

ratio:

Prepared for:

Norton Rose Fulbright on behalf of
Adelaide Brighton Cement Limited

Prepared by:

Hilary Marshall

**Traffic and Transport Expert Evidence
Greater Geelong Planning Scheme
Amendment C395**

6 November 2019

r:

traffic:evidence

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Prepared for:

Norton Rose Fulbright on behalf of Adelaide
Brighton Cement Limited.
Our reference 16658PANEL001 D02 Geelong
Amendment C395

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1 Statement of Evidence

Reference

Greater Geelong Planning Scheme Amendment C395.

Name and Address

Hilary Anne Marshall - Director
Ratio Consultants Pty Ltd
8 Gwynne Street, Cremorne, VIC 3121

Professional Qualifications

Bachelor of Engineering (Civil) Hons, 1998, RMIT University
Bachelor of Business Administration (Management), 1998, RMIT University

Professional Experience

Director – Ratio Consultants	Jan 2018 - present
Senior Associate – Ratio Consultants	Jan 2016 – Dec 2017
Associate – Cardno	Nov 2015 – Jan 2016
Senior Engineer – Cardno	Feb 2011 – Oct 2015
Associate – Urban Crossroads, Irvine, California USA	2004-2006
Senior Engineer – Grogan Richards	2002-2004
Engineer – Grogan Richards	1999 - 2001

Professional Expertise

- 1.1.1 I have worked in the area of Traffic and Transportation Engineering throughout my career. My area of expertise includes traffic advice and assessment of a wide range of land use and development proposals for planning authorities, government agencies, corporations and developers.
- 1.1.2 My training, qualifications and experience including involvement with a wide variety of developments over a number of years, qualifies me to comment on the traffic and transport implications of this proposal.

Instructions which define the scope of this report

- 1.1.3 I have been instructed by Harwood Andrews on behalf of the City of Manningham, to undertake a review of the traffic and transport implications of the proposed North East Link road project and prepare an expert evidence statement for submission and presentation at the upcoming panel hearing.
- 1.1.4 My instructions from Norton Rose Fulbright are included in Section 2.2.

Facts, Matters and Assumptions Relied Upon

- 1.1.5 During preparation of this report the facts, matters and assumptions I have relied upon are outlined in Section 2.3.

Identity of Persons Undertaking the Work

- 1.1.6 Hilary Marshall of Ratio Consultants.

Declaration

- 1.1.7 I have read the Planning Panels Victoria Expert Witness guidelines (April 2019) and understand my obligations to the Panel.
- 1.1.8 I have no relationship with the client other than a business engagement to comment on this matter.
- 1.1.9 My involvement in this project commenced in September 2019 and I was not involved in the preparation of the Amendment or any associated planning.
- 1.1.10 I have made all the inquiries that I believe are desirable and appropriate and that no matters of significance which I regard as relevant have to my knowledge, been withheld from the Panel.



Hilary Marshall
Director: Traffic
Ratio Consultants

2 Introduction

2.1 Overview

- 2.1.1 I have been instructed by Norton Rose Fulbright lawyers on behalf of Adelaide Brighton Cement Limited (Adelaide Brighton), to provide my expert opinion with respect to the proposed Amendment to the Greater Geelong Planning Scheme (Amendment C395).
- 2.1.2 Amendment C395 seeks to implement the City of Greater Geelong's 'Settlement Strategy' (2018) and 'Northern and Western Geelong Growth Area Framework Plan' (2019).
- 2.1.3 This report has been prepared in accordance with the recently updated Planning Panels Victoria Expert Witness guidelines.
- 2.1.4 In the course of preparing this assessment, I have reviewed the existing conditions, examined the proposed road network plans and referred to the documents and plans outlined in the following instructions.
- 2.1.5 My opinions with respect to the traffic and transport issues relating to Amendment C395, that I have been asked to review, are set out in the following report.

2.2 Instructions

- 2.2.1 My instructions in this matter were provided by Norton Rose Fulbright on the 15th October 2019. The instructions were to undertake the following:
 - 1. *“Review the exhibited documents and background documents relevant to your area of expertise, including:*
 - a) *Northern & Western Geelong Growth Areas Framework Plan dated March 2019;*
 - b) *The City of Greater Geelong Settlement Strategy; and*
 - c) *Adelaide Brighton's written submission prepared by Golders dated 29 July 2019.*
 - 2. *Confer with instructing solicitors and counsel as necessary.*
 - 3. *Prepare an expert report considering traffic and transport matters associated with the AB site including (but limited to) a consideration of:*
 - a) *The appropriateness of the alternate alignment for the western arterial proposed by Adelaide Brighton;*
 - b) *The appropriateness of the alternative alignment for the Creative and Clever Corrido proposed by Adelaide Brighton; and*
 - c) *Any recommended changes to the Amendment documentation in relation to traffic and transport matters.*
 - 4. *Present your expert evidence at the Panel hearing to commence on 12 November 2019.”*

Additional Instructions

- 2.2.2 Further instructions were received from Norton Rose Fulbright on the 25th October 2019, as follows:

“Our client is no longer requesting the relocation of the sub-regional centre as part of this Amendment.

Our client's position is that, having regard to Amendment C395 to the Greater Geelong Planning Scheme, the location of the sub-regional centre as shown in the Northern and Western Geelong Growth Areas Framework Plan should be flexible and ultimately resolved during the PSP stage/s.

To the extent it is relevant to your area of expertise, you are requested to comment on the appropriateness of this approach in your report."

2.3 Facts, Matters and Assumptions

2.3.1 During the course of my assessment I have relied on the following facts, matters and assumptions:

- Site visit, Wednesday 23rd October 2019.
- Submission prepared by Golder on behalf of Adelaide Brighton Cement Limited dated 29/7/2019.
- Northern and Western Geelong Growth Areas Framework Plan, March 2019
- Northern and Western Geelong Growth Areas, Movement and Access Report (Reduced Size Format) prepared by GTA dated 14/6/2019.
- Batesford South RLUS, Preliminary Transport Impact Feasibility Assessment, by GTA, dated 20/10/2010.
- City of Greater Geelong's Settlement Strategy, October 2018.
- Greater Geelong Planning Scheme Clause 56-06, Clause 21.20,
- Powerpoint presentation by Michael Gerner of Golders titled Batesford South Masterplan, undated
- CAD files provided by Cardno TGM on the 28/10/2019

2.4 Limit of Review

2.4.1 Adelaide Brighton's land holdings are entirely contained within the Western Growth Area, as such I have focused my assessment on this part of the Framework Plan and other documentation that relates to the Western Growth Area, and have not reviewed the traffic and transport aspects of the Northern Growth Area with the exception of the road connections and their implications between the two growth areas.

2.4.2 In regards to assessing alternative alignments of the proposed North South Arterial road within the Western Growth Area, I have relied on the information prepared by Golder and Cardno TGM, which formed part of the submission put forward by Adelaide Brighton. The submitted information was provided to me in CAD format upon request.

2.4.3 Due to the limited time frames there was insufficient time to undertake detailed design review or investigate alternative alignments to those put forward by Cardno TGM and as such this review is based on the information provided, as detailed in Section 5.

2.5 Acronyms

2.5.1 For convenient reference a summary of commonly used acronyms in this report are outlined as follows:

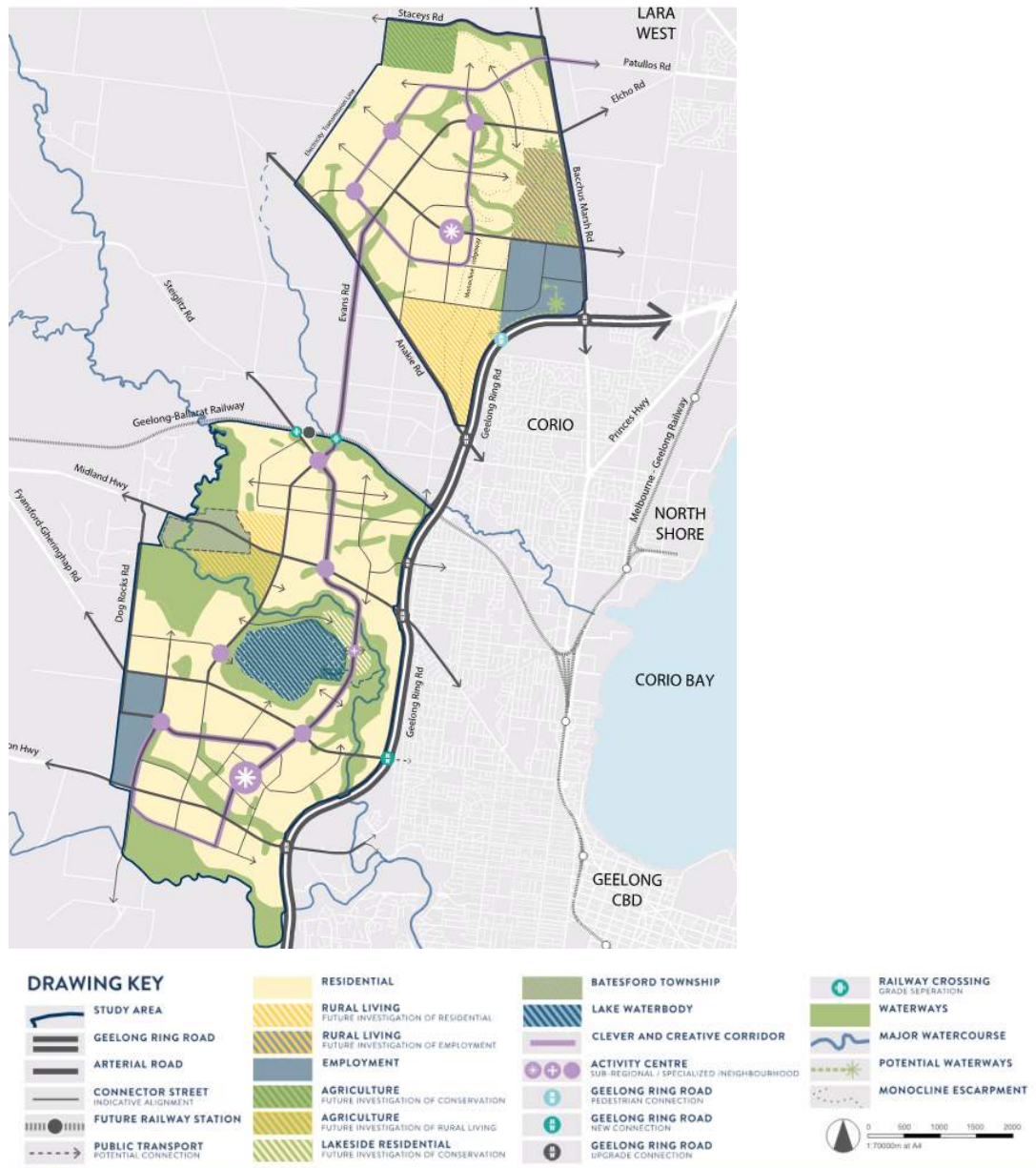
WGA	Western Growth Area
CCC	Clever and Creative Corridor
Adelaide Brighton	Adelaide Brighton Cement Limited
Vpd	vehicles per day
PSP	Precinct Structure Plan

3 Amendment C395

3.1 Overview

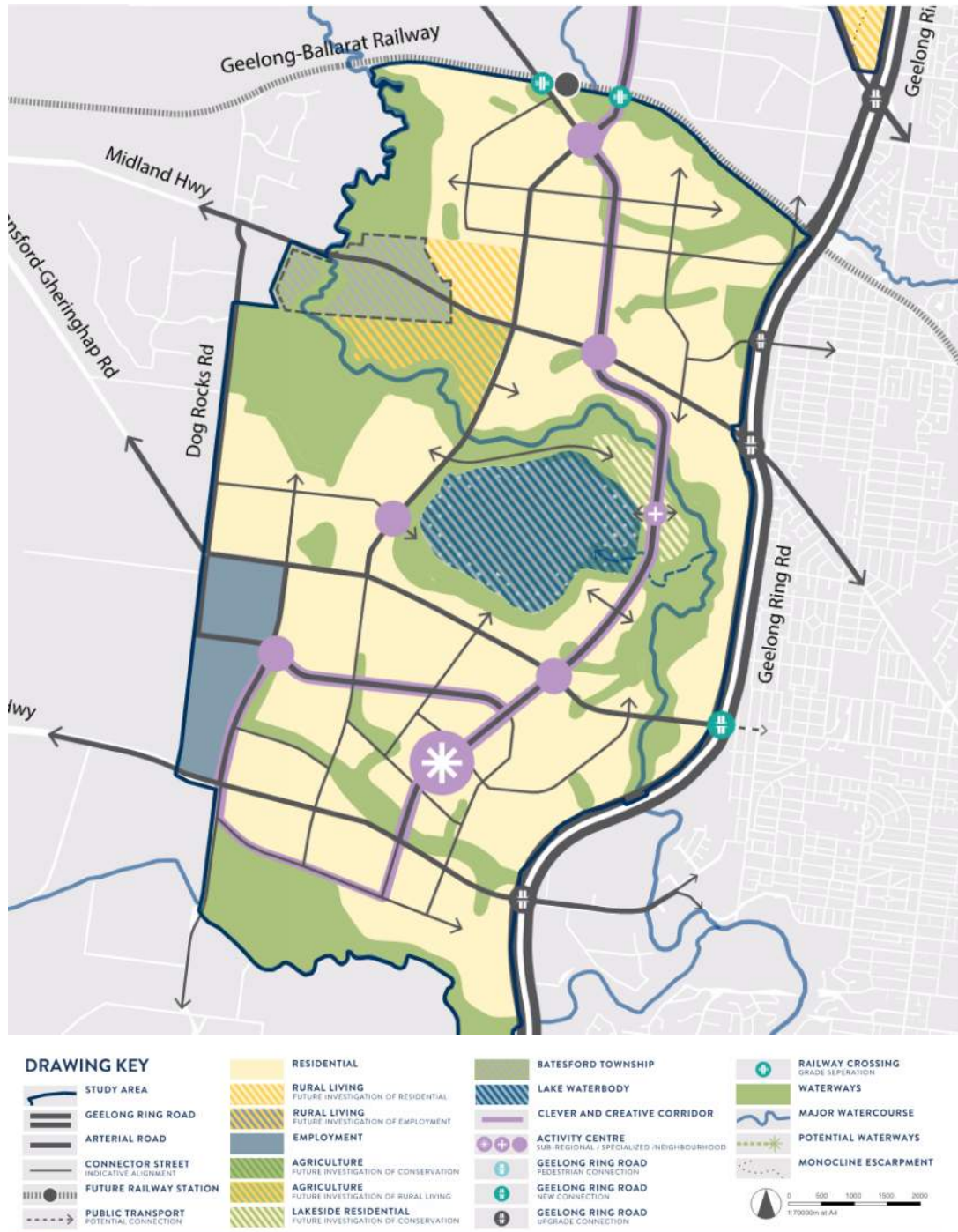
- 3.1.1 In order to plan for the proposed population growth in Geelong, the Greater Geelong City Council has proposed two new growth areas defined as the Northern and Western Growth Areas, respectively.
- 3.1.2 A Framework Plan has been prepared inclusive of both the Northern and Western Growth Areas, which was exhibited in July 2019.
- 3.1.3 A large number of submissions were received in regards to the Framework Plan including a submission by Adelaide Brighton.
- 3.1.4 The Future Urban Structure Plan proposed within the Framework Plan is reproduced as Figure 3.1.

Figure 3.1: Future Urban Structure Plan



3.1.5 An enlargement of the Structure Plan for the Western Growth Area is shown in Figure 3.2.

Figure 3.2: Future Urban Structure Plan – Western Growth Area



3.1.6 From a traffic and transport perspective, some of the key characteristics are as follows:

- The Geelong-Ballarat Railway Line forms the northern boundary of the Western Growth Area, with a potential future train station centrally located along the northern boundary of the Western Growth Area.
- The site is bordered by Geelong Ring Road to the east with connectivity provided via full diamond interchanges at Midland Highway and Hamilton Highway.

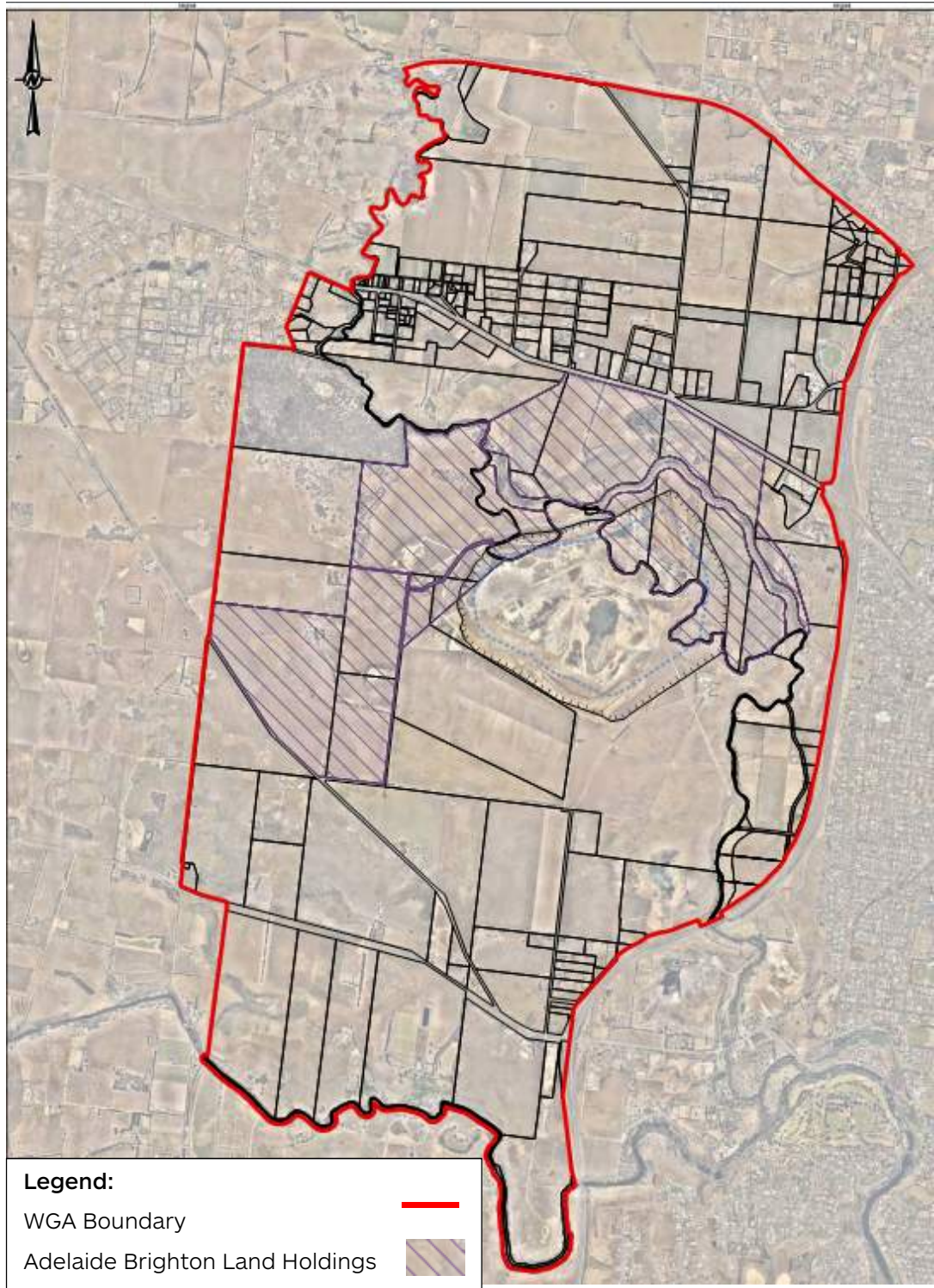
- The southern boundary of the Western Growth Area follows the Barwon River.
- The western boundary of the Western Growth Area is a combination of the Moorabool River north of Midland Highway, Dog Rocks Road between Midland Highway and Hamilton Road and Merrawarp Road south of Hamilton Highway.
- A north south Arterial is proposed through the center of the Growth Area.
- Existing east west Arterial Roads at Midland Highway and Hamilton Highway, with a new centrally located arterial in-between.
- Inclusion of 7 activity centre sites of varying size. The largest of the activity centres being a sub-regional centre towards the southern end of the Western Growth Area.
- A new crossing of the Geelong Ring Road centrally located between the Midland Highway and Hamilton Highway at Church Street.
- An interchange at Church Street is proposed to include an on and off ramp on the western side of the Ring Road only. Effectively allowing a left off and left on to the Ring Road from the Western Growth Area.
- A sustainable transport link that allows future separation of public transport is proposed to be located on the eastern side of the growth area, which has been referred to in the Framework documentation as a 'Clever and Creative Corridor'.

4 Adelaide Brighton Land Holding

4.1 Location and Context

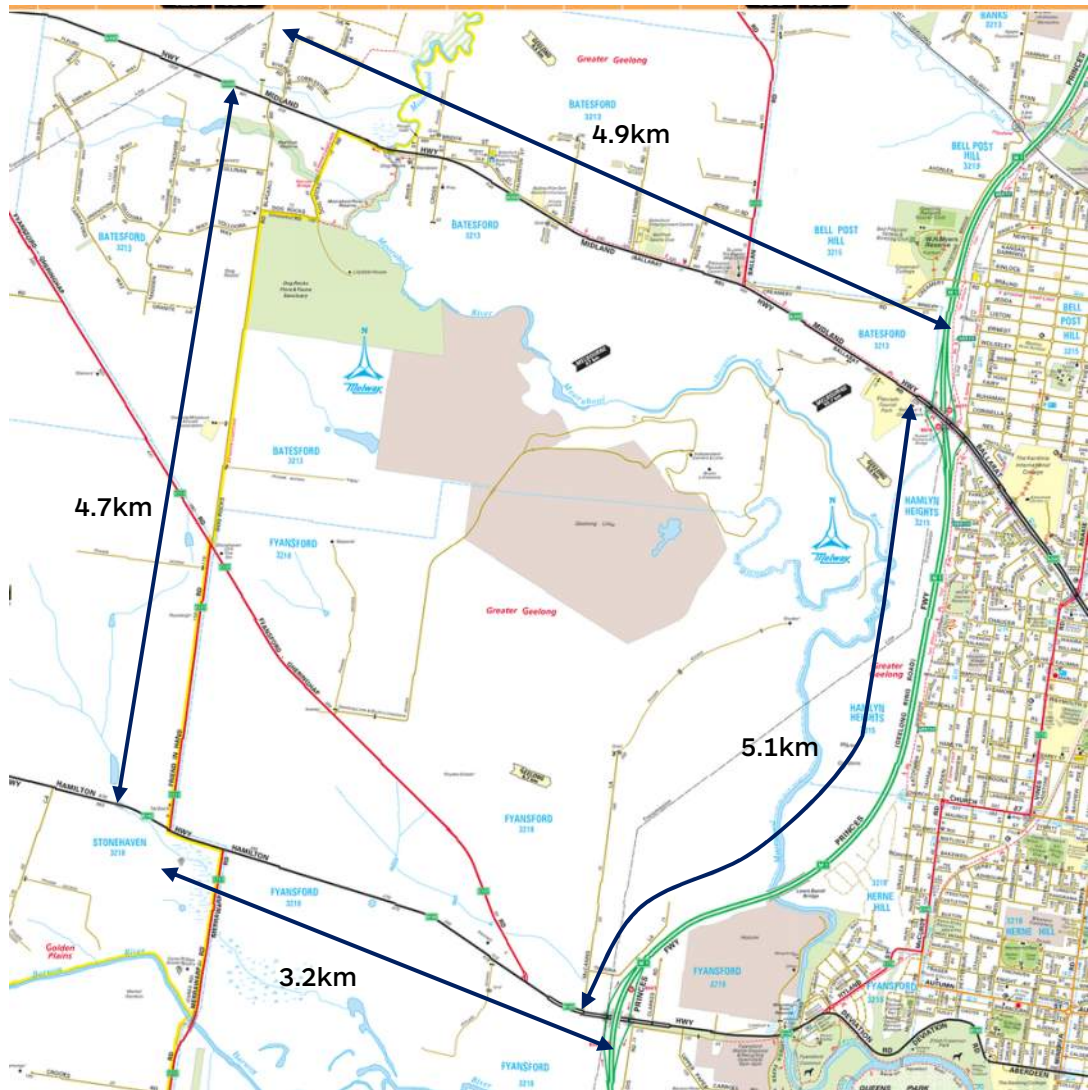
4.1.1 The Adelaide Brighton site is located south of Midland Highway and west of the Geelong Ring Road. Adelaide Brighton own a number of land parcels included in the Western Growth Area as shown in Figure 4.1.

Figure 4.1: Western Growth Area and Adelaide Brighton Land Holdings



4.1.2 The existing road network surrounding the subject site is shown in Figure 4.2. To put the area into context, distances between major intersections has been annotated as shown.

Figure 4.2: Surrounding Road Network and Locality Plan



Source: www.onlinemelway.com.au

As shown in the preceding figure, the distance between the major roads is summarised as follows:

- Midland Hwy from Geelong Ring Road to Dog Rocks Road ~ 4.9km
- Geelong Ring Road from Midland Hwy to Hamilton Hwy ~5.1km
- Dog Rocks Road from Midland Hwy to Hamilton Hwy ~ 4.7km
- Hamilton Hwy from Geelong Ring Rd to Dog Rocks Rd ~ 3.2km

4.2 Activities

4.2.1 It is my understanding that Adelaide Brighton manage limestone extractive activities at the Batesford Quarry within the Western Growth Area. Adelaide Brighton advised during my site visit that extraction activities are now confined to the east portion of the quarry and are anticipated to be completed by 2025.

4.2.2 Adelaide Brighton are currently undertaking landscape works to rehabilitate the land.

4.3 Adelaide Brighton Submission

- 4.3.1 Adelaide Brighton made a public submission in relation to the exhibited Amendment C395. As outlined in the submission, Adelaide Brighton are generally supportive of the adoption of the Settlement Strategy, Framework Plan and Amendment C395.
- 4.3.2 The issues raised in the Adelaide Brighton submission that I have been asked to review are as follows:
- The alignment of the Western Arterial through the Western Growth Area;
 - The location of the Clever and Creative Corridor through the Western Growth Area; and
 - If the location of the sub-regional centre at the southern end of the Western Growth Area should be resolved during the PSP process.
- 4.3.3 My review of the above matters and any other relevant considerations are discussed as follows:

5 Western Arterial Alignment:

5.1 Proposed Alignment

- 5.1.1 An arterial road is proposed to service the Western Growth Area generally aligned north south between the Northern Growth Area and Fyansford-Gherringhap Road.
- 5.1.2 The proposed alignment of the Arterial is shown in the Future Urban Structure Plan and reproduced as Figure 5.1. The Road Network Plan for the Western Growth Area, is reproduced as Figure 5.2.

Figure 5.1: Western Arterial Alignment through the Future Urban Structure Plan

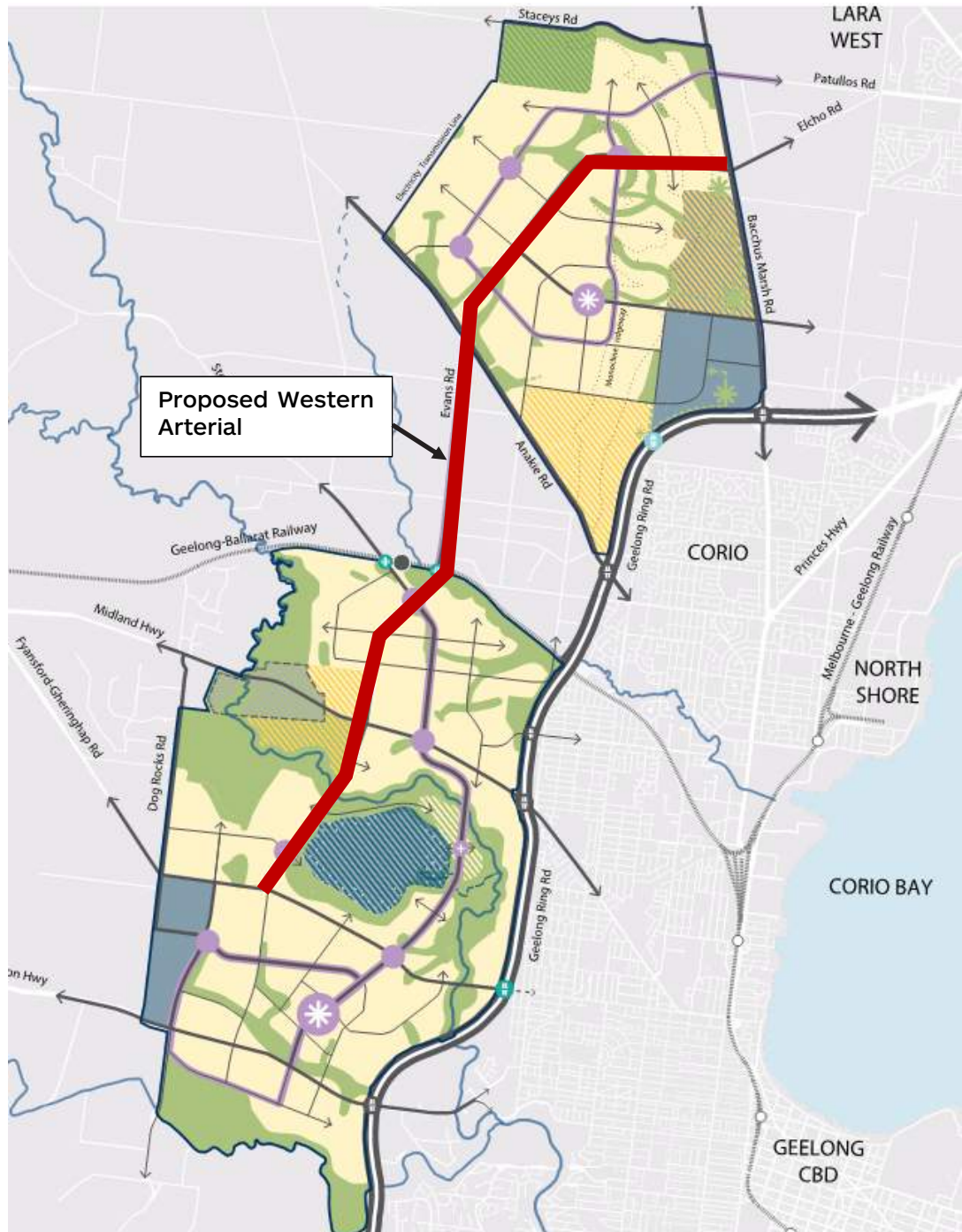
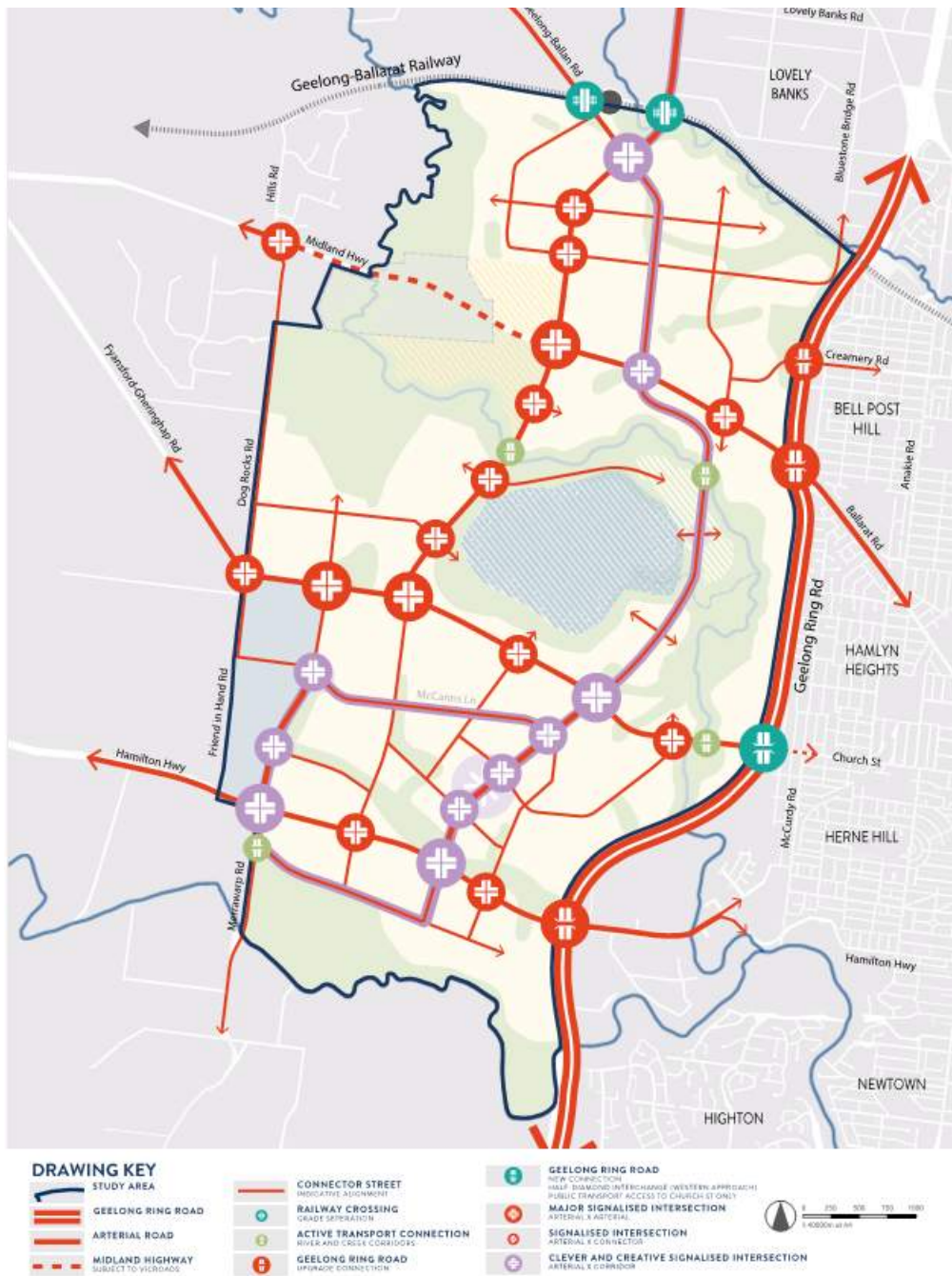


Figure 5.2: Western Growth Area Road Network Plan



- 5.1.3 The Arterial Road is proposed to connect to Elcho Road to the north and use the existing Evans Road alignment between the two growth areas. After crossing the Geelong Ballarat railway line, the arterial then deviates from the Evans Road alignment to cross the existing Geelong-Ballan Road at right angles continuing at an angle to then straighten up and cross Midland Highway at Lynnburn Avenue.
- 5.1.4 The arterial continues south of Midland Highway, crossing Moorabool River then following the western bank of the proposed lake. The north south arterial then intersects with the east west arterial which proposes to connect Fyansford-Gherringhap Road to Church Street.
- 5.1.5 There is no direct arterial road connection between Midland Highway and Hamilton Highway. The continuation of the arterial road south of Fyansford-Gherringhap Road is shown as a connector road.

5.2 Functionality of the Arterial

- 5.2.1 The function of an arterial is to provide a convenient connection between other arterial roads and major destinations. In this case the North South Arterial will provide a connection through the Western Growth Area from Midland Highway to the proposed east west arterial.
- 5.2.2 It is noted however that although the alignment continues to Hamilton Hwy the direct route south appears to be downgraded with priority transferred to the east west arterial, then south to Hamilton Hwy via the Clever and Creative Corridor.
- 5.2.3 I don't believe this is an appropriate location for the Western Arterial to end. Typically, you would expect the southern continuation to be an arterial connecting though to Hamilton Highway. As it is shown, vehicles will either use the Connector Road as a pseudo arterial or will divert to the east using the CCC link instead.
- 5.2.4 The Arterial will also provide a more regional connection, continuing to the north to provide a link through the Northern Growth Area.
- 5.2.5 Based on the traffic modelling undertaken by GTA Consultants, the anticipated traffic volumes through the Western Growth Area are shown in Table 5-1.

Table 5-1: Anticipated Daily Traffic Volumes – GTA Modelling Scenarios

GTA Run Ref.	Scenario	Midland Hwy range (vpd)	Hamilton Hwy range (vpd)	Western Arterial, Nth of Midland Hwy (vpd)	Western Arterial, Sth of Midland Hwy (vpd)	CCC Sth of Midland Hwy (vpd)	Church St (vpd)
NA	Existing Conditions (2016)	14,000	9600	NA	NA	NA	NA
PC02	2031 with ext upgrades	23,200-35,000	43300	10600	NA	NA	NA
PC04	2051 with ext upgrades	40,000-54200	23000-64000*	28200	24940	7600	NA
PC05	2051 no external upgrades + 1 connection to Anakie Rd	41600-54100	27000-67000*	28000	27900	8800	NA
PC06	2051 with ext upgrades + 1 connection to Anakie Rd	38700-53800	22850-63400	27500	23500	7600	NA
PC07	2051 no ext works but with Church St	38300-51000	28000-42000	28000	23500	6700	15500
PC08	2051 with ext works and Church St	37000-51600	35000-58300	27500	21300	6100	13900
PC09	2051 No ext works with realigned arterial	39300-53800	27800-not shown	25600	14100	21200	NA

Source: GTA Traffic Modelling Report

Notes:

** volume interpolated from adjacent volumes as not shown on the results

Midland Highway includes the range from east of the Arterial to west of the Ring Road

Hamilton Highway includes range from east of Arterial Road to west of the Ring Road

- 5.2.6 The preceding modelling indicates that the North South Arterial will carry in the order of 25,000 to 28,000 vehicles per day.
- 5.2.7 An arterial also needs to provide access to the adjacent land, typically at Connector Road intersections.
- 5.2.8 Connector Road / Arterial Road intersections are generally signalised, with intersections between signals restricted to left in / left out.

5.3 Road Design Principles

- 5.3.1 As outlined in Clause 56-06 of the Geelong Planning Scheme, arterial roads should be at intervals of approximately 1.6km that have adequate reservation widths to accommodate long term movement demand.
- 5.3.2 Clause 56-06 also states that Connector Roads should be located approximately half way between arterial roads.
- 5.3.3 As previously shown in Figure 4.2, the Western Growth Area has a frontage of approximately 4.9km to Midland Highway. On this basis, it would be reasonable to assume that Dog Rocks Road would become a north south arterial once development occurs further west and that 2 other arterial roads could be located between the Ring Road and Dog Rocks Road based on standard design principles.
- 5.3.4 Only one arterial road connection is proposed, with the Clever Creative Corridor replacing the second arterial and providing a Connector Road capacity traffic link.
- 5.3.5 The GTA modelling suggests that the Western Arterial will carry a maximum of up to 28,000 vehicles per day, with the Clever Creative Corridor carrying up to 9000 vpd.
- 5.3.6 On the basis of the modelling provided, the provision of a 4 lane arterial through the Western Growth Area, supported by a Connector Road capacity traffic link appears appropriate.
- 5.3.7 The CCC is proposed to provide one lane in each direction with indented parallel parking, giving it the same theoretical capacity as a Connector Road, which has a theoretical capacity of around 7,000vpd. It is noted that under most scenarios modelled by GTA, that the traffic volumes will exceed this theoretical capacity. However, I am not concerned by this, as many two lane roads function adequately with similar or higher volumes.
- 5.3.8 It is noted that the modelling suggests that all CCC scenarios modelled will either be at this level of traffic activity or higher, with the exception of PC07 and PC08 which includes a connection to Church Street across the Ring Road.
- 5.3.9 The relatively high traffic volumes on the CCC may increase delays for pedestrians, cyclists and public transport.
- 5.3.10 It is also noted that direct lot access is not typically provided to arterial roads and as such all abutting development would require a frontage road in the order of 14m wide. Assuming a lot depth of at least 28m means that there needs to be at least 32m of developable width adjacent to the edges of the Arterial to facilitate residential development.

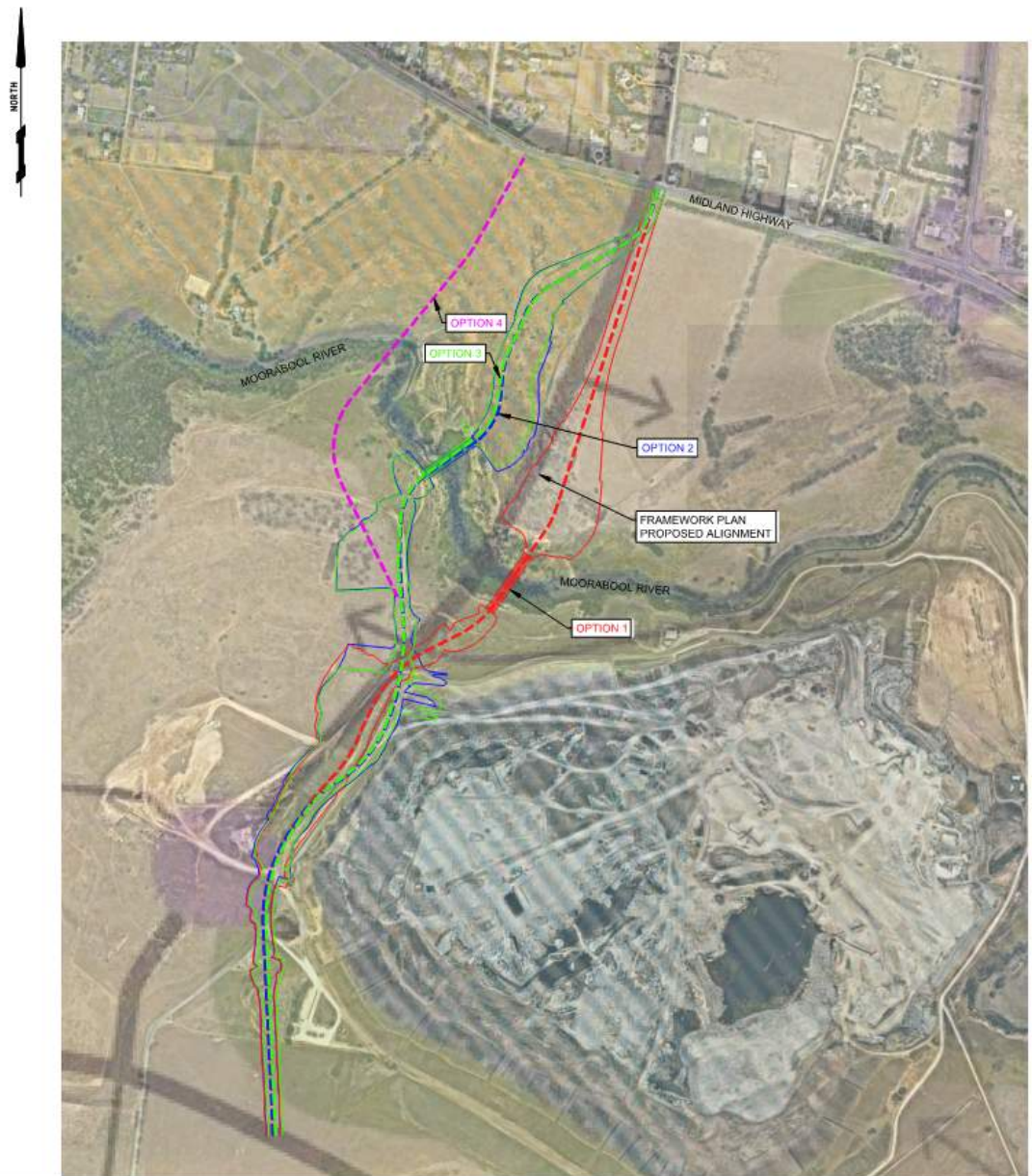
5.4 Limitations of Road Alignment Review

- 5.4.1 The following review is based on the preliminary work prepared by Golder and Cardno TGM, which formed part of the Adelaide Brighton submission to Amendment C395.
- 5.4.2 There has been insufficient time to prepare and test alternative road alignments and as such the following review is based on the 4 options prepared by Cardno TGM.
- 5.4.3 I do not have expertise in preparing cost estimates and have therefore relied on the information provided in regards to comparative costs.

5.5 Alternative Road Alignment Options

- 5.5.1 Golder Associates in conjunction with Cardno TGM were commissioned by Adelaide Brighton to review the alignment of the proposed north south arterial road through the Western Growth Area. As part of that review, Golders and Cardno TGM reviewed the proposed alignment, as well as exploring 3 other alternatives.
- 5.5.2 The 4 alternative options are indicatively shown in the following figure, prepared by Cardno TGM.

Figure 5.3: Alternative Arterial Road Alignments



Source: Cardno TGM letter dated 23/7/2019

- 5.5.3 The four options are described as follows:

Option 1

Option 1 aims to replicate the alignment shown in the Framework Plan, with the exception of the bridge crossing location which has been moved approximately 35m to the east, to reduce the bridge span required.

- 5.5.4 The dashed red lines either side of Option 1 indicate the extent of batter expected.

Option 2

- 5.5.5 Option 2 uses the same intersection at Midland Highway opposite Lynnburn Road as proposed in the Framework Plan, the alignment then moves to the west, to cross Moorabool River approximately 300 metres west of Option 1.
- 5.5.6 Option 2 aims to take advantage of the side of the hill to reduce the overall longitudinal grades along the road alignment.

Option 3

- 5.5.7 Option 3 uses the same alignment and river crossing location as Option 2, but has a split carriageway in some locations to better reflect the topography.
- 5.5.8 As cross sections and a longitudinal section have not been prepared the difference between Option 2 and 3 is not discernible based on the information provided.

Option 4

- 5.5.9 Option 4 uses an alternative access location to Midland Highway, approximately 300m to the west of Lynnburn Road. The resulting Moorabool River crossing location is approximately 600m upstream from Option 1.
- 5.5.10 After crossing Moorabool River, Option 4 curves to the south east to join up with the preceding 3 options adjacent to the lake.
- 5.5.11 Option 4 was not explored in detail by Cardno TGM as they determined that the bridge span, due to Moorabool River flood plain, would be approximately twice the length of the other options, which would significantly increase the cost of construction for Option 4.

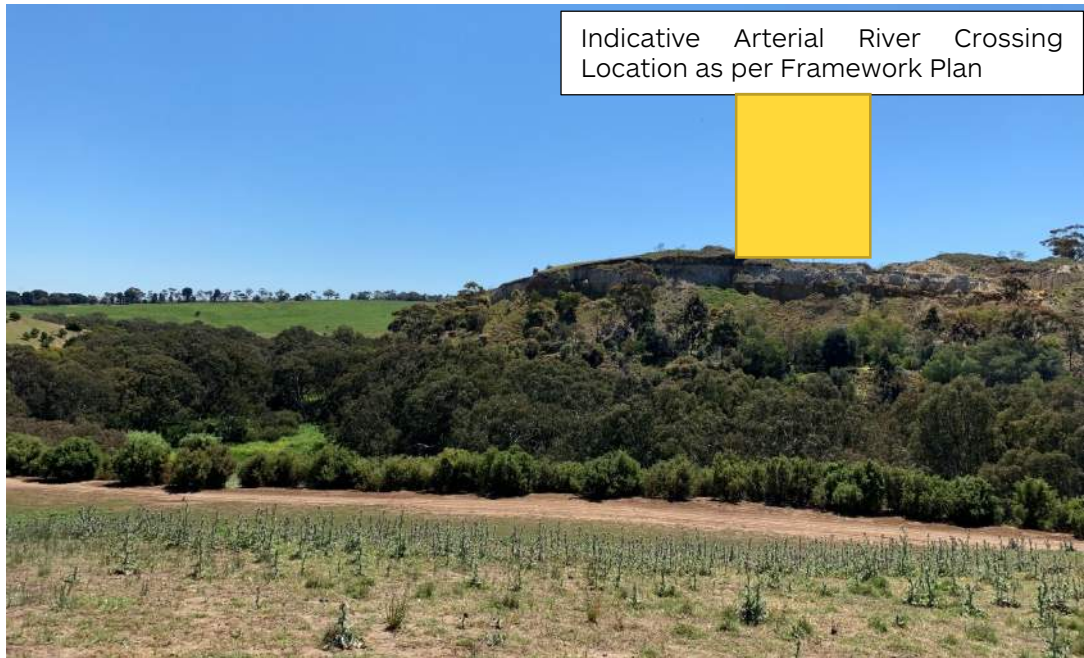
Southern Alignment

- 5.5.12 All four options deviate to the east of the proposed road alignment at the southern end of the proposed lake. The Cardno TGM letter dated 23/7/2019, states that all four options have adopted the deviation to the east at the southern end due to a 15m high embankment that would require extensive earthworks to achieve appropriate grades.
- 5.5.13 It is noted that in the framework plan an activity centre appears to be located on top of the hill referenced by Cardno TGM.

5.6 Constraints

- 5.6.1 The topography of the land between Midland Highway and the southern edge of the proposed lake is particularly challenging due to steep slopes and the need to cross Moorabool River.
- 5.6.2 For example, the proposed Arterial intersection at Midland Highway is at approximately RL 74, whilst the River is approximately RL 6.2, resulting in a vertical difference in the order of 68 metres.
- 5.6.3 I requested and received a copy of the feature and level survey used by Cardno TGM to better understand the topography constraints.
- 5.6.4 The complexity is further increased by the nature of the proposed arterial road and ensuring that the design is appropriate for public transport services and trucks. The maximum design grade for a bus capable road is typically 9%, however the extent of road at this grade should be limited to around 400m in length.
- 5.6.5 Any future road design will require input from multiple disciplines to ensure that it not only satisfies road alignment and grade requirements, but is sensitive to its environment, buildable and economically viable.
- 5.6.6 During my site visit I took photos of the proposed river crossing location.

Figure 5.4: View of escarpment where current arterial road would cross Moorabool River



- 5.6.7 As shown in the preceding photo, the proposed river crossing location shown in the Framework Plan crosses at one of the highest points of the escarpment along the northern side of the Moorabool River north of the future lake.
- 5.6.8 I was advised by Adelaide Brighton that the escarpment shown in the photo needed remediation works due to historical mining practices along the creek.

Figure 5.5: View of potential river crossing locations upstream from escarpment



- 5.6.9 As shown in the preceding photograph, the slope abutting the river reduces to the west of the proposed alignment.

5.7 Preferred Road Alignment

- 5.7.1 Based on an analysis undertaken by Cardno TGM and Golders, Option 3 was deemed to be the preferred route.

- 5.7.2 The CAD plans provided do not include a longitudinal section or details of the grade separation between the northbound and southbound lanes. Therefore, I have not been able to verify the advantage of Option 3 over Option 2.
- 5.7.3 Although the grade separation of the two carriageways may make sense from an engineering perspective, it could potentially restrict access to the road and require additional width to accommodate batters, retaining walls, barriers etc.
- 5.7.4 Option 3 is reproduced as Figure 5.6.

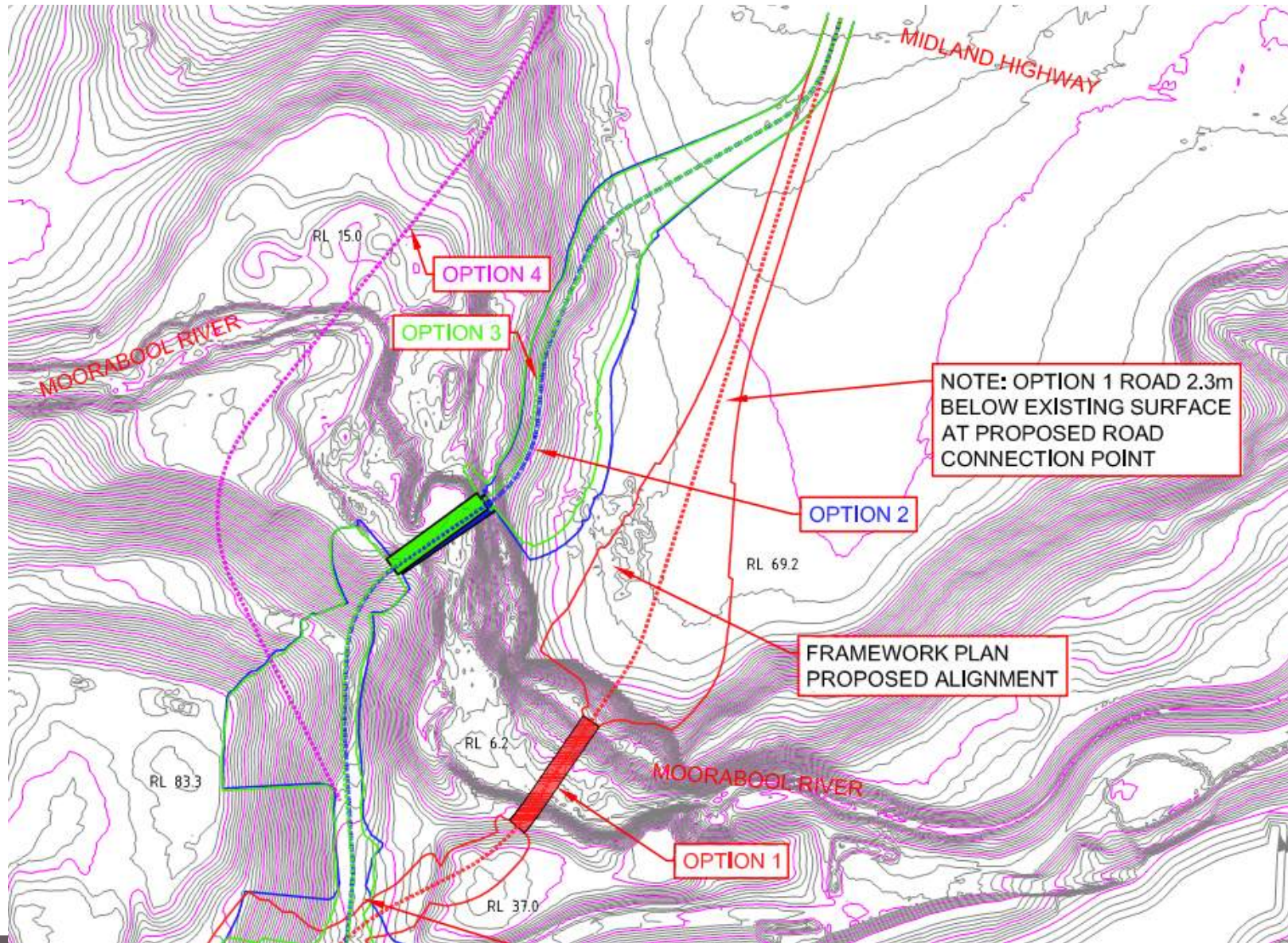
Figure 5.6: Cardno TGM Option 3 Alignment



Source: Golders submission on behalf of Adelaide Brighton

- 5.7.5 A copy of the preceding alignment overlaid on the feature survey by Cardno TGM is shown in Figure 5.7.

Figure 5.7: Alternative Western Arterial Road Alignments Prepared by Cardno TGM



Source: Cardno TGM CAD file provided 28/10/2019



5.8 Discussion

- 5.8.1 The proposed North South Arterial is anticipated to be a Secondary Arterial with a width of 34m. Typically, the road cross section is reduced to a minimum at a bridge crossing. To provide 2 lanes in each direction plus shared path on both sides would still require a 20m wide bridge.
- 5.8.2 As shown in Figure 5.7, the lines indicating batter are generally only required on the eastern side of Option 2/3, compared to the considerable width required for Option 1. This is due to Option 2/3 being cut into the side of the hill rather than in trench through the hillside as per Option 1.
- 5.8.3 All options considered demonstrate that more land will be required than a typical 34m arterial to accommodate batters, retaining walls etc.
- 5.8.4 The preliminary work undertaken by Cardno TGM suggests that the arterial road and associated bridge crossing through the Batesford South PSP area will cost substantially more than a typical arterial road.
- 5.8.5 The cost of the arterial road needs to be established at the outset of the planning process so that appropriate cost sharing measures can be established across the various PSPs and/or external sources of funding identified if necessary.

5.9 Opinion

- 5.9.1 Based on the preceding review, I believe there is merit in relocating the Arterial Road further to the west for the following reasons:
- Option 2/3 as provided appear to respond more sympathetically to the topography, potentially requiring less earthworks, retaining walls and batters.
 - Moving the road to the west would potentially negate the need for a significant trench through developable land.

6 Clever and Creative Corridor

6.1 Overview

- 6.1.1 As a means of promoting and prioritising sustainable transport choices, Geelong have developed a Transport Corridor with a wide central median that will ultimately allow separation of public transport services in the future. Geelong have named the transport route the Clever and Creative Corridor.
- 6.1.2 In the interim, the Cleve and Creative Corridor (CCC) will function as a bus capable Connector Road with one traffic lane in each direction shared with bus services and indented parallel parking. Footpath and a shared path are also proposed, as per a Connector Road cross section.

6.1 Proposed Cross Section

- 6.1.1 The proposed Clever and Creative Corridor is proposed to be developed with an Ultimate and Interim scenario.
- 6.1.2 The Framework Plan suggests that the overall cross section width is likely to be around 40m.
- 6.1.3 The interim cross section is indicatively shown in the Framework Plan and reproduced as Figure 6.1.

Figure 6.1: Indicative Interim Clever and Creative Corridor Cross Section



- 6.1.4 As shown in the preceding figure, the central public transport corridor of 14m will be used as open space with a shared path., until sufficient demand warrants a dedicated public transport route.
- 6.1.5 In the interim the traffic lanes shown on the preceding figure will be shared with bus services.
- 6.1.6 The Ultimate cross section is indicatively shown in the Framework Plan and reproduced as Figure 6.2.

Figure 6.2: Indicative Ultimate Clever and Creative Corridor Cross Section

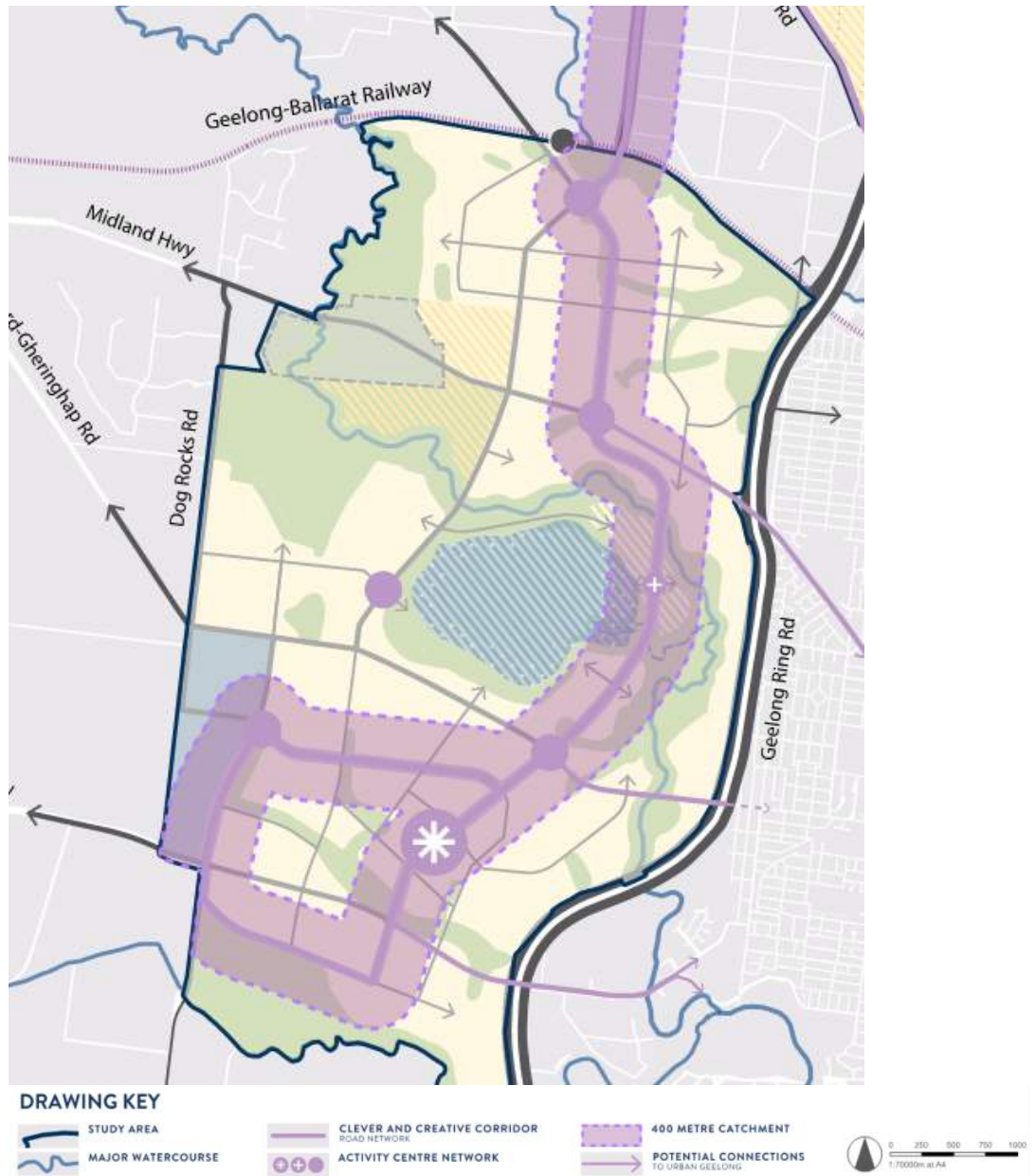


- 6.1.7 The Ultimate cross section shows the shared path being relocated from the central median to the edge, to allow for the dedicated public transport corridor.
- 6.1.8 Sustainable transport movements are currently well catered for with a typical Connector Road cross section of 25-26m. The standard Connector Road cross section adopted by the VPA in other growth areas, provides one bus capable traffic lane in each direction, indented parking, landscaped verges, a shared path and footpaths on both sides. Therefore, the only element of the above cross section that is a variation from this functionality is the 14m central median.
- 6.1.9 On that basis, I don't believe it is necessary to reserve a corridor of 40m or greater to achieve the long term aim of reserving land for a future public transport service. As long as an appropriate road network is provided to service the adjacent land uses, then a single 14m corridor should be sufficient to achieve this long term ambition.
- 6.1.10 Furthermore, in my opinion a road network that intermittently departs from the public transport corridor would allow larger open space opportunities at some locations and development opportunities closer to the corridor at others.

6.2 Catchment Area

- 6.2.1 The proposed route of the CCC is shown in Figure 6.3, including a 400m catchment either side of the corridor.

Figure 6.3: Clever Creative Corridor through the Western Growth Area



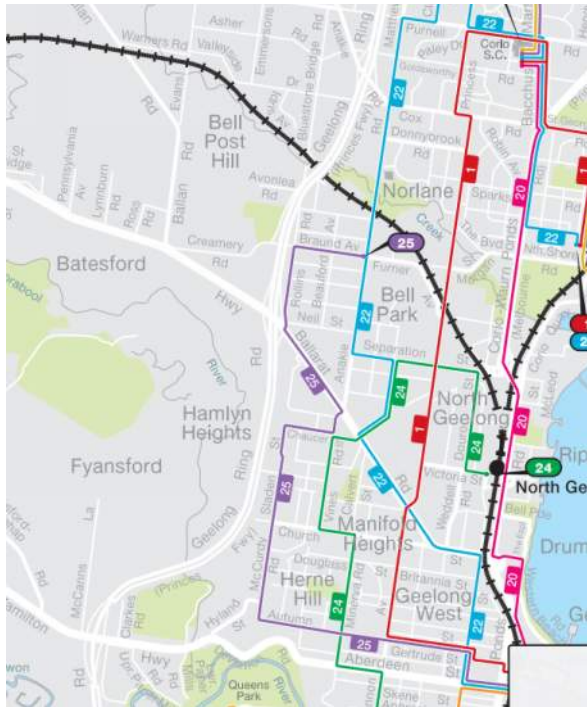
Source: Pg 44 of the Framework Plan

- 6.2.2 Although only a 400m catchment area is shown on the preceding plan the transport corridor will also provide convenient services for residents up to a km from the stops noting that this would be a 10-12 min walk.

6.3 Existing Public Transport

- 6.3.1 Existing public transport services in the vicinity of the site are shown in Figure 6.4.

Figure 6.4: Existing Public Transport Routes Near Western Growth Area



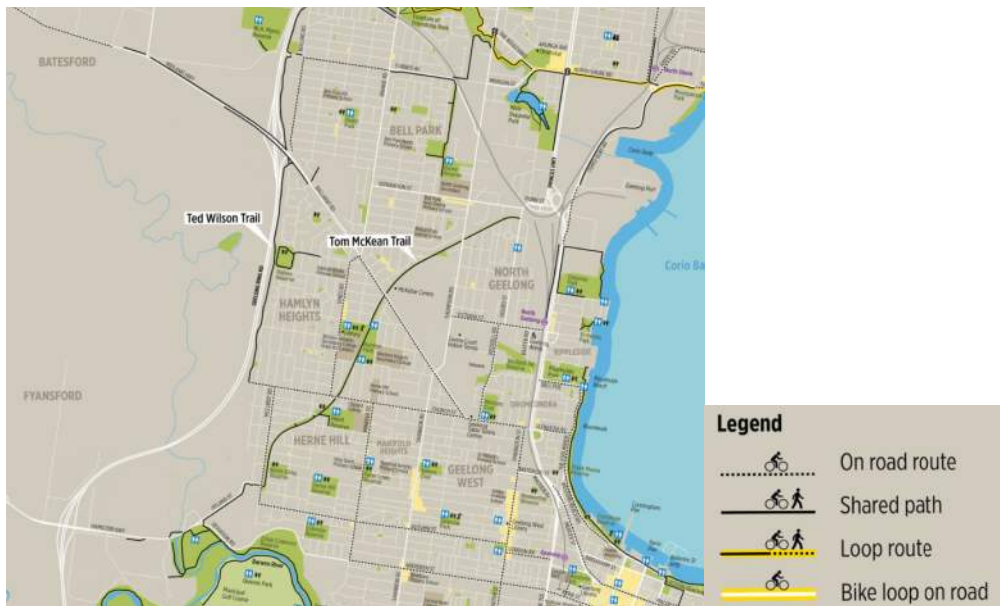
Source: PTV.vic.gov.au

- 6.3.2 As shown in the preceding figure, local bus services currently operate in close proximity to the eastern side of the Geelong Ring Road

6.4 Existing Cycling and Shared Paths

- 6.4.1 The following figure, demonstrates the existing bicycle and shared path network in the vicinity of the Western Growth Area.

Figure 6.5: Existing Cycling and Shared Path Network



Source: www.youareheremaps.com.au/Geelong/sharedpaths

- 6.4.2 As shown in the preceding figure, bike paths are currently provided along Midland Highway and on the eastern side of the Ring Road.

- 6.4.3 An on road bike path is also provided along Church Street, providing a link to the Geelong Foreshore and Central Geelong.

6.5 Issues

- 6.5.1 Although I support the intentions of providing a Clever Creative Corridor, I believe there are a number of issues with the proposed route of the CCC through the Western Growth Area, which are discussed as follows:

Connectivity to Existing Services

- 6.5.2 The CCC as proposed will provide good connectivity for pedestrians and cyclists through the growth area, however I believe it provides limited accessibility to existing infrastructure and existing public transport services.
- 6.5.3 The proposed route provides good north south connectivity but would require passengers to transfer to a different service to travel to areas outside the two growth areas, such as central Geelong, the coast or the nearest train station.
- 6.5.4 Given that the ambition of the growth areas is to provide public transport services at an early stage of development, the most efficient and economical way to do that is to tap into existing sustainable transport infrastructure.
- 6.5.5 Connectivity to existing public transport and infrastructure allows residents to start using alternative modes of transport, to the private vehicle earlier, whilst activity centres and places of employment are developed within the growth area.

Separation of northbound and southbound traffic lanes

- 6.5.6 The indicative cross sections indicate that the northbound and southbound traffic lanes will be separated by the central median, proposed to be 14m in width. I believe this will be a less practical design outcome for the following reasons:
- Traffic signals become very wide, reducing efficiency and significantly increasing the distance for pedestrians to cross the road.
 - Construction of the road is likely to cost more due to the having to construct two separate carriageways with associated kerb and channel both sides, plus 2 separate construction areas, earthworks, drainage etc, compared to construction of a single 2 way carriageway.
 - The central median is proposed to be a shared path / recreational area, which will have traffic movements on both sides. A safer option would be to restrict vehicle movements to one side where possible.
 - Providing a 2 way carriageway on one side, would provide opportunities for cyclists to gain access to the central shared path (interim treatment) without having to cross a road.

Speed

- 6.5.7 The framework study suggests that the corridor will be designed with a 40kph speed limit. This limit may be appropriate in some locations, such as schools or activity centres during business hours, but would otherwise unnecessarily slow down any public transport service and cyclists.
- 6.5.8 The proposed corridor largely separates the various modes of transport, such that conflict between the various modes would be minimised. On that basis a higher speed limit than 40kph would in my opinion be appropriate and reduce travel times.

Movement Restrictions

- 6.5.9 The framework study suggests that right turn movements across the corridor would be banned.

- 6.5.10 Banning right turns is not considered an appropriate treatment, although this may be appropriate at certain locations, it is not a reasonable approach for the entire corridor. The ban would result in unnecessary vehicle movements created by drivers diverting to a longer route in order to get to and from their desired location.
- 6.5.11 The right turn ban also has the potential to reduce the attractiveness of visiting the other side of the road, as it will be deemed too hard to get to.
- 6.5.12 In my opinion, the ban seems unnecessary and would create a greater number of vehicle movements and longer travel paths, whilst vehicles find an alternative route to arrive at their desired destination.

Connection between Northern and Western Growth Areas

- 6.5.13 The CCC link between the two growth areas proposes to use Evans Lane between the railway line and Anakie Road. The section between the growth areas is approximately 3km in length.
- 6.5.14 Evans Road is currently unsealed and would require widening and upgrade to facilitate the proposed corridor.
- 6.5.15 As this section of corridor is not included in either growth area, it is unclear how this section could be funded, unless the adjacent land was also developed as a future growth area.
- 6.5.16 The corridor would need an alternative (reduced) cross section through this section, as obtaining the land from adjacent properties that are not in a growth area would be very difficult.

Demand

- 6.5.17 Neither growth area contains a major employment hub or significant land use, such as a university, making the north south demand largely about local shopping and recreational trips.
- 6.5.18 I am not convinced that there will be sufficient demand for north south movements between the two growth areas to justify the provision of a dedicated public transport service.

Catchment Area

- 6.5.19 The proposed path of the corridor on the eastern side of the lake appears particularly constrained. The proposed corridor appears to double back on itself as it travels south of Midland Highway, such that it is approximately 200m from Midland Highway. The route then crosses Moorabool River and continues south between the relatively narrow space between the future lake and Moorabool River.
- 6.5.20 It is anticipated that the River and the Lake will require buffers such that the amount of developable land between the two will be limited.
- 6.5.21 The confined catchment area is highlighted on Figure 6.6.

Figure 6.6: Clever and Creative Corridor East of Lake



- 6.5.22 The expected 400m catchment has been overlaid on the preceding plan, which indicates that the proposed section of the CCC between Midland Highway and Church Street would not achieve 400m of developable area on either side, let alone facilitate a second tier catchment for residents in the 400-800m radius of the corridor.
- 6.5.23 The portion of the corridor highlighted in red in the preceding figure, is approximately 3km long. This is a significant length of the corridor that would have less than desirable accessibility.

Bridges

- 6.5.24 The proposed Framework Plan proposes 2 new crossings of Moorabool River within the Batesford South PSP area. Both crossings will require bridges to span the river.
- 6.5.25 As it is currently proposed the western arterial will be a 34m cross section with the second crossing accommodating the 40m wide Clever and Creative Corridor. Although both road cross sections will undoubtedly be reduced at the bridge structure, they will still both need to be considerable structures to accommodate the aspirations of the road network proposed.
- 6.5.26 Given the catchment limitations of the proposed CCC route, it would seem reasonable to me to provide the CCC on the west side and provide a shared bridge.
- 6.5.27 I support the inclusion of a second river crossing, however if the arterial and the CCC were accommodated in the initial bridge crossing, the second bridge could be delivered at a later stage.
- 6.5.28 The second bridge crossing on the eastern side, could comprise one bus capable traffic lane in each direction, plus shared paths on each side that would still facilitate all modes of sustainable transport including a future bus service.

6.6 Opinion

- 6.6.1 The proposed road network of Connector and Arterial Roads will provide good bicycle connectivity throughout the growth area.
- 6.6.2 All roads within growth areas typically have footpaths on at least one side, facilitating good pedestrian movement through the various neighbourhoods.

- 6.6.3 In addition to the above, there will be opportunities for off road shared paths along the river corridors, around the lake and other open space recreational areas.
- 6.6.4 Therefore, the unique aspect of the Clever and Creative Corridor is the proposal to reserve the 14m central median as a dedicated public transport corridor in the future.
- 6.6.5 I believe the aspiration of retaining a future 14m wide corridor is to be supported and facilitated in the framework plan and the subsequent PSPs.
- 6.6.6 I do not believe that the 14m corridor needs to have an adjacent road shadowing it the entire length from north to south and that the flexibility to move the road away from the public transport corridor will be beneficial in my opinion. For example if development was able to occur adjacent to the public transport corridor, then it would reduce the walking distance between destinations and access to the public transport. It would also allow better visibility of adjacent services and facilities from the corridor.
- 6.6.7 Based on the preceding discussion, it is my opinion that in order to facilitate a timely, well utilised public transport corridor, it should achieve the following:
- Connect with existing services on the eastern side of the Ring Road as soon as practicable.
 - Exclude the link between the two growth areas, until such time as the intervening area is nominated for future growth.
 - Remove the proposed restrictions on right turn movements across the corridor.
 - Design the route for speeds greater than 40kph wherever appropriate.
 - Combine arterial and public transport corridor on the western side of the WGA so that one large bridge can be provided in this location and the second river crossing to the east can be reduced in size.
 - Maximise the catchment area by relocating the corridor to the western side of the lake within the Western Growth Area.

7 Sub-Regional Activity Centre

7.1 Adelaide Brighton's Position

7.1.1 Norton Rose Fulbright provided the following instructions for consideration:

Our clients position is that, having regard to Amendment C395 to the Greater Geelong Planning Scheme, the location of the sub-regional centre as shown in the Northern and Western Geelong Growth Areas Framework Plan should be flexible and ultimately resolved during the PSP stage/s.

To the extent it is relevant to your area of expertise, you are requested to comment on the appropriateness of this approach in your report."

7.2 Sub-Regional Activity Centre Considerations

7.2.1 I agree that the Activity Centres will largely be resolved during the preparation of the PSP's for each precinct and that the Sub-Regional Activity Centre will require an Urban Design Framework Study prior to commencement of any planning applications.

7.2.2 However, it is my opinion that the location of the dots representing Activity Centres should be located to some degree of accuracy during the development of the growth area plans.

7.2.3 I form this view based on the following considerations:

- Large Activity Centres should be located in close proximity to the arterial road network to facilitate convenient access by patrons external to the development area.
- The density of development in any given area is influenced by its proximity to an activity centre. For example, high density residential uses should be located in close proximity to an activity centre.
- The ambition of the Clever and Creative Corridor is for it to link up the activity centres and as such the location of the activity centres will largely dictate the CCC route.
- As I have suggested further work is required on the proposed road network and CCC, it follows that the activity centre locations will also require consideration of any such changes.

8 Other Matters:

8.1 Church St Connection

- 8.1.1 Of relevance to the planning of the WGA is the potential connection to Church Street approximately midway between Midland Highway and Hamilton Highway from the Batesford South PSP area.
- 8.1.2 I consider discussion and planning for this connection should be included in the Framework Plan and subsequent PSP.
- 8.1.3 The Integrated Transport section of the NWGAFP suggests that a half diamond interchange may be provided to the Geelong Ring Road providing an on and off ramp to the west side of the Ring Road only.
- 8.1.4 The GTA study suggests that a “dedicated public transport” connection to Church Street may be one of the ‘interventions’ required in the Western Growth Area.
- 8.1.5 Based on the GTA modelling, the 2051 scenario (PC07 and PC08) suggests that the Church Street link would carry in the order of 15,500vpd without external improvements and 13,900vpd with external improvements, immediately west of the Ring Road.
- 8.1.6 This indicates that in the order of 14,000 to 15,500vpd would be removed from the Midland Highway and Hamilton Highway interchanges.
- 8.1.7 A connection to Church Street would significantly reduce travel times for all modes of transport from the centre of the Western Growth Area. Without the link residents would have a 2.5km trip from the centre of the WGA to get to either Midland Hwy or Hamilton Hwy to travel east.
- 8.1.8 The Ring Road currently presents a 5.1km barrier between the existing development in Geelong and the proposed Western Growth Area. A link at Church Street is centrally located along this section of the Ring Road and makes sense from a road connectivity perspective.
- 8.1.9 It is acknowledged that a connection to Church Street will be an overpass over an existing freeway and will need to address significant level differences between the eastern and western sides of the Ring Road. The extent of the overpass structure may impact on the location of connections to this road within the Western Growth Area.
- 8.1.10 I believe the Church Street link is important in terms of providing connectivity between the existing developed areas of Geelong and the proposed growth area.
- 8.1.11 I disagree with GTA’s suggestion that the connection should be a dedicated public transport connection. There is unlikely to be sufficient demand for public transport that would warrant such an expensive investment in infrastructure. My preference is that any such link provide access for all modes of transport.
- 8.1.12 Although desirable, the cost of providing road connections over freeways is considerable and would most likely require funding external to the PSP areas.
- 8.1.13 Due to the likely cost of such a connection, it is considered unlikely that it will be available in the short term.

9 Summary of Opinion:

9.1 Western Arterial Alignment

- 9.1.1 The north south arterial road proposed through the Western Growth Area will form the spine of the Western Growth Area and provide the primary link between development in the northern and southern parts of the Western Growth Area.
- 9.1.2 I agree with the Cardno TGM submission that there may be benefits in locating the proposed Western Arterial further west than the current alignment shown in the Framework Plan.
- 9.1.3 The benefits of moving the road to the location proposed by Cardno TGM appears to be more sympathetic to the topography in the area, potentially resulting in less earthworks, more developable land and better road design.
- 9.1.4 In my opinion, further design and planning for the western arterial should be undertaken prior to development of the Batesford South PSP. The topography, river crossing, and associated earthworks are likely to result in a significantly higher cost for construction of the arterial road through the Batesford South PSP area compared to other parts of the Western Growth Area.
- 9.1.5 The cost of the arterial road needs to be established at the outset of the planning process so that appropriate cost sharing measures can be established across the various PSPs or external funding sourced if necessary.

9.2 Clever and Creative Corridor

- 9.2.1 In my opinion further work needs to be undertaken on the route of the Clever and Creative Corridor through the Western Growth Area, particularly the alignment through the future Batesford South PSP area.
- 9.2.2 The current alignment along the eastern side of the future lake, will be constrained by the lake on one side and Moorabool River on the other, resulting in a less than desirable catchment area for the primary public transport corridor.
- 9.2.3 To achieve Geelong Council's ambition of providing public transport through the growth areas that is well utilised and able to be implemented at the initial stages of development rather than at completion, then it is critical that it connects to existing services and key destinations in the established parts of Geelong, whilst the activity centres and employment areas are being developed within the growth area.
- 9.2.4 To achieve the ambition of ultimately providing a dedicated public transport corridor, only the 14m portion of the proposed corridor is essential. All other modes of sustainable transport will already be provided throughout the growth area, prior to the use of the reserved land.
- 9.2.5 As outlined in the preceding report I don't support the proposed 40kph speed limit or right turn bans on the CCC. I also don't support the separated traffic lanes on either side of the 14m corridor.
- 9.2.6 The Clever and Creative Corridor will be an important element of the future PSP's which needs to be better developed during the overall framework process before individual pieces of the route are developed within the individual PSPs without proper consideration of the route as a whole.

9.3 Church Street Connection

- 9.3.1 In my opinion a connection to Church Street is a logical inclusion in planning for future development of the Western Growth Area. Without a connection at Church Street, the growth area would have no local connections to the east for a 5km section of the Ring Road.

- 9.3.2 It is acknowledged that a connection to Church Street will be an overpass over an existing freeway and will need to address significant level differences between the eastern and western sides of the Ring Road. The extent of the overpass structure may impact on the location of connections to this road within the Western Growth Area.
- 9.3.3 I believe the Church Street connection should be included in the Batesford South PSP planning as it will provide an important local connection for residents of the growth area to existing development within Geelong.
- 9.3.4 It is noted that only one of the GTA traffic modelling scenarios, includes the Church Street link. GTA note that various 'interventions' will be required to ensure the Western Growth Area road network functions satisfactorily, with one of those suggested interventions being a link to Church Street.
- 9.3.5 Although the Church Street link should be included in planning the PSP's it is my assumption that the associated costs of providing such a link and connections to the freeway would be funded by sources outside of the future Batesford South Infrastructure Contributions Plan.