

28 November 2018

Mr Ben Hawkins Strategic Planning Manager Victorian Planning Authority Level 25, 35 Collins Street MELBOURNE VIC 3000

Dear Mr Hawkins

# PLANNING SCHEME AMENDMENT GC102 – DONNYBROOK/WOODSTOCK INFRASTRUCTURE CONTRIBUTIONS PLAN – COUNCIL SUBMISSION

I advise that the above matter was formally reported to the 13 November 2018 meeting of Council. At this meeting Council resolved to:

- 1. Authorise Council Officers to make a submission to Planning Scheme Amendment GC102, and any subsequent Planning Panel Hearing, advocating for the inclusion of accurate project costing information and costs of borrowing, within the final Donnybrook/Woodstock Infrastructure Contributions Plan to facilitate the timely delivery of essential infrastructure and to minimise cost shortfalls.
- 2. Write to the Minister for Planning to request changes to the Infrastructure Contributions Plan system to enable contributions to be collected to fully fund the cost of provision of essential community and recreation infrastructure.

In preparation to the submission, and in response to the above Council resolutions, Council Officers have undertaken a cost comparison of the project costs in the exhibited Donnybrook/Woodstock Infrastructure Contributions Plan (the exhibited ICP). To this end, Council Officers have engaged WT Partnership (WTP) to peer review the exhibited infrastructure costings prepared by Cardno on behalf of the Victorian Planning Authority (VPA) for transport projects. Specifically, the reviews have identified the following key issues:



- 1. The transport projects in the exhibited ICP are significantly under-costed. WTP's independent P90 cost estimate of the transport projects in Donnybrook/Woodstock is \$197,337,605. This exceeds the VPA Benchmarks of \$134,888,243 in the exhibited DCP by \$62,449,363 (or 46.3%). The key factors contributing to such significant cost variances include:
  - a. WTP cost estimate of road projects exceeds the exhibited ICP by \$14.6 million. The exhibited ICP has shown standard design drawings of 34m wide road reserves for both primary and secondary arterial roads. However, only half (14m) of the road reserve is costed. This leads to significant cost shortfalls in pavement, shared user path and landscaping areas for road projects. Further, allowances for site preparation, subgrade preparation and landscape maintenance have not been allocated in the ICP.
  - b. WTP cost estimate of intersection projects exceeds the exhibited ICP by \$36.2 million, primarily due to variances in the quantities for road pavement, shared user path and landscaping areas. In addition, the rates for pavement and landscaping maintenance are considered low, and site preparation, subgrade preparation and street lighting have not been accounted for in the ICP for all intersection projects.
  - c. Further to the above, the ICP does not take into account the considerable cost of rock excavation for both road and intersection projects, which is highly relevant to the northern growth corridor.
  - d. WTP cost estimate of BR03, BR04 and BR05 exceeds the ICP by \$12.7 million. The ICP does not take into account allowances for bridge design in response to the protection of Growling Grass Frogs habitat in the Merri Creek.
- 2. Council is only able to collect \$83.6 million of contributions from the community and active recreation standard levy (capped at \$86,627 per hectare) to fund \$137.4 million worth of projects in the Donnybrook/Woodstock area, based on the community infrastructure benchmarks used. This is an inherent shortfall of \$53.8 million that Council needs to source alternative funding sources.
- 3. Further to this, the exhibited ICP project costs for community and active recreation projects are also considerably lower than comparable projects in the Wollert DCP. Benchmarks for CI-01, CI-02, CI-03 and CI-05 are each \$3 million less, and Benchmarks for SR-01, SR-02, SR-03, SR-04, SR-05 and SR-06 are each \$2.1 million less than comparable projects in the Wollert DCP. The cost



difference between the Benchmarks and the Wollert DCP adds a potential cost shortfall of \$24.6 million, in additional to the \$53.8 million of inherent shortfall.

4. The cost of borrowing is an allowable supplementary levy item for community and active recreation projects in the Ministerial Direction. Given the potential shortfalls, it is important that borrowing cost is an available option to Council as a potential means of managing cashflow and shortfalls.

### In summary:

- Review all transport projects in the exhibited ICP, taking into account the key issues identified in the WTP independent review, and its independent cost estimate.
- 2. Review the Benchmark costs for all community and active recreation project in the exhibited ICP in light of the issues identified in the Council Report.
- 3. Include the cost of borrowings for community and active recreation projects in the exhibited ICP.

Please find attached the Council Report, WTP independent peer review of the Benchmarks and independent cost estimates for your information.

Should you have any further questions in relation to this submission please do not

Yours sincerely

Encl.

# 6.1.3 DONNYBROOK / WOODSTOCK FINAL INFRASTRUCTURE CONTRIBUTIONS PLAN (ICP) SUBMISSION

Attachments: 1 Donnybrook/Woodstock Precinct Structure Plan Area

2 High Level Infrastructure Project Cost Comparison

3 Donnybrook/Woodstock Infrastructure Contributions Plan - Transport Projects

4 Donnybrook/Woodstock Infrastructure Contributions Plan - Community and Active Recreation Projects

Responsible Officer: Acting Director Partnerships, Planning & Engagement

Author: Senior Strategic Infrastructure Planner

### RECOMMENDATION SUMMARY

THAT Council resolve to authorise Council Officers to make a submission to Planning Scheme Amendment GC102, and any subsequent Planning Panel Hearing, advocating for the inclusion of accurate project costing information and costs of borrowing, within the final Donnybrook/Woodstock Infrastructure Contributions Plan to facilitate the timely delivery of essential infrastructure and to minimise cost shortfalls.

### **KEY FACTS AND / OR ISSUES**

- This report proposes that Council make a submission to the exhibited Planning Scheme Amendment GC102. The amendment seeks to update the Donnybrook/Woodstock Infrastructure Contributions Plan (ICP) to comply with recent incorporation of the Public Land Contributions Bill into the *Planning and Environment Act 1987* and update the contribution rates to reflect the Victorian Planning Authority (VPA) benchmark costing's for all infrastructure projects.
- Under the new ICP system "benchmark" costing's are applied as the basis for determining project costs and the standard levies applied for the different infrastructure categories.
- Preliminary analysis of the benchmark costing's have identified that the local context of
  the site such as extent of rock, environmental constraints have not been adequately
  accounted for and are considerably lower when compared to other comparable project in
  the Whittlesea municipality that have undergone detailed design and costing.
- Council officers have engaged an independent quantity surveying consultant to review the VPA benchmark costing's and provide bespoke costing's relating to Donnybrook/Woodstock area for transport projects. Council officers will also review the costing's for community and active recreation projects.
- These findings are proposed to form the basis of Council's submission to the Amendment and any Panel Hearing to ensure that the true costs of projects are accurately reflected.

#### **REPORT**

#### INTRODUCTION

The Donnybrook/Woodstock Infrastructure Contributions Plan (ICP) is the infrastructure and funding framework that will enable the orderly development of the Donnybrook/Woodstock Precinct Structure Plan (PSP). The ICP has been prepared by the Victorian Planning Authority (VPA) to comply with the *Public Land Contributions Bill (2017)* and to apply VPA's benchmark costing's for all infrastructure project costs. The ICP was exhibited as part of Amendment GC102 (the exhibited Amendment). Generally speaking, the drafting of the exhibited ICP is sound, and subject to the changes and recommendations identified within this report relating to costing's, it is recommended that the proposed Amendment be supported.

For this Planning Scheme Amendment, the VPA is the Planning Authority. Notwithstanding this, Council will be responsible for the collection of infrastructure contributions and the delivery of infrastructure items identified in the ICP.

This report discusses the key issues in relation to the infrastructure project costs in the exhibited ICP.

The key issues in this report are discussed by infrastructure category. These include:

- Roads
- Intersections
- Bridges and Culverts
- Pedestrian Crossings
- Community Facilities
- Active Recreation Facilities

This report forms the basis for Council's formal submission to the VPA for the proposed Amendment and likely subsequent Panel hearing. The directions hearing has been pre-set for the week commencing on 3 December 2018, with Panel Hearing scheduled in February 2019.

### **BACKGROUND**

The PSP covers approximately 1785 hectares of land located within Melbourne's Northern Growth Corridor and is located approximately 35km from Melbourne's Central Business District. The land within the PSP is bound by Donnybrook Road to the south, E6 road reservation to the north, Melbourne-Sydney railway to the west and Merriang Road to the east (*Attachment 1*). Part of the PSP (approximately 100 hectares) is located with the Shire of Mitchell. This land is north of the Merri Creek. The PSP is predominately designated for residential purposes with several town centres, schools, community facilities, parks and transport related infrastructure.

The PSP and 'initial' ICP were approved by the Minister for Planning under Amendment GC28 in November 2017.

The ICP system differs from the Development Contributions Plan system as it is based on standardised and supplementary levies to fund the provision of essential infrastructure supporting the new communities. Standard levies are pre-set and infrastructure funded under the standard levies are not supported by detailed construction cost estimates as per the old Development Contributions Plan system. Supplementary levies are to be used only to fund

specific transport related infrastructure (such as arterial roads, bridges or major culverts), and can only be used when standard levies cannot fully fund the allowable transport infrastructure. It is only when the supplementary levies are required that detailed, actual construction cost information for all the projects is sought.

Since the approval of GC28, the *Public Land Contributions Bill (2017)* was incorporated into the *Planning and Environment Act (1987)* on 2 July, 2018. This change required the Donnybrook Woodstock ICP to be amended in order to comply with the reformed legislative changes. An 'interim' ICP was approved under Amendment GC101 on 2 July, 2018, as a transitional arrangement while a 'final' ICP is prepared. The exhibited 'final' ICP is the main subject of this report.

### RECENT CHANGES TO PLANNING LEGISLATION - PUBLIC LAND CONTRIBUTIONS BILL 2017

The *Public Land Contributions Bill (2017)* introduces a new land contribution model for the ICP system. This new system replicates the principles of how open space is treated at Clause 53.10 in the Planning Scheme.

This essentially requires landowners to transfer "under" the average percentage of public land required at no cost to Council as part of their infrastructure contributions. This replaces the monetary component of the standard levy for public land in the ICP system. Some landowners will be required to contribute more or less land than others, as such, the Bill introduces provisions to ensure overall contributions are equalised between landowners. Landowners who contribute a greater percentage of their land than the average percentage, will be compensated by those contributing a smaller percentage of land who will pay a land equalisation amount. Council, as a Collecting Agency under the Act, will be responsible for the collection of land equalisation amount and payment of land credit amount to the over providers.

It is important to note that the ICP system and the Public Land Contributions model only apply to areas where an Infrastructure Contribution Overlay (ICO) is applied. Existing Development Contributions Plans are not affected by this planning legislative change.

### **APPROVED AMENDMENT GC101**

An interim Donnybrook/Woodstock ICP was amended and approved under Amendment GC101 in July 2018. This 'interim' ICP replaced the ICP approved in November 2017, under Amendment GC61.

The 'interim' ICP enables Council to issue permits and collect levies while the 'final' ICP is developed in accordance with the planning legislative changes as per the Public Land Contribution Bill.

### **EXHIBITED AMENDMENT GC102**

The 'final' ICP has been prepared by the VPA and was exhibited from 15 August to 14 September, 2018, as part of Amendment GC102. The proposed Amendment seeks to ultimately replace the 'interim' ICP (implemented through GC101) with a contributions plan that reflects the VPA's proposed benchmark costing's for the majority of infrastructure project costs. Specifically, the exhibited 'final' ICP provides the following:

- A standard levy of \$114,062 per hectare to fund the construction of transport projects (e.g. roads, intersections, bridges, culverts etc.).
- A standard levy of \$86,627 per hectare to fund the construction of community and recreation projects (e.g. community activity centres, sporting fields, pavilions etc).

- A supplementary levy of \$412 per hectare is introduced to fund the construction of a major bridge culvert, as the standard levy for transport projects is capped and cannot fully fund this project.
- The use of benchmark costing's prepared by the VPA for all infrastructure construction projects.
- The removal of the monetary component from the standard levy for public land.
- The introduction of an ICP public land contributions percentage of 15.05% of Net Developable Area (NDA) in accordance with the Public Land Contributions Bill 2017.

### **COUNCIL SUBMISSION**

Whilst Council is not the Planning Authority for this proposed Amendment, Council will be responsible for the collection of infrastructure contributions and the delivery of infrastructure contained within the 'final' ICP once approved. It is therefore important that Council provides a submission to the proposed Amendment to ensure that the infrastructure project costs proposed in the 'final' ICP appropriately reflect likely delivery costs, thus mitigating potential funding shortfalls to Council in the future.

In light of the above, Council's submission is proposed to focus on the review of the infrastructure project costs in the exhibited 'final' ICP and VPA's benchmark costing's. To get a better understanding of the potential differences between the benchmark costs and Council's estimated costs, a comparison of the infrastructure project costs was undertaken utilising:

- Approved Wollert and English Street DCP project costs. Project costs in these DCPs have been based on detailed concept designs and also tested during the planning panel process.
- Cost estimates submitted by developers for selected infrastructure projects proposed in the 'final' ICP for works in-kind discussion purposes.
- Actual delivery costs of comparable infrastructure projects delivered by Council in 2017/18 through its New Works Program.

Officers cost comparison analysis is detailed within Attachment 2.

The second part relates to the detailed review of the VPA benchmark costing's. Council officers engaged a suitably qualified quantity surveying consultant (WT Partnerships Pty. Ltd.) to review the VPA benchmark costing's in terms of the appropriateness of the proposed project scopes, and the rates used to estimate infrastructure project costs. It is anticipated that a final report of the consultant's review will be available in late November 2018. As such, the final report and its key findings will refine Council's submission to the anticipated Planning Panel. Notwithstanding, initial advice from the consultant is that the VPA benchmark costing's applied to the Donnybrook/Woodstock ICP projects are lower than the actual likely delivery costs.

As the consultant's benchmark costing review is not yet available, this report will focus on the key issues identified in Officer's cost comparison analysis.

It is important to note that we cannot change the standard levies (\$114,062 per hectare for transport projects and \$86,627 per hectare for community and recreation projects). Therefore, the purpose of this benchmark costing review is to identify the true costs of the infrastructure based on local conditions and recent implementation, with the aim of using this information to increase the supplementary levy to cover the cost for transport projects. A supplementary levy cannot be applied to the items in the community and recreation project category.

### DISCUSSION

### Roads

The exhibited 'final' ICP funds the construction of Gunns Gully Road (primary arterial road), Cameron Street and Koukoura Drive (secondary arterial roads) to their interim standards, in order to provide essential access within the PSP area. These road items are highlighted in *Attachment 3.* The average construction rates used to calculate the project costs for these arterial roads in the exhibited 'final' ICP are:

- Primary arterial road at \$3,485 per linear metre;
- Secondary arterial road at \$3,719 per linear metre.

The cost analysis highlights considerably higher construction rates:

- Primary arterial road at \$5,122 per linear metre, or \$1,637 per linear metre higher than the proposed 'final' ICP;
- Secondary arterial road at \$4,987 per linear metre, or \$1,268 per linear metre higher than the proposed 'final' ICP.

The approved Wollert DCP also funds the construction of key secondary arterial roads within the Wollert PSP area. The average construction rate is at \$6,376 per linear metre, which again, is significantly higher than the rate used in the proposed 'final' ICP for secondary arterial road construction (\$2,657 higher per linear metre).

The considerable difference in rates is likely due to the lack of consideration for contextual information in the VPA benchmark costing's. The exhibited 'final' ICP costs are based on average benchmark rates derived from approved DCP project costs estimates around metropolitan Melbourne. The costing's do not take into account contextual information relevant to the northern growth corridor, such as significant extent of rocks, service relocation, and roads running through gas easements, all of which will drive construction costs higher than other parts of Melbourne. As such, it is recommended that the VPA costing's be reviewed in light of the contextual constraints of Donnybrook/Woodstock.

#### Intersections

The exhibited 'final' ICP funds the construction of seventeen interim signalised intersections between primary and secondary arterial roads as well as connector roads. These are identified within *Attachment 3*.

The final ICP provides for intersection costs ranging between \$3.5 million to \$5.8 million. These costs are generally in-line with the comparable projects in the cost comparison analysis, with the exception of some higher order signalised intersections. These include:

- Primary/Connector 4 way interim signalised intersections Donnybrook Road/Hayes Hill Boulevard intersection (IN-01), Donnybrook Road and Connector Street intersection (IN-02) and Donnybrook Road and Connector Street (IN-05) intersection.
- Primary/Secondary 4-way interim signalised intersections Gunns Gully Road and Patterson Drive intersection (IN-14) and Gunns Gully Road and Koukoura Drive intersection (IN-15).

The average construction cost for a primary/connector 4-way interim signalised intersection is approximately \$6 million based on the Wollert DCP, compared to the average of \$4.5 million in the proposed 'final' ICP.

The average construction cost for a primary/secondary interim 4-way signalised intersection is approximately \$6 million based on the recently approved DCPs. The construction cost in the exhibited 'final' DCP is \$5.57 million in comparison.

To this end, it is recommended that the higher order intersections are reviewed to consider the contextual challenges within Donnybrook/Woodstock.

### **Pedestrian Crossings.**

The exhibited 'final' ICP funds the construction of three signalised pedestrian crossings (PED-01, PED-02 and PED-03) nominated within *Attachment 3*. The construction costs for the three crossings are generally in-line with the comparable projects in the cost comparison analysis. As such, in principle support is provided to these costing's subject to any additional findings from the WT Partnerships analysis.

### **Bridges/Culverts**

The exhibited 'final' ICP funds two secondary arterial road bridges (BR-01 and BR-05) and three culverts over waterways with growling grass frog habitat (BR-02, BR-03 and BR-04). These are nominated within *Attachment 3*.

The project costs for the two road bridges (BR-01 and BR-05) are based on the detailed costing prepared by One Mile Grid (OMG) for Donnybrook/Woodstock during the ICP development process in 2015. These costs have been informed by detailed design and should reflect likely delivery costs and are in principle supported, subject to any additional findings from the WT Partnership analysis.

The project costs for the three culverts (BR-02, BR-03 and BR-04) are \$795,000 each in the exhibited 'final' ICP. Cost estimates submitted by developers of the PSP area show that the culverts would cost approximately \$2 million each. The significant cost difference is due to the presence of Growling Grass Frog habitat in the PSP area. This requires bespoke culvert design to accommodate the requirements of the Growling Grass Frogs. This significance cost difference again emphasises the requirement for contextual information to be considered further to VPA benchmark costing's.

### **Community Facilities**

The exhibited 'final' ICP funds the construction of seven community activity centres (CAC) that will provide essential community services such as maternal and child health (MCH) spaces, early years facilities and community meeting spaces, to the future Donnybrook/Woodstock community. These are identified within *Attachment 4*.

Benchmark costs have been based on the CAC level of services – Level 1 CAC is a lower order community facility providing MCH rooms and dual kindergarten facility; Level 2 CAC is a medium order community facility providing MCH rooms, triple kindergarten facility and community meeting spaces; Level 3 CAC is a higher order community facility providing branch library, family centre, youth facility and dedicated meeting/consulting spaces. The construction costs for all three levels of CACs in the exhibited 'final' ICP are:

- Level 1 CAC (CI-06 and CI-07) at \$6.4 million.
- Level 2 CAC (CI-01, CI-02, CI-03 and CI-05) at \$7.65 million.
- Level 3 CAC (CI-04) at \$10.3 million.

The construction cost for Level 1 CAC in the exhibited 'final' ICP is in-line with similar projects in the Wollert DCP. However, the benchmark cost applied to the Level 2 CACs (CI-01, CI-02, CI-03 and CI-05) is approximately \$3 million less than the Wollert DCP (averaged at \$10.6 million).

The benchmark cost for the Level 3 CAC in the exhibited 'final' ICP (CI-04) is \$10.3 million, and consists of a library and a family resource centre. There are no similar projects in the recently approved DCPs or Council's capital works program, however, the construction of a library alone in the Wollert DCP is costed at \$9.3 million.

It is important to note that the construction of community and active recreation facilities can only be funded by the component of the standard levy for community and recreation facilities, which is capped at \$86,627 per hectare. The supplementary levy cannot be used to add to the funding of the construction of community and recreation facilities.

The total project cost for the community and active recreation facilities in the exhibited 'final' ICP is \$137.4 million or \$133,008 per hectare. This means that should the project costs for the Level 2 and 3 CACs be increased, Council will not be able to collect additional standard or supplementary levies towards the facilities. However, it is still important to raise the cost discrepancy in Council's submission to the VPA, as the 'final' ICP should reflect likely delivery costs. This will assist Council in understanding the likely extent of New Works funding to be allocated towards the community and recreation projects that are unable to be fully funded by the standard levies. This will also assist Council officers in determining the likely works in-kind credit if the developer wishes to construct the community or active recreation facility as works in-kind.

### **Active Recreation Facilities**

The exhibited 'final' ICP funds seven active recreation facilities within the PSP area. These are nominated within Attachment 4. The benchmark costs applied are based on the size of the facilities:

- 8 -10 hectare reserve with two playing areas and sports pavilion is at \$12.3 million each (this includes projects SR-01, SR-02, SR-03, SR-04, SR-05 and SR-06);
- 5 6 hectare reserve with two playing areas and sports pavilion is at \$9.8 million (SR-07).

The average construction cost is \$14.2 million for a comparable 8 - 10 hectare sports reserve with pavilion (\$2.1 million more than the benchmark costs), and \$9.1 million for a comparable 5 – 6 hectare sports reserve with pavilion in the municipality (\$700,000 less than the benchmark costs).

As discussed earlier, the standard levy for community and active recreation facilities is capped at \$86,627 per hectare. Therefore, Council will not be able to collect additional standard levies towards the active recreation facilities should the project costs be increased in the 'final' ICP. However, it is still important to raise the cost discrepancy in Council's submission to the VPA, as the 'final' ICP should reflect the likely delivery costs, and will assist Council in understanding the likely extent of New Works funding to be allocated towards the community and recreation projects that are unable to be fully funded by the standard levies.

### **Borrowing Costs**

One of the options available for Council to fund the shortfalls or manage cashflow in the provision of community and active recreation projects is from borrowing. The cost of borrowing is an allowable supplementary levy item for community and active recreation projects. Currently there is no allowance for this in the exhibited 'final' ICP. Given the potential shortfalls for projects in this category, it is important the cost of borrowing option is available to Council as a potential means of managing cashflow or shortfalls. In order to facilitate this, it is recommended to submit that the VPA include the cost of borrowings in the exhibited 'final' ICP.

### **REFERRAL**

The VPA benchmark costing's having been referred to the relevant delivery and service teams within Council for review and comments. This includes Development Engineering, Parks and Open Space, Community Infrastructure Planning, and Major Projects. A set of consolidated comments have informed this report and the WT Partnership analysis from the various teams. This will be provided to VPA for consideration.

### **ADMINISTRATIVE ERRORS**

It is noted that there are several typographical errors and issues with table structures and column headings within the ICP document that should be updated and clarified prior to a

'final' ICP being approved. Given the nature these changes are administrative and do not impact on the intent of the ICP document nor the project costing, it is not intended to detail these changes within the report but rather provide the information to the VPA directly to amend as necessary.

### **CRITICAL DATES**

The exhibited 'final' ICP was exhibited from 15 August to 14 September 2018.

Pending resolution of this report, Council officers will provide a formal position/submission on Amendment GC102 to the VPA.

The VPA will take into account submissions received, including Councils, and make recommendations to the Minister for Planning, who will make the ultimate decision on the proposed Amendment and the associated process. Broadly, the Minister will have a number of options before them to advance the amendment as per normal statutory practice:

- The Minister can recommend that a Panel, or similar, is convened to hear submissions and make recommendations to the Minister for his ultimate decision (considered the most likely outcome);
- The Minster can consider and approve an amendment under Section 20(4) of the Planning and Environment Act 1987. Under this provision the Minister can exempt himself from any of the notice provisions of the Act and approve an amendment;
- The Minister can abandon the amendment.

Due to the nature of the amendment, it is likely that a Panel will be convened. The directions hearing has been pre-set for the week commencing on 3 December 2018, with Panel Hearing scheduled for February 2019.

### FINANCIAL IMPLICATIONS

Council, as a development agency, will be responsible for the delivery of all projects contained within the ICP. Therefore, it is critical to ensure that the project costs in the 'final' ICP are appropriate and reflect likely delivery costs.

### POLICY STRATEGY AND LEGISLATION

The exhibited 'final' ICP has been prepared by the VPA in accordance with the guidelines and requirements as set out in the Ministerial Directions for Infrastructure Contributions Plan and the Public Land Contributions Bill 2017. The ICP is also in accordance with Clause 19.03-1S Development and Infrastructure Contributions Plans in the Whittlesea Planning Scheme to provide the basis for infrastructure contributions, and facilitate the timely provision of planned infrastructure to new communities.

### LINKS TO THE COUNCIL PLAN

**Council Priority Planning and Infrastructure** 

**Future Direction** Accessibility in, out and around our City

**Theme Built environment** 

**Strategic Objective** Our neighbourhoods are designed to be well-connected

and create cohesive communities

The exhibited 'final' ICP funds essential transport, community and recreational infrastructure to service the future Donnybrook/Woodstock communities. The review of the proposed VPA benchmark costing's will seek to ensure that the infrastructure projects in the ICP are costed

appropriately and reflect likely delivery costs. This will mitigate the potential significant funding shortfalls for Council and allow Council, as the Development Agency, to deliver high quality infrastructure to create a well-connected and serviced communities in an efficient manner.

### **DECLARATIONS OF CONFLICTS OF INTEREST**

Under section 80C of the Local Government Act 1989 officers providing advice to Council must disclose any interests, including the type of interest.

The Responsible Officer reviewing this report, having made enquiries with the relevant members of staff, reports that no disclosable interests have been raised in relation to this report.

### CONCLUSION

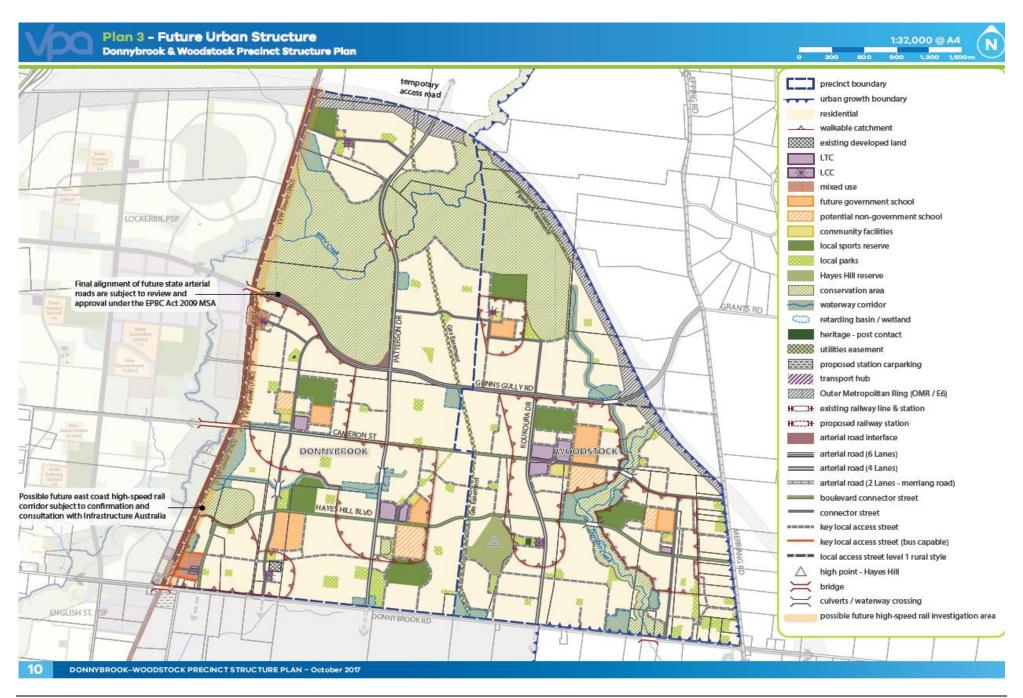
The finalisation of the Donnybrook Woodstock Infrastructure Contributions Plan has been complicated by the recent changes to the *Public Land Contributions Bill (2017)* and the application of proposed benchmark costing's for the construction of infrastructure projects.

Considering these changes, Council officers have reviewed the documents and identified a range of issues in relation to infrastructure project costs that need to be considered and resolved during the finalisation of the 'final' Infrastructure Contributions Plan and associated Planning Scheme Amendment GC102.

To this end, it is recommended that Council resolve to make a submission to Amendment GC102 and present to any subsequent Panel Hearing. The key objectives of the submissions will be to advocate for the updating of construction costs in-line with Council's expert advice and analysis to minimise cost shortfalls, including increase in the supplementary levy and the inclusion of the cost of borrowing for community and active recreation projects.

### RECOMMENDATION

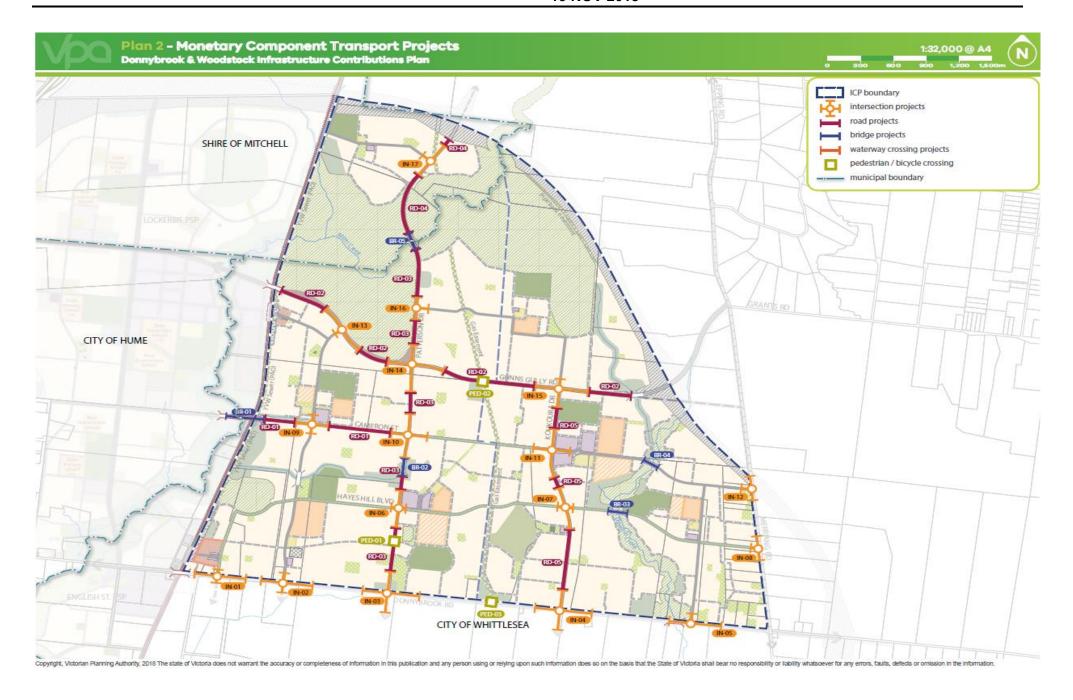
THAT Council resolve to authorise Council Officers to make a submission to Planning Scheme Amendment GC102, and any subsequent Planning Panel Hearing, advocating for the inclusion of accurate project costing information and costs of borrowing, within the final Donnybrook/Woodstock Infrastructure Contributions Plan to facilitate the timely delivery of essential infrastructure and to minimise cost shortfalls.



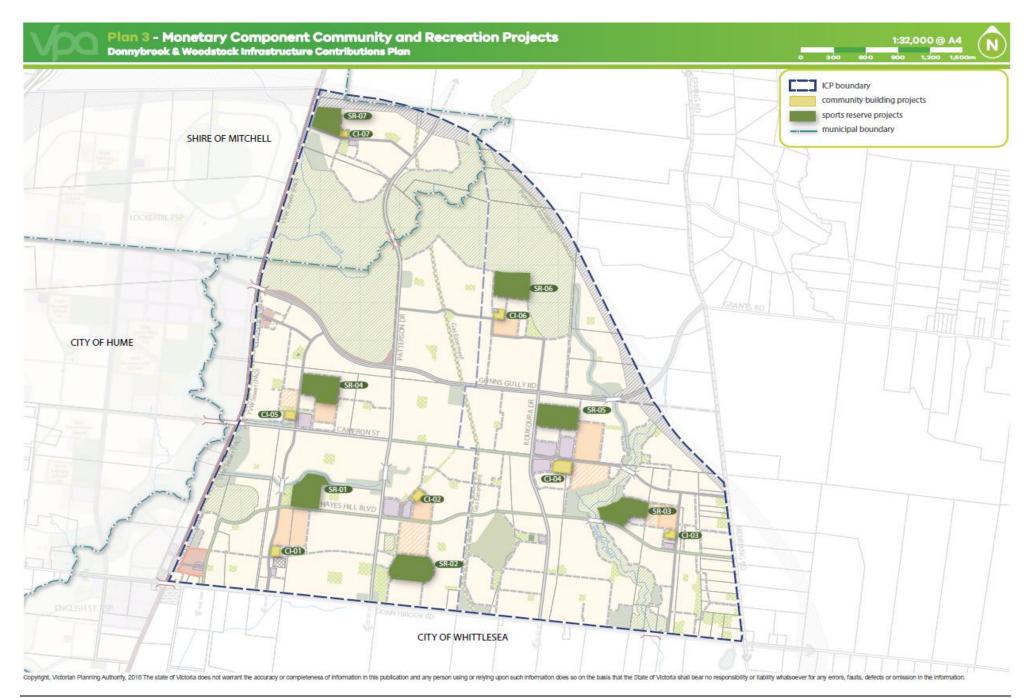
Item 6.1.3 Attachment 1

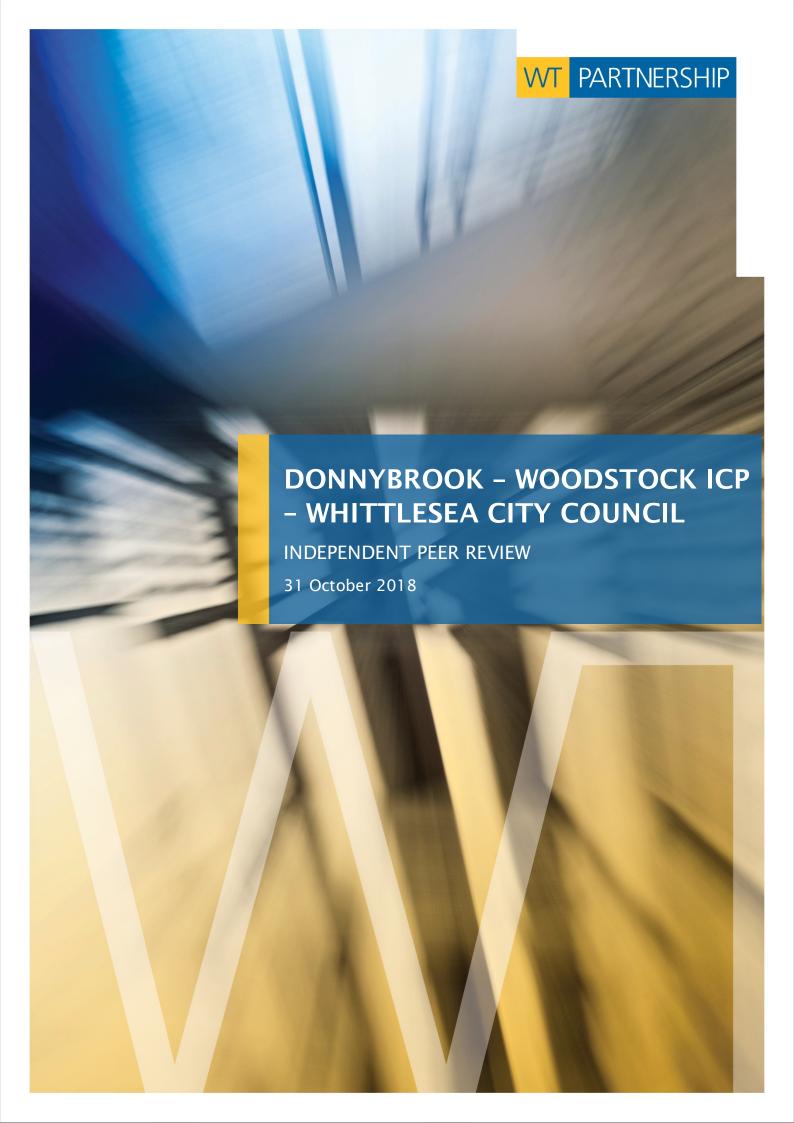
Attachment 2 - High Level Cost Comparison							
Infrastructure Project Category	Average Unit Rate (\$ 2018/19)						
				Comparable	Projects		
	Donnybrook-Woodstock				Developer		Average all
	exhibited Final ICP (August	Approved Wollert	Approved English	Developer (DFC)	(Olivine) Cost	Council NW	Comparable
	2018)	DCP	Street DCP	Cost Estimates	Estimates	Projects	Projects Sources
Roads							
Primary Arterial	\$3,485	n/a	n/a	\$5,122	n/a	n/a	\$5,122
Secondary Arterial	\$3,719	\$6,376	n/a	n/a	\$4,987	n/a	\$5,682
Intersections							
Primary/Secondary - 4-way - Signalised - Interim	\$5,656,333	\$6,989,359	\$5,108,536	n/a	n/a	n/a	\$6,048,947
Primary/Connector - T - Signalised - Interim	\$3,625,000	\$3,303,353	n/a	n/a	n/a	n/a	\$3,303,353
Primary/Connector - 4-way -Signalised - Interim	\$4,823,000	\$6,047,108	n/a	n/a	n/a	n/a	\$6,047,108
Secondary/Secondary - 4-way - Signalised - Interim	\$5,146,000	n/a	n/a	\$3,621,322	n/a	n/a	\$3,621,322
Secondary/Connector Boulevard - 4-way - Signalised - Interim	\$4,384,260	\$5,817,032	n/a	\$3,344,177	n/a	n/a	\$4,580,604
Secondary/Connector - T - Signalised - Interim	\$3,313,000	\$3,811,001	n/a	n/a	n/a	\$3,599,145	\$3,705,073
Connector/arterial - T - Signalised - Ultimate	\$3,463,000	\$3,811,001	n/a	n/a	n/a	n/a	\$3,811,001
Connector Boulevard/Connector - T - Signalised - Ultimate	\$3,463,000	\$2,758,942	n/a	n/a	n/a	n/a	\$2,758,942
Bridges/Culverts							
OMG Costs Option 2	\$23,117,000	n/a	n/a	n/a	n/a	n/a	n/a
Secondary arterial bridge	\$6,415,000	n/a	n/a	n/a	n/a	n/a	n/a
Culvert	\$795,000	\$1,683,662	n/a	\$2,152,549	n/a	n/a	\$1,918,106
Pedestrian signals							
Pedestrian signals	\$276,614	\$299,248	n/a	n/a	n/a	\$219,730	\$259,489
Community Facilities							
Level 1 Community facility	\$6,398,000	\$4,779,232	n/a	n/a	n/a	n/a	\$4,779,232
Level 2 Community facility	\$7,648,000	\$10,623,389	n/a	n/a	n/a	n/a	\$10,623,389
Level 3 Community facility	\$10,304,000	n/a	n/a	n/a	n/a	n/a	n/a
Active Recreation							
8-10 hectare reserve and sports pavilion 2 playing areas	\$12,305,975	\$9,231,761	n/a	\$20,147,492	\$13,173,595	n/a	\$14,184,283
5-6 hectare reserve sports pavilion 2 playing areas	\$9,840,550	\$9,124,498	n/a	n/a	n/a	n/a	\$9,124,498

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# **APPENDICES**

APPENDIX A COST ESTIMATES

APPENDIX B CURRICULUM VITAE



### 1 INTRODUCTION

### 1.1 **DECLARATION**

- 1.1.1 I, Andrew Loh, am an Associate of WTP Australia Pty Ltd (WT), an Australian owned quantity surveying practice. A copy of my Curriculum Vitae ("CV") is attached to this report at Appendix B.
- 1.1.2 WT provides specialist consultancy services to the construction and engineering industries. The principle services provided by WT are cost management and quantity surveying, asset and facilities management, project controls and contract support services.
- 1.1.3 We have prepared this joint report and have made all enquiries which we believe are desirable and appropriate. No matters of significance which we regard as relevant have to our knowledge, been withheld in making this statement.
- 1.1.4 In preparing this report we have had regard to the duties and responsibilities set out in Division 2 of Part 31 of the Uniform Civil Procedure Rules 2005 (UCPR) and we agree to be bound by the Expert Witness Code of Conduct in Schedule 7 of the UCPR. We have also had regard to the Guide to Expert Evidence.
- 1.1.5 This report does not purport to prove facts. All references to facts are to be read as references to assumed facts. Facts have been assumed for the purpose of carrying out the cost estimates and reaching the conclusions contained within this report. When a fact has been assumed based on the readings of a document, a reference to that document is generally provided to that document in the relevant section of this report.
- 1.1.6 We have used the reference material briefed to us in the email from Whittlesea City Council dated 20 September 2018 regarding the Donnybrook Woodstock Infrastructure Contributions Plan.
- 1.1.7 We understand that the immediate use of this statement is for Whittlesea City Council.

31 October 2018		
Date	Mr Andrew Loh	



### 1.2 **EXPLANATION OF EXPERTISE**

- 1.2.1 In our role as quantity surveyors we provide independent advice to both private and government clients offering independent assurance/validation that the estimates submitted as a representation of the construction costs for projects are market-related and relative to those that would be received in a competitive tendering environment.
- 1.2.2 Specific examples of projects that have relevance to the options that have been considered in this report are as follows:

PROJECT NAME	CLIENT	COMPLETION DATE	RELEVANCE TO THE REPORT
Level Crossing Removal Project - Project Options Report & Reference Design Stage	LXRA	2015 - 2018	Provision of P50/P90 risk adjusted cost estimates for 30 selected sites for various cost options including Reference Design
Western Distributor Proposal	Transurban	2014 - 2015	Provision of independent estimates
CityLink Tulla Widening	Transurban	2014	Provision of independent estimates
Melton Amendment C145 - Rockbank PSP & DCP	Melton City Council	2016	Expert costings evidence for Melton City Council
Melton Amendment C146 & C147 – Plumpton & Kororoit PSP	Melton City Council	2016	Expert costings evidence for Melton City Council

### 1.3 BRIEF DESCRIPTION OF THE MATTER

1.3.1 WT has been engaged by Whittlesea City Council to prepare a peer review of the costs included as part of the Donnybrook - Woodstock Infrastructure Contributions Plan report prepared by the Victorian Planning Authority (VPA).

### 1.4 **INSTRUCTIONS**

1.4.1 WT has been requested to prepare cost estimates for Donnybrook - Woodstock bespoke transport projects, RD-01 to RD-05 (inclusive), IN-01 to IN-17 (inclusive), BR-01 to BR-05 (inclusive) and Ped-01 to Ped-03 (inclusive) and determine any differences to those costings provided by the VPA.



### 1.5 **DOCUMENTS EXAMINED BY WT PARTNERSHIP**

1.5.1 In preparing this report, we have been provided with, and have examined the following relevant documents:

AUTHOR	DATE(S)	REV NO.	DESCRIPTION
VPA	August 2018	N/A	Donnybrook - Woodstock ICP
Whittlesea City Council	20 September 2018	N/A	Key Specific Issues relating to DW Transport Projects (Excel File)
VPA	October 2017	N/A	Plan 16 - Utilities (Donnybrook - Woodstock Precinct Structure Plan)
VPA	October 2017	N/A	Donnybrook Road – Typical Cross-Section with Services, West (Donnybrook – Woodstock Precinct Structure Plan)
VPA	October 2017	N/A	Gunns Gully Road Cross Section - Primary Arterial Road 6 Lance - 41.0m (Donnybrook - Woodstock Precinct Structure Plan)
VPA	October 2017	N/A	Koukoura Drive Interim Cross Section - Primary Arterial Road 4 Lance - 34.0m (Donnybrook - Woodstock Precinct Structure Plan)
VPA	October 2017	N/A	Patterson Drive & Cameron Street Interim Cross Section - Secondary Arterial Road 4 Lance - 34.0m (Donnybrook - Woodstock Precinct Structure Plan)
Cardno	October 2016	3	Preliminary Estimate of Development Costs - Wollert PSP - Interim Road Project Cost
Cardno	October 2016	6	Preliminary Estimate of Development Costs - Wollert PSP – Interim Intersection & Bridge Project Costs
Cardno	March 2016	1	Wollert PSP - Interim Road Projects Drawings
Cardno	March 2016	1	Wollert PSP - Ultimate Alignment Design Drawings (Road Projects)
Cardno	March 2016	3	Wollert PSP – Interim Design Drawings (Intersection Projects)
Cardno	March 2016	3	Wollert PSP – Ultimate Design Drawings (Intersection Projects)
DPM Consulting Group	June 2018	1.1	Peppercorn Hill ICP Estimates (Road, Intersection & Pedestrian Crossing Infrastructure)
DPM Consulting Group	Not stated	N/A	Hayes Hill Blvd - Darebin Creek Road Crossing Drawing
DPM Consulting Group	December 2015	N/A	Cameron Street - Darebin Creek Road Crossing Drawing
Traffix Design	June 2018	N/A	Pre-Interim ICP Set (Roads & Intersection Projects)



### 2 EXECUTIVE SUMMARY

- 2.1 This report has been prepared for Whittlesea city council as an independent review of the benchmarked infrastructure costings prepared by the Victorian Planning Authority (VPA) and seeks to identify any differences in scope and estimated costs.
- 2.2 All costs in this report exclude Goods & Services Tax (GST).
- 2.3 In the absence of any design criteria provided, we have made assumptions as detailed in Section 5 of this report and our detailed cost estimates.
- 2.4 We have prepared independent cost estimates for the transport projects, RD-01 to RD-05 (inclusive), IN-01 to IN-17 (inclusive), BR-01 to BR-05 (inclusive) and Ped-01 to Ped-03 (inclusive). These estimates have been prepared using first principles estimating based upon current day rates and benchmarking from our internal database to derive a base case cost estimate.
- 2.5 We note that HV power poles / overhead wires and telecommunication services run along Donnybrook Road and Merriang Road (along periphery of Donnybrook Woodstock ICP). We have made allowances for relocation works in relation to these existing services for the transport projects along these roads namely IN-01 to IN-05 (inclusive), IN-08 and IN-12.
- We note that whilst Delivery Costs for Traffic Management has been applied as per the percentage set by the VPA (5%) there is a potential likelihood that this may be higher to projects interfacing with Donnybrook Road (IN-01 to In-05 inclusive).
- 2.7 We note that the Delivery Costs for Supervision & Project Management for transport project BR-01 has been set by VPA at 13% (all other transport projects are at 9%). WT agrees with this change due to the complexities associated with construction over an existing rail corridor (VLine).
- 2.8 The base case cost estimates, excluding delivery costs, have been used as the basis of our Monte Carlo risk-based modelling to provide a P50 and P90 output with which to compare to the Benchmarked Infrastructure costings.
- 2.9 We note that the risk model has been applied to the base case construction value only and therefore is a representation of inherent risk (quantifiable uncertainties) only.
- 2.10 We note that no risk register has been developed as an assessment of Contingent Risk and it is assumed that the Contingency percentage applied as part of the 'Delivery' costs seeks to cover those unmeasured items outside of the base case estimate.
- 2.11 It is worthwhile noting that by undertaking an independent full risk assessment of Donnybrook Woodstock ICP including Contingent Risks, the issues unique to the Donnybrook Woodstock Region such as rock, environmental, cultural and heritage could be analysed with a view to providing Council with confidence that the contingency percentages set by the VPA (15% Roads & Intersections / 20% Bridges) are sufficient.



- 2.12 WT's Independent P90 Estimate of transport projects RD-01 to RD-05 (inclusive), IN-01 to IN-17 (inclusive), BR-01 to BR-05 (inclusive) and Ped-01 to Ped-03 (inclusive) is \$197,337,605. This exceeds the VPA's Cost Estimates of \$134,888,243 by \$62,449,363 or 46.3%.
- 2.13 We note that no detail cost breakdown has been provided for transport project Ped-01 to Ped-03 (inclusive) and we have assumed the respective estimated costs stated in section 3.2 of VPA report for Donnybrook Woodstock ICP to be P90 values.
- 2.14 Our costs are based upon current day costs excluding escalation.
- 2.15 A detailed breakdown of all our cost estimates are attached as Appendix A.

# 3 REVIEW OF BENCHMARK INFRASTRUCTURE COSTINGS

The table below is a summary comparison of the P90 costs for Donnybrook - Woodstock transport projects.

	BY VPA	BY WT		
DESCRIPTION	TOTAL COST (INCLUDING DELIVERY) (A)  (B)  TOTAL COST (INCLUDING DIFFERENCE (A - B)	DIFFERENCE %		
	P90	P90	P90	P90
	\$	\$	\$	
RD-01 Cameron Street: Sydney-Melbourne railway overpass to Patterson Drive - Construction of 2 lane carriageway, excluding intersections (interim treatment)	3,418,196	5,573,889	(2,155,692)	(63%)
RD-02 Gunns Gully Road: Sydney-Melbourne railway overpass to E6 / OMR reservation - Construction of 2 lane carriageway, excluding intersections (interim treatment)	8,538,250	13,689,791	(5,151,541)	(60%)
RD-03 Patterson Drive: Donnybrook Road to Merri Creek - Construction of 2 lane carriageway, excluding intersections (interim treatment)	6,920,868	9,585,485	(2,664,617)	(39%)



	BY VPA	BY WT		
DESCRIPTION	TOTAL COST (INCLUDING DELIVERY) (A)	TOTAL COST (INCLUDING DELIVERY) (B)	DIFFERENCE (A - B)	DIFFERENCE %
	P90	P90	P90	P90
	\$	\$	\$	
RD-04 Patterson Drive: Merri creek to OMR/E6 reservation - Construction of 2 lane carriageway, excluding intersections (interim treatment)	2,899,995	5,159,599	(2,259,604)	(78%)
RD-05 Koukoura Drive: Donnybrook Road to Gunns Gully Road - Construction of 2 lane carriageway, excluding intersections (interim treatment)	3,838,544	6,284,006	(2,445,462)	(64%)
IN-01 - Donnybrook Road & Hayes Hill Boulevard/Langley Park Drive (N-S Blvd Connector) - Construction of an arterial to connector road 4-way intersection (interim treatment)	4,718,000	6,283,668	(1,565,668)	(33%)
IN-02 - Donnybrook Road & Connector Street (N-S Connector) - Construction of an arterial to connector road 4-way intersection (interim treatment)	4,718,000	7,140,800	(2,422,800)	(51%)
IN-03 - Donnybrook Road & Patterson Drive - Construction of an arterial to arterial road 4-way intersection (interim treatment)	5,823,000	8,470,461	(2,647,461)	(45%)
IN-04 - Donnybrook Road & Koukoura Drive - Construction of an arterial to arterial road 4-way intersection (interim treatment)	5,823,000	9,186,309	(3,363,309)	(58%)
IN-05 - Donnybrook Road & Connector Street (Nth-Sth Connector) - Construction of an arterial to connector road 3-way intersection (interim treatment)	3,825,000	5,963,362	(2,138,362)	(56%)



	BY VPA	BY WT		
DESCRIPTION	TOTAL COST (INCLUDING DELIVERY) (A)	TOTAL COST (INCLUDING DELIVERY) (B)	DIFFERENCE (A - B)	DIFFERENCE %
	P90	P90	P90	P90
	\$	\$	\$	
IN-06 - Hayes Hill Boulevard & Patterson Drive - Construction of an arterial to blvd connector road 4-way intersection (interim treatment)	4,383,158	7,596,042	(3,212,884)	(73%)
IN-07 - Hayes Hill Boulevard & Koukoura Drive - Construction of an arterial to blvd connector road 4-way intersection (interim treatment)	4,383,158	6,397,241	(2,014,083)	(46%)
IN-08 - Hayes Hill Boulevard & Merriang Road - Construction of an arterial to arterial 3-way intersection (interim treatment)	3,394,000	3,831,930	(437,930)	(13%)
IN-09 - Cameron Street / Connector Street (Nth-Sth Connector) - Construction of an arterial to connector road 4-way intersection (interim treatment)	4,383,158	5,467,008	(1,083,849)	(25%)
IN-10 - Cameron Street / Connector Street (Nth-Sth Connector) - Construction of an arterial to connector road 4-way intersection (interim treatment)	5,145,136	8,661,752	(3,516,616)	(68%)
IN-11 - Cameron Street (blvd connector west/town centre connector east) & Koukoura Drive (arterial) - Construction of an arterial to connector road 4-way intersection (interim treatment)	5,145,136	8,119,910	(2,974,774)	(58%)
IN-12 - Cameron Street / Merriang Road - Construction of a connector to arterial road 3-way intersection (interim treatment)	3,394,000	3,922,654	(528,654)	(16%)



	BY VPA	BY WT		
DESCRIPTION	TOTAL COST (INCLUDING DELIVERY) (A)	TOTAL COST (INCLUDING DELIVERY) (B)	DIFFERENCE (A - B)	DIFFERENCE %
	P90	P90	P90	P90
	\$	\$	\$	
IN-13 - Gunns Gully Road & Connector St (Nth-Sth Connector) - Construction of an arterial to connector road 3-way intersection (interim treatment)	3,625,039	6,111,731	(2,486,691)	(69%)
IN-14 - Gunns Gully Road & Patterson Drive - Construction of an arterial to arterial road 4-way intersection (interim treatment)	5,572,439	8,997,605	(3,425,166)	(61%)
IN-15 - Gunns Gully Road & Koukoura Drive - Construction of an arterial to arterial road 4-way intersection (Connector road north of Gunns Gully Road) (interim treatment)	5,572,439	6,842,043	(1,269,604)	(23%)
IN-16 - Patterson Drive / Connector St (East-West Connector) - Construction of an arterial to connector road 3-way intersection (interim treatment)	3,312,141	5,359,941	(2,047,800)	(62%)
IN-17 - Patterson Drive / Connector St (East-West Connector) - Construction of an arterial to connector road 3-way intersection (interim treatment)	3,312,141	4,319,066	(1,006,924)	(30%)
BR-01 - Cameron Street: Construct a 2-lane interim road bridge spanning Merri Creek and Melbourne-Sydney Railway	23,116,643	21,780,380	1,336,263	6%
BR-02 - Patterson Drive: Construct a 2-lane interim culvert crossing of constructed waterway	794,217	970,447	(176,230)	(22%)
BR-03 - Hayes Hill Boulevard: Construct a Growling Grass	794,217	3,574,287	(2,780,070)	(350%)



	BY VPA	BY WT		
DESCRIPTION	TOTAL COST (INCLUDING DELIVERY) (A)	TOTAL COST (INCLUDING DELIVERY) (B)	DIFFERENCE (A - B)	DIFFERENCE %
	P90	P90	P90	P90
	\$	\$	\$	
Frog Habitat suitable culvert/bridge crossing of Darebin Creek - 2 lane culvert crossing				
BR-04 - Cameron Street: Construct a Growling Grass Frog Habitat suitable culvert/bridge crossing of Darebin Creek - 2 lane culvert crossing	794,217	3,373,076	(2,578,859)	(325%)
BR-05 - Patterson Drive: Construct a 2-lane interim bridge crossing of Merri Creek	6,414,305	13,798,090	(7,383,785)	(115%)
Ped-01 - Crossing Patterson Drive between Donnybrook Road and Hayes Hill Boulevard associated with the key local access street connecting Donnybrook Station to the Non-Gov't. P-12 school campus and SR-02	276,614	271,702	4,912	2%
Ped-02 - Crossing Gunns Gully Road between Koukoura Drive and Patterson Drive associated with the shared path along the gas pipeline easement	276,614	302,665	(26,051)	(9%)
Ped-03 - Crossing Donnybrook Road between Koukoura Drive and Patterson Drive associated with the shared path along the gas pipeline easement connecting south to Northern Quarries PSP	276,614	302,665	(26,051)	(9%)
TOTALS	\$134,888,243	\$197,337,605	(\$62,449,363)	(46.3%)
			I.	



### 3.1 ROADS (RD-01 TO RD-05 INCLUSIVE)

- 3.1.1 As highlighted above, the cost estimates indicate an average 57.3% cost difference for the road transport projects. This is due to the common basis of assessment, outlined as follows:
  - VPA estimated costs for RD-01 to RD-05 (inclusive) are summarised in Section 3.2, Table 5, Monetary Component Standard Levy Transport Projects of the Donnybrook / Woodstock ICP and are based upon a combination of bespoke projects (RD-01, RD-03 & RD-04) and VPA Benchmark Costing Items 01 & 02 for Primary Arterial & Secondary Arterial Roads respectively (RD-02 & RD-05).
  - We have been provided with cross sectional drawings for the proposed roads for all the road projects (refer Section 1.5) and have based our review on the various widths documented in these drawings. In addition, we have based the lengths of the proposed roads for the road projects on the those stated in the detail cost breakdown in the Donnybrook Woodstock ICP Report (RD-01, RD-03 & RD-04). However, for RD-02 & RD-05, which have been based on Benchmarked Items 01 & 02 respectively, we have calculated the length of the road projects using the following calculation:
  - P90 Primary Arterial Road  $\frac{900 \text{ Total Benchmark Cost Item-01}}{\text{Standard Lengh of Road (800m)}}$
  - Estimated Length of Road Project = VPA Total Estimated Cost P90 Primary Arterial Road \$ /m
  - P90 Secondary Arterial Road  $$/m = \frac{P90 \text{ Total Benchmark Cost Item-02}}{\text{Standard Lengh of Road (800m)}}$
  - Estimated Length of Road Project = 
    \[
    \frac{\text{VPA Total Estimated Cost}}{\text{P90 Secondary Arterial Road \$ /m}}
    \]
  - We have attempted to independently ascertain the length of road for the individual projects but based upon the scaling of Plan 2 (1:32,000 @ A4) the accuracy makes it difficult to confirm the lengths as appropriate. Therefore, we have assumed the lengths derived from our calculations based upon VPA information noted above, as correct.
  - VPA Benchmark Costing Item-01 Primary Arterial Road drawing indicate a road reserve of 34 m wide. However, the VPA Benchmarking costing is based on a road reserve width of 14 m (7 m wide non-divided 2-way roadway, 3 m wide bike path and 4 m wide nature strip). We have based our review on a road reserve width of 41 m, as per the Gunns Gully Road Cross Section by VPA (2 lane split carriageway only with central median and provision to extend to 6 lanes in the future, excluding local frontage road, comprising of 2 No. 3.5 m wide road lanes, 2 No. 3 m wide bike path, 1 No. 1.5 m wide pedestrian footpath, 20 m wide central median and 6.5 m wide nature strip).
  - VPA Benchmark Costing Item-02 Secondary Arterial Road drawings indicate a road reserve of 34 m wide. However, the VPA Benchmarking costing is based on a road reserve width of 14 m (9 m wide non-divided 2-way roadway with bike lanes, 2 m wide bike path and 3 m wide nature strip). We have based our review on a road reserve width of 34 m, as per the Koukoura Drive Cross Section by VPA (2 lane split carriageway only with central median and provision to extend to 4 lanes in the future, excluding local frontage road, comprising of 2 No. 3.5 m wide road lanes, 2 No. 3 m



wide bike path, 1 No. 1.5 m wide pedestrian footpath, 13 m wide central median and 6.5 m wide nature strip).

- 3.1.2 This review of the road projects is based upon our independent cost estimate on the VPA cross sectional drawings of the proposed roads within the Donnybrook Woodstock ICP provided by Whittlesea City Council, information within the Donnybrook Woodstock ICP Report, the road lengths established by the calculation mentioned above for the selected road projects and the WT Independent Peer Review of VPA Benchmark Infrastructure Costings dated 17 September 2018 (for rates). The following comments identify the cost variances established from our review:
  - In general, there appears to be a considerable variance in quantities for the road pavements, shared user path and landscaping areas for all the road projects. This is due to the following:
    - RD-01 Cameron Street: WT has based the quantities on a road reserve width of 37.8 m (2 lane split carriageway only with central median and provision to extend to 4 lane in the future excluding local frontage road, comprising of 2 No. 5.5 m wide road lanes including chevron & bike lane, 2 No. 3 m wide shared user path, 13 m wide central median and 7.8 m wide nature strip) whereas the VPA costing is based on a road reserve width of only 14 m (9 m wide non-divided 2-way roadway with shoulders on both sides, 2 m wide bike path and 3 m wide nature strip).
    - RD-03 and RD-04 Patterson Drive: We have based the quantities on a road reserve width of 37.8 m (2 lane split carriageway only with central median and provision to extend to 4 lane in the future excluding local frontage road comprising of 2 No. 3.5 m wide road lanes including chevron & bike lane, 2 No. 3 m wide shared user path, 13 m wide central median and 11.8 m wide nature strip) whereas the VPA costing is based on a road reserve width of only 14 m (9 m wide non-divided 2-way roadway with shoulders on both sides, 2 m wide bike path and 3 m wide nature strip).
    - RD-02 & RD-05 Refer to Section 3.1.1 for reason of major variance.
  - Site preparation although included as a line item in the VPA cost estimates, quantities have not been allocated.
  - Pavements generally benchmark costing rates for pavements are low when compared to the rates used by WT.
  - Subgrade preparation although included as a line item in the benchmark cost estimate, costs have not been allocated.
  - SUP / Footpath Rate has been amended to reflect a 120 mm thk concrete footpath with SL72 reinforcement (as advised by Whittlesea City Council).
  - Landscaping and Topsoil Seeding generally quantities are low based upon the overall site areas measured for site preparation less paved areas, and the assumption of 20% landscape planting / 80% topsoil seeding.
  - Landscape maintenance although included as a line item in the benchmark cost estimate, quantities have not been allocated.



- Allowances for rock excavation (assume 35% of total excavation volume), additional subgrade preparation, service protection and additional protection for conservation area included for selected road projects (as advised by Whittlesea City Council).
- Delivery costs these are percentage driven costs and are proportional to the variances in direct costs.

### 3.2 **INTERSECTIONS**

- 3.2.1 This review of intersection projects is based upon our independent cost estimates. The following comments identify the common cost variances found:
  - In general, there appears to be a considerable variance in quantities for the road pavements, shared user path and landscaping areas for all the intersection projects. WT has based the extent of all quantities in accordance to the intersection drawings within the Donnybrook Woodstock ICP Report and the Proposed Road Cross Sectional drawings by VPA (Patterson Drive, Cameron Street, Koukoura Drive and Gunns Gully Road).
  - Site preparation although included as a line item in the benchmark cost estimate, quantities have not been allocated.
  - Demolition of existing pavements item has been included for proposed intersection projects along Donnybrook Road (IN-01 to IN05 inclusive) and Merriang Road (IN-08 & IN-12).
  - Pavements generally benchmark costing rates for pavements are low when compared to the rates used by WT.
  - Subgrade preparation although included as a line item in the benchmark cost estimate, costs have not been allocated.
  - Concrete works there appears to be inconsistent variances (+/-) in quantities for kerbs, shared user paths, cycle paths and traffic islands.
  - SUP / Footpath Rate has been amended to reflect a 120mm thk concrete footpath with SL72 reinforcement (as advised by Whittlesea City Council).
  - Street lighting the benchmark costing estimates include a quantity per intersection leg, however, no rate is applied to this quantity and therefore the cost of this item is not captured as part of the benchmark cost estimates.
  - Landscaping and Topsoil Seeding generally quantities are low based upon the overall site areas measured for site preparation less paved areas, and the assumption of 20% landscape planting / 80% topsoil seeding.
  - Landscape maintenance the rate included in the benchmark cost estimate is low when compared to WT assumption and basis of costs.
  - Tie into existing pavements item has been included for proposed intersection projects along Donnybrook Road (IN-01 to IN05 inclusive) and Merriang Road (IN-08 & IN-12).
  - Allowances for rock excavation (assume 35% of total excavation volume), additional subgrade preparation, service relocation / protection, cultural heritage and additional protection for conservation area included for selected intersection projects (as advised by Whittlesea City Council).



 Delivery costs - these are percentage driven costs and are proportional to the variances in direct costs.

### 3.3 INTERSECTIONS, IN-01 TO IN-05 INCLUSIVE, IN-08 & IN-12

- 3.3.1 These are bespoke projects and no benchmark costing estimate has been applied.
- 3.3.2 Based upon our independent cost estimate, variances additional to those already highlighted in Section 3.2.1 include:
  - Pavements variances in pavement quantities are generally based on our following assumptions for the pavement types:
    - all pavements that run in-line with Donnybrook Road have been assumed as primary arterial roads.
    - all pavements that run in-line with Patterson Drive, Koukoura Drive, Merriang Road and Connector Street (IN-05) have been assumed as secondary arterial roads
    - all pavements that run in-line with Hayes Hill Boulevard / Langley Park Drive (IN-01 & IN-08) and Connector Street (IN-02) have been assumed as collector arterial roads.
  - New items demolition of existing pavements, tie-ins to existing pavements.
- 3.3.3 We note that whilst Delivery Costs for Traffic Management has been applied as per the percentage set by the VPA (5%) there is a likelihood that this will be higher based upon location and anticipated traffic volumes accessing Donnybrook Road.
- 3.3.4 We note that there are existing HV poles / overhead wires and telecommunication services which run along Donnybrook & Merriang Roads. We have made allowances for relocation of these services within our estimate for these intersection road projects (as advised by Whittlesea City Council).

### 3.4 **INTERSECTIONS, IN-06, IN-07 & IN-09**

- 3.4.1 Benchmark Costing Item-09 has been applied by VPA.
- 3.4.2 The extent of the respective intersections is generally higher than that of Item-09 reflected by longer 'legs' of both secondary and / or connector roads. This is presented by higher quantities in most instances.
- 3.4.3 A standard layout for Hayes Hill Boulevard / Connector Street (IN-09) has not been provided, however, we have assumed it to be similar to a Connector Boulevard as the pavement depth is the same.
- 3.4.4 Based upon our independent cost estimate, variances additional to those already highlighted in Section 3.2.1 include:
  - Intersection layouts include for dedicated turning lanes from secondary arterial roads to connector roads.



- New items allowances for rock excavation (assume 35% of total excavation volume), additional subgrade preparation and services protection have been included in our estimate (as advised by Whittlesea City Council).
- Concrete works additional areas of shared user paths.

### 3.5 INTERSECTIONS, IN-10 & IN-11

- 3.5.1 Benchmark Costing Item-08 has been applied by VPA.
- 3.5.2 The extent of the respective intersections is generally higher than that of Item-08 reflected by longer 'legs' of both secondary and / or connector roads. This is presented by higher quantities in most instances.
- 3.5.3 Based upon our independent cost estimate, variances additional to those already highlighted in Section 3.2.1 include:
  - Pavement we have assumed Koukoura Drive to be a primary arterial road (not secondary arterial as estimated in Item-08).
  - Intersection layouts include for dedicated turning lanes from secondary arterial roads to connector roads.
  - New items allowances for rock excavation (assume 35% of total excavation volume) and additional subgrade preparation have been included in our estimate (as advised by Whittlesea City Council).
  - Concrete works additional areas of shared user paths and traffic islands.

### 3.6 **INTERSECTION, IN-13**

- 3.6.1 Benchmark Costing Item-13 has been applied by VPA.
- 3.6.2 A standard layout for the Connector Street has not been provided, however, we have assumed it to be similar to a Connector Boulevard as the pavement depth is the same.
- 3.6.3 Based upon our independent cost estimate, variances additional to those already highlighted in Section 3.2.1 include:
  - Pavement we have assumed that the Connector Street to be a collector arterial road (not secondary arterial as estimated in Item-13).
  - Lower quantities generally with regards to Traffic islands.
  - New items allowances for rock excavation (assume 35% of total excavation volume), additional subgrade preparation and additional protection to conservation areas have been included in our estimate (as advised by Whittlesea City Council).
  - Concrete works additional areas of shared user paths.



### 3.7 **INTERSECTIONS, IN-14 & IN-15**

- 3.7.1 Benchmark Costing Item-06 has been applied by VPA.
- 3.7.2 The extent of the respective intersections is generally higher than that of Item-06 reflected by longer 'legs' of primary arterial roads. This is presented by higher quantities in most instances.
- 3.7.3 Based upon our independent cost estimate, variances additional to those already highlighted in Section 3.2.1 include:
  - Pavement we have assumed Gunns Gully Road and Koukoura Drive to be primary arterial roads (not secondary arterial as estimated in Item-06).
  - Intersection layouts include for dedicated turning lanes from primary arterial roads to secondary arterial roads.
  - New items allowances for rock excavation (assume 35% of total excavation volume), additional subgrade preparation and additional protection to conservation areas have been included in our estimate (as advised by Whittlesea City Council).
  - Concrete works additional areas of shared user paths.

### 3.8 **INTERSECTIONS, IN-16 & IN-17**

- 3.8.1 Benchmark Costing Item-15 has been applied by VPA.
- 3.8.2 The extent of the respective intersections is generally higher than that of Item-06 reflected by longer 'legs' of secondary arterial roads (IN-16 only) and collector arterial roads. This is presented by higher quantities in most instances.
- 3.8.3 Based upon our independent cost estimate, variances additional to those already highlighted in Section 3.2.1 include:
  - Intersection layouts include for dedicated turning lanes from secondary arterial roads to collector arterial roads.
  - New items allowances for rock excavation (assume 35% of total excavation volume), additional subgrade preparation, additional protection to conservation areas and services protection (protection slab for existing high-pressure gas line - IN-17 only) have been included in our estimate (as advised by Whittlesea City Council).
  - Concrete works additional areas of shared user paths.

### 3.9 **BRIDGE, BR-01**

- 3.9.1 This is a bespoke project and no benchmark costing estimate has been applied. We have based our independent estimate on the respective drawings (for BR-01) within the Donnybrook Woodstock ICP Report.
- 3.9.2 Based upon our independent cost estimate, variances include:
  - Site preparation although included as a line item in the benchmark cost estimate, quantities have not been allocated.



- Earthworks WT has allowed for imported fill for bridge abutments (behind reinforced earth walls).
- Overall Super T Cost (Main Span) We have based our bridge area of 2,781 m² on a 176 m span x 15.8 m width (to face of barriers). We believe that a rate of \$3,700/m² is sufficient to include for abutments / piers / footings, guard rails, transition slab and kerb & channels. Hence, we are of the opinion that the VPA rates for these selected items appear to be high.
- Anti-Throw Barrier rate appears to be low. We have based our rate of \$2,600/m on a 2.5 m high anti-throw barrier).
- GREAT Terminal WT believes a rate of \$15,000/No. to be more adequate (VPA rate of \$5,050/No. appears low).
- New items allowances included for:
  - Pier protection barriers (rail impact barriers @ up to 1.4 m wide x 2 m high x 2 No.)
  - Occupations Costs (\$750k 3 weekend VLine occupation cost)
  - Provisional Allowance for Native Flora / Fauna (\$100k) and Cultural Heritage Works (\$50k) as advised by Whittlesea City Council.
- Reinforced Earth Embankment WT has included reinforced earth walls (at abutments) for this item.
- Supervision & Project Management We note that VPA has allowed 13% (of total direct cost) for this item (instead of the standard 9%). We agree with this increase due to the complexities which relate to construction over an existing rail corridor.
- Delivery costs (excl. Supervision & Project Management) these are percentage driven costs and are proportional to the variances in direct costs.

### 3.10 **BRIDGES, BR-02**

- 3.10.1 Benchmark Costing Item-27 has been applied by VPA.
- 3.10.2 Based upon our independent cost estimate, the main variances include:
  - Stripping of topsoil quantity appears to be low, but rate appears to be high (appears that no allowance has been made for area taken up by batters).
  - Formation of batters quantity appears to be low. WT has assumed the reuse of stockpiled material for this item.
  - Box Culvert Unit (incl. Link & Foundation Slabs) in general rates appear to be low. Quantity for foundation slab appears to be high.
  - Apron Slab quantity appears to be low.
  - Wing / Head Wall quantities and rates appears to be low.
  - Structural Fill rate appears to be low.
  - Delivery costs these are percentage driven costs and are proportional to the variances in direct costs.



### 3.11 BRIDGES, BR-03 TO BR-04 INCLUSIVE

- 3.11.1 Benchmark Costing Item-27 has been applied by VPA.
- 3.11.2 We have based our review on a Bebo Arch Bridge Structure (as per DPM Peppercorn ICP) as instructed by Whittlesea City Council. This is not a like for like comparison as bebo arch bridge structures are different from box culvert bridge structures (Benchmark Costing Item-27) and tend to be more expensive due to the following:
  - Larger precast structural components (arches & spandrel panels).
  - Increased amount of structural backfill.
  - Additional items provisional allowances for native flora / fauna protection (\$100k) and cultural heritage works (\$50k) included (as advised by Whittlesea City Council).
  - Delivery costs these are percentage driven costs and are proportional to the variances in direct costs.

### 3.12 **BRIDGE, BR-05**

- 3.12.1 Benchmark Costing Item-19 has been applied by VPA. We have base our independent estimate on the respective drawings (for BR-05) within the Donnybrook Woodstock ICP Report.
- 3.12.2 Based upon our independent cost estimate, the main variances include:
  - Site preparation although included as a line item in the benchmark cost estimate, quantities have not been allocated.
  - Earthworks WT has allowed for imported fill for bridge abutments (behind reinforced earth walls).
  - Overall Super T Cost (Main Span) quantity appears to be low. We have based our bridge area of 1,72 m² on a 50 m span x 34.83 m width and believe that a rate of \$3,850/m² is sufficient (rate includes for transition slab). Hence, we believe the VPA rates for these selected items appear to be high.
  - Guard Rails / Balustrade quantity appears to be high and rate appears to be low.
  - GREAT Terminal WT believes a rate of \$15,000/No. to be more adequate (VPA rate of \$5,050/No. appears low).
  - New items provisional allowances for native flora / fauna protection (\$100k) and cultural heritage works (\$50k) included for this estimate (as advised by Whittlesea City Council).
  - Reinforced Earth Embankment WT has included reinforced earth walls (at abutments) for this item.
  - Delivery costs these are percentage driven costs and are proportional to the variances in direct costs.



### 3.13 SIGNALISED PEDESTRIAN INTERSECTIONS, PED-01 TO PED-03 INCLUSIVE

- 3.13.1 This is a bespoke project and no benchmark costing estimate has been applied (no detail cost breakdown provided by VPA).
- 3.13.2 We note that no detail cost breakdown has been provided for these projects (Ped-01 to Ped-03 inclusive) and we have assumed the respective estimated costs stated in section 3.2 of the VPA report for Donnybrook Woodstock ICP to be P90 values.
- 3.13.3 No reference drawings have been provided for these projects, on this basis, we are unable to verify the quantities used. We assume the scope of works include for a signalised pedestrian crossing including commissioning works.
- 3.13.4 Based upon our benchmarked costing review, variances include:
  - Crossing Construction / Materials rate for this item appears to be high.
  - New items allowances for rock excavation and service protection (temporary works during construction for existing APA transmission gas line – Ped-02 & Ped-03 only) included for this estimate (as advised by Whittlesea City Council).
  - Delivery costs these are percentage driven costs and are proportional to the increase in direct costs
- 3.13.5 A detailed breakdown of all our cost estimates are attached as Appendix A.

### 4 ESTIMATE METHODOLOGY

The methodology that we have assumed in the preparation of the estimates are as follows:

### 4.1 **COST ESTIMATES**

- 4.1.1 Identification and review of the appropriate drawing(s) for each respective item as per the information /documentation provided (Section 1.5 refers).
- 4.1.2 Identification and quantification of the various measurable components that make up the cost estimate for each respective item (i.e. area of pavement / bridge deck, length of kerb / pipework, etc.).
- 4.1.3 Where alternate units of measurement have been used in the preparation of our cost estimates or where new items have been added, it has been noted in our detailed comments.
- 4.1.4 Our cost estimates are generally based upon 'first principles' estimating methods based upon current day rates and reflect the 'base case (or 'most likely') cost estimate. These have been benchmarked against rates from current projects of a similar nature within our cost database.
- 4.1.5 We have included allowances to cover site specific conditions for the various transport project sites based on information provided by Whittlesea City Council (refer Section 1.5). These allowances generally include for excavation in rock, additional subgrade



- preparation, services relocation / protection, cultural heritage and protection of native flora / fauna.
- 4.1.6 Delivery costs have been included as a percentage consistent with those applied by the VPA.

### 4.2 **RISK**

- 4.2.1 The objective of risk analysis is to ascertain an appropriate level of cost contingency, based upon confidence levels. In the case of the Benchmark Infrastructure Costings report, VPA has included for P50 and P90 confidence levels which is consistent with many infrastructure projects.
- 4.2.2 The base case cost estimate excluding delivery costs has been used as the basis of our Monte Carlo risk-based modelling to provide a P50 and P90 output with which to compare to the Benchmarked Infrastructure costings.
- 4.2.3 We note that the risk model has been applied to the base case construction value only and therefore is a representation of inherent risk (quantifiable uncertainties) only.
- 4.2.4 It appears that no formal assessment of Contingent Risk has been undertaken and it is assumed that the Contingency percentage applied as part of the 'Delivery' costs seeks to cover those unmeasured items outside of the base case estimate.
- 4.2.5 Alternatively, by undertaking a risk assessment of the Donnybrook Woodstock ICP, the issues unique to the region (i.e. Rock, contamination, environmental or cultural and heritage) could be further assessed and therefore, offer confidence that the Contingent risk included in the project estimates have been adequately covered.
- 4.2.6 All outputs of the risk modelling have been generated using Pallisade @RISK software for the Monte Carlo simulation for probabilistic cost estimation.

# 5 ESTIMATE INCLUSIONS & ASSUMPTIONS

The assumptions that we have used in the preparation of the estimates are as follows:

### 5.1 **GENERALLY**

- 5.1.1 Interpretation of design guidelines contained within the Benchmark Costings Report has been accepted.
- 5.1.2 As the Items represent generic transport projects, the cost estimates assume natural site profiles.

#### 5.2 **ROADS**

5.2.1 Site preparation has been included based upon the overall length of the road x the road reserve width as indicated on the respective section drawing of each road type (refer Section 3.1.1 & 3.1.2).



- 5.2.2 Road pavement composition as per Table 3-3 Pavement makeup of the Cardno Benchmark Infrastructure Costing report.
- 5.2.3 Subgrade preparation has been included as a measured item based upon pavement areas rather than as a percentage as per Item Costing Sheets.
- 5.2.4 SUP / Footpath rate of \$60/m² has been based on a 120mm thk concrete footpath with SL72 reinforcement (as advised by Whittlesea City Council).
- 5.2.5 Drainage We have based the drainage pipework quantity on the overall length of each road project respectively and pits at 50m centres (of drainage alignment).
- 5.2.6 Tree planting The drawings provided do not indicate trees therefore quantities have been calculated based upon the spacing of trees indicated on the respective drawing of each road type.
- 5.2.7 Landscaping has been assumed as a split of 20% planting and 80% topsoil seeding. These quantities are calculated to the overall site area less paved areas.
- 5.2.8 Street Lighting we have applied a different pricing methodology, based upon the number of light poles, calculated at 50m spacing along the length of the road alignment. We have assumed that no lighting is required to Shared User Paths or Cycle Paths.
- 5.2.9 Signage we have assumed that no signage is required for the road projects (RD-01 to RD-05 inclusive).
- 5.2.10 Other Allowances for rock excavation (assume 35% of total excavation volume), additional subgrade preparation, service protection and additional protection for conservation area included for selected road projects (as advised by Whittlesea City Council).

#### 5.3 INTERSECTIONS

- 5.3.1 Site preparation has been included to the Ultimate project boundaries shown on the drawings.
- 5.3.2 Road pavement composition as per Table 3-3 Pavement makeup of the Cardno Benchmark Infrastructure Costing report.
- 5.3.3 Subgrade preparation has been included as a measured item based upon pavement areas rather than as a percentage as per Benchmark Costings Report.
- 5.3.4 SUP / Footpath rate of \$60/m² has been based on a 120 mm thk concrete footpath with SL72 reinforcement (as advised by Whittlesea City Council).
- 5.3.5 Drainage The drawings provided do not indicate drainage pipes therefore sizing and layouts have been assumed similar to the Benchmark Cost item referenced by VPA.

  Generally, 450 mm pipe has been assumed along length of road, with 300 mm dia. pipe at 50 m spacing typically used as cross drainage. Pits are also assumed at 50 m spacing.
- 5.3.6 Traffic signals have been costed as an item per intersection.



- 5.3.7 Tree planting The drawings provided do not indicate trees therefore quantities have been calculated based upon the spacing of trees indicated on the respective drawing of each road type and the number of trees indicated on the respective drawing of each intersection type.
- 5.3.8 Landscaping has been assumed as a split of 20% planting and 80% topsoil seeding. These quantities are calculated to the overall site area less paved areas.
- 5.3.9 Street Lighting our pricing is based upon the number of light poles, as indicated on the respective drawing of each intersection type.
- 5.3.10 Other Allowances for rock excavation (assume 35% of total excavation volume), additional subgrade preparation, service relocation / protection, cultural heritage and additional protection for conservation area included for selected intersection projects (as advised by Whittlesea City Council).

#### 5.4 **BRIDGES**

- 5.4.1 Drawings provided have been used as the basis for our measurement. The following assumptions are reflected in our cost estimate (BR-03 & BR-04 based on Bedo Arch Structures as per DPM Peppercorn ICP as instructed by Whittlesea City Council):
  - Bridges
    - Piers 100 mm diameter for BR-01; 900 mm diameter for BR-05.
    - 1200 deep super T beams to spans up to 26 m.
    - Anti-throw screens to road bridge over existing rail corridor (BR-01).
    - Pier protection barriers assumed up to 1.4 m wide x 2 m high.
    - Allowance for Rail Occupation Costs included (BR-01 only).
    - Provisional allowances for protection of native flora / fauna and cultural heritage included.

#### Culvert Structures

- Wing walls & head walls are assumed to be 350mm thick with reinforcement at 350kg/m³
- Road pavement has been excluded as part of the culvert costings. This is absent from the VPA costs and we therefore, assume that this is included for elsewhere as part of road or intersection projects.
- No allowance has been included for additional earthworks to suit interfaces with road projects

#### Bebo Arch Structures

- Bridge structure to consist of Humes Bebo Arch 6210S units (6 m diameter x 2.1 m height @ 11.9t/unit) and 12300S units (12 m diameter x 3 m height @ 16.8t/unit) including associated spandrel panels.
- Allowance for associated earthworks (excavation, imported structural fill and compaction) and rock beaching included.



- Provisional allowances for protection of native flora / fauna and cultural heritage included (excluding BR-02).

#### 5.5 SIGNALISED PEDESTRIAN INTERSECTIONS

- 5.5.1 No drawings provided (refer to Section 3.12 for scope assumptions). The following assumptions are reflected in our cost estimate:
  - Selected projects include for signalised pedestrian crossing inclusive of commissioning.

#### 5.6 **DELIVERY COSTS**

- 5.6.1 The VPA have set the percentages for delivery costs, and these have been applied in the preparation of the estimates as follows:
  - Allowance for Survey & Design 5% of total direct cost.
  - Allowance for Contingency 15% of total direct cost (20% for Bridges).
  - Allowance for Traffic Management 5% of total direct cost.
  - Allowance for Supervision & Project Management 9% of total direct cost (13% for BR-01 only)
  - Allowance for Council Fees 3.25% of total direct cost.
  - Allowance for Vic Roads Fees 1% of total direct cost.
  - Allowance for Environmental Management 0.5% of total direct cost.
  - Allowance for Site Establishment 2.5% of total direct cost.

## 6 ESTIMATE EXCLUSIONS

The exclusions that we have used in the preparation of the estimates are as follows:

- Lighting to footpaths
- Allowance for site remediation
- Contamination removal
- Relocation of existing services unless noted otherwise
- Underpinning of adjacent footings
- Works outside the site boundary
- Adjoining owner issues
- Loss of income and associated costs from affected businesses
- Negotiated contracts / construction management
- Financing costs
- Cost escalation in construction prices beyond October 2018
- Cost escalation until construction



- Cost escalation until completion
- Legal costs
- GST

## 7 CONCLUSION

We conclude that the costs prepared by VPA for the Donnybrook - Woodstock Roads, Intersections, Bridges and Pedestrian Crossing projects are low by approx. **46.3%**, the reasons are detailed in our report.

Whilst there are many differences of quantity or scope, variances are also driven by differences in pricing. As we have noted in previous reports, the State Government's ongoing appetite to procure and deliver major infrastructure projects is putting increasing pressure on the Victorian market, and therefore, unlikely that demand for labour, plant and material resources is going to reduce in the medium term.

Should you require any further assistance in the above matters please do not hesitate to contact Mr Andrew Loh of WT Partnership.





Description	Total Cost (Incl	vPA uding Delivery) A)	Total Cost (Inc	WTP luding Delivery) 3)	Diff. (	A - B)	Differ	ence %	Comments
	P50 \$	P90 \$	P50 \$	P90 \$	P50 \$	P90 \$	P50	P90	
RD-01 Cameron Street: Sydney-Melbourne railway overpass to Patterson Drive – Construction of 2 lane carriageway, excluding intersections (interim treatment)	3,026,405	3,418,196	5,173,810	5,573,889	(2,147,404)	(2,155,692)	-71%	-63%	Bespoke Project - new items included for site preparation & subgrade preparation - all pavements have been assumed as secondary arterial pavements - quantities differ for pavements / SUP & linemarking (WT has based the quantities on the Cameron St Interim Cross Section - 2 lane split carriageway only with central median and provision to extend to 4 lane in the future, excluding local frontage road by VPA dated Oct 2017) - higher pavement rates - Allowances for rock excavation & additional subgrade prep included
RD-02 Gunns Gully Road: Sydney-Melbourne railway overpass to E6 / OMR reservation – Construction of 2 lane carriageway, excluding intersections (interim treatment)		8,538,250		13,689,791	N/A	(5,151,541)	N/A	-60%	VPA costs have been taken from Section 3.2, Table 5 of the Donnybrook - Woodstock ICP Report dated August 2018 (rate based on Item 1 of benchmark items)  - WT assessment is based upon our assessment of Gunns Gully Rd Cross Section - 2 lane split carriageway only with central median and provision to extend to 6 lanes in the future, excluding local frontage rd by VPA dated Oct 2017  - all pavements have been assumed as primary arterial pavements  - quantities differ for pavements / SUP & linemarking  - higher pavement rates  - Allowances for rock excavation, additional subgrade prep included, protection slab for existing gas main & additional protection for conservation area
RD-03 Patterson Drive: Donnybrook Road to Merri Creek – Construction of 2 lane carriageway, excluding intersections (interim treatment)	6,253,080	6,920,868	9,010,991	9,585,485	(2,757,911)	(2,664,617)	-44%	-39%	Bespoke Project  - new items included for site preparation & subgrade preparation  - all pavements have been assumed as secondary arterial pavements  - quantities differ for pavements / SUP & linemarking (WT has based the quantities on the Patterson Dr Interim Cross Section - 2 lane split carriageway only with central median and provision to extend to 4 lane in the future, excluding local frontage road by VPA dated Oct 2017)  - higher pavement rates  - Allowances for rock excavation, additional subgrade prep included & additional protection for conservation area
RD-04 Patterson Drive: Merri creek to OMR/E6 reservation – Construction of 2 lane carriageway, excluding intersections (interim treatment)	2,619,926	2,899,995	4,791,424	5,159,599	(2,171,498)	(2,259,604)	-83%	-78%	Bespoke Project - new items included for site preparation & subgrade preparation - all pavements have been assumed as secondary arterial pavements - quantities differ for pavements / SUP & linemarking (WT has based the quantities on the Patterson Dr Interim Cross Section - 2 lane split carriageway only with central median and provision to extend to 4 lane in the future, excluding local frontage road by VPA dated Oct 2017) - higher pavement rates - Allowances for rock excavation & additional subgrade prepincluded
RD-05 Koukoura Drive: Donnybrook Road to Gunns Gully Road – Construction of 2 lane carriageway, excluding intersections (interim treatment)		3,838,544		6,284,006	N/A	(2,445,462)	N/A	-64%	VPA costs have been taken from Section 3.2, Table 5 of the Donnybrook - Woodstock ICP Report dated August 2018 (rate based on Item 2 of benchmark items) - WT assessment is based upon our assessment of Koukoura Dr Cross section - interim (2 lane split carriageway only with central median and provision to extend to 4 lanes in the future, excluding local frontage rd by VPA dated Oct 2017) - all pavements have been assumed as primary arterial pavements - quantities differ for pavements / SUP & linemarking - higher pavement rates - Allowances for rock excavation & additional subgrade prep included
TOTALS - ROAD PROJECTS	11,899,412	25,615,854	18,976,224	40,292,770 % Difference	(7,076,813)	(14,676,916) (57.3%)			
Intersection Projects									
IN-01 - Donnybrook Road & Hayes Hill Boulevard/Langley Park Drive (N–S Blvd Connector) - Construction of an arterial to connector road 4 way intersection (interim treatment)	4,336,770	4,718,000	5,904,758	6,283,668	(1,567,989)	(1,565,668)	-36%	-33%	Bespoke Project  - New items included for site preparation, demolition of existing pavements, subgrade preparation, tie-ins to existing pavements and removal of existing fencing  - Donnybrook Rd assumed to be a Primary Arterial Road  - Quantities differ significantly for SUP/Footpath, Traffic Islands & subsoil drainage  - WT services relocation rate is based off 100m for relocation of OH electrical and comms along Donnybrook Rd  - Higher pavement rates  - Inclusion of street lighting costs
IN-02 - Donnybrook Road & Connector Street (N–S Connector) – Construction of an arterial to connector road 4-way intersection (interim treatment)	4,336,770	4,718,000	6,712,952	7,140,800	(2,376,183)	(2,422,800)	-55%	-51%	Bespoke Project  - New items included for site preparation, demolition of existing pavements, subgrade preparation, tie-ins to existing pavements and removal of existing fencing  - Donnybrook Rd assumed to be a Primary Arterial Road  - Quantities differ significantly for SUP/Footpath, Traffic Islands & subsoil drainage  - WT services relocation rate is based off 100m for relocation of OH electrical and comms along Donnybrook Rd  - Higher pavement rates  - Inclusion of street lighting costs
IN-03 - Donnybrook Road & Patterson Drive – Construction of an arterial to arterial road 4-way intersection (interim treatment)	5,297,210	5,823,000	7,958,074	8,470,461	(2,660,864)	(2,647,461)	-50%	-45%	Bespoke Project  - New items included for site preparation, demolition of existing pavements, subgrade preparation, tie-ins to existing pavements and removal of existing fencing  - Donnybrook Rd assumed to be a Primary Arterial Road  - Quantities differ significantly for SUP/Footpath & subsoil drainage  - VPA top soil seeding area only 2,600m2 vs WT 19,000m2  - WT services relocation rate is based off 100m for relocation of OH electrical and comms along Donnybrook Rd  - Higher pavement rates  - Inclusion of street lighting costs



	-	VPA uding Delivery)	-	WTP	D:##	(A B)	Differ	ence %	31.10.2018
IN-04 - Donnybrook Road & Koukoura Drive – Construction of an	<b>(</b> )	4)	(I	В)	Diff. (	<b>y</b> j	Diller	J	Bespoke Project - New items included for site preparation, demolition of existing pavements, subgrade preparation, tie-ins to existing pavements and removal of existing fencing - Donnybrook Rd & Koukoura Drive assumed to be a Primary Arterial Road
arterial to arterial road 4-way intersection (interim treatment)	5,297,210	5,823,000	8,428,419	9,186,309	(3,131,209)	(3,363,309)	-59%	-58%	- Quantities differ significantly for SUP/Footpath & kerb & channel  - VPA topsoil seeding area only 2,600m2 vs WT 21,000m2  - WT services relocation rate is based off 100m for relocation of OH electrical and comms along Donnybrook Rd  - Higher pavement rates  - Inclusion of street lighting costs
IN-05 - Donnybrook Road & Connector Street (Nth-Sth Connector) – Construction of an arterial to connector road 3-way intersection (interim treatment)	3,520,607	3,825,000	5,588,678	5,963,362	(2,068,070)	(2,138,362)	-59%	-56%	Bespoke Project  - New items included for site preparation, demolition of existing pavements, subgrade preparation, tie-ins to existing pavements and removal of existing fencing  - Donnybrook Rd assumed to be a Primary Arterial Road  - Quantities differ significantly for SUP/Footpath & traffic island  - VPA topsoil seeding area only 2,600m2 vs WT 21,000m2  - WT services relocation rate is based off 100m for relocation of OH electrical and comms along Donnybrook Rd  - Higher pavement rates  - Inclusion of street lighting costs as well as allowance for cultural heritage works
IN-06 - Hayes Hill Boulevard & Patterson Drive – Construction of an arterial to blvd connector road 4-way intersection (interim treatment)	3,972,466	4,383,158	7,178,091	7,596,042	(3,205,625)	(3,212,884)	-81%	-73%	Benchmark Costing Item-9 applied by VPA  - New items included for site preparation & subgrade preparation  - Patterson Drive assumed to be a Primary Arterial Road while Hayes Hill Blvd assumed to be a Collector Arterial Road  - Quantities differ for SUP/Footpath, traffic island and landscaping (including topsoil seeding)  - Higher pavement rates  - Inclusion of street lighting costs  - Additional extra over costs for rock excavation & subgrade preparation
IN-07 - Hayes Hill Boulevard & Koukoura Drive – Construction of an arterial to blvd connector road 4-way intersection (interim treatment)	3,972,466	4,383,158	5,986,559	6,397,241	(2,014,093)	(2,014,083)	-51%	-46%	Benchmark Costing Item-9 applied by VPA  - New items included for site preparation & subgrade preparation  - Patterson Drive assumed to be a Primary Arterial Road while Hayes Hill Blvd assumed to be a Collector Arterial Road  - Quantities differ for SUP/Footpath, traffic island and landscaping (including topsoil seeding)  - Higher pavement rates  - Inclusion of street lighting costs  - Additional extra over costs for rock excavation & subgrade preparation
IN-08 - Hayes Hill Boulevard & Merriang Road – Construction of an arterial to arterial 3-way intersection (interim treatment)	3,140,479	3,394,000	3,602,730	3,831,930	(462,251)	(437,930)	-15%	-13%	Bespoke Project  - New items included for site preparation, demolition of existing pavements, subgrade preparation, tie-ins to existing pavements and removal of existing fencing  - Hayes Hill Blvd & Merriang Rd are assumed to be Collector Arterial Roads  - Quantities differ significantly for SUP/Footpath & kerb & channel  - WT services relocation rate is based off 100m for relocation of OH electrical and comms on Merriang Rd (VPA's services relocation rate appears to be low)  - Additional allowances for street lighting costs, extra over rock excavation and extra over cost for subgrade preparation  - Higher pavement rates
IN-09 - Cameron Street / Connector Street (Nth–Sth Connector) – Construction of an arterial to connector road 4-way intersection (interim treatment)	3,972,466	4,383,158	5,180,867	5,467,008	(1,208,401)	(1,083,849)	-30%	-25%	Benchmark Costing Item-9 applied by VPA  - New items included for site preparation & subgrade preparation  - Cameron St assumed to be a Secondary Arterial Road, cross road measured as Collector Arterial Road  - Quantities differ for SUP/Footpath, traffic island and landscaping (including topsoil seeding)  - Higher pavement rates  - Inclusion of street lighting costs  - Additional extra over costs for rock excavation & subgrade preparation  - Additional allowance for temporary protection during construction (for existing drainage corridor)
IN-10 - Cameron Street (arterial west/blvd connector east) & Patterson Drive (arterial) – Construction of an arterial to arterial/blvd connector road 4-way intersection (interim treatment)	4,720,246	5,145,136	8,048,076	8,661,752	(3,327,830)	(3,516,616)	-71%	-68%	Benchmark Costing Item-8 applied by VPA  - New items included for site preparation & subgrade preparation  - Cameron St assumed to be a Secondary Arterial Road and Koukoura Drive assumed to be a Primary Arterial Road  - Quantities differ for SUP/Footpath, traffic island, kerb & channel & landscaping (including topsoil seeding)  - Higher pavement rates  - Inclusion of street lighting costs  - Additional extra over costs for rock excavation & subgrade preparation.
IN-11 - Cameron Street (blvd connector west/town centre connector east) & Koukoura Drive (arterial) – Construction of an arterial to connector road 4-way intersection (interim treatment)	4,720,246	5,145,136	7,633,042	8,119,910	(2,912,797)	(2,974,774)	-62%	-58%	Benchmark Costing Item-8 applied by VPA  - New items included for site preparation & subgrade preparation  - Cameron St & Patterson St assumed to be Secondary Arterial Roads (VPA adopted same approach with quantities differing slightly)  - Quantities also differ for SUP/Footpath, kerb & channel & landscaping (including topsoil seeding)  - Higher pavement rates  - Inclusion of street lighting costs  - Additional extra over costs for rock excavation & subgrade preparation
IN-12 - Cameron Street / Merriang Road – Construction of an connector to arterial road 3-way intersection (interim treatment)	3,140,479	3,394,000	3,736,168	3,922,654	(595,689)	(528,654)	-19%	-16%	Bespoke Project  - New items included for site preparation, demolition of existing pavements, subgrade preparation, tie-ins to existing pavements and removal of existing fencing  - Merriang Rd assumed to be a Collector Arterial Road while Cameron St assumed to be a Primary Arterial Road  - Quantities differ significantly for SUP/Footpath, traffic island & kerb & channel  - WT services relocation rate is based off 100m for relocation of OH electrical and comms along Merriang Rd (VPA's services relocation rate appears to be low)  - Additional allowances for street lighting costs, extra over rock excavation and extra over cost for subgrade preparation  - Higher pavement rates



	Ву	VPA	Ву	WTP					31.10.2018
Description		luding Delivery) A)		luding Delivery) B)	Diff.	(A - B)	Differe	ence %	Comments
IN-13 - Gunns Gully Road & Connector St (Nth–Sth Connector) – Construction of an arterial to connector road 3-way intersection (interim treatment)	3,275,225	3,625,039	5,725,356	6,111,731	(2,450,130)	(2,486,691)	-75%	-69%	Benchmark Costing Item-13 applied by VPA  - New items included for site preparation & subgrade preparation  - Gunns Gully Rd assumed to be a Primary Arterial Road, side road has been assumed to be a Collector Arterial Road  - Quantities differ for SUP/Footpath, traffic island, kerb & channel & landscaping (including topsoil seeding)  - Higher pavement rates  - Inclusion of street lighting cost and protection for conservation area  - Additional extra over costs for rock excavation & subgrade preparation
IN-14 - Gunns Gully Road & Patterson Drive – Construction of an arterial to arterial road 4-way intersection (interim treatment)	5,078,677	5,572,439	8,464,168	8,997,605	(3,385,491)	(3,425,166)	-67%	-61%	Benchmark Costing Item-6 applied by VPA  - New items included for site preparation & subgrade preparation  - Gunns Gully Rd assumed to be a Primary Arterial Road and Paterson Drive assumed to be a Secondary Arterial Road  - Quantities differ for SUP/Footpath, traffic island, kerb & channel & landscaping (including topsoil seeding)  - Higher pavement rates  - Inclusion of street lighting cost and protection for conservation area  - Additional extra over costs for rock excavation & subgrade preparation
IN-15 - Gunns Gully Road & Koukoura Drive – Construction of an arterial to arterial road 4-way intersection (Connector road north of Gunns Gully Road) (interim treatment)	5,078,677	5,572,439	6,346,486	6,842,043	(1,267,810)	(1,269,604)	-25%	-23%	Benchmark Costing Item-6 applied by VPA  - New items included for site preparation & subgrade preparation  - Gunns Gully Rd & Koukoura Drive assume to be Primary Arterial Roads  - Quantities differ for SUP/Footpath, traffic island, kerb & channel & landscaping (including topsoil seeding)  - Higher pavement rates  - Inclusion of street lighting cost  - Additional extra over costs for rock excavation & subgrade preparation
IN-16 - Patterson Drive / Connector St (East–West Connector) – Construction of an arterial to connector road 3-way intersection (interim treatment)	3,006,961	3,312,141	5,065,127	5,359,941	(2,058,166)	(2,047,800)	-68%	-62%	Benchmark Costing Item-15 applied by VPA  - New items included for site preparation & subgrade preparation  - Patterson Drive assumed to be a Secondary Arterial Road, side road assumed to be a Collector Arterial Road  - Quantities differ for SUP/Footpath, traffic island, & landscaping (including topsoil seeding)  - Higher pavement rates  - Inclusion of street lighting cost and additional protection for conversation area  - Additional extra over costs for rock excavation & subgrade preparation
IN-17 - Patterson Drive / Connector St (East–West Connector) – Construction of an arterial to connector road 3-way intersection (interim treatment)	3,006,961	3,312,141	4,098,971	4,319,066	(1,092,010)	(1,006,924)	-36%	-30%	Benchmark Costing Item-15 applied by VPA - differences include site preparation, subgrade preparation missing from VPA's costings - Inclusion of street lighting costs and additional protection for conservation area - Inclusion of protection slab for high pressure gas line which passes through IN-17 according to Donnybrook ICP Utilities Map - Minimal differences in quantity for drainage pipes, SUP/Footpaths & kerbs & channels - Landscaping area only 4,000m2 for VPA, whereas WT 1,800m2 (WT's topsoil seeding allowance is almost double VPA's) - overall quantity of pavement is similar however, appears to be a difference in demarcation of secondary & collector pavements - higher rates for pavements
TOTALS - INTERSECTION PROJECTS	69,873,913	76,528,948	105,658,521	112,671,523 % Difference	(35,784,609) (51.2%)	(36,142,576) (47.2%)			
BR-01 - Cameron Street: Construct a 2 lane interim road bridge spanning Merri Creek and Melbourne-Sydney Railway	20,298,015	23,116,643	19,517,601	21,780,380	780,414	1,336,263	4%	6%	Bespoke Project (based on Dwg 140638-C003 Rev 3 within Donnybrook-Woodstock ICP Aug 2018)  - BR-01 comprises the construction a 2 lane interim road bridge spanning Merri Creek and Melbourne-Sydney Railway with deck area of 176m span x 15.8m width  - new items included for site preparation & subgrade preparation  - Super-T rate appears to be high  - Anti-throw barrier (WT's rate based on 2.4m high anti-throw barrier) and GREAT terminal rates appear to be low  - Allowance for rail impact pier protection included (up to 1400 wide x 2000 high x 2 No.)  - Allowances for reinforced earth wall with imported fill (behind) included at bridge abutments  - Allowance for rail occupation costs included (based on 3 weekend occupational costs for VLine)  - Allowances for protection of native flora/fauna (Growling Grass Frog) and cultural heritage included
BR-02 - Patterson Drive: Construct a 2 lane interim culvert crossing of constructed waterway	690,624	794,217	927,611	970,447	(236,987)	(176,230)	-34.3%	-22%	Benchmark Costing Item-27 applied by VPA - quantities differ for apron, headwalls & wing walls, possibly only measured to one side /end of culvert - rates differ for box culvert units, head walls & wing walls
BR-03 - Hayes Hill Boulevard: Construct a Growling Grass Frog Habitat suitable culvert/bridge crossing of Darebin Creek – 2 lane culvert crossing	690,624	794,217	3,441,786	3,574,287	(2,751,162)	(2,780,070)	-398.4%		Benchmark Costing Item-27 applied by VPA (WT review based on Bebo Arch Structure as per DPM Peppercorn ICP as advised by Whittlesea City Council) - Not a like for like comparison as bebo arch structure is more
BR-04 - Cameron Street: Construct a Growling Grass Frog Habitat suitable culvert/bridge crossing of Darebin Creek – 2 lane culvert crossing	690,624	794,217	3,241,327	3,373,076	(2,550,704)	(2,578,859)	-369.3%	-325%	costly compared to a regular box culvert bridge structre - Allowances for rock excavation, protection of native flora/fauna (Growling Grass Frog) and cultural heritage included
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	Ву	/PA	Ву	WTP					
Description	Total Cost (Incl (A			uding Delivery) 3)	Diff. (	A - B)	Differ	ence %	Comments
BR-05 - Patterson Drive: Construct a 2 lane interim bridge crossing of Merri Creek	5,828,456	6,414,305	12,359,097	13,798,090	(6,530,641)	(7,383,785)	-112.0%	-115%	Benchmark Costing Item-19 applied by VPA  - BR-05 comprises the construction of a 2 lane interim bridge crossing of Merri Creek with deck area based on 50m long span x deck width of 34.83m  - new items included for site preparation & subgrade preparation  - Super-T rate appears to be high  - Guard rails / balustrade and GREAT terminal rates appear to be low  - Allowances for reinforced earth wall with imported fill (behind) included at bridge abutments  - Allowances for protection of native flora/fauna (Growling Grass Frog) and cultural heritage included
TOTALS - BRIDGE PROJECTS	28,198,341	31,913,599	39,487,421	43,496,280	(11,289,080)	(11,582,681)			
				% Difference	(40.0%)	(36.3%)			
Signalised Pedestrian Intersection Projects									
Ped-01 - Crossing Patterson Drive between Donnybrook Road and Hayes Hill Boulevard associated with the key local access street connecting Donnybrook Station to the Non Gov't. P–12 school campus and SR-02		276,614		271,702	N/A	4,912	N/A	2%	Bespoke Project - Allowance for excavation in rock included (signal post footings / conduits etc.)
Ped-02 - Crossing Gunns Gully Road between Koukoura Drive and Patterson Drive associated with the shared path along the gas pipeline easement		276,614		302,665	N/A	(26,051)	N/A	-9%	Bespoke Project - Allowance for excavation in rock included (signal post
Ped-03 - Crossing Donnybrook Road between Koukoura Drive and Patterson Drive associated with the shared path along the gas pipeline easement connecting south to Northern Quarries PSP		276,614		302,665	N/A	(26,051)	N/A	-9%	footings / conduits etc.)  - Allowance for protection of existing APA gas main included
		222 222			-	(am a = 1)			
TOTALS - SIGNALISED PEDESTRIAN INTERSECTION PROJECTS	-	829,842	-	877,032 % Difference	0 N/Δ	(47,190) (5.7%)			
		****			N/A			<u> </u>	
GRAND TOTAL - ALL PROJECTS		134,888,243		197,337,605		(62,449,363)			
				% Difference		(46.3%)			



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RD-02  RD-03  (for R  VPA B (for R  Camer to Patt carriag treatm Soverpa lane ca treatm Estima linear is base  Patter Constr	Benchmark Costing - Primary Arterial road RD-02)  Benchmark Costing - Secondary Arterial road RD-05)  Mt Atkinson & Teron Street: Sydney-Melbourne railway overpass tterson Drive — Construction of 2 lane	Interim	\$ 2,787,821 2,702,456 P Costings	m m	800 800	,
RD-02  RD-03  (for R  VPA B (for R  Camer to Patt carriag treatm Soverpa lane ca treatm Estima linear is base  Patter Constr	RD-02)  Benchmark Costing - Secondary Arterial road RD-05)  Mt Atkinson & Teron Street: Sydney-Melbourne railway overpass	Interim	2,702,456			,
RD-02  RD-03  (for R  VPA B (for R  Camer to Patt carriag treatm Soverpa lane ca treatm Estima linear is base  Patter Constr	RD-02)  Benchmark Costing - Secondary Arterial road RD-05)  Mt Atkinson & Teron Street: Sydney-Melbourne railway overpass	Interim	2,702,456			,
RD-01 Camer to Patter RD-02 treatm linear is base RD-03 Constr	Mt Atkinson & 1 eron Street: Sydney-Melbourne railway overpass	Interim		m	800	3,378
RD-01 to Patticarriage treatm Gunns overpate lane cate treatm Estimate linear is base RD-03 Constr	eron Street: Sydney-Melbourne railway overpass	Tarneit Plains IC	P Costings			<b>,</b>
RD-01 to Patticarriage treatm Gunns overpate lane cate treatm Estimate linear is base RD-03 Constr						
RD-01 to Patticarriage treatm Gunns overpate lane cate treatm Estimate linear is base RD-03 Constr						
RD-02 treatm Estima linear is base  RD-03 Constr	ageway, excluding intersections (interim	Interim	3,418,196	m	843	4,055
RD-03 Constr	as Gully Road: Sydney-Melbourne railway coass to E6 / OMR reservation – Construction of 2 carriageway, excluding intersections (interim ment) - (length of road derived by dividing tated Cost for in Section 3.2 table by rate per metre of Benchmark Item 1, which road projec sed on)	Interim	8,538,250	m	2,450	3,485
	rson Drive: Donnybrook Road to Merri Creek – truction of 2 lane carriageway, excluding sections (interim treatment)	Interim	6,920,868	m	1,862	3,717
RD-04 Constr	rson Drive: Merri creek to OMR/E6 reservation – truction of 2 lane carriageway, excluding sections (interim treatment)	Interim	2,899,995	m	778	3,728
Road - interse derive table b	oura Drive: Donnybrook Road to Gunns Gully  — Construction of 2 lane carriageway, excluding sections (interim treatment) - (length of road ed by dividing Estimated Cost for in Section 3.2 by rate per linear metre of Benchmark Item 2,	Interim	3,838,544	m	1,136	3,379
	n road projec is based on)			m	7,069	

VPA

Estimated Total Cost (P90)	UoM	Estimated Length of Project	Assumed Rate per Im of road corridor
\$		m	\$
		assumed same as VPA	
13,689,791	m	2450	5,588
6,284,006	m	1136	5,532
5,573,889	m	843	6,612
13,689,791	m	2,450	5,588
9,585,485	m	1,862	5,148
5,159,599	m	778	6,632
6,284,006	m	1,136	5,532
	m	7,069	



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**VPA** 31.10.2018

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Item	Sub Item	Qty	Unit	Rate (P50)	Amount	Rate (P90)	Amount	Qty	Unit	Rate	Amount	Amount	Amount		erence	Comments
					(P50)		(P90)					(P50)	(P90)	(P50)	(P90)	
works & thworks	Site Preparation	-	%	2.39	-	2.70	-	31,865		2.50	79,664	88,032	94,839	(88,032)	(94,839)	Quantity missing; Rate includes for site clearance & topsoil removal to suit Ultimate design standard to full width of road reserve.
Site	Demolition of existing pavements								m2	25.00	0			-	-	O and the land and a state of the state of t
	Earthworks	5,411	m3	35.43	191,669	40.63	219,815	5,888	m3	39.00	229,646	253,770	273,393	(62,101)	(53,578)	Quantity low based upon differences to pavement areas (refer comments below)
	Primary Arterial Pavement	_	m2	157.08	-	171.71	-		m2	155.00	0			-	-	(Teter comments below)
nts	Secondary Arterial Pavement	7,567		123.23	932,498	130.48	987,351	9,273		141.00	1,307,493	1,444,844	1,556,571	(512,346)	(569,220)	Quantity is low based upon WT measured areas; pavement area assume to include chevron and on road bike path areas (2 lane carriageway only with provision to extend to 4 lane in the future, excluding local frontage road as per Cameron St Interim Cross Section) Rate is low based upon nominated pavement depth.
ž	Collector Arterial Pavement	-	m2	91.07	-	100.18	-		m2	126.00	0			-	-	
	Subgrade preparation	-	%	15.21	-	17.86	-	9,273	m2	2.50	23,183	25,618	27,599	(25,618)	(27,599)	Quantity missing; cost item required.
	Pavement rehab	-	m2	45.90	-	45.90	-		m2		0			-	-	
	Pavement other	-	m2	-	-	-	-		m2		0			-	-	
	Kerb & channel	1,682	m	50.42	84,785	56.78	95,488	3,372	m	55.00	185,460	196,856	212,079	(112,071)	(116,590)	Quantity is low based upon WT measured lengths; assume kerb / channel on both sides of each carriageway
rks	Cycle path	-	m2	59.60	-	69.63	-		m2	50.00	0			-	-	
Concrete Wo	SUP / Footpath	1,682	m2	58.44	98,279	68.10	114,513	5,058	m2	60.00	303,480	322,128	347,038	(223,849)	(232,525)	Quantity is low based upon WT measured areas; pavement area assume to 3m wide SUP on both side of road Rate is low (WT has based rate on 120mm thk concrete pavement with SL72 mesh as advised by Whittlesea City Council).
	Traffic Island	-	m2	71.43	-	76.92	-		m2	60.00	0			-	-	
	Drainage pipe - 300mm CR backfilled	105		162.30	17,058	176.53	18,553	105		225.00	23,681	26,169	28,192	(9,111)	(9,639)	
	Drainage pipe - 375mm CR backfilled	368		226.68	83,385	247.84	91,166	369		260.00			114,178	(22,597)		Rate appears to be low
	Drainage pipe - 450mm CR backfilled	368		291.67	107,290	322.90	118,779	369		290.00	106,974	118,211	127,352	(10,922)	(8,573)	
<u>o</u>	Drainage pipe - 525mm CR backfilled	-	m	375.71	-	404.67	-		m	355.00		-,	,	-	-	
Drainag	Drainage - pits	17	no.	2,325.57	39,107	2,510.70	42,220	17	no.	2,150.00		43,583	46,953	(4,476)		Quantity assumes pits @ 50m centres based upon length of pipework; Rate assumes for 600 x 900 JP, max depth 1.5m.
	Drainage - Subsoil drainage	1,682	m	23.05	38,756	26.77	45,010	3,372	m	45.00	151,740	167,680	180,646	(128,924)	(135,636)	Quantitiy & rate low - allowances include for pits and risers
	Drainage - culvert	_	no.	_	_	-	-		no.		0				-	
	Traffic Signals		Item	88,375.88		100,881.35			Item	300,000.00	0					
Traffic	Traffic Signal conduit	_	m	45.71	_	53.99			m	300,000.00	0				_	
a	Tree Planting	114	no.	259.62	29,468	322.72	36,631	169	no.	250.00	42,250	44,846	48,314	(15,378)	(11,683)	Quantity appears to be low; assumes trees @15m spacing along road length on median & nature strips (as per Cameron St Interim Cross Section)
a po	Landscaping	_	m2	20.72	-	23.48	_	3,507	m2	15.00	52,603	55,836	60,153	(55,836)	(60.153)	Quantity is low - area used assumes overall site area (as per
Landsc	Topsoil seeding	2,522		7.00	17,647	7.98	20,138	14,028		5.50	77,151	81,892	88,225	(64,245)		Site Preparation) less paved areas; Assume 20% landscape planting & 80% topsoil seeding
Street Lighting	Street lighting (all inclusive)	841		207.67	174,606	237.49	199,680	17	no.	12,000.00	204,000	225,430	242,862	(50,824)		Rate - pricing methodology differs; Quantity based upon 50m spacing along road length; Note: lighting requirements to Cycle path & SUP is excluded
	Street lighting - Intersections	-	Item / pe		-	-	-		Item / p	•	0			-	-	
	Regulatory signage	-	Item	329.29	-	365.51	-		Item	350.00	0			-	-	
Misc.	Linemarking Landscape maintenance	7,567	m2 of pa	2.40 75,000.00	18,182	2.84 86,250.00	21,474	9,273	m2 of pa	2.50		24,607 105,874	26,510 114,062	(6,425) (105,874)		Quantity appears to be low; based on new pavement quantity  Quantity missing
	Tactile pavers (hazard only)	-	Item	75,000.00	-	428.57	-	<del>                                     </del>	Item	320.00		105,874	114,002	(105,874)	(114,062)	Quantity inissing
L	ractile pavers (Hazaru Offiy)	-	iteili	55/.14	-	428.57	-		ונכווו	320.00	0			-		<u>I</u>



VPA WTP 31.10.2018

Item	Sub Item	Qty	Unit	Rate (P50)	Amount	Rate (P90)	Amount	Qty	Unit	Rate	Amount	Amount	Amount			Comments
					(P50)		(P90)					(P50)	(P90)	(P50)	(P90)	
	Service relocation and local site conditions	1	ltem	309,859.44	309,859	409,143.00	409,143		Item					309,859	409,143	Items below include for allowances for local site conditions
Other	Extra over cost for excavation in rock				-		-	1	Item	207,000.00	207,000	228,745	246,434	(228,745)	(246,434)	Additional site specific item. Assume 35% of total excavated volume to be in rock
	Extra over cost for subgrade preparation				,		-	1	Item	93,000.00	93,000	102,770	110,717	(102,770)		Additional site specific item. Assume 25% of pavement area requires additional subgrade preparation works
					-		-							-	-	
					-		-							-	-	
	Surveying & Design	1	%	5.00	107,129	5.00	120,998	1	%	5.00	167,348	\$ 183,143.70	\$ 197,305.79	(76,014)	(76,308)	% driven item
	Contingency	1	%	15.00	321,388	15.00	362,994	1	%	15.00	502,045	\$ 549,431.10	\$ 591,917.37	(228,043)	(228,923)	% driven item
>	Traffic Management	1	%	5.00	107,129	5.00	120,998	1	%	5.00	167,348	\$ 183,143.70	\$ 197,305.79	(76,014)	(76,308)	% driven item
Ver	Supervision & Project Management	1	%	9.00	192,833	9.00	217,797	1	%	9.00	301,227	\$ 329,658.66	\$ 355,150.42	(136,826)	(137,354)	% driven item
el:	Council Fees	1	%	3.25	69,634	3.25	78,649	1	%	3.25	108,776	\$ 119,043.41	\$ 128,248.76	(49,409)	(49,600)	% driven item
	Vic Roads Fees	1	%	1.00	21,426	1.00	24,200	1	%	1.00	33,470	\$ 36,628.74	\$ 39,461.16	(15,203)	(15,262)	% driven item
	Environmental Management	1	%	0.50	10,713	0.50	12,100	1	%	0.50	16,735	\$ 18,314.37	\$ 19,730.58	(7,601)	(7,631)	% driven item
	Site Establishment	1	%	2.50	53,565	2.50	60,499	1	%	2.50	83,674	\$ 91,571.85	\$ 98,652.90	(38,007)	(38,154)	% driven item
	T							_								1
TOTAL	Excluding Delivery				2,142,588		2,419,962		$\vdash$		3,346,964			(1,520,286)	(1,526,154)	
	Including Delivery				3,026,405		3,418,196				4,727,587	\$ 5,173,810	\$ 5,573,889	(2,147,404)	(2,155,692)	1

RD-02 - Gunns Gully Road: Sydney-Melbourne railway overpass to E6 / OMR reservation – Construction of 2 lane carriageway, excluding intersections (interim treatment)
Benchmark Item 1

VPA (Qty & Cost Basd on Benchmark Item 1)



WTP (Qty based on Gunns Gully Cross Rd Section - Interim)



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ltem	Sub Item	Qty	Unit	Rate (P50)	Amount	Rate (P90)	Amount	Qty	Unit	Rate	Amount	Amount	Amount	Difference (Indica has based project Item make u estimated c	p only - total	Comments
					(P50)		(P90)					(P50)	(P90)	(P50)	(P90)	
					(F30)		(F 30)					(F30)	(F30)	(150)	(130)	
orks & Earthworks	Site Preparation	-		2.39	-	2.68	-	100,450	m2	2.50	251,125	277,962	296,202	(277,962)	(296,202)	Quantity missing; Quantity based on Gunns Gully Cross Rd section - interim (2 lanes only with provision to extend to 6 lanes in the future, excluding local frontage rd). Rate includes for site clearance & topsoil removal to suit Interim design standard from edge of road reserve through centre verge.
Sitewo	Earthworks	4,200	m3	35.43	148,785	40.63	170,634	12,262	m3	39.00	478,228	529,334	564,069	(380,549)		Quantity based on Gunns Gully Rd Cross section - interim (2 lanes only with provision to extend to 6 lanes in the future).
ments	Primary Arterial Pavement	5,600	m2	157.08	879,648	171.71	961,596	17,150	m2	155.00	2,658,250	2,942,327	3,135,402	(2,062,679)	(2,173,806)	Quantity based on Gunns Gully Rd Cross section - interim (2 lanes only with provision to extend to 6 lanes in the future). Rate is low based upon nominated pavement depth.
ave	Secondary Arterial Pavement	-	m2	123.23	-	130.48	-		m2	141.00	0			-	-	
9 6	Collector Arterial Pavement	-	m2	91.07	-	100.18	-		m2	126.00	0			-	-	
loa	Subgrade preparation	-	%	15.21	-	17.86	-	17,150	m2	2.50	42,875	47,457	50,571	(47,457)	(50,571)	Quantity missing; cost item required.
<u> </u>	Pavement rehab	-	m2	45.90	-	45.90	-		m2		0			-	-	
	Pavement other	-	m2	-	-	-	-		m2		0			-	-	
	Kerb & channel	1,600		50.42	80,670	56.78	90,855	9,800		55.00	539,000	573,061	610,665	(492,391)	(519,811)	of each carriageway
rks	Cycle path	2,400	m2	59.60	143,040	69.63	167,121		m2	50.00	0			143,040	167,121	Included in Primary Arterial Pavement costs
Concrete Wor	SUP / Footpath	-	m2	58.44	-	68.10	-	18,375	m2	60.00	1,102,500	1,172,170	1,249,088	(1,172,170)	(1,249,088)	Quantity based on Gunns Gully Cross Rd section - interim (2 lanes only with provision to extend to 6 lanes in the future). Rate is low (WT has based rate on 120mm thk concrete pavement with SL72 mesh as advised by Whittlesea City Council).
	Traffic Island	-	m2	71.43	-	76.92	-		m2	60.00	0			-	-	
	Drainage pipe - 300mm CR backfilled	100	m	162.30	16,230		17,653	306	m	225.00	68,906	76,270	81,275	(60,040)	(63,622)	
	Drainage pipe - 375mm CR backfilled	350		226.68	79,339	247.84	86,743	1,072		260.00	278,688		328,712	(229,131)		Quantity based on overall road alignment length of 2,450m
	Drainage pipe - 450mm CR backfilled	350	m	291.67	102,083	322.90	113,015	1,072	m	290.00	310,844	344,062	366,640	(241,979)	(253,624)	
96	Drainage pipe - 525mm CR backfilled	-	m	375.71	-	404.67	-		m	355.00	0			-	-	
Drainag	Drainage - pits	16	no.	2,325.57	37,209	2,510.70	40,171	49	no.	2,150.00	105,350	125,828	134,084	(88,618)		Quantity assumes pits @ 50m centres based upon length of pipework; Rate assumes for 600 x 900 JP, max depth 1.5m.
	Drainage - Subsoil drainage	1,600	m	23.05	36,875	26.77	42,826	9,800	m	45.00	441,000	488,128	520,159	(451,253)	(477,333)	Quantity based on kerb length measured. Rate low - allowances include for pits and risers
	Drainage - culvert	-	no.	-	-	-	-		no.		0			-	-	
Traffic	Traffic Signals	-	Item	88,375.88	-	100,881.35	-		Item	250,000.00	0			-	-	
Traine	Traffic Signal conduit	-	m	45.71	-	53.99	-		m		0			-	-	
ape	Tree Planting	160	no.	259.62	41,538	322.72	51,635	492	no.	250.00	123,000	130,773	139,354	(89,234)	(87,719)	Quantity assumes trees @15m spacing along road length on median & nature strips (as per Gunns Gully Rd Interim Cross Section)
ndsc	Landscaping	-	m2	20.72	-	23.48	-	12,985	m2	15.00	194,775	207,083	220,672	(207,083)		Quantity assumes overall site area (as per site Preparation)
Га	Topsoil seeding	3,200	m2	7.00	22,387	7.98	25,548	51,940	m2	5.50	285,670	303,722	323,653	(281,335)		less paved areas; Assume 20% landscape planting & 80% topsoil seeding
Street Lighting	Street lighting (all inclusive)	800		207.67	166,133	237.49	189,990		no.	12,000.00	588,000	650,837	693,545	(484,704)	(503,555)	Rate - pricing methodology differs; Quantity based upon 50m spacing along road length; Note: lighting requirements to Cycle path & SUP is excluded
	Street lighting - Intersections	-	Item / p	-	-	-	-		Item / p		0					
	Regulatory signage	-	Item	329.29	-	365.51	-		Item	350.00	0					
Misc.	Linemarking	5,600	m2 of pa	2.40	13,455	2.84	15,891	17,150	m2 of pa	2.50	42,875	45,584	48,576	(32,129)	(32,684)	Quantity based on Gunns Gully Rd Cross section - interim (2 lanes only with provision to extend to 6 lanes in the future).
	Landscape maintenance	-	Item	75,000.00	-	86,250.00	-	1	Item	104,000.00	104,000	106,049	113,007	(106,049)	(113,007)	Quantity missing
	Tactile pavers (hazard only)	-		337.14	-	428.57	-		Item		0			-	-	

RD-02 - Gunns Gully Road: Sydney-Melbourne railway overpass to E6 / OMR reservation – Construction of 2 lane carriageway, excluding intersections (interim treatment)
Benchmark Item 1





31.10.2018

VPA (Qty & Cost Basd on Benchmark Item 1)

WTP (Qty based on Gunns Gully Cross Rd Section - Interim)

Item	Sub Item	Qty	Unit	Rate (P50)	Amount	Rate (P90)	Amount	Qty	Unit	Rate	Amount	Amount	Amount	Difference (Indico has based projec Item make up estimated c	t on Benchmark o only - total	Comments
					(P50)		(P90)					(P50)	(P90)	(P50)	(P90)	
					· · ·		, ,					` '	` '		, ,	
	Services reloaction				-		-		Item					-	-	Items below include for allowances for local site conditions & service protection
	Extra over cost for excavation in rock				-		-	1	Item	430,000.00	430,000	475,952	507,184	(475,952)	(507,184)	Additional site specific item. Assume 35% of total excavated volume to be in rock
(1)	Extra over cost for subgrade preparation				-		-	1	ltem	172,000.00	172,000	190,381	202,874	(190,381)	(202,874)	Additional site specific item. Assume 25% of pavement area requires additional subgrade preparation works
Othe	Protection slab for high pressure gas line				-		-	1	Item	80,000.00	80,000	88,549	94,360	(88,549)	(94,360)	WT's rate based on 45m x 1.5m wide x 150mm thk concrete protection slab including non-destructive digging & gas authority costs
	Allowance for additional protection for conservation area				-		-	1	Item	10,000.00	10,000	11,069	11,795	(11,069)	(11,795)	Allowance for additional protection during construction
	Surveying & Design	1	%	5.00	88,370	5.00	98,684	1	0/	5.00	415,354	\$ 454,753.41	\$ 484,594.38	(366,384)	(205.010)	% driven item
	Contingency	1	%	15.00	265,109		296,052	1	%	15.00	· · · · · · · · · · · · · · · · · · ·	\$ 1,364,260.23	,	(1,099,151)		% driven item
	Traffic Management	1	%	5.00	88,370		98,684	1	%	5.00	415,354		\$ 484,594.38	(366,384)		% driven item
	Supervision & Project Management	1	%	9.00	159,065		177,631	1	%	9.00	747,638	, ,	,	(659,491)		% driven item
Deli	Council Fees	1	%	3.25	57,440	3.25	64,145	1	%	3.25	269,980	\$ 295,589.72	\$ 314,986.35	(238,149)	(250,842)	% driven item
	Vic Roads Fees	1	%	1.00	17,674	1.00	19,737	1	%	1.00	83,071	\$ 90,950.68	\$ 96,918.88	(73,277)	(77,182)	% driven item
	Environmental Management	1	%	0.50	8,837	0.50	9,868	1	%	0.50	41,535	. ,	\$ 48,459.44	(36,638)	, , ,	% driven item
	Site Establishment	1	%	2.50	44,185	2.50	49,342	1	%	2.50	207,677	\$ 227,376.70	\$ 242,297.19	(183,192)	(192,955)	% driven item
	Excluding Delivery		<u> </u>		1,767,394	<u> </u>	1,973,679			-	8,307,085	9,095,068	9,691,888	(7,327,674)	(7,718,209)	1
TOTAL	Including Delivery				2,496,445		2,787,821		<del>                                     </del>		11,733,758	12,846,784	13,689,791	(10,350,339)	(10,901,970)	
	melading belivery				2,730,773		2,707,021				11,733,730	12,040,704	13,003,731	(10,000,000)	(10,301,370)	J



1,862 m

VPA WTP

Item	Sub Item	Qty	Unit	Rate (P50)	Amount	Rate (P90)	Amount	Qty	Unit	Rate	Amount	Amount	Amount	Diffe	rence	Comments
					(P50)		(P90)					(P50)	(P90)	(P50)	(P90)	
vorks & hworks	Site Preparation	-	%	2.39	-	2.70	-	70,384	m2	2.50	175,959	194,795	207,214	(194,795)	(207,214)	Quantity missing; Rate includes for site clearance & topsoil removal to suit Ultimate design standard to full width of road reserve.
Sitew Earth	Demolition of existing pavements								m2	25.00	0			-	-	
	Earthworks	11,982	m3	35.43	424,461	40.63	486,793.70	8,277	m3	39.00	322,787	357,340	380,122	67,121	106 671	Quantity low based upon differences to pavement areas (refer comments below)
	Primary Arterial Pavement	-	m2	157.08	-	171.71	-		m2	155.00	0			-	-	
ad Paven	Secondary Arterial Pavement	16,758	m2	123.23	2,065,070	130.48	2,186,544.71	13,034	m2	141.00	1,837,794	2,034,523	2,164,234	30,546	22,311	Quantity is low based upon WT measured areas; pavement area assume to include chevron and on road bike path areas (2 lane carriageway only with provision to extend to 4 lane in the future, excluding local frontage road as per Patterson Dr Interim Cross Section)  Rate is low based upon nominated pavement depth.
&	Collector Arterial Pavement	-	m2	91.07	-	100.18	-		m2	126.00				-	-	
	Subgrade preparation	-	%	15.21	-	17.86	-	13,034	m2	2.50	32,585	36,073	38,373	(36,073)	(38,373)	Quantity missing; cost item required.
	Pavement rehab	-	m2	45.90	-	45.90	-		m2		0			-	-	
	Pavement other	-	m2	-	-	-	-		m2		0			-	-	
	Kerb & channel	3,724	m	50.42	187,761	56.78	211,463.93	7,448	m	55.00	409,640	435,597	463,369	(247,837)	(751 U(151)	Quantity is low based upon WT measured lengths; assume kerb / channel on both sides of each carriageway
<u> </u>	Cycle path	-	m2	59.60	-	69.63	-		m2	50.00	0			-	-	
Concrete Works	SUP / Footpath	3,724	m2	58.44	217,645	68.10	253,594.97	11,172		60.00	670,320	712,796	758,240	(495,151)	(504,645)	Quantity is low based upon WT measured areas; pavement area assume to 3m wide SUP on both side of road Rate is low (WT has based rate on 120mm thk concrete pavement with SL72 mesh as advised by Whittlesea City Council).
	Traffic Island		m2	71.43	-	76.92	-		m2	60.00	0			-	-	
	Drainage pipe - 300mm CR backfilled	233		162.30	37,775	176.53	41,087.18	233		225.00	52,369	57,975	61,671	(20,199)	(20,584)	
	Drainage pipe - 375mm CR backfilled	815		226.68	184,661	247.84	201,893.33	815		260.00		234,475	249,424	(49,814)		Rate appears to be low
	Drainage pipe - 450mm CR backfilled	815	m	291.67	237,599	322.90	263,043.45	815	m	290.00	236,241	261,530	278,204	(23,931)	(15,160)	
Drainage	Drainage pipe - 525mm CR backfilled  Drainage - pits		m no.	375.71 2,325.57	86,604	404.67 2,510.70	93,498.56	38	m no.	355.00 2,150.00	81,700	97,596	103,819	(10,992)	(10,320)	Quantity assumes pits @ 50m centres based upon length of pipework; Rate assumes for 600 x 900 JP, max depth 1.5m.
	Drainage - Subsoil drainage	3,724	m	23.05	85,827	26.77	99,677.43	7,448	m	45.00	335,160	371,038	394,693	(285,211)		Quantitiy & rate low - allowances include for pits and risers
	Drainage - culvert		no.	-	-	-	-		no.		0			-	-	
Traffic	Traffic Signals		Item	88,375.88	-	100,881.35	-		Item	300,000.00	0			-	-	
	Traffic Signal conduit	-	m	45.71	-	53.99	-		m		0			-	-	O continuous de la la continuous de la c
scape	Tree Planting	154	no.	259.62	40,067	322.72	49,806.00	375	no.	250.00	93,750	99,691	106,046	(59,624)	(56,240)	Quantity appears to be low; assumes trees @15m spacing along road length on median & nature strips (as per Patterson Dr Interim Cross Section)
an de	Landscaping	-	m2	20.72	- ]	23.48	- ]	9,236	m2	15.00	138,533	147,311	156,703	(147,311)	(156,703)	Quantity is low - area used assumes overall site area (as per
ت	Topsoil seeding	5,586	m2	7.00	39,080	7.98	44,597.46	36,942	m2	5.50	203,181	216,056	229,831	(176,977)	(125 222)	Site Preparation) less paved areas; Assume 20% landscape planting & 80% topsoil seeding
Street Lighting	Street lighting (all inclusive)	1,862		207.67	386,676	237.49	442,202.77		no.	12,000.00		504,813	536,997	(118,138)	(94,795)	Rate - pricing methodology differs; Quantity based upon 50m spacing along road length; Note: lighting requirements to Cycle path & SUP is excluded
	Street lighting - Intersections		Item / pe	-		-			Item / pe	er leg	0				-	
	Regulatory signage		Item	329.29		365.51	-		Item	350.00	0			-	-	
Misc.	Linemarking	16,758	m2 of pa		40,265	2.84	47,554.69	13,034	m2 of pa		32,585	34,650	36,859	5,615	10,696	Quantity appears to be low; based on new pavement quantity
≥	Landscape maintenance	-	Item	75,000.00	-	86,250.00	-	1	Item	104,000.00	104,000	106,066	112,828	(106,066)	(112,828)	Quantity missing
	Tactile pavers (hazard only)	-	Item	337.14	-	428.57	-		Item	320.00	0			-	-	
	Service relocation and local site conditions	1	ltem	393,469.18	393,469	477,971.00	477,971.00		Item					393,469	477,971	Items below include for allowances for local site conditions & service protection

VPA Benchmarked Infrastructure Costings - Independent Peer Review

RD-03 - Patterson Drive: Donnybrook Road to Merri Creek – Construction of 2 lane carriageway, excluding intersections (interim treatment)



1,862 m

VPA WTP 31.10.2018

Item	Sub Item	Qty	Unit	Rate (P50)	Amount	Rate (P90)	Amount	Qty	Unit	Rate	Amount	Amount	Amount	Diffe	rence	Comments
					(P50)		(P90)					(P50)	(P90)	(P50)	(P90)	
ther	Extra over cost for excavation in rock				-		-		1 Item	290,000.00	290,000	321,043	341,512	(321,043)	(341,512)	Additional site specific item. Assume 35% of total excavated volume to be in rock
Ó	Extra over cost for subgrade preparation				1		-		1 Item	131,000.00	131,000	145,023	154,269	(145,023)	(154,269)	Additional site specific item. Assume 25% of pavement area requires additional subgrade preparation works
	Allowance for additional protection for conservation area				-		-		1 Item	10,000.00	10,000	11,070	11,776	(11,070)	(11,776)	Allowance for additional protection during construction
					-		-							-	-	
	Surveying & Design	1	%	5.00	221,348	5.00	244,986		1 %	5.00				(97,625)		% driven item
	Contingency	1	%	15.00	664,044	15.00	734,959		1 %	15.00	, i		\$ 1,017,927.61	(292,875)		% driven item
>	Traffic Management	1	%	5.00	221,348		244,986		1 %	5.00	291,270	\$ 318,973.12	\$ 339,309.20	(97,625)	(94,323)	% driven item
ver	Supervision & Project Management	1	%	9.00	398,426	9.00	440,976		1 %	9.00	524,287	\$ 574,151.62	\$ 610,756.57	(175,725)	(169,781)	% driven item
eli	Council Fees	1	%	3.25	143,876	3.25	159,241		1 %	3.25	189,326	\$ 207,332.53	\$ 220,550.98	(63,456)	(61,310)	% driven item
٥	Vic Roads Fees	1	%	1.00	44,270	1.00	48,997		1 %	1.00	58,254	\$ 63,794.62	\$ 67,861.84	(19,525)	(18,865)	% driven item
	Environmental Management	1	%	0.50	22,135	0.50	24,499		1 %	0.50	29,127	\$ 31,897.31	\$ 33,930.92	(9,763)	(9,432)	% driven item
	Site Establishment	1	%	2.50	110,674	2.50	122,494		1 %	2.50	145,635	\$ 159,486.56	\$ 169,654.60	(48,813)	(47,161)	% driven item
			-		•	-	-		_				-		-	_
TOTAL	Excluding Delivery				4,426,959		4,899,729			·	5,825,407	\$ 6,379,462	\$ 6,786,184	(1,952,503)	(1,886,455)	
IOIAL	Including Delivery				6,253,080		6,920,868				8,228,387	\$ 9,010,991	\$ 9,585,485	(2,757,911)	(2,664,618)	



VPA WTP

Item Sub Item Qty Unit Rate (P50) Amount Rate (P90) A						Amount Oty Unit Rate Amount Amount Difference Comments										
Item	Sub Item	Qty	Unit	Rate (P50)		Rate (P90)	Amount	Qty	Unit	Rate	Amount	Amount	Amount		_	Comments
					(P50)		(P90)					(P50)	(P90)	(P50)	(P90)	
vorks & hworks	Site Preparation	-	%	2.39	-	2.70	-	29,408	m2	2.50	73,521	81,208	87,448	(81,208)	(87,448)	Quantity missing; Rate includes for site clearance & topsoil removal to suit Ultimate design standard to full width of road reserve.
Sitev Eart	Demolition of existing pavements								m2	25.00	0			-	-	
S	Earthworks	5,006	m3	35.43	177,352.78	40.63	203,397.15	5,434	m3	39.00	211,939	234,098	252,086	(56,745)	(48,689)	Quantity low based upon differences to pavement areas (refer comments below)
	Primary Arterial Pavement	-	m2	157.08	-	171.71	-		m2	155.00	0			-	-	
oad Pavements	Secondary Arterial Pavement	7,002	m2	123.23	862,848.68	130.48	913,604.61	8,558	m2	141.00	1,206,678	1,332,843	1,435,259	(469,994)	(521,654)	Quantity is low based upon WT measured areas; pavement area assume to include chevron and on road bike path areas (2 lane carriageway only with provision to extend to 4 lane in the future, excluding local frontage road as per Patterson Dr Interim Cross Section) Rate is low based upon nominated pavement depth.
ĕ	Collector Arterial Pavement	-	m2	91.07	-	100.18	-		m2	126.00	0			-	-	
	Subgrade preparation	-	%	15.21	-	17.86	-	8,558	m2	2.50	21,395	23,632	25,448	(23,632)	(25,448)	Quantity missing; cost item required.
	Pavement rehab	-	m2	45.90	-	45.90	-		m2		0			-	-	
	Pavement other	1	m2	-	-	-	-		m2		0			-	-	
	Kerb & channel	1,556	m	50.42	78,452.04	56.78	88,356.04	3,112	m	55.00	171,160	181,596	195,550	(103,144)	(111) 1 U/I	Quantity is low based upon WT measured lengths; assume kerb / channel on both sides of each carriageway
rks	Cycle path	-	m2	59.60	-	69.63	-		m2	50.00	0			-	-	
Concrete Wor	SUP / Footpath	1,556	m2	58.44	90,938.57	68.10	105,959.66	4,668	m2	60.00	280,080	297,157	319,991	(206,219)	(214,032)	Quantity is low based upon WT measured areas; pavement area assume to 3m wide SUP on both side of road Rate is low (WT has based rate on 120mm thk concrete pavement with SL72 mesh as advised by Whittlesea City Council).
	Traffic Island	-	m2	71.43	-	76.92	-		m2	60.00	0			-	-	
	Drainage pipe - 300mm CR backfilled	97		162.30	15,783.68	176.53	17,167.47	97		225.00		24,169	26,026	(8,385)	(8,859)	
	Drainage pipe - 375mm CR backfilled	340	m	226.68	77,157.01	247.84	84,357.15	340	m	260.00	88,498	97,750	105,262	(20,593)	(20,904)	
	Drainage pipe - 450mm CR backfilled	340	m	291.67	99,276.04	322.90	109,907.52	340	m	290.00	98,709	109,029	117,407	(9,753)	(7,500)	
зgе	Drainage pipe - 525mm CR backfilled	-	m	375.71	-	404.67	-		m	355.00	0			-	-	
Draina	Drainage - pits	16	no.	2,325.57	36,185.89	2,510.70	39,066.53	16	no.	2,150.00	34,400	41,001	44,151	(4,815)	(5,085)	Quantity assumes pits @ 50m centres based upon length of pipework; Rate assumes for 600 x 900 JP, max depth 1.5m.
	Drainage - Subsoil drainage	1,556	m	23.05	35,861.13	26.77	41,648.25	3,112	m	45.00	140,040	154,682	166,568	(118,821)	(124,920)	Quantitiy & rate low - allowances include for pits and risers
	Drainage - culvert	-	no.	-	-	-	-		no.		0			-	-	
Traffic	Traffic Signals	-	Item	88,375.88	-	100,881.35	-		Item	300,000.00	0			-	-	
	Traffic Signal conduit	-	m	45.71	-	53.99	-		m		0			-	-	
scape	Tree Planting	105	no.	259.62	27,267.40	322.72	33,895.22	156	no.	250.00	39,000	41,378	44,557	(14,111)	(10,662)	Quantity appears to be low; assumes trees @15m spacing along road length on median & nature strips (as per Pattersor Dr Interim Cross Section)
pu	Landscaping	-	m2	20.72	-	23.48	-	3,236	m2	15.00	48,547	51,507	55,465	(51,507)	(33,403)	Quantity is low - area used assumes overall site area (as per
្ន	Tonsoil sooding	2,334	m2	7.00	16,328.66	7.98	18,634.17	12,946	m2	5.50	71,203	75,544	81,349	(59,215)		Site Preparation) less paved areas;
	Topsoil seeding	2,334	IIIZ	7.00	10,328.00	7.98	18,034.17	12,940	IIIZ	5.50	71,203	75,544	81,349	(59,215)	(02,715)	Assume 20% landscape planting & 80% topsoil seeding
Street Lighting	Street lighting (all inclusive)	778	m	207.67	161,564.80	237.49	184,765.71	16	no.	12,000.00	192,000	212,075	228,371	(50,510)	(43,605)	Rate - pricing methodology differs; Quantity based upon 50m spacing along road length; Note: lighting requirements to Cycle path & SUP is excluded
	Street lighting - Intersections	-	Item / pe	-	-	-	-		Item / pe	er leg	0			-	-	
	Regulatory signage	-	Item	329.29	-	365.51	-		Item	350.00	0			-	-	
SC.	Linemarking	7,002	m2 of pa	2.40	16,823.90	2.84	19,869.79	8,558	m2 of pa	2.50	21,395	22,700	24,444	(5,876)	(4,574)	Quantity appears to be low; based on new pavement quantity
Ξ	Landscape maintenance	_	Item	75,000.00	_	86,250.00	_	1	Item	104,000.00	104,000	105,827	113,959	(105,827)	(113 959)	Quantity missing
	Tactile pavers (hazard only)		Item	337.14	_	428.57		<u> </u>	Item	320.00	,	103,027	113,333	(±05,027)	(113,333)	
<u>.</u>	Service relocation and local site conditions	1	Item	158,974.31	158,974.31	192,465.00	192,465.00		ltem	320.00	0			158,974	192,465	Items below include for allowances for local site conditions
<b>7</b> 1																



VPA WTP

Item	Sub Item	Qty	Unit	Rate (P50)	Amount	Rate (P90)	Amount	Qty	Unit	Rate	Amount	Amount	Amount	Differ	ence	Comments
					(P50)		(P90)					(P50)	(P90)	(P50)	(P90)	
Othe	Extra over cost for excavation in rock				-		-	1	Item	191,000.00	191,000	210,970	227,181	(210,970)	(227,181)	Additional site specific item. Assume 35% of total excavated volume to be in rock
	Extra over cost for subgrade preparation						-	1	Item	86,000.00	86,000	94,992	102,291	(94,992)	(102 201)	Additional site specific item. Assume 25% of pavement area requires additional subgrade preparation works
					-		-							-	-	
	Surveying & Design	1	%	5.00	92,741	5.00	102,655	1	%	5.00	155,072	\$ 169,607.93	\$ 182,640.67	(76,867)	(79,986)	% driven item
	Contingency	1	%	15.00	278,222	15.00	307,964	1	%	15.00	465,217	\$ 508,823.78	\$ 547,922.02	(230,602)	(239,958)	% driven item
>	Traffic Management	1	%	5.00	92,741	5.00	102,655	1	%	5.00	155,072	\$ 169,607.93	\$ 182,640.67	(76,867)	(79,986)	% driven item
ver	Supervision & Project Management	1	%	9.00	166,933	9.00	184,778	1	%	9.00	279,130	\$ 305,294.27	\$ 328,753.21	(138,361)	(143,975)	% driven item
eli	Council Fees	1	%	3.25	60,281	3.25	66,726	1	%	3.25	100,797	\$ 110,245.15	\$ 118,716.44	(49,964)	(51,991)	% driven item
	Vic Roads Fees	1	%	1.00	18,548	1.00	20,531	1	%	1.00	31,014	\$ 33,921.59	\$ 36,528.13	(15,373)	(15,997)	% driven item
	Environmental Management	1	%	0.50	9,274	0.50	10,265	1	%	0.50	15,507	\$ 16,960.79	\$ 18,264.07	(7,687)	(7,999)	% driven item
	Site Establishment	1	%	2.50	46,370	2.50	51,327	1	%	2.50	77,536	\$ 84,803.96	\$ 91,320.34	(38,434)	(39,993)	% driven item
																•
TOTAL	Excluding Delivery				1,854,815		2,053,094				3,101,445	\$ 3,392,159	\$ 3,652,813	(1,537,344)	(1,599,719)	
I	Including Delivery				2,619,926		2,899,995	_			4,380,791	\$ 4,791,424	\$ 5,159,599	(2,171,498)	(2,259,603)	

RD-05 - Koukoura Drive: Donnybrook Road to Gunns Gully Road - Construction of 2 lane carriageway, excluding intersections (interim treatment)
Benchmark Item 2

VPA (Qty & Cost Basd on Benchmark Item 2)

1,136 m

#### WTP (Qty based on Koukoura Dr Cross Section - Interim)



31.10.2018

Difference (Indicative only as VAF has based project on Benchmark Rate (P90) Unit Rate Item Sub Item Qty Unit Rate (P50) **Amount** Amount Qty Amount **Amount** Amount Comments Item make up only - total estimated cost differs) (P50) (P90) (P50) (P90) (P50) Quantity missing; Quantity based on Koukoura Dr Cross section - interim (2 & Earthwor lanes only with provision to extend to 4 lanes in the future, Site Preparation 2.39 2.70 38,624 m2 2.50 96,560 106,987 113,687 (106,987)excluding local frontage rd). Rate includes for site clearance & opsoil removal to suit Interim design standard from edge of road reserve through centre verge Quantity based on Koukoura Dr Cross section - interim (2 5,148 m3 182,368 7,606 m3 Earthworks 35.43 40.63 209,149 39.00 296,615 328,646 349,227 (146,278)(140,078) lanes only with provision to extend to 4 lanes in the future, excluding local frontage rd). Primary Arterial Pavement m2 157.08 171.71 155.00 m2 Quantity based on Koukoura Dr Cross section - interim (2) Secondary Arterial Pavement 7,200 m2 123.23 887,248 130.48 939,439 7,952 m2 141.00 1,121,232 1,242,312 1,320,108 (355,064) (380,668) lanes only with provision to extend to 4 lanes in the future). Rate is low based upon nominated pavement depth. 100.18 126.00 Collector Arterial Pavement m2 91.07 m2 Quantity based on Koukoura Dr Cross section - interim (2) 15.21 7,952 m2 2.50 22,027 23,406 (22,027)Subgrade preparation 17.86 19,880 (23,406)anes only with provision to extend to 4 lanes in the future). Pavement rehab m2 45.90 45.90 m2 Pavement other WT measured lengths; assume kerb / channel on both sides 1,600 50.42 Kerb & channel 80,670 56.78 90,855 4,544 m 55.00 249,920 265,983 282,639 (185,312) (191,784) of each carriageway 59.60 69.63 50.00 Cycle path m2 Quantity based on Koukoura Dr Cross section - interim. Rate is low (WT has based rate on 120mm thk concrete SUP / Footpath 1,600 m2 58.44 93,510 68.10 108,956 8,520 m2 60.00 511,200 544,056 578,125 (450,545)pavement with SL72 mesh as advised by Whittlesea City Council). 60.00 Traffic Island m2 71 43 76.92 m2 Drainage pipe - 300mm CR backfilled 100 m 162.30 16.230 176.53 17.653 225.0 142 31.95 (19.17) Drainage pipe - 375mm CR backfilled 350 m 226.68 79,339 247.84 86,743 497 260.00 129,220 143,174 152,140 (63,835 (65,397) Quantity based on overall road alignment length of 1136m 497 Drainage pipe - 450mm CR backfilled 350 m 291.67 102,083 322.90 113,015 290.00 144,130 159,694 169,695 (57,611)(56,679) Drainage pipe - 525mm CR backfilled 375.71 404.67 355.00 Quantity assumes pits @ 50m centres based upon length of 2,325.57 37,209 40,171 2,150.00 Drainage - pits 16 no. 2,510.70 23 no. 49,450 59,122 62,824 (21,913)(22,653) pipework; ate assumes for 600 x 900 JP, max depth 1.5m. Quantity based on kerb length measured. Rate low -1,600 m 42,826 4,544 m Drainage - Subsoil drainage 23.05 36,875 26.77 45.00 204,480 226,562 240,749 (189,686) (197,923) allowances include for pits and risers Drainage - culvert no. 88,375.88 100,881.35 260,000.00 Traffic Signals Item Item Traffic Traffic Signal conduit 45.71 53.99 m Quantity assumes trees @15m spacing along road length on Tree Planting 108 no. 259.62 28,038 322.72 34,854 228 no. 250.00 57,000 60,663 64,462 (32,625) (29,609) median & nature strips (as per Koukoura Dr Interim Cross (75,156) Quantity assumes overall site area (as per Site Preparation) Landscaping m2 20.72 23.48 4,430 m2 15.00 66,456 70,727 75,156 (70,727 2,400 m2 7.00 16,790 7.98 19,161 17,722 m2 5.50 103,733 110,229 (86,943) 97,469 (91,068) Assume 20% landscape planting & 80% topsoil seeding Topsoil seeding Rate - pricing methodology differs; Street Street lighting (all inclusive) 800 m 207.67 166,133 237.49 189,990 23 no. 12,000.00 276,000 305,805 324,955 (139,671)(134,964) Quantity based upon 50m spacing along road length; Note: lighting requirements to Cycle path & SUP is excluded Lighting Street lighting - Intersections Item / p Item / per leg Regulatory signage 329.29 365.51 350.00 Item Item Quantity based on Koukoura Dr Cross section - interim (2 2.84 22,483 7,200 m2 of 2.40 17,300 20,432 7,952 m2 of 2.50 19,880 21,158 (3,858)(2,051)Linemarking anes only with provision to extend to 4 lanes in the future). 86,250.00 104,000.00 112,804 Landscape maintenance Item 75,000.00 Item 104,000 106,156 (106, 156)(112,804) Quantity missing 337.14 428 57 Tactile pavers (hazard only)

### VPA Benchmarked Infrastructure Costings - Independent Peer Review

RD-05 - Koukoura Drive: Donnybrook Road to Gunns Gully Road - Construction of 2 lane carriageway, excluding intersections (interim treatment)
Benchmark Item 2

VPA (Qty & Cost Basd on Benchmark Item 2)

1,136 <u>m</u>

WTP (Qty based on Koukoura Dr Cross Section - Interim)

31.10.2018

WT PARTNERSHIP

Item	Sub Item	Qty	Unit	Rate (P50)	Amount	Rate (P90)	Amount	Qty	Unit	Rate	Amount	Amount	Amount	Difference (Indico has based project Item make up estimated c	t on Benchmark p only - total	Comments
					(P50)		(P90)					(P50)	(P90)	(P50)	(P90)	
	Extra over cost for excavation in rock				-		-	1	Item	267,000.00	267,000	295,833	314,358	(295,833)	1374 3581	Additional site specific item. Assume 35% of total excavated volume to be in rock
Other	Extra over cost for subgrade preparation				-		-	1	Item	80,000.00	80,000	88,639	94,190	(88,639)	(94,190)	Additional site specific item. Assume 25% of pavement area requires additional subgrade preparation works
					-		-									
	Surveying & Design	1	%	5.00	87,190	5.00	95,662	1	%	5.00	191,122		\$ 222,442.68	(122,144)		% driven item
	Contingency	1	%	15.00	261,569		,	1	%	15.00	573,366		\$ 667,328.03	(366,432)		% driven item
>	Traffic Management	1	%	5.00	87,190		,	1	%	5.00	191,122	. ,	\$ 222,442.68	(122,144)		% driven item
Ver	Supervision & Project Management	1	%	9.00	156,942			1	%	9.00		\$ 376,801.02	\$ 400,396.82	(219,859)		% driven item
Seli	Council Fees	1	%	3.25	56,673	3.25	62,180	1	%	3.25	124,229	\$ 136,067.03	\$ 144,587.74	(79,394)		% driven item
	Vic Roads Fees	1	%	1.00	17,438	1.00	19,132	1	%	1.00	38,224	\$ 41,866.78	\$ 44,488.54	(24,429)		% driven item
	Environmental Management	1	%	0.50	8,719	0.50	9,566	1	%	0.50	19,112	\$ 20,933.39	\$ 22,244.27	(12,214)		% driven item
	Site Establishment	1	%	2.50	43,595	2.50	47,831	1	%	2.50	95,561	\$ 104,666.95	\$ 111,221.34	(61,072)	(63,390)	% driven item
	le i i o i				4 742 705		4 040 040				2 222 442	4.406.670	4 440 054	(2.442.000)	(2.525.640)	1
TOTAL	Excluding Delivery				1,743,795		1,913,243				3,822,442	4,186,678	4,448,854	(2,442,883)		
	Including Delivery				2,463,110		2,702,456				5,399,199	5,913,683	6,284,006	(3,450,572)	(3,581,549)	



VPA WTP 31.10.2018

Item	Sub Item	Qty	Unit	Rate (P50)	Amount	Rate (P90)	Amount	Qty	Unit	Rate	Amount	Amount	Amount	Diffe	erence	Comments
					(P50)		(P90)					(P50)	(P90)	(P50)	(P90)	
orks & nworks	Site Preparation	-	%	2.39	-	2.60	-	29,335	m2	2.50	73,338	81,212	86,424	(81,212)	(86,424)	Quantity missing;  Rate includes for site clearance & topsoil removal to suit  Ultimate design standard to full width of road reserve.
Sitew Earth	Demolition of existing pavements							5,676	m2	25.00	141,900	157,137	167,221	(157,137)	(167,221)	New item - Demolition of Existing Donnybrook Rd
Si	Earthworks	6,106	m3	35.43	216,309	39.04	238,367	6,646	m3	39.00	259,181	287,011	305,429	(70,703)	(67,062)	Quantity low based upon differences to pavement areas (refer comments below)
nents	Primary Arterial Pavement	5,250	m2	157.08	824,687	167.24	878,025	7,638		155.00	1,183,890	1,311,014	1,395,143	(486,327)	(517,118)	Quantity is low based upon WT measured areas; Donnybrook Rd measured as primary arterial road. Rate is low based upon nominated pavement depth.
Ver	Secondary Arterial Pavement		m2	123.23	-	128.26	-		m2	141.00	0			-	-	
l Pa	Collector Arterial Pavement	3,290	m2	91.07	299,625	100.18	329,587	2,214	m2	126.00	278,964	308,919	328,742	(9,294)	845	Quantity is high
Road	Subgrade preparation	-	%	15.21	-	17.05	-	9,852		2.50	24,630	27,275	29,025	(27,275)	(29,025)	Quantity missing; Rate - pricing methodology differs, m2 v %
	Pavement rehab	-	m2	45.90	-		-		m2		0			-	-	
	Pavement other	2.050	m2	- 50.42	140.726	F4.04	161 775	2.614	m2	FF 00	142.770	152.026	162 720	- (4.100)	- (0.6.4)	O continuis local accordance MCT accorded by other
y,	Kerb & channel	2,950 2,370		50.42 59.60	148,736 141,252	54.84 66.57	161,775 157,765	2,614	m m2	55.00 50.00	143,770	152,926	162,739	(4,190) 141,252	157,765	Quantity is low based upon WT measured lengths
ncrete Work	Cycle path SUP / Footpath	1,120		58.44	65,457	65.15	72,965	4,628		60.00	277,680	295,364	314,318	(229,907)		Quantity is very low, scope to be confirmed. Rate is low (WT has based rate on 120mm thk concrete pavement with SL72 mesh as advised by Whittlesea City Council).
<b>.</b>	Traffic Island	2,890	m2	71.43	206,442	75.24	217,446	220	m2	60.00	13,200	14,041	14,942	192,402	202,505	Quantity high; extent of islands at intersection to be confirmed
	Drainage pipe - 300mm CR backfilled	290	m	162.30	47,067	172.18	49,932	278	m	225.00	62,550	69,267	73,711	(22,200)	(23,779)	Quantity assumed to run through Collector Arterial
	Drainage pipe - 375mm CR backfilled	-	m	226.68	-	241.37	-		m	260.00	0			-	-	
a	Drainage pipe - 450mm CR backfilled	730	m	291.67	212,917	313.36	228,750	537	m	290.00	155,730	172,452	183,518	40,465	45,232	Quantity assumed to run through Primary Arterial
Jag	Drainage pipe - 525mm CR backfilled	-	m	375.71	-	395.82	-		m	355.00	0			-	-	
Drair	Drainage - pits	33	no.	2,325.57	76,744	2,454.13	80,986	16	no.	2,150.00	34,400	41,106	43,743	35,638	37,243	Quantity assumes pits @ 50m centres based upon length of pipework; Rate assumes for 600 x 900 JP, max depth 1.5m.
	Drainage - Subsoil drainage	3,440	m	23.05	79,282	25.63	88,166	2,614	m	45.00	117,630	130,261	138,620	(50,979)	(50,454)	rate low - allowances include for pits and risers. Quantity quite high
	Drainage - culvert	-	no.	-	-		-		no.		0			-	-	
Traffic	Traffic Signals	4	ltem	88,375.88	353,504	97,059.82	388,239	1	Item	300,000.00	300,000	332,214	353,532	21,290	34,707	X-Intersection
	Traffic Signal conduit	-	m	45.71	-	51.46	-		m		0			-	-	
ape	Tree Planting		no.	259.62	25,442	303.44	29,737		no.	250.00	14,500	15,423	16,413	10,019	13,324	wide
osp	Landscaping	5,000	m2	20.72	103,583	22.64	113,190	2,927	m2	15.00	43,905	46,701	49,698	56,882	63,492	Quantity is low - area used assumes overall site area (as per
Lar	Topsoil seeding	5,000	m2	7.00	34,980	7.68	38,410	11,708	m2	5.50	64,394	68,495	72,890	(33,515)	(34,481)	Site Preparation) less paved areas; Assume 20% landscape planting & 80% topsoil seeding
Street Lighting	Street lighting (all inclusive)	-	m	207.67	-	228.38	-	24	no.	12,000.00	288,000	318,925	339,391	(318,925)	(339,391)	Rate - pricing methodology differs; Quantity based upon 50m spacing along road length + intersection; Note: lighting requirements to Cycle path & SUP is excluded
	Street lighting - Intersections		Item / p		-		-		Item / p		0			-	-	
	Regulatory signage		Item	329.29	5,269	354.44	5,671		Item	350.00	5,600	5,957	6,339	(688)		Quantity - ok
ن	Linemarking	8,540	m2 of pa	2.40	20,519	2.70	23,099	9,852	m2 of pa	2.50	24,630	26,199	27,880	(5,679)	(4,781)	)
Misc	Landscape maintenance		ltem	75,000.00	75,000	86,250.00	86,250	1	Item	104,000.00	104,000	108,357	115,310	(33,357)	(29,060)	\$1000 (assumes 1 man + venicle x 1 day/wk)
	Tactile pavers (hazard only)	24	Item	337.14	8,091	400.63	9,615	16	Item	320.00	5,120	5,670	6,034	2,422	3,581	WT measure variance
Other	Service relocation	1	ltem	125,373.07	125,373	142,200.87	142,201	1	ltem	116,000.00	116,000	128,456	136,699	(3,083)	5,502	Rate appears to be high, WT's rate is based off 100m for OH Electrical power to be removed / relocated as well as relocation of comms during works to IN-01 (extent based on Donnybrook-Woodstock ICP Plan)
	Remove - existing fencing							1034	m	18.00	18,612	20,611	21,933	(20,611)	(21,933)	Quantiy missing - WT allowance
	Tie into existing pavements							2	no.	25,000.00	50,000	55,369	58,922	(55,369)	(58,922)	iegs)
	Surveying & Design	1	%	5.00	153,514	5.00	167,009	1	%	5.00	190,081	. ,	\$ 222,430.72	(55,504)	, , ,	% driven item
	Contingency	1	%	15.00	460,542	15.00	501,027	1	%	15.00	570,243	\$ 627,053.98	\$ 667,292.16	(166,512)	(166,266)	% driven item



VPA	WTP

Item	Sub Item	Qty	Unit	Rate (P50)	Amount	Rate (P90)	Amount
					(P50)		(P90)
^	Traffic Management	1	%	5.00	153,514	5.00	167,009
ver	Supervision & Project Management	1	%	9.00	276,325	9.00	300,616
Delive	Council Fees	1	%	3.25	99,784	3.25	108,556
	Vic Roads Fees	1	%	1.00	30,703	1.00	33,402
	Environmental Management	1	%	0.50	15,351	0.50	16,701
	Site Establishment	1	%	2.50	76,757	2.50	83,504

Qty	Unit	Rate	Amount	Amount	Amount	Diffe	erence	Comments
				(P50)	(P90)	(P50)	(P90)	
1	%	5.00	190,081	\$ 209,017.99	\$ 222,430.72	(55,504)	(55,422)	% driven item
1	%	9.00	342,146	\$ 376,232.39	\$ 400,375.30	(99,907)	(99,759)	% driven item
1	%	3.25	123,553	\$ 135,861.70	\$ 144,579.97	(36,078)	(36,024)	% driven item
1	%	1.00	38,016	\$ 41,803.60	\$ 44,486.14	(11,101)	(11,084)	% driven item
1	%	0.50	19,008	\$ 20,901.80	\$ 22,243.07	(5,550)	(5,542)	% driven item
1	%	2.50	95,041	\$ 104,509.00	\$ 111,215.36	(27,752)	(27,711)	% driven item

(1,108,437)

(1,565,668)

(1,110,080) (1,567,989)

e e	Council rees	1 %	3.25	99,784	3.25	108,556	1 %	3.25	123,553	\$ 135,861.70	\$ 144,579.97	
	Vic Roads Fees	1 %	1.00	30,703	1.00	33,402	1 %	1.00	38,016	\$ 41,803.60	\$ 44,486.14	
	Environmental Management	1 %	0.50	15,351	0.50	16,701	1 %	0.50	19,008	\$ 20,901.80	\$ 22,243.07	
	Site Establishment	1 %	2.50	76,757	2.50	83,504	1 %	2.50	95,041	\$ 104,509.00	\$ 111,215.36	
TOTAL	Excluding Delivery			3,070,279		3,340,177			3,801,623	\$ 4,180,360	\$ 4,448,614	$\overline{}$
IOTAL	Including Delivery			4,336,770		4,718,000			5,369,793	\$ 5,904,758	\$ 6,283,668	



VPA WTP 31.10.2018

Item	Sub Item	Qty	Unit	Rate (P50)	Amount	Rate (P90)	Amount	Qty	Unit	Rate	Amount	Amount	Amount	Diffe	erence	Comments
					(P50)		(P90)					(P50)	(P90)	(P50)	(P90)	
					, ,		, ,					ì	, ,	•		
Siteworks & Earthworks	Site Preparation	-	%	2.39	-	2.60	-	35,101	m2	2.50	87,753	97,149	103,341	(97,149)	(103,341)	Quantity missing; Rate includes for site clearance & topsoil removal to suit Ultimate design standard to full width of road reserve.
itev art	Demolition of existing pavements							6,721	m2	25.00	168,025	186,017	197,873	(186,017)	(197,873)	New item - Demolition of Existing Donnybrook Rd
S H	Earthworks	6,106	m3	35.43	216,309	39.04	238,367	7,698	m3	39.00	300,221	332,369	353,553	(116,061)	(115,186)	Quantity low based upon differences to pavement areas
nents	Primary Arterial Pavement	5,250		157.08	824,687	167.24	878,025	8,479		155.00	1,314,245	1,454,976	1,547,708	(630,288)		(refer comments below)  Quantity is low based upon WT measured areas; Donnybrook Rd measured as primary arterial road. Rate is low based upon nominated pavement depth.
ver	Secondary Arterial Pavement	-	m2	123.23	-	128.26	-		m2	141.00	0			-	-	
l Pa	Collector Arterial Pavement	3,290	m2	91.07	299,625	100.18	329,587	3,057	m2	126.00	385,182	426,428	453,606	(126,803)	(124,018)	Quantities almost match
Road	Subgrade preparation	-	%	15.21	-	17.05	-	11,536		2.50	28,840	31,928	33,963	(31,928)	(33,963)	Quantity missing; Rate - pricing methodology differs, m2 v %
	Pavement rehab	-	m2	45.90	-		-		m2		0			-	-	
	Pavement other	-	m2	-	-		-		m2		0			- (0.000)	-	
	Kerb & channel	2,950		50.42	148,736	54.84	161,775	2,685		55.00	147,675	157,038	167,046	(8,301)		Quantity is low based upon WT measured lengths
ncrete Work	Cycle path SUP / Footpath	2,370 1,120		59.60 58.44	141,252 65,457	66.57 65.15	72,965	5,751	m2 m2	50.00 60.00	345,060	366,937	390,323	(301,480)		Quantity is very low, scope to be confirmed.
Ö	Traffic Island	2,890	m2	71.43	206,442	75.24	217,446	202	m2	60.00	12,120	12,888	13,710	193,554	203,736	Quantity high: extent of islands at intersection to be
	Drainage pipe - 300mm CR backfilled	290	m	162.30	47,067	172.18	49,932	365	m	225.00	82,125	90,919	96,714	(43,852)	(46,781)	Quantity assumed to run through Collector Arterial
	Drainage pipe - 375mm CR backfilled	-	m	226.68	-	241.37	-		m	260.00	0			-	-	
	Drainage pipe - 450mm CR backfilled	730	m	291.67	212,917	313.36	228,750	621	m	290.00	180,090	199,374	212,081	13,542	16,669	Quantity assumed to run through Primary Arterial
age	Drainage pipe - 525mm CR backfilled	-	m	375.71	-	395.82	-		m	355.00	0	,	,	-	-	·
Drain	Drainage - pits	33	no.	2,325.57	76,744	2,454.13	80,986	20	no.	2,150.00	43,000	51,368	54,642	25,376	26,344	Quantity assumes pits @ 50m centres based upon length of pipework; Rate assumes for 600 x 900 JP, max depth 1.5m.
	Drainage - Subsoil drainage	3,440	m	23.05	79,282	25.63	88,166	2,685	m	45.00	120,825	133,763	142,288	(54,481)	(54,122)	rate low - allowances include for pits and risers. Quantity quite high
	Drainage - culvert	-	no.	-	-		-		no.		0			-	-	
Traffic	Traffic Signals	4	Item	88,375.88	353,504	97,059.82	388,239	1	Item	300,000.00	300,000	332,124	353,292	21,379	34,947	X-Intersection
Trainc	Traffic Signal conduit	-	m	45.71	-	51.46	-		m		0			-	-	
ape	Tree Planting	98	no.	259.62	25,442	303.44	29,737	89	no.	250.00	22,250	23,661	25,169	1,782	4,568	assumes trees @15m spacing along nature strip length >3m wide
osp	Landscaping	5,000	m2	20.72	103,583	22.64	113,190	3,522	m2	15.00	52,836	56,186	59,767	47,398	53,424	Quantity is low - area used assumes overall site area (as per
Lan	Tonsoil sooding	5,000	m2	7.00	34,980	7.68	38,410	14,090	m2	5.50	77,493	82,406	87,658	(47,426)	(40.249)	Site Preparation) less paved areas;
	Topsoil seeding	3,000	1112	7.00	34,960	7.08	36,410	14,090	IIIZ	5.50	77,493	62,400	67,036	(47,420)	(49,240)	Assume 20% landscape planting & 80% topsoil seeding
Street Lighting	Street lighting (all inclusive)		m	207.67	-	228.38	-		no.	12,000.00	324,000	358,694	381,556	(358,694)	(381,556)	Rate - pricing methodology differs; Quantity based upon 50m spacing along road length + intersection; Note: lighting requirements to Cycle path & SUP is excluded
	Street lighting - Intersections		Item / pe	-	-		-		Item / pe		0			-	-	
	Regulatory signage		Item	329.29	5,269	354.44	5,671		Item	350.00	5,600	5,955	6,335	(686)	` '	Quantity - ok
.;	Linemarking	8,540	m2 of pa	2.40	20,519	2.70	23,099	11,536	m2 of pa	2.50	28,840	30,668	32,623	(10,149)	(9,524)	
Misc	Landscape maintenance		ltem	75,000.00	75,000	86,250.00	86,250		Item	104,000.00	104,000	108,328	115,232	(33,328)		\$1000 (assumes 1 man + venicie x 1 day/wk)
	Tactile pavers (hazard only)	24	Item	337.14	8,091	400.63	9,615	16	Item	320.00	5,120	5,668	6,030	2,423	3,586	WT measure variance
Other	Service relocation	1	ltem	125,373.07	125,373	142,200.87	142,201	1	Item	116,000.00	116,000	128,421	136,606	(3,048)	5,595	Rate appears to be high, WT's rate is based off 100m for OH Electrical power to be removed / relocated as well as relocation of comms during works to IN-02 (extent based on Donnybrook-Woodstock ICP Plan)
	Remove - existing fencing				-		-	1200	m	18.00	21,600	23,913	25,437	(23,913)	(25,437)	Quantiy missing - WT allowance
	Tie into existing pavements							2	no.	25,000.00	50,000	55,354	58,882	(55,354)		Assumes ties into both sides of Donnybrook Rd (East & West legs)
	Surveying & Design	1	%	5.00	153,514	5.00	167,009	1	%	5.00	216,145		\$ 252,771.69	(84,113)	` ' '	% driven item
	Contingency	1	%	15.00	460,542	15.00	501,027	1	%	15.00	648,435	\$ 712,879.89	\$ 758,315.08	(252,338)	(257,289)	% driven item



VPA	WTP

Item	Sub Item	Qty	Unit	Rate (P50)	Amount	Rate (P90)	Amount
					(P50)		(P90)
>	Traffic Management	1	%	5.00	153,514	5.00	167,009
ver	Supervision & Project Management	1	%	9.00	276,325	9.00	300,616
Deliveı	Council Fees	1	%	3.25	99,784	3.25	108,556
	Vic Roads Fees	1	%	1.00	30,703	1.00	33,402
	Environmental Management	1	%	0.50	15,351	0.50	16,701
	Site Establishment	1	%	2.50	76,757	2.50	83,504

Qty	Unit	Rate	Amount	Amount	Amount	Diffe	rence	Comments
				(P50)	(P90)	(P50)	(P90)	
1	%	5.00	216,145	\$ 237,626.63	\$ 252,771.69	(84,113)	(85,763)	% driven item
1	%	9.00	389,061	\$ 427,727.93	\$ 454,989.05	(151,403)	(154,373)	% driven item
1	%	3.25	140,494	\$ 154,457.31	\$ 164,301.60	(54,673)	(55,746)	% driven item
1	%	1.00	43,229	\$ 47,525.33	\$ 50,554.34	(16,823)	(17,153)	% driven item
1	%	0.50	21,614	\$ 23,762.66	\$ 25,277.17	(8,411)	(8,576)	% driven item
1	%	2.50	108,072	\$ 118,813.31	\$ 126,385.85	(42,056)	(42,881)	% driven item

(1,682,253)

(2,376,183)

(1,715,257) (2,422,800)

>	Traffic Management	1 %	5.00	153,514	5.00	167,009	1 %	5.00	216,145	\$ 237,626.63	\$ 252,771.69
ver	Supervision & Project Management	1 %	9.00	276,325	9.00	300,616	1 %	9.00	389,061	\$ 427,727.93	\$ 454,989.05
eli	Council Fees	1 %	3.25	99,784	3.25	108,556	1 %	3.25	140,494	\$ 154,457.31	\$ 164,301.60
	Vic Roads Fees	1 %	1.00	30,703	1.00	33,402	1 %	1.00	43,229	\$ 47,525.33	\$ 50,554.34
	Environmental Management	1 %	0.50	15,351	0.50	16,701	1 %	0.50	21,614	\$ 23,762.66	\$ 25,277.17
	Site Establishment	1 %	2.50	76,757	2.50	83,504	1 %	2.50	108,072	\$ 118,813.31	\$ 126,385.85
TOTAL	Excluding Delivery			3,070,279		3,340,177			4,322,900	\$ 4,752,533	\$ 5,055,434
IOIAL	Including Delivery			4,336,770		4,718,000			6,106,096	\$ 6,712,952	\$ 7,140,800



VPA WTP

## Properties   P	Item	Sub Item	Qty	Unit	Rate (P50)	Amount	Rate (P90)	Amount	Qty	Unit	Rate	Amount	Amount	Amount	Diffe	erence	Comments
## Page 19   Pag			ζ.,	J	Titude (1 50)		1.000 (1.00)		ζ-1	0	11000	71111001110					
Page						(100)		(122)					(100)	(1.2.5)	(	(100)	
Part	rorks & nworks	Site Preparation	-	%	2.39	-	2.68	-	45,794	m2	2.50	114,485	126,839	135,005	(126,839)	(135,005)	Rate includes for site clearance & topsoil removal to suit
Part	itew	Demolition of existing pavements							6,776	m2	25.00	169,400	187,679	199,763	(187,679)	(199,763)	
Marke   Mark	Si	Earthworks	10,003	m3	35.43	354,351	40.30	403,141	10,535	m3	39.00	410,864	455,198	484,507	(100,847)	(81,366)	
Agricult Approximation   10   2   20.00   10	nents	Primary Arterial Pavement	6,840	m2	157.08	1,074,450	170.80	1,168,277	9,902	m2	155.00	1,534,810	1,700,426	1,809,909	(625,976)	(641,632)	Rd measured as primary arterial road. Rate is low based upon
Page	ven	Secondary Arterial Pavement	7,150	m2	123.23	881,087	130.03	929,681	5,441	m2	141.00	767,181	849,965	904,690	31,122	24,991	Quantity is high
## Page 1979 of Pa	Pa	Collector Arterial Pavement	-	m2	91.07	-	100.18	-		m2	126.00	0			-	-	
Second content	Road	Subgrade preparation		%		-	17.70	-	15,343	m2	2.50	38,358	42,497	45,233	(42,497)	(45,233)	
## Mile Cassed   1,000 ft   1,500			-	-	45.90	-		-				0			-	-	
Page		Pavement other	-	m2	-	-		-		m2		0			-	-	
March   1966   1976	ks								1,463			80,465	85,630	91,144		·	
Marging place	Vor	Cycle path	1,120	m2	59.60	66,752	69.01	77,288		m2	50.00	0			66,752	77,288	
Part	Concrete W	SUP / Footpath	735	m2	58.44	42,956	67.50	49,609	5,921	m2	60.00	355,260	378,065	402,407	(335,109)	(352,798)	Rate is low (WT has based rate on 120mm thk concrete pavement with SL72 mesh as advised by Whittlesea City
Description   Part		Traffic Island	850	m2	71.43	60,718	76.57	65,088	711	m2	60.00	42,660	45,398	48,321	15,320	16,767	
Part			260	m		42,198		45,667	509	m		114,525	126,883	135,052	(84,685)	(89,386)	Quantity assumed to run through Secondary Arterial
Part			-	m				-		m		0					
Parage - 115   Par	e,	0 1 1	870	m				279,228	624	m		180,960	200,487	213,395	53,263	65,833	Quantity assumed to run through Primary Arterial
Paramage - Subsoil drainage   3,000 m   2,000 m   2,0	Drainag		39	no.				97,467	23	no.		49,450	59,117	62,924	31,580	34,543	pipework;
Traffic Signals		Drainage - Subsoil drainage	3,000	m	23.05	69,141	26.53	79,602	1,463	m	45.00	65,835	72,939	77,635	(3,798)	1,967	rate low - allowances include for pits and risers. Quantity
Traffic Signal conduit		Drainage - culvert	-	no.	-	-		-		no.		0			-	-	
Traffic Signal conduit   Traffic Signal cond	Traffic	Traffic Signals	4	Item	88,375.88	353,504	100,101.03	400,404	1	Item	300,000.00	300,000	332,372	353,772	21,132	46,632	X-Intersection
Fee Fairting   Fee	Hanne	Traffic Signal conduit	-	m	45.71	-	53.47	-		m		0			-	-	
Part	ape	Tree Planting	62	no.	259.62	16,096	318.78	19,764	98	no.	250.00	24,500	26,073	27,751	(9,977)	(7,987)	
Topsoil seeding   Topsoil se	dsc	Landscaping	2,600	m2	20.72	53,863	23.31	60,609	4,764	m2	15.00	71,457	76,044	80,940	(22,181)	(20,332)	Quantity is low - area used assumes overall site area (as per
Street lighting   Street lighting   Inclusive)   Street lighting   Inclusive   Incl	Land	Topsoil seeding	2,600	m2	7.00	18,190	7.92	20,598	19,055	m2	5.50	104,804	111,531	118,712	(93,342)	(98,115)	
Regulatory signage 16 ltem 329.29 5,269 363.25 5,812 16 ltem 350.00 5,600 5,959 6,343 (691) (531) Quantity - ok 1,000 1,		Street lighting (all inclusive)	-	m	207.67	-	235.63	-	29	no.	12,000.00	348,000	385,551	410,375	(385,551)		Rate - pricing methodology differs; Quantity based upon 50m spacing along road length + intersection;
Linemarking   13,990   m2 of pt   2.40   33,614   2.81   39,320   15,343   m2 of pt   2.50   38,358   40,820   43,448   (7,206)   (4,128)   WT measure variance   1   tem   75,000.00   75,000   86,250.00   86,			4	Item / pe				-			•	0					
Landscape maintenance				-											, ,	` '	
Tactile pavers (hazard only)		Linemarking	13,990	m2 of pa	2.40	33,614	2.81	39,320	15,343	m2 of pa	2.50	38,358	40,820	43,448	(7,206)	(4,128)	WT measure variance
Service relocation	Misc	Landscape maintenance	1	Item	75,000.00	75,000	86,250.00	86,250	1	Item	104,000.00	104,000	108,408	115,388	(33,408)	(29,138)	
Service relocation 1 Item 154,713.77 154,714 177,388.39 177,388 177,38		Tactile pavers (hazard only)	24	Item	337.14	8,091	422.86	10,149	24	no.	320.00	7,680	8,509	9,057	(417)	1,092	Quantity - ok
Remove - existing fencing - 1190 m 18.00 21,420 23,731 25,259 (23,731) (25,259) Quantiy missing - WT allowance  Tie into existing pavements - 190 m 18.00 21,420 23,731 25,259 (23,731) (25,259) Quantiy missing - WT allowance    Assumes ties into both sides of Donnybrook Rd (East & West legs)	Other	Service relocation	1	ltem	154,713.77	154,714	177,388.39	177,388	1	Item	116,000.00	116,000	128,517	136,792	26,197	40,597	Electrical power to be removed / relocated as well as relocation of comms during works to IN-03 (extent based on
Tie into existing pavements  2 no. 25,000.00 50,000 55,395 58,962 (55,395) (58,962) Assumes ties into both sides of Donnybrook Rd (East & West legs)		Remove - existing fencing				-		-	1190	m	18.00	21,420	23,731	25,259	(23,731)	(25,259)	Quantiy missing - WT allowance
Surveying & Design 1 % 5.00 187,512 5.00 206,124 1 % 5.00 255,804 \$ 281,701.72 \$ 299,839.32 (94,190) (93,715) % driven item											ì				• • •		
		Surveying & Design	1	%	5.00	187,512	5.00	206,124	1	%	5.00	255,804	\$ 281,701.72	\$ 299,839.32	(94,190)	(93,715)	% driven item

VPA



31.10.2018

Item	Sub Item	Qty	Unit	Rate (P50)	Amount	Rate (P90)	Amount	Qty	Unit	Rate	Amount	Amount	Amount	Differ	ence	Comments
					(P50)		(P90)					(P50)	(P90)	(P50)	(P90)	
	Contingency	1	%	15.00	562,536	15.00	618,372	1	%	15.00	767,411	\$ 845,105.15	\$ 899,517.96	(282,570)	(281,146)	% driven item
>	Traffic Management	1	%	5.00	187,512	5.00	206,124	1	<b>%</b>	5.00	255,804	\$ 281,701.72	\$ 299,839.32	(94,190)	(93,715)	% driven item
Ver	Supervision & Project Management	1	%	9.00	337,521	9.00	371,023	1	<b>%</b>	9.00	460,446	\$ 507,063.09	\$ 539,710.78	(169,542)	(168,688)	% driven item
eli	Council Fees	1	%	3.25	121,883	3.25	133,981	1	<b>%</b>	3.25	166,272	\$ 183,106.12	\$ 194,895.56	(61,223)	(60,915)	% driven item
	Vic Roads Fees	1	%	1.00	37,502	1.00	41,225	1	<b>%</b>	1.00	51,161	\$ 56,340.34	\$ 59,967.86	(18,838)	(18,743)	% driven item
	Environmental Management	1	%	0.50	18,751	0.50	20,612	1	%	0.50	25,580	\$ 28,170.17	\$ 29,983.93	(9,419)	(9,372)	% driven item
	Site Establishment	1	%	2.50	93,756	2.50	103,062	1	<b>%</b>	2.50	127,902	\$ 140,850.86	\$ 149,919.66	(47,095)	(46,858)	% driven item

WTP

TOTAL	Excluding Delivery		3,750,237	4,122,478		5,116,070 \$	5,634,034	5,996,786	(1,883,797)	(1,874,309)
TOTAL	Including Delivery		5,297,210	5,823,000		7,226,449 \$	7,958,074	8,470,461	(2,660,864)	(2,647,461)



WTP

VPA 31.10.2018 Item Qty Unit Rate (P50) Rate (P90) Rate Difference Sub Item Amount Amount Qty Unit Comments Amount **Amount Amount** (P50) (P90) (P50) (P90) (P50) (P90) Quantity missing; Site Preparation 2.39 2.68 46,008 m2 2.50 115,020 126,842 138,247 (126,842)(138, 247)Rate includes for site clearance & topsoil removal to suit Ultimate design standard to full width of road reserve. Demolition of existing pavements 6.600 m2 25.00 165.00 181,959 198,321 (181,959 (198,321) New item - Demolition of Existing Donnybrook Rd Quantity low based upon differences to pavement areas 10,003 m3 40.30 403,141 11,419 m3 39.00 (132,146)Earthworks 35.43 354,351 445,35 491,124 535,287 (136,774) Quantity is low based upon WT measured areas; Donnybrook 1,074,450 1,168,277 (1,807,138) Rd & Koukoura Drive measured as primary arterial road. Rate Primary Arterial Pavement 6,840 m2 157.08 170.80 15,971 m2 155.00 2,475,505 2,729,937 2,975,415 (1,655,487)is low based upon nominated pavement depth. 881,087 929,681 929,681 7,150 m2 123.23 130.03 141.00 881,087 Secondary Arterial Pavement 100.18 m2 91 07 m2 126.00 Collector Arterial Pavement Quantity missing; % 15.21 17.70 15,971 m2 2.50 39,928 44,031 47,991 (44,031) (47,991)Subgrade preparation Rate - pricing methodology differs, m2 v % m2 45.90 Pavement rehah m2 Pavement other m2 m2 1,900 m 50.42 95,796 56.39 107,135 201,465 213,405 232,595 (117,609) (125,460)Quantity is low based upon WT measured lengths Kerb & channel 3,663 55.00 Cycle path 1,120 m2 59.60 66,752 69.01 77,288 50.00 66,752 Quantity is very low, scope to be confirmed. Rate is low (WT has based rate on 120mm thk concrete SUP / Footpath 735 m2 58.44 42,956 67.50 49,609 2,912 m2 60.00 174,720 185,075 201,717 (142,119)(152,109)pavement with SL72 mesh as advised by Whittlesea City 65,088 42,72 45,252 Traffic Island 850 m2 71.43 60,718 76.57 712 m2 60.00 49,321 15,466 15,767 Quantity - ok compared to WT measure 260 m 162.30 42,198 175.64 45,667 225.0 42,198 45,667 Drainage pipe - 300mm CR backfilled Drainage pipe - 375mm CR backfilled 226.68 246.52 260.00 870 m 253,750 320.95 279,228 290.00 332,920 367,137 400,151 (113,387) (120,922)Drainage pipe - 450mm CR backfilled 291.67 1,148 m Quantity assumed to run through Primary Arterial 402.87 355.00 Drainage pipe - 525mm CR backfilled 375.71 Quantity assumes pits @ 50m centres based upon length of Drainage - pits 39 no. 2,325.57 90,697 2,499.15 97,467 23 no. 2,150.00 49,450 58,844 64,135 31,853 33,332 Rate assumes for 600 x 900 JP, max depth 1.5m. Drainage - Subsoil drainage 3,000 23.05 69,141 26.53 79,602 3,663 45.00 164,835 181,777 198,122 (112,636) (118,520) rate low - allowances include for pits and risers. Quantity low Drainage - culvert 88,375.88 353,504 400,404 300,000.0 330,834 22,670 Traffic Signals 4 Item 100,101.03 Item 300,000 360.583 39,821 X-Intersection Traffic Traffic Signal conduit 45.71 53.47 ssumes trees @15m spacing along nature strip length >3m ree Planting 62 no. 259.62 16,096 318.78 19,764 84 no. 250.00 21,000 22,245 24,245 (6,148)(4,480)Quantity is low - area used assumes overall site area (as per 2,600 m2 20.72 53,863 23.31 60,609 5,283 m2 15.00 79,23 83,935 91,483 (30,072 (30,874)Lands Landscaping ite Preparation) less paved areas; 2,600 7.00 18,190 7.92 20,598 21,130 m2 5.50 134,175 Topsoil seeding m2 116,21 123,105 (104,916)(113,577)Assume 20% landscape planting & 80% topsoil seeding Rate - pricing methodology differs; Quantity based upon 50m spacing along road length + (447,123)Street Street lighting (all inclusive) 207.67 235.63 31 no. 12,000.00 372,000 410,234 447,123 (410,234)Lighting Note: lighting requirements to Cycle path & SUP is excluded Street lighting - Intersections 4 Item / p Item / per leg 5,812 Regulatory signage 16 Item 329.29 5.269 363.25 16 Item 350.00 5.600 5.932 6.465 (663) (653) Quantity appears to be low 13,990 m2 of pa 42,294 (8,680)Linemarking 2.40 33,614 2.81 39,320 15,971 m2 of p 2.5 39.92 46,097 (6,777)allowance for maintenance during DLP assumes 104 wks x 75,000.00 75,000 86,250.00 86,250 104,000.00 104,000 107,907 117,610 (32,907) (31,360)andscape maintenance Item Item \$1000 (assumes 1 man + vehicle x 1 day/wk) 8,091 422.86 10,149 7,680 8,469 9,231 Tactile pavers (hazard only) 24 Item 337.14 24 no. 320.0 (378)918 Quantity - okay Rate appears to be high, WT's rate is based off 100m for OH Electrical power to be removed / relocated as well as Service relocation 1 Item 154,713.77 154,714 177,388.39 177,388 1 Item 116,000.00 116,000 127,922 139,425 26,791 37,963 relocation of comms during works to IN-04 (extent based on Other Donnybrook-Woodstock ICP Plan) 1190 m 18.00 21,420 23,622 25,746 (23,622) (25,746) Quantiy missing - WT allowance Remove - existing fencing Assumes ties into both sides of Donnybrook Rd (East & West 25,000.0 50,000 55,139 60,097 (55,139)(60,097 Tie into existing pavements



			V	PA							WTP						31.10.201
Item	Sub Item	Qty	Unit	Rate (P50)	Amount	Rate (P90)	Amount	Qty	Unit	Rate	Amount	Amount	Amount	Diffe	rence	Comr	ments
					(P50)		(P90)					(P50)	(P90)	(P50)	(P90)		
	Surveying & Design	1	%	5.00	187,512	5.00	206,124	1	%	5.00	272,000	\$ 298,351.10	\$ 325,179.07	(110,839)	(119,055)	% driven item	
	Contingency	1	%	15.00	562,536	15.00	618,372	1	%	15.00	816,000	\$ 895,053.31	\$ 975,537.22	(332,518)	(357,166)	% driven item	
>	Traffic Management	1	%	5.00	187,512	5.00	206,124	1	%	5.00	272,000	\$ 298,351.10	\$ 325,179.07	(110,839)	(119,055)	% driven item	
ver	Supervision & Project Management	1	%	9.00	337,521	9.00	371,023	1	%	9.00	489,600	\$ 537,031.99	\$ 585,322.33	(199,511)	(214,299)	% driven item	
) eli	Council Fees	1	%	3.25	121,883	3.25	133,981	1	%	3.25	176,800	\$ 193,928.22	\$ 211,366.40	(72,046)	(77,386)	% driven item	
	Vic Roads Fees	1	%	1.00	37,502	1.00	41,225	1	%	1.00	54,400	\$ 59,670.22	\$ 65,035.81	(22,168)	(23,811)	% driven item	
	Environmental Management	1	%	0.50	18,751	0.50	20,612	1	%	0.50	27,200	\$ 29,835.11	\$ 32,517.91	(11,084)		% driven item	
	Site Establishment	1	%	2.50	93,756	2.50	103,062	1	%	2.50	136,000	\$ 149,175.55	\$ 162,589.54	(55,420)	(59,528)	% driven item	
TOTAL	Excluding Delivery				3,750,237		4,122,478				5,439,998			(2,216,785)			
IJIAL	Including Delivery				5,297,210		5,823,000				7,683,997	\$ 8,428,419	\$ 9,186,309	(3,131,209)	(3,363,309)		



VPA WTP 31.10.2018 Item Qty Unit Rate (P50) Rate (P90) Unit Rate Difference Sub Item Amount Amount Qty Amount Comments Amount **Amount** (P50) (P90) (P50) (P90) (P50) (P90) Quantity missing Rate includes for site clearance & topsoil removal to suit Site Preparation 2.39 2.60 28,727 m2 2.50 71,818 79,480 84,808 (79,480)(84,808)Ultimate design standard to full width of road reserve. Demolition of existing pavements 6.380 m2 25.00 159.50 176,517 188,351 (176,517) (188,351) New item - Demolition of Existing Donnybrook Rd uantity low based upon differences to pavement areas 5,031 m3 35.43 178,239 39.04 196,415 6,352 m3 39.00 292,546 Earthworks 247,734 274,165 (95,926) (96,131)(refer comments below) Quantity is low based upon WT measured areas; Donnybrook Rd measured as primary arterial road. Rate is low based upor 1,382,482 Primary Arterial Pavement 5,295 m2 157.08 831,756 167.24 885,550 7,553 m2 155.00 1,170,715 1,295,619 (463,863)(496,932)nominated pavement depth. 1,742 m2 123.23 214,665 223,433 223,433 128.26 141.00 214.665 Secondary Arterial Pavement WT measure North portion of T-Intersection as Collector Collector Arterial Pavement m2 91.07 100.18 1,779 m2 126.00 224,154 248,069 264,701 (248,069)(264,701) 15.21 17.05 9,332 m2 2.50 23,330 25,819 27,550 (25,819) (27,550)Subgrade preparation Rate - pricing methodology differs, m2 v % 45.90 Pavement rehab m2 m2 Pavement other m2 m2 Kerh & channel 2.127 m 50.42 107.241 54.84 116.643 2.328 55.00 128.040 136.110 145.235 (28.868) (28.592) Quantity is low based upon WT measured lengths 1.615 m2 59.60 96.254 66.57 107.507 m2 50.0 96.254 107.507 Works Cycle path Quantity is very low, scope to be confirmed. Rate is low (WT has based rate on 120mm thk concrete 29,806 240,137 (210,331) (223,012)SUP / Footpath 510 m2 58.44 65.15 33,225 3,765 m2 60.00 225,900 256,237 pavement with SL72 mesh as advised by Whittlesea City Quantity high; extent of islands at intersection to be Traffic Island 675 m2 71.43 48,217 75.24 50,788 103 m2 60.00 6,180 6,569 7,010 41,648 43,778 confirmed Drainage pipe - 300mm CR backfilled 205 162.30 33,272 172.18 35,297 231 225.00 51,97 57,520 61,377 (24,249) (26,080)Quantity assumed to run through Collector Arterial Drainage pipe - 375mm CR backfilled 260.0 226.6 241.3 Drainage pipe - 450mm CR backfilled Quantity assumed to run through Primary Arterial 540 m 291.67 157,500 313.36 169,212 596 m 290.0 172,840 191,280 204,105 (33,780) (34,892) Drainage pipe - 525mm CR backfilled 375.71 395.82 355.0 Quantity assumes pits @ 50m centres based upon length of 25 no. 2,150.00 Drainage - pits 2,325.57 58,139 2,454.13 61,353 17 no. 36,550 43,648 46,574 14,492 14,779 Rate assumes for 600 x 900 JP, max depth 1.5m. rate low - allowances include for pits and risers. Quantity 2,627 23.05 60,544 25.63 67,329 2,328 45.00 104,760 115,937 123,710 (55,392)(56,381)Drainage - Subsoil drainage uite high Drainage - culvert no. Traffic Signals 3 Item 88,375.88 265,128 97,059.82 291,179 Item 250,000.00 250,000 276,673 295,222 (11,545) (4,042)Γ-Intersection Traffic Traffic Signal conduit m 45.71 51.46 ssumes trees @15m spacing along nature strip length >3m 78 no. 259.62 20,250 23,668 250.00 21,750 23,121 24,671 (2,871) (1,003 ree Planting 303.44 87 no. Quantity is low - area used assumes overall site area (as per 4,250 m2 20.72 88,046 22.64 96,212 3,105 m2 46,582 49,517 52,837 38,529 43,375 Landscaping 15.00 ite Preparation) less paved areas; (44,845) Assume 20% landscape planting & 80% topsoil seeding 4,250 m2 7.00 29,733 7.68 32,648 12,422 m2 5.50 68,319 72,625 77,494 (42,892) Topsoil seeding Rate - pricing methodology differs; Quantity based upon 50m spacing along road length + (283,413) intersection; Street Street lighting (all inclusive) 207.67 228.38 20 no. 12,000.00 240,000 265,606 283,413 (265,606) Lighting Note: lighting requirements to Cycle path & SUP is excluded Street lighting - Intersections 3 Item / p Item / per leg 329.29 1,976 354.44 2,127 2,382 Quantity - ok 350.00 2,100 2.232 (257)(255) Regulatory signage 6 Item Item 7,037 m2 of pa 2.40 16,908 19,034 9,332 23,330 24,800 26,463 (7,892) Linemarking 2.70 m2 of p 2.50 (29,299) allowance for maintenance during DLP assumes 104 wks x 86,250 104,000.00 104,000 108,289 115,549 (33,289)75,000.00 75,000 86,250.00 Landscape maintenance Item Item \$1000 (assumes 1 man + vehicle x 1 day/wk) 7,211 Tactile pavers (hazard only) 18 Item 337.14 6,069 400.63 8 no. 320.00 2,560 2,833 3,023 3,235 4,188 WT measure variance Rate appears to be high, WT's rate is based off 100m for OH Electrical power to be removed / relocated as well as elocation of comms during works to IN-05 (extent based on Service relocation 1 Item 173,721.98 173,722 202,882.72 202,883 1 Item 116,000.00 116,000 128,376 136,983 45,346 Donnybrook-Woodstock ICP Plan) - No allowance for high pressure gas protection slab



			V	PA							WTP					31.10.2018
Item	Sub Item	Qty	Unit	Rate (P50)	Amount	Rate (P90)	Amount	Qty	Unit	Rate	Amount	Amount	Amount	Diffe	rence	Comments
					(P50)		(P90)					(P50)	(P90)	(P50)	(P90)	
Ö	Allowance for Cultural Heritage Works				-		-	1	Item	30,000.00	30,000	33,201	35,427	(33,201)	(35,427)	Allowance for cultural heritage works
	Remove - existing fencing				-		-	1160	m	18.00	20,880	23,108	24,657	(23,108)	(24,657)	Quantiy missing - WT allowance
	Tie into existing pavements							2	no.	25,000.00	50,000	55,335	59,044	(55,335)	(59,044)	Assumes ties into both sides of Donnybrook Rd (East & West legs)
	Surveying & Design	1	%	5.00	124,623	5.00	135,398	1	%	5.00	179,951	\$ 197,829.30	\$ 211,092.46	(73,206)	(75,694)	% driven item
	Contingency	1	%	15.00	373,870	15.00	406,195	1	%	15.00	539,852	\$ 593,487.89	\$ 633,277.39	(219,618)		% driven item
>	Traffic Management	1	%	5.00	124,623	5.00	135,398	1	%	5.00	179,951	\$ 197,829.30	\$ 211,092.46	(73,206)	(75,694)	% driven item
Ver	Supervision & Project Management	1	%	9.00	224,322	9.00	243,717	1	%	9.00	323,911	\$ 356,092.74	\$ 379,966.43	(131,771)	(136,250)	% driven item
e j	Council Fees	1	%	3.25	81,005	3.25	88,009	1	%	3.25	116,968	\$ 128,589.04	\$ 137,210.10	(47,584)	(49,201)	% driven item
	Vic Roads Fees	1	%	1.00	24,925	1.00	27,080	1	%	1.00	35,990	\$ 39,565.86	\$ 42,218.49	(14,641)	(15,139)	% driven item
	Environmental Management	1	%	0.50	12,462	0.50	13,540	1	%	0.50	17,995	\$ 19,782.93	\$ 21,109.25	(7,321)	(7,569)	% driven item
	Site Establishment	1	%	2.50	62,312	2.50	67,699	1	%	2.50	89,975	\$ 98,914.65	\$ 105,546.23	(36,603)	(37,847)	% driven item
TOTAL	Excluding Delivery				2,492,465		2,707,965				3,599,016	\$ 3,956,586	\$ 4,221,849	(1,464,121)	(1,513,885)	
IOIAL	Including Delivery				3,520,607		3,825,000				5,083,609	\$ 5,588,678	\$ 5,963,362	(2,068,070)	(2,138,362)	]

Contingency

IN-06 - Hayes Hill Boulevard & Patterson Drive – Construction of an arterial to blvd connector road 4-way intersection (interim treatment)
Benchmark Item 9

15.00

1 %

421,855

15.00

465,468



31.10.2018

VPA WTP

	I I			(222)		- (500)										
Item	Sub Item	Qty	Unit	Rate (P50)	Amount	Rate (P90)	Amount	Qty	Unit	Rate	Amount	Amount	Amount		rence	Comments
					(P50)		(P90)					(P50)	(P90)	(P50)	(P90)	
Siteworks & Earthworks	Site Preparation			2.39	-	2.68	-	34,970	m2	2.50	87,425	96,949	102,594	(96,949)	(102,594)	Quantity missing; Rate includes for site clearance & topsoil removal to suit Ultimate design standard to full width of road reserve.
Site	Earthworks	6,266	m3	35.43	221,985	40.30	252,550	7,625	m3	39.00	297,381	329,778	348,980	(107,793)	(96,430)	Quantity low based upon differences to pavement areas (refer comments below)
	Primary Arterial Pavement	-	m2	157.08	-	170.80	-	0	m2	155.00	0			-	-	
ements	Secondary Arterial Pavement	6,970	m2	123.23	858,905	130.03	906,277	8,772	m2	141.00	1,236,852	1,371,596	1,451,458	(512,690)	(545,182)	Quantity is low based upon WT measured areas; Patterson Dr measured as Secondary arterial road. Rate is low based upon nominated pavement depth.
Ра	Collector Arterial Pavement	3,440	m2	91.07	313,286	100.18	344,614	3,841	m2	126.00	483,966	536,690	567,939	(223,404)	(223,325)	Quantities almost match
load	Subgrade preparation	-	%	15.21	-	17.70	-	12,613	m2	2.50	31,533	34,968	37,004	(34,968)	(37,004)	Quantity missing; Rate - pricing methodology differs, m2 v %
<u> </u>	Pavement rehab		m2	45.90	_	_	_		m2		0			-	_	rate pricing methodology uniters, m2 v 70
	Pavement other		m2	-3.50	_	_			m2		0			_	_	
	Kerb & channel	3,000		50.42	151,257	56.39	169,161	3,319		55.00	182,545	194,444	205,766	(43,187)	(36,605)	Quantity is low based upon WT measured lengths
ς.	Cycle path	1,090		59.60	64,964	69.01	75,218	3,313	m2	50.00	102,545	134,444	203,700	64,964	75,218	Qualitity is low based apoin wit incasured lengths
ete Work	SUP / Footpath	1,910		58.44	111,628	67.50	128,916	6,474		60.00	388,440	413,761	437,853	(302,133)	(308,937)	Quantity is very low, scope to be confirmed. Rate is low (WT has based rate on 120mm thk concrete pavement with SL72 mesh as advised by Whittlesea City
Concr	Tuefficatelesed	105		71.42	7.500	76.57	2.040	210	2	CO 00	12 140	12.007	14.012	(5,405)	(6.771)	Council).
	Traffic Island	105	m2	71.43	7,500	76.57	8,040	219	m2	60.00	13,140	13,997	14,812	(6,496)	(6,771)	confirmed
	Drainage pipe - 300mm CR backfilled	280	m	162.30	45,444	175.64	49,180	408	m	225.00	91,800	101,801	107,728	(56,357)	(58,549)	Quantity assumed to run through Collector Arterial
	Drainage pipe - 375mm CR backfilled	-	m	226.68	-	246.52	-		m	260.00	0			-	-	
	Drainage pipe - 450mm CR backfilled	790	m	291.67	230,417	320.95	253,552	716	m	290.00	207,640	230,260	243,668	156	9,885	Quantity assumed to run through Secondary Arterial
	Drainage pipe - 525mm CR backfilled	-	m	375.71	-	402.87	-		m	355.00	. 0	·	·	-	· -	
Drainage	Drainage - pits	32	no.	2,325.57	74,418	2,499.15	79,973	22	no.	2,150.00	47,300	56,600	59,896	17,818	20,077	Quantity assumes pits @ 50m centres based upon length of pipework; Rate assumes for 600 x 900 JP, max depth 1.5m.
	Drainage - Subsoil drainage	3,540	m	23.05	81,586	26.53	93,931	3,319	m	45.00	149,355	165,626	175,270	(84,039)	(81,339)	rato low allowances include for nits and risers. Quantity
	Drainage - swale								m	25.00	0			-	-	
	Drainage - culvert		no.	- 1	-	-	-		no.		0			_	-	
	Traffic Signals	4	Item	88,375.88	353,504	100,101.03	400,404	1	Item	300,000.00	300,000	332,682	352,053	20,821	48 351	X-Intersection
Traffic	Traffic Signal conduit		m	45.71	333,304	53.47	-	-	m	300,000.00	300,000	332,002	332,033	20,021		X mersection
	Traffic Signal Colludit	-	1111	43.71	-	33.47			111		0			-		assumes trees @15m spacing along nature strip length >3m
аре	Tree Planting	88	no.	259.62	22,846	318.78	28,053	94	no.	250.00	23,500	25,032	26,489	(2,186)	1,563	wide
ndsc	Landscaping	5,890	m2	20.72	122,021	23.31	137,302	3,133	m2	15.00	46,992	50,055	52,970	71,966	84,332	Quantity is low - area used assumes overall site area (as per Site Preparation) less paved areas;
el	Topsoil seeding	5,890	m2	7.00	41,206	7.92	46,661	12,531	m2	5.50	68,922	73,414	77,689	(32,208)	(31,027)	Assume 20% landscape planting & 80% topsoil seeding
Street Lighting	Street lighting (all inclusive)	-	m	207.67	-	235.63	-	35	no.	12,000.00	420,000	465,755	492,874	(465,755)	(492,874)	Rate - pricing methodology differs; Quantity based upon 50m spacing along road length + intersection; Note: lighting requirements to Cycle path & SUP is excluded
	Street lighting - Intersections	4	Item /		-	-	-		Item / pe		0			-	-	
	Regulatory signage	10	Item	329.29	3,293	363.25	3,632	10	Item	350.00	3,500	3,728	3,945	(435)	(313)	Quantity - ok
	Linemarking		m2 of p	2.40	25,012	2.81	29,258	12,613	m2 of pa	2.50	31,533	33,588	35,544	(8,576)		
Misc.	Landscape maintenance	1	Item	75,000.00	75,000	86,250.00	86,250		Item	104,000.00	104,000	108,510	114,828	(33,510)		allowance for maintenance during DLP assumes 104 wks v
	Tactile pavers (hazard only)	24	Item	337.14	8,091	422.86	10,149	16	Item	320.00	5,120	5,678	6,008	2,414	4,140	WT measure variance
	Extra over cost for excavation in rock				-		-	1	Item	267,000.00	267,000	296,087	313,327	(296,087)	(313,327)	Additional site specific item. Assume 35% of total excavated volume to be in rock
Other	Extra over cost for subgrade preparation				-		-	1	Item	127,000.00	127,000	140,835.50	149,035.77	(140,835)	(149,036)	Additional site specific item. Assume 25% of payement area
	Surveying & Design	1	%	5.00	140,618	5.00	155,156	1	%	5.00	230,747	\$ 254,091.72	\$ 268,886.44	(113,473)	(113,730)	% driven item
	Contingency		0/	15.00	/21 955		165.168	_	0.4	15.00	602 2/11			(3/0/120)		% driven item

15.00

692,241 \$ 762,275.16 \$ 806,659.33

(340,420)

(341,191) % driven item

## VPA Benchmarked Infrastructure Costings - Independent Peer Review

IN-06 - Hayes Hill Boulevard & Patterson Drive – Construction of an arterial to blvd connector road 4-way intersection (interim treatment)
Benchmark Item 9



			VI	PA							WTP						31.10.2018
Item	Sub Item	Qty	Unit	Rate (P50)	Amount	Rate (P90)	Amount	Qty	Unit	Rate	Amount	Amount	Amount	Diffe	rence	Comments	
					(P50)		(P90)					(P50)	(P90)	(P50)	(P90)		
_	Traffic Management	1	%	5.00	140,618	5.00	155,156		1 %	5.00	230,747	\$ 254,091.72	\$ 268,886.44	(113,473)	(113,730)	% driven item	
Ver	Supervision & Project Management	1	%	9.00	253,113	9.00	279,281		1 %	9.00	415,345	\$ 457,365.10	\$ 483,995.60	(204,252)	(204,715)	% driven item	
eli	Council Fees	1	%	3.25	91,402	3.25	100,851		1 %	3.25	149,986	\$ 165,159.62	\$ 174,776.19	(73,758)	(73,925)	% driven item	
	Vic Roads Fees	1	%	1.00	28,124	1.00	31,031		1 %	1.00	46,149	\$ 50,818.34	\$ 53,777.29	(22,695)	(22,746)	% driven item	
	Environmental Management	1	%	0.50	14,062	0.50	15,516		1 %	0.50	23,075	\$ 25,409.17	\$ 26,888.64	(11,347)	(11,373)	% driven item	
	Site Establishment	1	%	2.50	70,309	2.50	77,578		1 %	2.50	115,374	\$ 127,045.86	\$ 134,443.22	(56,737)	(56,865)	% driven item	
-																_	
TOTAL	Excluding Delivery				2,812,365		3,103,121				4,614,943	\$ 5,081,834	\$ 5,377,729	(2,269,469)	(2,274,608)		
IOIAL	Including Delivery				3,972,466		4,383,158				6,518,606	\$ 7,178,091	\$ 7,596,042	(3,205,625)	(3,212,884)		

IN-07 - Hayes Hill Boulevard & Koukoura Drive – Construction of an arterial to blvd connector road 4-way intersection (interim treatment)
Benchmark Item 9



31.10.2018

VPA WTP

Item	Sub Item	Qty	Unit	Rate (P50)	Amount	Rate (P90)	Amount	Qty	Unit	Rate	Amount	Amount	Amount	Diffe	rence	Comments
item	Just Itelli	Qty	Onit	nate (P30)	(P50)	nate (P50)	(P90)	Qty	Offic	nate	Amount	(P50)	(P90)	(P50)	(P90)	Comments
					(P5U)		(190)					(P5U)	(190)	(P5U)	(190)	
vorks & hworks	Site Preparation			2.39	-	2.68	-	27,585	m2	2.50	68,963	76,352	81,590	(76,352)	(81,590)	Quantity missing; Rate includes for site clearance & topsoil removal to suit Ultimate design standard to full width of road reserve.
Sitew	Demolition of existing property							0	m2	0.00	0			-	-	This has been excluded from WT's assessment
is m	Earthworks	6,266	m3	35.43	221,985	40.30	252,550	6,897	m3	39.00	268,976	297,797	318,226	(75,811)	(65,676)	Quantity low based upon differences to pavement areas (refer comments below)
nents	Primary Arterial Pavement	-	m2	157.08	-	170.80	-	8,534	m2	155.00	1,322,770	1,464,505	1,564,971	(1,464,505)	(1,564,971)	Quantity is low based upon WT measured areas; Koukoura Drive measured as Primaryarterial road. Rate is low based upon nominated pavement depth.
Ven	Secondary Arterial Pavement	6,970	m2	123.23	858,905	130.03	906,277		m2	141.00	0			858,905	906,277	
Pa	Collector Arterial Pavement	3,440	m2	91.07	313,286	100.18	344,614	1,486	m2	126.00	187,236	207,298	221,519	105,987	123,095	Quantity is high based upon WT measured area
Road	Subgrade preparation	-	%	15.21	-	17.70	-	10,020		2.50	25,050	27,734	29,637	(27,734)	(29,637)	Quantity missing; Rate - pricing methodology differs, m2 v %
	Pavement rehab	-	m2	45.90	-	-	-		m2		0			-	-	
	Pavement other	-	m2	-	-	-	-		m2	<b></b>	0			-	-	
S	Kerb & channel	3,000		50.42	151,257	56.39	169,161	2,356		55.00	129,580	137,804	147,257	13,453	•	Quantity is high based upon WT measured lengths
/orl	Cycle path	1,090	m2	59.60	64,964	69.01	75,218		m2	50.00	0			64,964	75,218	Overskits in complete acceptable confirmed
Concrete W	SUP / Footpath	1,910	m2	58.44	111,628	67.50	128,916	4,808	m2	60.00	288,480	306,789	327,835	(195,161)	(198,919)	Quantity is very low, scope to be confirmed.  Rate is low (WT has based rate on 120mm thk concrete pavement with SL72 mesh as advised by Whittlesea City Council).
	Traffic Island	105	m2	71.43	7,500	76.57	8,040	246	m2	60.00	14,760	15,697	16,774	(8,196)	(8,733)	Quantity low; extent of islands at intersection to be confirmed
	Drainage pipe - 300mm CR backfilled	280	m	162.30	45,444	175.64	49,180	213	m	225.00	47,925	53,060	56,700	(7,616)	(7,521)	Quantity assumed to run through Collector Arterial
	Drainage pipe - 375mm CR backfilled	-	m	226.68	-	246.52	-		m	260.00	0			-	-	
	Drainage pipe - 450mm CR backfilled	790	m	291.67	230,417	320.95	253,552	620	m	290.00	179,800	199,066	212,722	31,351	40,831	Quantity assumed to run through Primary Arterial
o)	Drainage pipe - 525mm CR backfilled	-	m	375.71	-	402.87	-		m	355.00	0			-	-	
Drainag	Drainage - pits	32	no.	2,325.57	74,418	2,499.15	79,973	17	no.	2,150.00	36,550	43,666	46,661	30,753	33,312	Quantity assumes pits @ 50m centres based upon length of pipework; Rate assumes for 600 x 900 JP, max depth 1.5m.
	Drainage - Subsoil drainage	3,540	m	23.05	81,586	26.53	93,931	2,356	m	45.00	106,020	117,380	125,432	(35,794)	(31,501)	rate low - allowances include for pits and risers. Quantity high
	Drainage - swale								m	25.00	0			-	-	
	Drainage - culvert		no.	-	-	-	-		no.		0			-	-	
Traffic	Traffic Signals	4	Item	88,375.88	353,504	100,101.03	400,404	1	Item	300,000.00	300,000	332,145	354,930	21,359	45,474	X-Intersection
	Traffic Signal conduit	-	m	45.71	-	53.47	-		m		0			-	-	
аре	Tree Planting	88	no.	259.62	22,846	318.78	28,053	66	no.	250.00	16,500	17,547	18,751	5,299	9,302	assumes trees @15m spacing along nature strip length >3m wide
andsc	Landscaping	5,890		20.72	122,021	23.31	137,302	2,502		15.00	37,533	39,915	42,653	82,106	94,648	Quantity is low - area used assumes overall site area (as per Site Preparation) less paved areas;
	Topsoil seeding	5,890	m2	7.00	41,206	7.92	46,661	10,009	m2	5.50	55,048	58,542	62,558	(17,336)	(15,897)	Assume 20% landscape planting & 80% topsoil seeding
Street Lighting	Street lighting (all inclusive)	-	m	207.67	-	235.63	-		no.	12,000.00	288,000	318,859	340,733	(318,859)	(340,733)	Rate - pricing methodology differs; Quantity based upon 50m spacing along road length + intersection; Note: lighting requirements to Cycle path & SUP is excluded
	Street lighting - Intersections		Item / p		-	-	-		Item / pe		0	2 = 2 = 2			- ''	Overtite of
	Regulatory signage		Item	329.29	3,293	363.25	3,632		Item	350.00	3,500	3,722	3,977	(429)		Quantity - ok
Misc.	Linemarking Landscape maintenance		m2 of p	75,000.00	25,012 75,000	2.81 86,250.00	29,258 86,250		m2 of pa	2.50	25,050 104,000	26,640 108,334	28,467 115,766	(33,334)	791 (29,516)	allowance for maintenance during DLP assumes 104 wks x \$1000 (assumes 1 man + vehicle x 1 day/wk)
	Tactile pavers (hazard only)	24	Item	337.14	8,091	422.86	10,149	16	Item	320.00	5,120	5,669	6,057	2,423		WT measure variance
	Extra over cost for excavation in rock				-		-		Item	242,000.00	242,000	267,930	286,310	(267,930)	(286,310)	Additional site specific item. Assume 35% of total excavated volume to be in rock
Other	Extra over cost for subgrade preparation				-		-	1	Item	101,000.00	101,000	111,822.14	119,493.21	(111,822)	(119,493)	Additional site specific item. Assume 25% of pavement area requires additional subgrade preparation works

## VPA Benchmarked Infrastructure Costings - Independent Peer Review

IN-07 - Hayes Hill Boulevard & Koukoura Drive – Construction of an arterial to blvd connector road 4-way intersection (interim treatment)
Benchmark Item 9



			V	PA							WTP						31.10.
Item	Sub Item	Qty	Unit	Rate (P50)	Amount	Rate (P90)	Amount	Qty	Unit	Rate	Amount	Amount	Amount	Diffe	rence		Comments
					(P50)		(P90)					(P50)	(P90)	(P50)	(P90)		
									<u> </u>								
					-		-				0	-	-	(=	<b>,</b>		
	Surveying & Design	1	%	5.00		5.00	-		1 %	5.00	192,693			(71,295)		% driven item	
	Contingency	1	%	15.00	-				1 %	15.00	578,079	\$ 635,740.79		(213,886)		% driven item	
>	Traffic Management	1	%	5.00	140,618	5.00	155,156		1 %	5.00	192,693	\$ 211,913.60	\$ 226,451.01	(71,295)	(71,295)	% driven item	
ver	Supervision & Project Management	1	%	9.00	253,113	9.00	279,281		1 %	9.00	346,847	\$ 381,444.47	\$ 407,611.83	(128,332)	(128,331)	% driven item	
eli	Council Fees	1	%	3.25	91,402	3.25	100,851		1 %	3.25	125,250	\$ 137,743.84	\$ 147,193.16	(46,342)	(46,342)	% driven item	
۵	Vic Roads Fees	1	%	1.00	28,124	1.00	31,031		1 %	1.00	38,539	\$ 42,382.72	\$ 45,290.20	(14,259)	(14,259)	% driven item	
	Environmental Management	1	%	0.50	14,062	0.50	15,516		1 %	0.50	19,269	\$ 21,191.36	\$ 22,645.10	(7,130)		% driven item	
	Site Establishment	1	%	2.50	70,309	2.50	77,578		1 %	2.50	96,347	\$ 105,956.80	\$ 113,225.51	(35,648)	(35,647)	% driven item	
		•	_						_					()	<b>.</b>	3	
TOTAL	Excluding Delivery				2,812,365		3,103,121				3,853,861		\$ 4,529,020	(1,425,907)			
IOIAL	Including Delivery				3,972,466		4,383,158				5,443,578	\$ 5,986,559	\$ 6,397,241	(2,014,093)	(2,014,083)		



VPA WTP

Itom	Sub Item	Qty	Unit	Rate (P50)	Amount	Rate (P90)	Amount	Otv	Unit	Rate	Amount	Amount	Amount	Diff	erence	Comments
Item	July Itelii	Qty	Onic	nate (PSU)	(P50)	nate (P90)	(P90)	Qty	Onit	nate	Amount	Amount (P50)	(P90)	(P50)	(P90)	Comments
					(۲၁۷)		(190)					(P3U)	(190)	(P3U)	(1790)	
vorks &	Site Preparation			2.39	-	2.60	-	12,902	m2	2.50	32,255	35,706	37,977	(35,706)	(37,977)	Quantity missing; Rate includes for site clearance & topsoil removal to suit Ultimate design standard to full width of road reserve.
Sitew	Demolition of existing pavements							3,190	m2	25.00	79,750	88,282	93,898	(88,282)	(93,898)	New item - Demolition of Existing Merriang Rd
Sit	Earthworks	5,556	m3	35.43	196,805	39.04	216,875	3,006	m3	39.00	117,240	129,783	138,040	67,022	78,835	Quantity low based upon differences to pavement areas (refer comments below)
	Primary Arterial Pavement	-	m2	157.08	-	167.24	-		m2	155.00	0			-	-	
	Secondary Arterial Pavement	5,915	m2	123.23	728,899	128.26	758,673		m2	141.00	0			728,899	758,673	
Pavements	Collector Arterial Pavement	1,855	m2	91.07	168,937	100.18	185,831	5,619	m2	126.00	707,994	783,737	833,598	(614,800)	(647,766)	Quantity is high based upon WT measured areas; Hayes Hill Rd & Merriang Rd measured as Collector arterials. Rate is low based upon nominated pavement depth.
Road	Subgrade preparation	-	%	15.21	-	17.05	-	5,619	m2	2.50	14,048	15,550	16,540	(15,550)	(16,540)	Quantity missing; Rate - pricing methodology differs, m2 v %
	Pavement rehab	-	m2	45.90	-		-		m2		0			-	-	
	Pavement other	-	m2	-	-		-		m2		0			-	-	
	Kerb & channel	1,980	m	50.42	99,830	54.84	108,581	1,245		55.00	68,475	72,810	77,442	27,020		Quantity is low based upon WT measured lengths
rs	Cycle path	560	m2	59.60	33,376	66.57	37,278		m2	50.00	0			33,376	37,278	
oncrete Wo	SUP / Footpath	1,330	m2	58.44	77,730	65.15	86,646	2,203	m2	60.00	132,180	140,548	149,489	(62,817)	(62,843)	pavement with SL72 mesh as advised by whittlesea City Council).
ŏ	Traffic Island	485	m2	71.43	34,645	75.24	36,492	102	m2	60.00	6,120	6,507	6,921	28,138	29,570	Quantity high; extent of islands at intersection to be confirmed
	Drainage pipe - 300mm CR backfilled	-	m	162.30	-	172.18	-		m	225.00	0			-	-	
	Drainage pipe - 375mm CR backfilled	-	m	226.68	-	241.37	-		m	260.00	0			-	-	
	Drainage pipe - 450mm CR backfilled	580	m	291.67	169,167	313.36	181,747	500	m	290.00	145,000	160,513	170,724	8,654	11,023	Quantity assumed to run through Collector Arterial
ge	Drainage pipe - 525mm CR backfilled	-	m	375.71	-	395.82	-		m	355.00	0			-	-	
Draina	Drainage - pits	27	no.	2,325.57	62,790	2,454.13	66,261	10	no.	2,150.00	21,500	25,682	27,316	37,109	38,946	Quantity assumes pits @ 50m centres based upon length of pipework; Rate assumes for 600 x 900 JP, max depth 1.5m.
	Drainage - Subsoil drainage	2,480		23.05	57,157	25.63	63,562	1,245	m	45.00	56,025	62,019	65,964	(4,862)	(2,403)	rate low - allowances include for pits and risers. Quantity quite high
	Drainage - culvert	-	no.	-	-		-		no.		0			-	-	
Traffic	Traffic Signals	3	Item	88,375.88	265,128	97,059.82	291,179	1	Item	250,000.00	250,000	276,746	294,352	(11,618)	(3,172)	T-Intersection
	Traffic Signal conduit	-	m	45.71	-	51.46	-		m		0			-	-	
аре	Tree Planting	66	no.	259.62	17,135	303.44	20,027	66	no.	250.00	16,500	17,545	18,661	(410)		assumes trees @15m spacing along nature strip length >3m wide
qsc	Landscaping	4,180	m2	20.72	86,596	22.64	94,627	996	m2	15.00	14,934	15,879	16,890	70,716	77,738	Quantity is low - area used assumes overall site area (as per
Lan		4.400		7.00	20.242	7.60	22.442	2 000		5.50	24.000	22.222	24.774	5.050	7,000	Site Preparation) less paved areas;
	Topsoil seeding	4,180	m2	7.00	29,243	7.68	32,110	3,982	m∠	5.50	21,903	23,290	24,771	5,953	7,339	Assume 20% landscape planting & 80% topsoil seeding
Street Lighting	Street lighting (all inclusive)	-	m	207.67	-	228.38	-		no.	12,000.00	168,000	185,973	197,804	(185,973)	(197,804)	Rate - pricing methodology differs; Quantity based upon 50m spacing along road length + intersection; Note: lighting requirements to Cycle path & SUP is excluded
	Street lighting - Intersections	3	Item / p	-	-		-		Item / pe	Ü	0			-	-	
	Regulatory signage	5	Item	329.29	1,646	354.44	1,772		Item	350.00	1,750		1,979	(214)		Quantity - ok
	Linemarking	7,770	m2 of p	2.40	18,669	2.70	21,016	5,619	m2 of pa	2.50	14,048	14,937	15,887	3,732		
Misc.	Landscape maintenance	1	Item	75,000.00	75,000	86,250.00	86,250	1	Item	104,000.00	104,000	108,318	115,209	(33,318)		allowance for maintenance during DLP assumes 104 wks x \$1000 (assumes 1 man + vehicle x 1 day/wk)
	Tactile pavers (hazard only)	18	Item	337.14	6,069	400.63	7,211	4	Item	320.00	1,280	1,417	1,507	4,652	5,704	WT measure variance
	Service Relocation	1	ltem	94,526.02	94,526	106,692.87	106,693	1	Item	116,000.00	116,000	128,410	136,579	(33,884)	(29,886)	(extent based on Donnybrook-Woodstock ICP Plan)
ther	Extra over cost for excavation in rock				-		-	1	Item	113,000.00	113,000	11,557	12,292	(11,557)	(12,292)	Additional site specific item. Assume 35% of total excavated volume to be in rock



			VI	PA							WTP					31.10.2018
Item	Sub Item	Qty	Unit	Rate (P50)	Amount	Rate (P90)	Amount	Qty	Unit	Rate	Amount	Amount	Amount	Diffe	rence	Comments
					(P50)		(P90)					(P50)	(P90)	(P50)	(P90)	
0	Extra over cost for subgrade preparation				1		-	1	Item	57,000.00	57,000	55,349	58,870	(55,349)	(58,870)	Additional site specific item. Assume 25% of pavement area requires additional subgrade preparation works
	Remove - existing fencing							580	m	18.00	10,440	125,089	133,047	(125,089)	(133,047)	Quantiy missing - WT allowance
	Tie into existing pavements				-		-	2	no.	25,000.00	50,000	63,098	67,112	(63,098)	(67,112)	Assumes ties into both sides of Merriang Rd (North & South legs)
	Surveying & Design	1	%	5.00	111,167	5.00	120,142	1	%	5.00	115,972	\$ 127,530.26	\$ 135,643.54	(16,363)	(15,502)	% driven item
	Contingency	1	%	15.00	333,502		360,425	1	%	15.00	347,916	\$ 382,590.77	\$ 406,930.62	(49,089)		% driven item
>	Traffic Management	1	%	5.00	111,167	5.00		1	%	5.00	115,972	\$ 127,530.26	\$ 135,643.54	(16,363)		% driven item
Ver	Supervision & Project Management	1	%	9.00	200,101			1	%	9.00	208,750	\$ 229,554.46	\$ 244,158.37	(29,453)		% driven item
Seli:	Council Fees	1	%	3.25	72,259			1	%	3.25	75,382			(10,636)		% driven item
	Vic Roads Fees	1	%	1.00	22,233	1.00	24,028	1	%	1.00	23,194	\$ 25,506.05	\$ 27,128.71	(3,273)	(3,100)	% driven item
	Environmental Management	1	%	0.50	11,117	0.50	12,014	1	%	0.50	11,597	\$ 12,753.03	\$ 13,564.35	(1,636)		% driven item
	Site Establishment	1	%	2.50	55,584	2.50	60,071	1	%	2.50	57,986	\$ 63,765.13	\$ 67,821.77	(8,181)	(7,751)	% driven item
TOTAL	Excluding Delivery				2,223,348		2,402,832				2,319,442	\$ 2,550,605		(327,257)		
IOIAL	Including Delivery				3,140,479		3,394,000				3,276,211	\$ 3,602,730	\$ 3,831,930	(462,251)	(437,930)	



			V	PA							WTP			31.10.20			
Item	Sub Item	Qty	Unit	Rate (P50)	Amount	Rate (P90)	Amount	Qty	Unit	Rate	Amount	Amount	Amount	Diffe	erence	Comments	
110111		٩٠١	0	1.000 (1.00)	(P50)	nate (i se)	(P90)	ς.,	0	11010	7.11104114	(P50)	(P90)	(P50)	(P90)	Comments	
					(1 50)		(1 50)					(1.00)	(. 55)	(1.50)	(1.30)		
Siteworks & Earthworks	Site Preparation			2.39	-	2.68	-	23,038	m2	2.50	57,595	63,905	67,435	(63,905)	(67 435)	Quantity missing; Rate includes for site clearance & topsoil removal to suit Ultimate design standard to full width of road reserve.	
Site	Earthworks	6,266	m3	35.43	221,985	40.30	252,550	5,373	m3	39.00	209,553	232,512	245,353	(10,526)	7,197	Quantity low based upon differences to pavement areas (refer comments below)	
	Primary Arterial Pavement	-	m2	157.08	-	170.80	-	0	m2	155.00	0			-	-		
ements	Secondary Arterial Pavement	6,970	m2	123.23	858,905	130.03	906,277	5,710	m2	141.00	805,110	893,317	942,655	(34,411)	(36 378)	Quantity is low based upon WT measured areas; Cameron St measured as Secondary arterial road. Rate is low based upon nominated pavement depth.	
Pav	Collector Arterial Pavement	3,440	m2	91.07	313,286	100.18	344,614	3,266	m2	126.00	411,516	456,601	481,819	(143,315)	(137,205)	Quantities almost match	
ad	Subgrade preparation	_	%	15.21	_	17.70		8,976	m2	2.50	22,440	24,898	26,274	(24,898)	(26.274)	Quantity missing;	
8						17.70				2.50	22,440	24,030	20,274	(24,030)	(20,274)	Rate - pricing methodology differs, m2 v %	
	Pavement rehab	-	m2	45.90	-	-	-		m2		0			-	-		
-	Pavement other	-	m2	-	-	-	-		m2		0			-	-	0 17 11 1 1 1 1 1	
	Kerb & channel	3,000	m	50.42	151,257	56.39	169,161	2,019	m	55.00	111,045	118,349	124,886	32,908	44,275	Quantity is high based upon WT measured lengths	
rks	Cycle path	1,090	m2	59.60	64,964	69.01	75,218		m2	50.00	0			64,964	75,218		
oncrete Wo	SUP / Footpath	1,910		58.44	111,628	67.50	128,916	4,610		60.00	276,600	294,795	311,076	(183,167)	(182 161)	Quantity is very low, scope to be confirmed. Rate is low (WT has based rate on 120mm thk concrete pavement with SL72 mesh as advised by Whittlesea City Council).	
Ö	Traffic Island	105	m2	71.43	7,500	76.57	8,040	207	m2	60.00	12,420	13,237	13,968	(5,736)	(5.028)	Quantity low: extent of islands at intersection to be	
											•		·		(3,328)	confirmed	
	Drainage pipe - 300mm CR backfilled	280	m	162.30	45,444	175.64	49,180	371	m	225.00	83,475	92,620	97,736	(47,176)	(48,556)	Quantity assumed to run through Collector Arterial	
	Drainage pipe - 375mm CR backfilled		m	226.68	-	246.52	-		m	260.00	0			-	-		
	Drainage pipe - 450mm CR backfilled	790	m	291.67	230,417	320.95	253,552	427	m	290.00	123,830	137,397	144,985	93,020	108,567	Quantity assumed to run through Secondary Arterial	
ο	Drainage pipe - 525mm CR backfilled	-	m	375.71	-	402.87	-		m	355.00	0			-	-		
Drainag	Drainage - pits	32	no.	2,325.57	74,418	2,499.15	79,973	16	no.	2,150.00	34,400	41,187	43,461	33,232	36,512	Quantity assumes pits @ 50m centres based upon length of pipework;  Rate assumes for 600 x 900 JP, max depth 1.5m.	
	Drainage - Subsoil drainage	3,540	m	23.05	81,586	26.53	93,931	2,019	m	45.00	90,855	100,809	106,377	(19,223)	(12,446)	rate low - allowances include for pits and risers. Quantity almost matches	
	Drainage - swale								m	25.00	0			-	-		
	Drainage - culvert		no.	-	-	-	-		no.		0			-	-		
	Traffic Signals	4	Item	88,375.88	353,504	100,101.03	400,404		Item	300,000.00	300,000	332,868	351,252	20,636	49.152	X-Intersection	
Traffic	Traffic Signal conduit		m	45.71	-	53.47	-		m	300,000.00	0	332,000	331,232	-	-		
											Ü					assumes trees @15m spacing along nature strip length >3m	
abe	Tree Planting	88	no.	259.62	22,846	318.78	28,053	68	no.	250.00	17,000	18,118	19,119	4,728	8,934	wide	
Jdsc	Landscaping	5,890	m2	20.72	122,021	23.31	137,302	1,849	m2	15.00	27,735	29,559	31,192	92,462	106,110	Quantity is high - area used assumes overall site area (as per Site Preparation) less paved areas;	
Lar	Topsoil seeding	5,890	m2	7.00	41,206	7.92	46,661	7,396	m2	5.50	40,678	43,354	45,748	(2,147)	913	Assume 20% landscape planting & 80% topsoil seeding	
Street Lighting	Street lighting (all inclusive)	-	m	207.67	-	235.63	-	23	no.	12,000.00	276,000	306,238	323,152	(306,238)	(323,152)	Rate - pricing methodology differs; Quantity based upon 50m spacing along road length + intersection; Note: lighting requirements to Cycle path & SUP is excluded	
	Street lighting - Intersections		Item /	-	-	-	-		Item / pe		0		I	-	-		
	Regulatory signage		Item	329.29	3,293	363.25	3,632		Item	350.00	3,500	3,730	3,936	(437)		Quantity - ok	
	Linemarking	10,410	m2 of p	2.40	25,012	2.81	29,258	8,976	m2 of pa	2.50	22,440	23,916	25,237	1,096	4,021		
Misc	Landscape maintenance	1	Item	75,000.00	75,000	86,250.00	86,250	1	Item	104,000.00	104,000	108,570	114,566	(33,570)	, ,	allowance for maintenance during DLP assumes 104 wks x \$1000 (assumes 1 man + vehicle x 1 day/wk)	
	Tactile pavers (hazard only)	24	Item	337.14	8,091	422.86	10,149	16	Item	320.00	5,120	5,681	5,995	2,410	4,154	WT measure variance	
	Extra over cost for excavation in rock				-		-	1	Item	189,000.00	189,000	209,707	221,289	(209,707)	(221,289)	Additional site specific item. Assume 35% of total excavated volume to be in rock	
her	Extra over cost for subgrade preparation				-		-	1	Item	90,000.00	90,000	99,860.26	105,375.57	(99,860)		Additional site specific item. Assume 25% of pavement area requires additional subgrade preparation works	

### VPA Benchmarked Infrastructure Costings - Independent Peer Review

Including Delivery

IN-09 - Cameron Street / Connector Street (Nth–Sth Connector) – Construction of an arterial to connector road 4-way intersection (interim treatment)
Benchmark Item 9

3,972,466

4,383,158



VPA WTP 31.10.2018 Item Qty Unit Rate (P50) Rate (P90) Unit Rate Difference Sub Item Amount Amount Qty Amount Amount Amount Comments (P50) (P90) (P50) (P90) (P50) (P90) Allowance for temporary protection Allowance for temporary protection during construction only 15,000.00 16,643.38 17,562.59 (16,643) (17,563) (drainage corridor to be built on the northern side of the during construction (drainage corridor 1 Item 15,000 on the Northern side of the western leg) western leg) 5.00 140,618 5.00 155,156 5.00 166,466 \$ 183,393.53 \$ 193,522.40 (42,775) (38,366) % driven item Surveying & Design 1 % 421,855 15.00 465,468 15.00 550,180.58 \$ 580,567.21 (128.326 Contingency 1 | % 15.00 499,397 \$ (115,099) % driven item Traffic Management 5.00 140,618 5.00 155,156 5.00 166,466 183,393.53 \$ 193,522.40 (42,775 1 | % (38,366) % driven item Supervision & Project Management 9.00 253,113 9.00 279,281 9.00 299,638 330,108.35 348,340.33 (76,99 (69,059) % driven item Council Fees 3.25 91,402 3.25 100,851 3.25 108,203 119,205.79 125,789.56 (27,804 (24,938) % driven item Vic Roads Fees 1.00 28,124 1.00 31,031 1.00 33,293 36,678.71 38,704.48 (8,555 (7,673) % driven item Environmental Management 1 % 0.50 14,062 0.50 15,516 0.50 16,647 18,339.35 19,352.24 (4,278 (3,837) % driven item Site Establishment 2.50 2.50 (21,388) 1 | % 70,309 77,578 2.50 83,233 91,696.76 \$ 96,761.20 (19,183) % driven item 2,812,365 3,103,121 3,329,312 \$ 3,667,871 \$ 3,870,448 (855,505) (767,327) Excluding Delivery TOTAL

4,702,654 \$

5,180,867 \$

5,467,008

(1,208,401)

(1,083,849)

VPA Benchmarked Infrastructure Costings - Independent Peer Review

IN-10 - Cameron Street (arterial west/blvd connector east) & Patterson Drive (arterial) – Construction of an arterial to arterial/blvd connector road 4-way intersection (interim treatment)

Benchmark Item 8

VPA



31.10.2018

			VP					-			WIP					31.10.2018
Item	Sub Item	Qty	Unit	Rate (P50)	Amount	Rate (P90)	Amount	Qty	Unit	Rate	Amount	Amount	Amount	Diffe	rence	Comments
					(P50)		(P90)					(P50)	(P90)	(P50)	(P90)	
works & thworks	Site Preparation	-		2.39	-	2.68	-	42,334	m2	2.50	105,835	117,016	125,939	(117,016)	(125,939	Quantity missing; Rate includes for site clearance & topsoil removal to suit Ultimate design standard to full width of road reserve.
Sitewo	Earthworks	9,867	m3	35.43	349,538	40.30	397,666	9,141	m3	39.00	356,492	394,154	424,209	(44,615)	(26,543)	Quantity high based upon differences to pavement areas (refer comments below)
	Primary Arterial Pavement	-	m2	157.08	-	170.80	-			155.00	0			-	-	
/ements	Secondary Arterial Pavement	13,800	m2	123.23	1,700,559	130.03	1,794,350	14,395	m2	141.00	2,029,695	2,244,123	2,415,240	(543,564)	(620,890	Quantity is low based upon WT measured areas; Patterson Dr & Cameron St measured as Secondary arterial road. Rate is low based upon nominated pavement depth.
Pav	Collector Arterial Pavement	-	m2	91.07	-	100.18	-		m2	126.00	0			-	-	
Road	Subgrade preparation	-	%	15.21	-	17.70	-	14,395	m2	2.50	35,988	39,789	42,823	(39,789)	(42,823	Quantity missing; Rate - pricing methodology differs, m2 v %
	Pavement rehab	-	m2	45.90	-	-	-		m2		0			-	-	
	Pavement other	-	m2	-	-	-	-		m2		0			-	-	
S	Kerb & channel	2,000	m	50.42	100,838	56.39	112,774	3,584		55.00	197,120	209,346	225,308	(108,507)	(112,535	Quantity is low based upon WT measured lengths
oncrete Worl	Cycle path SUP / Footpath	1,700	m2 m2	59.60 58.44	99,354	69.01 67.50	114,742	6,434	m2 m2	50.00 60.00	0 386,040	409,982	441,244	(310,628)	(326,502	Quantity is very low, scope to be confirmed.  Rate is low (WT has based rate on 120mm thk concrete pavement with SL72 mesh as advised by Whittlesea City Council).
O	Traffic Island	680	m2	71.43	48,575	76.57	52,071	710	m2	60.00	42,600	45,242	48,692	3,333	3,379	Quantity almost match
	Drainage pipe - 300mm CR backfilled	260	m	162.30	42,198	175.64	45,667		m	225.00	0			42,198	45,667	
	Drainage pipe - 375mm CR backfilled	-	m	226.68	-	246.52	-		m	260.00	0			-	-	
	Drainage pipe - 450mm CR backfilled	900	m	291.67	262,500	320.95	288,857	1,195	m	290.00	346,550	383,161	412,378	(120,661)	(123,521)	Quantity assumed to run through Secondary Arterial
o)	Drainage pipe - 525mm CR backfilled	-	m	375.71	-	402.87	-		m	355.00	0			-	-	
Drainago	Drainage - pits	40	no.	2,325.57	93,023	2,499.15	99,966	24	no.	2,150.00	51,600	61,562	66,256	31,461	33,710	Quantity assumes pits @ 50m centres based upon length of pipework; Rate assumes for 600 x 900 JP, max depth 1.5m.
	Drainage - Subsoil drainage	3,100	m	23.05	71,446	26.53	82,256	3,584	m	45.00	161,280	178,318	191,915	(106,873)	(109,660	rate low - allowances include for pits and risers. Quantity low
	Drainage - swale								m	25.00	0			-	-	
	Drainage - culvert	-	no.	-	-	-	-		no.		0			-	-	
Traffic	Traffic Signals	4	Item	88,375.88	353,504	100,101.03	400,404	1	Item	300,000.00	300,000	331,694	356,986	21,810	43,418	X-Intersection
	Traffic Signal conduit	-	m	45.71	-	53.47	-		m		0			-	-	
o)	Tree Planting	60	no.	259.62	15,577	318.78	19,127	81	no.	250.00	20,250	21,506	23,146	(5,929)	(4,019	assumes trees @15m spacing along nature strip length >3m
dscape	Landscaping	3,000	m2	20.72	62,150	23.31	69,933	4,159	m2	15.00	62,385	66,254	71,306	(4,104)	(1,373	Quantity is quite low - area used assumes overall site area (as per Site Preparation) less paved areas;
Lanc	Topsoil seeding	3,000	m2	7.00	20,988	7.92	23,766	16,636	m2	5.50	91,498	97,173	104,582	(76,185)	(80,816	
Street Lighting	Street lighting (all inclusive)	-	m	207.67	-	235.63	-	32	no.	12,000.00	384,000	424,568	456,942	(424,568)	(456,942	Rate - pricing methodology differs; Quantity based upon 50m spacing along road length + intersection; Note: lighting requirements to Cycle path & SUP is excluded
	Street lighting - Intersections		Item / p	-	-	-	-		Item / pe		0			-	-	
	Regulatory signage		Item	329.29	5,269	363.25	5,812		Item	350.00	5,600	5,947	6,401	(679)		Quantity - ok
	Linemarking	13,800	m2 of p	2.40	33,158	2.81	38,786	14,395	m2 of pa	2.50	35,988	38,219	41,134	(5,062)	(2,348	
Misc	Landscape maintenance	1	Item	75,000.00	75,000	86,250.00	86,250		Item	104,000.00	104,000	108,187	116,436	(33,187)		allowance for maintenance during DLP assumes 104 wks x \$1000 (assumes 1 man + vehicle x 1 day/wk)
	Tactile pavers (hazard only)	24		337.14	8,091	422.86	10,149	24	Item	320.00	7,680	8,491	9,139	(400)	1,010	WT measure variance
	Extra over cost for excavation in rock				-		-	1	Item	320,000.00	320,000	353,807	380,785	(353,807)	(380,785	Additional site specific item. Assume 35% of total excavated volume to be in rock
Other	Extra over cost for subgrade preparation				-		-	1	Item	144,000.00	144,000	159,212.94	171,353.12	(159,213)	(171,353	Additional site specific item. Assume 25% of pavement area requires additional subgrade preparation works
	Surveying & Design	1	%	5.00	167,088	5.00	182,129	1	%	5.00	259,430	\$ 284,887.65	\$ 306,610.69	(117,799)	(124,482	% driven item

WTP

VPA Benchmarked Infrastructure Costings - Independent Peer Review

IN-10 - Cameron Street (arterial west/blvd connector east) & Patterson Drive (arterial) – Construction of an arterial to arterial/blvd connector road 4-way intersection (interim treatment)

Benchmark Item 8

VPA



31.10.2018

Item	Sub Item	Qty	Unit	Rate (P50)	Amount	Rate (P90)	Amount	Qty	Unit	Rate	Amount	Amount	Amount	Differ	ence	Comments
					(P50)		(P90)					(P50)	(P90)	(P50)	(P90)	
	Contingency	1	%	15.00	501,265	15.00	546,386	1	1 %	15.00	778,290	\$ 854,662.95	\$ 919,832.07	(353,398)	(373,446)	% driven item
>	Traffic Management	1	%	5.00	167,088	5.00	182,129	1	1 %	5.00	259,430	\$ 284,887.65	\$ 306,610.69	(117,799)	(124,482)	% driven item
/er	Supervision & Project Management	1	%	9.00	300,759	9.00	327,832	1	1 %	9.00	466,974	\$ 512,797.77	\$ 551,899.24	(212,039)	(224,068)	% driven item
eli	Council Fees	1	%	3.25	108,607	3.25	118,384	1	1 %	3.25	168,630	\$ 185,176.97	\$ 199,296.95	(76,570)	(80,913)	% driven item
۵	Vic Roads Fees	1	%	1.00	33,418	1.00	36,426	1	1 %	1.00	51,886	\$ 56,977.53	\$ 61,322.14	(23,560)	(24,896)	% driven item
	Environmental Management	1	%	0.50	16,709	0.50	18,213	1	1 %	0.50	25,943	\$ 28,488.76	\$ 30,661.07	(11,780)	(12,448)	% driven item
	Site Establishment	1	%	2.50	83,544	2.50	91,064	1	1 %	2.50	129,715	\$ 142,443.82	\$ 153,305.35	(58,900)	(62,241)	% driven item
	-							-								
TOTAL	Excluding Delivery				3,341,767		3,642,574				5,188,600	\$ 5,697,753	\$ 6,132,214	(2,355,986)	(2,489,640)	
TOTAL	Including Delivery				4,720,246		5,145,136				7,328,898	\$ 8,048,076	\$ 8,661,752	(3,327,830)	(3,516,616)	

WTP

IN-11 - Cameron Street (blvd connector west/town centre connector east) & Koukoura Drive (arterial) – Construction of an arterial to connector road 4-way intersection (interim treatment) Benchmark Item 8



			VF	PA							WTP					31.10.2018
Item	Sub Item	Qty	Unit	Rate (P50)	Amount	Rate (P90)	Amount	Qty	Unit	Rate	Amount	Amount	Amount	Diffe	rence	Comments
					(P50)	( 11)	(P90)					(P50)	(P90)	(P50)	(P90)	
orks & works	Site Preparation	-		2.39	-	2.68	-	37,835	m2	2.50	94,588	104,725	111,405	(104,725)	(111,405)	Quantity missing; Rate includes for site clearance & topsoil removal to suit Ultimate design standard to full width of road reserve.
Sitewo Earthw	Earthworks	9,867	m3	35.43	349,538	40.30	397,666	9,162	m3	39.00	357,331	395,629	420,864	(46,091)	(23,199)	Quantity high based upon differences to pavement areas (refer comments below)
	Primary Arterial Pavement	-	m2	157.08	-	170.80	-	9,651	m2	155.00	1,495,905	1,656,234	1,761,876	(1,656,234)		Koukoura Drive measured as Primary arterial road. Rate is low based upon nominated pavement depth.
avements	Secondary Arterial Pavement	13,800	m2	123.23	1,700,559	130.03	1,794,350	3,562	m2	141.00	502,242	556,072	591,540	1,144,487	1,202,810	Quantity is high based upon WT measured areas; Cameron St measured as Secondary arterial road. Rate is low based upon nominated pavement depth.
ad P	Collector Arterial Pavement	-	m2	91.07	-	100.18	-		m2	126.00	0			-	-	
Ro	Subgrade preparation	-	%	15.21	-	17.70	-	13,213		2.50	33,033	36,573	38,906	(36,573)	(38,906)	Quantity missing; Rate - pricing methodology differs, m2 v %
	Pavement rehab	-	m2	45.90	-	-	-		m2		0			-	-	
	Pavement other Kerb & channel	2,000	m2	- 50.42	100,838	56.39	- 112,774	3,129	m2	55.00	0 172,095	183,022	194,696	(82,184)	- (01 022)	Quantity is low based upon WT measured lengths
S	Cycle path	2,000	m2	59.60	100,656	69.01	-	3,129	m2	50.00	172,093	103,022	194,090	(02,104)	(01,922)	Quantity is low based upon with leasured lengths
ncrete Work	SUP / Footpath	1,700		58.44	99,354	67.50	114,742	5,909		60.00	354,540	377,051	401,101	(277,696)	(286,359)	Quantity is very low, scope to be confirmed. Rate is low (WT has based rate on 120mm thk concrete pavement with SL72 mesh as advised by Whittlesea City Council).
0)	Traffic Island	680	m2	71.43	48,575	76.57	52,071	267	m2	60.00	16,020	17,037	18,124	31,538	33,947	Quantity is low, Traffic Island scope to be confirmed
	Drainage pipe - 300mm CR backfilled	260	m	162.30	42,198	175.64	45,667	446	m	225.00	100,350	111,105	118,192	(68,907)	(72,525)	Quantity assumed to run through Secondary Arterial
	Drainage pipe - 375mm CR backfilled	-	m	226.68	-	246.52	-		m	260.00	0			-	-	
	Drainage pipe - 450mm CR backfilled	900	m	291.67	262,500	320.95	288,857	626	m	290.00	181,540	200,997	213,818	61,503	75,039	Quantity assumed to run through Primary Arterial
Drainage	Drainage pipe - 525mm CR backfilled  Drainage - pits	40	m no.	375.71 2,325.57	93,023	402.87 2,499.15	99,966	21	m no.	355.00 2,150.00	45,150	53,941	57,382	39,082	42,584	Quantity assumes pits @ 50m centres based upon length of pipework; Rate assumes for 600 x 900 JP, max depth 1.5m.
	Drainage - Subsoil drainage	3,100	m	23.05	71,446	26.53	82,256	3,129	m	45.00	140,805	155,896	165,840	(84,451)	(83,584)	rate low - allowances include for pits and risers. Quantity almost matches
	Drainage - swale								m	25.00	0			-	-	
	Drainage - culvert	-	no.	-	-	-	-	<u> </u>	no.		0	222.17.1		-	-	
Traffic	Traffic Signals	4	Item	88,375.88	353,504	100,101.03	400,404	1	Item	300,000.00	300,000	332,154	353,340	21,350	47,064	X-Intersection
	Traffic Signal conduit Tree Planting	60	m no.	45.71 259.62	15,577	53.47 318.78	19,127	122	m no.	250.00	30,500	32,437	34,505	(16,860)	(15,379)	assumes trees @15m spacing along nature strip length >3m wide
саре	Landscaping	3,000	m2	20.72	62,150	23.31	69,933	3,689	m2	15.00	55,338	58,852	62,605	3,298	7,328	Quantity is quite low - area used assumes overall site area (as
Landsc	Topsoil seeding	3,000		7.00	20,988	7.92	23,766	14,757		5.50	81,162	86,316	91,821	(65,328)	(68,055)	per Site Preparation) less paved areas; Assume 20% landscape planting & 80% topsoil seeding
Street Lighting	Street lighting (all inclusive)	-	m	207.67	-	235.63	-	29	no.	12,000.00	348,000	385,298	409,874	(385,298)	(409,874)	Rate - pricing methodology differs; Quantity based upon 50m spacing along road length + intersection; Note: lighting requirements to Cycle path & SUP is excluded
	Street lighting - Intersections		Item / p	-	-	-	-		Item / pe		0			-	-	
	Regulatory signage		Item	329.29	5,269	363.25	5,812		Item	350.00	5,600	5,956	6,335	(687)		Quantity - ok
Misc.	Linemarking Landscape maintenance	13,800	m2 of p	75,000.00	33,158 75,000	2.81 86,250.00	38,786 86,250		m2 of pa	2.50 104,000.00	33,033 104,000	35,130 108,337	37,371 115,247	(33,337)		allowance for maintenance during DLP assumes 104 wks x \$1000 (assumes 1 man + vehicle x 1 day/wk)
	Tactile pavers (hazard only)	24		337.14	8,091	422.86	10,149	24	Item	320.00	7,680	8,503	9,045	(412)		Quantity - ok
- C	Extra over cost for excavation in rock				-		-	1	Item	321,000.00	321,000	355,404	378,074	(355,404)	(378,074)	Additional site specific item. Assume 35% of total excavated volume to be in rock

# VPA Benchmarked Infrastructure Costings - Independent Peer Review

IN-11 - Cameron Street (blvd connector west/town centre connector east) & Koukoura Drive (arterial) – Construction of an arterial to connector road 4-way intersection (interim treatment) Benchmark Item 8



			VI	PA							WTP					31.10.2018
Item	Sub Item	Qty	Unit	Rate (P50)	Amount	Rate (P90)	Amount	Qty	Unit	Rate	Amount	Amount	Amount	Differe	ence	Comments
		Ψ.,			(P50)		(P90)			11000		(P50)	(P90)	(P50)	(P90)	
Ť																
ŏ	Extra over cost for subgrade preparation				-		-	1	1 Item	133,000.00	133,000	147,254.76	156,647.30	(147,255)	(156,647)	Additional site specific item. Assume 25% of pavement area requires additional subgrade preparation works
	Surveying & Design	1	%	5.00	167,088	5.00	182,129	1	1 %	5.00	245,646	\$ 270,196.19	\$ 287,430.46	(103,108)	(105,302)	% driven item
	Contingency	1	%	15.00	501,265	15.00	546,386	1	1 %	15.00	736,937	\$ 810,588.58	\$ 862,291.37	(309,324)	(315,905)	% driven item
>	Traffic Management	1	%	5.00	167,088	5.00	182,129	1	1 %	5.00	245,646	\$ 270,196.19	\$ 287,430.46	(103,108)	(105,302)	% driven item
Ver	Supervision & Project Management	1	%	9.00	300,759	9.00	327,832	1	1 %	9.00	442,162	\$ 486,353.15	\$ 517,374.82	(185,594)	(189,543)	% driven item
eli	Council Fees	1	%	3.25	108,607	3.25	118,384	1	1 %	3.25	159,670	\$ 175,627.52	\$ 186,829.80	(67,020)	(68,446)	% driven item
	Vic Roads Fees	1	%	1.00	33,418	1.00	36,426	1	1 %	1.00	49,129	\$ 54,039.24	\$ 57,486.09	(20,622)	(21,060)	% driven item
	Environmental Management	1	%	0.50	16,709	0.50	18,213	1	1 %	0.50	24,565	\$ 27,019.62	\$ 28,743.05	(10,311)	(10,530)	% driven item
	Site Establishment	1	%	2.50	83,544	2.50	91,064	1	1 %	2.50	122,823	\$ 135,098.10	\$ 143,715.23	(51,554)	(52,651)	% driven item
TOTAL	Excluding Delivery				3,341,767		3,642,574				4,912,911	\$ 5,403,924	\$ 5,748,609	(2,062,157)	(2,106,035)	
IOIAL	Including Delivery				4,720,246		5,145,136				6,939,487	\$ 7,633,042	\$ 8,119,910	(2,912,797)	(2,974,774)	

Item

Sub Item

Site Preparation

Earthworks

Linemarking

Landscape maintenance

Tactile pavers (hazard only)

Misc.

Demolition of existing pavements

Primary Arterial Pavement

Secondary Arterial Pavement

Collector Arterial Pavement

Qty

5,556

m3

m2

5,915 m2

1,855 m2

Unit Rate (P50)

2.39

35.43

157.08

123.23

91.07

Amount

(P50)

196,805

728,899

168,937

Rate (P90)

2.60

39.04

167.24

128.26

100.18

Amount

(P90)

216,875

758,673

185,831



VPA WTP

31.10.2018 Qty Unit Rate Difference Amount Amount Comments Amount (P50) (P90) (P50) (P90) Quantity missing; Rate includes for site clearance & topsoil removal to suit 12,628 m2 2.50 31,570 35,057 36,807 (35,057 (36,807)Ultimate design standard to full width of road reserve. (92,979) New item - Demolition of Existing Merriang Rd 3,190 m2 25.00 79.750 88,559 92,979 (88,559 Quantity high based upon differences to pavement areas 3,349 m3 39.00 130,61 145,037 152,277 51,768 64,598 (refer comments below) 155.00 m2 Quantity is high based upon WT measured areas; Cameron St measured as Secondary arterials. Rate is low based upon 1,957 m2 141.00 275,937 306,416 321,710 422,483 436,963 nominated pavement depth. Quantity is low based upon WT measured areas; Merriang Rd 3,937 m2 126.00 496,062 550,855 578,350 (381,918) (392,519) measured as Collector arterials. Rate is low based upon nominated pavement depth. Quantity missing; 5,894 m2 2.50 14,735 16,363 17,179 (16,363 (17,179)Rate - pricing methodology differs, m2 v % m2 Quantity is high based upon WT measured lengths 1,038 m 63,934 55.00 57,090 60,895 38,935 44,647 50.00 33,376 37,278 Quantity is very low, scope to be confirmed. Rate is low (WT has based rate on 120mm thk concrete 2,343 m2 60.00 140,580 149,948 157,433 (72,218)pavement with SL72 mesh as advised by Whittlesea City Quantity high; extent of islands at intersection to be 100 m2 60.00 6,000 6,400 6,719 28,245 29,773 confirmed 225.00 260.00 Quantity assumed to run through Secondary & Collector 517 290.00 149,930 166,491 174,801 2,676 6,946 355.0 Quantity assumes pits @ 50m centres based upon length of 2,150.00 21,500 25,762 27,048 37,028 39,213 pipework; Rate assumes for 600 x 900 JP, max depth 1.5m. rate low - allowances include for pits and risers. Quantity 5,287 1,038 45.00 46,710 51,869 54,458 9,103 250,000.0 250,000 277,614 291,471 (12,486 (291) T-Intersection Item ssumes trees @15m spacing along nature strip length >3m 250.00 14,500 15,466 16,238 1,668 3,788 58 no. Quantity is low - area used assumes overall site area (as per 858 m2 15.00 12,873 13,731 14,416 72,865 80,211 Site Preparation) less paved areas; Assume 20% landscape planting & 80% topsoil seeding 3,433 m2 5.50 18,88 20,139 21,144 9,105 10,967 Rate - pricing methodology differs; Quantity based upon 50m spacing along road length + 12,000.00 168,000 186,557 195,868 (186,557) (195,868) intersection; 14 no. Note: lighting requirements to Cycle path & SUP is excluded Item / per leg Quantity - ok 350.00 1,750 1,867 1,960 (220) (188)Item 21,016 5.894 m2 of p 2.50 14,735 15,717 16,501 2,952 4.515 allowance for maintenance during DLP assumes 104 wks x

R	Subgrade preparation	-	%	15.21	-	17.05	-
	Pavement rehab	-	m2	45.90	-		-
	Pavement other	-	m2	-	-		-
	Kerb & channel	1,980	m	50.42	99,830	54.84	108,581
or <del>k</del> s	Cycle path	560	m2	59.60	33,376	66.57	37,278
Concrete Works	SUP / Footpath	1,330	m2	58.44	77,730	65.15	86,646
	Traffic Island	485	m2	71.43	34,645	75.24	36,492
	Drainage pipe - 300mm CR backfilled	-	m	162.30	-	172.18	-
	Drainage pipe - 375mm CR backfilled	-	m	226.68	-	241.37	-
	Drainage pipe - 450mm CR backfilled	580	m	291.67	169,167	313.36	181,747
age	Drainage pipe - 525mm CR backfilled	-	m	375.71	-	395.82	-
Drainage	Drainage - pits	27	no.	2,325.57	62,790	2,454.13	66,261
	Drainage - Subsoil drainage	2,480	m	23.05	57,157	25.63	63,562
	Drainage - culvert	-	no.	-	-		-
Traffic	Traffic Signals	3	Item	88,375.88	265,128	97,059.82	291,179
- Traine	Traffic Signal conduit	-	m	45.71	-	51.46	-
ed	Tree Planting	66	no.	259.62	17,135	303.44	20,027
Landscape	Landscaping	4,180	m2	20.72	86,596	22.64	94,627
Ea	Topsoil seeding	4,180	m2	7.00	29,243	7.68	32,110
Street Lighting	Street lighting (all inclusive)	-	m	207.67	-	228.38	-
	Street lighting - Intersections	3	Item / p	-	-		-
	Regulatory signage	5	Item	329.29	1,646	354.44	1,772

7,770 m2 of p

18 Item

Item

2.40

75,000.00

337.14

18,669

75,000

6,069

2.70

86,250

7,211

86,250.00

400.63

Item

4 Item

104,000.00

320.00

104,000

1,280

108,658

1,421

114,081

1,492

(33,658)

4,647

(27,831)

5,719 WT measure variance

\$1000 (assumes 1 man + vehicle x 1 day/wk)

Including Delivery

3,140,479

3,394,000



VPA WTP 31.10.2018 Unit Rate (P50) Rate (P90) Difference Item Sub Item Qty Amount Amount Qty Unit Rate Amount Comments Amount Amount (P50) (P90) (P50) (P90) (P50) (P90) Rate appears to be low, WT's rate is based off 100m for OH Electrical power to be removed / relocated as well as 94,526.02 94,526 106,692.87 106,693 116,000.00 116,000 128,813 135,242 (34,287) (28,550)Service Relocation 1 Item 1 Item relocation of comms during works to IN-12 along Merriang Rd (extent based on Donnybrook-Woodstock ICP Plan) Additional site specific item. Assume 35% of total excavated 125,000.00 125,000 138,807 145,735 (138,807 (145,735) Other Extra over cost for excavation in rock Item volume to be in rock Additional site specific item. Assume 25% of pavement area Extra over cost for subgrade preparation Item 59,000.00 59,000 65,517 68,787 (65,517 (68,787)requires additional subgrade preparation works Remove - existing fencing 580 m 18.00 10,440 11,593 12,172 (11,593 (12,172) Quantity missing - WT allowance Assumes ties into both sides of Merriang Rd (North & South 25,000.00 50,000 55,523 58,294 (55,523 (58,294) Tie into existing pavements 2 no. 138,855.00 (18,713) % driven item 5.00 111,167 5.00 120,142 119,847 132,253.72 \$ (21,086 Surveying & Design 1 % 5.00 15.00 15.00 359,540 333,502 360,425 396,761.17 \$ 416,564.99 15.00 (63,259 (56,140) % driven item Contingency 1 | % 120,142 5.00 111,167 5.00 119,847 132,253.72 \$ 138,855.00 Traffic Management 1 % 5.00 (21,086 (18,713) % driven item Supervision & Project Management 9.00 200,101 9.00 216,255 238,056.70 249,939.00 (37,955 1 | % 9.00 215,724 (33,684) % driven item Deliv 72,259 3.25 3.25 78,092 3.25 77,900 85,964.92 90,255.75 (12,164)Council Fees (13,706 1 % % driven item 1.00 22,233 1.00 24,028 1.00 23,969 (3,743)Vic Roads Fees 1 % 26,450.74 27,771.00 (4,217) % driven item Environmental Management 0.50 11,117 0.50 12,014 0.50 11,985 13,225.37 13,885.50 (2,109) % driven item (1,871)Site Establishment 2.50 55,584 2.50 60,071 59,923 66,126.86 69,427.50 (10,543 (9,357) % driven item 2,223,348 2,402,832 2,396,933 \$ 2,645,074 \$ 2,777,100 (421,727) (374,268) **Excluding Delivery TOTAL** 3,385,668 \$

3,736,168 \$

3,922,654

(595,689)

(528,654)

VPA Benchmarked Infrastructure Costings - Independent Peer Review

IN-13 - Gunns Gully Road & Connector St (Nth–Sth Connector) – Construction of an arterial to connector road 3-way intersection (interim treatment)

Benchmark Item 13



31.10.2018

WTP VPA

Primary Arterial Pavement   1,742   m2   123.23   214.665   130.03   226.504   226.5	P90) (P50) 94,704 (88,71 307,130 (109,47			(P90)	Quantity missing;
Side Preparation   2.39   - 2.68   - 32,064 m2   2.50   80,160   88,717	94,704 (88,71 307,130 (109,47	94,704			Quantity missing;
Steel Preparation   2.39   -   2.68   -   32,064   m2   2.50   80,160   88,717	307,130 (109,47		(88,717	) (94.70	Quantity missing;
Site Preparation   2.39   -   2.68   -   32,064   m2   2.50   80,160   88,717	307,130 (109,47		(88,717	) (94.70	Quantity missing;
Primary Arterial Pavement 5,295 m2 157.08 831,756 170.80 904,390 7,812 m2 155.00 1,210,860 1,340,112 3  Secondary Arterial Pavement 1,742 m2 123.23 214,665 130.03 226,504 0 m2 141.00 0  Collector Arterial Pavement - m2 91.07 - 100.18 - 2,019 m2 126.00 254,394 281,549    Subgrade preparation - % 15.21 - 17.70 - 9,831 m2 2.50 24,578 27,201    Pavement rehab - m2 45.90 -		307,130		(3.),, (	Rate includes for site clearance & topsoil removal to suit Ultimate design standard to full width of road reserve.
Secondary Arterial Pavement   1,742   m2   123.23   214,665   130.03   226,504     0 m2   141.00   0	1,430,549 (508,35		(109,474	) (104,34	Quantity low based upon differences to pavement areas (refer comments below)
Collector Arterial Pavement - m2 91.07 - 100.18 - 2,019 m2 126.00 254,394 281,549  Subgrade preparation - % 15.21 - 17.70 - 9,831 m2 2.50 24,578 27,201  Pavement rehab - m2 45.90 -		1,430,549	(508,356	) (526,16	Quantity is low based upon WT measured areas; Gunns  Gulley Road measured as Primary arterials Rate is low based upon nominated pavement depth.
Subgrade preparation - % 15.21 - 17.70 - 9,831 m2 2.50 24,578 27,201  Pavement rehab - m2 45.90	214,66		214,665	226,50	4
Pavement rehab	300,549 (281,54	300,549	(281,549	) (300,54	upon nominated pavement depth.
Pavement other - m2 m2 10 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	29,037 (27,20	29,037	(27,201	) (29,03	Quantity missing; 7) Rate - pricing methodology differs, m2 v %
Kerb & channel         2,127 m         50.42         107,241         56.39         119,935         1,412 m         55.00         77,660         82,558           Cycle path         1,615 m2         59.60         96,254         69.01         111,447         m2         50.00         0           SUP / Footpath         510 m2         58.44         29,806         67.50         34,422         4,951 m2         60.00         297,060         315,797           Traffic Island         675 m2         71.43         48,217         76.57         51,688         96 m2         60.00         5,760         6,123           Drainage pipe - 300mm CR backfilled         205 m         162.30         33,272         175.64         36,006         252 m         225.00         56,700         62,752	-		-	-	
Cycle path   1,615   m2   59.60   96,254   69.01   111,447   m2   50.00   0	-		-	-	
SUP / Footpath 510 m2 58.44 29,806 67.50 34,422 4,951 m2 60.00 297,060 315,797 Traffic Island 675 m2 71.43 48,217 76.57 51,688 96 m2 60.00 5,760 6,123 Drainage pipe - 300mm CR backfilled 205 m 162.30 33,272 175.64 36,006 252 m 225.00 56,700 62,752		88,130	24,683		
Traffic Island	96,25		96,254	111,44	
Traffic Island     675     m2     71.43     48,217     76.57     51,688     96     m2     60.00     5,760     6,123       Drainage pipe - 300mm CR backfilled     205     m     162.30     33,272     175.64     36,006     252     m     225.00     56,700     62,752	337,109 (285,99	337,109	(285,991	) (302,68	pavement with SL/2 mesh as advised by Whittlesea City Council).
	6,537 42,09	6,537	42,094		Quantity high; extent of islands at intersection to be confirmed
	66,987 (29,48	66,987	(29,481	(30,98	Quantity assumed to run through Collector Arterial
Drainage pipe - 375mm CR backfilled - m 226.68 - 246.52 - m 260.00 0	-		-	-	
Drainage pipe - 450mm CR backfilled 540 m 291.67 157,500 320.95 173,314 650 m 290.00 188,500 208,621	222,700 (51,12	222,700	(51,121	(49,38	6) Quantity assumed to run through Primary Arterial
under Drainage pipe - 525mm CR backfilled - m 375.71 - 402.87 - m 355.00 0	-		-	-	
Drainage - pits 25 no. 2,325.57 58,139 2,499.15 62,479 18 no. 2,150.00 38,700 46,217	49,336 11,92	49,336	11,922	13,14	Quantity assumes pits @ 50m centres based upon length of pipework; Rate assumes for 600 x 900 JP, max depth 1.5m.
Drainage - Subsoil drainage 2,627 m 23.05 60,544 26.53 69,705 1,412 m 45.00 63,540 70,323	75,068 (9,77	75,068	(9,778	) (5,36	rate low - allowances include for pits and risers. Quantity quite high
Drainage - culvert - no no. 0	-			-	
Traffic         Traffic Signals         3         Item         88,375.88         265,128         100,101.03         300,303         1         Item         250,000.00         250,000         276,686	295,358 (11,55	295,358	(11,558	) 4,94	T-intersection
Traffic Signal conduit - m 45.71 - 53.47 - m 0	-		-	-	
Tree Planting 78 no. 259.62 20,250 318.78 24,865 97 no. 250.00 24,250 25,780	27,519 (5,53	27,519	(5,530	) (2,65	wide
Landscaping 4,250 m2 20.72 88,046 23.31 99,072 3,437 m2 15.00 51,558 54,810	58,509 33,23	58,509	33,236	40,56	Quantity is low - area used assumes overall site area (as per Site Preparation) less paved areas;
Topsoil seeding 4,250 m2 7.00 29,733 7.92 33,669 13,749 m2 5.50 75,618 80,388	85,813 (50,65	85,813	(50,655	(52,14	Assume 20% landscape planting & 80% topsoil seeding
Street Lighting         Street lighting (all inclusive)         -         m         207.67         -         235.63         -         21 no.         12,000.00         252,000         278,899	297,721 (278,89	297,721	(278,899	) (297,72	Rate - pricing methodology differs; Quantity based upon 50m spacing along road length +  1) intersection; Note: lighting requirements to Cycle path & SUP is excluded
Street lighting - Intersections 3   Item / pr   Item / per leg 0	2 202 /25	2 222		- 12-	A) Quantity, ok
Regulatory signage 6 Item 329.29 1,976 363.25 2,179 6 Item 350.00 2,100 2,232			(257		4) Quantity - ok
Landscape maintenance  7,037 m2 of p 2.40 16,908 2.81 19,778 9,831 m2 of p 2.50 24,578 26,128 104,000.00 104,000 108,295			(9,220		allowance for maintenance during DLP assumes 104 wks x \$1000 (assumes 1 man + vehicle x 1 day/wk)
Tactile pavers (hazard only) 18 Item 337.14 6,069 422.86 7,612 8 Item 320.00 2,560 2,833		2.024	3,235	4,58	7 WT measure variance
Extra over cost for excavation in rock - 1 Item 234,000.00 234,000 258,978	3,024 3,23	3,024	-,	1	Additional site specific items Assume 250/ -ft-t-1
Extra over cost for subgrade preparation 1 Item 99,000.00 99,000 109,567.65 11			(258,978	(276,45	Additional site specific item. Assume 35% of total excavated volume to be in rock

VPA Benchmarked Infrastructure Costings - Independent Peer Review

IN-13 - Gunns Gully Road & Connector St (Nth–Sth Connector) – Construction of an arterial to connector road 3-way intersection (interim treatment)

Benchmark Item 13



			VF	PA							WTP					31.10.2018
Item	Sub Item	Qty	Unit	Rate (P50)	Amount	Rate (P90)	Amount	Qty	Unit	Rate	Amount	Amount	Amount	Diffe	rence	Comments
					(P50)		(P90)					(P50)	(P90)	(P50)	(P90)	
	Allowance for additional protection for conservation area				-		-	1	l Item	10,000.00	10,000	11,067.44	11,814.32	(11,067)	(11,814)	Allowance for additional protection during construction
	Surveying & Design	1	%	5.00	115,937	5.00	128,320	1	1 %	5.00	184,377	\$ 202,667.45	\$ 216,344.45	(86,730)	(88,024)	% driven item
	Contingency	1	%	15.00	347,812	15.00	384,960	1	1 %	15.00	553,131	\$ 608,002.36	\$ 649,033.35	(260,191)	(264,073)	% driven item
_	Traffic Management	1	%	5.00	115,937	5.00	128,320	1	1 %	5.00	184,377	\$ 202,667.45	\$ 216,344.45	(86,730)	(88,024)	% driven item
/er	Supervision & Project Management	1	%	9.00	208,687	9.00	230,976	1	1 %	9.00	331,879	\$ 364,801.41	\$ 389,420.01	(156,115)	(158,444)	% driven item
eli	Council Fees	1	%	3.25	75,359	3.25	83,408	1	1 %	3.25	119,845	\$ 131,733.84	\$ 140,623.89	(56,375)	(57,216)	% driven item
	Vic Roads Fees	1	%	1.00	23,187	1.00	25,664	1	1 %	1.00	36,875	\$ 40,533.49	\$ 43,268.89	(17,346)	(17,605)	% driven item
	Environmental Management	1	%	0.50	11,594	0.50	12,832	1	1 %	0.50	18,438	\$ 20,266.75	\$ 21,634.44	(8,673)	(8,802)	% driven item
	Site Establishment	1	%	2.50	57,969	2.50	64,160	1	1 %	2.50	92,188	\$ 101,333.73	\$ 108,172.22	(43,365)	(44,012)	% driven item
TOTAL	Excluding Delivery				2,318,743		2,566,400				3,687,539		\$ 4,326,889	(1,734,606)	(1,760,489)	
	Including Delivery				3,275,225		3,625,039				5,208,649	\$ 5,725,356	\$ 6,111,731	(2,450,130)	(2,486,691)	

IN-14 - Gunns Gully Road & Patterson Drive – Construction of an arterial to arterial road 4-way intersection (interim treatment)
Benchmark Item 6



31.10.2018

VPA WTP

Item	Sub Item	Qty	Unit	Rate (P50)	Amount	Rate (P90)	Amount	Qty	Unit	Rate	Amount	Amount	Amount	Diffe	erence	Comments
				,	(P50)	( 2 3 )	(P90)					(P50)	(P90)	(P50)	(P90)	
					(100)		(100)					(100)	(100)	(100)	(100)	
Siteworks & Earthworks	Site Preparation			2.39	-	2.68	-	44,488	m2	2.50	111,220	123,227	130,993	(123,227)	(130,993)	Quantity missing; Rate includes for site clearance & topsoil removal to suit Ultimate design standard to full width of road reserve.
Sitev	Earthworks	10,003	m3	35.43	354,351	40.30	403,141	10,368	m3	39.00	404,361	448,013	476,248	(93,662)	(73,108)	Quantity low based upon differences to pavement areas (refer comments below)
nts	Primary Arterial Pavement	6,840	m2	157.08	1,074,450	170.80	1,168,277	10,596	m2	155.00	1,642,380	1,819,680	1,934,362	(745,230)	(766,085)	Quantity is low based upon WT measured areas; Gunns Gulley Road measured as Primary arterials Rate is low based upon nominated pavement depth.
Pavemei	Secondary Arterial Pavement	7,150		123.23	881,087	130.03	929,681	4,397		141.00	619,977	686,905	730,196	194,181	199,485	Quantity is low based upon WT measured areas; Patterson Dr measured as Secondary arterial. Rate is low based upon nominated pavement depth.
oad	Collector Arterial Pavement	-	m2	91.07	-	100.18	-	0	m2	126.00	0			-	-	Quantity missing.
	Subgrade preparation	-	%	15.21	-	17.70	-	14,993		2.50	37,483	41,529	44,146	(41,529)	(44,146)	Quantity missing; Rate - pricing methodology differs, m2 v %
	Pavement rehab	-	m2	45.90	-		-		m2		0			-	-	
	Pavement other	-	m2	-	-		-		m2		0			-	-	lo
"	Kerb & channel	1,900		50.42	95,796	56.39	107,135	3,639		55.00	200,145	213,002	226,426	(117,206)		Quantity is low based upon WT measured lengths
ncrete Works	Cycle path SUP / Footpath	1,120 735	m2 m2	59.60 58.44	66,752 42,956	69.01 67.50	77,288 49,609	5,815	m2 m2	50.00 60.00	0 348,900	371,312	394,714	(328,356)	77,288 (345,105)	Quantity is very low, scope to be confirmed. Rate is low (WT has based rate on 120mm thk concrete pavement with SL72 mesh as advised by Whittlesea City Council).
Ō	Traffic Island	850	m2	71.43	60,718	76.57	65,088	609	m2	60.00	36,540	38,887	41,338	21,831	23,750	Quantity high; extent of islands at intersection to be confirmed
	Drainage pipe - 300mm CR backfilled	260	m	162.30	42,198	175.64	45,667	512	m	225.00	115,200	127,636	135,680	(85,438)		Quantity assumed to run through Secondary Arterial
	Drainage pipe - 375mm CR backfilled	-	m	226.68	-	246.52	-		m	260.00	0			-	-	
	Drainage pipe - 450mm CR backfilled	870	m	291.67	253,750	320.95	279,228	626	m	290.00	181,540	201,138	213,814	52,612	65,414	Quantity assumed to run through Primary Arterial
	Drainage pipe - 525mm CR backfilled	-	m	375.71	-	402.87	-		m	355.00	0	·	· ·	-	-	
ıina	Drainage - pits	39	no.	2,325.57	90,697	2,499.15	97,467	23	no.	2,150.00	49,450	59,120	62,846	31,577		Quantity assumes pits @ 50m centres based upon length of pipework; Rate assumes for 600 x 900 JP, max depth 1.5m.
	Drainage - Subsoil drainage	3,000	m	23.05	69,141	26.53	79,602	3,639	m	45.00	163,755	181,433	192,867	(112,292)	(113,265)	rate low - allowances include for pits and risers. Quantity low
	Drainage - culvert	-	no.	-	-		-		no.		0			-	-	
Traffic	Traffic Signals	4	Item	88,375.88	353,504	100,101.03	400,404	1	Item	300,000.00	300,000	332,386	353,334	21,118	47,070	X-intersection
	Traffic Signal conduit	-	m	45.71	-	53.47	-		m		0			-	-	
	Tree Planting	62	no.	259.62	16,096	318.78	19,764	95	no.	250.00	23,750	25,276	26,869	(9,179)	(7,104)	wide
scape	Landscaping	2,600	m2	20.72	53,863	23.31	60,609	4,614	m2	15.00	69,213	73,659	78,301	(19,796)	(17,693)	Quantity is quite low - area used assumes overall site area (as
Lands	Topsoil seeding	2,600	m2	7.00	18,190	7.92	20,598	18,457	m2	5.50	101,512	108,033	114,842	(89,844)	(94,244)	per Site Preparation) less paved areas; Assume 20% landscape planting & 80% topsoil seeding
Street Lighting	Street lighting (all inclusive)	-	m	207.67	-	235.63	-	30	no.	12,000.00	360,000	398,863	424,001	(398,863)	(424,001)	Rate - pricing methodology differs; Quantity based upon 50m spacing along road length + intersection; Note: lighting requirements to Cycle path & SUP is excluded
	Street lighting - Intersections	4	Item / p	-	-		-		Item / pe	er leg	0			-		
	Regulatory signage	16	Item	329.29	5,269	363.25	5,812	16	Item	350.00	5,600	5,960	6,335	(691)	(523)	Quantity - ok
	Linemarking	13,990	m2 of p	2.40	33,614	2.81	39,320	14,993	m2 of pa	2.50	37,483	39,890	42,404	(6,276)	(3,084)	
Misc.	Landscape maintenance		Item	75,000.00	75,000	86,250.00	86,250		Item	104,000.00	104,000	108,413	115,245	(33,413)	, , ,	allowance for maintenance during DLP assumes 104 wks x \$1000 (assumes 1 man + vehicle x 1 day/wk)
	Tactile pavers (hazard only)	24	Item	337.14	8,091	422.86	10,149	24	Item	320.00	7,680	8,509	9,045	(418)	1,103	Quantity - ok
	Extra over cost for excavation in rock				-		-	1	Item	363,000.00	363,000	402,187	427,534	(402,187)	(427,534)	Additional site specific item. Assume 35% of total excavated volume to be in rock

# VPA Benchmarked Infrastructure Costings - Independent Peer Review

IN-14 - Gunns Gully Road & Patterson Drive – Construction of an arterial to arterial road 4-way intersection (interim treatment)
Benchmark Item 6



			VI	PA							WTP					31.10.2018
		0:		D . (DEO)		n . (noo)		0:								
Item	Sub Item	Qty	Unit	Rate (P50)	Amount	Rate (P90)	Amount	Qty	Unit	Rate	Amount	Amount	Amount	Diffe		Comments
					(P50)		(P90)					(P50)	(P90)	(P50)	(P90)	
Other	Extra over cost for subgrade preparation				-		-	1	Item	150,000.00	150,000	166,192.98	176,666.96	(166,193)	11/h hh / 1	Additional site specific item. Assume 25% of pavement area requires additional subgrade preparation works
	Allowance for additional protection for conservation area				-		-	1	Item	10,000.00	10,000	11,079.53	11,777.80	(11,080)	(11,778)	Allowance for additional protection during construction
	Surveying & Design	1	%	5.00	179,776	5.00	197,254	1	L %	5.00	272,159	\$ 299,616.56	\$ 318,499.29	(119,840)	(121,245)	% driven item
	Contingency	1	%	15.00	539,328	15.00	591,763	1	L %	15.00	816,478	\$ 898,849.67	\$ 955,497.88	(359,521)	(363,734)	% driven item
_	Traffic Management	1	%	5.00	179,776	5.00	197,254	1	L %	5.00	272,159	\$ 299,616.56	\$ 318,499.29	(119,840)	(121,245)	% driven item
/er	Supervision & Project Management	1	%	9.00	323,597	9.00	355,058	1	L %	9.00	489,887	\$ 539,309.80	\$ 573,298.73	(215,713)	(218,241)	% driven item
e <u>j</u>	Council Fees	1	%	3.25	116,855	3.25	128,215	1	L %	3.25	176,904	\$ 194,750.76	\$ 207,024.54	(77,896)	(78,809)	% driven item
	Vic Roads Fees	1	%	1.00	35,955	1.00	39,451	1	L %	1.00	54,432	\$ 59,923.31	\$ 63,699.86	(23,968)	(24,249)	% driven item
	Environmental Management	1	%	0.50	17,978	0.50	19,725	1	L %	0.50	27,216	\$ 29,961.66	\$ 31,849.93	(11,984)	(12,124)	% driven item
	Site Establishment	1	%	2.50	89,888	2.50	98,627	1	L %	2.50	136,080	\$ 149,808.28	\$ 159,249.65	(59,920)	(60,622)	% driven item
							-									
TOTAL	Excluding Delivery				3,595,523		3,945,089				5,443,189	\$ 5,992,331	\$ 6,369,986	(2,396,808)	(2,424,896)	
TOTAL	Including Delivery		Ī		5,078,677		5,572,439				7,688,504	\$ 8,464,168	\$ 8,997,605	(3,385,491)	(3,425,166)	

IN-15 - Gunns Gully Road & Koukoura Drive – Construction of an arterial to arterial road 4-way intersection (Connector road north of Gunns Gully Road) (interim treatment)
Benchmark Item 6



31.10.2018

VPA WTP

Item	Sub Item	Qty	Unit	Rate (P50)	Amount	Rate (P90)	Amount	Qty l	Jnit Rate	Amou	ınt	Amount	Amount	Diffe	erence	Comments
					(P50)	` ,	(P90)					(P50)	(P90)	(P50)	(P90)	
					, ,		` ,					` ,	` ,	` '	<u> </u>	
Siteworks & Earthworks	Site Preparation			2.39	-	2.68	-	34,474 m2	2	2.50	86,185	95,230	102,666	(95,230)	(102,666)	Quantity missing; Rate includes for site clearance & topsoil removal to suit Ultimate design standard to full width of road reserve.
Site	Earthworks	10,003	m3	35.43	354,351	40.30	403,141	7,457 m3	3	9.00	290,841	321,364	346,457	32,987	56,684	Quantity high based upon differences to pavement areas (refer comments below)
lents	Primary Arterial Pavement	6,840	m2	157.08	1,074,450	170.80	1,168,277	10,430 m2	2 15	5.00 1,6	516,650	1,786,314	1,925,796	(711,864)	(757,519)	Quantity is low based upon WT measured areas; Gunns Gully Road & Koukoura Road measured as Primary arterials. Rate is low based upon nominated pavement depth.
le n	Secondary Arterial Pavement	7,150	m2	123.23	881,087	130.03	929,681	0 m2	2 14	L.00	0			881,087	929,681	
Ра	Collector Arterial Pavement	-	m2	91.07	-	100.18	-	0 m2	2 12	5.00	0			-	-	
Road	Subgrade preparation	-	%	15.21	-	17.70	-	10,430 m <sup>2</sup>	2	2.50	26,075	28,812	31,061	(28,812)	(31,061)	Quantity missing; Rate - pricing methodology differs, m2 v %
	Pavement rehab	-	m2	45.90	-		-	m2	2		0			-	-	
	Pavement other	-	m2	-	-		-	m2	2		0			-	-	
	Kerb & channel	1,900	m	50.42	95,796	56.39	107,135	2,684 m		5.00	147,620	156,677	168,910	(60,880)	(61,775)	Quantity is low based upon WT measured lengths
<u>\$</u>	Cycle path	1,120	m2	59.60	66,752	69.01	77,288	m2	2	0.00	0			66,752	77,288	
oncrete Wor	SUP / Footpath	735	m2	58.44	42,956	67.50	49,609	4,806 m2	2	0.00 2	288,360	306,051	329,949	(263,095)	(280,340)	Quantity is very low, scope to be confirmed. Rate is low (WT has based rate on 120mm thk concrete pavement with SL72 mesh as advised by Whittlesea City Council).
Ö	Traffic Island	850	m2	71.43	60,718	76.57	65,088	309 m2	2 6	0.00	18,540	19,677	21,214	41,041	43,874	Quantity high; extent of islands at intersection to be confirmed
	Drainage pipe - 300mm CR backfilled	260	m	162.30	42,198	175.64	45,667	m	22	5.00	0			42,198	45,667	
	Drainage pipe - 375mm CR backfilled	-	m	226.68	-	246.52	-	m	26	0.00	0			-	-	
	Drainage pipe - 450mm CR backfilled	870	m	291.67	253,750	320.95	279,228	889 m	29	0.00	257,810	273,627	294,993	(19,877)	(15,764)	Quantity assumed to run through Primary Arterials
e,	Drainage pipe - 525mm CR backfilled	-	m	375.71	-	402.87	-	m		5.00	. 0	•	·		-	
Drainag	Drainage - pits	39	no.	2,325.57	90,697	2,499.15	97,467	18 no			38,700	46,142	49,745	44,555	47,722	Quantity assumes pits @ 50m centres based upon length of pipework; Rate assumes for 600 x 900 JP, max depth 1.5m.
	Drainage - Subsoil drainage	3,000	m	23.05	69,141	26.53	79,602	2,684 m	4	5.00	120,780	133,456	143,876	(64,315)	(64,274)	rate low - allowances include for pits and risers. Quantity quite high
	Drainage - culvert	-	no.	-	-		-	no			0			-	-	
Traffic	Traffic Signals	4	Item	88,375.88	353,504	100,101.03	400,404	1 Ite	m 250,00	0.00	250,000	276,237	297,807	77,267	102,598	T-intersection
ITAIIIC	Traffic Signal conduit	-	m	45.71	-	53.47	-	m			0			-	-	
ø	Tree Planting	62	no.	259.62	16,096	318.78	19,764	63 no	. 25	0.00	15,750	16,716	18,022	(620)	1,743	assumes trees @15m spacing along nature strip length >3m wide
dscap	Landscaping	2,600	m2	20.72	53,863	23.31	60,609	3,786 m <sup>2</sup>	2 1	5.00	56,787	60,271	64,977	(6,408)	(4,369)	Quantity is quite low - area used assumes overall site area (as per Site Preparation) less paved areas;
Land	Topsoil seeding	2,600	m2	7.00	18,190	7.92	20,598	15,143 m2	2	5.50	83,288	88,397	95,300	(70,208)	(74,702)	Assume 20% landscape planting & 80% topsoil seeding
Street Lighting	Street lighting (all inclusive)	-	m	207.67	-	235.63	-	25 no	. 12,00	0.00	300,000	331,484	357,368	(331,484)		Rate - pricing methodology differs; Quantity based upon 50m spacing along road length + intersection; Note: lighting requirements to Cycle path & SUP is excluded
	Street lighting - Intersections		Item / I	-	-		-		m / per leg		0			-	-	
	Regulatory signage		Item	329.29	5,269	363.25	5,812	16 Ite		0.00	5,600	5,944	6,408	(675)	<u> </u>	Quantity - ok
	Linemarking	13,990	m2 of p	2.40	33,614	2.81	39,320	10,430 m <sup>2</sup>	2 of pa	2.50	26,075	28,812	31,061	4,803	8,259	
Misc.	Landscape maintenance		Item	75,000.00	75,000	86,250.00	86,250	1 Ite	Í		104,000	108,119	116,561	(33,119)	, ,	allowance for maintenance during DLP assumes 104 wks x \$1000 (assumes 1 man + vehicle x 1 day/wk)
	Tactile pavers (hazard only)	24	Item	337.14	8,091	422.86	10,149	12 Ite	m 32	0.00	3,840	4,243	4,574	3,848	5,574	WT measure variance
	Extra over cost for excavation in rock				-		-	1 Ite	m 262,00	0.00	262,000	289,496	312,101	(289,496)	(312,101)	Additional site specific item. Assume 35% of total excavated volume to be in rock
Other	Extra over cost for subgrade preparation				-		-	1 Ite	m 105,00	0.00	105,000	116,019.53	125,078.76	(116,020)	(125,079)	Additional site specific item. Assume 25% of pavement area requires additional subgrade preparation works
	Summaring & Design		0/	F 00	- 170 770	F 00	- 107.254	4.07		.00	OC 105	- 224 CE4 20	- - 242 406 22	/// 070	[44.042]	D/ duites there
	Surveying & Design	1	%	5.00	179,776	5.00	197,254	1 %		5.00	205,195	\$ 224,654.38	\$ 242,196.22	(44,878)	(44,942)	% driven item

# VPA Benchmarked Infrastructure Costings - Independent Peer Review

IN-15 - Gunns Gully Road & Koukoura Drive – Construction of an arterial to arterial road 4-way intersection (Connector road north of Gunns Gully Road) (interim treatment)
Benchmark Item 6



			VI	PA							WTP							31.10.2018
Item	Sub Item	Qty	Unit	Rate (P50)	Amount	Rate (P90)	Amount	Qty	Unit	Rate	Amount	Amount	Amount	Diffe	rence		Comments	
					(P50)		(P90)					(P50)	(P90)	(P50)	(P90)			
	Contingency	1	%	15.00	539,328	15.00	591,763	1	%	15.00	615,585	\$ 673,963.13	\$ 726,588.67	(134,635)	(134,825)	% driven item		
>	Traffic Management	1	%	5.00	179,776	5.00	197,254	1	%	5.00	205,195	\$ 224,654.38	\$ 242,196.22	(44,878)	(44,942)	% driven item		
Ver	Supervision & Project Management	1	%	9.00	323,597	9.00	355,058	1	%	9.00	369,351	\$ 404,377.88	\$ 435,953.20	(80,781)	(80,895)	% driven item		
eli	Council Fees	1	%	3.25	116,855	3.25	128,215	1	%	3.25	133,377	\$ 146,025.35	\$ 157,427.55	(29,171)	(29,212)	% driven item		
	Vic Roads Fees	1	%	1.00	35,955	1.00	39,451	1	%	1.00	41,039	\$ 44,930.88	\$ 48,439.24	(8,976)	(8,988)	% driven item		
	Environmental Management	1	%	0.50	17,978	0.50	19,725	1	%	0.50	20,520	\$ 22,465.44	\$ 24,219.62	(4,488)	(4,494)	% driven item		
	Site Establishment	1	%	2.50	89,888	2.50	98,627	1	%	2.50	102,598	\$ 112,327.19	\$ 121,098.11	(22,439)	(22,471)	% driven item		
	-															_		
TOTAL	Excluding Delivery				3,595,523		3,945,089				4,103,900	\$ 4,493,088	\$ 4,843,924	(897,564)	(898,835)			
IOTAL	Including Delivery				5,078,677		5,572,439				5,796,759	\$ 6,346,486	\$ 6,842,043	(1,267,810)	(1,269,604)			

IN-16 - Patterson Drive / Connector St (East—West Connector) — Construction of an arterial to connector road 3-way intersection (interim treatment)

Benchmark Item 15



31.10.2018

VPA WTP

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Item	Sub Item	Qty	Unit	Rate (P50)	Amount	Rate (P90)	Amount	Qty	Unit	Rate	Amount	Amount	Amount	Diffe	rence	Comments
					(P50)		(P90)					(P50)	(P90)	(P50)	(P90)	
works & thworks	Site Preparation			2.39	-	2.68	-	23,546 m	m2	2.50	58,865	65,280	69,079	(65,280)	(69,079)	Quantity missing; Rate includes for site clearance & topsoil removal to suit Ultimate design standard to full width of road reserve.
Sitewo	Earthworks	5,556	m3	35.43	196,805	40.30	223,903	5,339 m	m3	39.00	208,231	230,923	244,364	(34,117)	(20,461)	Quantity slightly high based upon differences to pavement areas (refer comments below)
	Primary Arterial Pavement	-	m2	157.08	-	170.80	-	0 m	n2	155.00	0			-	-	
ements	Secondary Arterial Pavement	5,915	m2	123.23	728,899	130.03	769,100	6,366 m	m2	141.00	897,606	995,423	1,053,361	(266,524)	(284,261)	Quantity is low based upon WT measured areas; Patterson Dr measured as Secondary arterial. Rate is low based upon nominated pavement depth.
d Pave	Collector Arterial Pavement	1,855	m2	91.07	168,937	100.18	185,831	2,424 m	n2	126.00	305,424	338,708	358,422	(169,770)	(172,591)	Side road measured as Collector arterials. Rate is low based upon nominated pavement depth.
Roa	Subgrade preparation	-	%	15.21	-	17.70	-	8,790 m		2.50	21,975	24,370	25,788	(24,370)	(25,788)	Quantity missing; Rate - pricing methodology differs, m2 v %
	Pavement rehab	-	m2	45.90	-		-		n2		0			-	-	
	Pavement other	1 000	m2	- 50.42	-	56.30	-		n2	55.00	110.440	117.642	124 400	- (47.042)	- (12.044)	Overstitude level be and whom W/T recognized levelths
ν <sub>ι</sub>	Kerb & channel Cycle path	1,980	m m2	50.42 59.60	99,830 33,376	56.39 69.01	111,646 38,644	2,008 m	n n2	55.00 50.00	110,440	117,643	124,490	(17,813) 33,376	38,644	Quantity is low based upon WT measured lengths
oncrete Work	SUP / Footpath	1,330		58.44	77,730	67.50	89,768	4,532 m		60.00	271,920	289,654	306,514	(211,924)	(216,745)	Quantity is very low, scope to be confirmed. Rate is low (WT has based rate on 120mm thk concrete pavement with SL72 mesh as advised by Whittlesea City Council).
ა	Traffic Island	485	m2	71.43	34,645	76.57	37,139	99 m	m2	60.00	5,940	6,327	6,696	28,318	30,443	Quantity high; extent of islands at intersection to be confirmed
	Drainage pipe - 300mm CR backfilled	-	m	162.30	-	175.64	-	m	n	225.00	0			-	-	
	Drainage pipe - 375mm CR backfilled	-	m	226.68	-	246.52	-	n	n	260.00	0			-	-	Quantity accumed to run through Collector & Secondary
	Drainage pipe - 450mm CR backfilled	580	m	291.67	169,167	320.95	186,152	783 m	n	290.00	227,070	241,879	255,958	(72,713)	(69,805)	Quantity assumed to run through Collector & Secondary Arterial
age	Drainage pipe - 525mm CR backfilled	-	m	375.71	-	402.87	-	m	n	355.00	0			-	-	
Drain	Drainage - pits	27	no.	2,325.57	62,790	2,499.15	67,477	16 n	10.	2,150.00	34,400	41,165	43,561	21,626	23,916	Quantity assumes pits @ 50m centres based upon length of pipework; Rate assumes for 600 x 900 JP, max depth 1.5m.
	Drainage - Subsoil drainage	2,480	m	23.05	57,157	26.53	65,805	2,008 m	n	45.00	90,360	100,207	106,040	(43,050)	(40,235)	rate low - allowances include for pits and risers. Quantity quite high
	Drainage - culvert	-	no.	-	-		-		10.		0			-	-	
Traffic	Traffic Signals	3	Item	88,375.88	265,128	100,101.03	300,303		tem	250,000.00	250,000	277,244	293,381	(12,116)	6,922	T-intersection
a)	Traffic Signal conduit Tree Planting	- 66	m no.	45.71 259.62	17,135	53.47 318.78	21,040	66 n	-	250.00	16,500	17,576	18,599	(441)	2,440	assumes trees @15m spacing along nature strip length >3m
ndscape	Landscaping	4,180	m2	20.72	86,596	23.31	97,440	2,025 m	m2	15.00	30,375	32,356	34,239	54,240	63,201	Quantity is quite low - area used assumes overall site area (as per Site Preparation) less paved areas;
Lano	Topsoil seeding	4,180	m2	7.00	29,243	7.92	33,115	8,100 m	m2	5.50	44,550	47,456	50,218	(18,212)	(17,103)	Assume 20% landscape planting & 80% topsoil seeding
Street Lighting	Street lighting (all inclusive)	-	m	207.67	-	235.63	-	23 n		12,000.00	276,000	306,077	323,892	(306,077)	(323,892)	Rate - pricing methodology differs; Quantity based upon 50m spacing along road length + intersection; Note: lighting requirements to Cycle path & SUP is excluded
	Street lighting - Intersections		Item / p	-	-				tem / pe		0			- (240)	- (4.5.6)	Quantity of
	Regulatory signage		Item	329.29	1,646	363.25	1,816		tem	350.00	1,750	1,864	1,973	(218)		Quantity - ok
Misc.	Linemarking Landscape maintenance		m2 of p	75,000.00	18,669 75,000	2.81 86,250.00	21,838 86,250	8,790 m	n2 of pa	2.50 104,000.00	21,975 104,000	24,370 108,513	25,788 114,829	(5,701)	(3,950) (28,579)	allowance for maintenance during DLP assumes 104 wks x \$1000 (assumes 1 man + vehicle x 1 day/wk)
	Tactile pavers (hazard only)	18	Item	337.14	6,069	422.86	7,612	8 It	tem	320.00	2,560	2,839	3,004	3,230	4,607	WT measure variance
	Extra over cost for excavation in rock				-		-	1 lt	tem	187,000.00	187,000	207,378	219,449	(207,378)	(219,449)	Additional site specific item. Assume 35% of total excavated volume to be in rock
Other	Extra over cost for subgrade preparation				-		-	1 lt	tem	88,000.00	88,000	97,589.82	103,270.01	(97,590)	(103,270)	Additional site specific item. Assume 25% of pavement area requires additional subgrade preparation works

VPA Benchmarked Infrastructure Costings - Independent Peer Review

IN-16 - Patterson Drive / Connector St (East–West Connector) – Construction of an arterial to connector road 3-way intersection (interim treatment)

Benchmark Item 15



			VI	PA							WTP					31.10.2018
Item	Sub Item	Qty	Unit	Rate (P50)	Amount	Rate (P90)	Amount	Qty	Unit	Rate	Amount	Amount	Amount	Diffe	rence	Comments
					(P50)		(P90)					(P50)	(P90)	(P50)	(P90)	
	Allowance for additional protection for conservation area				-		-	1	1 Item	10,000.00	10,000	11,089.75	11,735.23	(11,090)	(11,735)	Allowance for additional protection during construction
	Surveying & Design	1	%	5.00	106,441	5.00	117,244	1	1 %	5.00	163,247	\$ 179,296.54	\$ 189,732.44	(72,855)	(72,488)	% driven item
	Contingency	1	%	15.00	319,323	15.00	351,732	1	1 %	15.00	489,741	\$ 537,889.61	\$ 569,197.32	(218,566)	(217,465)	% driven item
>	Traffic Management	1	%	5.00	106,441	5.00	117,244	1	1 %	5.00	163,247	\$ 179,296.54	\$ 189,732.44	(72,855)	(72,488)	% driven item
/er	Supervision & Project Management	1	%	9.00	191,594	9.00	211,039	1	1 %	9.00	293,845	\$ 322,733.77	\$ 341,518.39	(131,140)	(130,479)	% driven item
eli	Council Fees	1	%	3.25	69,187	3.25	76,209	1	1 %	3.25	106,111	\$ 116,542.75	\$ 123,326.09	(47,356)	(47,118)	% driven item
	Vic Roads Fees	1	%	1.00	21,288	1.00	23,449	1	1 %	1.00	32,649	\$ 35,859.31	\$ 37,946.49	(14,571)	(14,498)	% driven item
	Environmental Management	1	%	0.50	10,644	0.50	11,724	1	1 %	0.50	16,325	\$ 17,929.65	\$ 18,973.24	(7,286)	(7,249)	% driven item
	Site Establishment	1	%	2.50	53,221	2.50	58,622	1	1 %	2.50	81,624	\$ 89,648.27	\$ 94,866.22	(36,428)	(36,244)	% driven item
						•			·							
TOTAL	Excluding Delivery				2,128,822		2,344,879				3,264,941	\$ 3,585,931	\$ 3,794,649	(1,457,109)	(1,449,770)	
TOTAL	Including Delivery				3,006,961		3,312,141		T		4,611,729	\$ 5,065,127	\$ 5,359,941	(2,058,166)	(2,047,800)	1

IN-17 - Patterson Drive / Connector St (East–West Connector) – Construction of an arterial to connector road 3-way intersection (interim treatment)
Benchmark Item 15



31.10.2018

VPA WTP

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Item	Sub Item	Qty	Unit	Rate (P50)	Amount	Rate (P90)	Amount	Qty	Unit	Rate	Amount	Amount	Amount	Differ	ence	Comments
					(P50)		(P90)					(P50)	(P90)	(P50)	(P90)	
works & thworks	Site Preparation			2.39	-	2.68	-	18,550	m2	2.50	46,375	51,507	54,273	(51,507)	(54,273)	Quantity missing; Rate includes for site clearance & topsoil removal to suit Ultimate design standard to full width of road reserve.
Sitewor	Earthworks	5,556	m3	35.43	196,805	40.30	223,903	4,588	m3	39.00	178,947	198,749	209,421	(1,944)	14,482	Quantity high based upon differences to pavement areas (refer comments below)
	Primary Arterial Pavement	-	m2	157.08	-	170.80	-		m2	155.00	0			-	-	
ents	Secondary Arterial Pavement	5,915	m2	123.23	728,899	130.03	769,100	3,490	m2	141.00	492,090	546,545	575,892	182,354	193,208	Quantity high based upon WT measurement of areas; Rate is low based upon nominated pavement depth.
oad Paveme	Collector Arterial Pavement	1,855	m2	91.07	168,937	100.18	185,831	3,335	m2	126.00	420,210	466,711	491,771	(297,773)	(305,940)	Quantity high based upon WT measurement of areas; Rate is low based upon nominated pavement depth.
Ro	Subgrade preparation	-	%	15.21	-	17.70	-	6,825	m2	2.50	17,063	18,951	19,968	(18,951)	(19,968)	Quantity missing; Rate - pricing methodology differs, m2 v %
	Pavement rehab	-	m2	45.90	-		-		m2		0			-	-	
	Pavement other	-	m2	-	-		-		m2		0			-	-	Outstitutie laure assessed to 1977
ks	Kerb & channel	1,980	m	50.42	99,830	56.39	111,646	2,135	m	55.00	117,425	125,273	132,000	(25,444)	(20,354)	Quantity is low compared to WT measured lengths
Vor	Cycle path	560	m2	59.60	33,376	69.01	38,644	610	m2	50.00	30,500	32,539	34,286	837	4,359	
ncrete V	SUP / Footpath	1,330	m2	58.44	77,730	67.50	89,768	1,350	m2	60.00	81,000	86,414	91,054	(8,684)	(1,285)	Rate is low (WT has based rate on 120mm thk concrete pavement with SL72 mesh as advised by Whittlesea City Council).
S	Traffic Island	485	m2	71.43	34,645	76.57	37,139	380	m2	60.00	22,800	24,324	25,630	10,321	11,509	Quantity high; extent of islands at intersection to be confirmed
	Drainage pipe - 300mm CR backfilled	-	m	162.30	-	175.64	-	195	m	225.00	43,875	48,730	51,347	(48,730)	(51,347)	Quantity missing;
	Drainage pipe - 375mm CR backfilled	-	m	226.68	-	246.52	-		m	260.00	0			-	-	
	Drainage pipe - 450mm CR backfilled	580	m	291.67	169,167	320.95	186,152	560	m	290.00	162,400	180,371	190,056	(11,205)	(3,904)	Minimal difference in quantity
o.	Drainage pipe - 525mm CR backfilled	-	m	375.71	-	402.87	-		m	355.00	0			-	-	
ainag	Drainage - pits	27	no.	2,325.57	62,790	2,499.15	67,477	28	no.	2,150.00	60,200	72,148	76,022	(9,358)	(8,545)	Quantity low; rate assumes for 600 x 900 JP, max depth 1.5m.
۵	Drainage - Subsoil drainage	2,480	m	23.05	57,157	26.53	65,805	2,135	m	45.00	96,075	106,707	112,436	(49,550)	(46,632)	Quantity high - refer to new item included for swale drainage Rate low - allowances include for pits and risers
	Drainage - swale	-	no.	-	-		-	290	no.	25.00	7,250	8,052	8,485	(8,052)	(8,485)	New item; swales indicated on drawings
	Drainage - culvert	-	no.	-	-		-		no.		0			-	-	
Traffic	Traffic Signals	3	Item	88,375.88	265,128	100,101.03	300,303	1	Item	250,000.00	250,000	277,665	292,574	(12,538)	7,729	Rate - pricing methodology differs
	Traffic Signal conduit	-	m	45.71	- 47.425	53.47	-	20	m	350.00	0.500	40.425	40.670	- 7.000	- 10.260	
ре	Tree Planting		no.	259.62	17,135	318.78	21,040		no.	250.00	9,500		10,679	7,000	10,360	Quantity is low - area used assumes overall site area (as per
Isca	Landscaping	4,180	m2	20.72	86,596	23.31	97,440	1,877	m2	15.00	28,155	30,037	31,650	56,559	65,790	Site Preparation) less paved areas;
Lanc	Topsoil seeding	4,180	m2	7.00	29,243	7.92	33,115	7,508	m2	5.50	41,294	44,054	46,420	(14,811)	(13,305)	Assume 20% landscape planting & 80% topsoil seeding
Street	Street lighting (all inclusive)	-	m	207.67	-	235.63	-	13	no.	12,000.00	156,000	173,263	182,566	(173,263)	(182,566)	Rate - pricing methodology differs
Lighting	Street lighting - Intersections	3	Item / p	-	-		-		Item / p	er leg	0			-	-	Rate missing - refer item above
	Regulatory signage	5	Item	329.29	1,646	363.25	1,816	4	Item	350.00	1,400	1,555	1,638	92	178	
ن	Linemarking	7,770	m2 of p	2.40	18,669	2.81	21,838	6,825	m2 of pa	2.50	17,063	18,203	19,180	466	2,658	Quantity is low based upon differences to pavement areas
Misc.	Landscape maintenance	1	Item	75,000.00	75,000	86,250.00	86,250	1	Item	104,000.00	104,000	108,678	114,513	(33,678)		allowance for maintenance during DLP assumes 104 wks x \$1000 (assumes 1 man + vehicle x 1 day/wk)
	Tactile pavers (hazard only)	18	Item	337.14	6,069	422.86	7,612	24	Item	320.00	7,680	8,530	8,988	(2,461)	(1,376)	WT measure variance
her	Protection slab for high pressure gas line				-		-	1	Item	210,000.00	210,000	251,679	265,193	(251,679)	(265,193)	WT's rate based on 90m $$ x 1.5m wide $x$ 150mm thk concrete protection slab including non-destructive digging $\&$ gas authority costs
Oth	Allowance for additional protection for conservation area				-		-	1	Item	10,000.00	10,000	11,107	11,703	(11,107)	(11,703)	Allowance for additional protection during construction
	Surveying & Design	1	%	5.00	106,441	5.00	117,244	1	%	5.00	130,565	\$ 145,096,32	\$ 152,887.28	(38,655)	(35.643)	% driven item
	our reying a besign	1	70	5.00	100,441	5.00	111,277		/0	5.00	130,303	7 173,030.32	¥ 132,007.20	(30,033)	(33,043)	/v wither item

# VPA Benchmarked Infrastructure Costings - Independent Peer Review

IN-17 - Patterson Drive / Connector St (East–West Connector) – Construction of an arterial to connector road 3-way intersection (interim treatment)
Benchmark Item 15



			VI	PA							WTP							31.10.2018
Item	Sub Item	Qty	Unit	Rate (P50)	Amount	Rate (P90)	Amount	Qty	Unit	Rate	Amount	Amount	Amount	Diffe	rence	ı	Comments	
					(P50)		(P90)					(P50)	(P90)	(P50)	(P90)			
	Contingency	1	%	15.00	319,323	15.00	351,732	-	1 %	15.00	391,695	\$ 435,288.96	\$ 458,661.84	(115,966)	(106,930)	% driven item		
>	Traffic Management	1	%	5.00	106,441	5.00	117,244	:	1 %	5.00	130,565	\$ 145,096.32	\$ 152,887.28	(38,655)	(35,643)	% driven item		
Ver	Supervision & Project Management	1	%	9.00	191,594	9.00	211,039	2	1 %	9.00	235,017	\$ 261,173.38	\$ 275,197.10	(69,579)	(64,158)	% driven item		
e j	Council Fees	1	%	3.25	69,187	3.25	76,209	1	1 %	3.25	84,867	\$ 94,312.61	\$ 99,376.73	(25,126)	(23,168)	% driven item		
	Vic Roads Fees	1	%	1.00	21,288	1.00	23,449	:	1 %	1.00	26,113	\$ 29,019.26	\$ 30,577.46	(7,731)	(7,129)	% driven item		
	Environmental Management	1	%	0.50	10,644	0.50	11,724	1	1 %	0.50	13,057	\$ 14,509.63	\$ 15,288.73	(3,866)	(3,564)	% driven item		
	Site Establishment	1	%	2.50	53,221	2.50	58,622	-	1 %	2.50	65,283	\$ 72,548.16	\$ 76,443.64	(19,328)	(17,822)	% driven item		
	-															_		
TOTAL	Excluding Delivery				2,128,822		2,344,879				2,611,301	\$ 2,901,926	\$ 3,057,746	(773,105)	(712,867)			
IOTAL	Including Delivery				3,006,961		3,312,141				3,688,462	\$ 4,098,971	\$ 4,319,066	(1,092,010)	(1,006,924)			



VPA WTP 31.10.2018 Qty Unit Rate (P50) Rate (P90) Rate Difference Item Sub Item Amount Amount Qty Unit Amount Amount Amount Comments (P50) (P90) (P50) (P90) (P50) (P90) Site Preparation 37.08 57.52 Item 10,000.00 10,000 11,001 12,276 (11,001 (12,276) assumes 1 crew x 1 day for site clearance & topsoil removal - imported fill to bridge abutments; behind reinforced earth (530,334) - quantity includes for imported fill of 30m wide x 20m long x 46.78 51.50 9,600 m3 45.00 432,000 475,238 530,334 (475,238) Earthworks m3 up to 8m depth for each abutment Note: any preloading requirements are excluded Retaining walls, abutments, footings 8 No. 238,163.38 1,905,307 354,810.89 2,838,487 m2 1,905,307 2,838,487 inc Structure Works 1.080.00 1,826.52 Bridge deck m2 m2 2,385.00 352 Item 839.520 2.949.31 1,038,157 1,038,157 839.520 Guard rails / balustrade inc Item Transistion slab 2 No 30,000.00 60,000 30,000.00 60,000 incl 60,000 60,000 m2 40.00 Asphalt 40.00 m2 incl Concrete footway m2 38.46 50.86 m2 incl 42.50 7,480 8,125 Kerb & channel 176 m 46.16 7,480 8,125 incl Bridge deck area based on 176m span x 15.8m width (to 2,410 m2 4,352.00 10,488,320 4,848.72 11,685,418 2,781 m2 3,700.00 10,288,960 10,872,154 12,132,621 (383,834 (447,202)Overall Super T Cost - main span - Super-T rate appears to be high Overall Super T Cost - Ramps m2 Ramps on embankment Anti Throw Barrier 52 200.00 10,400 184.24 9,580 2,600.00 135,200 142,863 159,426 (132,463 (149,846) Rate is low (WT's rate based on 2.4m high anti-throw barrier) **Structure Works** Scour protection Item Item 350.00 20,439 5,050.00 20,200 5,109.84 60,000 63,401 70,751 (43,201) (50,312) rate is low for road bridge **GREAT** terminal 15,000.00 4 No. No. uard rails assumed sufficient however may be a requireme Off structure barrier Item 1,395.56 2,301.98 1,550.00 for concrete barrier Off Allow rail impact barriers @ up to 1400 wide x 2000 high x 2 108,000 114,122 127,352 (114,122) (127,352 Pier protection barriers 3,600.00 Assume reinforced earth walls (30m long x up to 8m high) at Reinforced Earth Embankment Item 337,469.90 337,470 337,469.90 337,470 Item 360,000.00 360,000 396,031 441,945 (58,561 (104,475)oridge abutments (imported fill included above in Earthworks 1 Item 750,000.00 750,000 890,296 993,513 (890,296 (993,513) Allownace for 3 weekends only for Vline occupations Allowance for Occupations Cost -Other Allowance for Native Flora / Fauna 100,000.00 100,000 118,706 132,468 (118,706 (132,468) Allowance for protection of Growling Grass Frog habitat Item Protection Allowance for Cultural Heritage Works Item 50,000.00 50,000 59,353 66,234 (59,353 (66,234) Allowance for cultural heritage works 683,435 799,884 Surveying & Design 5.00 5.00 5.00 614,708 657,158.27 733,346.12 26,277 66,538 % driven item Contingency 20.00 2,733,739 20.00 3,199,535 20.00 2,458,832 \$ 2,628,633.08 \$ 2,933,384.47 399,560 \$ 427,152.88 \$ 476,674.98 444,233 3.25 519,924 3.25 17,080 43,250 % driven item Traffic Management 3.25 Delivery 6 driven item (amended to 13%, inline with VPA costing, due Supervision & Project Management 13.00 1,776,931 9.00 1,439,791 13.00 1,598,241 \$ 1,708,611.50 \$ 1,906,699.90 68,319 (466,909)to complexities of construction over existing rail corridor) Council Fees 1 % 3.25 444,233 3.25 519,924 3.25 399.560 S 427,152.88 476,674.98 17.080 43.250 % driven item 159.977 1.00 136.687 1.00 1.00 122,942 \$ 131.431.65 146,669,22 5.255 13.308 % driven item Vic Roads Fees 1 % **Environmental Management** 0.50 68,343 0.50 79,988 0.50 61,471 65,715.83 73,334.61 2,628 6,654 % driven item Site Establishment 2.50 341,717 2.50 399,942 307,354 328,579.14 366,673.06 13,138 33,269 % driven item 13,668,697 1,330,754 12,294,160 13,143,165 14,666,922 525,531 15,997,677 Excluding Delivery TOTAL Including Delivery 20,298,015 23,116,643 18,256,828 \$ 19,517,601 \$ 21,780,380 \$ 780,414 1,336,263



Item	Sub Item	Qty	Unit	Rate (P50)	Amount	Rate (P90)	Amount	Qty Ur	nit Rate	Amount	Amount	Amount	Diffe	rence	Comments
					(P50)		(P90)				(P50)	(P90)	(P50)	(P90)	
	Site Preparation	1	Item	20,000.00	20,000	23,000.00	23,000	1 Item	,	11,100	12,331	12,900	7,669	10,100	
<b>%</b> &	Diversion Works	1	Item	15,000.00	15,000	17,250.00	17,250	1 Item	· ·	15,000	16,663	17,433	(1,663)		assume 1 crew x 2 days
s s orks	Waterway reshaping	1	Item	3,000.00	3,000	3,450.00	3,450	1 Item	n 3,000.00	3,000	3,333	3,487	(333)	(37)	
Siteworl Earthwo	Stripping of topsoil	485	m2	5.00	2,425	5.75	2,789	740 m2	2.80	2,072	2,211	2,313	214	476	Quantity is low but rate is high - would appear that no allowance has been made for area taken up by batters
	Excavation	2,300	m3	35.00	80,500	40.25	92,575	2,201 m3	39.00	85,839	95,356	99,760	(14,856)	(7,185)	
	Formation of batters	320	m3	14.00	4,480	16.10	5,152	1,004 m3	16.00	16,064	17,845	18,669	(13,365)	(13,517)	reuse of stockpiled material assumed
	Box Culverts units 1800 x 3000	32	No.	3,630.00	116,160	4,174.50	133,584	32 No	4,770.00	152,640	162,873	170,395	(46,713)	(36,811)	Rate is low
	Link slab 1800 x 3000	16	No.	2,018.00	32,288	2,320.70	37,131	16 No	2,920.00	46,720	49,852	52,154	(17,564)	(15,023)	Rate is low
ıres	Foundation slab (250mm)	560	m2	200.00	112,000	230.00	128,800	392 m2	224.00	87,808	93,695	98,022	18,305	30,778	Quantity is high
턴	Granular bedding 150mm thick crushed r	560	m2	18.00	10,080	20.70	11,592	392 m2	16.50	6,468	6,902	7,220	3,178	4,372	Quantity is high
Str	Apron slab	40	m2	200.00	8,000	230.00	9,200	164 m2	240.50	39,442	42,086	44,030	(34,086)	(34,830)	Quantity is low - would appear to be only 1 No.
ainage	Wing wall	32	m2	500.00	16,000	575.00	18,400	59 m2	900.00	53,100	56,660	59,276	(40,660)	(40,876)	Quantity is low - would appear to be only 1 No. Rate is low - walls assumed as 350 thick & reo @ 350kg/m3
۵	Head wall	26	m2	500.00	13,000	575.00	14,950	41 m2	900.00	36,900	39,374	41,192	(26,374)	(26,242)	Quantity is low - would appear to be only 1 No. head wall measured
ė	Structural fill	640	m3	70.00	44,800	80.50	51,520	430 m3	80.00	34,400	36,706	38,401	8,094	13,119	Rate is low
On Structure Works	Vehicle barrier	52	lm	145.00	7,540	166.75	8,671	41 lm	350.00	14,350	15,312	16,019	(7,772)	(7,348)	Rate allows for guardrail and end terminals
On tructu Work	Signs	1	Item	2,500.00	2,500	2,875.00	2,875	1 Item	1,100.00	1,100	1,174	1,228	1,326	1,647	
S	Line marking	485	m2/pav	2.40	1,164	2.76	1,339	740 m2/	pave 5.50	4,070	4,343	4,543	(3,179)	(3,205)	is this required? Road is measured separately?
					-		-						-	-	
	Surveying & Design	1	%	5.00	24,446.85	5.00	28,113.88	1 %	5.00	30,504	\$ 32,835.77	\$ 34,352.12	(8,389)	(6,238)	% driven item
	Contingency	1	%	15.00	73,340.55	15.00	84,341.63	1 %	15.00	91,511	\$ 98,507.32	\$ 103,056.36	(25,167)	(18,715)	% driven item
	Traffic Management	1	%	5.00	24,446.85	5.00	28,113.88	1 %	5.00	30,504	\$ 32,835.77	\$ 34,352.12	(8,389)	(6,238)	% driven item
ery	Supervision & Project Management	1	%	9.00	44,004.33	9.00	50,604.98	1 %	9.00	54,907	\$ 59,104.39	\$ 61,833.81	(15,100)	(11,229)	% driven item
Delive	Council Fees	1	%	3.25	15,890.45	3.25	18,274.02	1 %	3.25	19,827	\$ 21,343.25	\$ 22,328.88	(5,453)	(4,055)	% driven item
۵	Vic Roads Fees	1	%	1.00	4,889.37	1.00	5,622.78	1 %	1.00	6,101	\$ 6,567.15	\$ 6,870.42	(1,678)	(1,248)	% driven item, should this not be Melbourne Water in lieu o Vic Roads?
	Environmental Management	1	%	0.50	2,444.69	0.50	2,811.39	1 %	0.50	3,050	\$ 3,283.58	\$ 3,435.21	(839)	(624)	% driven item
	Site Establishment	1	%	2.50	12,223.43	2.50	14,056.94	1 %	2.50	15,252	\$ 16,417.89	\$ 17,176.06	(4,194)	(3,119)	% driven item
TOTAL	Excluding Delivery				488,937		562,278			610,073	\$ 656,715	\$ 687,042	(167,778)	(124,765)	
IOIAL	Including Delivery				690,624		794,217			861,728	\$ 927,611	\$ 970,447	(236,987)	(176,230)	]

BR-03 - Hayes Hill Boulevard: Construct a Growling Grass Frog Habitat suitable culvert/bridge crossing of Darebin Creek – 2 lane culvert crossing Benchmark Item 27



ltem	Sub Item	Qty	Unit	Rate (P50)	Amount	Rate (P90)	Amount	Qty	Unit	Rate	Amount	Amount	Amount	Difference (WT Bridge Design of structure as per Hill ICP - as advise City Co	on a Bebo Arch the Peppercorn ed by Whittlesea ouncil)	Comments
					(P50)		(P90)					(P50)	(P90)	(P50)	(P90)	
	Site Preparation	1	Item	20,000.00	20,000	23,000.00	23,000	1	Item	30,000.00	30,000	33,354	34,638	(13,354)	(11,638)	
<u>s</u>	Diversion Works		Item	15,000.00	15,000	17,250.00	17,250		Item	75,000.00	75,000	83,385	86,595	(68,385)	, ,	assume 2 crew x 5 days
Nor	Waterway reshaping	1	Item	3,000.00	3,000	3,450.00	3,450	1	Item	15,000.00	15,000	16,677	17,319	(13,677)	(13,869)	
& Earth	Stripping of topsoil	485	m2	5.00	2,425	5.75	2,789	5,454	m2	2.80	15,271	16,309	16,936	(13,884)	(14,148)	Quantity appears to be low but rate appears to be high (based on Bebo arch design - Peppercorn Hill ICP)
rks &	Bulk Excavation	2,300	m3	35.00	80,500	40.25	92,575	2,520	m3	39.00	98,280	109,268	113,474	(28,768)	(20,899)	Quantity appears to be slightly low
Sitewo	Detail Excvation (strip footings)							117	m3	80.00	9,386	10,435	10,837	(10,435)	(10,837)	New item for excavation of strip footing for precast arches (Assume 1000mm wide x 700mm deep)
	Formation of batters	320	m3	14.00	4,480	16.10	5,152	832	m3	16.00	13,313	14,802	15,372	(10,322)	(10,220)	reuse of stockpiled material assumed
l Pavements Concrete Works	Collector Arterial Pavement						1	941	m2	126.00	118,548	131,802	136,876	(131,802)	(136,876)	Assume Hayes Hill Blvd to be a collector arterial road
eme crete ks	Subgrade preparation							941	m2	2.50	2,352	2,615	2,716	(2,615)	(2,716)	
Pav Sonc Nor	Kerb & channel							420		55.00	23,100	24,669	25,619	(24,669)		New items (based on Bebo arch design - Peppercorn Hill ICP
Road   & C	SUP / Footpath							418	m2	60.00	25,090	26,794	27,826	(26,794)	(27,826)	as advised by Whittlesea City Council)
Ro	Traffic Island							251	m2	60.00	15,054	16,076	16,695	(16,076)	(16,695)	
	Box Culverts units 1800 x 3000		No.	3,630.00	116,160	4,174.50	133,584		No	4,770.00	0			116,160	133,584	
	Link slab 1800 x 3000		No.	2,018.00	32,288	2,320.70	37,131		No	2,920.00	0			32,288	37,131	Not applicable (WT has based review on Bebo arch design -
	Foundation slab (250mm) Granular bedding 150mm thick crushed	560		200.00	112,000	230.00	128,800		m2	224.00	0			112,000	128,800	Peppercorn Hill ICP as advised by Whittlesea City Council)
	rock	560	m2	18.00	10,080	20.70	11,592		m2	16.50	0			10,080	11,592	
	Strip footing for arches (assume 1m wide x 700mm deep)							168	m	350.00	58,660	62,645	65,057	(62,645)	(65,057)	
	Supply Humes Bebo Arch 6210s (11no. X 2.5m wide units); 1 unit = 11.9t							131	t	1,100.00	143,990	153,772	159,692	(153,772)	(159,692)	
	Supply Humes Bebo Arch 6210s (11no. X 2.5m wide units); 1 unit = 11.9t							131	t	1,100.00	143,990	153,772	159,692	(153,772)	(159,692)	New item (based on Bebo arch design - Peppercorn Hill ICP)
ıres	Supply Humes Bebo Arch 12300s (16no. X 1.8m wide units); 1 unit = 16.8t							269	t	1,100.00	295,680	315,766	327,923	(315,766)	(327,923)	
Structur	Installation of arch							1	Item	195,000.00	195,000	208,247	216,264	(208,247)	(216,264)	Allow installation of 3 units / day (including stitching & temporary propping works)
rainage	Supply & install pre-cast plain concrete spandrel wall for 6210s (4 units) 1 unit = 8.2t							33	t	1,250.00	41,000	43,785	45,471	(43,785)	(45,471)	
Ā	Supply & install pre-cast plain concrete spandrel wall for 1230s (2 units) 1 unit = 17.2t							34	t	1,250.00	43,000	45,921	47,689	(45,921)	(47,689)	New item (based on Bebo arch design - Peppercorn Hill ICP)
	Rock beaching (at ends of crossing)							510	-	130.00	66,300	73,712	76,550	(73,712)	(76,550)	
	Apron slab		m2	200.00	8,000		9,200		m2	240.50	0			8,000	9,200	
	Wing wall	32	m2	500.00	16,000	575.00	18,400		m2	900.00	0			16,000	18,400	Not applicable (WT has based review on Bebo arch design -
	Head wall	26	m2	500.00	13,000	575.00	14,950		m2	900.00	0			13,000	14,950	Peppercorn Hill ICP as advised by Whittlesea City Council)
	Allowance for Drainage pipe - 375mm CR backfilled							105	m	260.00	27,300	30,352	31,521	(30,352)	(31,521)	
	Allowance for Drainage - pits  Allowance for Drainage - Subsoil							3.00	No.	2,150.00	6,450	7,171	7,447	(7,171)	(7,447)	New items - allowance for drainage
	drainage							420		45.00	18,900	21,013	21,822	(21,013)	(21,822)	Quantity & Rate appears to be low (based on Bebo arch
Structure Works	Structural fill	640		70.00	44,800	80.50	51,520	4,208	1	80.00	336,640	374,276	388,685	(329,476)	(337,165)	design - Peppercorn Hill ICP)  Rate allows for guardrail and end terminals (based on Bebo
Stru	Vehicle barrier		lm	145.00	7,540	166.75	8,671	230		350.00	80,500	85,969	89,278	(78,429)	(80,607)	arch design - Peppercorn Hill ICP)
u C	Signs	1	Item	2,500.00	2,500	2,875.00	2,875	1	Item	1,100.00	1,100	1,175	1,220	1,325	1,655	

BR-03 - Hayes Hill Boulevard: Construct a Growling Grass Frog Habitat suitable culvert/bridge crossing of Darebin Creek – 2 lane culvert crossing Benchmark Item 27



VPA WTP

Item	Sub Item	Qty	Unit	Rate (P50)	Amount	Rate (P90)	Amount	Qty	Unit	Rate	Amount	Amount	Amount	Difference (WT Bridge Design of structure as per Hill ICP - as advis City Co	on a Bebo Arch the Peppercorn ed by Whittlesea	Comments
					(P50)		(P90)					(P50)	(P90)	(P50)	(P90)	
)																
	Line marking	485	m2/pave	2.40	1,164	2.76	1,339	941	m2/pave	5.50	5,175	5,526	5,739	(4,362)	(4,400)	
	Landscaping							832	m2	15.00	12,481	13,329	13,842	(13,329)	(13,842)	Quantity is low - area used assumes overall site area (as per Site Preparation) less paved areas;
	Topsoil seeding							3,328	m2	5.50	18,306	19,549	20,302	(19,549)	(20,302)	Assume 20% landscape planting & 80% topsoil seeding
er	Allowance for street lighting							1	Item	50,000.00	50,000	55,590	57,730	(55,590)	(57,730)	Allowance for street lighting
Other	Extra over cost for excavation in rock allowance							1	Item	89,000.00	89,000	98,950	102,760	(98,950)	(102,760)	Additional site specific item. Assume 35% of total excavated volume to be in rock
	Allowance for Native Flora / Fauna Protection							1	Item	100,000.00	100,000	119,970	124,589	(119,970)	(124,589)	Allowance for protection of Growling Grass Frog habitat (provisional allowance)
	Allowance for Cultural Heritage Works							1	Item	50,000.00	50,000	59,985	62,294	(59,985)	(62,294)	Allowance for cultural heritage works (provisional allowance)
					-		-							-	-	
	Surveying & Design	1	%	5.00	24,446.85	5.00	28,113.88		%	5.00	111,193	,	. ,	(97,386)	, , ,	% driven item
	Contingency	1	%	15.00	73,340.55	15.00	84,341.63	1	%	15.00	333,580	. ,	\$ 379,570.28	(292,159)		% driven item
	Traffic Management	1	%	5.00	24,446.85	5.00	28,113.88	1	%	5.00	111,193	. ,	\$ 126,523.43	(97,386)	, , ,	% driven item
ery	Supervision & Project Management	1	%	9.00	44,004.33	9.00	50,604.98	1	%	9.00	200,148	,	\$ 227,742.17	(175,295)	, , ,	% driven item
Deliv	Council Fees	1	%	3.25	15,890.45	3.25	18,274.02	1	%	3.25	72,276	\$ 79,191.53	\$ 82,240.23	(63,301)	(63,966)	% driven item
ă	Vic Roads Fees	1	%	1.00	4,889.37	1.00	5,622.78	1	%	1.00	22,239	\$ 24,366.62	\$ 25,304.69	(19,477)	(19,682)	% driven item, should this not be Melbourne Water in lieu of Vic Roads?
	Environmental Management	1	%	0.50	2,444.69	0.50	2,811.39	1	%	0.50	11,119	\$ 12,183.31	\$ 12,652.34	(9,739)	(9,841)	% driven item
	Site Establishment	1	%	2.50	12,223.43	2.50	14,056.94	1	%	2.50	55,597	\$ 60,916.56	\$ 63,261.71	(48,693)	(49,205)	% driven item
TOTAL	Excluding Delivery				488,937		562,278				2,223,866		\$ 2,530,469	(1,947,725)	(1,968,191)	
IOIAL	Including Delivery				690,624		794,217				3,141,210	\$ 3,441,786	\$ 3,574,287	(2,751,162)	(2,780,070)	

BR-04 - Cameron Street: Construct a Growling Grass Frog Habitat suitable culvert/bridge crossing of Darebin Creek – 2 lane culvert crossing Benchmark Item 27



ltem	Sub Item	Qty	Unit	Rate (P50)	Amount	Rate (P90)	Amount	Qty	Unit	Rate	Amount	Amount	Amount	Difference (WT Bridge Design of structure as per Hill ICP - as advise City Co	on a Bebo Arch the Peppercorn ed by Whittlesea	Comments
					(P50)		(P90)					(P50)	(P90)	(P50)	(P90)	
	Cita Buonauntian	1	lhous	20,000,00	20,000	22 000 00	22,000	1	lkom	20,000,00	20,000	22.242	24.000	(12.242)	(11 000)	
	Site Preparation Diversion Works		Item Item	20,000.00 15,000.00	20,000 15,000	23,000.00 17,250.00	23,000 17,250		Item Item	30,000.00 75,000.00	30,000 75,000	33,343 83,358	34,699 86,746	(13,343) (68,358)	(11,699)	assume 2 crew x 5 days
orks	Waterway reshaping		Item	3,000.00	3,000	3,450.00	3,450		Item	15,000.00	15,000	16,672	17,349	(13,672)	(13,899)	assume 2 crew x 3 days
& Earthwo	Stripping of topsoil	485		5.00	2,425	5.75	2,789	4,822		2.80	13,502	14,414	15,000	(11,989)	(12,211)	Quantity appears to be low but rate appears to be high (based on Bebo arch design - Peppercorn Hill ICP)
ks 8	Bulk Excavation	2,300	m3	35.00	80,500	40.25	92,575	2,366	m3	39.00	92,274	102,557	106,726	(22,057)	(14,151)	
Sitewor	Detail Excvation (strip footings)							105	m3	80.00	8,422	9,361	9,742	(9,361)	(9,742)	New item for excavation of strip footing for precast arches (Assume 1000mm wide x 700mm deep)
	Formation of batters	320	m3	14.00	4,480	16.10	5,152	748	m3	16.00	11,974	13,309	13,850	(8,829)	(8,698)	reuse of stockpiled material assumed
⊗ (2. 4)	Secondary Arterial Pavement							918		141.00	129,438		149,710	(143,863)		Assume Cameron St to be a secondary arterial road
ad and and and and and and and and and a	Subgrade preparation							918		2.50	2,295		2,654	(2,551)	(2,654)	
Road Ivemen Concret	Kerb & channel							204		55.00	11,220	11,978	12,465	(11,978)		New items (based on Bebo arch design - Peppercorn Hill ICP
- yave	SUP / Footpath							459	_	60.00	27,540	29,401	30,596	(29,401)	(30,596)	as advised by Whittlesea City Council)
<u> </u>	Traffic Island			2 522 22	115.150	4.474.50	100 501		m2	60.00	0			-	-	
	Box Culverts units 1800 x 3000		No.	3,630.00	116,160	4,174.50	133,584		No	4,770.00	0			116,160	133,584	Not anyline bla (MT base based anyline and Daha angle daring
	Link slab 1800 x 3000	560	No.	2,018.00	32,288	2,320.70	37,131 128,800		No	2,920.00	0			32,288	,	Not applicable (WT has based review on Bebo arch design - Peppercorn Hill ICP as advised by Whittlesea City Council)
	Foundation slab (250mm) Granular bedding 150mm thick crushed re	560		200.00 18.00	112,000 10,080	230.00 20.70	11,592		m2 m2	224.00 16.50	0			112,000 10,080	128,800 11,592	reppercontinuiter as advised by whittiesea city councily
	Strip footing for arches (assume 1m wide	500	IIIZ	18.00	10,080	20.70	11,592	150		350.00	52,640	56,198	58,482	(56,198)	(58,482)	
	x 700mm deep) Supply Humes Bebo Arch 6210s (10no. X							119		1,100.00	130,900	139,747	145,428	(139,747)	(145,428)	
v	2.5m wide units); 1 unit = 11.9t  Supply Humes Bebo Arch 6210s (10no. X							119		1,100.00	130,900		145,428	(139,747)	(145,428)	New item (based on Bebo arch design - Peppercorn Hill ICP)
Structure	2.5m wide units); 1 unit = 11.9t  Supply Humes Bebo Arch 12300s (14no. X 1.8m wide units); 1 unit = 16.8t							235	t	1,100.00	258,720	276,207	287,433	(276,207)	(287,433)	
rainage	Installation of arch							1	Item	180,000.00	180,000	192,166	199,977	(192,166)	(199,977)	Allow installation of 3 units / day (including stitching & temporary propping works)
ă	Supply & install pre-cast plain concrete spandrel wall for 62100s (4 units) 1 unit = 8.2t							33	t	1,250.00	41,000	43,771	45,550	(43,771)	(45,550)	, , , , , , , , , , , , , , , , , , ,
	Supply & install pre-cast plain concrete spandrel wall for 12300s (2 units) 1 unit = 17.2t							34	t	1,250.00	43,000	45,906	47,772	(45,906)	(47,772)	New item (based on Bebo arch design - Peppercorn Hill ICP)
	Rock beaching (at ends of crossing)							450		150.00	67,500	75,022	78,072	(75,022)	(78,072)	
	Apron slab		m2	200.00	8,000		9,200		m2	240.50	0			8,000	9,200	
	Wing wall	32	m2	500.00	16,000	575.00	18,400		m2	900.00	0			16,000	18,400	Not applicable (WT has based review on Bebo arch design -
	Head wall	26	m2	500.00	13,000	575.00	14,950		m2	900.00	0			13,000	14,950	Peppercorn Hill ICP as advised by Whittlesea City Council)
	Allowance for Drainage pipe - 375mm CR backfilled							102	m	260.00	26,520	29,475	30,674	(29,475)	(30,674)	
	Allowance for Drainage - pits							3.00	No.	2,150.00	6,450	7,169	7,460	(7,169)	(7,460)	New items - allowance for drainage
	Allowance for Drainage - Subsoil drainage							204	m	45.00	9,180	10,203	10,618	(10,203)	(10,618)	
ture	Structural fill	640	m3	70.00	44,800	80.50	51,520	4,088	m3	80.00	327,040	363,486	378,261	(318,686)	(326,741)	Quantity & Rate appears to be low (based on Bebo arch design - Peppercorn Hill ICP)
Structur Works	Vehicle barrier		lm	145.00	7,540	166.75	8,671	224		350.00	78,400	83,699	87,101	(76,159)	(78,430)	Rate allows for guardrail and end terminals (based on Bebo arch design - Peppercorn Hill ICP)
o	Signs		Item	2,500.00	2,500		2,875		Item	1,100.00	1,100		1,222	1,326	1,653	
	Line marking	485	m2/pave	2.40	1,164	2.76	1,339	918	m2/pave	5.50	5,049	5,390	5,609	(4,226)	(4,271)	is this required? Road is measured separately?

BR-04 - Cameron Street: Construct a Growling Grass Frog Habitat suitable culvert/bridge crossing of Darebin Creek – 2 lane culvert crossing Benchmark Item 27



ltem	Sub Item	Qty	Unit	Rate (P50)	Amount	Rate (P90)	Amount	Qty	Unit	Rate	Amount	Amount	Amount	Bridge Design structure as per Hill ICP - as advis	T has based the on a Bebo Arch the Peppercorn sed by Whittlesea ouncil)	Comments
					(P50)		(P90)					(P50)	(P90)	(P50)	(P90)	
	Landscaping							748	m2	15.00	11,226	11,985	12,472	(11,985)	(12,472)	Quantity is low - area used assumes overall site area (as per Site Preparation) less paved areas;
L	Topsoil seeding							2,994	m2	5.50	16,465	17,578	18,292	(17,578)	(18,292)	Assume 20% landscape planting & 80% topsoil seeding
Other	Allowance for street lighting							1	Item	50,000.00	50,000	55,572	57,831	(55,572)	(57,831)	Allowance for street lighting
Ó	Extra over cost for excavation in rock allowance							1	Item	83,000.00	83,000	99,543	103,589	(99,543)	(103,589)	Additional site specific item. Assume 35% of total excavated volume to be in rock
	Allowance for Native Flora / Fauna Protection							1	Item	100,000.00	100,000	119,932	124,806	(119,932)		Allowance for protection of Growling Grace Frog habitat
	Allowance for Cultural Heritage Works							1	Item	50,000.00	50,000	59,966	62,403	(59,966)	(62,403)	Allowance for cultural heritage works (provisional allowance)
					-		-							-	-	
	Surveying & Design		%	5.00	24,446.85	5.00	28,113.88	_	%	5.00	104,288		. ,	(90,290)		% driven item
	Contingency		%	15.00	73,340.55	15.00	84,341.63		%	15.00	312,863		. ,	(270,871)		% driven item
>	Traffic Management Supervision & Project Management		% %	5.00 9.00	24,446.85 44,004.33	5.00 9.00	28,113.88 50,604.98		%	5.00 9.00	104,288 187,718	. ,	\$ 119,400.93 \$ 214,921.67	(90,290) (162,523)		% driven item % driven item
ver	Council Fees		%	3.25	15,890.45	3.25	18,274.02		%	3.25	67,787	. ,	\$ 77,610.60	(58,689)	` ' '	% driven item
Delivery	Vic Roads Fees		%	1.00	4,889.37	1.00	5,622.78		%	1.00	20,858		, i	(18,058)	1	% driven item, should this not be Melbourne Water in lieu of Vic Roads?
	Environmental Management	1	%	0.50	2,444.69	0.50	2,811.39	1	%	0.50	10,429	\$ 11,473.73	\$ 11,940.09	(9,029)	(9 129)	% driven item
	Site Establishment	1	%	2.50	12,223.43	2.50	14,056.94	1	%	2.50	52,144	. ,	\$ 59,700.47	(45,145)		% driven item
					,		,							( -,=)	( -//	
TOTAL	Excluding Delivery				488,937		562,278				2,085,755	\$ 2,294,745	\$ 2,388,019	(1,805,808)	(1,825,741)	
IOIAL	Including Delivery				690,624		794,217				2,946,129	\$ 3,241,327	\$ 3,373,076	(2,550,704)	(2,578,859)	

BR-05 - Patterson Drive: Construct a 2 lane interim bridge crossing of Merri Creek Benchmark Item 19



								•								
Item	Sub Item	Qty	Unit	Rate (P50)	Amount	Rate (P90)	Amount	Qty	Unit	Rate	Amount	Amount	Amount	Diffe	rence	Comments
					(P50)		(P90)					(P50)	(P90)	(P50)	(P90)	
thworks	Site Preparation	-		37.08	-	55.13	-	1	Item	10,000.00	10,000	10,996	12,277	(10,996)	(12,277)	assumes 1 crew x 1 day for site clearance & topsoil removal
Siteworks & Ear	Earthworks	12,960	m3	46.78	606,269	50.95	660,298	12,000	m3	45.00	540,000	593,795	662,931	12,474	(2,634)	<ul> <li>imported fill to bridge abutments; behind reinforced earth wall</li> <li>quantity includes for imported fill of 75m wide x 20m long yup to 4m depth for each abutment</li> <li>Note: any preloading requirements are excluded</li> </ul>
	Retaining walls, abutments, footings		No.	238,163.38	-	341,185.01	-	-	No.		incl			-	-	
ks	Bridge deck	-	m2	1,080.00	-	1,739.32	-	-	m2		incl			-	-	
Vor	Guard rails / balustrade	-	Item	2,385.00	-	2,883.39	-	-	Item		incl			-	-	
é >	Transition slab	2	No	30,000.00	60,000	34,500.00	69,000		No		incl			60,000	69,000	
ctur	Asphalt	-	m2	40.00	-	40.00	-	-	m2		incl			-	-	
ţr	Concrete footway	-	m2	38.46	-	49.41	-	-	m2		incl			-	-	
S u	Kerb & channel	-	m	42.50	-	45.74	-	-	m			_		-	-	
ō	Overall Super T Cost	750	m2	4,352.00	3,264,000	4,790.70	3,593,024	1,742	m2	3,850.00	6,704,775	7,081,802	7,906,350	(3,817,802)	(4,313,327)	Bridge area based on 50m long span x deck width of 34.83m
e Works	Guard rails / balustrade	240	m	145.00	34,800	179.66	43,117	120	m	220.00	26,400	27,885	31,131	6,915	11,986	<ul> <li>Rate is low for road bridge</li> <li>WT quantity based on 50m span road bridge (+ 5m each side of abutment)</li> </ul>
ţ	Scour protection	-	Item	- 1	-	-	-	-	Item	350.00	0			-	-	
truc	GREAT terminal	4	No.	5,050.00	20,200	5,102.85	20,411		No.	15,000.00	60,000	63,374	70,753	(43,174)	(50.341)	Rate is low for road bridge
off s	Off structure barrier	-	Item	1,395.56	-	2,196.10	-	-	m	1,550.00	0	,		-	-	Guard rails assumed sufficient however may be a requirement for concrete barrier
	Rock beaching				-		-		m2	220.00				-	-	
	Reinforced Earth Wall (Abutment)							1	ltem	450,000.00	450,000	494,829	552,443	(494,829)	(552,443)	Assume reinforced earth walls (75m long x up to 4m high) at bridge abutments (imported fill included above in Earthworks)
Misc.	Allowance for Native Flora / Fauna Protection							1	Item	100,000.00	100,000	118,656	132,471	(118,656)	(132,471)	Allowance for protection of Growling Grass Frog habitat
_	Allowance for Cultural Heritage Works							1	Item	50,000.00	50,000	59,328	66,236	(59,328)	(66,236)	Allowance for cultural heritage works
	Companies 9 D		0/	7.00	100.000		246.000		0/	7.00	207.050	ć 422.522.25	¢ 474 700 50	- (222.270)	- (252.45=)	O/ deiven there
	Surveying & Design		% %	5.00	199,263	5.00 20.00	219,292	1	%	5.00	397,059	,		(223,270)		% driven item
	Contingency Traffic Management		%	20.00 5.00	797,054 199,263	5.00	877,170 219,292		%	20.00 5.00	1,588,235 397,059		\$ 1,886,918.26 \$ 471,729.56	(893,079) (223,270)		% driven item % driven item
er <b>y</b>	Supervision & Project Management		%	9.00	358,674	9.00	394,726	1	%	9.00	714,706			(401,886)		% driven item % driven item
Delive	Council Fees		%	3.25	129,521	3.25	142,540	1	%	3.25	258,088			(145,125)		% driven item
۵	Vic Roads Fees		%	1.00	39,853	1.00	43,858	1	%	1.00	79,412			(44,654)		% driven item
	Environmental Management		%	0.50	19,926	0.50	21,929	1	%	0.50	39,706			(22,327)		% driven item
	Site Establishment		%	2.50	99,632	2.50	109,646	1	%	2.50				(111,635)		% driven item
TOTAL	Excluding Delivery				3,985,269		4,385,850				7,941,175			(4,465,396)	(5,048,742)	
IOIAL	Including Delivery				5,828,456		6,414,305				11,613,968	\$ 12,359,097	\$ 13,798,090	(6,530,641)	(7,383,785)	



			\	/PA							WTP					31.10.2018
Item	Sub Item	Qty	Unit	Rate (P50)	Amount	Rate (P90)	Amount	Qty	Unit	Rate	Amount	Amount	Amount	Differ	rence	Comments
		-			(P50)		(P90)					(P50)	(P90)	(P50)	(P90)	
	Crossing construction / materials	1	. Item		-	183,832.92	183,832.92	1	l Item	138,900.00	138,900	144,322	157,409	(144,322)	26,424	Rate appears to be high
	Testing & Commissioning	1	. Item		-	12,000.00	12,000.00	1	l Item	10,000.00	10,000	10,390	11,333	(10,390)	667	-
Other	Extra over cost for excavation in rock (signal post footings / conduits etc)							1	L Item	20,000.00	20,000	21,651	23,614	(21,651)	(23,614)	Allowance for rock excavation included (signal post footings / conduits etc)
J														-	-	
	Surveying & Design	1	. %	5.00	-	5.00	9,792	1	L %	5.00	8,445	\$ 8,818.17	\$ 9,617.77	(8,818)	174	% driven item
	Contingency	1	. %	15.00	-	15.00	29,375	1	L %	15.00	25,335	\$ 26,454.50	\$ 28,853.31	(26,455)	522	% driven item
	Traffic Management	1	. %	5.00	1	5.00	9,792	1	L %	5.00	8,445	\$ 8,818.17	\$ 9,617.77	(8,818)	174	% driven item
/er/	Supervision & Project Management	1	. %	9.00	-	9.00	17,625	1	L %	9.00	15,201	\$ 15,872.70	\$ 17,311.98	(15,873)	313	% driven item
eli	Council Fees	1	. %	3.25	-	3.25	6,365	1	L %	3.25	5,489	\$ 5,731.81	\$ 6,251.55	(5,732)	113	% driven item
	Vic Roads Fees	1	. %	1.00	-	1.00	1,958	1	L %	1.00	1,689	\$ 1,763.63	\$ 1,923.55	(1,764)	35	% driven item
	Environmental Management	1	. %	0.50	-	0.50	979	1	L %	0.50	845	\$ 881.82	\$ 961.78	(882)	17	% driven item
	Site Establishment	1	. %	2.50	-	2.50	4,896	1	L %	2.50	4,223	\$ 4,409.08	\$ 4,808.88	(4,409)	87	% driven item
·																
TOTAL	Excluding Delivery				-		195,832.92				168,900	176,363	192,355	-176,363		
	Including Delivery				-		276,614.00				238,571	\$ 249,113	\$ 271,702	\$ (249,113)	\$ 4,912	



	VPA										WTP		31.10.2018			
Item	Sub Item	Qty	Unit	Rate (P50)	Amount	Rate (P90)	Amount	Qty	Unit	Rate	Amount	Amount	Amount	Difference		Comments
					(P50)		(P90)					(P50)	(P90)	(P50)	(P90)	
	Crossing construction / materials	1	Item		-	183,832.92	183,832.92	1	l Item	138,900.00	138,900	144,442	156,175	(144,442)	27,658	Rate appears to be high
	Testing & Commissioning	1	Item		-	12,000.00	12,000.00	1	l Item	10,000.00	10,000	10,399	11,244	(10,399)	756	
Other	Extra over cost for excavation in rock (signal post footings / conduits etc)							1	l Item	20,000.00	20,000	21,669	23,429	(21,669)	(23,429)	Allowance for rock excavation included (signal post footings / conduits etc)
	Additional protection works for APA transmission gas line							1	L Item	20,000.00	20,000	21,669	23,429	(21,669)	(23,429)	Allowance for protection of existing APA tranmission gas line included (temporary works during construction only)
	Surveying & Docien	1	L %	5.00		5.00	9,792	1	L %	5.00	0 9,445	\$ 9,908.95	\$ 10,713.81	(9,909)	(022)	% driven item
	Surveying & Design Contingency	1	L %	15.00	-	15.00		1	%	15.00	28,335			(9,909)		% driven item
	Traffic Management	1	L %	5.00	-	5.00		1	%	5.00	9,445			(9,909)		% driven item
/ery	Supervision & Project Management	1	L %	9.00	-	9.00	17,625	1	%	9.00	17,001	\$ 17,836.12	\$ 19,284.86	(17,836)		% driven item
eliv	Council Fees	1	L %	3.25	-	3.25	6,365	1	L %	3.25	6,139	\$ 6,440.82	\$ 6,963.98	(6,441)	(599)	% driven item
0	Vic Roads Fees	1	L %	1.00	-	1.00	1,958	1	L %	1.00	1,889	\$ 1,981.79	\$ 2,142.76	(1,982)	(184)	% driven item
	Environmental Management	1	L %	0.50	-	0.50	979	1	L %	0.50	945	\$ 990.90	\$ 1,071.38	(991)	(92)	% driven item
	Site Establishment	1	L %	2.50	-	2.50	4,896	1	%	2.50	4,723	\$ 4,954.48	\$ 5,356.91	(4,954)	(461)	% driven item
	le i ii o ii			<u> </u>		<u> </u>	405.000.00				400 000	400 470	244 275	400 470	40	1
TOTAL	Excluding Delivery				-		195,832.92 276,614.00	-	+	<del>                                     </del>	188,900 266,821	198,179 \$ 279,928	214,276 \$ 302,665			
	Including Delivery				-		2/0,014.00				200,821	۶ 2/۶,۶28	<b>⇒</b> 302,005	\$ (279,928)	\$ (26,051)	4



	VPA										WTP		31.10.2018			
Item	Sub Item	Qty	Unit	Rate (P50)	Amount	Rate (P90)	Amount	Qty	Unit	Rate	Amount	Amount	Amount	Difference		Comments
					(P50)		(P90)					(P50)	(P90)	(P50)	(P90)	
	Crossing construction / materials	1	Item		_	183,832.92	183,832.92		1 Item	138,900.00	138,900	144,442	156,175	(144,442)	27 658	Rate appears to be high
	Testing & Commissioning	1	Item		-	12,000.00	12,000.00	1	1 Item	10,000.00	10,000	10,399	11,244	(10,399)	756	
Other	Extra over cost for excavation in rock (signal post footings / conduits etc)							1	1 Item	20,000.00	20,000	21,669	23,429	(21,669)	(23,429)	Allowance for rock excavation included (signal post footings / conduits etc)
	Additional protection works for APA transmission gas line							1	1 Item	20,000.00	20,000	21,669	23,429	(21,669)	(23,429)	Allowance for protection of existing APA tranmission gas line included (temporary works during construction only)
	Surveying & Design	1	%	5.00	-	5.00	9,792	1	1 %	5.00	9,445	\$ 9,908.95	\$ 10,713.81	(9,909)	(922)	% driven item
	Contingency	1	%	15.00	-	15.00	29,375	1	1 %	15.00	28,335	\$ 29,726.86	\$ 32,141.44	(29,727)		% driven item
	Traffic Management	1	%	5.00	-	5.00	9,792	1	1 %	5.00	9,445	\$ 9,908.95	\$ 10,713.81	(9,909)	(922)	% driven item
er,	Supervision & Project Management	1	%	9.00	-	9.00	17,625	1	1 %	9.00	17,001	\$ 17,836.12	\$ 19,284.86	(17,836)	(1,660)	% driven item
Deli	Council Fees	1	%	3.25	-	3.25	6,365	1	1 %	3.25	6,139	\$ 6,440.82	\$ 6,963.98	(6,441)	(599)	% driven item
	Vic Roads Fees	1	%	1.00	-	1.00	1,958	1	1 %	1.00	1,889	\$ 1,981.79	\$ 2,142.76	(1,982)	(184)	% driven item
	Environmental Management	1	%	0.50	-	0.50	979	1	1 %	0.50	945	\$ 990.90	\$ 1,071.38	(991)		% driven item
	Site Establishment	1	%	2.50	-	2.50	4,896	1	1 %	2.50	4,723	\$ 4,954.48	\$ 5,356.91	(4,954)	(461)	% driven item
TOTAL	Excluding Delivery		1			<u> </u>	195,832.92		<del>1</del>		188,900	198,179	214,276	-198,179	-18,443	1
	Including Delivery				-		276,614.00				266,821		\$ 302,665 \$	(279,928)	\$ (26,051)	





# **ANDREW LOH**

**ASSOCIATE** 

ANDREW BRINGS EXCEPTIONAL SKILLS IN THE FIELDS OF PROJECT AND COST MANAGEMENT FOR BUILDING AND INFRASTRUCTURE PROJECTS.



### PERSONAL DETAILS

**YEARS OF EXPERIENCE: 13** 

**COUNTRIES WORKED:** Australia, Singapore

# QUALIFICATIONS & AFFILIATIONS: Bachelor Degree in Property &

Construction, University of Melbourne

Bachelor Degree in Architecture, University of Melbourne

Bachelor of Planning and Design, University of Melbourne

Andrew's extensive experience focuses on measurement and cost management of major infrastructure and heavy engineering projects. He is an expert in a number of key sectors including water, rail, oil and gas, health, commercial and residential.

He has provided an array of quantity surveying services including feasibility studies, preparation of tender documentation and analysis, bills of quantities and independent estimator advice to a wide variety of clients.

### PROFESSIONAL EXPERIENCE

### **MAJOR PROJECTS:**

## Engineering

'us' Alliance

Angelsea Power Station Desulphurisation Project

Asia Pacific LNG Condabri

Barwon Water Alliance

Braidwood Gas Networks

Esso Australia LIP Laboratory

Port Capacity Project

**Program Alliances** 

**QAL Gladstone Fines Reduction Project** 

South East Recycled Water Alliance

UGL Kaefer, Esso Bass Strait Maintenance Works Contract

Water Resources Alliance

Waterways Alliance

### Health

Nathalia District Hospital Redevelopment Shepparton Multicultural Aged Care Facility



### Rail

Level Crossing Removals

Melbourne Metro

Metro Trains Melbourne Infrastructure Renewals Programme

Regional Rail Link Package C

### Retail

Dandenong Market Refurbishment

### Roads

Melton Amendment C145 - Rockbank PSP & DCP

Melton Amendment C146 & C147 - Plumpton & Kororoit PSP

CityLink Tulla Widening (CTW)

Transurban Western Distributor Proposal

### Water

Colac WEB Project

Air Treatment Facility NSP Stage 2

Edgars Creek Intercepting Sewer

Icon Water Regulatory Submission (Capital Works Estimates)

Northern Water Plant

Painkalac Reservoir Upgrade

Pakenham and Somers RWTP

