday, 10 April 2017 at 6.10 pm at page 27

²⁹ Traditional funding sources are rates, development contributions and State government funding

³⁰ See City of Parramatta (10 April 2017) "ibid" at page 136.

³¹ See City of Parramatta "Minutes of the Meeting of City of Parramatta Council held in the Epping Community Centre at 9 Oxford Street, Epping on Monday, 10 April 2017 at 6.10 pm" at page 28 available at

https://businesspapers.parracity.nsw.gov.au/Open/2017/OC_10042017_MIN_406.PDF

³² See City of Parramatta (13 June, 2017) "Notice of Council Meeting: Public Copy: Book 1 of 2: Item 12.1" and City of Parramatta "Minutes of the Meeting of City of

2014 strategy which oversaw the master-planning for the redevelopment of the Riverside theatre.

This strategy identifies a number of focus areas for the Riverside Theatre including:

- Ensuring current facilities are fit for purpose while simultaneously developing enhanced and expanded facilities;
- Identification of commercial and business opportunities to increase earned revenue and increased funding;
- Ensure programming is of high quality and develop new and relevant cultural production namely through the National Theatre of Parramatta.

2.1.3.7 Riverside Theatre Business Planning

In late 2014, PCC considered a market analysis, developed by Deloitte, of the potential to upgrade the Riverside Theatre³³. The Deloitte report found a *prima facie* case for an upgrade to the Riverside Theatre based on projections of population and proposed plans for the region. Following consideration of the Deloitte report, Parramatta Council resolved in principle to the redevelopment of Riverside Theatre including providing for a larger capacity theatre (1,200 – 1,600 seats), the retention of complimentary spaces, expanded multipurpose facilities and accommodation for a resident theatre company³⁴.

Following the Deloitte market analysis, the Riverside Advisory Board and PCC undertook a planning process to further consider Riverside Theatre options³⁵. The process considered four options for the redevelopment of the Riverside Theatre summarised below³⁶.

Table 2.4 Riverside redevelopment options

Theatre Option	Theatre Gross Floor Area (m ²)	Cost (\$m) ¹
New 1600, 400 and 2 x 150 seat theatres and residential	18,500	116
New 1600 theatre and residential	10,329	70
New 500 and 2 x 150 seat theatres and residential	7,650	50
Refurbishment of existing theatre (750, 350 & 150 theatres) and residential	6,100	40

Notes: (1) includes provision for 200 public car parking spaces

Source: Parramatta City Council (2015)

Parramatta Council held in the Jubilee Room, Parramatta Town Hall, Centenary Square, Parramatta on Tuesday, 13 June 2017 at 6.04 pm available at https://businesspapers.parracity.nsw.gov.au/Open/2017/OC_13062017_MIN_408.PDF

³³ See Parramatta City Council (15 December 2014) "Notice of Council Meeting: Item 9.1"

³⁴ See Parramatta City Council "Minutes of the Meeting of City of Parramatta Council held in the Council Chamber, Civic Place, Parramatta on Monday, 15 December at 6.45 pm" at pages 29-30

³⁵ See Parramatta City Council (28 September, 2015) "Notice of Council Meeting: Item 9.2" and Parramatta City Council "Minutes of the Meeting of Parramatta City Council held in the Council Chamber, Civic Place, Parramatta on Monday, 28 September 2015 at 6.53 pm" at page 19

³⁶ A fifth option to relocate the Riverside elsewhere and apply the site to residential and other social/community uses was also considered

2.2 New South Wales Government

2.2.1 Relocation of Museum of Applied Arts and Sciences

The NSW Government announced the MAAS relocation to Parramatta on the 26 February, 2015. As part of the announcement, the NSW Government allocated \$10 million to complete a business case for the MAAS relocation and a further \$800,000 to attract a resident company to the Riverside Theatre in partnership with PCC³⁷.

On the 9 September, 2015 the NSW Government announced a shortlist of sites for the proposed relocation including the Parramatta Golf Course and the Riverbank site (referred to as the Old David Jones car park)³⁸. In April 2016, the NSW Government announced the chosen site for the relocation as the Riverbank due to its proximity to transport and easy accessibility for pedestrians³⁹.

In April 2017, the NSW Government reaffirmed its commitment to building a new Parramatta museum as the "*flagship campus for the Museum of Applied Arts and Sciences*" announcing the commencement of an enhanced business case for the MAAS relocation (including the option of retaining some presence at the current Ultimo site) together with a public consultation process⁴⁰. The NSW Government indicated its intention to release the final business case by year end and to "*building a truly iconic museum in Western Sydney*".

2.2.2 Create in NSW: NSW Arts and Cultural Policy Framework

The overall direction for the arts and cultural industries in NSW is provided through Create NSW's arts and cultural policy framework⁴¹. The framework sets out the priorities for the NSW Government including the investments proposed in Western Sydney to enhance arts and cultural practice.

The framework commits the NSW Government to revitalising arts infrastructure, including the creation of a Parramatta Cultural Precinct in partnership with PCC, private sector partners and Western Sydney arts and cultural organisations and artists. The framework states "*we will work with our partners towards an enhanced Riverside Entertainment Precinct, ensuring the city's extraordinary heritage, as well as its arts and culture, drive urban renewal and attract visitors to the precinct*"⁴².

2.2.3 Rebuilding NSW and Infrastructure NSW State Infrastructure Strategy Update 2014

The NSW Government announced the establishment of the *Rebuilding NSW* fund in June 2014.⁴³ To guide expenditure for the fund, Infrastructure NSW (INSW) was tasked with reviewing State infrastructure under section 3 16(3) of the *Infrastructure NSW Act 2011*.

³⁷ NSW Government Media Release (26 February, 2015) "*Powerhouse powers into Parramatta: \$30 million to grow Western Sydney Arts Precinct*"

³⁸ NSW Government Media Release (9 September, 2015) "*Sites shortlisted for Parramatta's Powerhouse*"

³⁹ NSW Government Media Release (11 April, 2016) "*New home chosen for Powerhouse Museum*"

⁴⁰ NSW Government Media Release (19 April, 2017) "*Tell us what you want from Parramatta Powerhouse*"

⁴¹ Arts NSW (2015) "*Create in NSW: NSW Arts and Cultural Policy Framework*"

⁴² Arts NSW (2015) "*op cit*" at page 48

⁴³ NSW Government (11 June 2014) "*Rebuilding NSW - \$20 billion plan to turbocharge infrastructure*" accessed at <https://www.nsw.gov.au/news-and-events/news/rebuilding-nsw-20-billion-plan-to-turbocharge-infrastructure/>

INSW identified the significant opportunity available in developing a new Parramatta Cultural Precinct. Specifically, INSW recommended the need to:

- Plan for and prioritise investment in a new Parramatta Cultural Precinct, based around the Riverside Theatre Complex, the old David Jones site, Parramatta Stadium and the old Kings School;
- Urgently consider relocation of the Powerhouse Museum to the Parramatta Cultural Precinct;
- Promote sharing of collections from CBD-based institutions (such as the Australian Museum) with the Parramatta Cultural Precinct⁴⁴.

INSW also recommended that \$600 million be reserved from the Rebuilding NSW initiative for the NSW Cultural Infrastructure Program⁴⁵. Subsequently, the NSW Government announced that funding under the program would flow from 2017/18⁴⁶.

2.2.4 Greater Sydney Commission - Greater Parramatta and Olympic Peninsula and West Central District Plan

The Greater Sydney Commission ("GSC") was established in 2015 following the passage of the *Greater Sydney Commission Act 2015* ("the GSC Act"). The principal functions of the GSC is to lead metropolitan planning for Greater Sydney and to promote orderly development in Greater Sydney integrating economic, social and environmental considerations⁴⁷.

Section 10 (e) of the *GSC Act* provides that the GSC has a function of assisting local councils in the Greater Sydney region on the implementation of any plan relating to development in the region while Section 6 (b) requires the GSC membership to represent a district as defined in the *Environmental Planning & Assessment Act 1979*⁴⁸ (*the EP & A Act*). Section 75AD of the *EP & A Act* sets out the arrangements for completing district plans including the responsibility of the GSC to prepare a draft plan, its inclusions and the public consultation obligation⁴⁹.

In October 2016, the GSC issued a vision for the greater Parramatta district described as Greater Parramatta and the Olympic Peninsula (GPOP)⁵⁰. The GPOP vision included distinct strategies for four zones:

- Zone 1 comprising Parramatta CBD and the Westmead Health and Education Precinct;
- Zone 2 comprising Camelia through to Carlingford;
- Zone 3 comprising urban services and advanced technology spanning across Rydalmere, Camellia, Silverwater and Auburn;
- Zone 4 comprising the Olympic Park precinct.

The GPOP vision identified committed projects in the area including the revitalisation of the Parramatta River through the CBD and the MAAS. In the case of the latter, the GSC stated "*the Museum of Applied Arts and Sciences (MAAS) is set to spur an arts and culture precinct along the banks of the*

⁴⁴ Infrastructure NSW (2014) "*State Infrastructure Strategy Update*" at page 114

⁴⁵ Infrastructure NSW (2014) "op cit" at page 127

⁴⁶ NSW Government (October 2016) "*State Infrastructure Strategy*" accessed at <https://www.nsw.gov.au/improving-nsw/projects-and-initiatives/state-infrastructure-strategy/#sports-and-cultural-infrastructure>

⁴⁷ See Section 9 (a) and (b) of the *NSW Greater Sydney Commission Act 1985*.

⁴⁸ See Section 75AB (b) of the *NSW Environmental Planning and Assessment Act 1979*

⁴⁹ See Sections 75AD (2) (3) of the *NSW Environmental Planning and Assessment Act 1979*

⁵⁰ Greater Sydney Commission (October 2016) "*GPOP: Greater Parramatta and the Olympic Peninsula: Our true centre: the connected, unifying heart*".

*Parramatta River, following relocation of its popular Powerhouse Museum from Sydney's CBD to Parramatta CBD*⁵¹.

Following the release of the GPOP Vision, the GSC released the Draft West Central District Plan in November 2016⁵². The District Plan consolidates Parramatta as fundamental to Sydney's metropolitan planning future and confirms the centrality of Parramatta CBD as the economic anchor⁵³. The District Plan also affirms the significance of the Parramatta Riverbank strategy as the means to "activate the Parramatta River as a key cultural precinct. The Riverbank will be the setting of the Museum of Applied Arts and Sciences, as part of a \$30 million arts and cultural package for Western Sydney that includes funding to artists and arts organisations as well as a resident arts company at the Riverside Theatre"⁵⁴.

CoPC considered the GSC Draft District Plan on the 13 March, 2017⁵⁵. The CoPC submission to the GSC emphasised the following key issues:

- The reduced clarity and emphasis given in the Draft Plan to the metropolitan significance of a successful Parramatta CBD;
- The failure to provide an accompanying infrastructure plan to accompany the District Plan;
- The need for a "City plan" for each of the proposed "Three Cities" rather than the GSC model of six district plans.

Submissions to the GSC District Planning process have now closed. The GSC expects the final District Plans to be completed by the end of 2017⁵⁶.

⁵¹ Greater Sydney Commission (October 2016) "GPOP: Greater Parramatta and the Olympic Peninsula: Our true centre: the connected, unifying heart" at page 17

⁵² Greater Sydney Commission (November 2016) "Draft West Central District Plan: Co-creating a Greater Sydney"

⁵³ Greater Sydney Commission (November 2016) "ibid" at page 21

⁵⁴ Greater Sydney Commission (November 2016) "ibid" at page 34

⁵⁵ See City of Parramatta (13 March 2017) "Notice of Council Meeting: Item 8.7" and City of Parramatta "Minutes of the meeting of the City of Parramatta Council held in the Ermington Community Centre, 8 River Road, Ermington on Monday, 13 March at 6.04 pm" accessed at

https://businesspapers.parracity.nsw.gov.au/Open/2017/OC_13032017_MIN_405.PDF

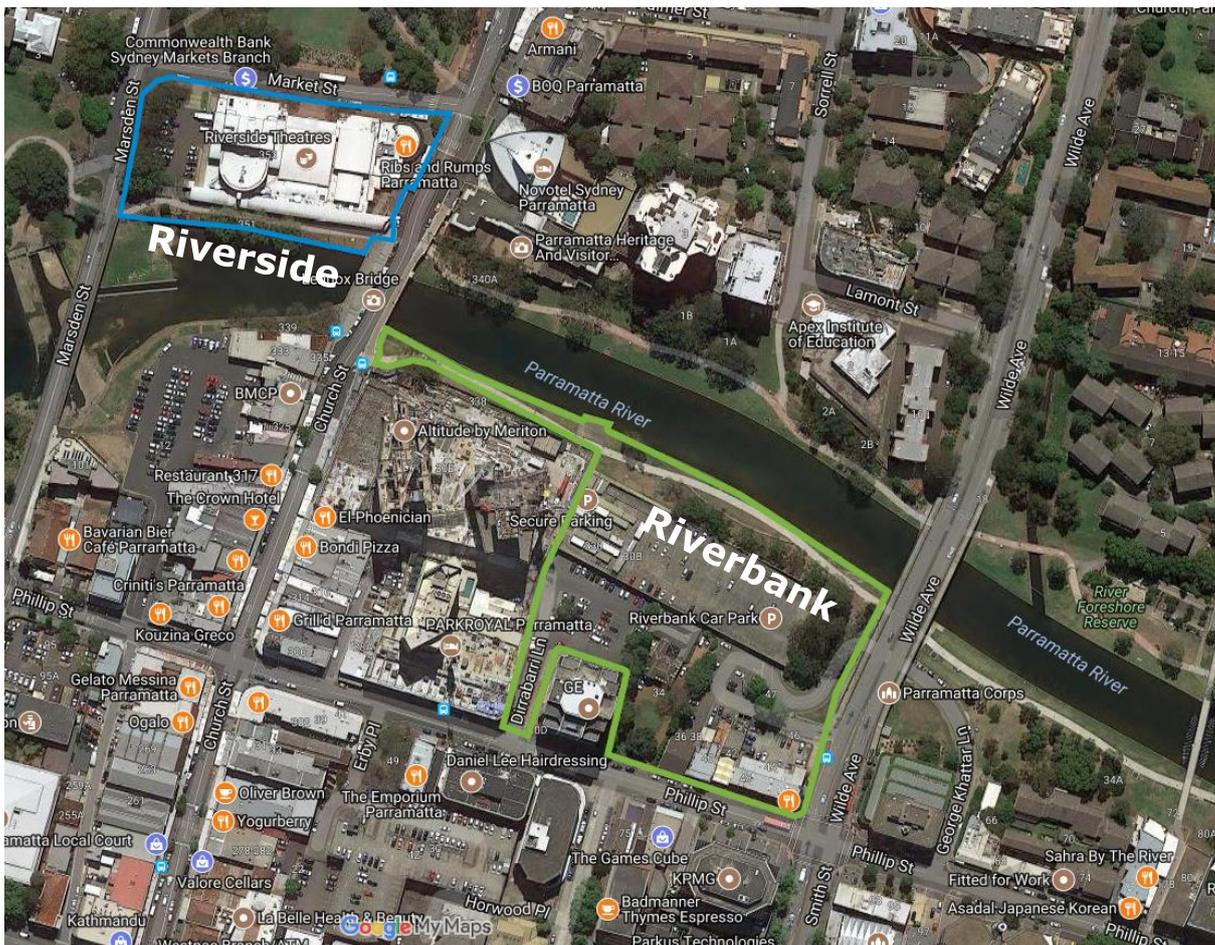
⁵⁶ Greater Sydney Commission (November 21, 2016) "Media Statement: Creating a more liveable Greater Sydney for all" accessed at

<https://www.greater.sydney/creating-more-liveable-greater-sydney-all>

3 The Heads of Agreement (HoA)

3.1 Overview

Figure 3.1 The proposed Parramatta Arts & Cultural Precinct, the Riverbank and Riverside sites



Source: Google Maps

The proposed draft HoA⁵⁷ to develop an arts and cultural precinct in the Parramatta CBD incorporates the following features:

- The CoPC Riverbank site⁵⁸ to be acquired by the NSW Government, for the MAAS, for a consideration of \$140 million, \$40 million of which will be provided in cash, consistent with the acquisition cost of the site⁵⁹.

⁵⁷ Draft Heads of Agreement – Parramatta Arts and Cultural Precinct, Henry Davis York, received 26/7/2017

⁵⁸ The Riverbank site incorporates three separate sites owned by COPC

⁵⁹ Savills Valuation Report, "Riverbank Site 30B Phillip Street Parramatta NSW", 2 April 2017, Savills Australia

- CoPC to allocate \$40 million to spending on arts and culture in accordance with the Cultural Plan over a 20 year period⁶⁰.
- The balance of the consideration (\$100 million) to be set aside for a proposed RJV formed between the CoPC and the NSW government.
- CoPC to provide the RJV with a 99 year lease on the land occupied by the current Riverside Theatre.
- NSW Government will establish a Project Steering Committee⁶¹ to oversee the development of a business case on the proposed redevelopment of the Riverside Theatre complex⁶²
- The Project Steering Committee to commission the NSW Government to undertake the business case by 31 December 2018, once completed the business case will be provided to the RJV.
- The RJV will be required to provide recommendations, to the NSW Government, on whether or not the redevelopment of the Riverside Theatre should proceed.
- Upon a successful business case being established⁶³, the redevelopment of the Riverside Theatre to proceed through the RJV.
- The NSW Government to fund the construction of a linkage between the Riverbank site and the Riverside Theatre.
- In the event a successful business case is not established, the RJV to be wound up, the Riverside Theatre to revert to CoPC and CoPC to be paid \$100 million.

A schematic representation of the proposed arrangement is illustrated below.

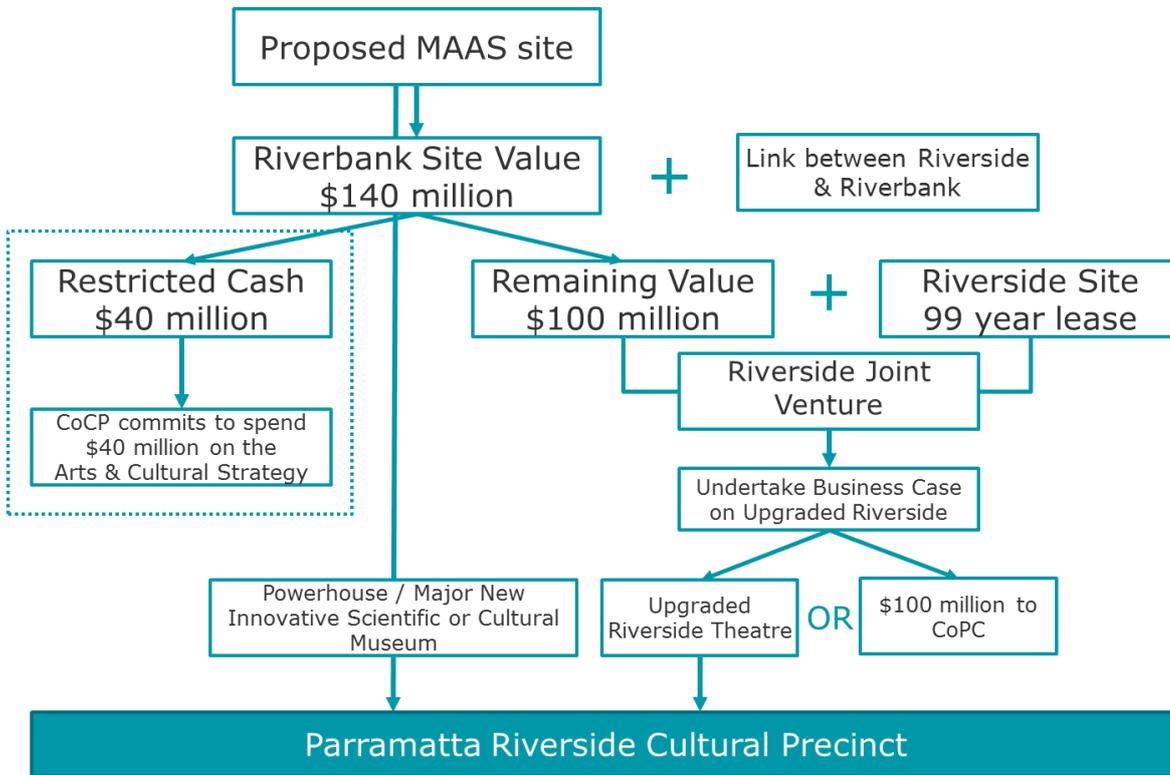
⁶⁰ The HoA commits the expenditure to be indexed in January of each year in accordance with the Consumer Price Index for Sydney

⁶¹ The project steering committee will comprise representatives from the Department of Planning and Environment, NSW Treasury, Department of Premier and Cabinet, Property NSW, CoPC (which will obtain three representatives), the Director of Riverside Theatre and an independent representative jointly appointed by the parties (and in the absence of agreement to be jointly appointed by the Minister for Arts and the Lord Mayor of CoPC)

⁶²The business case for the Riverside Theatre will consider principles around design excellence, the valued brand of the current Theatre and audiences, educational and cultural industry development, and CoPC's Cultural Plan. The business case will also need to demonstrate an ability to achieve sufficient positive cash flow in the longer term to cover maintenance and operations of the physical building.

⁶³ The "success" of the business case refers to whether the NSW Government agrees to go forward with the redevelopment of the Riverside Theatre. The criteria for a successful business case is yet to be determined.

Figure 3.2 Summary of the draft Heads of Agreement



Source: Deloitte analysis

3.2 Current CoPC outlays on the Riverside Theatre

The CoPC 2017/18 Operational Plan⁶⁴ outlines the current commitments in support of the Riverside Theatre. In 2017/18 CoPC is expected to outlay \$4.35 million in support of the Riverside Theatre

The outlays on the Riverside Theatre during 2017/18 are summarised below:

Table 3.1 CoPC outlays on Riverside Theatre 2017/18(\$m)⁶⁵

Capital outlays	(\$m)
Riverside Theatre plant, equipment and refurbishment	0.45
Riverside Theatres building renewal program	0.4
Riverside events and city activation storage	0.3
Riverside Theatre future analysis	0.1
Operational outlays	3.1
Riverside Theatre Total	4.35

Source: City of Parramatta "Operational Plan and Budget: 2017/18"

The HoA proposes the RJV will assume responsibility⁶⁶ for the future costs of the Riverside Theatre. To the extent that the RJV relieves CoPC from its current outlays, the improvement to CoPC's financial position of the RJV arrangement will be greater⁶⁷.

⁶⁴ City of Parramatta "Operational Plan and Budget: 2017/18"

⁶⁵ GST is not considered as part of this analysis

⁶⁶ Assuming a successful business case for the Riverside Theatre

⁶⁷ Deloitte have not assessed the extent of these financial gains arising from the RJV.

4 Analysis

4.1 Economic benefits of an arts and cultural precinct in CoPC

4.1.1 Methodology

Deloitte has undertaken an analysis of the economic effect of establishing an arts and cultural precinct in the Parramatta CBD.

The analysis applies Deloitte Access Economics' – Regional General Equilibrium Model (DAE-RGEM). The DAE-RGEM encompasses all economic activity in a regional economy – including production, consumption, employment, taxes and trade – and the inter-linkages between them. For this project, the model has been customised to explicitly identify the City of Parramatta local government area regional economy⁶⁸.

Deloitte has estimated the economic effect of an arts and cultural precinct in Parramatta reflecting⁶⁹:

- Additional construction activity of \$500 million⁷⁰ on arts and cultural facilities in the CoPC region;
- An increase in visitation to the CoPC arising from the development of an arts and cultural precinct⁷¹ under a low and high scenario.

The assessment has been undertaken against a baseline of business as usual for CoPC⁷².

It is important to note that the modelling examines the potential impact of the relocation of the MAAS to the CoPC LGA. Alternate infrastructure projects of this magnitude would be expected to flow through to other regions. However, these economic impacts have not been assessed.

4.1.2 Modelling Results

4.1.2.1 Impact on Gross Regional Product (GRP)

It has been estimated that the economic impact of the project could lead to an increase of around \$106 million (Low scenario) to \$422 million (high scenario) to the Gross Regional Product of CoPC LGA⁷³. This results in the CoPC LGA economy being in the range of 0.5 to 2.0 per cent higher than it could have been in the baseline by 2028.

4.1.2.2 Employment

The modelling indicates that employment is expected to increase strongly over the labour intensive construction phase under both options. The induced tourism under both scenarios also results in growth in employment once the MAAS becomes operational in 2021. For the low scenario and high

⁶⁸ For further detail on the DAE-RGEM framework, please see Appendix B

⁶⁹ For detailed assumptions see Appendix A

⁷⁰ Deloitte have modelled \$500 million consistent with the Destination NSW "Western Sydney Visitor Profile: Year Ended June 2016" estimate of the cost to re-locate MAAS

⁷¹ Deloitte have estimated the economic effects under two scenarios of visitation. A high and low scenario. Under both scenarios, visitors spend \$100 per visit (Source: Destination NSW "Western Sydney Visitor Profile: Year Ended June 2016")

⁷² Deloitte have also not assessed the impacts of alternate proposals on the CoPC regional economy.

⁷³ Estimated in net present value terms applying a 7% real discount rate.

scenario, over the period 2021 – 2028, 150 and 600 FTE additional jobs respectively are expected.

4.2 Agglomeration benefits of a cultural precinct

The goal of the proposed arrangement is to establish a leading arts and cultural precinct anchored by two key institutions - an iconic Museum on one side and a re-developed Riverside Theatre on the other. The establishment of these two anchor institutions would serve to anchor the commitments made by both tiers of government to make Parramatta Sydney's Central City CBD.

The level of additional arts and cultural activity expected in the cultural precinct would lead to direct impacts such as employment as well as indirect impacts from greater activation of the surrounding economy. Specifically, it is expected the precinct would bring forward the activation of the local economy by:

- Inducing additional tourism into the area
- Activating pedestrian and visitor usage of the river frontage
- Increasing demand for retail, dining and entertainment within an immediate 400 m catchment of the site
- Supporting the activation of the CBD's night time and weekend economy through increased local expenditure outside weekly work hours
- Attracting younger professionals and families to the City centre
- Changing the perceptions of the region as a place of living, not only work
- Faster provision of local street level infrastructure following works in kind expected under the HoA.

While, provision of at least one anchor institute or alternatively a cultural precinct developed by CoPC, would also induce many of these benefits, it is expected they would occur to a lesser extent due to the economies of agglomeration⁷⁴.

Arts and cultural precincts have been identified as a key design feature in the long-term success of major cities. Further, the benefits of agglomeration have been identified by leading scholars with close proximity of services/activities lowering the cost of provision, increasing productivity and the exchange of ideas⁷⁵.

The benefits of agglomeration is inextricably linked to a vibrant arts and culture scene that directly contributes to the amenity of a place by creating a distinctive local identity and establishing social and community networks that promote knowledge sharing and innovation. These virtuous networks in turn create substantial economic benefits in the form of employment, productivity and further investment. Agglomeration benefits accrue at the local level, as well as at the regional level.

⁷⁴ Glaeser, E.L. 2010, 'Agglomeration Economics', The University of Chicago Press

⁷⁵ See Deloitte Access Economics 2016, 'Building the Lucky Country #5: The purpose of place reconsidered' and Glaeser, E 2011, 'The Triumph of the City', Glaeser, E.L. 2010, 'Agglomeration Economics', The University of Chicago Press

Case Study: Queensland Cultural Centre, Brisbane

The Cultural Precinct, located on Brisbane's South Bank, adjacent to the city's CBD, is the cornerstone of Queensland's arts and culture portfolio. It enjoys heritage listing and is home to the State's leading arts and cultural institutions including:

- Queensland Art Gallery/Gallery of Modern Art
- Queensland Museum and Sciencentre
- Queensland Performing Arts Centre
- State Library of Queensland

This co-location of cultural institutions on a single site is unparalleled across Australia and the rest of the world and represents a substantial investment by the Queensland Government (replacement value is estimated at approximately \$1 billion and annual operational funding is estimated at \$117 million⁷⁶).

However, the Precinct has generated substantial revenue and created a number of jobs through cultural tourism – with over five million visits per year, 95-98% utilisation of venues and a substantial increase in visitor nights per year. In addition, the state has been able to attract and retain a large number of cultural workers (16% of all persons employed in cultural industries resided in Queensland in 2011 and the majority (57%) of these live in the Greater Brisbane area)⁷⁷. This does not include the social benefits associated with arts and culture. Research conducted by Arts Queensland⁷⁸ indicates that on average, Queenslanders believe that arts impact creativity and innovation and play a formative role in shaping community pride and identity.

4.3 Other considerations

4.3.1 Implementation of the Riverbank vision

Both CoPC and the NSW Government have an unequivocal strategy of underpinning Parramatta as Sydney's Central City CBD. Fundamental to this objective has been the importance attached to developing an arts and cultural precinct concomitant with this CBD status.

A number of implications arise from this statement of purpose. These include:

- The need for a clearly defined implementation strategy and governance arrangement. Previous cases of metropolitan developments of scale (such as Barangaroo and Sydney Olympic Park) have required special planning authorities to oversee their development. The proposed HoA between CoPC and the NSW Government represents a step towards recognising that a project of this magnitude for the Parramatta arts and cultural precinct requires joint action across the tiers of government. In the absence of shared responsibility, the risk to the completion of the

⁷⁶ Department of Science, Information Technology, Innovation and the Arts Queensland 2013, 'Cultural Precinct Strategy 2013-2015'

⁷⁷ Arts Queensland 2016, '10 Facts – Queensland's cultural jobs', Queensland Government

⁷⁸ Arts Queensland 2013, 'Queenslanders attitudes to the arts', Queensland Government

precinct is that it is undertaken in an ad-hoc fashion or over a longer period of time.

- Although it is open to CoPC to implement the Riverside arts and cultural precinct vision on its own, the extent of the undertaking is expected to be significant. In the absence of NSW Government support, CoPC faces a large infrastructure shortfall in arts and culture with implications for potential increases in the levels of rates and imposts⁷⁹ or the rationing of the arts and culture vision.
- The future of Parramatta as Sydney's Central City CBD challenges understanding in the funding and management of cultural assets in the CoPC. Traditionally, arts and cultural precincts located in LGAs have relied on the sole support of the local authority to sustain. However, in much the same way as existing cultural assets such as the Sydney Opera House, NSW Art Gallery, Walsh Bay etc. are not the responsibility of the City of Sydney Council, it is similarly inappropriate that State wide assets be the sole responsibility of CoPC. The proposed arrangement provides a framework from which to allow CoPC to work strategically with the NSW Government to ensure the ongoing viability and future of arts and cultural resources in the Parramatta CBD.

4.4 Risks

4.4.1 Riverside Joint Venture (RJV)

Through participation in the RJV with the NSW government, CoPC faces a number of risks, including:

- That the capital costs associated with the redevelopment of the Parramatta Riverside Theatre exceed business case estimates/expectations and that through the RJV, CoPC is obligated to contribute additional capital to complete the project;
- That the recurrent or operating costs of the redeveloped Riverside Theatre exceed the initial business case estimates and that CoPC is required to contribute its share of any shortfalls through the RJV;
- That insufficient allowance is made for the costs of disruption during the transition stage to a redeveloped Riverside Theatre including the costs of maintaining operations and staffing arrangements.

The ability of CoPC to quantify⁸⁰ and manage these risks during the project (and in particular, the business case stage) will be fundamental to project success.

⁷⁹ Deloitte have not assessed the efficiency or distributional impacts of alternate taxation approaches to fund the arts and cultural precinct.

⁸⁰ The Deloitte scope did not extend to estimating the risks attached to the RJV.

5 Key Findings & Conclusion

5.1 Key findings

In undertaking the review, Deloitte find the draft HoA:

- Provides strategic alignment to the objectives of both CoPC and the NSW Government to develop a unique arts and cultural precinct in the Parramatta CBD compatible with the joint goal of consolidating Parramatta as Central Sydney's CBD;
- Relocating the MAAS on the CoPC Riverbank site provides consideration equivalent (cash and in kind) to the acquisition cost of the Riverbank site;
- Commits CoPC to funding arts and cultural activities in accordance with the Cultural Plan for no less than \$40 million over the next 20 years;
- Shares the responsibility and governance between CoPC and the NSW Government for the upgrade and future operational costs of the Riverside Theatre;
- Results in the avoidance for CoPC of large infrastructure costs attached to the upgrade of the Riverside Theatre and the associated improvements to amenity and connection in the arts and cultural precinct;
- Results in the expedited delivery of an arts and cultural precinct in Parramatta;
- Provides a boost to the local economy including an uplift to local employment and an increase in regional income of between \$106 and \$422 million;
- Returns CoPC consideration of \$100 million in the event that the business case for the upgrade of the Riverside Theatre is unsuccessful.

However, the review also observed a number of risks for CoPC including:

- Obligations to CoPC through the joint venture arrangement to meet unbudgeted costs attached to the future upgrade or operations of the Riverside Theatre;
- Any costs of disruption and transition for the Riverside Theatre operations during the development/construction phase;
- Satisfactory independent confirmation of the accounting implications of the HoA arrangement on CoPC assets and liabilities;
- That the design of the proposed MAAS could result in the "iconic" objective set in the Cultural Plan not being met.

CoPC will be required to manage these risks going forward.

5.2 Conclusion

In the absence of any alternative proposal, Deloitte find that the draft HoA represents a reasonable arrangement for CoPC to develop an arts and cultural precinct consistent with the Cultural Plan.

Appendix A CGE assumptions

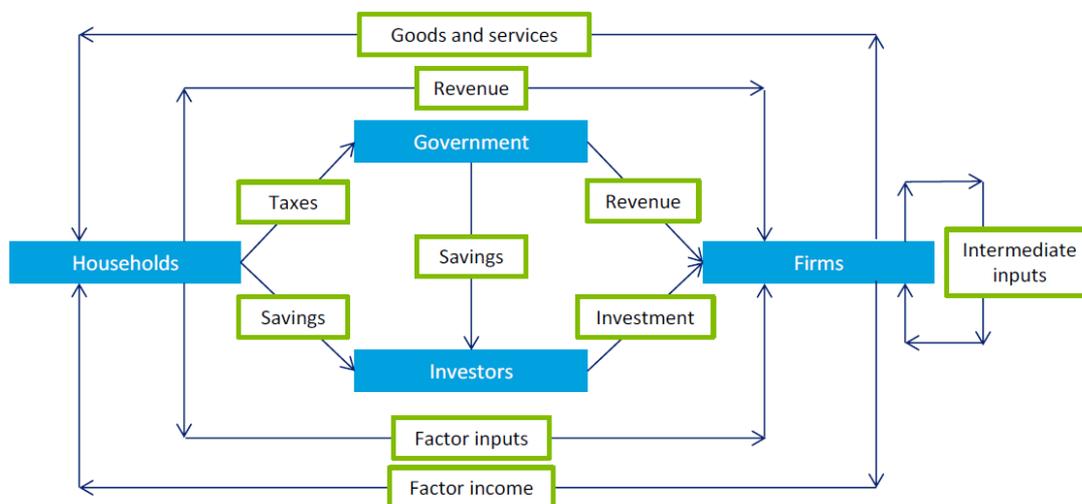
Computable general equilibrium (CGE) modelling

A change (or shock) in any part of the economy has impacts that reverberate throughout the economy. For example, in the current context, the proposed re-location of the MAAS will involve higher economic activity over the construction phase due to the large capital stimulus, as well as higher activity over the long term from the induced additional tourism to the City of Parramatta local government area.

The project utilises the Deloitte Access Economics' – Regional General Equilibrium Model (DAE-RGEM). DAE-RGEM is a large scale, dynamic, multi-region, multi-commodity CGE model of the world economy with bottom-up modelling of Australian regions. DAE-RGEM encompasses all economic activity in an economy – including production, consumption, employment, taxes and trade – and the inter-linkages between them. For this project, the model has been customised to explicitly identify the City of Parramatta local government area regional economy.

Figure A.1 is a stylised diagram showing the circular flow of income and spending that occurs in DAE-RGEM. To meet demand for products, firms purchase inputs from other producers and hire factors of production (labour and capital). Producers pay wages and rent (factor income) which accrue to households. Households spend their income on goods and services, pay taxes and put some away for savings. The government uses tax revenue to purchase goods and services, while savings are used by investors to buy capital goods to facilitate future consumption. As DAE-RGEM is an open economy model, it also includes trade flows with other regions interstate and foreign countries.

Figure A.1 The components of DAE-RGEM and their relationships



The model compares a baseline scenario where the proposed relocation of MAAS *doesn't* occur and therefore the related tourism benefits *don't* occur with a counterfactual scenario where it *does*. This requires developing a set of inputs that stylize these alternative scenarios, so that the economic impact of the development can be projected. More detail on the CGE modelling framework used is provided in Appendix B.

Scenarios and inputs to the modelling

The scenarios modelled and their related inputs are detailed below. All scenarios were undertaken over a 10 year period 2018 to 2028. All results are provided in net present value terms (using a 7% discount rate) unless otherwise specified.

In the baseline scenario, the MAAS is assumed to not re-locate to Parramatta, therefore no additional construction activity is expected to occur and the expected induced tourism from MAAS in Parramatta will not take place⁸¹.

Two scenarios are then assessed against the baseline scenario, these are detailed below:

- Scenario 1 (high): The re-location of MAAS will induce additional tourism to the CoPC LGA of 1 million people⁸²
- Scenario 2 (low): The re-location of MAAS will induce a lower level of additional tourism to the CoPC LGA of 250,000 people.

For both of the Scenarios, it is assumed that the relocation of MAAS induces additional construction activity of \$500 million to the CoPC LGA that would not occur otherwise and that each additional visitor induced, spends \$100 in the local economy⁸³.

⁸¹ It is also assumed that no other capital expenditure will occur of the same magnitude over the same time period.

⁸² Destination NSW, Western Sydney Visitor Profile (Facts & Figures), June 2016

⁸³ Ibid

Appendix B CGE modelling framework

The Deloitte Access Economics – Regional General Equilibrium Model (DAE-RGEM) is a large scale, dynamic, multi-region, multi-commodity computable general equilibrium model of the world economy with bottom-up modelling of Australian regions. The model allows policy analysis in a single, robust, integrated economic framework. This model projects changes in macroeconomic aggregates such as GDP, employment, export volumes, investment and private consumption. At the sectoral level, detailed results such as output, exports, imports and employment are also produced.

The model is based upon a set of key underlying relationships between the various components of the model, each which represent a different group of agents in the economy. These relationships are solved simultaneously, and so there is no logical start or end point for describing how the model actually works. However, they can be viewed as a system of interconnected markets with appropriate specifications of demand, supply and the market clearing conditions that determine the equilibrium prices and quantity produced, consumed and traded.

DAE-RGEM is based on a substantial body of accepted microeconomic theory. Key assumptions underpinning the model are:

- The model contains a 'regional consumer' that receives all income from factor payments (labour, capital, land and natural resources), taxes and net foreign income from borrowing (lending).
- Income is allocated across household consumption, government consumption and savings so as to maximise a Cobb-Douglas (C-D) utility function.
- Household consumption for composite goods is determined by minimising expenditure via a CDE (Constant Differences of Elasticities) expenditure function. For most regions, households can source consumption goods only from domestic and imported sources. In the Australian regions, households can also source goods from interstate. In all cases, the choice of commodities by source is determined by a CRESH (Constant Ratios of Elasticities Substitution, Homothetic) utility function.
- Government consumption for composite goods, and goods from different sources (domestic, imported and interstate), is determined by maximising utility via a C-D utility function.
- All savings generated in each region are used to purchase bonds whose price movements reflect movements in the price of creating capital.
- Producers supply goods by combining aggregate intermediate inputs and primary factors in fixed proportions (the Leontief assumption). Composite intermediate inputs are also combined in fixed proportions, whereas individual primary factors are combined using a CES production function.
- Producers are cost minimisers, and in doing so, choose between domestic, imported and interstate intermediate inputs via a CRESH production function.

- The supply of labour is positively influenced by movements in the real wage rate governed by an elasticity of supply.
- Investment takes place in a global market and allows for different regions to have different rates of return that reflect different risk profiles and policy impediments to investment. A global investor ranks countries as investment destinations based on two factors: global investment and rates of return in a given region compared with global rates of return. Once the aggregate investment has been determined for Australia, aggregate investment in each Australian sub-region is determined by an Australian investor based on: Australian investment and rates of return in a given sub-region compared with the national rate of return.
- Once aggregate investment is determined in each region, the regional investor constructs capital goods by combining composite investment goods in fixed proportions, and minimises costs by choosing between domestic, imported and interstate sources for these goods via a CRESH production function.
- Prices are determined via market-clearing conditions that require sectoral output (supply) to equal the amount sold (demand) to final users (households and government), intermediate users (firms and investors), foreigners (international exports), and other Australian regions (interstate exports).
- For internationally-traded goods (imports and exports), the Armington assumption is applied whereby the same goods produced in different countries are treated as imperfect substitutes. But, in relative terms, imported goods from different regions are treated as closer substitutes than domestically-produced goods and imported composites. Goods traded interstate within the Australian regions are assumed to be closer substitutes again.
- The model accounts for greenhouse gas emissions from fossil fuel combustion. Taxes can be applied to emissions, which are converted to good-specific sales taxes that impact on demand. Emission quotas can be set by region and these can be traded, at a value equal to the carbon tax avoided, where a region's emissions fall below or exceed their quota.

Below is a description of each component of the model and key linkages between components

Households

Each region in the model has a so-called representative household that receives and spends all income. The representative household allocates income across three different expenditure areas: private household consumption, government consumption, and savings.

The representative household interacts with producers in two ways. First, in allocating expenditure across household and government consumption, this sustains demand for production. Second, the representative household owns and receives all income from factor payments (labour, capital, land and natural resources) as well as net taxes. Factors of production are used by producers as inputs into production along with intermediate inputs. The level of production, as well as supply of factors, determines the amount of income generated in each region.

The representative household's relationship with investors is through the supply of investable funds – savings. The relationship between the representative household and the international sector is twofold. First, importers compete with domestic producers in consumption markets.

Second, other regions in the model can lend (borrow) money from each other.

- The representative household allocates income across three different expenditure areas – private household consumption, government consumption and savings – to maximise a Cobb-Douglas utility function.
- Private household consumption on composite goods is determined by minimising a CDE (Constant Differences of Elasticities) expenditure function. Private household consumption on composite goods from different sources is determined by a CRESH (Constant Ratios of Elasticities Substitution, Homothetic) utility function.
- Government consumption on composite goods, and composite goods from different sources, is determined by maximising a Cobb-Douglas utility function.
- All savings generated in each region is used to purchase bonds whose price movements reflect movements in the price of generating capital.

Producers

Apart from selling goods and services to households and government, producers sell products to each other (intermediate usage) and to investors. Intermediate usage is where one producer supplies inputs to another's production. For example, coal producers supply inputs to the electricity sector.

Capital is an input into production. Investors react to the conditions facing producers in a region to determine the amount of investment. Generally, increases in production are accompanied by increased investment. In addition, the production of machinery, construction of buildings and the like that forms the basis of a region's capital stock, is undertaken by producers. In other words, investment demand adds to household and government expenditure from the representative household, to determine the demand for goods and services in a region.

Producers interact with international markets in two main ways. First, they compete with producers in overseas regions for export markets, as well as in their own region. Second, they use inputs from overseas in their production.

- Sectoral output equals the amount demanded by consumers (households and government) and intermediate users (firms and investors) as well as exports.
- Intermediate inputs are assumed to be combined in fixed proportions at the composite level. As mentioned above, the exception to this is the electricity sector that is able to substitute different technologies (brown coal, black coal, oil, gas, hydropower and other renewables) using the 'technology bundle' approach developed by ABARE (1996).
- To minimise costs, producers substitute between domestic and imported intermediate inputs is governed by the Armington assumption as well as between primary factors of production (through a CES aggregator). Substitution between skilled and unskilled labour is also allowed (again via a CES function).
- The supply of labour is positively influenced by movements in the wage rate governed by an elasticity of supply is (assumed to be 0.2). This implies that changes influencing the demand for labour, positively or negatively, will impact both the level of employment and the wage rate. This is a typical labour market specification for a dynamic model such as DAE-RGEM. There are other labour market 'settings' that can be used. First, the labour market could take on long-run characteristics with

aggregate employment being fixed and any changes to labour demand changes being absorbed through movements in the wage rate. Second, the labour market could take on short-run characteristics with fixed wages and flexible employment levels.

Investors

Investment takes place in a global market and allows for different regions to have different rates of return that reflect different risk profiles and policy impediments to investment. The global investor ranks countries as investment destination based on two factors: current economic growth and rates of return in a given region compared with global rates of return.

- Once aggregate investment is determined in each region, the regional investor constructs capital goods by combining composite investment goods in fixed proportions, and minimises costs by choosing between domestic, imported and interstate sources for these goods via a CRESH production function.

International

Each of the components outlined above operate, simultaneously, in each region of the model. That is, for any simulation the model forecasts changes to trade and investment flows within, and between, regions subject to optimising behaviour by producers, consumers and investors. Of course, this implies some global conditions that must be met, such as global exports and global imports, are the same and that global debt repayment equals global debt receipts each year.

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Contact us

Deloitte Financial Advisory Pty Ltd

ACN 611 749 841
Eclipse Tower
60 Station Street
Parramatta
Sydney, NSW, 2150
Australia
Phone: +61 2 9840 7000

www.deloitte.com.au

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