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JULY 2018
17-001746
ORIGINAL
TRANSPORT

John Gorton Drive Stage 3B
PSP Report

COMMERCIAL IN CONFIDENCE

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DOCUMENT CONTROL
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1	23/03/18	Revised to incorporate initial Client comments	JKM	JRS	JRS
2	05/06/18	Final PSP	JRP	JKM	JKM
3	05/07/18	Revised to incorporate light rail, updates to VMW, sewer and water sections	JRP	JKM	JKM

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EXECUTIVE SUMMARY

INTRODUCTION

The Chief Minister, Treasury and Economic Development Directorate, engaged Calibre in August 2017 to develop the design and documentation of John Gorton Drive (JGD) 500m further south of the stage currently under construction (JGD3A). This extension is known as JGD3B and extends from Chainage 16,975 to Chainage 17,500.

The purpose of this report is to outline the development of the Preliminary Sketch Plan (PSP) design. The next phase of the project is the Development Application (DA) submission scheduled for July 2018.

DESCRIPTION OF THE WORKS

The project primarily involves replacement of a further 500m of Coppins Crossing Road with dual carriageway in order to facilitate access and servicing for adjacent future land development. An intermediate four-way signalised intersection provides a connection point for the future Bindubi Street Extension (BSE).

STUDIES AND INVESTIGATIONS

Studies and investigations undertaken include:

- Topographical survey.
- Services potholing.
- Tree assessment.
- Geotechnical Investigation.
- Traffic analysis.
- Ecological Impact Assessment.

DESIGN

Key elements of the design include:

- Two lanes in each direction along JGD.
- Construction of two intersections on JGD.
- Construction of new pavement, kerbs, paths and stormwater drainage.
- Installation of new utilities including street lighting, sewer, electricity, gas and telecommunications.
- Installation of new linemarking and signage.
- Landscaping.

CONSTRUCTION STAGING

The construction sequence will generally involve construction of the southbound JGD carriageway followed by the construction of the northbound JGD carriageway. Traffic switches between carriageways are likely to be required.

OPINION OF COST

Construction cost for the project is estimated to be approximately $11.7M including GST but excluding procurement and contract administration. This figure was determined through a probabilistic risk workshop which took account of contingent and inherent risks to determine a P50 and P90 cost estimate.

UNRESOLVED ISSUES

- Electrical supply point for new traffic signals at Intersection 3.
- ICON Water requirements for construction over the BSWM.
- GHD's update to the Molonglo 3 water supply master plan is yet to be accepted by ICON Water.

1 INTRODUCTION

The Chief Minister, Treasury and Economic Development Directorate, engaged Calibre in August 2017 to develop the design and documentation of John Gorton Drive (JGD) 500m further south of the stage currently under construction (JGD3A). This extension is known as JGD3B and extends from Chainage 16,975 to Chainage 17,500.

The purpose of this report is to discuss the development of the Preliminary Sketch Plan (PSP) design. The next phase of the project is Development Application (DA) submission scheduled for July 2018.

1.1 JOHN GORTON DRIVE

JGD is the major north-south arterial within Molonglo connecting William Hovell Drive (WHD) in the north with Cotter Road in the south. It effectively replaces Coppins Crossing Road which is a rural road of low standard.

The total length of the JGD roadway is planned to be approximately 7.2km, with 3.8km complete in the southern section and another 900m currently under construction in the northern section (JGD3A).

The northern section of JGD, through Molonglo 3, is characterised by steep topography especially in the section departing north from the Molonglo River.

1.2 BINDUBI STREET EXTENSION

Bindubi Street is an existing roadway connecting Belconnen Way in the north with WHD in the south.

Bindubi Street is proposed to be extended from WHD southwards and connect with JGD to the north of the Molonglo River. This future road through Molonglo 3 is known as Bindubi Street Extension (BSE).

BSE is the nominated preferred corridor for possible future Inter-town Public Transport (IPT) in the form of either Light Rail Transit (LRT) or Bus Rapid Transit (BRT).

1.3 JOHN GORTON DRIVE INTERSECTIONS

There are four intersections currently planned for JGD, north of the Molonglo River. This excludes the WHD intersection. The intersections are numbered from north to south. Refer Figure 1-1.

Only Intersections 2 and 3 are within the JGD3B project limits. Intersection 3 is the ACT Government endorsed connection point for BSE to JGD. Refer Appendix H for correspondence in regard to this matter.

1.3.1 INTERSECTION 1

Intersection 1 is a four-way signalised intersection providing access to both sides of JGD including the Whitlam Residential Estate. It is located approximately 525m south of WHD at Chainage 17,885. This intersection is part of the JGD3A project currently under construction.

1.3.2 INTERSECTION 2

Intersection 2 is a left-in / left-out unsignalised intersection providing access to the Whitlam Residential Estate. The intersection is located approximately 970m south of WHD at Chainage 17,440 and aligns with Road 8 which provides access/egress into the Estate.

1.3.3 INTERSECTION 3

Intersection 3 is a four-way signalised intersection providing access to the Whitlam Residential Estate via Road 3 and is the current connection point proposed for the BSE. The intersection is located approximately 1,300m south of WHD at Chainage 17,115.

1.3.4 INTERSECTION 4

Intersection 4 is to be a signalised intersection providing access to both sides of JGD. This intersection is part of the future JGD3C project.

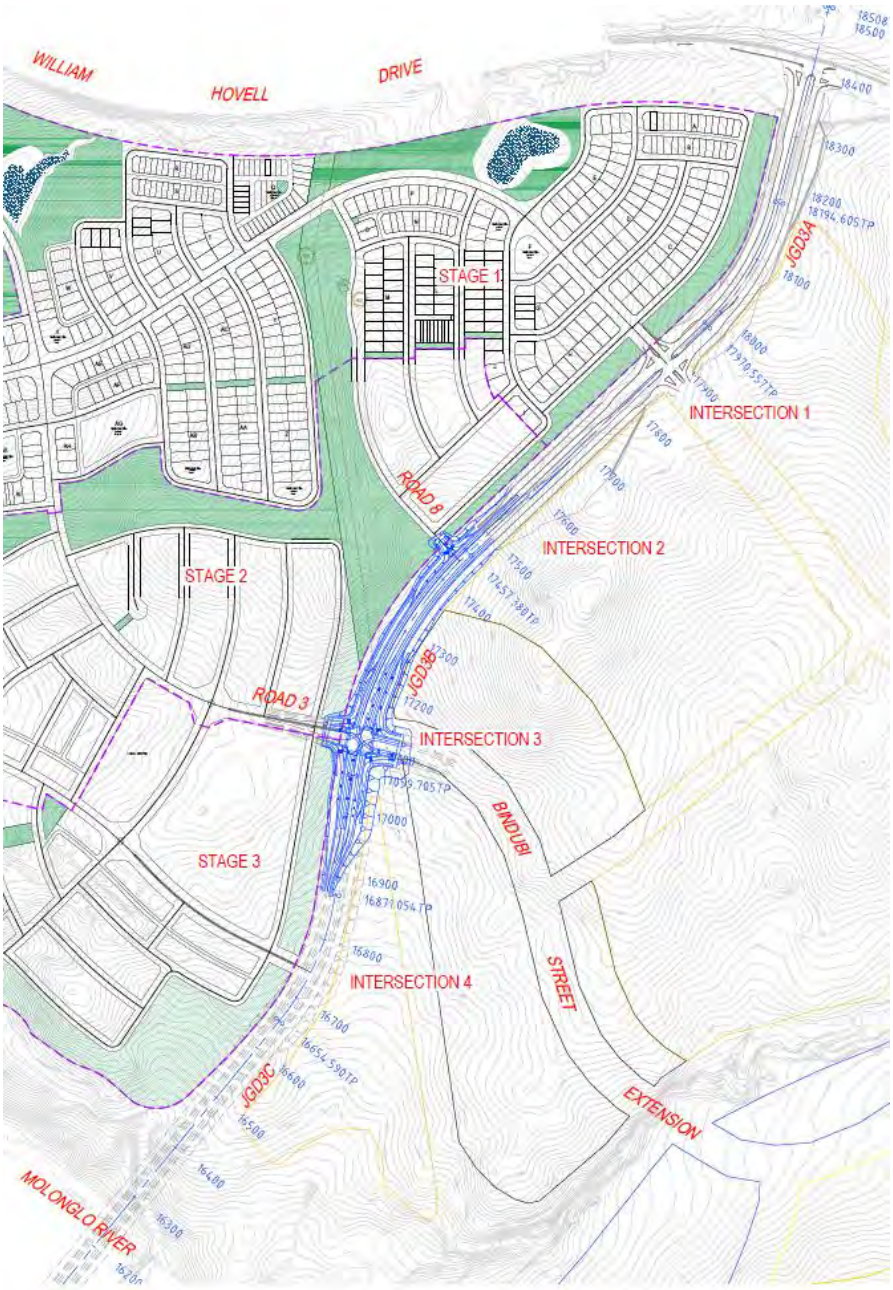

Figure 1-1: John Gorton Drive Intersections

2 DESCRIPTION OF WORKS

The key features of the works are as follows:

- Replacement of 500m of the existing two lane Coppins Crossing Road with a four lane roadway, directly south of the JGD3A project, which is currently under construction.
- Construction of a four-way signalised intersection on John Gorton Drive (Intersection 3) approximately 1,300m south of William Hovell Drive.
- Construction of a left-in / left-out unsignalised intersection on John Gorton Drive (Intersection 2) approximately 970m south of William Hovell Drive.
- Construction of new pavement, kerbs, paths and stormwater drainage.
- Relocation of existing utilities services.
- New utilities along John Gorton Drive including electricity, gas and telecommunications.
- New utilities across John Gorton Drive including electricity, gas, telecommunications and potable water.
- Construction of new street lighting.
- Installation of new linemarking and signage.
- Landscaping.

Refer to drawing 17-001746-005+ for General Arrangement Plan.

3 PRE-DESIGN STUDIES

In late 2017, Calibre was engaged to undertake two engineering studies prior to commencement of the PSP design.

3.1 BINDUBI STREET EXTENSION - JUNCTION WITH JOHN GORTON DRIVE ENGINEERING ASSESSMENT REPORT

The assessment's primary objective was to determine the preferred location for the BSE junction with JGD from an engineering road design perspective. The assessment excluded land planning considerations and transport planning.

Two options were assessed:

- Connection at JGD Intersection 4 (Option A)
- Connection at JGD Intersection 3 (Option B).

Despite not allowing for an IPT station on JGD, it was recommended that Option B be adopted to allow flexibility in planning for the BSE alignment through Molonglo 3 Stage 2. The proposed IPT station would be on the BSE, just east of Intersection 3.

Option B was also assessed to capture a greater IPT catchment by travelling further along the Whitlam Residential Estate and being more centralised through the Molonglo 3 Stage 2 development area.

3.2 JOHN GORTON DRIVE STAGE 3B FEASIBILITY STUDY

The key objective of the feasibility study was to identify any risks, constraints and issues that may arise during the detail design and construction phases. The study reviewed multiple factors and issues that will need to be considered in delivering the project.

The report concluded that there did not appear to be any major impediment to detail design and construction of JGD3B between Chainages 16,975 and 17,500.

4 OTHER RELEVANT PROJECTS

4.1 MOLONGLO 3 ROAD ACCESS AND MOLONGLO RIVER BRIDGE FEASIBILITY STUDY

AECOM was engaged in 2014 by the ACT Government to prepare a feasibility study covering the major road network in Molonglo 3. The objective of the study was to identify preferred road alignments, intersection arrangements and staging strategy. The feasibility study was informed by the Molonglo Structure Plan.

The project scope included the following:

- Traffic assessment.
- Alignment of major roads, typical cross sections and intersections.
- Options for the bridge over the Molonglo River.
- Construction staging.
- Opinion of probable costs.

The study is directly relevant to JGD3B as it forms the basis for many aspects of the design for JGD beyond the southern limit of JGD3A.

4.2 JOHN GORTON DRIVE STAGE 3A (JGD3A)

Calibre delivered the detailed design of the northern most section of JGD in late 2016. This design covered the first 900m of road directly south of WHD. The vertical alignment was adjusted slightly from that shown in the AECOM feasibility study in order to provide adequate stopping site distance approaching Intersection 1 and to allow an appropriate grade approaching WHD.

The JGD3A project is currently in construction.

4.3 WHITLAM ESTATE DESIGN

Calibre was engaged in 2017 by the Suburban Land Agency (SLA) to undertake the Estate Development Plan (EDP) and detailed design for the future suburb of Whitlam, to the west of John Gorton Drive.

The project is directly relevant to JGD3B as it provides the following inputs:

- Location of Intersections 2 and 3 along JGD.
- Grading of connecting and adjacent roads.
- Requirements for utility services (size and location).

4.4 JOHN GORTON DRIVE STAGE 3C (JGD3C)

This is the next stage of John Gorton Drive and will commence directly south of JGD3B. Stage 3C also includes a proposed bridge over the Molonglo River. The design model for JGD3B has been provided to the design consultant for JGD3C to allow for coordination.

4.5 MOLONGLO 3 PLANNING DESIGN FRAMEWORK

It is understood that there is some masterplanning for Molonglo 3 being undertaken concurrently by the ACT Government, but details have not yet been finalised. An extract from a recent concept plan (received September 2017) is shown in Figure 4-1.

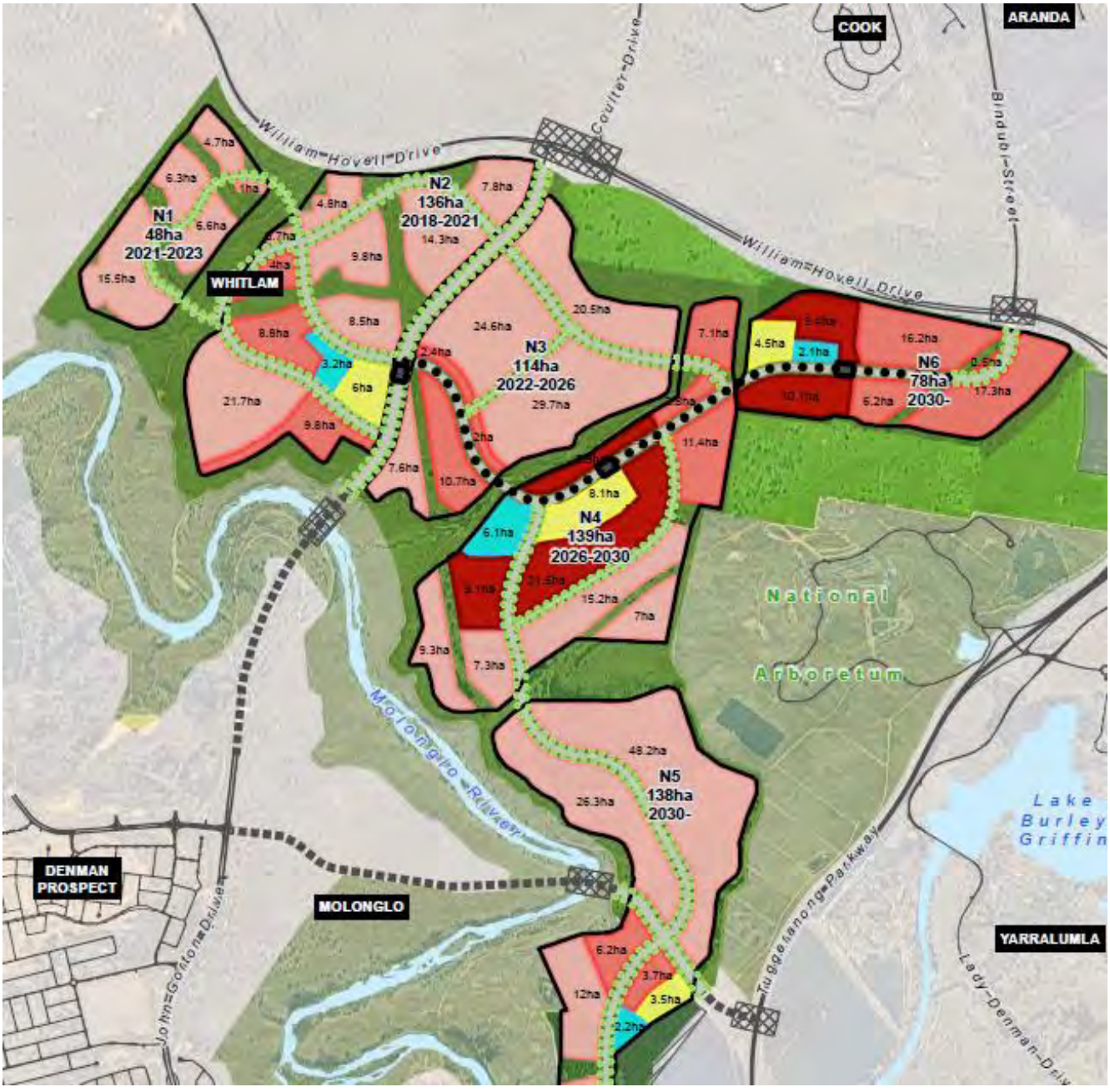

Figure 4-1: Molonglo 3 Concept Plan

5 STAKEHOLDERS AND CONSULTATION

5.1 STAKEHOLDERS

The following is a list of stakeholders and interested parties.

- Chief Minister, Treasury and Economic Development Directorate (CMTEDD)
- Suburban Land Agency (SLA)
- Transport Canberra and City Services Directorate (TCCS):
    - Roads ACT
    - Urban Treescapes
    - Development Review and Coordination (Formerly Asset Acceptance)
    - Transport Canberra Light Rail (TCLR)
- Environment, Planning and Sustainable Development Directorate (EPSDD):
    - Major Projects and Transport
    - Greenfield Planning
    - Estate Development
- Infrastructure Finance and Capital Works
- ICON Water
- Evo Energy
- Zinfra and Jemena
- Telecommunication providers

5.2 VALUE MANAGEMENT WORKSHOP

A Value Management Workshop (VMW) was undertaken in May 2017. The workshop included representatives from the following organisations:

- CMTEDD
- TCCS
- SLA
- Public Transport EPSDD
- Strategic Planning EPSDD
- ICON Water
- Calibre

The following topics were discussed:

- Shared paths and noise mitigation.
- Earthworks and materials management.
- 900mm Bulk Supply Water Main (BSWM).
- Telstra relocation.
- Planning approval.
- Lease withdrawal.
- Staging and construction under traffic.

The final Value Management Workshop Report is included in Appendix F. This summarises key feedback from the workshop. This feedback has been incorporated into the design where appropriate.

5.3 SPECIFIC LIAISON

Other specific liaison has been undertaken during development of the design. This includes the following:

- Meeting with ICON Water on 1 February 2018 to discuss depth of fill over BSWM and service clearances.
- Meeting with TCCS on 1 March 2018 to discuss traffic modelling undertaken to inform layout of JGD Intersection 3.
- Various emails with Jemena and Zinfra regarding secondary gas main and gas servicing requirements.
- Various emails and site visits with Telstra regarding relocation of existing assets and conduit requirements.
- Various meetings with the Whitlam Residential Estate design teams to discuss interface between projects.
- Various emails with TCLR regarding future provision for light rail.

5.4 APPROVALS

The following approvals are required for this project:

- TCCS Design Approval.
- EPSDD Development Application (DA) approval.
- TCCS Traffic Control Device approval.
- ICON Water Design Acceptance.
- Jemena and Zinfra design acceptance for the gas main layout.
- Evo Energy street lighting approval.

6 SUPPORT STUDIES AND INVESTIGATIONS

6.1 TOPOGRAPHICAL SURVEY

LANDdata Survey Pty Ltd was commissioned by Land Development Agency (LDA) (now Suburban Land Agency) in 2014 to undertake detailed survey for the Molonglo Stage 3 development. The detailed ground survey model is incorporated in this project.

6.2 SERVICES POTHOLING

In August 2017, Steger and Associates was engaged to physically locate the 900mm Bulk Supply Water Main traversing Coppins Crossing Road. These potholes where used to improve accuracy of the 12d water main model recreated from ICON Water WAE drawings.

Steger and Associates also provided survey of traced Telstra assets located on the western side of Coppins Crossing Road in late October 2017.

6.3 TREE ASSESSMENT

A tree assessment covering the project area was completed by GHD in 2014. This included groups of trees on the eastern side of Coppins Crossing Road.

In January 2018, EnviroLinks Design reviewed and updated the GHD assessment in order to better represent current tree conditions. Refer Appendix B for Tree Assessment report.

The project requires removal of approximately 27 existing trees and numerous shrubs in order to facilitate construction. All trees to be removed have been assessed as low, poor or medium value.

The landscape design includes a provision for planting of native and deciduous trees within the JGD verges.

6.4 GEOTECHNICAL INVESTIGATION

A geotechnical investigation was undertaken by Douglas Partners Pty Ltd to provide information regarding site trafficability, stripping, excavation conditions, final batter slopes, reuse of excavated material, fill placement, pavement design and site drainage.

The scope of works for the investigation broadly included the following:

- Preparation and approval of a CEMP.
- 9 test pits down to 5m maximum along the roadway.
- California Bearing Ratio (CBR) tests.
- Engineering assessment and reporting.

The geotechnical investigation identified the presence of extremely low strength to high strength rhyodacite rock and silty/sandy soil throughout the site.

A copy of the Geotechnical Report is provided in Appendix C.

6.5 NOISE ASSESSMENT

WSP has prepared a noise assessment for Whitlam Residential Estate and the assessment includes JGD3B. The purpose of the assessment is to determine predicted future noise levels generated from vehicular traffic. The SLA has agreed to cater for any JGD generated noise exceedances through planning controls within the estate. The noise assessment will accompany the DA submission.

A copy of the Noise Assessment is provided in Appendix D.

Confirmation from SLA that they will manage noise mitigation within the estate is provided in Appendix H.

6.6 HERITAGE STUDY

A heritage study was undertaken by Biosis in 2013 covering the whole of Molonglo 3. No heritage sites were identified in the vicinity of the JGD3B project area.

Figure 6-1: Molonglo 3 Heritage Sites

Advice from the ACT Heritage Council was received on 20 April 2018 indicating that two registered Aboriginal places occur within the vicinity of the Stage 3B project area, being two isolated finds recorded as MOL IF1 and MOL IF2. The Heritage Council further advised that approval was sought in 2013 for the salvage of MOL IF2. However, MOL IF1 is believed to remain in situ. This advice from the Heritage Council is provided in Appendix H.

The exact location of MOL IF2 was obtained from the Heritage Council, and it was confirmed that this item is some distance from the footprint of John Gorton Drive 3B and will therefore not be impact by the construction of this project. The location of MOL IF2 is not included in this report or shown in the drawings as the information is restricted and is not to be made available to a broader audience.

The location of MOL IF2 will be provided to the Construction Contractor for information.

6.7 ENVIRONMENTAL SITE ASSESSMENT

Various environmental assessments have been prepared for Molonglo 3. These include:

- Molonglo 3 Phase 1 Environmental Site Assessment, AECOM, June 2012.
- Molonglo 3 Phase 1 Environmental Site Assessment, WSP, September 2012.
- Molonglo 3 Phase 2 Environmental Site Assessment, AECOM, January 2014.
- Molonglo 3 Phase 2 Contamination Assessment, WSP, September 2015.
- Molonglo 3 Phase 1 Environmental Site Assessment Sites A, B and C, Robson Environmental, 2014.

None of the assessments identified an Area of Environmental Concern (AEC) within the vicinity of the project.

The proposed location for the JGD 3B site compound is the site of a future school (to be constructed in Whitlam Stage 3). EPSDD Land Supply & Policy provided advice that when the site compound is removed, the Contractor must engage a specialist contamination consultant to complete a post-use validation inspection and report to confirm that the site has not been contaminated. If any residual material is contaminated, the Contractor will be responsible for its removal. Refer to Appendix H for a copy of this advice. These requirements will be incorporated into the Request for Tender (RFT) documentation.

6.8 MOLONGLO 3 UXO ASSESSMENT AND REMEDIATION

The Molonglo Valley site was used for the training of artillery soldiers from 1915 until the middle of the 1920's. The Department of Defence and EPSDD has taken reasonable steps to locate and remove all explosive ordnance waste and unexploded ordnance from the site.

There is a possibility that future users of the site may encounter explosive ordnance waste or unexploded ordnance (UXO). As such, any workers undertaking construction related issues in the area will need to be inducted by Milsearch Pty Ltd, the specialty company engaged by EPSDD to investigate and report on UXO within Molonglo 3.

Figure 6-2: Molonglo 3 UXO Assessment and Remediation Area

6.9 MOLONGLO 3 ROAD NETWORK SCENARIOS MODELLING

SMEC was commissioned by the EPD to conduct strategic transport modelling of future road network scenarios associated with the Molonglo Stage 3 and Huntly developments. This was undertaken using the recently updated Canberra Strategic Transport Model (CSTM).

The work was undertaken in two stages, with the second stage building on the first. The final report consolidates and supersedes the technical notes (for the two stages) previously submitted to EPD. The report was completed in December 2017.

2041 traffic volumes from the SMEC scenarios modelling form the basis of the SIDRA intersection analysis undertaken by Calibre for John Gorton Drive Intersection 3.

6.10 ECOLOGICAL IMPACT ASSESSMENT

An Ecological Impact Assessment was undertaken by Capital Ecology in January 2018 to determine and assess the impacts of the proposed road and intersections project upon habitat for terrestrial flora and fauna species and ecological communities.

Relevant points from the assessment are as follows:

- The highly modified and planted vegetation within the study area does not constitute a threatened community listed pursuant to either the Commonwealth Environment Protection and Biodiversity Conservation Act or the ACT Nature Conservation Act.
- A small area of 'low quality potential' Pink-tailed Worm-lizard habitat may be impacted, however this is a very small impact in the context of the species' habitat across the Molonglo Valley, a large proportion of which is to be conserved as stipulated in the Molonglo NES Plan. The impact to this species has been assessed and approved through the Molonglo Valley Strategic Assessment. Similarly, impacts to the Superb Parrot have already been assessed and approved.
- The project will not result in ecological impacts that would trigger the requirement to prepare an EIS under the ACT Planning and Development ACT 2007.
- The proposal is not likely to have a significant impact any matters of national environmental significance (MNES).

A copy of the EIA is provided in Appendix I.

6.11 OTHER STUDIES

Other Molonglo 3 studies and investigations previously reviewed prior to the commencement of this assessment include:

- Molonglo Arterial Roads Feasibility Study (Incl. Variation 6), SMEC, January 2013.
- Molonglo Arterial Roads Feasibility Study – Supplementary information, SMEC, October 2013
- Molonglo 3 Earthworks Management Strategy and Preliminary Geotechnical Investigation, Indesco, June 2015.
- Molonglo 3 Major Electrical Infrastructure (132kV) Relocation Feasibility Study, Calibre, May 2015.
- Molonglo 3 Stage 2 Master Plan (Roberts Day).
- Vertical Alignment Review of John Gorton Drive, Coleman Engineering Services, March 2016.

Note that these studies and investigations are either superseded, outdated or not directly relevant to the development of the Preliminary Sketch Plan for JGD3B.

7 DESIGN CRITERIA

The design criteria were adopted from the latest AUSTROADS publications (Guide to Road Design) and are generally consistent with other sections of John Gorton Drive including JGD3A. The only addition to the design criteria for JGD3A is that the maximum grades for IPT routes and stations have been considered where appropriate.

The key design criteria for the project are listed in Table 7.1 and Table 7.2.

Table 7.1: Design Criteria for John Gorton Drive

Criterion	Value	Comment
Road classification	Arterial	
Design speed	90km/h	
Posted speed	80km/h	Matching in with other sections of JGD
Sight Distance	SISD: 214 SSD: 139	(Based on a car, R_T = 2.0s). AUSTROADS Guide to Road Design, Part 4A Unsignalised and Signalised Intersections, Section 3 Sight Distance and AUSTROADS Guide to Road Design, Part 3 Geometric Design, Section 5.3.1 Car Stopping Sight Distance
Normal crossfall	3%	
Batter slope	1V:4H Fill 1V:2.5H / 1V:4H Cut	Mowable slope in fill Stable cut slopes
Vehicular lane width	3.5m	TaMS Standards, Part 3 Road Design, Section 3.3.7 Typical Cross Section
Median width	12.0m mid-block	To allow for possible future IPT provision. Adequate width for construction. Adequate width for WSUD measures
Shoulder width	2.0m for exclusive bicycle lane	AUSTROADS Guide to Road Design, Part 3 Geometric Design, Section 4.8.7 Exclusive Bicycle Lanes
Verge width	10.0m	To comply with clear zone requirements and allow for utilities, landscaping, street lighting and shared use path.
Horizontal Alignment		
Desirable Minimum Radius	400m	Based on 3% superelevation. AUSTROADS Guide to Road Design, Part 3 Geometric Design, Section 7.4.1 Horizontal curve equation
Vertical Alignment		

Criterion	Value	Comment
Minimum desirable longitudinal grade	1%	To allow adequate drainage
Maximum desirable longitudinal grades	General – 5 to 7%	AUSTROADS Guide to Road design, Part 3 Geometric Design, Section 8.5.3 – Rolling Terrain
	Four-way intersections – 4% (achieving 5% adverse resultant grade with 3% crossfall)	AUSTROADS Guide to Road design, Part 4A Unsignalised and Signalised Intersections, Section 2.2.4 Superelevation at or near intersections
	Left-in left-out intersection – 5.4% (to limit resultant grade to 6% with 3% crossfall)	
	IPT main line – 5%	Appendix 17 – Trackwork for Capital Metro Scope and Performance Requirements
	IPT station – 2.5%	Appendix 17 – Trackwork for Capital Metro Scope and Performance Requirements
Minimum K values	Crest: 42.9 Sag: 13	AUSTROADS Guide to Road design, Part 3 Geometric Design, Section 8.6 Vertical Curves. Based on R_T = 2.0s. Sag value based on comfort criteria.

Table 7.2: Design Criteria for Intersections

Criterion	Value	Comment
Design vehicles	AUSTROADS 19m Semi-trailer and Steer Tag Bus IPT (Light Rail Transit or Bus Rapid Transit)	
Check vehicle	AUSTROADS 25m B-Double	
Normal crossfall	3%	

Design criteria for BSE is likely to be similar to JGD3B, but is subject to the outcome of a future feasibility study.

8 FIXED CONSTRAINTS

There are a number of fixed constraints that must be considered in the design, specifically in regards to the vertical alignment of JGD.

8.1 MOLONGLO 3 TOPOGRAPHY

The topography of Molonglo 3 is relatively steep with average slopes above 5%. The vertical alignment of JGD must be sympathetic to the terrain to avoid excessive earthworks for the roadway and future adjacent development, which would result in a poor urban design outcome.

8.2 JGD3A ALIGNMENT

The level and grade of JGD is fixed at the northern end by the JGD3A project currently under construction. The southern limit of works of JGD3A is at Chainage 17,500 and no realignment can occur further north beyond this point.

There is some minor scope to adjust the JGD northbound carriageway crossfall between Chainage 17,500 and Chainage 17,600 as this is an area of temporary tie-in pavement for the JGD3A project that will eventually become redundant.

8.3 BULK SUPPLY WATER MAIN

A 900mm Bulk Supply Water Main (BSWM) crosses the JGD alignment at Chainage 17,200. This water main supplies the Weetangera Reservoir to the north of WHD.

The cost of relocating this water main is considered prohibitive. The inconvenience of relocation would also be significant and it is likely that ICON Water would be highly restrictive as to when any works on the BSWM could occur, possibly imposing a low peak seasonal limitation.

Figure 8-1: BSWM Anchor Blocks

Also, the grade of the BSWM adjacent to JGD is already 16% and greater (with large anchor blocks clearly visible above ground) hence making it very difficult to undertake any lowering. Refer Figure 8-2.

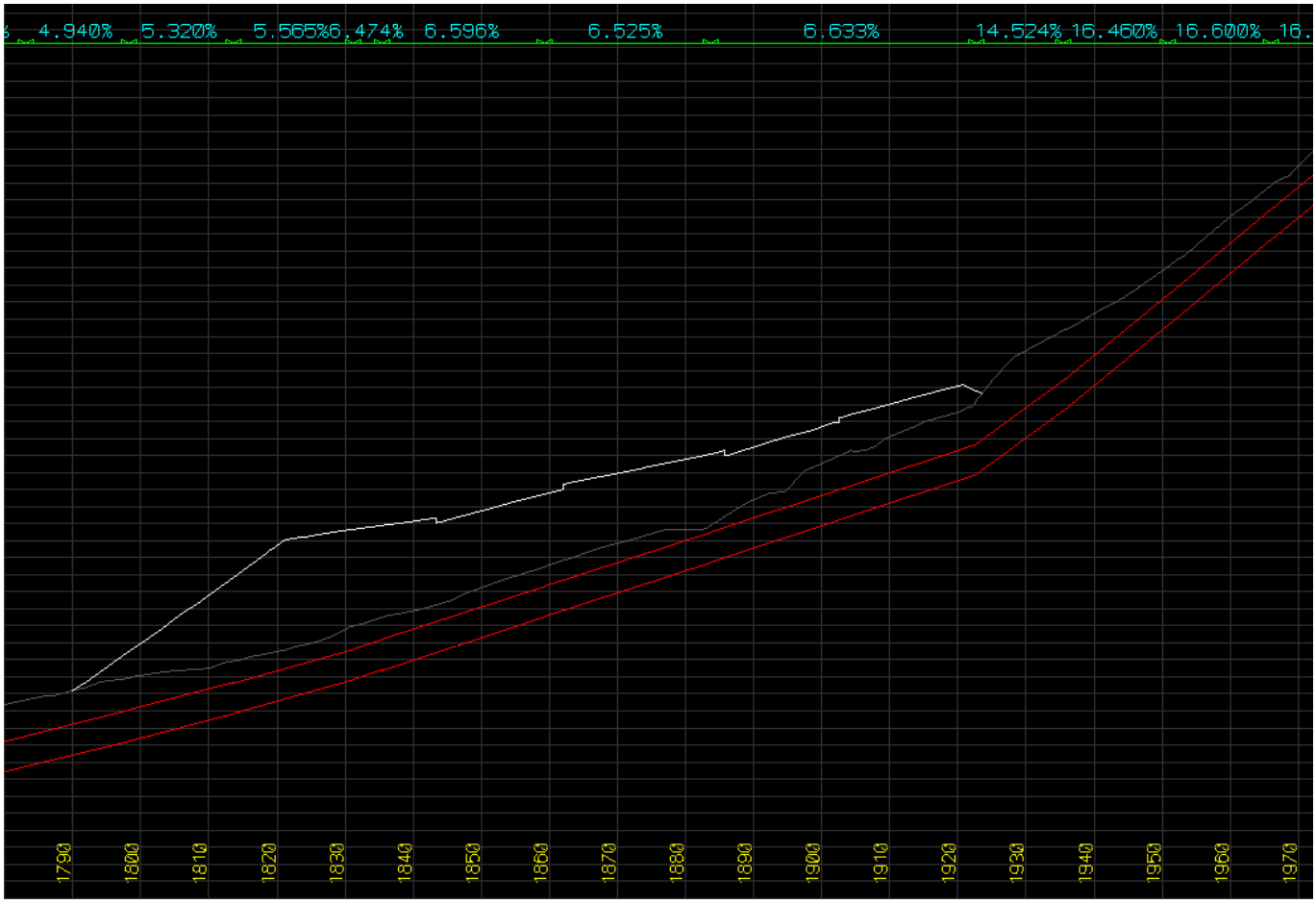

Figure 8-2: BSWM Profile Beneath JGD

ICON Water advised that the depth of fill over the BSWM should be between 1.5m and 2.5m depth, to limit the depth of excavation required if ICON Water need to access the main for maintenance or repairs. ICON Water later advised that they would accept up to a fill depth of 3.0m.

Calibre adjusted the grading of JGD3B to limit the depth of fill to 3.0m or less (except for one short location in the south-eastern verge where the fill is 3.171m. ICON Water provided acceptance of the revised grading. Refer Appendix H.

JGD3B grading will require minimum vertical clearance between the BSWM and HV electrical conduits in the western verge. In order to reduce the depth of fill over the BSWM. The depth of the HV electrical conduits was locally reduced to achieve the minimum allowable clearance of 600mm between the conduits and the BSWM. Liaison with Evo Energy to confirm acceptance of the conduit depths is ongoing.

8.4 JGD INTERSECTION LOCATIONS

The location of JGD Intersections 2 and 3 are fixed by the planning and design undertaken for the Whitlam Residential Estate.

9 DESIGN CONSIDERATIONS

Along with the fixed constraints there are a number of design considerations that will affect the design to a lesser extent.

These can be summarised as follows:

- Safety and amenity for all road users including pedestrians and cyclists.
- Design criteria and requirements of the road authority (TCCS).
- An acceptable level of service for both John Gorton Drive intersections allowing for expected future traffic volumes.
- Vehicular turning movement requirements.
- Staging and constructability.
- Cost effectiveness of the solution with an aim to provide value for money for the Territory.
- Minimisation of risks during construction to the civil contractor and road users.
- Minimisation of delays to road users during construction.
- Possible future upgrades and further John Gorton Drive stages.
- Interface with the adjacent land development.
- Provision of adequate space for future light rail construction with minimal future rework.

10 INTERSECTION MODELLING

10.1 TRAFFIC VOLUMES

As part of the Molonglo 3 Road Network Scenarios Modelling project (refer Section 6.9), the Canberra Strategic Transport Model (CSTM) was refined to cover probable planning outcomes for Molonglo 3. A base case model and four additional scenarios were developed by SMEC for future years 2031 and 2041. Only 2041 models were used as the basis of Calibre's JGD3B SIDRA analysis as per TCCS guidelines.

SMEC's land use inputs for their 2041 strategic modelling are based upon West Belconnen being completed and a population of 25,000 in the new suburb of Huntly, directly west of Molonglo 2.

The 2041 base case comprises the following:

- WHD duplication.
- WHD / Coulter Drive / JGD intersection at grade.
- WHD / Bindubi Street / BSE intersection at grade.
- BSE has two lanes each way.
- EWA connection to Tuggeranong Parkway.
- EWA connection to Uriarra Road via Huntly.
- Link from Huntly to Stockdill Drive.

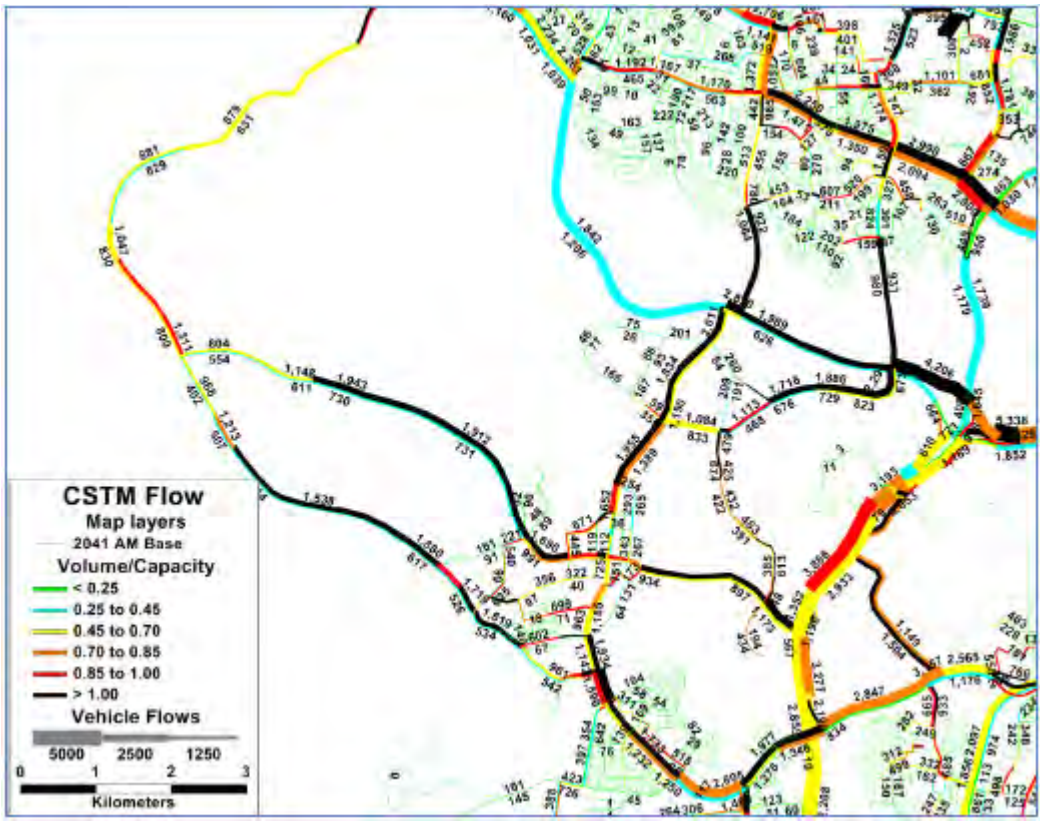

Figure 10-1: 2041 AM Base Scenario Flow Diagram

Scenario 1 comprises the base case with the following changes:

- Coulter Drive duplication.
- BSE has one transit lane and one transit lane each way.

Scenario 2 comprises the base case with the following changes:

- No WHD duplication.
- Coulter Drive duplication.
- BSE has one transit lane and one transit lane each way.

Scenario 3 comprises the base case with the following changes:

- Bindubi Street duplication north of WHD.
- WHD / Bindubi Street / BSE grade separated.

Scenario 4 comprises the base case with the following changes:

- Coulter Drive duplication.
- WHD / Coulter Drive / JGD grade separated.
- WHD / Bindubi Street / BSE grade separated.
- No EWA connection to Tuggeranong Parkway.

The removal of the EWA connection creates a significant increase in volumes on JGD. Refer Figure 10-2.

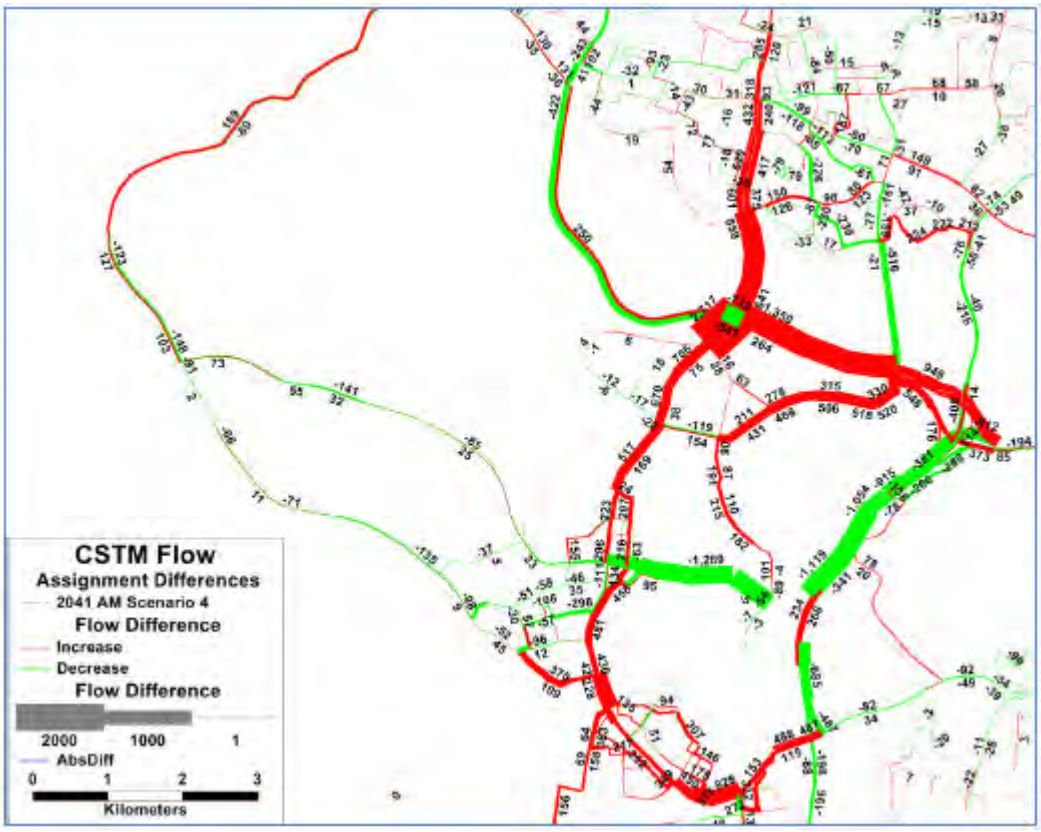

Figure 10-2: 2041 AM Scenario 4 Flow Difference Diagram

The forecast traffic flows produced by SMEC were used by Calibre to undertake SIDRA analysis for the JGD Intersection 3. Refer Table 10.1 and Table 10.2.

Table 10.1: SMEC Forecast AM 2041 Peak Traffic Flows

Approach	Movement	2041 AM Peak				
		Base Case	Scenario 1	Scenario 2	Scenario 3	Scenario 4
JGD South	Left	154	174	174	154	116
	Through	1,097	1,006	1,013	1,177	1,626
	Right	594	452	452	514	545
BSE	Left	459	494	494	481	598
	Through	80	12	12	81	82
	Right	431	650	651	357	430
JGD North	Left	328	335	331	310	336
	Through	705	727	719	683	747
	Right	120	149	149	116	126
Whitlam Access	Left	258	384	386	278	279
	Through	89	25	24	67	53
	Right	258	315	314	256	247
Total		4,573	4,723	4,719	4,474	5,185

Table 10.2: SMEC Forecast PM 2041 Peak Traffic Flows

Approach	Movement	2041 PM Peak				
		Base Case	Scenario 1	Scenario 2	Scenario 3	Scenario 4
JGD South	Left	210	249	250	221	204
	Through	847	874	882	800	755
	Right	410	437	437	439	690
BSE	Left	619	428	429	578	479
	Through	135	25	25	132	57
	Right	364	389	389	296	346
JGD North	Left	336	517	521	313	330
	Through	859	922	918	888	1,403
	Right	139	290	290	133	229
Whitlam Access	Left	118	165	167	114	128
	Through	90	23	23	87	79
	Right	186	186	186	188	157
Total		4,313	4,505	4,517	4,189	4,857

10.2 SIDRA ANALYSIS

SIDRA analysis was undertaken for Intersection 3, on all scenarios, using peak traffic volumes in Section 10.1 and the layout in Figure 10-3.

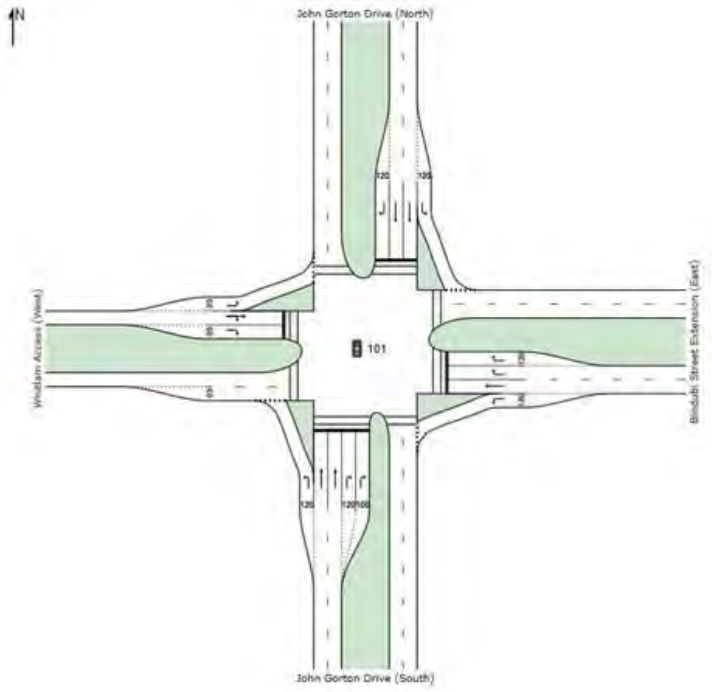

Figure 10-3: Intersection 3 Layout

Table 10.3: SIDRA Analysis Results

Scenario	Peak	LOS	Delays	Queue	V/C
Base Case	AM	C	41.9	243.6 (south)	0.897
	PM	B	28.2	114.4 (north)	0.845
Scenario 1	AM	C	29.3	209.5 (south)	0.923
	PM	C	30.9	144.2 (north)	0.888
Scenario 2	AM	C	29.8	213.4 (south)	0.918
	PM	C	30.8	142.8 (north)	0.888
Scenario 3	AM	C	36.5	227.6 (south)	0.917
	PM	B	27.8	124.5 (north)	0.871
Scenario 4	AM	F	79.1	697.1 (south)	1.061
	PM	E	68.1	486.6 (north)	0.993

Key points from the SIDRA results follow:

- The base case and Scenarios 1 to 3 all have acceptable results. Scenario 4 fails.
- Scenario 3, with BSE / WHD interchange, offers a slight improvement to the base case.

- Scenario 4 appears to be an unfeasible option due to the existence of interchanges on WHD, however it does demonstrate the importance of connecting the EWA to Tuggeranong Parkway.
- There are no scenarios with light rail specific phasing.

10.3 FURTHER SIDRA ANALYSIS

Further optimisation of the SIDRA models was undertaken by Calibre and an optional through and right phase included in the cycle.

The results were favourable allowing removal of a right turn lane on John Gorton Drive southern leg and an auxiliary lane on Bindubi Street Extension leg.

Table 10.4: Revised SIDRA Analysis Results

Scenario	Peak	LOS	Delays	Queue	V/C
Scenario 3	AM	C	39.3	229.8 (south)	0.927
	PM	C	39.3	189.0 (north)	0.953

Refer to Appendix E for detailed SIDRA analysis results.

A review of all SIDRA analysis was undertaken by TCCS during March 2018. TCCS preferred that the double right from JGD into BSE be incorporated in the initial construction of JGD3B.

Refer Appendix H for stakeholder correspondence.

11 DESIGN ELEMENTS

11.1 HORIZONTAL ALIGNMENT

11.1.1 JOHN GORTON DRIVE

The JGD horizontal alignment is generally in accordance with AECOM's feasibility study. The alignment removes geometric deficiencies associated with the existing Coppins Crossing Road. The AECOM horizontal alignment comprises two straights joined by a 400m radius with superelevation through the curved area.

For this design, the right hand curve approaching JGD3A has been increased to 600m radius. This increase creates a lateral shift of approximately 10m to the east, allowing the vertical alignment to be improved over the BSWM. As a consequence, JGD road reserve is just beyond the start of the BSWM that exceeds 16% grade.

The northbound carriageway is located in line with Coppins Crossing Road. This affects staging of works only, requiring the southbound carriageway to be built first in order to facilitate continuous traffic movement.

There are no physical constraints in the corridor that have not been catered for (including the BSWM). The alignment allows for a suitable tie-in to Coppins Crossing Road beyond the southern limit of project.

The increase in JGD curve radius to 600m discussed above has some affects including:

- Minor increase in the area of green space within Whitlam Residential Estate.
- Minor realignment of Intersections 2 and 3.
- Improvement to Safe Intersection Sight Distance (SISD) for Intersections 2 and 3.
- Extension of superelevation transition into JGD3A project limits. This is not a problem as the proposed JGD3A pavement on the northbound carriageway in this area is temporary (for tie-in to Coppins Crossing Road) and requires replacement as part of JGD3B anyway. The southbound carriageway of JGD3A matches in exactly to JGD3B so will not need replacement.

11.1.2 BINDUBI STREET EXTENSION

The alignment of Bindubi Street Extension is perpendicular to John Gorton Drive at Intersection 3. The length of the intersection stub has been minimised in order to provide maximum flexibility for the future extension into Molonglo 3 Stage 2.

It is likely that the future alignment will curve and follow the natural surface contours as shown in the draft Molonglo 3 Planning and Design Framework layout. Refer Figure 4-1 above.

11.1.3 ACCESS ROAD 3 AND 8

Access Roads 3 and 8 are perpendicular to John Gorton Drive for the intersection stubs. The alignment beyond has been determined by the layout of the Whitlam Residential Estate.

11.2 VERTICAL ALIGNMENT

11.2.1 JOHN GORTON DRIVE

From south to north the vertical alignment of JGD comprises the following elements separated by appropriate length vertical curves:

- A 5% upgrade between the limit of works and Intersection 3. This allows for light rail along JGD.

- A 4% upgrade through Intersection 3 enabling this intersection to be four-way and signalised.
- A 5.7% upgrade through Intersection 2.
- A 5.8% upgrade matching JGD3A.

The longitudinal grade of JGD is 5.7% at Intersection 2, precluding this intersection being four-way and signalised due to excessive adverse crossfall for right turn movements.

The alignment allows for a four-way signalised intersection at JGD Intersections 3.

There is sufficient clearance between proposed utilities along JGD and the BSWM. The maximum depth of fill where the BSWM crosses the road reserve is 3.17m. This has been accepted by ICON Water. Refer Appendix H.

At the southern limit of works (Chainage 16,975), the northbound carriageway of JGD is approximately 1.6m above Coppins Crossing Road, requiring the tie-in to extend approximately 100m further south.

For the following stage of JGD (JGD3C), it is possible to increase the grade of JGD between Intersection 3 and 4 to 7% which would allow a flatter 2.5% grade through Intersection 4, suitable for locating an IPT station.

Refer to drawings 17-001746-301 to 17-001746-303 for John Gorton Drive longitudinal sections.

11.2.2 BINDUBI STREET EXTENSION

From west to east the vertical alignment of BSE comprises the following elements separated by appropriate length vertical curves:

- A 3% downgrade matching JGD crossfall.
- A 2.5% upgrade allowing for a future light rail station.

Refer to drawing 17-001746-310 for Bindubi Street Extension longitudinal section.

11.2.3 ACCESS ROAD 3 AND 8

Access Roads 3 and 8 comprise a 3% upgrade matching JGD superelevation. The alignment beyond the intersection stubs is dictated by the design of Whitlam. Length of stubs is minimised but allows for inclusion of traffic signals (Road 3 only) and stormwater drainage at the intersection.

Refer to drawings 17-001746-310 to 17-001746-311 for access road longitudinal sections.

11.3 TYPICAL CROSS SECTION

11.3.1 JOHN GORTON DRIVE

The cross section of JGD3B is similar to JGD3A and generally in accordance with AECOM's feasibility study:

- 50m wide road reserve.
- 12m wide median. Median width is required for WSUD, future IPT and constructability.
- Two 3.5m wide traffic lanes in both directions.
- 2.0m wide dedicated on-road cycle lane on both sides.
- 3.0% pavement crossfall and superelevation where required.
- 10m wide verges. Minimum clearances requirements between utility services, landscaping and paths have been adopted in each verge.
- Stormwater located 600mm behind kerb line.
- Street lighting in both verges.

- Landscape planting in median and both verges.
- Electricity and gas shared trench in western verge and telecommunications shared trench in eastern verge.
- Additional electricity trench in eastern verge.

Shared use paths have been generally omitted from the road corridor of John Gorton Drive as the SLA has confirmed that they are to be included in the Molonglo 3 Stage 1 and Stage 2 estate designs. Some sections of path have been included to allow pedestrian access to bus stops and to allow cyclist on/off road transitions near intersections.

Refer to drawing 17-001746-010 for John Gorton Drive Stage 3B typical cross section.

11.3.2 BINDUBI STREET EXTENSION

The cross section of Bindubi Street Extension is generally in accordance with AECOM's feasibility study and has the following key characteristics:

- 50m wide road reserve.
- 12m wide median. Median width is required for WSUD and future IPT.
- Two 3.5m wide traffic lanes in both directions. Note that AECOM's feasibility study included only one lane in each direction.
- 2.0m wide dedicated on-road cycle lane on both sides.
- 3.0% pavement crossfall.
- 10m wide verges. Minimum clearances requirements between utility services, landscaping and paths have been adopted in each verge.
- Stormwater located 600mm behind kerb line.
- Street lighting in both verges.
- Landscape planting in median and both verges.

Refer to drawing 17-001746-011 for Bindubi Street Extension typical cross section.

11.3.3 ACCESS ROAD 3 AND 8

Access Roads 3 and 8 are collector roads that provide access to residential areas within Molonglo 3. The cross sections vary within the transition from the JGD intersections and estate roads.

Refer to drawing 17-001746-012 for the typical cross sections of the access roads.

11.4 PROVISION FOR LIGHT RAIL

CMTEDD contacted TCLR to confirm the requirements for light rail. TCLR provided a list of comments. The comments, and responses to them, are provided in Appendix J.

Refer to drawing 17-001746-820+ for details of the provisions for light rail.

The typical section and turning path were established with inputs from Jacobs Australia Pty Ltd, who has worked on the Sydney light rail project and is currently incorporating light rail requirements into the JGD3C project.

Drawing 17-001746-820+ demonstrates that a 12.0m median is sufficient for future construction of the light rail along JGD3B.

11.5 INTERSECTION ARRANGEMENTS

JGD Intersection 2 is left-in, left-out and Intersection 3 is four-way signalised. The grade through these intersections is 5.7% and 4% respectively.

Intersection 2 is restricted to left-in, left-out due to the local grade of JGD. Nonetheless, it is possible to include future additional left-in, left-out intersections on the southbound carriageway to provide intermediate restricted access to the eastern side of Molonglo 3.

Intersection 3 is 800m from Intersection 1. The signalised arrangement allows full access to Molonglo 3 Stage 2. This arrangement will also allow pedestrians and cyclists to cross from one side of JGD to the other. With a school and local centre being incorporated in the Whitlam Residential Estate, connectivity between suburbs is an important design consideration.

Connection to a future IPT station on BSE is provided by the pedestrian facilities incorporated in the traffic signals.

11.6 VEHICULAR TURNING MOVEMENTS

Turning movement simulations were undertaken using AutoTURN Version 9 vehicle turning movement software. The design vehicles were an AUSTROADS 19m semi-trailer and a Steer Tag Bus. The check vehicle was an AUSTROADS 25m B-Double.

Intersection 3 allows for diamond right turns from John Gorton Drive into the side roads. Diamond right turns from side roads into JGD are not provided as these movements are controlled by split phasing.

Refer to drawings 17-001746-600 to 17-001746-603 for vehicle turning movement simulations.

11.7 PEDESTRIAN FACILITIES

The following factors were considered in the design development of pedestrian facilities:

- Connectivity between Whitlam and future development on the eastern side of John Gorton Drive.
- Planned route alignments defined in the ACTive Travel Infrastructure Practitioner Tool.
- The requirements of the draft Municipal Infrastructure Standards, Part 5 Active Travel Facilities Design.
- Addressing the requirements of people with disabilities, including compliance with the Disability Discrimination Act 1992

The proposed provisions for pedestrians includes the following:

- 3.0m asphalt, shared use path along the eastern verge of a section of John Gorton Drive.
- Shared use paths along access roads.
- Shared paths at intersection 3, to allow off/on road connectivity for cyclists and to allow access to bus stops.
- Signalised pedestrian facilities at intersection 3 with zebra crossings on high angle entry left turns.
- Tactile Ground Surface Indicators at the pram crossings and bus stops.

Apart from locations close to intersections, the JGD3B shared use paths have been moved from the road reserve into the adjacent estates to create a better user experience. Construction of the shared paths would occur during the estate development.

11.8 CYCLIST FACILITIES

The provisions for cyclists have included consideration off likely cycle routes and connectivity with proposed off-road path networks.

Key on road cycling provisions:

- 2.0m wide on-road cycle lane in both directions along JGD and BSE.

- 2.0m wide on-road cycle lanes on Road 3.
- Coloured pavement treatment at intersections to distinguish cycle lanes as per the warrant system.
- Ramps connecting on-road and off-road facilities at approach and departures to intersections.

Additionally, the shared use paths mentioned in Section 11.7 will cater for less confident cyclists.

11.9 BUS STOPS

Indented bus stops have been included along John Gorton Drive at the departures of Intersection 3. TCCS has agreed with a distance of 15m between left turns and the start of bus stops.

Refer drawing 17-001746-102 for the location of bus stops.

11.10 EARTHWORKS

Earthworks quantities for JGD3B are approximately 3,000cu.m cut, 61,000cu.m fill, resulting in 58,000cu.m of imported fill being required. This includes the tie-in to Coppins Crossing Road.

The required imported material could be sourced from the stockpiles adjacent to JGD3A. The stockpiles have been generated from cut within the JGD3A project and are estimated to be approximately 85,000cu.m in volume.

The geotechnical investigation confirms that variable strength rhyodacite will be encountered as per other recent construction projects in Molonglo. The ease of excavating the rock will be largely dependent on the degree of fracturing within the rock mass and the extent of weaker zones.

Proposed stockpile locations have been nominated in the drawings. Refer Drawing 17-001746-701.

11.11 ROAD PAVEMENT

For the pavement design, design criteria is in accordance with Part 6.4 of the TCCS Design Standards for Urban Infrastructure and are as follows:

- Design Traffic Loading for through carriageway - 1 x 10^7 ESA (Arterial Road).
- Design Traffic Loading for intersections - 4 x 10^7 ESA.
- The adopted design life of the pavement is 25 years.

The pavement design has been based upon advice received from Douglas Partners. The adopted sub-grade CBR is 3%. The adopted percentage of heavy vehicles is 5% as per other sections of JGD.

The pavement type proposed is deep lift asphalt as per Roads ACT's preference for new roads and is the same composition as adopted for JGD3A. Pavement wearing course is Dense Graded Asphalt (DGA).

Refer drawings 17-001746-200 to 17-001746-203 for Pavement Plans and Details.

11.12 STORMWATER DRAINAGE

11.12.1 ROAD DRAINAGE

The stormwater road drainage network has been designed in accordance with the criteria detailed in the TCCS standard DS01. A minor system design average recurrence interval (ARI) of 10 years has been adopted. This is the same as adopted on previous stages of JGD. Although the median will initially be a depressed grassed median, the stormwater pipes have been sized based on the assumption that the median will eventually be fully paved when the light rail is constructed.

11.12.2 WATER SENSITIVE URBAN DESIGN

Water Sensitive Urban Design (WSUD) principles have been incorporated in the design. This is by the use of a grass lined depressed median which picks up stormwater flows from at least one carriageway all the way along the JGD alignment.

11.12.3 CROSS DRAINAGE

The major cross drainage system has been designed for a 100 year ARI. The location and size of the cross drainage has been developed considering the locations of existing gullies and water courses as well as the future land use requirements on each side of the corridor.

A key area for cross drainage is across BSE intersection stub directly east of JGD. The alignment of BSE crosses over an existing gully which conveys significant flows during a 100 year ARI storm event. At this location, Calibre is proposing the use of existing 2400 x 900 reinforced concrete box culverts remaining from the Majura Road widening project.

The stormwater cross drainage culverts and pipes have been sized based upon the following assumptions:

- Catchment boundaries based upon existing topography as well as the Whitlam Residential Estate block layout.
- A 70% impervious area.
- A 0% blocking factor.

11.12.4 STORMWATER MANAGEMENT DURING CONSTRUCTION

For the management of stormwater flows, JGD3B would ideally be constructed in the following order:

- Construction of sedimentation ponds.
- Construction of cross drainage culverts and pipes.
- Construction of upstream catch drains.
- Construction of bulk earthworks.

11.13 UTILITY SERVICES

11.13.1 EXISTING SERVICES

Utility services exist adjacent to Coppins Crossing Road. These services include the following:

- 900mm Bulk Supply Water Main (BSWM).
- Telstra (copper and optical fibre).
- Rural water supply.

11.13.2 TELECOMMUNICATIONS

Telecommunication service providers have provided advice on their requirements for servicing the proposed future Molonglo 3 developments. Telecommunication conduits are to be included within shared trenches proposed in the eastern verge of JGD, northern verge of BSE and both verges of Road 3. The proposed shared trench details include the provision of conduits for ICON, Telstra and NBNCo.

Initial investigations confirmed that Telstra optic fibre will need to be relocated during construction of JGD. Telstra has provided a quote and concept design for this work.

Most of the Telstra conduits required for the project will be installed by Telstra, except for a few selected locations including road crossings. The details of the Telstra conduits are provided in the trench details (17-001746-031 to 17-001746-032) and the Detail Plans (17-001746-101 to 17-001746-103).

11.13.3 INTELLIGENT TRANSPORT SYSTEMS (ITS)

Intelligent Transport Systems (ITS) conduits are also required for Intersection 3 and along John Gorton Drive, as confirmed by Network & Communications Services (CMTEDD). Refer drawing 17-001746-550 for ITS conduits plan.

11.13.4 TRAFFIC SIGNALS

The design also includes traffic signals at Intersection 3. A new traffic signal controller is proposed at this location, as shown on the traffic control device drawings.

11.13.5 ELECTRICITY

Evo Energy has advised that they require 6x150mm conduits along both sides of John Gorton Drive to ultimately connect their 11kV cables from the future Molonglo zone substation to Denman Prospect and other areas in Molonglo 2.Liaison with Evo Energy is ongoing to confirm acceptance of locally raising the HV conduits where they cross the BSWM.

11.13.6 GAS

The design includes space for a 200mm steel secondary main on the eastern side of John Gorton Drive. The design also includes a 160mm PE main on the western side of John Gorton Drive, in a shared trench. There is a 160mm PE main in a shared trench on BSE and Road 3.

11.13.7 WATER SUPPLY

The design currently includes two 225mm water mains that cross JGD 3B at Intersections 2 and 3. This is based on the latest water supply layout provided by the Whitlam Estate team. The Whitlam team has determined this layout in consultation with ICON Water. It is understood that GHD is currently preparing a revised water supply master plan for the Molonglo 3 area, although this has yet to be approved by ICON Water.

At the Value Management Workshop (VMW), ICON Water confirmed that, due to the depth of cover, no protection slab would be required over the BSWM.

11.13.8 SEWER

At the VMW, ICON Water agreed that no sewer is required within the scope of this project, to give SLA flexibility in the future estate planning. Refer Appendix F.

11.14 LANDSCAPING

EnviroLinks Design Pty Ltd has undertaken a preliminary site investigation and analysis of the existing and proposed adjacent landscape treatment of the site. This has informed the landscape and urban design principles as follows:

- The design comprises street tree planting and dry land grassing to the central median, verges and batters.
- Tree plantings are a minimum of 2.5m offset from utility services and planted approximately 12m apart.
- The central median planting is to be planted with staggered Eucalyptus Rossii.
- The road verges include planting of exotic street tree species. The main tree species are Platanus orientallis ‘Digitata’, Prunus cerasifera ‘Oakvill Crimson Spire’ and Quercus palustris ‘Freefall’.

The landscape scheme is consistent with earlier stages of JGD. Refer to drawings 1544-L00 to 1544-L03.

11.15 STREET LIGHTING

The street lighting design for the JGD has been designed in accordance with TCCS Design Standards for Urban Infrastructure Part 12 Public Lighting and AS/NZS 1157.1.1.2005. The project is located beyond the 5km limit for lighting restrictions imposed by Stromlo Observatory.

Standard street light poles and LED luminaires will be adopted for JGD, BSE and the Whitlam Estate access roads.

The following parameters have been used in the design of the lighting:

- Lighting category V3 and P4 along the roadway and at intersections.
- Lighting category P1X at pedestrian crossings.

Refer to drawings PS107426-E000 to PS107426-E103 for Street Lighting details.

12 SAFETY IN DESIGN

A Safety in Design workshop will be held following finalisation of the PSP.

Key considerations and hazards likely to be identified in the workshops are as follows:

- Construction under traffic.
- Construction over the BSWM.
- Method of earthworks and stockpiling of material.

13 PLANNING APPROVAL

13.1 THE MOLONGLO VALLEY PLAN FOR THE PROTECTION OF MATTERS OF NATIONAL ENVIRONMENTAL SIGNIFICANCE (NES PLAN)

The NES Plan provides for urban development within the Molonglo Valley and establishes the ACT Government's commitments to protect Matters of National Environmental Significance (MNES).

The NES Plan is structured as follows:

- Section 1 provides an introduction to the NES Plan.
- Section 2 provides a description of the activities that will take place under NES Plan. These include development, conservation and bushfire management.
- Section 3 outlines how the NES Plan will be implemented.
- Section 4 provides the ACT Government commitments to conservation outcomes for the relevant MNES.
- Section 5 provides a description of the monitoring, evaluation and reporting mechanisms to ensure that actions committed to in the NES Plan are being met and publicly reported.
- Section 6 provides reasonable assurance in relation to implementation of the NES Plan.

The NES plan was endorsed on 7 October 2011 by the Minister for Sustainability, Environment, Water, Population and Communities, the Honourable Tony Burke.

A very small area of 'low quality potential' Pink-tailed Worm-lizard habitat may be impacted, however this is a very small impact in the context of the species' habitat across the Molonglo valley, a large proportion of which is to be conserved as stipulated in the Molonglo NES Plan. The impact to this species has been assessed and approved through the Molonglo Valley Strategic Assessment. Similarly, impacts to the Superb Parrot have already been assessed and approved. No Box Gum Woodland will be impacted by this project. Refer drawing 17-001746-800.

13.2 S211 EXEMPTION

In accordance with the Planning and Development Act 2007, an Environmental Impact Statement (EIS) is normally required for projects that involve a process or activity likely to have significant adverse environmental impact on an endangered species or ecological community.

Section 211 of the Act allows an applicant to seek exemption from the requirement to complete an EIS. The Minister responsible for the Act has discretion under Section 211 to grant exemption based on the information presented in previous studies. If an exemption is granted, then the EIS process is regarded as complete and allows an application to lodge a development application (DA) for evaluation under the impact track process.

In May 2018, the EIS exemption was granted by Mick Gentleman MLA, the Minister for Planning and Land Management. The DA report addresses the risks that were identified in the s211 Application Supporting Documentation.

13.3 PLANNING AND DESIGN FRAMEWORK

A Planning Design Framework (PDF) document is a project requirement arising from the NES Plan. It is not required for statutory approval, but does need to be endorsed by the Commonwealth Government prior to construction. The PDF preparation is currently underway, however timing of delivery is yet to be confirmed.

13.4 DEVELOPMENT APPLICATION

A Development Application (DA) will be submitted to EPSDD following finalisation of this PSP.

14 CONSTRUCTABILTY

14.1 STAGING OF WORKS

Construction would most likely follow the following staging sequence:

- Tree removal.
- Construction of the southbound carriageway. Coppins Crossing Road would remain open to traffic.
- Construction of a semi-permanent tie-in beyond the southern limit of permanent works. This tie-in also acts as a temporary traffic switch at the southern end of the project.
- Construction of a temporary pavement in the median at the northern end of the project. Refer Figure 14-1 for possible switch locations.
- Switch of all traffic to JGD3B southbound carriageway. Northbound traffic to use temporary median pavement to get back onto JGD3A northbound carriageway.
- Relocation of Telstra.
- Construction of the northbound carriageway.
- Switch northbound traffic to northbound carriageway and remove redundant temporary pavement.

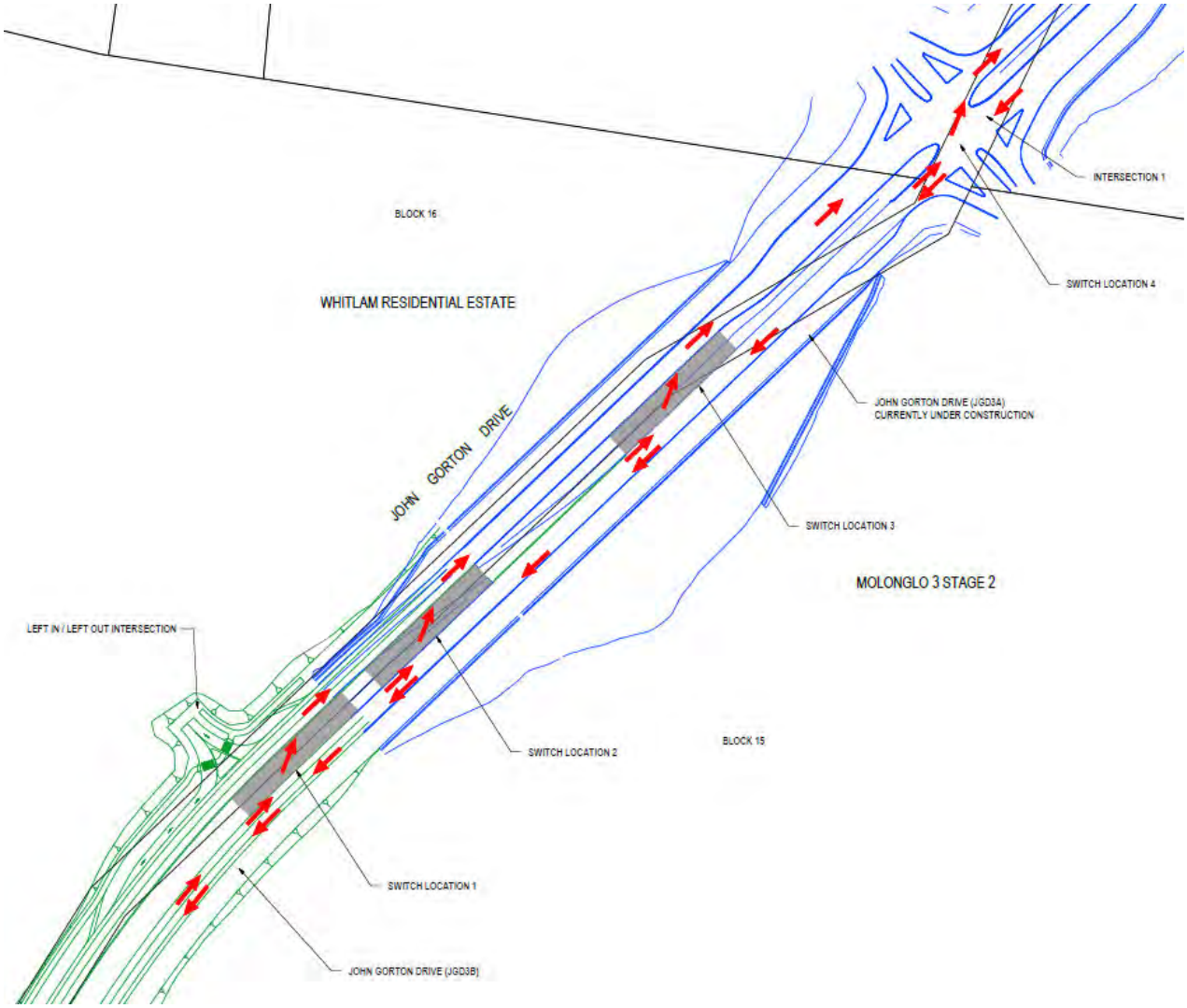

Figure 14-1: Possible Switch Locations

The switching of all traffic onto the southbound JGD3B carriageway is required in order to facilitate northbound carriageway construction. Figure 14-1 shows four possible locations for getting northbound traffic back onto the JGD3A northbound carriageway. These locations are as follows:

- Switch Location 1 – Wholly within the limits of JGD3B and does not initially affect JGD3A Contractor if still on site. Some northbound carriageway works would need to occur under traffic. Switch may require regrading to suit northbound carriageway construction.
- Switch Location 2 – Within tie-in area of JGD3A. Will require liaison with JGD3A Contractor if still on site. Removal of JGD3A temporary pavement and tie-in would need to occur under traffic. Switch may require regrading to suit northbound carriageway construction.
- Switch Location 3 – North of JGD3A tie-in. Allows full construction of northbound carriageway including removal of JGD3A temporary pavement and tie-in. Will require liaison with JGD3A Contractor if still on site. Some JGD3A kerb removal and replacement required.
- Switch Location 4 – Through JGD3A signalised intersection. Allows full construction of northbound carriageway including removal of JGD3A temporary pavement and tie-in. Will require liaison with JGD3A Contractor if still on site. Precludes the use of JGD3A intersection to access Whitlam. May be tight for long or large vehicles to negotiate.

The proposed vertical alignment of JGD3B is such that the construction of the southbound carriageway can be undertaken without adversely impacting upon the adjacent section of Coppins Crossing Road. This allows continuous traffic flow for the duration of the construction phase, without requiring an expensive side track.

Chainage 16,975 is the ideal location for southern limit of permanent works as there is no superelevation development in this area. This chainage is also just beyond the start of the turn lanes for Intersection 3. A southern tie-in to Coppins Crossing Road beyond the permanent works between Chainage 16,890 and 16,975 has the following benefits:

- The grade between these chainages is 5%, which is similar to grading of the future JGD stage (JGD3C).
- The tie-in has no adverse impacts upon the layout and grading of Intersection 3. As this intersection is only 130m from the southern limit, a tie-in within the permanent works area could be problematic.
- The external tie-in can be used as part of the staging, enabling construction of all of the northbound carriageway of JGD after the traffic switch to the newly constructed southbound carriageway.

Refer to drawing 17-001746-800 for Construction Staging Plan.

14.2 TEMPORARY TRAFFIC MANAGEMENT

Temporary traffic management for the works will mainly consist of the following:

- Reduction in the posted speed limit.
- Signage on approaches, departures and through the works.
- Variable message signs on approaches.
- Concrete barriers adjacent to the work zone.
- Temporary linemarking.
- Temporary traffic switches where required.

14.3 POLLUTION CONTROL

During construction normal procedures would be in place to minimise erosion and control transfer of sediment to downstream water bodies. These measures would include:

- Use of silt fences.
- Temporary sediment ponds downstream of stormwater outlets. These will be detailed in the final design.
- Temporary fence and grass buffer zones that must be left undisturbed.
- Locate stockpiles in areas that minimise land take and erosion.
- Revegetate disturbed areas and stabilise drainage outlets.

Refer drawings 17-001746-700 to 17-001746-701 for Pollution Control Concept Plans.

14.4 FENCING

Temporary fencing is required to facilitate construction of JGD3B. The fencing arrangement shown on the drawings allows room for engineering construction activities, topsoil stockpiling, the construction compound, temporary sedimentation basins and access to the JGD3A material stockpile.

The fencing also considers stock grazing of adjacent rural blocks until residential development commences. The existing rural licenses will need to be removed within the fenced limit of work.

It is understood that some of the new fencing will be erected by a contractor engaged by CMTEDD, prior to construction. The extent of fencing erected by CMTEDD's fencing contractor will be confirmed in the detailed design drawings.

Refer drawing 17-001746-750 for Fencing Plan.

14.5 ADJACENT CONSTRUCTION

It is possible that the adjacent JGD3A project will still be under construction when JGD3B commences. The two projects have some overlap at the interface.

Careful coordination between Contractors is likely to be required in the following areas:

- Traffic management including TTM arrangements. Ideally TTM's would be developed by the same engineering consultant (RD Gossip) and consider both projects concurrently.
- Access to JGD3B compound. This is currently proposed to be at the future Whitlam school site, west of JGD3B.
- Telstra relocation and cut-over.
- Fencing and gate locations.
- Access to JGD3A stockpiles by the JGD3B Contractor.
- Physical works within the overlap of the two projects.

The JGD3B contract may include additional milestones in order to restrict possession of site at the northern end of the project, whilst the JGD3A project is still being constructed.

15 OPINION OF COST

15.1 COST ESTIMATE ASSUMPTIONS

The following assumptions and allowances have been made in the preparation of the Opinion of Cost:

- All values are inclusive of GST.
- Rates used are current at the time of this design and assume construction in 2018.
- Rates used are an average of tender rates received from the JGD3A project.
- Fees for design, procurement and contract administration and surveillance are not included.

15.2 COST ESTIMATE

A cost estimation has been prepared for the project and is summarised as follows.

Table 15.1: Cost Estimate

	Base	P50	P90
John Gorton Drive 3B Cost Estimate	$9,722,404.81	$10,826,527.00	$11,691,350.00

The P50 and P90 estimates were prepared following a probabilistic risk workshop which took account of both contingent and inherent risks. The outputs from the workshop are provided in Appendix K.

16 UNRESOLVED ISSUES

The following is a list of unresolved issues:

- Electrical supply point for new traffic signals at Intersection 3.
- ICON Water requirements for construction over the BSWM.
- GHD's update to the Molonglo 3 water supply master plan is yet to be accepted by ICON Water.

17 FURTHER WORK

Following completion of this PSP further design phase work is required including:

- Development Application (DA) approval.
- Document Readiness (DR) design.
- Construction tender documentation.

APPENDICES

APPENDIX A DRAWINGS

APPENDIX B TREE ASSESSMENT

APPENDIX C GEOTECHNICAL INVESTIGATION

APPENDIX D NOISE ASSESSMENT

APPENDIX E SIDRA ANALYSIS

APPENDIX F VALUE MANAGEMENT WORKSHOP

APPENDIX G SAFETY IN DESIGN

APPENDIX H STAKEHOLDER CORRESPONDENCE

APPENDIX I ECOLOGICAL IMPACT ASSESSMENT

APPENDIX J COMMENT REGISTERS

APPENDIX K PROBABILISTIC RISK WORKSHOP