Stakeholder Comments Review

Benchmark Infrastructure Costings Project

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Victoria Planning Authority

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Cardno

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Executive Summary

Cardno was engaged in 2017 by the Victoria Planning Authority (VPA) to assess a variety of background data available to the VPA and to subsequently standardise and benchmark the cost estimation of ICP projects. The project is currently in the stakeholder engagement stage and stakeholder comments are being reviewed.

Several councils and the UDIA have provided feedback during mid-late 2018 on the draft project outcomes which included comments on the scope of the project and additionally providing various cost estimates.

A summary of this feedback and commentary on the merits of points raised is provided below:

Cardinia Shire Council (CSC) has provided data on a variety of transport road projects and community infrastructure projects. These include;

- Functional layouts and estimates for a variety of intersection projects – however, scope differences exist due to the CSC projects being brownfield developments. The overall cost per metre of pavement is higher for the current benchmark estimates;
- Construction drawings and estimates for two intersection projects – similar to above, scope differences exist due to these being brownfield developments and cost per metre of pavement is again higher for the current benchmark estimates;
- Rates of line items from the functional layout estimates and construction estimates above which have similar scope to the benchmark project will be utilised to improve the statistical analysis and adjust rates;
- Construction estimates and functional drawings for James Bathe recreational reserve – the drawings show that components allowed for are generally the same as those allowed for in the benchmark project. Several items not considered to be 'basic and essential' were included however, overall project cost is less than the benchmark estimates. Rates from the above reserve will be utilised in the improvement of the benchmark project's statistical analysis;
- Estimates and drawings of various other community facilities and a pavilion – these items were not considered for benchmark rate improvement purposes due to a variety of reasons including significant differences in scope (double story vs single story buildings) and low granularity in the provided documents.

Similar to CSC, City of Casey has provided cost estimates for a variety of transport road projects and community infrastructure projects;

- As constructed plans and concept plans for various intersection and road projects were submitted along with their estimates. However, similar to CSC's transport submissions these were brownfield developments and had a variety of scope differences. The overall cost per metre of pavement is higher for the current benchmark estimates. Rates of line items which have similar scope will be utilised to improve the statistical analysis;
- Functional plans and estimates for recreation fields were submitted by council. These submissions included several items that were not considered to be 'basic and essential'. The benchmark layouts generally allowed for more sporting fields (generally more tennis courts, netball fields and cricket nets). Overall, benchmark estimates were higher than council submitted estimates. Rates of line items which have similar scope will be utilised to improve the statistical analysis;
- Several community facilities and respective estimates – similar to the CSC's submission these items were not considered for benchmark rate improvement purposes due to a variety of reasons including vast differences in scope (double story vs single story buildings) and low granularity in the provided documents

City of Melton together with City of Whittlesea engaged WT Partnership (WTP) to undertake a peer review of the transport projects. City of Melton also engaged Turner & Townsend (T&T) to undertake a peer review of the community infrastructure projects.

General comments from all councils (including WTP and T&T above) have resulted in the following key conclusions;

- Remove redundant line items including site preparation (site preparation is covered by the deliverable site establishment);
- Include/ revise rates and quantities against the line item for subgrade preparation and adjust current rates for pavements as required;
- Allocate costs against the line item for landscape maintenance which currently has no costs against it but typically forms part of construction projects & contracts;
- Allocate costs against the line item for street lighting which currently has no costs against it;
- Discuss the inclusion of an ESD deliverable in certain community infrastructure projects;
- Make a variety of minor changes to the cost sheets and project drawings as specified in subsequent sections of the report;

In addition to council's submissions, the UDIA has submitted comments regarding the application of the benchmark project, the inputs used for the benchmarking project and comments surrounding comparison of the benchmark estimates against actual projects. Certain comments relevant to Cardno's scope of works have been addressed within this report.

Following the finalisation of all the changes specified in this report, all rates are intended to be cost indexed as per relevant ABS data. This indexed data will be used in the statistical analysis and final P90 rates will be recommended.

The recommendations from the benchmark project have currently been applied in the several ICPs (Infrastructure Contributions Plans). As part of the ICP process it is expected that stakeholders will provide comments on the respective ICP. It is envisaged that some of this feedback could have an impact on the benchmark process. Any feedback that justifies changes to the benchmark project will be addressed as required outside of this report in the future.

Detailed discussions of the items specified above are outlined in the following sections of the report.

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Appendices

1 Introduction

Cardno was engaged in 2017 by the Victoria Planning Authority (VPA) to assess a variety of background data available to the VPA and to subsequently standardise and benchmark the cost estimation of ICP projects. The initial stage of the project has been completed and has now progressed to the stakeholder engagement phase.

Over the course of two workshops (held on 27 August and 31 August) Cardno presented the recommendations from the benchmarking process to a variety of stakeholders including several growth area councils and the Urban Development Institute of Australia (UDIA). Following these two sessions, the VPA requested from stakeholders to submit their comments and to provide additional background data that could be used to calibrate the findings of the benchmarking process further.

Comments and a variety of infrastructure documents (costings and drawings) were submitted by the following stakeholders during mid-late October.

- Cardinia Shire Council
- City of Casey
- Melton City Council
- City of Whittlesea
- UDIA

The following table summarises the nature of the documents submitted by the above stakeholders. A detailed list of the submissions has been outlined in Appendix C.

		As-built costs with supporting evidence	Project cost estimates & supporting evidence	Peer review of Benchmark estimates	Comments on Benchmark project
Cardinia Shire Council	Toomah community centre		✓ (Low granularity)		
	Seven intersection projects (Arena Pde, Bayview Rd, Brunt Rd, McMullen Rd, O'Neil Rd, Thewlis Rd, Tivendale Rd).		✓		
	Two intersection projects (Siding Ave, Timbertop Pde)	✓			
	James Bathe recreation reserve	✓			
	James Bathe pavilion		✓ (Low granularity)		
	Additional comments				✓
City of Casey	Ramleigh estate community centre		✓		
	Cranbourne West community centre		✓		
	Four recreational reserves (Livingston, Selendra, Clyde, Kilora)		✓		
	Three intersection projects (Glasscocks, Berwick-Cranbourne Road, Gwen Road)	✓			
	Thompsons road project	✓ (Low granularity)			
	Additional comments				✓

Melton City Council	Peer review by WTP			✓	
	Peer review by T&T			✓	
City of Whittle-sea	Peer review by WTP			✓	
	Additional comments				✓
UDIA	Comments				✓

This document aims to outline to the VPA Cardno's review of the submitted documents and their applicability in improving the benchmarking process. The final section of the report summarises a potential scope of work that is intended to be undertaken to improve infrastructure cost estimates subject to discussion with the VPA.

The following sections of the document outline detailed observations of the feedback received from stakeholders.

2 Cardinia Shire Council submission

Cardinia Shire Council (CSC) has submitted cost sheets (estimates/construction claims) and drawings for a range of transport infrastructure and community infrastructure projects.

2.1 Various intersection projects

Council submitted functional plans and functional cost estimates (date prepared – June 2018) of seven roads intersecting with Princes Highway as outlined below.

- Arena Parade/ Princes Highway
- Bayview Road/ Princes Highway
- Brunt Road/ Princes Highway
- McMullen Road/ Princes Highway
- O'Neil Road/ Princes Highway
- Thewlis Road/ Princes Highway
- Tivendale Road/ Princes Highway

T Intersection (Primary to Connector adopted)		
Arena Parade estimated cost	$1,981,148	$286/m^2 of pavement
O'Neil Road estimated cost	$2,473,572	$328/m^2 of pavement
Thewlis Road estimated cost	$3,260,244	$355/m^2 of pavement
Benchmark Cost	**$3,626,000**	**$515/m^2 of pavement**
Cross Intersection (Primary to Connector adopted)		
Bayview Road estimated cost	$4,343,004	$392/m^2 of pavement
Brunt Road estimated cost	$7,923,923	$400/m^2 of pavement
McMullen Road estimated cost	$6,230,164	$380/m^2 of pavement

Tivendale Road estimated cost	$4,408,950	$283/m^2 of pavement
Benchmark Cost	**$4,622,000**	**$542/m^2 of pavement**

In all the cases analysed, the benchmark 'per m^2 of pavement' rate was higher compared to the functional estimates. However, in the case of Brunt Parade estimate and McMullen Parade intersection estimate, the total cost was higher than the benchmark P90 cost. The reason for the above divergence can be attributed larger area of works of these two projects resulting in higher quantities compared to the benchmark values.

Several overall major differences in scope noted are outlined below

- Cost estimates are for brownfield projects, which involves requirements for demolitions /greater proving of existing services (3%-6%), and asphalt overlays (2.5%-7%). However, in general total project costs are lower due to an overall reduction in scope of works (reduced area where full depth pavements are required);
- Brunt Road intersection estimate has allowed for the relocation of utilities, amounting to more than 10% of the total estimate. Similarly, McMullen Road intersection estimate had allowed for the same amounting to about 5.5% of the total estimate;
- Pavement composition of the estimate is different to the benchmark pavement composition. However, for comparison purposes, pavement rates and quantities have been compared based on the assumption that Princes Highway is comparable to a Primary Arterial road and the all other roads are connector roads;
- Estimates have allowed for Telstra connections, power connections, signal maintenance and operating costs and operating Costs for Street Lighting (2%-4.7%).

For items with a similar scope, a rate comparison and quantity comparison was undertaken as outlined in Appendix A.1, A.2 and A.3.

As discussed with the VPA, items which have a similar scope to the benchmark project will be used improve the Monte Carlo analysis' input data.

2.2 Siding Avenue and Princes Highway/ Timbertop and Princes Highway intersections

CSC provided as constructed plans and schedules of quantities/ prices for Siding Avenue and Princes Highway intersection and Timbertop and Princes Highway intersection as part of the benchmarking comments submission. Certain items provided within the submission are not relevant to the benchmark scope of works as outlined below. As discussed with the VPA, other relevant rates are present and will be utilised to improve the Monte-Carlo analysis.

For items with a similar scope, rate comparisons were undertaken for the two intersection projects as outlined in Appendix A.4 and A.5.

Several notable differences in scope noted are outlined below;

- Estimate for Timbertop and Princes Highway intersection has provisionally allowed for stabilisation of subgrade amounting to 4.4% of the total project cost (3% cement and 3% lime to 200mm depth over a provisional area of 2285m^2 at a rate of $14.90);
- Estimate for Siding Avenue and Princes Highway intersection has allowed for the stabilisation of subgrade amounting to 28% of the total cost (9200m^2 of Excavation of soft, wet or unstable areas within the road reserve for subgrade improvement including replacement and compaction with approved subgrade material and disposal of surplus spoil off site);
- Both cost estimates are for brownfield projects, which involves requirements for demolitions, asphalt overlays etc.;
- Pavement asphalt overlay has been allowed for Siding Avenue intersection. This amounts to 5% of the total project cost;
- Siding Avenue intersection has demolition allowances including provisional demolition allowances for the removal of existing structures within council recreation reserves and removal of a netball court and associated seating. Total demolition costs amount to 2.4% of the total project cost;

- Siding Avenue intersection has also allowed for the adjustment of existing utilities and works on new utilities amounting to 1.3% of the total project cost.
- Pavement composition of the estimates are different to the benchmark pavement composition. However, for comparison purposes, pavement rates and quantities have been compared based on the assumption that Princes Highway is comparable to a Primary Arterial road and the all other roads are connector roads.
- A minor allowance amounting to about 1% of the total cost has been allowed for Melbourne Water drainage works and a house drain within the Timbertop intersection cost.
- As evident by the quantity comparison, Timbertop/ Princes Highway intersection appears to have a much smaller scope of works compared to the benchmark scope of works (see appendix A.4), as well as a much lower overall pavement cost/m^2.

T Intersection (Primary to Connector adopted)		
Timbertop Intersection cost	$772,748	$435/$m^2$ of pavement
Benchmark cost	**$3,626,000**	**$515/$m^2$ of pavement**
Cross Intersection (Primary to Connector adopted)		
Siding Avenue Intersection cost	$3,441,700	$252/$m^2$ of pavement
Benchmark cost	**$4,622,000**	**$542/$m^2$ of pavement**

2.3 Toomah Community centre

Several documents outlining details of the community centre were supplied by council.

- 1d ICP Benchmarking_Toomah Community Centre_ground floor.pdf
- 1d. ICP Benchmarking_Toomah Community Centre_3D image.pdf
- 1d. ICP Benchmarking_Toomah Community Centre_first floor.pdf
- 1d. ICP Benchmarking_Toomah Community Centre_site plan car parking.pdf
- 1c. Toomah Community Centre costing comparison_31.10.2017

The above documents indicated that Toomah community centre is a double storey community centre with a car park and had construction commence in 2012. Since Toomah centre was a double storey building Cardno considers that CSC's cost submission is dissimilar for comparison and improvement purposes of the community centres specified in the Benchmark Infrastructure costings project. Accordingly, no further analysis was conducted.

2.4 James Bathe Recreation Reserve – pavilion and sporting fields

Several documents outlining details of the pavilion were supplied by council

- 2a. 180219 _James BatheSD_red pavilion.pdf
- 2c. ICP Benchmarking_Kurt Pitts_James Bathe Tender Adjustments – McMahons.xlsx
- 2d. ICP Benchmarking_Kurt Ptts_James Bathe recreation reserve costs_2018.pdf
- 2. ICP Benchmarking_Walter Carmignani_community facility and pavillon costs_2018.xlsx

Through the above documents, council has provided construction costs (tender adjustments) for the sporting field. As per the previous items, rates relevant to the scope will be extracted and applied to the Monte-Carlo analysis.

Further analysis of the inclusions for each of the supplied sporting field is outlined in the sections below.

James Bathe Active Open Space (Approx. 9Ha)

Item	Council layout	Benchmark layout (8-10Ha)
Ovals	2	2
Netball/Basketball fields	3	2
Cricket nets	5	4
Tennis Court	0	2
Playground	1	1
Car parking	196 car parks	175 car parks
TOTAL	**$5,722,963**	**$7,626,000**

The documents additionally outlined costing information for James Bathe Pavilion. However, as the information provided was of insufficient detail and no construction cost documents were provided these costs will not be able to be utilised in improving the statistical analysis**.**

Similarly, a costing comparison exercise was conducted by council outlining council's rates for two sports fields and two community facilities (3. Pakenham East estimated costings for sport reserves 30.07.18.xlsx). The VPA rates outlined within these documents differ to those outlined in the Benchmark report. A few instances noted included;

- Netball fields estimate is $60,632 in the benchmark report compared to $70,000 in the CSC document
- Football oval construction estimate is $847,042 in the benchmark report compared to $1,522,500 in the CSC document

2.5 CSC comments on Community and recreation infrastructure projects

Commentary on community and recreation infrastructure items and Cardno's responses are outlined in the following table.

	Council Comment	Cardno response	Cardno recommendation
Sporting Pavilions	No allowance made for sealed disabled parking bay and associated sealed path way to building (DDA and BCA)	Location of disabled parking can be changed to be located closer to sporting pavilions. Sealed path can be modified to suit.	Revise drawings. Revise quantities as required
	Basic layout design proposed does not give consideration to Crime Prevention Through Environmental Design (CPTED). Cannot confirm if allowance has been m ade for Sport and Recreation Victoria – Female Friendly Infrastructure Guide	Limited access to the fields, and fencing around the perimeter of the area is provided. Provision for lighting can be increased within the entrance and in the vicinity of the pavilion. Plans provided are however high level plans with the main purpose of outlining costed items as part of the benchmarking exercise.	Revise drawings. Revise quantities as required.
	Cannot confirm if allowance made for ESD considerations.	ESD considerations are relevant to life-cycle cost savings. Not currently included within basic	Discussion currently underway with the

		and essential infrastructure provided through ICPs. Cardinia Council's submission regarding James Bathe pavilion had a line item amounting to 4.7% for ESD considerations. Cardno however recommends VPA to include a new deliverable item.	VPA to consider an allowance for ESD.
	No allowance made for the type of sport and number of players on a team (Refer below); Basic AFL is 70m2 for change room with toilets and showers, which is 40m2 above the Cardno proposal.	A total area of 120m^2 is allowed for change rooms with toilets and showers within the costings. The above area can be partitioned as required if a larger area is required.	No change
	Consider proximity and access requirements to accessible car space from the site parking to the facility.	Location of disabled parking can be changed to be closer to sporting pavilions	Revise drawings. Revise quantities as required
	Provide ambulant (accessible where appropriate) toilet facilities for the public, players and officials. In public accessible toilet facilities also make provision for baby change facilities. Consideration of Universal Design principles to change rooms and amenities (both player and official's spaces) that cater for all users and abilities. These can include unisex and accessible amenities Provision of showers and toilet cubicles that achieve appropriate privacy Privacy to change room entry points, minimising site lines externally and provide screening Appropriately located hygiene disposal points Provision of shelves and power points to vanities for general accessories Provision of family change facilities including baby change tables	Layouts provided meet minimum standard requirements and are for high level information of provided components only. Design specific items mentioned in comments will be addressed in detailed design stages, overall costs will not be affected for these items at concept stages.	No change

3 City of Casey submission

City of Casey has submitted project costs (opinions of cost and construction costs) for a variety of infrastructure items. Further details of the submission and their applicability to improve the Benchmark costings are outlined in the following sections.

3.1 Community Centre opinions of cost

Council has submitted drawings and architect's opinion of cost for two community facilities through the documents below

- 1 Ramleigh estate.pdf
- Example Costing L2 Community Facility-CranWest ICH-20180702.pdf
- Example Floor Plan L2 Community Facility-CranWest ICH-20180702.pdf

The documents outlined that Ramleigh estate is a 1265m^2 community facility with roughly the same footprint as a level 1 benchmark community facility. The total cost estimate for the facility provided by council is $5,608,050 while the benchmark P90 community facility estimate is $6,398,000. Further analysis of the differences in quantities and rates are outlined in Appendix B.1.

Although the scope of work for the above community centre appears to be comparable to the benchmark costings project, the estimates provided are opinions of cost from Programmed Facility Management and are not construction costs. In addition as discussed with the VPA the level of detail provided within the estimate are limited. Due to the above these rates will not be used for improvement of the statistical analysis.

Cranbourne West Integrated community centre on the other hand is a double story community centre. Due to this (as discussed with the VPA), Cardno considers the scope too dissimilar for comparison and benchmark rate improvement purposes of the community centres specified in the Benchmark Infrastructure costings project and no further analysis was conducted.

3.2 Recreational fields

Examples of 4 playing fields and preliminary construction cost estimates have been submitted through council's submissions. Further analysis of the inclusions for each of the supplied sporting fields are outlined in the sections below (A rate analysis for Livingston, Selandra and Kilora active open spaces are outlined in Appendix B.2 and B.3).

Livingston Active Open Space (Approx. 9Ha from drawings)		
Item	**Council layout**	**Benchmark layout (8-10Ha)**
Ovals	2	2
Netball fields	2	2
Cricket nets	3	4
Tennis Court	0	2
Playground	1	1
Car parking	287 car parks	175 car parks
TOTAL	**$6,633,484 (Excluding cost for the pavilion)**	**$7,626,000**
Selandra Reserve Active Open Space (Approx. 8.5Ha from drawings)		

Item	Council layout	Benchmark layout (8-10Ha)
Ovals	2 (inclusive of 3 soccer fields)	2 (inclusive of 2 soccer fields)
Netball fields	0	2
Cricket nets	3	4
Tennis Court	0	2
Playground	1	1
Car parking	Unknown- unable to interpret from drawings	175 car parks
TOTAL	**$6,863,903 (Excluding cost for the pavilion)**	**$7,626,000**
Clyde Creek Reserve Active Open Space (Unknown Area- 8-10Ha adopted)		
Item	**Council layout**	**Benchmark layout (8-10Ha)**
Ovals	2 (inclusive of 3 soccer fields)	2 (inclusive of 2 soccer fields)
Netball fields	0	2
Cricket nets	3	4
Tennis Court	0	2
Playground	1	1
Car parking	Unknown- unable to interpret from drawings	175 car parks
TOTAL	**$6,325,698 (Excluding cost for the pavilion)**	**$7,626,000**
Kilora Reserve Active Open Space (Unknown Area-5-6Ha adopted)		
Item	**Council layout**	**Benchmark layout (5-6Ha)**
Ovals	1	1
Netball fields	2	2
Soccer field	0	1
Cricket nets	3	4
Tennis Court	0	0

Playground	1	0
Car parking	146 car parks	120 car parks
TOTAL	**$4,420,000 (Excluding cost for the pavilion)**	**$5,408,000**

Through the above analysis it can be seen that the benchmark estimates for the equivalent sized active open space projects are higher than the estimates submitted by council. This is despite the inclusion of several items not considered to be 'basic and essential' within council's estimates and inclusion of several items that differed from the benchmark project's scope. These items include;

- Installation of boot cleaners (Selendra reserve Active Open Space estimate);
- Pump and shed installation;
- Electronic scoreboards;
- WSUD treatments;
- Construction of a bus bay to City of Casey standard (Selandra reserve Active Open Space estimate);
- Provision for public art (Kilora reserve Active Open Space estimate).

The benchmark layouts and estimates generally include more sporting field items within the same area compared to council's adopted layouts.

As discussed with the VPA, details of items from council's submissions which have a similar scope to the benchmark project will be used in the benchmark rate improvement phase.

3.3 Transport infrastructure costs

As constructed plans and concept plans for a variety of intersections and road projects have been submitted by council. A variety of cost information has also been supplied for the intersections (construction claims, tender submissions). Some of the submitted items were unable to be analysed due to insufficient granularity or difficulties in identifying scope of works from the provided drawings.

For items with sufficient granularity and relevant drawings, similar scoping items exist within the documents supplied and as discussed with the VPA the rates for these items will be extracted to improve the statistical analysis. The total costs outlined in the following sections have excluded provisional items where possible in order to attempt to compare like for like in the /m^2 of pavement rates.

Item 1 – Glasscocks Road and Wheelers Park Drive T intersection

T Intersection (Secondary to Connector Boulevard adopted)		
Contractor estimated cost (excl. provisional items)	$2,203,274	$345/$m^2$ of pavement
Benchmark Cost	$3,313,000	$427/$m^2$ of pavement
Contractor estimated cost (incl. all items)	$2,563,274	
DCP estimated cost	$2,119,500	

Major reasons for cost discrepancy:

- Total project cost discrepancy partly due to the development being a brownfield development and a significant portion of Glasscocks road pavement is left in its existing condition;
- Total project cost discrepancy partly due to Wheelers Park Drive leg being shorter than benchmark template's leg;

- Contractor has however allowed for service conduits, demolitions in Glasscocks road, and significantly larger drainage pipe infrastructure which were not allowed for within the benchmark costs (currently excluded from benchmark scope of works);
- Noteworthy provisional sums include an allowance for subgrade improvement, electrical works and communication works;
- For further clarification of cost discrepancy, a rate comparison has been conducted (see Appendix B.4).

Item 2 – Berwick-Cranbourne Road and Plymouth Boulevard T intersection

T Intersection (Secondary to Connector Boulevard adopted)		
Contractor estimated cost (excl. all provisional items, includes traffic signals)	$1,896,843	$194/m^2 of pavement
Benchmark Cost	$3,313,000	$427/m^2 of pavement
Contractor estimated cost (incl. all items)	$3,130,383	

Major reasons for cost discrepancy:

- Similar to item 1, the project is a brown field development and does not involve new works throughout the entirety of the project.
- Rate analysis and quantity analysis outline details of discrepancy as outlined in Appendix B.5.
- It was noted that a significant portion of the total cost is allocated to provisional items (about $1.35 million). However, these items are excluded from the benchmark scope of works.

Item 3 – Gwen Road/ Industrial Circuit and Furlong Street

The three roads provided within this submission served vastly different purposes to the roads analysed within the benchmark costings. Due to this the contractor's cost were not compared to benchmarked costs. The rates from the contractor will however be used for benchmark rate data improvement. The total length of the roads were approximated to be 1200m based on the drawings provided. A rate comparison was however conducted utilising the civil contractor's rates (see Appendix B.6).

Industrial Street		
Contractor priced cost (excl. all provisional items)	$2,152,405	$1793/m of road

Item 4 – Thompsons Road

Drawings and construction reimbursement review rates for Thompsons Road were supplied by council. The documents outlined that Thompsons Road is a secondary arterial road. It was however not possible to correlate the drawings provided to the breakdown structure of the costs in order to understand the length of road costed under each section.

A rate comparison was however conducted utilising the civil contractor's rates as outlined in Appendix B.7. This rate comparison showed that generally current VPA rates are higher than those quoted in the submission. These rates will be used for benchmark rate data improvement

3.4 General Comments

General comments that council would like VPA to give further considerations are outlined in the following section.

	Council Comment	Cardno response	Cardno recommendation
Indexation method	Considered appropriate to reiterate that the escalation rate needs to reflect those of the construction industry as the values are generally higher than the CPI provided by ABS. As such, consultation with a Quantity Surveyor on the draft report would ensure rates are reflective of the current market values.	Rates specified are based on rates tested at previous panels. As outlined in the following sections of the report, WTP's and T&T's (both Quantity surveyors) rates will be included in the analysis.	Cost index all input rates as per relevant ABS data.
Intersections/ Roads	Transport – council strongly encourage VPA to communicate with VicRoads and reiterate the 60km/h design speed for future ICP projects.		No changes to the benchmark project.
Community Centre/ Pavilion	Community facilities and sporting ovals in the draft report are generally smaller than those delivered by Council. For instance, a community facility delivered by Council is typically around 1270m² to 1300m² in size and include 3 kindergartens, maternal child health and one community room. This is similar to the design scope of Level 1 Community facility shown in the draft report but the area only measures 1200m².	Community facility areas applied were based on the VPA original project brief and requirements. Contingencies and P90 rates should cover an increase of building space by 70-100m²	No change
	Council typically delivered District Level Active Open Space of 8-13ha (with two sporting ovals) in the PSPs areas. Specifics of the facilities are guided by Council adopted policy.	The size adopted for 2 sporting ovals is 8-10 ha.	No change
	ESD and other service level enhancements that are mandatory for compliance under the Building Regulations or to Australian standards must be factored into costings. Based on recent Council's delivered community facilities projects, an escalation rate of 6% per annum is allowed for buildings/materials price increases as well as changes to standards/codes.	Similar to Cardnia council comment, discuss with VPA on ESD allowance. Council's example had allowed for an item about 2% of the total project cost.	Cost index all input rates as per relevant ABS data. Discussion underway with the VPA on providing an ESD allowance.

	Council's recent delivery of Ramleigh Family and Community Centre is approximately 15% greater in cost than the estimate value provided in the DCP. This shortfall of funding is of great significance given the rate capped environment Council is facing.	The total cost estimate for this facility provided by council is $5,608,050 while the benchmark P90 community facility (Level 1) estimate is $6,398,000. If $5,608,050 was allowed in the DCP a 15% increase results in a cost of about 6,440,000 which is similar to the benchmark estimate.	Cost index all input rates as per relevant ABS data.

4 Melton City Council and Whittlesea Council submission

Melton City Council and Whittlesea Council engaged WT Partnership (WTP) and Turner & Townsend (T&T) to conduct peer reviews of the transport infrastructure and community infrastructure elements respectively of the Benchmark Infrastructure Costing project.

General comments outlined in the two reports and responses to these comments are outlined in the following section.

	Council Comment	Cardno response	Cardno recommendation
Intersections/ Roads	Site preparation – although included as a line item in the benchmark cost estimate, quantities have not been allocated.	This item was initially provided Appendix 4 of VPA's project brief. As such, rates for this item were extracted from previous cost estimates. However, due to the fact that another item 'Site Establishment' is provided under the deliverables section, only this line item was kept to avoid double up of costs.	Remove the line item 'Site preparation' from cost sheets to avoid further confusion.
	Pavements – generally benchmark costing rates for pavements are low when compared to the rates used by WT.	Pavement costs based on previous estimates. Cost indexing will be conducted to improve accuracy	Cost index all input rates. As discussed with the VPA, WTP base rates will be included in the statistical analysis.
	Pavements – quantities for Items 3 & 4, Collector pavements, are low and would appear to not account for the widening of pavements to suit parking bays along the length of road.	Quantities are inclusive of widened parking bays. A double checking of pavement quantities for items 3 & 4 however can be undertaken.	No change at this stage.
	Subgrade preparation - although included as a line item in the benchmark cost estimate, costs have not been allocated.		Revise rates for roads and intersections to include subgrade preparation. As discussed with the VPA, previous estimates and allowances used as inputs of the analysis to be reviewed. A new line item will be inserted and current pavement rates are to be adjusted accordingly to ensure there is no doubling of work.
	Landscaping and Topsoil Seeding – generally quantities are low based	Landscaping areas are from drawings for unpaved	No change

		medians and verges that were designated to have topsoil seeding and landscaping.	
	Landscape maintenance - although included as a line item in the benchmark cost estimate, quantities have not been allocated.		Revise rates to include Landscape maintenance.
	Drainage, swales – these are shown on drawings but not captured as part of the benchmark cost estimates, however, in some cases the subsoil drainage quantity is higher than that measured by WT	As no major swales are expected, creating an invert line for swales can be adopted as part of landscaping.	No change
	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.	Error noted	Revise rates to include street lighting
	Landscape maintenance – the rate included in the benchmark cost estimate is low when compared to WT assumption and basis of costs.	Landscape maintenance costs based on previous estimates provided by the VPA. Cost indexing can be conducted to improve accuracy	Cost index all input rates.
Bridges	Earthworks – quantities of imported fill are low, WT assumptions regarding length of embankments are based upon a 6% gradient (equal to 90m).	Revisit general assumptions surrounding the quantities for earthworks and approach road pavement.	As discussed with VPA adjust the extents for the bridge scope of works and inform the VPA the subsequent changes to the road extents.
	Bridge deck – area of bridges used in the benchmark cost estimates differ. It appears that the areas have been measured to the inside face of bridge barriers rather than the edge of deck.		Revisit quantity calculations and address any errors. Check if costs will be affected.
	Super T Bridge – consistent rate ($/m2) has been used in the benchmark cost estimates for overall bridge cost irrespective of the number of spans. We are of the view that this rate would vary dependent upon length and width of bridge along with the number of spans.	One set of rates are required to be nominated for each infrastructure category. However, the input for the statistical analysis was based on a variety of examples and thus, a variety of Super T sizes as well. Using the P90 rates should therefore cover a range of sizes.	No change

	Guardrails and end terminals – consistent rate has been used in the benchmark cost estimates irrespective of whether road or pedestrian bridge. Higher level of containment required to road bridges and therefore, rate should be higher than that to a pedestrian bridge	Revisit rates and explore possibility of including.	Include new line item in cost sheets specifically for pedestrian bridge barriers.
Culverts	Box Culverts – generally benchmark costing rates for box culvert units are low when compared to the rates used by WT	Benchmark project aims to provide for infrastructure items that meet the minimum standard rates.	No change
	Head Walls / Wing Walls – generally quantities are low and would suggest that only one side of the culvert has been included in the benchmark cost estimate. Additionally, rates used appear to be low based on our assumption of 350mm thick walls with reinforcement ration of 350 kg/m3	Revision of quantities can be undertaken. Volumes based on VicRoads standard drawing dimensions.	Revise quantities.

	Council Comment	Cardno response	Cardno recommendation
Community Centre/ Pavilion	Differences exist when checking the areas between T&T's measure and as scheduled in the report	Areas are based on VPA original project brief. Drawings for community centres outline these areas.	No change
	Costs for the external works including carparks, playgrounds and site services differ to the P90 estimate and it appears that the P90 estimated costs are high in comparison.	Costs based on previous estimates provided by VPA	As discussed with the VPA analyse rates with similar scopes.
	Costs for project delivery fees differ to the P90 estimate	Delivery rates based on the ministerial direction (contingency) and as guided by VPA	No change
	VPA costs for the sports field lighting appears low. Our estimates include for reticulation, sports lighting, lighting control, and foundations.	Lighting for sports field provided to address basic and essential necessities.	No change
	Previous VPA estimate allowed $1.2 M + on costs associated with basic landscape inclusive of topsoil seeding.	An error was identified in the previous cost estimate where the lump sum for sporting fields included irrigation costs and top soiling costs along with additional separate line items for these two items. This has now been corrected by removing the double up from the lump sums.	No change

5 City of Whittlesea Council submission

In addition to engaging WTP to conduct a peer review of the Benchmark project jointly with Melton City Council, City of Whittlesea council carried out a review on draft ICP Benchmark Infrastructure Costing project report.

The council specified comments on the functional plan and cost estimates which recommend inclusion of certain items and adjustments of rates to match their council requirements. Relevant items and rates to the benchmark costing project scope can be applied in the Monte Carlo analysis in the approval of VPA.

The following section outlined the comments and recommendations provided by City of Whittlesea.

	Council Comment	Cardno response	Cardno recommendation
Intersections/ Roads	*Primary and Secondary Arterial Road Design* - Design must be based on two carriageway (split carriageway) outer single lane in each direction leading to ultimate set up for the verges and any intersection. • Kerb length numbers will double. • Drainage numbers for pits and length of drains will double. • Sub-surface drains length will double.	Road design for the interim layout is based on VPA requirements	No change
	Primary and Secondary Arterial Road Design - Bike path must be provided on both sides	Road design for the interim layout is based on VPA requirements	No change
	Primary and Secondary Arterial Road Design - Footpath must be added to one side within 7m verge.	Road design for the interim layout is based on VPA requirements. Footpath is not required to be added within the 7m verge.	No change
Community Facilities	Community Facilities Level 1 to 3 Design - Missing items: -Veranda -circulation space -office (min 6 staff) -toilets -foyer -air lock -cleaners store -storage -services -IT -ESD requirements	The design consists of a multipurpose community spaces which is a combination of small and medium community meeting spaces, plus public toilets and amenities, office, staff room and staff toilets and amenities, reception and circulation space. Error noted in lack of direct costs attributed against toilets.	No change for items specified with the exception of ESD allowance and area quantities for toilets. ESD allowance is currently under review as outlined in previous sections of the report.

Sporting Pavilion	*Sporting Pavilion Design – Servicing two playing areas* • 2 change rooms with Toilet/Shower should have an area of 45m^2 each. • Are the toilets are separate gender toilets?	Facility areas are based on the VPA original project brief. A total area of 120m^2 is allowed for change rooms with toilets and showers within the costings. The above area can be partitioned as required if a larger area is required. All toilet facilities are separate gender toilets.	No change
Sporting & Recreational Facilities	*Multipurpose Sports & Recreation Design – with 2 Ovals* The size of the football/cricket ovals are shown as 130 x 155m. Although this would be acceptable for competition, we would aim for a full size which is 135m x 165m which would obviously increase the cost.	P90 rates and contingencies aimed at covering minor changes in scope.	No change
	Multipurpose Sports & Recreation Design – with 2 Ovals The allowance made for services connections will vary according to the site. As noted in our meeting, some sites may have services (gas, water, power, comms) provided to them through development but connecting the service from the property boundary to the actual facility may require a 600mm deep trench over 100m through rock. This will add substantial cost to the project.	The cost estimates produced is general costing, requirements for specific condition of site is aimed to be captured via the use of P90 rates and contingencies.	No change
Sporting & Recreational Facilities	*Multipurpose Sports & Recreation Design – with 2 Ovals* With the sporting field taking up majority of the public open space, we encourage 2.5m wide shared paths around the perimeter of the sport field boundary. This acts a shared path through the public opens space while also providing spectator access.	Concrete footpath around the perimeter is not required as part of basic and essential infrastructure.	No change
	Multipurpose Sports & Recreation Design – with 2 Ovals No allowance has been made for maintenance.		As discussed with the VPA, Landscape maintenance line item to be reviewed and costs to be allocated against it.

	Multipurpose Sports & Recreation Design – with 2 Ovals No allowance has been made for ball catching nets. If the site is close to roads or has steep embankments then the provision of ball catching nets might be required.	Detailed design item. Lump sums allocated include provision for catching nets	No change .
	Multipurpose Sports & Recreation Design – with 2 Ovals No specific allowance has been made for public furniture such as shelters, drinking fountain, picnic settings, bins, seats, etc. I'm not sure if this has been captured under 'Playground' or not.	Public furniture are included in playground cost.	No change.
	Multipurpose Sports & Recreation Design – with 2 Ovals The percentage amount allocated to the delivery component will vary according to the location of the site. For example, 2.5% for site establishment might be too low if the site is isolated, has poor drainage, needs trees cleared, etc.	Delivery rates based on VPA requirements.	No change
	Multipurpose Sports & Recreation Design – with 2 Ovals Sites around 10ha in size may require a second entry/exit depending on where they are located. If this is the case, then this cost should be accounted for.	Additional access/gate to be added.	Revise drawings and quantities
Appendix B for Roads	*Roads Cost Estimates* Pavement subgrade improvement as per COW requirements (Subgrade prep as mentioned is too light and won't cover the full requirements).	No construction data provided. Unable to quantify rates as per COW requirements.	Revise rates for roads and intersections to include subgrade preparation and revise rates for pavements (as per previous recommendation).
	Roads Cost Estimates Inclusion of capping layer due to expansive nature of soils in COW.	The cost estimates produced is general costing, requirements for specific condition of site has not been considered at the concept level. P90 rates and contingencies are provided to accommodate this requirement. Additionally see previous comment.	As per previous comment.
	Roads Cost Estimates Rock removal due to terrain in COW.	The cost estimates produced is general costing, requirements for specific condition of site has not been considered.	As discussed with the VPA this is not a standard item and is will not be included in the benchmarks.

		Additionally see previous comment.	
	Roads Cost Estimates Street Lighting must not be per meter length but based on number of lights required as per Australian Standards (V3 category).	Street lighting was quantified to be required at a 50m interval, the rates reflect this assumption.	No change
	Roads Cost Estimates Drainage design is based on basic assumptions and may change as part of hydrology calculations (must be considered in contingencies accordingly).	15% contingency cost has been provided as part of delivery for both design and construction contingency.	No change.
	Roads Cost Estimates Signage and line marking costs.	No quantities provided for regulatory signage, however line marking has been costed per sq. of pavement.	Add quantities for regulatory signage.
	Roads Cost Estimates Earthworks quantities used seem to be low.	Earthworks quantified only to pavement quantity depth.	No change.
	Roads Cost Estimates All the items that are calculated as % of the total cost like Site preparation, authority fees, design etc. are not fixed and will change once all of the above are added and as such shall be amended accordingly.		Delivery costs will be recalculated (no change in percentage) for the revised totals.
Appendix B for Intersections	*Intersections Cost Estimates* Pavement subgrade improvement as per COW requirements (Subgrade prep as mentioned is too light and won't cover the full requirements).	As per previous subgrade improvement comment	As per previous subgrade improvement comment
	Intersections Cost Estimates Inclusion of capping layer due to expansive nature of soils in COW	As per previous subgrade improvement comment	As per previous subgrade improvement comment
	Intersections Cost Estimates Shared path/footpath/bike path to be provided on all sides as per the requirements of the cross section in PSP	Shared paths/ bike paths and footpaths are required on both sides of the road for Connector roads only. These have been reflected in intersection comprising connector roads. VPA cross sections do not indicate a similar requirement for interim primary and secondary arterial roads	No change

	Intersections Cost Estimates Kerb and channel must be extended from the intersections to meet the kerb and channel for the roads	Short section of about 120m without kerb and channel between intersections and road sections is acceptable as this would reduce demolition works when the intersection is later upgraded to its ultimate configuration.	No change
	Intersections Cost Estimates Swale drains and shoulder along medians (and outer verges) must be replaced with proper kerb and channel and drainage	The ICP is meant to cover basic and essential items. There is no requirement to provide kerbs in the medians.	No change
	Intersections Cost Estimates Street Lighting as per Aust Standards	Assumptions for lighting layout can be found in the report.	No change
	Intersections Cost Estimates Traffic Signal costs appear to be too low (eg Andrew Rd/St Claire/CRE close to 350k instead of avg. 88K with STD of 24K)	The rate used is per leg of intersection.	Adjust cost sheet description to avoid confusion.
	Intersections Cost Estimates For intersections on Donnybrook Road, changes/rehabilitation to existing pavement must be included.	Application specific comment.	As discussed with the VPA this item may be included in the ICP, but is not a standard item, so should not be included in the benchmark costs.
	Intersections Cost Estimates All the items that are calculated as % of the total cost like Site preparation, authority fees, design etc. are not fixed and will change once all of the above are added and as such shall be considered.		Delivery costs will be recalculated (no change in percentage) for the revised totals.
Appendix B for Community Facility	*Community Facility Cost Estimates* No allowance has been made for surface rock or potential buried rock (of which is extremely common in Whittlesea soil profiles). this averages at $100,000 for a facility this size.	The cost estimates produced is general costing, requirements for specific condition of site has not been considered.	As discussed with the VPA this is not a standard item and is will not be included in the benchmarks.
	Community Facility Cost Estimates Hard landscaping is required.	ICP meant to cover basic and essential item	No change
	Community Facility Cost Estimates Internal fit out ($40,000 per kinder room or $200-250K all up)		

	Community Facility Cost Estimates A 4m depth veranda is required.	Veranda is not included in the VPA specifications.	No change
	Community Facility Cost Estimates Council normally allows for 7-8% for DESIGN contingency.	Overall 15% contingency cost has been provided as part of delivery for both design and construction contingency.	No change
	Community Facility Cost Estimates No allowance has been made for car park lighting.		Carpark lighting to be added to the costing.
Appendix B for Sporting & Recreational Facility	*Sporting & Recreational Facility Cost Estimates* No allowance has been made for surface rock or potential buried rock (of which is extremely common in Whittlesea soil profiles).	The cost estimates produced is general costing, requirements for specific condition of site has not been considered.	As discussed with the VPA this is not a standard item and is will not be included in the benchmarks.
	Sporting & Recreational Facility Cost Estimates No allowance has been made for grade or steepness of the site.	The cost estimates produced is general costing, requirements for specific condition of site has not been considered. Sporting and recreational facilities will not be constructed along steeply graded sites.	No change
	Sporting & Recreational Facility Cost Estimates No allowance has been made for Cultural Heritage Management Plans and associated recommendations.		As discussed with the VPA, this item is a planning permit requirement and is not funded through the ICP.
	Sporting & Recreational Facility Cost Estimates No Allowance has been made for Tree Protection Zones – in Whittlesea, the establishment of TPZs around existing significant Red Gums will come at a cost to construction.	Environmental Management cost shall cover this item. Additionally, the benchmark project is not meant to cover complex sites.	No change
	Sporting & Recreational Facility Cost Estimates No separate allowance has been made for DESIGN contingency, only construction contingency.	Delivery cost includes both design and construction contingency of 15%.	No change
	Sporting & Recreational Facility Cost Estimates No delineation between playing field surface types i.e natural turf vs synthetic vs hybrid surfaces.	Playing field surface type is natural turf. Synthetic cricket wicket has been allowed.	Amend report to specify use of natural turf.

	Sporting & Recreational Facility Cost Estimates No allowance has been made for car park lighting		Carpark lighting to be added to the costing.

6 Urban Development Institute of Australia (UDIA)

The UDIA has submitted feedback in the form of comments on improving the benchmark process. Several key comments relevant to this phase of the project have been outlined below alongside with Cardno's responses.

UDIA Comment	Cardno Response
The accuracy of the benchmark costs is limited because they have been derived from previous cost estimates. More robust cost estimates can be achieved by including actual project costs in the analysis	Several applicable actual project costs have been received and have been outlined within this report. Following agreement with the VPA, this information will be incorporated in to the benchmark process.
An analysis should be performed which compares the actual project costs to the estimated costs, and where there are any large discrepancies, the estimated costs should be discarded from the benchmarking.	Where comparable projects have been received, these have been compared to estimated costs as outlined in previous sections of the report.
P90 cost estimates provide an overly conservative method for determining the total amount of funds to be collected, and may result in a significant amount of excess funds being collected.	P90 cost estimates and P50 cost estimates are only roughly 10-15% apart. Adopting the P50 rates runs the risk of having insufficient allowances to fund 50% of the projects. Cardno is of the opinion that use of P90 cost estimates is not an overly conservative method.
Cost escalation should be applied to construction cost rates to reflect inflation or increasing costs in the industry over time.	Cost escalation will be applied as per ABS data.

7 Potential scope of work

Based on the above review Cardno recommends the following scope of work to improve the benchmark estimates (subject to discussion with the VPA).

1. As identified, make minor adjustments to the cost sheet descriptions to avoid confusion
2. Make minor adjustments to community facility concept drawings/ quantities/ cost sheets as per council comments;
    a. Relocate disabled parking locations closer to the sporting pavilion and adjust paths to suit. Adjust quantities as required;
    b. Make minor changes to car park lighting to address CPTED factor. Add car park lighting as a cost item within cost sheets;
    c. Review the landscape maintenance line item for active open spaces;
    d. Discuss with the VPA on including a deliverable for ESD.
3. Make minor adjustments to transport infrastructure concept drawings/ quantities/ cost sheets as per council comments
    a. Remove the line item ‘site preparation’ from cost sheets to avoid confusion;
    b. Revise rates for roads and intersections to include subgrade preparation;
    c. Revisit bridge quantities as per WTP comment and adjust the limit of works;
    d. Add regulatory signage for road sections;
    e. Add rates for pedestrian bridge barriers.
4. Calibrate the estimates by including construction rates from the following relevant infrastructure projects
    a. Estimates for various Princes Highway intersections;
    b. Siding Avenue and Princes Highway/ Timbertop and Princes Highway intersections;
    c. James Bathe Recreation Reserve – sporting fields;
    d. Glasscocks Road and Wheelers Park Drive T intersection;
    e. Berwick-Cranbourne Road and Plymouth Boulevard T intersection;
    f. Gwen Road/ Industrial Circuit and Furlong Street;
    g. Thompsons Road;
    h. Livingston, Selandra, and Kilora active open spaces.
5. Include base rates from quantity surveyors WTP and T&T in the statistical analysis.
6. Cost index all relevant data utilised in the statistical analysis as per relevant ABS data;
7. Re-run the Monte-Carlo analysis following the completion of the above tasks and update the P50 and P90 rates.

APPENDIX

A

CARDINIA COUNCIL SUBMISSION ANALYSIS

Appendix A.1	
Description:	Cardinia Council functional estimates comparison - rates

VPA RATE COUNCIL SUBMISSION

Group	Sub Item	Unit	Rate (P90)	Rate Utilised (lowest)	Rate Utilised (highest)	% Difference (compared to highest rate)	Comments
Siteworks and Earthworks	Site Preparation	%	2.678279365				
	Earthworks	m3	40.30257443	28.00	45.00	-11.66	VPA rate marginally lower than highest rate for earthworks (cut), however significantly higher than lowest rate for earthworks (fill)
Road Pavement	Primary Arterial Pavement	m2	170.8007041		160.00	6.32	Pavement composition different to VPA standards, however, compared as per road classification. VPA rate marginally higher
	Secondary Arterial Pavement	m2	130.0253503				
	Collector Arterial Pavement	m2	100.1785714		97.00	3.17	
	Subgrade Preparation	%	17.69555716				
	Pavement Rehab	m2					
	Pavement Other	m2					
Concrete Works	Kerb and Channel	m	56.38691475	55.00	60.00	-6.41	VPA Rate marginally lower than highest rate and similar lowest rate
	Cycle Path	m2	69.00757582				
	SUP/ Footpath	m2	67.49509186		53.00	21.48	VPA rate higher than estimate
	Traffic Island	m2	76.5743594		66.00	13.81	VPA Rate higher than estimate
Drainage	Drainage Pipe 300mm CR Bfilled	m	175.6413387				
	Drainage Pipe 375mm CR Bfilled	m	246.5159559		280.00	-13.58	VPA rate lower than estimate
	Drainage Pipe 450mm CR Bfilled	m	320.952275		320.00	0.30	VPA rate similar to estimate
	Drainage Pipe 525mm CR Bfilled	m	402.8666788		405.00	-0.53	VPA rate similar to estimate
	Drainage - pits	No.	2499.150624	1500.00	2000.00	19.97	VPA rate higher than estimate
	Drainage – Sub-soil drainage	m	26.53415231	26.00	42.00	-58.29	VPA rate significantly lower than estimate for highest rate (type 2 SSD), however similar to lower rate (type 1 SSD)
	Drainage Culvert	No.					
Traffic	Traffic Signals	Item	100101.0266		150000.00	-49.85	VPA rate lower than estimate
	Traffic Signal Conduit	m	53.47003415				
Landscape	Tree Planting	No.	318.7818124				
	Landscaping	m2	23.31097997		15.00	35.65	VPA rate higher than estimate
	Topsoil Seeding	m2	7.922155422				
Street Lighting	Street Lighting (all Inclusive)	m	235.6272522				
	Street Lighting - Intersections	Item/ Per Leg					
Misc	Regulatory Signage	Item	363.2477854		N/A		Lump Sum Provided, unable to obtain rates
	Linemarking	m2 of Pavement	2.810586745		0.68	75.92	Lump Sum Provided, approx rate derived
	Landscape maintenance	Item	86250				
	Tactile Pavers (Hazard only)	Item	422.8635525				
Other			0				
			0				
			0				
Delivery	Council Fees	%	3.25		0.00		Delivery rates derived from lumpsums provided
	VicRoads Fees	%	1		1.10		
	Traffic Management	%	5		3.00		
	Environmental Management	%	0.5		0.00		
	Surveying and Design	%	5		2.70		
	Supervision and Project management	%	9		3.00		
	Site Establishment	%	2.5		5.00		
	Contingency	%	15		30.00		

Appendix A.2	
Description:	Cardinia Council functional estimates comparison - quantities

			VPA QUANTITIES	COUNCIL SUBMISSION			
Group	**Sub Item**	**Unit**	**Benchmark Quantities**	**Bayview Road**	**Brunt Road**	**McMullen Parade**	**Tivendale Road**
Siteworks and Earthworks	Site Preparation	%	0				
	Earthworks	m3	6106.1	-	-	-	-
Road Pavement	Primary Arterial Pavement	m2	5250	5470.00	4630.00	6730.00	2540.00
	Secondary Arterial Pavement	m2	0				
	Collector Arterial Pavement	m2	3290	0.00	2100.00	3220.00	180.00
	Subgrade Preparation	%	0				
	Pavement Rehab	m2	0	5620.00	13100.00	6410.00	12910.00
	Pavement Other	m2	0				
Concrete Works	Kerb and Channel	m	2950	1995.00	3510.00	3310.00	2585.00
	Cycle Path	m2	2370				
	SUP/ Footpath	m2	1120	2500.00	4160.00	4490.00	2525.00
	Traffic Island	m2	2890	1460.00	560.00	1410.00	990.00
Drainage	Drainage Pipe 300mm CR Bfilled	m	290				
	Drainage Pipe 375mm CR Bfilled	m	0	440.00	335.00	660.00	500.00
	Drainage Pipe 450mm CR Bfilled	m	730	315.00	110.00	115.00	160.00
	Drainage Pipe 525mm CR Bfilled	m	0		120.00	35.00	30.00
	Drainage - pits	No.	33	34.00	37.00	34.00	38.00
	Drainage – Sub-soil drainage	m	3440	2790.00	6140.00	4356.00	3275.00
	Drainage Culvert	No.	0				
Traffic	Traffic Signals	Item	4	4.00	4.00	4.00	4.00
	Traffic Signal Conduit	m	0				
Landscape	Tree Planting	No.	98				
	Landscaping	m2	5000	2150.00	6800.00	8800.00	2560.00
	Topsoil Seeding	m2	5000				
Street Lighting	Street Lighting (all Inclusive)	m	0				
	Street Lighting - Intersections	Item/ Per Leg	4	4.00	4.00	4.00	4.00
Misc	Regulatory Signage	Item	16				
	Linemarking	m2 of Pavement	8540				
	Landscape maintenance	Item	1				
	Tactile Pavers (Hazard only)	Item	24				
Other	Drainage Pipe 600mm CR Bfilled	m	0		250.00	60.00	
	Drainage Pipe 750mm CR Bfilled	m	0	70.00	65.00	0.00	
	Drainage Pipe 825mm CR Bfilled	m	0		185.00	0.00	
	Drainage Pipe 1050mm CR Bfilled	m	0	30.00	0.00	70.00	60.00
	Drainage Pipe 1200mm CR Bfilled	m	0	30.00	0.00	140.00	125.00
	Drainage Pipe 1350mm CR Bfilled	m	0		0.00	50.00	
Delivery	Council Fees	%	1				
	VicRoads Fees	%	1				
	Traffic Management	%	1				
	Environmental Management	%	1				
	Surveying and Design	%	1				
	Supervision and Project management	%	1				
	Site Establishment	%	1				
	Contingency	%	1				

*Only quantities for items with similar scope have been compared.

Appendix A.3	
Description:	Cardinia Council functional estimates comparison - quantities

			VPA RATE	COUNCIL SUBMISSION		
Group	**Sub Item**	**Unit**	**Benchmark Quantities**	**Arena Parade**	**O'Neil Rpad**	**Thewlis Road**
Siteworks and Earthworks	Site Preparation	%	0			
	Earthworks	m3	5031.455	-	-	-
Road Pavement	Primary Arterial Pavement	m2	5295	2390.00	1305.00	1510.00
	Secondary Arterial Pavement	m2	0			
	Collector Arterial Pavement	m2	1742	0.00	0.00	480.00
	Subgrade Preparation	%	0			
	Pavement Rehab	m2	0	4530.00	6240.00	7215.00
	Pavement Other	m2	0			
Concrete Works	Kerb and Channel	m	2127	1070.00	1800.00	1505.00
	Cycle Path	m2	1615			
	SUP/ Footpath	m2	510	1220.00	1255.00	1390.00
	Traffic Island	m2	675	285.00	190.00	345.00
Drainage	Drainage Pipe 300mm CR Bfilled	m	205			
	Drainage Pipe 375mm CR Bfilled	m	0	335.00	170.00	550.00
	Drainage Pipe 450mm CR Bfilled	m	540	71.00	75.00	450.00
	Drainage Pipe 525mm CR Bfilled	m	0	16.00		
	Drainage - pits	No.	25	22.00	14.00	24.00
	Drainage – Sub-soil drainage	m	2627	1490.00	2220.00	2330.00
	Drainage Culvert	No.	0		1.00	
Traffic	Traffic Signals	Item	3	3.00	3.00	3.00
	Traffic Signal Conduit	m	0			
Landscape	Tree Planting	No.	78			
	Landscaping	m2	4250	1550.00	1050.00	855.00
	Topsoil Seeding	m2	4250			
Street Lighting	Street Lighting (all Inclusive)	m	0			
	Street Lighting - Intersections	Item/ Per Leg	3	3.00	3.00	3.00
Misc	Regulatory Signage	Item	6			
	Linemarking	m2 of Pavement	7037			
	Landscape maintenance	Item	1			
	Tactile Pavers (Hazard only)	Item	18			
Other	Drainage Pipe 600mm CR Bfilled	m	0	25.00		
	Drainage Pipe 750mm CR Bfilled	m	0			
	Drainage Pipe 825mm CR Bfilled	m	0			
	Drainage Pipe 900mm CR Bfilled	m	0		95.00	
	Drainage Pipe 1050mm CR Bfilled	m	0			
	Drainage Pipe 1200mm CR Bfilled	m	0			
	Drainage Pipe 1350mm CR Bfilled	m	0			
Delivery	Council Fees	%	1			
	VicRoads Fees	%	1			
	Traffic Management	%	1			
	Environmental Management	%	1			
	Surveying and Design	%	1			
	Supervision and Project management	%	1			
	Site Establishment	%	1			
	Contingency	%	1			

*Only quantities for items with similar scope have been compared.

Appendix A.4	
Description:	Cardinia Council Timbertop/Princess Hwy comparison

						VPA RATE	COUNCIL SUBMISSION		
Group	**Sub Item**	**Unit**	**VPA Quantity**	**Council Quantity**	**Rate (P90)**	**Rate Utilised (lowest)**	**Rate Utilised (highest)**	**% Difference (compared to highest rate)**	**Comments**
Siteworks and	Site Preparation	%	0		2.678279				
	Earthworks	m3	5031.455	4205	40.30257		12.00	70.23	VPA Rate significantly higher than estimate
Road Pavement	Primary Arterial Pavement	m2	5295	655	170.8007		95.20	44.26	
	Secondary Arterial Pavement	m2			130.0254				Pavement composition different to VPA standards, however, compared as per road classification. VPA rate is higher/ simillar
	Collector Arterial Pavement	m2	1742	1120	100.1786		101.40	-1.22	
	Subgrade Preparation	%	0		17.69556				
	Pavement Rehab	m2	0						
	Pavement Other	m2	0						
Concrete Works	Kerb and Channel	m	2127	660	56.38691	39.00	55.00	2.46	VPA Rate similar to highest rate and higher than lowest rate
	Cycle Path	m2	1615		69.00758				
	SUP/ Footpath	m2	510	915	67.49509		47.00	30.37	VPA Rate higher than estimate
	Traffic Island	m2	675		76.57436				
Drainage	Drainage Pipe 300mm CR Bfilled	m	205	166	175.6413	139.00	194.00	-10.45	VPA Rate within estimated range
	Drainage Pipe 375mm CR Bfilled	m	0	36	246.516	232.00	292.00	-18.45	VPA Rate within estimated range
	Drainage Pipe 450mm CR Bfilled	m	540	17	320.9523		270.00	15.88	VPA Rate higher than estimate
	Drainage Pipe 525mm CR Bfilled	m	0		402.8667				
	Drainage - pits	No.	25	11	2499.151	1400.00	2950.00	-18.04	VPA Rate within estimated range
	Drainage – Sub-soil drainage	m	2627	660	26.53415		18.00	32.16	VPA Rate higher than estimate
	Drainage Culvert	No.	0						
Traffic	Traffic Signals	Item	3		100101				
	Traffic Signal Conduit	m	0		53.47003				
Landscape	Tree Planting	No.	78		318.7818				
	Landscaping	m2	4250		23.31098				
	Topsoil Seeding	m2	4250	2150	7.922155		4.00	49.51	VPA Rate higher than estimate
Street Lighting	Street Lighting (all Inclusive)	m	0		235.6273				
	Street Lighting - Intersections	Item/ Per	3						
Misc	Regulatory Signage	Item	6	7	363.2478	250.00	300.00	17.41	VPA Rate significantly higher than estimate
	Linemarking	2 of Paveme	7037	1775	2.810587				
	Landscape maintenance	Item	1		86250				
	Tactile Pavers (Hazard only)	Item	18	8	422.8636		200.00	52.70	VPA Rate significantly higher than estimate
Other	Drainage Pipe 600mm CR Bfilled	m	0	20	0				
	Drainage Pipe 750mm CR Bfilled	m	0	7	0				
					0				
Delivery	Council Fees	%			3.25		3.25	0.00	Plan checking fee and council supervision
	VicRoads Fees	%			1				
	Traffic Management	%			5				
	Environmental Management	%			0.5		0.30	40.00	
	Surveying and Design	%			5				
	Supervision and Project management	%			9				
	Site Establishment	%			2.5				
	Contingency	%			15				

Appendix A.5	
Description:	Cardinia Council Sliding Ave/Princess Hwy comparison

			VPA QUANTITIY	COUNCIL QUANTITY	VPA RATE	COUNCIL SUBMISSION			
Group	**Sub Item**	**Unit**	**VPA Quantity**	**Council Quantity**	**VPA Rate (P90)**	**Rate Utilised (lowest)**	**Rate Utilised (highest)**	**% Difference (compared to highest rate)**	**Comments**
Siteworks and	Site Preparation	%	0		2.678279				
	Earthworks	m3	6106.1	4055	40.30257	12.16	24.02	40.40	VPA rate significantly higher than estimate
Road Pavement	Primary Arterial Pavement	m2	5250	5015	170.8007		113.00	33.84	
	Secondary Arterial Pavement	m2	0		130.0254				Pavement composition different to VPA standards, however, compared as per road classification. VPA rate is higher
	Collector Arterial Pavement	m2	3290	2505	100.1786		76.73	23.41	
	Subgrade Preparation	%	0		17.69556				
	Pavement Rehab	m2	0	6090					
	Pavement Other	m2	0						
Concrete Works	Kerb and Channel	m	2950	2235	56.38691	42.33	43.96	22.04	VPA rate similar to highest rate and higher than lowest rate
	Cycle Path	m2	2370		69.00758				
	SUP/ Footpath	m2	1120	661	67.49509		48.25	28.51	VPA rate higher than estimate
	Traffic Island	m2	2890	815	76.57436		60.05	21.58	VPA rate higher than estimate
Drainage	Drainage Pipe 300mm CR Bfilled	m	290	9	175.6413		171.60	2.30	VPA rate within estimated range
	Drainage Pipe 375mm CR Bfilled	m	0	551	246.516	165.55	200.00	18.87	VPA rate within estimated range
	Drainage Pipe 450mm CR Bfilled	m	730	55	320.9523	345.38	400.00	-24.63	VPA rate lower than estimate
	Drainage Pipe 525mm CR Bfilled	m	0		402.8667				
	Drainage - pits	No.	33	36	2499.151	800.00	2148.00	14.05	VPA rate higher than estimate
	Drainage – Sub-soil drainage	m	3440	2480	26.53415	23.53	38.61	-45.51	VPA rate within estimated range
	Drainage Culvert	No.	0						
Traffic	Traffic Signals	Item	4	4	100101		53754.25	46.30	VPA rate higher than estimate
	Traffic Signal Conduit	m	0		53.47003				
Landscape	Tree Planting	No.	98	0	318.7818				
	Landscaping	m2	5000		23.31098				
	Topsoil Seeding	m2	5000	7375	7.922155		2.60	67.18	VPA rate higher than estimate
Street Lighting	Street Lighting (all Inclusive)	m	0		235.6273				
	Street Lighting - Intersections	Item/ Per	4						
Misc	Regulatory Signage	Item	16		363.2478				
	Linemarking	2 of Paveme	8540		2.810587		5.67	-101.74	Approx rate derived from lump sum provided and area of pavement
	Landscape maintenance	Item	1		86250				
	Tactile Pavers (Hazard only)	Item	24		422.8636				
Other					0				
					0				
					0				
Delivery	Council Fees	%			3.25				
	VicRoads Fees	%			1				
	Traffic Management	%			5		4.30	14.00	
	Environmental Management	%			0.5				
	Surveying and Design	%			5				
	Supervision and Project management	%			9				
	Site Establishment	%			2.5		4.40	-76.00	
	Contingency	%			15				

APPENDIX

B

CASEY COUNCIL SUBMISSION ANALYSIS

Appendix B.1	
Description:	Community Facilities Level 1- Ramleigh Estate Rate and Quantity comparison

Group	Sub Item	Unit	VPA Qty	VPA Rate (P90)	Council Qty	Council Rate	Comments
Pre-Construction	Site Preparation	Item					
Building	Library	m2	0	2322.983405			Approx. quantities obtianed form drawings
	Small commercial Kitchen	m2	15	2817.290451	34.9	2200	
	Consulting Suite	m2	100	2463.230177	20.5	2200	
	Multipurpose community Spaces	m2	200	2383.637589	1069.3	2200	
	Storage External	m2	0	2063.109399			
	space	m2	250	2383.637589			
	Disabled toilet/ Parent's Change room	m2	0	3078.072882			
	Toilets/ Change Rooms	m2	0	2828.743068	116	3000	
	Administration	m2	0	2234.209936	24.3		
	Cleaners	m2	0	2270.857805			
Canopy & Veranda	Canopy & Veranda	m2	0	700	320	1200	
Car Park	Pavement	m2	1910	100.1792			
	Kerb and Channel	m	220	57.18613392			
	Drainage Pipes	m	159	177.4279515			
	Drainage Pits	Item	7	2522.394352			
	Linemarking/Signage	Item	1910	2.862554112			
	Other		0				
Outdoor Play	Kindergarten outdoor playspaces	m2	700	536.5173722			
	Playground	m3	800	536.5173722	1450	275	
Site Works	Paths	m2	210	68.70318245			
	Landscaping	m2	500	23.65843191			
	Lighting	Item	0				
	Boundary Fencing	m	125	111.615357			
	Gates	Item	1	600			
	Other		0	0			
Services	Stormwater	%	1	3.3	1	0.3	
	Sewer	%	1	2.025	1	0.3	
	Water	%	1	1.975	1	0.3	
	Gas	%	1	0.88	1	0.3	
	Fire Protection	%	1	0.66	1	1.5	
	Light & Power	%	1	2.375	1	0.3	
	Communication	%	1	0.5	1	0.3	
Miscellaneous	ESD Item	Item	0	0		100000	
	Landscape maintenance-1 year/2 summers	Item	0	0			
	Kitchen Fit out items	Item	0	0	1	188000	
Delivery	Council Fees	%	1	3.25			
	Authority Fees	%	1	1			
	Traffic Management	%	1	2			
	Environmental Management	%	1	0.5			
	Survey/ Design Fees	%	1	5			
	Supervision and Project Management	%	1	9			
	Site Establishment	%	1	2.5			
	Contingency	%	1	15			

Appendix B.2	
Description:	Livingston/Selandra Sporting & Recreation Facilities

Group	Sub Item	Qty	Unit	Rate (P90)	Council Rates	% Difference	Comments
Playing Fields	Football Field	2	No	847041.5	611323.60	29.50	Council rate inclusive of cricket pitch
	Cricket Pitch	2	No	20132.27			
	Cricket Nets	1	No	45936.49	31666.67	31.06	
	Soccer Field	0	No	570947.5			
	Tennis Court	2	No	71299.91			
	Netball Court	2	No	60632.95	131373.00	-57.08	Council Rate inclusive of lighting
Lighting	Lighting Netball Court	2	No	23000			
	Lighting Tennis	2	No	22835.87			
	Lighting Soccer	0	No	60300.45			
	Lighting Football	2	No	107716.6	886900.00	-723.36	
Landscapin	Landscaping Level A	4000	m2	24.61984			
Car Parking	Pavement	5180	m2	91.21977	114.10	-25.08	
	Kerb and Channel	450	m	53.3402	65.00	-21.86	
	Drainage Pipes	530	m	168.8303	150.00	11.15	
	Drainage Pits	21	No	2410.534	2300.00	4.59	
	Linemarking/ Signage	5180	m2/pavem	2.599673	4.08	-56.94	
Site Works	Footpaths and paved areas	800	m2	62.87425	85.00	-35.19	
Services	Stormwater Drainage	1	Item	184000			
	Sewer	1	Item	11500			
	Water	1	Item	57500	106700.00	-85.57	
	Gas	1	Item	11500	78500.00	-582.61	
	Light & power	1	Item	34500			
	Communications	1	Item	149500			
	Fire	1	Item	34500			
Miscellaneous	Gates	1	Item	690	650.00	5.80	
	Works maintenance-1 year	0	Item	0			
	Interchange shelter	10	Item	10217.35			
	Fencing	1300	m	97.62581	100.00	-2.43	
	Signage	20	No	345.9112			
	Landscape maintenance-1 year/2 summers	1	Item	0			
Irrigation	Irrigation Soccer	0	m	51237.57			
	Irrigation Football	2	Item	56317.45			
Other	Access Road	1980	m2	162	4.30	97.35	
	Playground	2	m2	600000			
	Tree Planting	40	No	312			
Delivery	Council Fees	1	%	3.25			
	Authority Fees	1	%	1			
	Traffic Management	1	%	2	0.10	95.00	
	Environmental Management	1	%	0.5	0.10	80.00	
	Survey/Design	1	%	5	5.00	0.00	
	Supervision & Project Management	1	%	9			
	Site Establishment	1	%	2.5	2.00	20.00	
	Contingency	1	%	15	5.00	66.67	

Appendix B.3	
escription:	Kilora Sporting & Recreation Facility

Group	Sub Item	Unit	Rate (P90)	Council Rates	% Difference	Comments
Playing Fields	Football Field	No	847041.5	748000.00	13.74	Council rate inclusive of cricket pitch
	Cricket Pitch	No	20132.27			
	Cricket Nets	No	45936.49	31666.67	31.06	
	Soccer Field	No	570947.5			
	Tennis Court	No	71299.91			
	Netball Court	No	60632.95	106000.00	-74.82	
Lighting	Lighting Netball Court	No	23000	30000.00	-30.43	
	Lighting Tennis	No	22835.87			
	Lighting Soccer	No	60300.45			
	Lighting Football	No	107716.6	129000.00	-19.76	
Landscapi	Landscaping Level A	m2	24.61984			
Car Parking	Pavement	m2	91.21977			Lumpsum provided, unable to obtain quantities and rates
	Kerb and Channel	m	53.3402			
	Drainage Pipes	m	168.8303			
	Drainage Pits	No	2410.534			
	Linemarking/ Signage	m2/pavem	2.599673			
Site	Footpaths and paved areas	m2	62.87425			
Services	Stormwater Drainage	Item	184000			
	Sewer	Item	11500			
	Water	Item	57500			
	Gas	Item	11500			
	Light & power	Item	34500			
	Communications	Item	149500			
	Fire	Item	34500			
Miscellaneous	Gates	Item	690			
	Works maintenance-1 year	Item	0			
	Interchange shelter	Item	10217.35			
	Fencing	m	97.62581			
	Signage	No	345.9112			
	Landscape maintenance-1 year/2 summers	Item	0			
Irrigation	Irrigation Soccer	m	51237.57			
	Irrigation Football	Item	56317.45			
Other	Access Road	m2	162			
	Playground	m2	600000			
	Tree Planting	No	312			
Delivery	Council Fees	%	3.25			
	Authority Fees	%	1			
	Traffic Management	%	2			
	Environmental Management	%	0.5			
	Survey/Design	%	5	5.00	0.00	
	Supervision & Project Management	%	9			
	Site Establishment	%	2.5			
	Contingency	%	15	5.00	66.67	

Appendix B.4	
Description:	Casey Council estimates comparison - Glasscocks/Wheelers Park Drive

					VPA RATE	COUNCIL SUBMISSION			
Group	**Sub Item**	**Unit**	**VPA Quantity**	**Council Quantity**	**Rate (P90)**	**Rate Utilised (lowest)**	**Rate Utilised (highest)**	**% Difference (compared to highest rate)**	**Comments**
Siteworks and	Site Preparation	%	0		2.678279365				
	Earthworks	m3	6266.35	17000	40.30257443	12.10	18.50	54.10	VPA Rate higher than estimate
Road Pavement	Primary Arterial Pavement	m2	0		170.8007041				
	Secondary Arterial Pavement	m2	6970	4020	130.0253503		125.35	3.60	Glasscocks Road Pavement composition largely similar to secondary arterial pavement. VPA Rate marginally higher than estimate
	Collector Arterial Pavement	m2	3440	2360	100.1785714	64.80	80.65	19.49	Pavement composition for Wheelers Park Drive pavement and Karawarra Circuit different to benchmark composition. However, these were compared to connector road pavement
	Subgrade Preparation	%	0		17.69555716				
	Pavement Rehab	m2	0						
	Pavement Other	m2	0						
Concrete Works	Kerb and Channel	m	3000	2090	56.38691475		35.50	37.04	VPA Rate higher than estimate
	Cycle Path	m2	1090		69.00757582				
	SUP/ Footpath	m2	1910	1000	67.49509186		39.50	41.48	VPA Rate higher than estimate
	Traffic Island	m2	105	1140	76.5743594		63.00	17.73	VPA Rate higher than estimate
Drainage	Drainage Pipe 300mm CR Bfilled	m	280	180	175.6413387		141.35	19.52	VPA Rate higher than estimate
	Drainage Pipe 375mm CR Bfilled	m	0	195	246.5159559		157.50	36.11	VPA Rate higher than estimate
	Drainage Pipe 450mm CR Bfilled	m	190		320.952275				
	Drainage Pipe 525mm CR Bfilled	m	0		402.8666788				
	Drainage - pits	No.	32	27	2499.150624	1552.00	5425.00	-117.07	VPA Rate higher than lowest estimate but what appears to be bespoke drainage pits have been priced in
	Drainage – Sub-soil drainage	m	3540	2560	26.53415231	16.85	33.60	-26.63	VPA rate within range used by estimator
	Drainage Culvert	No.	0						
Traffic	Traffic Signals	Item	4		100101.0266		50562.67	49.49	Derived from lump sum. VPA Rate higher than estimate
	Traffic Signal Conduit	m	0		53.47003415				
Landscape	Tree Planting	No.	88		318.7818124				
	Landscaping	m2	5890		23.31097997				
	Topsoil Seeding	m2	5890	6300	7.922155422		2.50	68.44	VPA Rate higher than estimate
Street Lighting	Street Lighting (all Inclusive)	m	0		235.6272522				
	Street Lighting - Intersections	Item/ Per	4						
Misc	Regulatory Signage	Item	10	5	363.2477854		300.00	17.41	VPA Rate higher than estimate
	Linemarking	2 of Paveme	10410		2.810586745		2.60	7.49	Approx. derived based on lump sum provided and total pavement area of work. VPA rate is similar
	Landscape maintenance	Item	1		86250				
	Tactile Pavers (Hazard only)	Item	24		422.8635525				
Other					0				
					0				
					0				
Delivery	Council Fees	%			3.25				
	VicRoads Fees	%			1				
	Traffic Management	%			5				
	Environmental Management	%			0.5				
	Surveying and Design	%			5				
	Supervision and Project management	%			9				
	Site Establishment	%			2.5				
	Contingency	%			15				

Appendix B.5	
Description:	Casey Council estimates comparison - Berwick Cranbourne/ Plymouth Bvd

					VPA RATE	COUNCIL SUBMISSION			
Group	**Sub Item**	**Unit**	**VPA Quantity**	**Council Quantity**	**Rate (P90)**	**Rate Utilised (lowest)**	**Rate Utilised (highest)**	**% Difference (compared to highest rate)**	**Comments**
Siteworks and Earthworks	Site Preparation	%	0		2.678279365				
	Earthworks	m3	6266.35	10740	40.30257443	8.01	10.26	74.54	VPA rate marginally lower than highest rate for earthworks (cut), however significantly higher than lowest rate for earthworks (fill)
Road Pavement	Primary Arterial Pavement	m2	0		170.8007041				
	Secondary Arterial Pavement	m2	6970	5405	130.0253503		109.99	15.41	Berwick Cranbourne Road full depthPavement composition largely similar to primary arterial pavement. VPA rate higher than estimate
	Collector Arterial Pavement	m2	3440		100.1785714				
	Subgrade Preparation	%	0		17.69555716				
	Pavement Rehab	m2	0						
	Pavement Other	m2	0						
Concrete Works	Kerb and Channel	m	3000	1605	56.38691475	31.74	44.30	21.44	VPA rate marginally lower than highest rate and similar lowest rate
	Cycle Path	m2	1090		69.00757582				
	SUP/ Footpath	m2	1910	1120	67.49509186		50.57	25.08	VPA rate higher than estimate
	Traffic Island	m2	105	255	76.5743594		57.79	24.53	VPA rate higher than estimate
Drainage	Drainage Pipe 300mm CR Bfilled	m	280		175.6413387				
	Drainage Pipe 375mm CR Bfilled	m	0	232	246.5159559	158.96	211.05	14.39	VPA rate higher than estimate
	Drainage Pipe 450mm CR Bfilled	m	190	40	320.952275		233.25	27.33	VPA rate higher than estimate
	Drainage Pipe 525mm CR Bfilled	m	0		402.8666788				
	Drainage - pits	No.	32	41	2499.150624	1366.52	3772.78	-50.96	VPA rate within contractor's estimate
	Drainage – Sub-soil drainage	m	3540	2520	26.53415231	13.42	32.34	-21.88	VPA rate within contractor's estimate range
	Drainage Culvert	No.	0						
Traffic	Traffic Signals	Item	4		100101.0266		40333.33	59.71	Derived from lump sum. VPA rate higher than estimate
	Traffic Signal Conduit	m	0		53.47003415				
Landscape	Tree Planting	No.	88		318.7818124				
	Landscaping	m2	5890		23.31097997				
	Topsoil Seeding	m2	5890		7.922155422		3.28	58.60	VPA rate higher than estimate
Street Lighting	Street Lighting (all Inclusive)	m	0		235.6272522				
	Street Lighting - Intersections	Item/	4						
Misc	Regulatory Signage	Item	10	40	363.2477854	167.46	470.15	-29.43	VPA rate within contractor's estimate
	Linemarking	of Pavem	10410		2.810586745		2.25	19.95	Approx. derived based on lump sum provided and total pavement area of work. VPA rate is higher
	Landscape maintenance	Item	1		86250				
	Tactile Pavers (Hazard only)	Item	24		422.8635525		373.77	11.61	VPA rate higher than estimate
Other					0				
					0				
					0				
Delivery	Council Fees	%			3.25				Delivery rates derived from lumpsums provided
	VicRoads Fees	%			1				
	Traffic Management	%			5		4.25	15.00	
	Environmental Management	%			0.5		0.25	50.00	
	Surveying and Design	%			5				
	Supervision and Project management	%			9				
	Site Establishment	%			2.5		0.36	85.60	
	Contingency	%			15				

Appendix B.6	
Description:	Casey Council estimates comparison - Gwen Street

			VPA RATE	COUNCIL SUBMISSION			
Group	**Sub Item**	**Unit**	**Rate (P90)**	**Rate Utilised (lowest)**	**Rate Utilised (highest)**	**% Difference (compared to highest rate)**	**Comments**
Siteworks and	Site Preparation	%	2.678279365				
	Earthworks	m3	40.30257443	15.21	17.80	55.83	VPA rate higher than estimate
Road Pavement	Primary Arterial Pavement	m2	170.8007041				
	Secondary Arterial Pavement	m2	130.0253503				
	Collector Arterial Pavement	m2	100.1785714				
	Subgrade Preparation	%	17.69555716				
	Pavement Rehab	m2					
	Pavement Other	m2					
Concrete Works	Kerb and Channel	m	56.38691475		37.28	33.89	VPA rate higher than estimate
	Cycle Path	m2	69.00757582				
	SUP/ Footpath	m2	67.49509186		43.21	35.98	VPA rate higher than estimate
	Traffic Island	m2	76.5743594				
Drainage	Drainage Pipe 300mm CR Bfilled	m	175.6413387	73.16	80.89	53.95	VPA rate higher than estimate
	Drainage Pipe 375mm CR Bfilled	m	246.5159559	87.45	95.17	61.39	VPA rate higher than estimate
	Drainage Pipe 450mm CR Bfilled	m	320.952275	114.92	22.64	92.95	VPA rate significantly higher than estimate
	Drainage Pipe 525mm CR Bfilled	m	402.8666788		142.53	64.62	VPA rate higher than estimate
	Drainage - pits	No.	2499.150624	1219.52	4653.54	-86.20	VPA rate within contractor's estimate range
	Drainage – Sub-soil drainage	m	26.53415231				
	Drainage Culvert	No.					
Traffic	Traffic Signals	Item	100101.0266				
	Traffic Signal Conduit	m	53.47003415				
Landscape	Tree Planting	No.	318.7818124		260.00	18.44	VPA rate higher than estimate
	Landscaping	m2	23.31097997		9.15	60.75	VPA rate higher than estimate
	Topsoil Seeding	m2	7.922155422				
Street Lighting	Street Lighting (all Inclusive)	m	235.6272522				
	Street Lighting - Intersections	Item/ Per Leg					
Misc	Regulatory Signage	Item	363.2477854		242.05	33.37	VPA rate within contractor's estimate
	Linemarking	m2 of Pavement	2.810586745				
	Landscape maintenance	Item	86250		23660.00	72.57	VPA rate higher than estimate
	Tactile Pavers (Hazard only)	Item	422.8635525		324.45	23.27	VPA rate higher than estimate
Other	Drainage Pipe 525mm CR Bfilled		0		191.17		
			0				
			0				
Delivery	Council Fees	%	3.25				
	VicRoads Fees	%	1				
	Traffic Management	%	5				
	Environmental Management	%	0.5				
	Surveying and Design	%	5				
	Supervision and Project management	%	9				
	Site Establishment	%	2.5				
	Contingency	%	15				

Appendix B.7		
Description:	Casey Council estimates comparison - Thompsons Road	

			VPA RATE	COUNCIL SUBMISSION			
Group	**Sub Item**	**Unit**	**Rate (P90)**	**Rate Utilised (lowest)**	**Rate Utilised (highest)**	**% Difference (compared to highest rate)**	**Comments**
Siteworks and	Site Preparation	%	2.678279365				
	Earthworks	m3	40.30257443	7.60	9.80	75.68	VPA Rate higher than estimate
Road Pavement	Primary Arterial Pavement	m2	170.8007041				
	Secondary Arterial Pavement	m2	130.0253503				
	Collector Arterial Pavement	m2	100.1785714				
	Subgrade Preparation	%	17.69555716				
	Pavement Rehab	m2					
	Pavement Other	m2					
Concrete Works	Kerb and Channel	m	56.38691475		45.70	18.95	VPA Rate higher than estimate
	Cycle Path	m2	69.00757582				
	SUP/ Footpath	m2	67.49509186		35.20	47.85	VPA Rate higher than estimate
	Traffic Island	m2	76.5743594				
Drainage	Drainage Pipe 300mm CR Bfilled	m	175.6413387		157.10	10.56	VPA Rate higher than estimate
	Drainage Pipe 375mm CR Bfilled	m	246.5159559				
	Drainage Pipe 450mm CR Bfilled	m	320.952275				
	Drainage Pipe 525mm CR Bfilled	m	402.8666788				
	Drainage - pits	No.	2499.150624	1098.50	2128.10	14.85	VPA Rate higher than estimate
	Drainage – Sub-soil drainage	m	26.53415231	18.60	38.60	-45.47	VPA rate within range used by estimator
	Drainage Culvert	No.					
Traffic	Traffic Signals	Item	100101.0266				
	Traffic Signal Conduit	m	53.47003415				
Landscape	Tree Planting	No.	318.7818124				
	Landscaping	m2	23.31097997				
	Topsoil Seeding	m2	7.922155422				
Street Lighting	Street Lighting (all Inclusive)	m	235.6272522				
	Street Lighting - Intersections	Item/ Per Leg					
Misc	Regulatory Signage	Item	363.2477854		241.50	33.52	VPA Rate higher than estimate
	Linemarking	m2 of Pavement	2.810586745		1.20	57.30	Approx. derived based on lump sum provided and total pavement area of work. VPA rate is similar
	Landscape maintenance	Item	86250				
	Tactile Pavers (Hazard only)	Item	422.8635525				
Other			0				
			0				
			0				
Delivery	Council Fees	%	3.25				Delivery rates derived from lumpsums provided
	VicRoads Fees	%	1				
	Traffic Management	%	5				
	Environmental Management	%	0.5				
	Surveying and Design	%	5				
	Supervision and Project management	%	9				
	Site Establishment	%	2.5				
	Contingency	%	15				

APPENDIX

C

DETAILED SUBMISSIONS LIST

Cardinia Council

Item	Reference	Description	
Submission 1 of 3			
1	1a Paul Richardson notes	Paul R comments on Toomah (2 storey bldg.)	
2	1a Paul Richardson notes	Paul R comments on Sports Pavilion for 2 fields. (420 m^2)	
3	1b Emerald Hub plans	Sample of Cardinia's Community Hub Design	
4	1c. Toomah Community Centre costing comparison_31.10.2017	Email	
5	1d ICP ground flr	Toomah Community Centre grnd flr plan	
6	1d ICP image	Toomah Community Centre 3D image layout	
7	1d ICP 1st flr	Toomah Community Centre 3D image 1st flr plan	
8	1d ICP car park	Toomah Community Centre 3D image car park layout	
9	2. ICP Benchmarking_Walter Carmignani_community facility and pavillon costs_2018	Sample Cardinia's cost	2. ICP Benchmarking_Walter Carmignani_community facility and pavillon costs_2018
10	3. Pakenham East estimated costings for Community Centres 30.07.18	Sample Cardinia's cost	3. Pakenham East estimated costings for Community Centres 30.07.18
11	4. Rates for construction area and rates of community areas_30.10.2017	Email	4. Rates for construction area and rates of community areas_30.10.2017
Submission 1 of 3			
12	1. ICP Benchmarking_Daniel Mauger_intersections 2018	Email about VPA infrastructure cost	
13	ARENA Parade - V180084-Estimate-ARENA Parade_V02	Cardinia's Cost estimate for Princess Hwy - Arena Pde Road & Intersection	ARENA Parade - V180084-Estimate-ARENA Parade_V02
14	ARENA Parade - V180084-SK001-V02	Princess Hwy - Arena Pde Road & Intersection Layout	ARENA Parade - V180084-SK001-V02
15	Bayview Road - V180084-Estimate-Bayview Road-V02	Cardinia's Cost estimate for Princess Hwy - Bayview Rd for Road & Intersection	

16	Bayview Road - V180084-SK005-V02	Princess Hwy - Bayview Road & Intersection Layout
17	Brunt Road - V180084-Estimate-Brunt Road-V02	Cardinia's Cost estimate for Princess Hwy - Arena Pde Road & Intersection
18	CardiniaSC-Fees & Bonds_0361E-PHI	Princess Hwy - Arena Pde Road & Intersection Layout
19	DRW29135 Plan 1-2277 As Constructed - Siding Avenue Intersection Officer S13 157(2)	
20	ICP Benchmarking_Daniel_north leg of timbertop	
21	McMullen - V180084-Estimate-McMullen-V02	
22	McMullen - V180084-SK007-V02	
23	O'Neil Road - V180084-Estimate-O'Neil Road-V02	
24	O'Neil Road - V180084-SK004-V02	
25	Plan 1-2130 - As Constructed - Timbertop~Drive - Nil Lots - Timbertop Bo...	
26	Princes Hwy and Siding Ave Intersection _Claim 6	
27	Thewlis Road - V180084-Estimate-Thewlis Road-V02	
28	Thewlis Road - V180084-SK002-V02	
29	Tivendale Road - V180084-Estimate-Tivendale Road-V02	
30	Tivendale Road - V180084-SK006-V02	

Submission 3 of 3

31	1a. ICP benchmarking_Paul Richardson notes on buildings_20.9.2018	Email, comments regarding Cardno Infra Cost	1a. ICP benchmarking_Paul Richardson notes on buildings_20.9.2018
32	2. ICP Benchmarking_Kurt Pitt_message with James Bathe recreation reserve_2018	Email about Cardno draft Benchmarking Infra Costing	
33	2a. 180219 _James BatheSD_red pavillion	Cardinia's Bathe Reserve Pavilion Plan	
34	2c. ICP Benchmarking_Kurt Pitts_James Bathe Tender Adjustments - McMahons	Cost estimates for James Bathe Reserve	
35	2d. ICP Benchmarking_Kurt Ptts_James Bathe recreation reserve costs_2018	Overall layout of James Bathe Recreation Reserve	2d. ICP Benchmarking_Kurt Ptts_James Bathe recreation reserve costs_2018
36	3. Pakenham East estimated costings for sport reserves 30.07.18	Cost Estimates for Pakenham Sports Reserve	3. Pakenham East estimated costings for sport reserves 30.07.18

Casey Council

Item	Reference	Description	Link
Submission 1 of 3			
1	1 Ramleigh estate	Layout for Community Facility Centre	2 Ramleigh estate
2	Example Costing L2 Community Facility-CranWest ICH-20180702	Cost Estimates for Community Facility Centre	Example Costing L2 Community Facility-CranWest ICH-20180703
3	Example Floor Plan L2 Community Facility-CranWest ICH-20180702	Layout for Community Facility Centre	Example Floor Plan L2 Community Facility-CranWest ICH-20180703
4	Feedback on ICP benchmark costing	Casey Council feedback on VPA ICP Benchmark Infrastructure Cost	Feedback on ICP benchmark costing
Submission 2 of 3			
5	1. DCP-IN-53-09-Clydevale Int.- 660 berwick-53-09 DCP Claims Vn1 -	Clydevale Cost Estimates	1. DCP-IN-53-09-Clydevale Int.- 660 berwick-53-09 DCP Claims Vn1 - 27122017
6	1. DCP-IN-53-09-Clydevale Int.- 660 berwick-1200687-VR-REV D	Clydevale Set of drawings	1. DCP-IN-53-09-Clydevale Int.- 660 berwick-1200687-VR-REV D
7	2. 1400205-INT-300-INT	Road Long section drawings	
8	2. DCP Claims Vn1 190917..- Shan - 27-02-2018	Heather Grove Intersection Cost Estimates	2. DCP Claims Vn1 190917..- Shan - 27-02-2018
9	3. 00A4E657.002	Email with detailed design plans for Thompsons Road	3. 00A4E657.002
10	3. 5387-TR-R-001	Thompsons Road detailed design drawings	3. 5387-TR-R-001
11	3. 14062018 - Thompsons Road - Reimbursement Review - Council- Shan, Latest	Thompsons Road Cost Estimates	3. 14062018 - Thompsons Road - Reimbursement Review - Council- Shan, Latest
12	4. DCP Claim IN53-02-Meridian		
13	4. Meridian Claims Summary		

14	6. 11675.2_Revised Stage Layout Plan	CAD layout	
15	6. DCP Costs Breakdown 15 Dec 17 - Council Workings	DCP Cost Summary	
16	6. 11675.3_Stage 3 Layout Plan	Cad Layout	
17	7 . Summary of Contract and DCP Cost - Shan -22-05-2018 - final values	DCP Cost Estimates	7 . Summary of Contract and DCP Cost - Shan -22-05-2018 - final values
18	7. ECM_12124359_v1_Approval of Engineering Construction Plans of 30	Set of Drawings	
19	8. ECM_12149808_v1_As constructed engineering plans (R4757) - Glassco	Set of Drawings	
20	8. PE4-7 PPC 3 Tulliallan Stage 11 - DCP & Developer COST	DCP Cost Estimates	8. PE4-7 PPC 3 Tulliallan Stage 11 - DCP & Developer COST
21	8. Cranbourne North DCP - RD18 Project Scope and Cost		
22	IN-54-01		
Submission 3 of 3			
23	AOS1 Clyde North PSP Functional Model Option 5	Sport Field Layout (1 Football field)	AOS1 Clyde North PSP Functional Model Option 5
24	Clyde Creek Soccer Rev B	Sport Field Layout (2 Football field)	Clyde Creek Soccer Rev B
25	Engineering Estimate PPS54-AOS1 Ramlegh	Cost Summary for sport field	Engineering Estimate PPS54-AOS1 Ramlegh
26	Functional Layout Rev 7 Sheet 2 14.08.18	Sport Field Layout (2 Football field)	Functional Layout Rev 7 Sheet 2 14.08.18
27	Kilora Reserve Project Estimate for Grants 06-07-2018	Cost Estimate for Kilora Sports Field	Kilora Reserve Project Estimate for Grants 06-07-2018
28	Livingston Active Open Space Engineering Concept Estimate	Cost Estimates for Livingston Active Sports Field	Livingston Active Open Space Engineering Concept Estimate
29	Selandra Active Open Space Engineering Estimate 29.08.18	Cost Estimates for Selandra	Selandra Active Open Space Engineering Estimate 29.08.18
30	Selandra Reserve Schematic Layout	Selandra Sport Field layout	Selandra Reserve Schematic Layout 24.06.18

Melton Council

Item	Reference	Description	Comments Link
Submission 1 of 1			
1	WT Partnership peer review		
2	Turner & Townsend peer review		

Whittlesea Council

Item	Reference	Description	Comments Link
Submission 1 of 1			
1	Council comments		