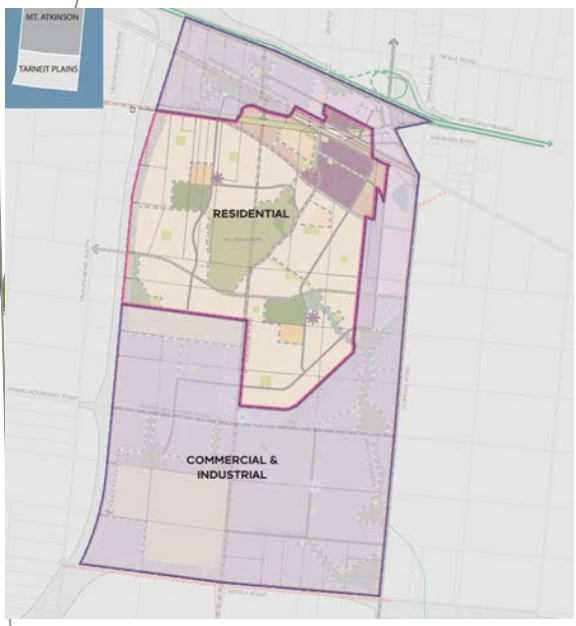
Expert Evidence Statement – Infrastructure Costings by Stephen Joseph Howe

Mt Atkinson &Tarneit Plains Infrastructure Contributions Plan (ICP) – Melton Amendment C201



Instructed by

Hall & Wilcox Lawyers on behalf of Victorian Planning Authority

06 June 2019

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Document Information

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Document History

Version	Effective Date	Description of Revision	Prepared by	Reviewed by
V01	29 May 2019	Initial Issue	Stephen Howe Viraj Abeykoon	Stephen Howe
V02	30 May 2019	Final Issue	Stephen Howe Viraj Abeykoon	Stephen Howe
V03	06 June 2019	Final Issue – Minor comments	Stephen Howe Viraj Abeykoon	Stephen Howe

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Annexures

‘Stakeholder Comments Review – Mt Atkinson-Tarneit Plains ICP (Document reference V181544 RP01 Mt Atkinson Tarneit Plans D02.docx, Version D02) – updated report – issued 13/12/2018.

'Benchmark Infrastructure Costing - Result Application - Result Application Mt Atkinson and Tarneit (Document reference - V181544 Mt Atkinson Tarneit Costings D04.docx, Version D04) - issued 12/04/2019

1 Qualifications and Expertise

In accordance with the 'Guide to Expert Evidence' prepared by Planning Panels Victoria, my qualifications and expertise to undertake this work are summarised below:

Name:

Stephen Joseph Howe

Address:

Cardno

Level 4, 501 Swanston Street

Melbourne Vic 3000

Professional Qualifications:

- Degree of Bachelor of Civil Engineering (1st class Honours), Swinburne Institute of Technology, 1988;
- Diploma of Company Directorship (Order of Merit), AICD, 2006.
- Chartered Professional Engineer, Engineers Australia (Member No. 241277), National Professional Engineers Register.
- Fellow, Engineers Australia.

Professional Experience:

- Cardno Victoria, Principal Transport Infrastructure, May 2018 – Present
- SMEC Australia, Regional Manager Gippsland, 2010-2018
- V/Line Pty Ltd, Manager Routine Maintenance Track & Civil, 2008-2010
- Urban Maintenance Systems, Consultant, 2008
- JG Castle Group, CEO, 2007-08
- Latrobe City Council, Manager Infrastructure Operations, 2004-07
- City of Boroondara, Manager Asset Management, 2000-2004
- Plus, various early career roles between 1988-2000 which included work as a graduate design engineer (Bonacci Winward), Research & Development Engineer (Boral), property manager (Servants in Hawthorn Inc), Technical Services Manager (Laticrete), Acting Manager Fleet & Property (Ambulance Victoria) and as a self-employed consultant.
- With regards to transport and community infrastructure I have overseen projects from strategic planning through to functional and detailed design, construction and maintenance in both urban and rural environments including municipal, VicRoads and private roads, car parks, path networks, railway systems, and all types of municipal community and recreation facilities.

Areas of Expertise:

- Planning, development, design, construction and maintenance of diverse infrastructure assets, including transport and community infrastructure;
- Whole of life asset management;
- Stakeholder and risk management;
- Financial analysis including life cycle cost;

> Business Planning and Reporting.

I am employed by Cardno in the capacity of Principal, Infrastructure and Transport Infrastructure Group Manager, within the Transport Business Unit in the Melbourne office.

Expertise to Prepare this Report:

My training and experience including involvement with all forms of asset development and use over the past 30 years qualifies me to comment on the infrastructure costing aspects of the Mt Atkinson-Tarneit Plains Infrastructure Contributions Plan (ICP), to be integrated into the Melton Planning Scheme via Amendment C201.

Instructions which Defined the Scope of this Report:

I have been instructed by Hall & Wilcox Lawyers on behalf of the Victorian Planning Authority (VPA) to provide expert evidence at the Panel Hearing for Melton Amendment C201, in a letter dated 4 March 2019. In addition, I received further verbal instruction at a meeting held 24 May 2019 and a subsequent email of the same date from Mr Rory O'Connor of Hall & Wilcox Lawyers.

Facts, Matters and Assumptions Relied Upon:

> The 'predecessor' work done by Cardno on the broader 'Benchmark costings' project, which included development and use of a range of 'template' functional designs and associated costs, to be used to support the general development of ICP's for Precinct Structure Plans in growth areas;

> The design guidelines and standards referenced in the various Cardno reports developed for the VPA in reference to benchmark costs and ICP's;

> Original instructions from the VPA to analyse and comment on specific 'stakeholder' submissions to the Mt Atkinson-Tarneit Plains ICP;

> Subsequent additional feedback provided by the VPA in response to clarifications sought by Cardno;

> Cardno's specific reports and bespoke designs for the Mt Atkinson-Tarneit Plains Infrastructure Contributions Plan (ICP);

> Submissions received on the exhibited documents;

> Email from Mr Rory O'Connor of Hall & Wilcox Lawyers on 29 May 2019 advising changes to road lengths.

Identity of Persons Undertaking the Work:

Stephen Howe, assisted by Viraj Abeykoon (Civil Engineer) of Cardno Victoria.

Aspects of the broader (predecessor) work and bespoke designs were also undertaken by former or other current Cardno employees.

I have made all the inquiries that I believe are desirable and appropriate and no matters of significance which I regard as relevant have to my knowledge been withheld from the Panel.

Stephen Howe

Principal

for **Cardno**

2 Introduction

I have been instructed by Hall & Wilcox Lawyers on behalf of the VPA to provide my opinion on the proposed Mt Atkinson & Tarneit Plains Infrastructure Contributions Plan (ICP) – Melton Amendment C201. In this report I comment specifically (and only) on **infrastructure costing** matters.

The full scope of my engagement, as instructed by Hall & Wilcox is as follows:

- Consider the submissions to the exhibited Amendment in relation to infrastructure costing matters, and provide an expert opinion in relation to these submissions by 4pm, 5 April 2019, later revised to 4pm, 31 May 2019; and
- Present my expert opinion at an expert witness conclave to be held between 8 April 2019 and 15 April 2019 and sign off on the conclave statement by 16 April 2019, recently revised to a future date yet to be confirmed.
- Be available to present evidence at the panel hearing between 20-23 May 2019, noting that I am scheduled to present evidence on 21 May 2019 for C201, also revised to a later date yet to be confirmed.

This expert witness statement document sets out my opinions with respect to these matters. It is noted that the Planning Panels Victoria document 'Guide to Expert Evidence' states that "*where an expert has prepared a report that has been used to inform the preparation of an amendment or proposal, the expert should not provide a revised version of that report*", but sets out how the statement should, in a brief manner, comment on the past report.

As Cardno has prepared several documents of this nature, this expert witness statement will follow the format of required responses as prescribed.

3 Previous instructions

With regard *specifically* to C201, Cardno was first instructed by Ben Hawkins of the VPA via email on Wed 31/10/2018 3:19 PM as follows:

- *"Determination of scope (VPA has/will provide initial scope analysis) and components of infrastructure costs and designs that are outside of the benchmark standards and recommendation of whether the costs should be included in the ICP.*
- *Assessment of standard quantities and rates (through benchmark costs)*
- *Application of standard rates to quantities required through design*
- *Provide draft report containing relevant analysis*"

This scope covered both functional layout and cost/rate matters, however the focus of this expert witness statement is solely with regard to Infrastructure Costing matters.

In addition, the VPA instructed Cardno on the broader 'Benchmark costings' project at various other times both before and after the specific instruction date of 31/10/2018 for C201.

4 Comments on past reports

With regard to the Infrastructure costing matters pertaining to C201:

> Documents prepared by Cardno have been utilised under three phases;
  - Phase 1: Exhibited ICP;
  - Phase 2: Responses to submission to the exhibited ICP; and
  - Phase 3: Changes recommended to the panel.
> The documents prepared by Cardno for the exhibited ICP were based on the benchmark project prior to conducting the benchmark project stakeholder engagement process. Following the completion of the above task for the benchmark project, the changes recommended to the panel documents for Mt Atkinson Tarneit Plains ICP (phase 3) were prepared considering both ensuing changes from the benchmark project (due to adopting comments from its own stakeholder engagement process) and also considering the submissions received responding to the exhibited ICP document (phase 2). A summary of the changes between the exhibited ICP (phase 1) and changes recommended to the panel document (phase 3) is provided later in this report.

The exhibited documents (phase 1) utilised:

> Benchmark Infrastructure Costing-Result Application – Result Application Mt Atkinson and Tarneit, 17 July 2018 (document V170524 Mt Atkinson Tarneit Costings D02, version D02) which included;
  - Cardno 'template' functional layouts for road mid-block cross sections and community and recreation infrastructure (developed for the broader "Benchmark costings' project, and not specifically for Mt Atkinson-Tarneit Plains ICP);
  - Cardno functional layout plans for certain road intersections developed specifically for the Mt Atkinson-Tarneit Plains ICP (IT-03 to IT-16);
  - 2 functional layout plans for intersections developed by Traffix Group (IT-01 and IT-02);
  - 2 Functional layout plans developed by SMEC for bridges (BR-02 and BR-03) and
  - Costings for the intersection projects IT-01, IT-02, IT-03, IT-04, IT-14 and IT-16, bridge projects BR-02 and BR-03 and culvert project CU-01 (remaining infrastructure costings were prepared by the VPA based on the benchmark infrastructure project).

Cardno prepared its responses to submissions to the exhibited documents for the VPA (phase 2) with regard to the specific 31/10/2018 scope for the Mt Atkinson-Tarneit Plains Infrastructure Contributions Plan update as follows:

> 'Stakeholder Comments Review – Mt Atkinson-Tarneit Plains ICP (Document reference V181544 RP01 Mt Atkinson Tarneit Plans D02.docx, Version D02) – updated report – issued 13/12/2018 (previous version D01, issued - 14/11/2018).

I had a direct role in the preparation of these reports, providing review comments and authorising the final version to be issued to the VPA.

The updated changes recommended to panel documents (phase 3) utilised:

> Benchmark Infrastructure Costing-Result Application – Result Application Mt Atkinson and Tarneit, 12 April 2019 (document V181544 Mt Atkinson Tarneit Costings D04, version D04) which included;
  - Cardno functional layout plans for certain road intersections developed specifically for the Mt Atkinson-Tarneit Plains ICP (IT-03 to IT-16);
  - 1 functional layout plan prepared by Cardno specifically for the bridge project 'BR-02' of Mt Atkinson-Tarneit Plains ICP;
  - 2 functional layout plans for intersections developed by Traffix Group (IT-01 and IT-02);

- 1 functional layout plan developed by SMEC for the bridge project BR-03; and
- Costings for the intersection projects (IT-01 to IT-16) and bridge projects (BR-02 and BR-03) based on the above plans, and costings for the culvert project CU-01 (remaining infrastructure costings were prepared by the VPA based on the benchmark infrastructure project).

I have no significant departure from the *Cardno* material used in the latest recommended changes to panel documents; only minor corrections noted later in this statement. However, there are corrections required to the road lengths calculated by VPA and used to develop the cost estimates for roads RD01 to RD12. Refer section 5.4 later in this statement. Also, for avoidance of doubt, the cost rates to be applied to the corrected road lengths should be the latest rates from the Benchmark Costings report.

In terms of other reports and associated costing exercises which have been used as the basis of the ICP update which is the subject of C201, Cardno has prepared several other documents, including the following:

> 'Review of Benchmark Infrastructure Costings', 23 July 2018 (document number V170524-RPT-0001.docx);

> 'Stakeholder Comments review – Benchmark Infrastructure Costings project, 7 November 2018, revised 12 December 2018 (Document number V170524 Stakeholder Comment Review.docx); and

> 'Benchmark Infrastructure Report', 11 April 2019 (document number V181544-RPT-0001.docx, version D8). This is a later update of document number V170524-RPT-0001.docx;

I had a direct role in the preparation of these reports, providing review comments and authorising the final version of each draft to be issued to the VPA.

Through the preparation of the above documents, I believe the rates recommended through the benchmark infrastructure project are highly relevant and should be generally applicable to Mt Atkinson Tarneit Plains ICP. Reasons for this include;

> The Benchmark Infrastructure Report utilises previously approved and panel tested DCP rates as the basis of a Monte-Carlo statistical analysis to provide rate recommendations for the line items of each of the nominated infrastructure projects. A Monte-Carlo analysis is highly relevant and is widely used in many industries as an analysis tool and for use in probability-based estimates. One major relevant advantage of using this technique is the ability to obtain rates with a probability percentage of materialising. The total P90 project cost obtained through this method is therefore highly useful as it indicates that 90% of the time the actual project construction cost should be below the recommended total;

> Through the subsequent iterations of the benchmark report several major updates were conducted. This includes indexing all the inputs (i.e. - previous panel tested DCP rates) used as the inputs of the statistical analysis and conducting a stakeholder engagement process: indexing was necessary as the input data varied from 2011 to 2016;

> Through the stakeholder engagement process several councils including City of Melton provided feedback on the work completed at the time for the benchmark infrastructure costings project. Stakeholders as part of this process additionally provided a variety of additional inputs on transport projects and community and recreation projects which included;

  - As built data;
  - Construction rates as priced by builders;
  - Rates from quantity surveyors (WT Partnership and Turner & Townsend via City of Melton's submission).

> The above rate information provided by stakeholders were subsequently indexed and utilised in the benchmark project as additional inputs in the statistical analysis. As a result, the background data utilised in producing the benchmark rates currently arise from a broad range of previous applications which in return makes the benchmark rates highly versatile for the broader benchmark costings project.

> In terms of questions falling outside the expert's expertise:

  - I am not a qualified Recreation Planner or Architect and certain matters relating to the size and layout of the Community and Recreation infrastructure functional layout plans used as the basis for

cost estimates could arguably be subject to alternative viewpoints. The overall reserve and building sizing for recreation and community facilities was set by the VPA in their brief, and not determined by Cardno.

- I am not a Quantity Surveyor; however, it is a normal and widely accepted practice in the engineering and development industries to adopt 'Engineers Estimates' of costs, based on quantity take-offs by engineering staff and use of rates developed and updated by engineers, especially for road and drainage infrastructure.

> In terms of key assumptions:

- Cardno adopted the following key documents as the basis of its functional designs for the broader 'Benchmark Costings' project:
    - Victorian Planning Authority Standards (supplied as part of the project brief)
    - Austroads Guide to Road Design – Full Set (Fourth edition)
    - VicRoads supplement to Austroads Guide to Road Design – Full Set
    - VicRoads Road Design Notes (RDNs)
    - VicRoads Standard Drawings for Roadworks
    - Austroads Guide to Traffic Management – Parts 1 to 13 (Third edition)
    - VicRoads supplement to Austroads Guide to Traffic Management – Parts 1 to 13
    - Austroads Design Vehicles and Turning Path Templates
    - VicRoads Guidance for Planning Road Networks in Growth Areas (2015)
    - Austroads guide to Road design – Part 5 and 5A (Third and First editions respectively)
    - VicRoads supplement to Austroads Guide to Road Design
    - VicRoads Traffic Engineering Manual Volume 1, Traffic Management
    - VicRoads Traffic Engineering Manual Volume 2, Signs and Markings
    - VicRoads Manual of Standard Drawings for Road Signs
    - AS 1743 Road Signs Specifications (2007)
- **Note**: the 'VicRoads Guidance for Planning Road Networks in Growth Areas (2015)' assumes the design speed at intersections to be 60 km/h.
- All other assumptions regarding the 'basic and essential' nature of the functional layout plans as listed in our report 'Benchmark Infrastructure Report', 11 April 2019 (document number V181544-RPT-0001.docx, version D8) and its predecessors.

> I am satisfied that the recommended changes to panel documents implements our recommendations in our report 'Benchmark Infrastructure Costing-Result Application Mt Atkinson and Tarneit, 12 April 2019 (document V181544 Mt Atkinson Tarneit Costings D04, version D04), with the proviso that the minor inaccuracies specified within this expert witness statement document are corrected in the final version of the ICP.

5 Review and response to submissions received

Submissions received in response to the exhibited documents, include both:

> Submissions received, analysed and responded to by Cardno in its reports dated 14/11/2018 and 13/12/2018; and

> Submissions not reviewed before (by Melton City Council cover letter, Transport for Victoria cover letter).

Submissions received in response to the changes recommended to the panel documents (phase 3) include;

- Submissions received and previously not responded to by Cardno (by Melton City Council)

With regard to the submissions to the exhibited documents already responded to in our reports (phase 2) listed above:

- There appears to be nothing additional in the submissions made to the exhibited (phase 1) documents;
- Cardno has not changed its stance on costings matters, as expressed in our latest report dated 13/12/2018;
- The positions taken on the reviewed submissions to the exhibited documents (during phase 2) formed the basis of the estimates within the latest recommended changes to the panel document (phase 3). Comments accepted and rejected are summarised in the table below (summary based on 13/12/18 report);

Table 5-1 Comments accepted and rejected summary

WTP Comment	Response
Inclusion of quantities of several line items previously omitted (site preparation, subgrade preparation, landscape maintenance)	Accepted – changes reflected in latest ICP documents (phase 3)
Low quantities for landscaping and topsoil seeding	Rejected
Classifying all pavements as primary arterial pavements for IT-01/02/03/04	Accepted – changes reflected in latest ICP documents (phase 3)
Higher delivery costs for IT-01/02/03/04	Rejected
Inclusion of brownfield development line items within the infrastructure cost sheets (i.e. - demolitions of existing pavements and tie-ins to existing pavements	Accepted – changes reflected in latest ICP documents (phase 3)
Relocation of overhead power poles	Partially rejected – allowance made to increase vertical clearance
Pavements – new pavement to Hopkins Road is measured as primary arterial	Accepted – changes reflected in latest ICP documents (phase 3)
Bridge 02, main span – Super T construction is generally limited to a maximum span of 38m.	Accepted – changes reflected in latest ICP documents (phase 3)
CU-01 Errors noted in rates application	Accepted – changes reflected in latest ICP documents (phase 3)
Head Walls / Wing Walls – rates used appear to be low	Accepted – rates reviewed
Several comments about differences in quantities for intersections	Accepted – Quantities obtained from bespoke intersection designs for all intersections, changes reflected in latest ICP documents (phase 3)

- With regard to WT Partnership's rate methodology outlined in the reviewed documents, the following extraction from Cardno's report dated 13/12/2018 is noteworthy; '*WTP have specified that they have used their 'base rate' within a Monte-Carlo risk-based modelling software to provide P90 costs. They have further stated that the risk modelling aims to represent the inherent and quantifiable uncertainties only. The report does not provide additional information on what uncertainties WTP aims to quantify through this approach. Details on the inputs/ considerations used to obtain WTP's P90 rates were not outlined in*

the submission. Therefore, it is not possible to comment on the applicability of WTP's P90 rates on the project estimates. It was also noted that for the line item 'High pressure gas protection slab and relocation of other services' WTP have adopted VPA's P90 rate as the base cost and have provided a P90 cost that is about 19% higher'.

With regard to the submissions to the exhibited documents not reviewed before:

- The submission from Transport for Victoria (TfV) which does not discuss any costings matters; and
- The submission from Melton City Council. Earlier, Cardno was only engaged by the VPA to analyse the report prepared by WT Partnership (on behalf of Melton City Council), and not any cover letter submitted by Melton City Council itself:
  - With regard to the WT Partnership report, there were no new matters raised and Cardno adheres to its position as expressed in its report of 13/12/2018;
  - The cover letter does raise several functional layout plan matters. However, as Council has requested a conclave on only costings matters, these have not been discussed in this statement:

With regard to the more recent submission by Melton City Council received in response to the changes recommended to the panel documents (phase 3):

- The submission specifies that the transport projects apportioned to the ICP will cost $124,829,622 based on the analysis conducted by WT Partnership on behalf of Council. Council outlines that a difference of $7,632,580 exists between their estimates and the recommended changes to panel documents estimates. WT Partnership's total estimate specified in Table 3 of council's submission should however be slightly revised to $124,655,708 due to an error in the road estimate (refer section 5.3) and an incorrect use of P90 totals for BR-03 and CU-01. Additionally, within section 2.2 of council's submission the WT Partnership total is quoted to be $120,071,318 and the VPA total estimate is quoted to be $113,357,760. The infrastructure components making up this total is unknown; therefore, this statement has focused on the estimates identified in table 3 of Melton City Council's submission;
- It is also worth noting that within VPA's $117,197,042 estimate, roughly $12,500,000 is allocated towards contingencies and based on the P90 methodology not all projects are expected to go beyond the project estimate;
- Council has also specified that its review has found that many of the projects have been identified as 'benchmark' projects with bespoke functional layout plans in the ICP for the same projects. Council requests that these projects be costed based on the bespoke plans. I can confirm that the costings prepared by Cardno as outlined in the changes recommended to the panel documents for the intersection projects are based on the bespoke plans prepared for the ICP;
- The following sections provide my opinion on the significance of costing differentials. I have focused on projects that have cost differences that are greater than 5% as projects with discrepancies less than 5% are in my view not material, given the differences in analysis, methodologies, the P90 approach and inbuilt contingencies.

5.1 Intersection projects IT-06/11/12/14/16

- Five intersection projects have a cost differential that is higher than 5% (IT – 06/11/12/14/16)
- The line item group that has resulted in the largest cost difference for these intersection projects is 'pavements'. Due to this, I have focused on comparing differences between the two estimates for this line item despite the fact that differences in other line items exist (cost differences in other line items produce a relatively smaller overall impact). The cost difference for pavements has risen due to differences in both the rates utilised and quantities specified.
- The rates specified by WT Partnership for pavements are higher than the rates specified by Cardno. As specified in section 4, the benchmark rates used in preparing the Mt Atkinson Tarneit Plains ICP costings are based on a variety of background rates including WT Partnership's own 'base' rates. Furthermore, as discussed previously, WT Partnership's rate methodology in producing P90 rates (as opposed to the base rates) is unknown and the background data used in producing these rates is also unknown. Due to this, my opinion is that the P90 rates specified in the benchmark document and the ensuing changes

recommended to the panel document are robust and appropriate for the purpose of costing Mt Atkinson Tarneit Plain ICP infrastructure projects.

- With regard to the quantities used for pavements, a summary of the differences is provided below in table 5-2.
- The pavement quantities specified in the changes recommended to the panel document have been extracted by Cardno from the bespoke CAD plan for each intersection. Therefore, I am of the view that Cardno's quantities presented (in the changes recommended to panel document) are sufficiently accurate and reliable. We cannot comment on WT Partnership's quantity extraction process as it is unknown. Adjusting WT Partnership's quantities to match the quantities extracted by Cardno would reduce the cost discrepancies between the two estimates vastly for these intersections.
- It is also worth noting that the WT Partnership's generally higher pavement areas appear to be the cause of higher earthworks quantities as well. This as a result further exacerbates cost discrepancies.

Table 5-2 Comparison of pavement quantities (for intersections with discrepancies higher than 5%)

Intersection	Overall Cost difference (including delivery)	Pavement Type	Pavement areas (m2)		Pavement Costs (Before delivery)		Cost difference	Net cost difference *(before delivery - pavements only)
			WTP	Cardno	WTP	Cardno		
IT-06	10% ($436,342)	Secondary	8700	8074	$1,480,224.00	$1,080,139.00	$400,085.00	$400,085.00
IT-11	6% ($317,469)	Secondary	7715	5075	$1,288,475.00	$678,933.50	$609,541.50	$404,584.06
		Connector	2790	5526	$416,386.00	$621,343.44	-$204,957.44	
IT-12	7% ($381,095)	Secondary	10440	9865	$1,773,429.00	$1,319,736.32	$453,692.68	$453,692.68
IT-14	15% ($862,293)	Primary	7920	6708	$1,456,656.00	$1,249,432.08	$207,223.92	$479,937.92
		Secondary	1630	0	$272,714.00	$0.00	$272,714.00	
IT-16	8% ($490,587)	Primary	8810	6161	$1,623,521.00	$1,147,531.10	$475,989.90	$421,034.49
		Secondary	1395	2347	$208,975.00	$263,930.41	-$54,955.41	

Footnote* - Delivery for road/intersection projects add 41.25% overhead including contingencies, fees, survey and design etc.

5.2 Intersection project IT-16

- In addition to the items specified for IT-16 within section 5.1, We also note that the changes recommended to the panel document include a slight error in providing the total cost for this intersection. The cost should be $5,329,000 as specified in the Cardno report 'Benchmark Infrastructure Costing-Result Application – Result Application Mt Atkinson and Tarneit, 12 April 2019 (document V181544 Mt Atkinson Tarneit Costings D04, version D04)' and not the $5,539,000 value specified in the recommended changes document by the VPA.

5.3 Intersection project IT-09

- A cost discrepancy of 27% ($855,187) exists between the WT Partnership estimate and the Cardno estimate.
- The site preparation line item for IT-09 within the changes recommended to panel document by Cardno appears to overstate the quantity for the line item site preparation. Due to this I am of the view that the quantity for this line item should be revised to 10,075m^2 which has been verified by Cardno in this statement and was an error in the previous report (Benchmark Infrastructure Costing-Result Application – Result Application Mt Atkinson and Tarneit, 12 April 2019 (document V181544 Mt Atkinson Tarneit Costings D04, version D04).
- Correcting this error would bring the cost difference down to 7% (WT Partnership's estimate would remain lower due to differences in costs for a variety of other line items). The new IT-09 costing should therefore be $3,411,000.

5.4 Road projects (mid-block)

- Council has outlined in its submission that a cost difference of -35% and +25% exists for RD-09 and RD-10 respectively. However, this is not the case as an error has been made in Table 3 of council's submission. WT Partnership's original estimate for RD-09 (as per the documents submitted on 24 October 2018) is $1,489,616. This compared closely to VPA's revised estimate of $1,478,750 and results in a cost difference of 1%. Similarly, WT Partnership's original estimate for RD-10 is $2,278,496. Comparing this cost to the revised VPA estimate of $2,310,000 also leads to a cost difference of about 1%;
- Based on the above all the mid-block road projects have a cost difference that is less than 1%. Cardno was not engaged in the preparation of the road cost estimates, road length calculation or confirming of road lengths. Cardno however provided through the benchmark project (Report – Benchmark Infrastructure Report', 11 April 2019) the 'per linear metre' rate used by the VPA to calculate the road estimates. As WT Partnership priced roads based on a 'per linear metre' rate as well, the above results indicate that the two sets of rates differ by roughly 1%. Total costs would too differ by roughly 1% assuming both parties adopt the same road lengths on costings;
- The road lengths calculated by VPA and listed in section 5.1 of the Stakeholder Review document (Phase 2 work, issued 14/11/18) have recently been determined as being incorrect. Cardno was advised of this by Mr Rory O'Connor of Hall & Wilcox Lawyers on 29 May 2019. These corrections should be applied in conjunction with the rates developed by Cardno in finalising the road mid-block costing items in the finalised ICP.

5.5 Bridge project BR-02

- A cost difference of 58% ($7,170,252) exists between WT Partnership's estimate ($12,354,252) and Cardno's estimate ($5,184,000) for the pedestrian and cyclist bridge crossing project.
- As the concept design has been updated by Cardno since exhibition, the estimate from WT Partnership in my opinion is no longer relevant. The new concept design prepared by Cardno recommends a construction methodology involving steel trusses and the updated estimate ($5,184,000) reflects this approach. The steel trusses can be prefabricated and subsequently craned into place on-site. This construction method is expected to reduce overall costs largely compared to the Super T beam and Steel

girder construction method adopted and costed in the design assumed by WT Partnership, for which no plans were made available for comparison purposes.

5.6 Bridge project BR-03

- A cost difference of 69% ($410,039) exists between WT Partnership's estimate ($594,961) and Cardno's 'P90' estimate ($1,005,000) for the pedestrian railway crossing project.
- As this project involves highly specialised tasks due to the rail environment, the estimate was arrived at by including high-level advisory input received 5/6/2018 from an external consultant (Wabtec Control Systems) who undertakes design of these specialised components regularly and subsequently applying VPA's delivery percentages to those elements and other elements developed/reviewed by Cardno. As Cardno's estimate is higher that WT Partnership's, it is considered prudent to adopt the higher of the two. The external consultant input comprised $620K of the $1,005,000 total cost estimate developed by Cardno.

5.7 Community and recreation projects

- Council's submission states that it is unclear why the construction estimates for the 10Ha active open space reserves (OS-01 and 0S-03) have dropped from $14.6million to 12.011 million. This appears to be due to an error in the exhibited documents at the time by the VPA. Other minor changes have also taken place however as part of the benchmark project stakeholder engagement process.
- Council further states that the $12,872,000 estimate from T&T should be utilised for OS-01 and OS-03 in place of VPA's estimate of $12,011,000. The estimates used by T&T's on arriving at the $12,872,000 have been assumed to be the same as the estimates in the documents submitted within benchmark stakeholder engagement process. When comparing the playing field component of the above projects, the estimate for T&T ($10,850,000) is very similar to the VPA estimate ($10,355,000). However, the overall difference has risen in the pavilion component where T&T has priced the component at $2,022,000 compared to the VPA estimate of $1,656,000. One reason for the larger difference in this instance is due to the different delivery percentages used by T&T which totals to 48%. The delivery percentage recommended by the VPA is 40.25% and has been applied to all estimates. The additional delivery amounts specified by T&T result in a cost escalation of about $100,000. Another reason for the difference is due to T&T costing the pavilion with an extra 62m^2 of building footprint (resulting in an extra $124,000). As both the delivery percentages and the building areas are specified by the VPA, the T&T estimates appear to be overstated in this instance. Due to this, my opinion is that considering all the phases the benchmark project has undergone, the estimates specified within that project is relevant for use in the ICP and no substitutions are required.
- T&T have additionally provided information on what appears to be previous estimates for Melton City Council in Appendix C of its submission as part of the benchmark stakeholder engagement process (24 October 2018). It is worth noting that the estimates within T&T's appendix C specifies $11,946,400 for a 10Ha site. This estimate is similar to the VPA estimate of $12,011,000.
- When comparing the two estimates for OS-02 however, the totals specified within T&T's estimate appears to have incorrectly combined the total for a 6Ha playing field along with the estimate for a 3 playing area pavilion. This should not be the case as the pavilion to be used is the 2 playing area size pavilion. Correcting this error would result in a total of $9,861,000 for T&T's estimate. This value is similar to the VPA estimate of $9,677,000 for OS-02. Any remaining difference can once again be attributed to the higher delivery cost (48%) and higher building footprint (extra 62m^2) used by T&T in the pavilion estimate.

6 Conclusion

Accordingly, I am satisfied the recommended changes to the panel documents captures Cardno's current position on all costings matters relating to the Mt Atkinson Tarneit Plains ICP, with the exception of the minor inaccuracies noted above in item 5.2 and 5.3 and the road length corrections to mid-block costings for roads RD01 to RD12 mentioned in section 5.4.

Within this statement I have only addressed items relating to the infrastructure costings work conducted by Cardno or influenced by previous work conducted by Cardno. Other items pertaining to planning such as changes to standard/ supplementary levies and caps that are based on these costings and were raised within certain submissions have not been addressed as these items are outside my role. Additionally, the comments provided and analysis conducted are only for C201 Mt Atkinson & Tarneit Plains ICP and not all PSPs affecting Melton City Council.