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Report
Prepared for
Maddocks Lawyers on behalf of
Lovely Banks Development Group

November 2019

**Amendment C395 to the Greater
Geelong Planning Scheme**

traffic: evidence

r:

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Prepared for:

Maddocks Lawyers on behalf of
Lovely Banks Development Group
Our reference 16658T-REP01-F01

ratio:consultants Pty Ltd

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1.1 Planning Panels Reference

- 1.1.1 Amendment C395 to the Greater Geelong Planning Scheme

1.2 Name and Address

- 1.2.1 My name is Brett James Young. I am a Director at Ratio Consultants Pty Ltd and I practice as a Consulting Traffic Engineer. Ratio Consultants Pty Ltd is located at 8 Gwynne Street, Cremorne.

1.3 Qualifications and Expertise

- 1.3.1 My educational qualifications are as follows:
- Bachelor of Engineering (with Honours), University of Canterbury.
 - Member, Victorian Planning and Environmental Law Association.
 - Member, Institute of Transportation Engineers – Australian and New Zealand Section.
- 1.3.2 I have approximately 11 years of experience in Traffic Engineering, including:
- Two and a half years with Traffic Design Group Ltd (Auckland, New Zealand);
 - Nine years with Ratio Consultants Pty Ltd.

1.4 Relevant Experience

- 1.4.1 I have experience and expertise in traffic engineering, road safety planning and development impact assessments of a wide range of land-use developments.

1.5 Instructions which defined the scope of this report

- 1.5.1 I have been instructed by Maddocks on behalf of Lovely Banks Development Group (LBDG), to undertake a review of all relevant background material and prepare an expert witness statement for submission and presentation at Planning Panels Victoria, in regards to Amendment C395 of the Greater Geelong Planning Scheme.
- 1.5.2 Specifically, I was instructed to prepare an evidence witness statements, which includes the following:
- A review of the Amendment documentation as relevant to your field of expertise, with a particular focus on how the Amendment deals with the Northern and Western Growth Areas;
 - A review of the Settlement Strategy and Framework Plan as relevant to your field of expertise, with a particular focus on how these documents deal with the Northern and Western Growth Areas;
 - An evaluation of the Lovely Banks submissions as relevant to your expertise, including an opinion on the changes sought by Lovely Banks;
 - An evaluation of the Council-adopted response to the submission; and
 - Any other matters in relation to the Amendment which you consider should be highlighted or considered, as relevant to your field of expertise.

1.6 Facts, Matters and Assumption Relied Upon

1.6.1 In the course of preparing this report I have had access to and relied upon:

- Municipal Strategic Statement.
- Clause 37.07 – Schedule 1 to the Urban Growth Zone.
- Clause 72.08 Schedule – Background Documents.
- Planning Scheme Maps.
- Western Geelong Growth Area – Retail and Activity Centre Technical Report (dated June 2017).
- Northern Geelong Growth Area – Urban Form and Capacity Assessment (dated July 2017).
- Northern Geelong Growth Area – Activity Centre Assessment (dated August 2017).
- Planning and Design Principles for Promoting Active Transport in the Northern and Western Geelong Growth Areas (August 2017).
- Northern and Western Geelong Growth Areas – Consolidated Activity Centre Assessment (dated September 2017).
- NWGGA Road and Rail Planning Investigations (dated September 2017).
- NWGGA Employment Land (December 2017).
- Council Meeting Report (dated October 2018).
- Settlement Strategy (dated October 2018).
- Discussion Papers (dated October 2018).
- Northern & Western Geelong Growth Areas – Clever and Creative Corridor (November 2018).
- Council Meeting Report (dated March 2019).
- Northern & Western Geelong Growth Areas Framework Plan (dated March 2019).
- Northern and Western Geelong Growth Areas – Movement and Access Report (June 2019).
- Submission of Lovely Banks Development Group (dated July 2019).
- Northern & Western Geelong Growth Areas – Movement and Access Report (dated July 2019).
- Council Meeting Report (dated September 2019).
- Geelong Ring Road Employment Precinct (GRREP) Prospectus.
- Creating a More Liveable Melbourne.
- Plan Melbourne 2017-2050.
- My relevant experience.

1.7 Identity of Persons Undertaking the Work

- Brett Young of Ratio Consultants.
- James McKenzie, Senior Traffic Engineer at Ratio Consultants, assisted in the preparation of the evidence statement under my direction.

1.8 Declaration

1.8.1 I confirm that I have read and that I understand the Planning Panels Victoria's 'Guide to Expert Evidence' and that I comply with the provisions of that guide.

1.8.2 I have no relationship with the client other than a business engagement to comment on this matter.

1.8.3 I also declare that 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

2.1 Introduction

- 2.1.1 I have been instructed by Maddocks Lawyers on behalf of Lovely Banks Development Group (LBDG), to undertake a review of all relevant background material and prepare an expert evidence statement for submission and presentation at Planning Panels Victoria, in regards to Amendment C395 of the Greater Geelong Planning Scheme.
- 2.1.2 This report has been prepared in accordance with the Planning Panels Victoria Guide to Expert Evidence. In the course of preparing this assessment, I have inspected the subject site and surrounding road network, reviewed the PSP and referred to the documents and plans outlined in Section 1.6.
- 2.1.3 My opinions with respect to the transport related matters are set out in the following report.

2.2 Structure of Evidence Statement

- 2.2.1 The following evidence witness statement has been structured to address the following:
- **Section 3:** LBDG's proposed changes to the activity centre network, including the development of two centres in the north-eastern part of the North Geelong Growth Area (NGGA) and the proposed relocation of the sub-regional activity centre to the north of Heales Road.
 - **Section 4:** LBDG's alternate alignment of Elcho Road.
 - **Section 5:** LBDG's indicated realignment and adjustments to the Clever and Creative Corridor.
 - **Section 6:** LBDG's proposed to bring forward the south-east PSP.
 - **Section 7:** LBDG's proposed amendment to Action N2.2.6.
 - **Section 8:** Statement conclusions.

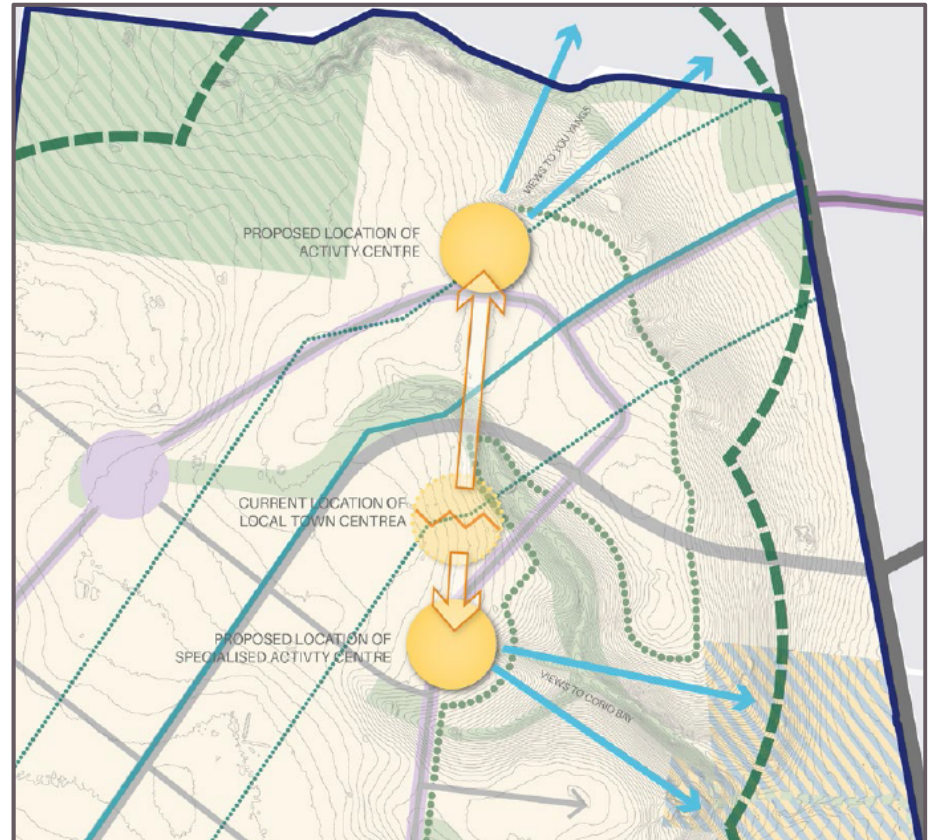
3 Amendments to Activity Centre Locations:

LBDG's submission seeks to extend the coverage of the activity centre network by splitting the north eastern NAC into two smaller NAC's, relocating the sub-regional Activity Centre and adding a Local Activity Centre.

Transport Review of Splitting the NE Activity Centre

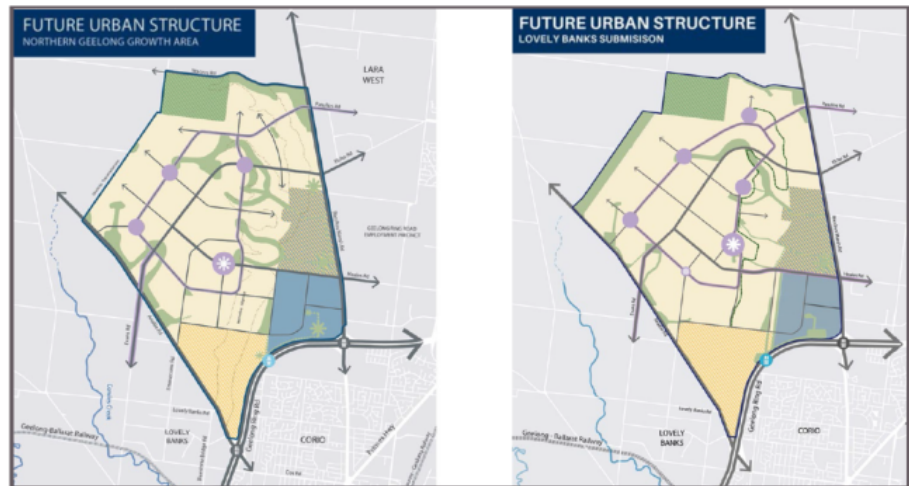
- 3.1.1 LBDG submission proposes to split the Neighbourhood Activity Centre located in the north-east corner of the NGGA and provide two smaller Neighbourhood Activity Centres, as shown in Figure 3.1 below.

Figure 3.1: Proposed splitting of north eastern activity centre



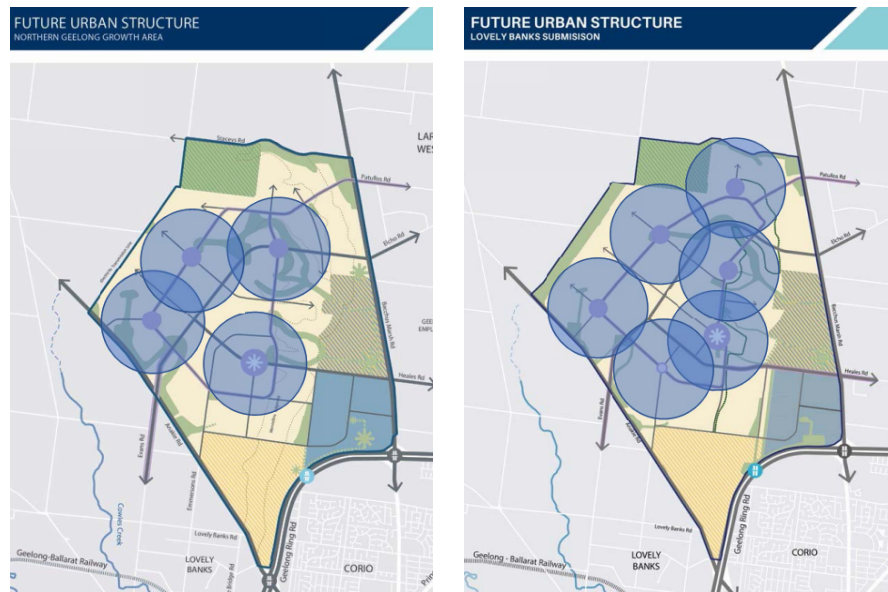
- 3.1.2 This would result in the NGAA providing a total of four Neighbourhood Activity Centres, as opposed to the three which are currently shown in the Framework Plan. Figure 3.2 below illustrates the layout of the NGAA Activity Centres proposed by the LGDG submission as compared to the Framework Plan.

Figure 3.2: Comparison of Activity Centre Arrangement



- 3.1.3 The LBDG submission states that the purpose of the change to the Neighbourhood Activity Centres within the NGGA, amongst other things, is to 'significantly improve the walkability of the urban area'.
- 3.1.4 This aim of the LBDG submission is consistent with several of the objectives noted within the Framework Plan. Of particular relevance, Action N2.1.1 of the Framework Plan states the following:
 - 3.1.5 Action N2.1.1 – Geelong's new neighbourhoods will allow residents to live locally and meet most of their everyday needs within a 20-minute walk, cycle or local public transport trip of their home. The design of each neighbourhood will place activity centres, health facilities and services, schools, local parks and recreational facilities along the Clever Creative Corridor within the 20-minute neighbourhood catchments.
 - 3.1.6 The '20-minute neighbourhood' design principle referenced within the Framework Plan is also adopted within Plan Melbourne 2017 – 2050 (the long-term plan which helps inform State Planning Policy). As outlined with Plan Melbourne, the 20-minute neighbourhood is all about 'living locally'—giving people the ability to meet most of their everyday needs within a 20-minute walk, cycle or local public transport trip of their home.
 - 3.1.7 The document prepared by the Victoria State Government as part of Plan Melbourne '20 Minute Neighbourhoods – Creating a more liveable Melbourne' specifies a walkable catchment radius of 800m associated with a 20-minute walkable journey, said to be the maximum time people are willing to walk to meet their daily needs locally.
 - 3.1.8 Action N3.1.12 of the Framework Plan states that the three neighbourhood activity centres will be delivered throughout the Northern Geelong Growth Area located to provide convenient, walkable access to their respective catchments.
 - 3.1.9 Based on the definition of a 20-minute neighbourhood, there will be considerable areas of residential land located outside the walkable catchments of the NACs. This is illustrated in the diagrams below for the Framework Plan and LBDG plan respectively.

Figure 3.3: Comparison of Activity Centre Walkable Catchments



- 3.1.10 The activity centre arrangement in the Framework Plan suggests that 41% of the residential areas will be beyond the walkable catchments of the activity centres, compared with just 23% in the LBDG submitted arrangement.
- 3.1.11 Those living outside the walkable catchments for the activity centres would be more likely to choose an alternative mode to access their daily needs, through a combination of cycling, public transport or driving.
- 3.1.12 Based on the above, it can be reasonably expected that there would be a higher proportion of walking trips by residents in the LBDG plan than the Framework Plan. In addition, the LBDG plan could be expected to result in fewer trips by car as a result of more residents travelling by foot. This would be a positive transport outcome.
- 3.1.13 I have considered the shifting of the sub-regional activity centre from its current location where it has arterial road frontage to Heales Road to its proposed location where it is accessed from connector roads. Given that the sub-regional activity centre will largely service a local catchment (i.e. the NGGA), the proposed connector road network will be sufficient to cater for the level of traffic accessing the activity centre.

4 Alternate Alignment of Elcho Road:

LBDG's submission seeks to amend the alignment of Elcho Road

- 4.1.1 LBDG's submission is to amend the alignment of Elcho Road to better respond to the contour constraints of the monocline. The proposed realignment of the road and proposed splitting of the north eastern NAC is such that Elcho Road would no longer pass through an activity centre as is currently proposed in the Framework Plan.
- 4.1.2 Diagrams illustrating the proposed alignment of Elcho Road and how it would no longer pass through an activity are included below in Figures 4.1 and 4.2 respectively.

Figure 4.1 : Proposed realignment of Elcho Road

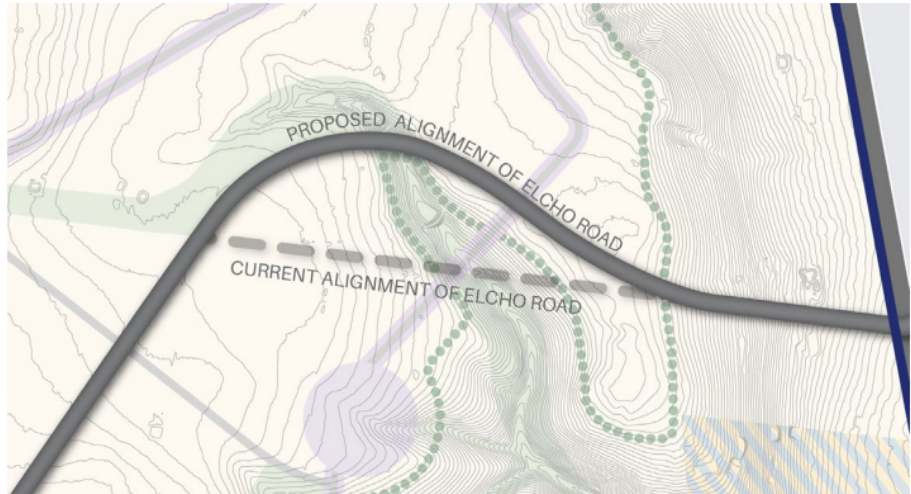
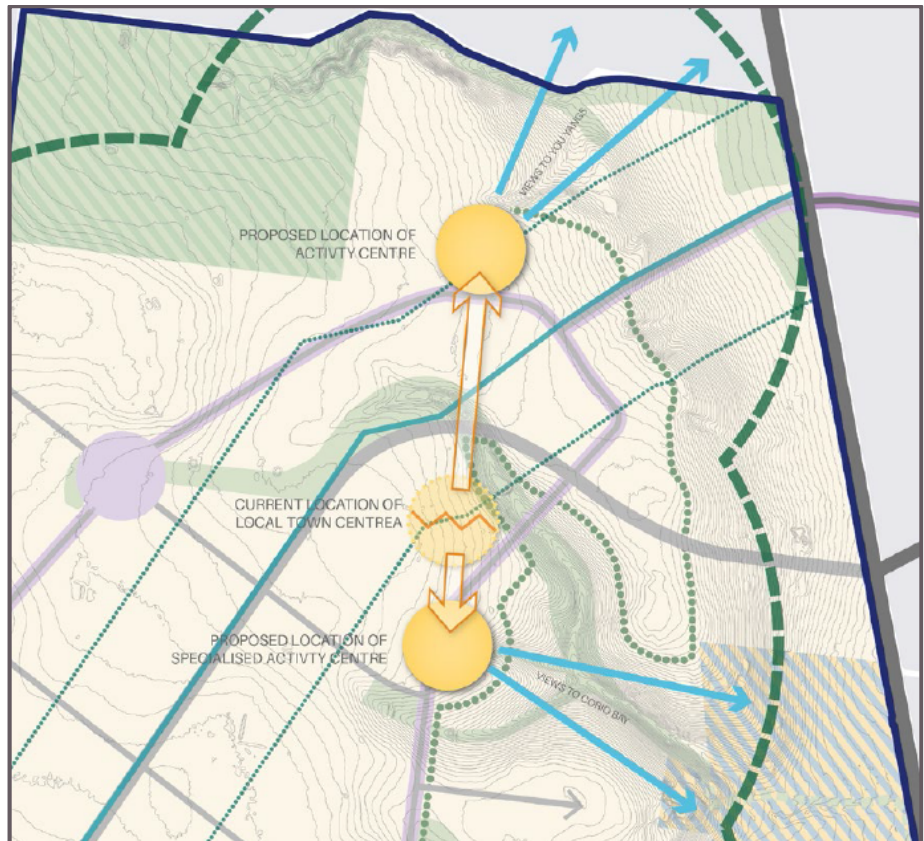


Figure 4-1: Proposed shifting of Activity Centres in context of realigned Elcho Road



- 4.1.3 I have reviewed the relevant transport considerations associated with this proposal. My assessment of the impact of the changes on the transport function of the road considers both the realignment and the changes to the activity centre locations. Plans prepared by Beveridge Williams to inform the proposed LBDG alignment were provided to me by my instructing solicitors and are included in Appendix A (horizontal alignment) and Appendix B (vertical alignment) respectively. I have reviewed the relevant parameters adopted in the horizontal and vertical alignment designs.

I note as follows:

Horizontal Geometry Review

1. I have undertaken a review of the curvature proposed for Elcho Road against the Austroads Guide to Road Design Part 3 – Geometric Design and VicRoads supplements. The tighter of the two curves proposed on the realigned section of Elcho Road has a radius of 233m (refer to Appendix A for Horizontal Geometry plans). Assuming an operating speed of 80km/hr, the superelevation, or amount of banking/camber required for this curve would be less than the 5% maximum specified for an urban arterial road. On this basis I am satisfied that the horizontal road alignment as proposed by the LBDG submission could be delivered within the relevant design parameters of curvature and superelevation.

Vertical Geometry Review

2. I have reviewed the grades adopted for vertical geometry as per the plans attached in Appendix B. The relevant reference documents for the vertical geometry of arterial roads is the Austroads Guide to Road Design Part 3 – Geometric Design and the VicRoads supplements to these guides. It specifies a maximum general gradient for roads with an operating speed of 80km/hr of between 4% and 9% depending on the terrain type. The Beveridge Williams plans have adopted designs based on a maximum grade of 7% which is within the permissible range.
 3. An alternative design adopting a maximum gradient of 10% was also prepared, which I believe was understood to be in line with the desirable maximum grade specified in Table 4 of the *Infrastructure Design Manual*. I note that this is not the relevant design manual for arterial road design and is only applicable to the design of municipal roads. Notwithstanding, the Austroads Guide to Road Design, which is applicable to the design of arterial roads notes that the adoption of grades steeper than the general maximum (i.e. such as 10%) may be justified in certain situations as follows:
 - *Comparatively short sections of steeper grade which can lead to significant cost savings.*
 - *Difficult terrain in which general grades are not practical.*
 - *Where absolute numbers of heavy vehicles are generally low.*
 - *Less important roads where the costs or impact of achieving higher standards are difficult to justify.*
 4. On the basis of the above, I would suggest viewing the design based on a 7% maximum gradient as a design that falls within published vertical geometry design parameters and the 10% design as being one that is potentially justifiable.
-
5. The GTA traffic modelling that informed the Framework Plan (modelling scenario PC04B) showed Elcho Road as carrying between 15,000vpd and 18,000vpd where it passes through the activity centre

and would have a four-lane configuration with additional turning lanes at the intersection. The high level of traffic and wide road reservation in this location poses difficulties in delivering an activity centre that caters well for sustainable transport modes such as walking and cycling, owing to greater crossing distances and delays at the signalised crossings. The LBDG outcome, having activity centres that are accessed by narrower connector level streets carrying much lower levels of traffic (~8,000vpd) would result in activity centres that can better integrate sustainable transport modes.

6. Elcho Road would likely carry less activity centre related traffic with the LBDG proposal as it would pass through the edges of the two relocated NAC catchments as opposed to passing through the centre of one as per the Framework Plan. This would result in an improved traffic carrying function for Elcho Road.
 7. The minor localised realignment of Elcho Road, i.e. the introduction of curvature, would unlikely have a negative impact on its traffic carrying function as an arterial road.
- 4.1.4 There are transport benefits associated with the proposed realignment of Elcho Road, owing to the splitting of the Neighbourhood Activity Centres which warrant consideration as part of assessing LBDG's submission.
- 4.1.5 Conversely, whilst the final alignment of Elcho Road requires further investigation and inputs from multiple disciplines to inform the PSPs, I have not identified any transport reason why the amendments sought by LBDG should not be adopted in the Framework Plan.

5 Amendment to Clever and Creative Corridor:

LBDG’s submission seeks to amend the alignment of the Clever and Creative Corridor and to embed more flexibility in its delivery.

Adjustments sought to alignment

- 5.1.1 A summary of LBDG’s requests to amend the alignment of the Clever and Creative Corridor (C&CC) is as follows:
 - Realign the C&CC to connect their amended Activity Centre arrangement.
 - Extend the C&CC to better cater for walkability in the northern part of the NGGA.
 - Provide a third external link from the Town Centre to the GREP and rail.

Figure 5-1: NGGA Framework Plan – Clever and Creative Corridor Alignment



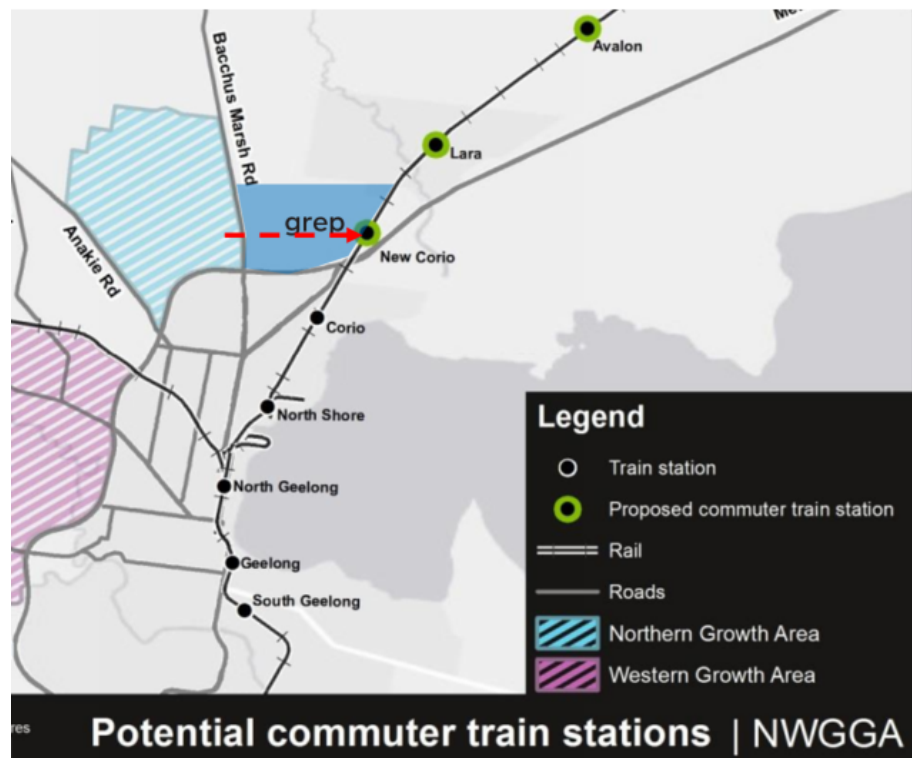
Figure 5-2: LBDG – Proposed Clever and Creative Corridor Alignment



5.1.2 My comments on the proposed realignment from a transport perspective are as follows:

- If the proposed splitting of the north-eastern activity centre is accepted by the Panel, then the Framework plan objectives for the C&CC supports the proposed realignment of the C&CC to pass through the amended arrangement in that maintains connectivity through the activity centre network. The length of the amended alignment of the corridor, with the exception of the proposed extension along Heales Road is approximately 300m longer than that presented in the Framework Plan. This is unlikely to impact on public transit times.
- The extension of the C&CC along Heales Road to Bacchus Marsh Road would support a continuation of public and active transport east through the Geelong Ring Road Employment Precinct (GREP) and to the rail line beyond. This would support the adoption of public transport by occupants of the NGGC to employment destinations within GREP as well as for commuters seeking to access the rail line further to the east. As referenced in the Aecom technical report NWGGA Road and Rail Investigations, a new railway station could potentially be constructed north of the existing Corio Station 'New Corio' in line with Heales Road as illustrated in Figure 5.3 below. In the interim or in the absence of a New Corio station, the extension of the C&CC could support a public transport connection between the NGGC and the existing Corio Station.

Figure 5.3: Extract from Aecom Road and Rail Investigations Report showing potential new station 'New Corio' with indicative 'GREP' boundary and Heales Road alignment overlaid as red dashed line



- The proposal to extend the C&CC along Heales Road would support an increase in public transport use for work-based trips by residents of NGGA, contributing towards Council's vision to have 50% of work-based trips made by public transport, walking or cycling.

- I note that the modelling results presented in the GTA report Movement and Access indicates Heales Road carrying between 17,270vpd and 18,640vpd along the section between Bacchus Marsh Road and the current C&CC alignment respectively. It is noted that this level of traffic is approaching the transition point between the capacity of a two-lane road and a four-lane road.
- Subject to the level of traffic generated by residents and level of alternative transport adoption, the actual level of traffic carried along this section could be less, such that a four-lane carriageway is not required, presenting an opportunity for the additional land to be utilised to achieve an extension of the C&CC without necessarily requiring additional land. The GTA modelling undertaken suggests that if public transport usage for employment trips outside the NWGGA reached 15% (PC04A) as opposed to 1.7% (PC04B model), Heales Road could be expected to carry between 15,030vpd and 16,170vpd along the section of Heales Road between the C&CC and Bacchus Marsh Road, which is comfortably within the capacity limit for a two lane road of 18,000-20,000vpd. This suggests that Heales Road may not need to be widened to four lanes, even at full build out of the NWGGA.
- Based on the above, in my view there is transport merit to consider extending the C&CC along Heales Road as submitted by LBDG. Furthermore, subject to further transport modelling, extending the C&CC could potentially be delivered within the four-lane road reservation currently contemplated for Heales Road such that no or minimal additional widening is required.

Flexibility sought for delivery of Clever and Creative Corridor

- 5.1.3 LBDG's submission recommends greater diversity being allowed for in the physical form of the C&CC including opportunities for:
- Asymmetrical linear open spaces along one side of the C&CC.
 - Road sharing of public transport and vehicles including potential public transport only conditions.
 - Compact urban 'Main Street' conditions.

What does the Framework Plan say about the physical form sought for the C&CC?

- 5.1.4 For the interim configuration, the Framework Plan specifies the following features for the C&CC.

CLEVER AND CREATIVE CORRIDOR – INTERIM CONFIGURATION

Design features

- | | |
|--|--|
| • Median reserve* for dedicated commuter-style shared path, planting, furniture and place making (14 metres) | • Pedestrian paths (1.5 metres) |
| • Bus capable road carriageways (3.5 metres) | • Tree outstands |
| • Parking bays (2.1 metres) | • Large nature strips |
| | • Planting for large tree canopy |
| | * side-running reserve where appropriate |

For the ultimate configuration, the Framework Plan specifies the following features for the C&CC.

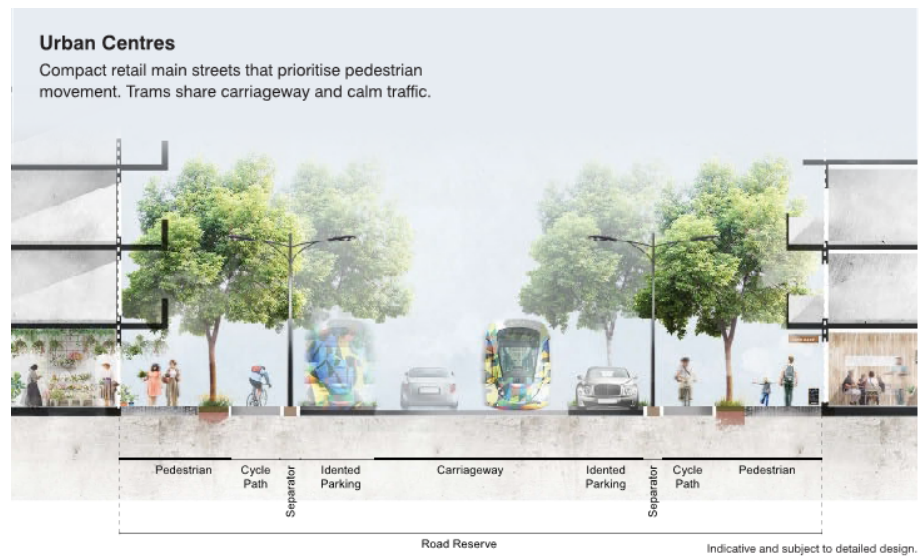
CLEVER AND CREATIVE CORRIDOR – ULTIMATE CONFIGURATION

Design features

- Median reserve* for dedicated public transport (14 metres)*
 - Bus capable road carriageways (3.5 metres)
 - Parking bays (2.1 metres)
 - Pedestrian paths (1.5 metres)
 - Off-road shared path (3.0 metres)
 - Tree outstands
 - Large nature strips
 - Large tree canopy
- * side-running reserve where appropriate

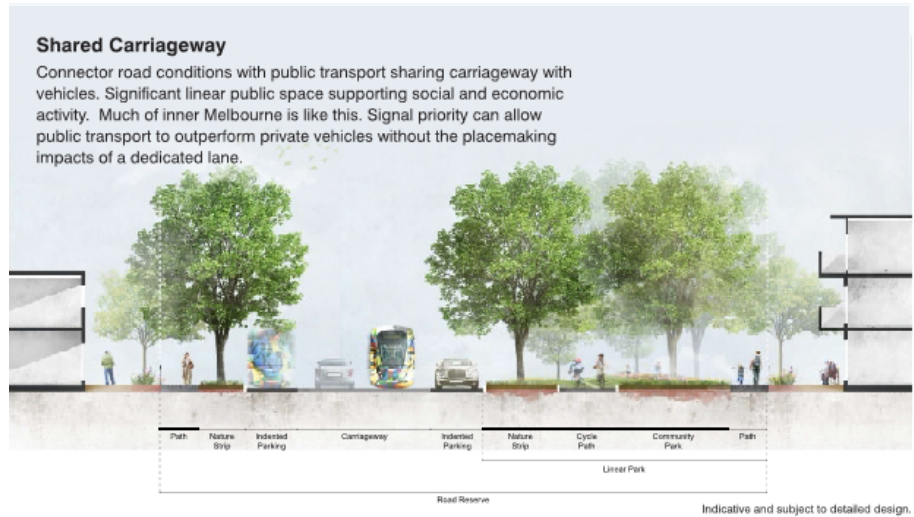
What is sought by LBDG's submission for the C&CC?

- 5.1.5 I have reviewed the examples of potential variation in the C&CC as per P11 of LBDG's submission and provide the following opinions from a transport perspective.



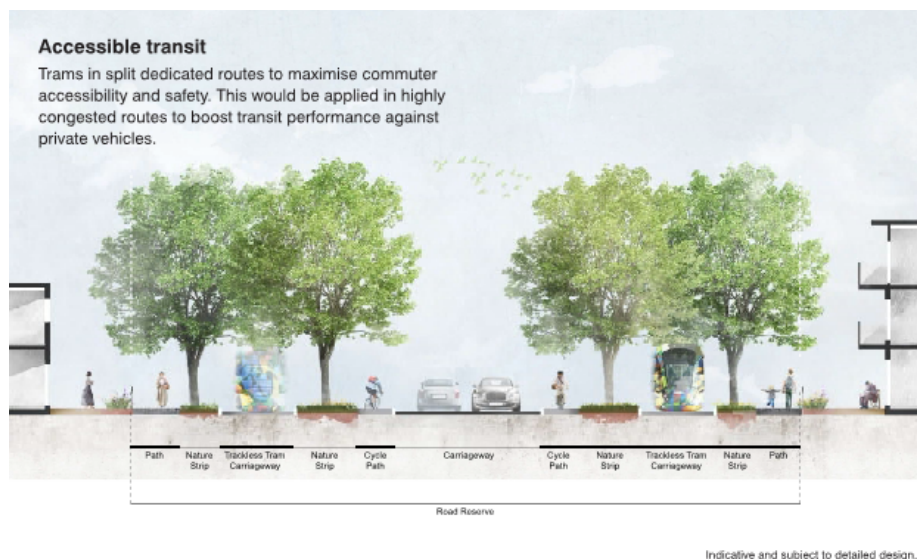
- 5.1.6 My opinions on the transport considerations of the 'Urban Centres' cross section example are as follows:

- It does not deliver a dedicated, separated public transport as is sought by the Framework Plan. This could result in slower journey times for passengers as the services pass through the urban centres and detract from their use.
- In my view, there exists a further iteration of the above plan to be considered that would achieve a separated public transport corridor by replacing the indented parking lane with a traffic lane.
- A further iteration to the above to be considered involves removing indented parking and allowing public transport services to share the roadspace with vehicles. Removing the parking would reduce the level of disruption associated with vehicles manoeuvring to and from parking spaces and/or looking for vacant kerbside parking. Reducing what is termed 'side friction' by removing kerbside parking would mean delays to public transport services would be reduced such that the sharing of road space does may not adversely impact on the operation of public transport services passing through the urban centres so as to detract from their utilisation.

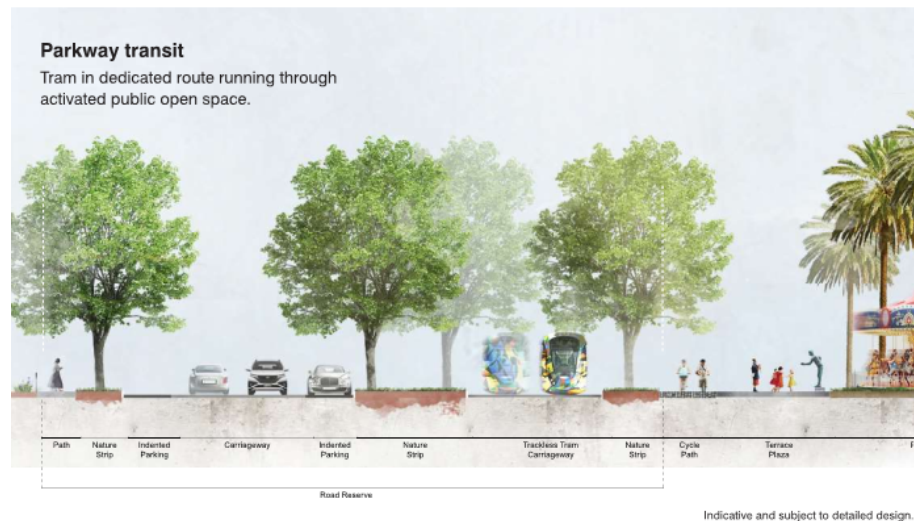


5.1.7 My opinions on the transport considerations of the 'Shared Carriageway' cross section example above are as follows:

- This cross section does not achieve a dedicated public transport corridor, which may be suitable in locations where vehicle traffic would not impact on the operation of the public transport services.
- Similar to the alternative options described above for the urban centres cross section, public transport could be given greater priority in the example above by removing the indented parking and providing public transport its own carriageway or removing the parking and allowing vehicle traffic to share the space with public transport, thereby reducing side friction impacts as I discussed previously.
- The Aecom report suggests that for purposes of offering a consistent and efficient future public transport service along the C&CC, a primary route alignment should be selected through each growth area, which in relation to the 'loops' in the C&CC alignment, means one arc of the loop may become part of the primary PT route alignment and the other becomes a secondary route. That report also goes on to suggest that the secondary routes could either be used as part of the high priority public transport corridor, or that the corridors could be used for alternate purposes or retained in their short-term passive state. A variation on the above cross section could be appropriate for the secondary arc of the C&CC loops.



- Locating the public transport services in reserves to the side as opposed to the median results in greater levels of conflict with turning vehicles and is described in the Aecom report as the reason why a central median option was identified. I agree in principle with the rationale in the Aecom report.



- My understanding of the Framework Plan is that it contemplates this outcome as being accepted, with the exception of the cycle path being located outside the road reserve in this example, i.e. it states 'side running reserve' where appropriate which would appear to be the case in the example described above.

5.1.8 In my opinion, the Framework Plan should be amended to remove the reference to an explicit 14m reserve being required to deliver the outcomes sought by the Clever and Creative Corridor. As discussed above, there are a number of outcomes for the configuration of the corridor that could achieve the objectives sought for the corridor whilst at the same time responding to the particular requirements of the adjoining land uses.

5.1.9 I note that the Objectives and Strategies for the Clever and Creative Corridor in the proposed drafting of Clause 21-20 *Northern and Western Geelong Growth Corridors* are not so rigid as the Framework Plan. I would support the wording as proposed below as being a sufficiently flexible and clear guide for the preparation of cross sections for the Clever and Creative Corridor to be undertaken as part of the Precinct Structure Plans such that the reference to a 14m reserve could be removed from the Framework Plan.

Clause 21.02-2 Objectives

5.1.10 *To develop a Clever and Creative Corridor as a consistent and unifying design element of the growth areas to ensure development is sustainable, self-sufficient, distinctive and connected by active and public transport options.*

Clause 21.02-3 Strategies

5.1.11 *Develop the Clever and Creative Corridor as a tree-lined, boulevard style transit corridor that prioritises public transport, walking and cycling between activity centres and education, community and recreation*

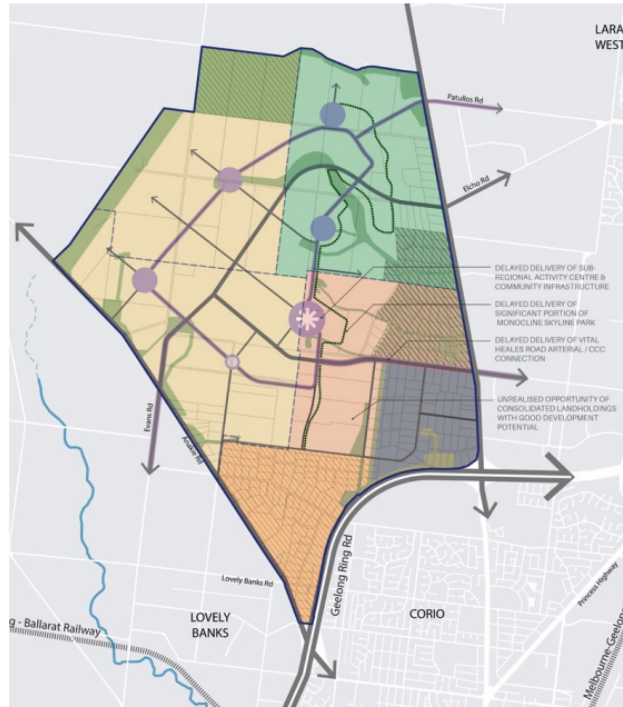
facilities, and provides a focal point for the design of sustainable neighbourhoods that are interconnected and support housing diversity.

6 Development Sequencing of the SRAC:

LBDG's submission is to bring forward the delivery of part of the Heales Road East PSP

- 6.1.1 The diagram below from LBDG's submission illustrates their request to bring forward the timing of the western portion of the Heales Road East PSP to the medium term as opposed to the long term as currently proposed in the Framework Plan.

Figure 6.1: LBDG's proposed split staging of Heales Road East PSP



- 6.1.2 I have reviewed the potential transport impacts of bringing forward the western portion of the Heales Road East PSP, which would involve earlier delivery of the second portion of the sub-regional activity centre.
- Being a sub-regional activity centre, traffic movements will largely be derived from the surrounding local catchment.
 - The remaining section of the Heales Road East PSP, in its undeveloped state may mean that Heales Road is not able to be delivered in its ultimate four lane configuration at the time the land in question is brought forward. There is however scope to upgrade the unsealed section of Heales Road to a sealed two-lane standard between Houston Road and the activity centre.
 - As I discussed previously, Heales Road is modelled to carry between 17,270vpd and 18,640vpd between Bacchus Marsh Road and the C&CC. Prior to the development of the balance of the Heales Road East PSP, the level of traffic carried on this section is likely to be less such that it would be operating within the capacity of 18,000-20,000vpd associated with its two-lane configuration.
 - On this basis, the potential inability to upgrade Heales Road to its ultimate 4-lane carriageway does not restrict the proposal to bring forward the western portion of the Heales Road East PSP.
 - There are further transport benefits to be considered as part of the proposed amendment to the staging:
 - Bringing forward the balance of the sub-regional activity centre would result in residents being able to undertake more of their

daily trip needs locally within the NGGA sooner. Until it is completed, residents would likely need to travel externally to meet some of their needs. As a result, the level of traffic leaving the confines of NGGA would be less, reducing traffic pressure on external roads such as Bacchus Marsh Road and the Geelong Ring Road which is a positive transport outcome.

What is LBDG’s proposed change to Action N2.2.6?

The LBDG submission proposed to amend Action N2.2.6 to add the following new sentence:

“New arterial road reserves are expected to provide a mid-block reserve sufficient for 4 traffic lanes to maximise walkability.”

The existing wording of this action is provided below.

Figure 7.1: Existing Action N2.2.6 from the Framework Plan

ACTION N2.2.6

Key existing arterial roads will be designed to ensure that upgrades and duplications reflect the urban nature of the area and provide high quality gateway treatments.

Road design on existing arterial roads will ensure that design speeds, cross sections, intersection treatments and interfaces are designed to respect the urban nature of the area, minimise widths and prioritise pedestrians, cyclists and public transport, where appropriate.

Would this amendment result in a traffic capacity concern?

7.1.1 The modelling undertaken by GTA and presented in the *Movement and Access Report* indicates that all new internal arterial roads will likely require no more than two lanes in each direction. Table 7.1 from that report (extracted below), shows all of the internal arterial roads carrying no more than 28,200vpd in their four-lane configuration at full build out and are all well below their theoretical capacity limit of between 36,000-40,000vpd. On this basis, the LBDG proposal to limit new internal arterial roads to no more than 4 traffic lanes does not present a traffic capacity concern. Limiting the width of roads where appropriate supports other transport modes such as walking and cycling as it reduces the crossing distances at intersections and making these modes more attractive.

Figure 7.1: Extract from GTA Movement and Access Report

Table 7.1: Summary of Ultimate Daily Volumes on Key Internal Roads (2051)

No.	Road Name	Expected Daily Traffic Volume	Proposed Classification and No. lanes	Capacity Limit (based on No. lanes)
N1	Heales Road (east)	17,300vpd	Arterial (4 lanes)	36,000 to 40,000vpd
N2	Elcho Road (east)	19,600vpd	Arterial (4 lanes)	36,000 to 40,000vpd
N3	Emmersons Road (south)	3,400vpd	Connector (2 lanes)	18,000 to 20,000vpd
N4	Evans Road (south)	17,500vpd	Arterial (4 lanes)	36,000 to 40,000vpd
N5	Heales Road (west)	14,500vpd	Arterial (4 lanes)	36,000 to 40,000vpd
N6	Evans Road (north)	14,700vpd	Arterial (4 lanes)	36,000 to 40,000vpd
N7	C & C Corridor (north)	5,700vpd	Clever & Creative Corridor (2 lanes)	18,000 to 20,000vpd
N8	C & C Corridor (WEST)	4,300vpd	Clever & Creative Corridor (2 lanes)	18,000 to 20,000vpd
NW Link	Evans Road Link	18,000vpd	Arterial (2 lanes)	18,000 to 20,000vpd
W1	Merrawarp Road (north)	12,000vpd	Arterial (4 lanes)	36,000 to 40,000vpd
W2	New N-S Arterial (south)	16,500vpd	Arterial (4 lanes)	36,000 to 40,000vpd
W3	New E-W Arterial (central)	7,900vpd	Arterial (4 lanes)	36,000 to 40,000vpd
W4	New N-S Arterial (north)	24,900vpd	Arterial (4 lanes)	36,000 to 40,000vpd
W5	Lynnburn Road (south)	28,200vpd	Arterial (4 lanes)	36,000 to 40,000vpd
W6	Geelong-Ballan Road (south)	8,600vpd	Clever & Creative Corridor (2 lanes)	18,000 to 20,000vpd
W7	C & C Corridor (north)	7,600vpd	Clever & Creative Corridor (2 lanes)	18,000 to 20,000vpd

8.1.1 Based on my findings outlined above, I conclude as follows:

Activity Centre Amendments

- The greater number and spread of activity centres proposed by Lovely Banks Development Group would likely result in a higher proportion of walking trips by residents in the LBDG plan than the Framework Plan. In addition, the LBDG plan could be expected to result in fewer trips by car as a result of more residents travelling by foot. This would be a positive transport outcome.

Amended Elcho Road Alignment

- The proposed realignment results in it no longer passing through an activity centre, improving its traffic carrying function whilst improving accessibility to the relocated activity centres to walking and cycling.
- The amended alignment broadly aligns with the relevant geometric road design parameters.
- The proposed realignment would not detract from its function as an arterial road.

Clever and Creative Corridor Amendments

- The amendments to the alignment to connect the amended activity centre arrangement is supported by the C&CC principles contained in the Framework Plan to provide connectivity between activity centres.
- The C&CC is made approximately 300m longer by extending to the northern section of the NGGC. This is unlikely to impact on public transit service times.
- The extension of the C&CC along Heales Road would support public transit by residents of the NGGC to the neighbouring employment area of GREP and for commuters seeking to access the rail line beyond. Subject to further modelling consideration, there is potential for Heales Road to be capped at a two-lane arterial road which could enable the C&CC to be delivered along the Heales Road with no or minimal widening to the 4-lane road reservation currently allowed.
- There numerous alternative means of achieving the objectives sought for transport along the C&CC which should be further explored as part of the development of the PSP's to follow. The reference to a rigid 14m separate reservation should be removed from the Framework Plan. The objectives and strategies for the C&CC contained in proposed Clause 21.02 are sufficiently clear and flexible to guide the transport outcomes sought for the C&CC through the PSP process.

Development Sequencing Amendments

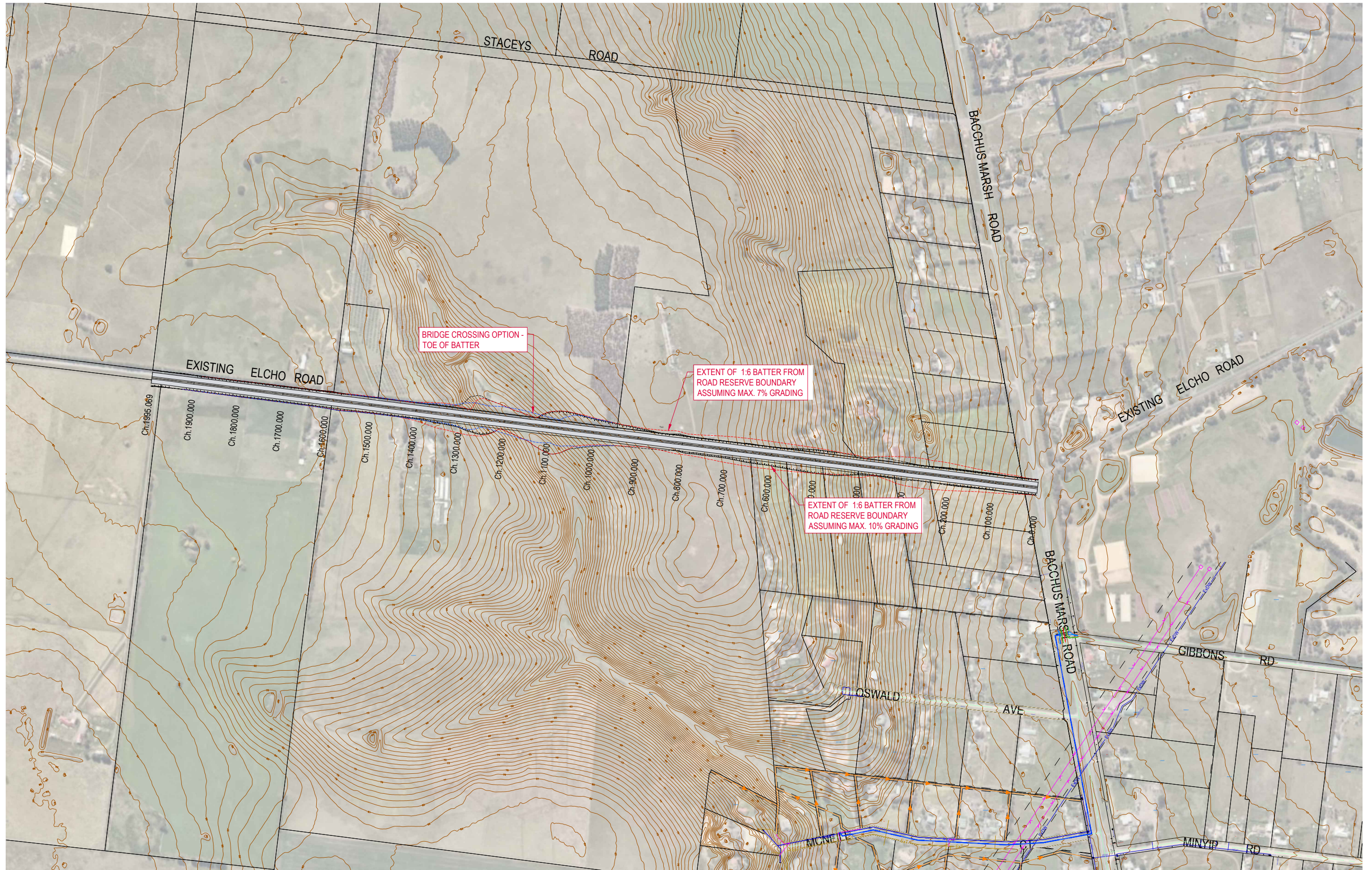
- There is sufficient capacity in the proposed road network for the western section of the Heales Road East PSP to be brought forward. The resultant earlier completion of the sub-regional activity would result in less traffic leaving the confines of the NGGC which would have traffic benefits on external roads such as Bacchus Marsh Road and the Geelong Ring Road as resident needs would be met locally sooner.

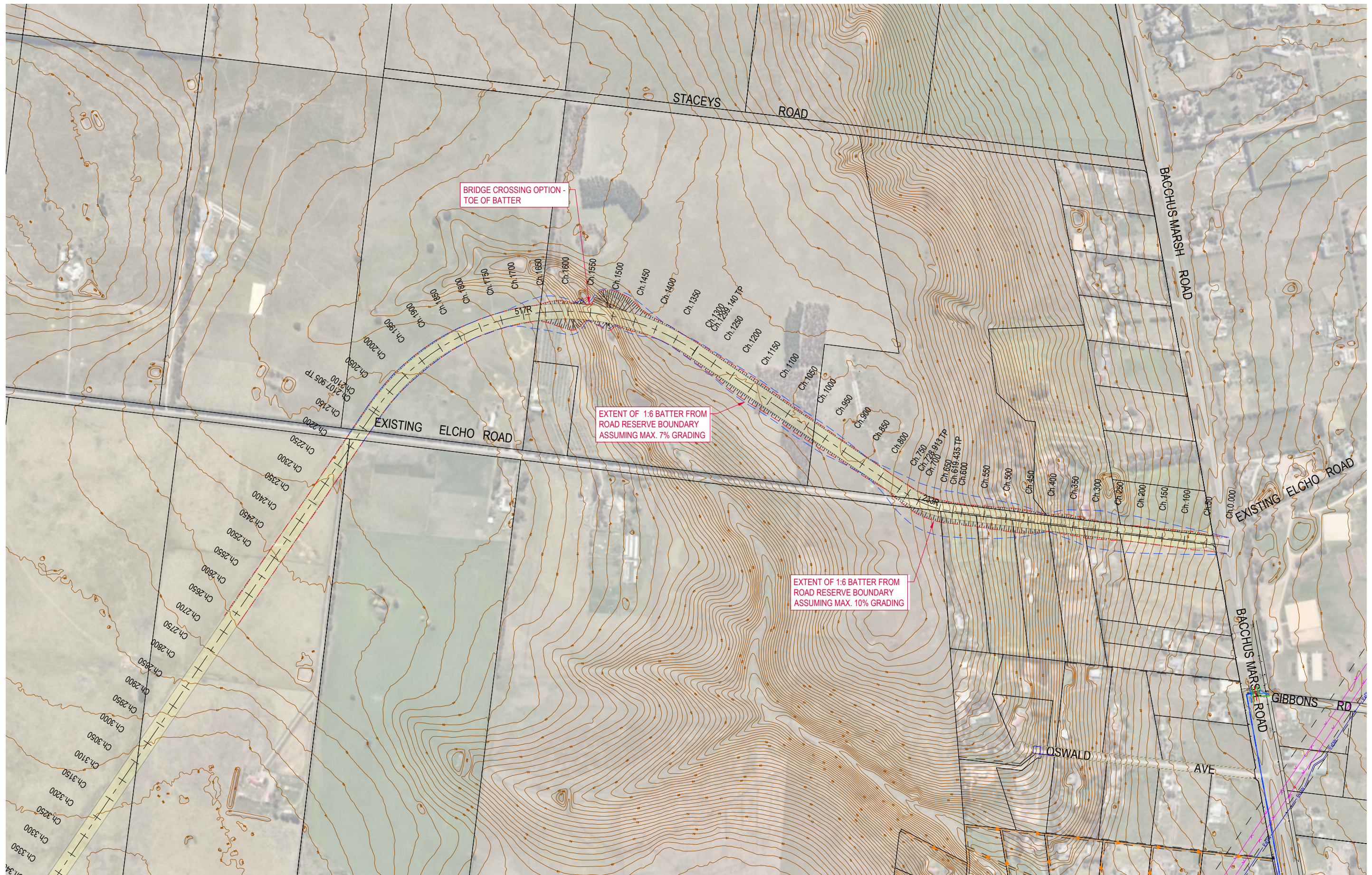
Amendment to Action N2.2.6

- The proposed restriction of all new arterial roads to four lanes is supported by the traffic modelling undertaken by GTA which indicates that all new four-lane arterial roads proposed will carry much less than their theoretical capacity at full build out. This restriction in width supports walking and cycling as it minimises road crossing distances.



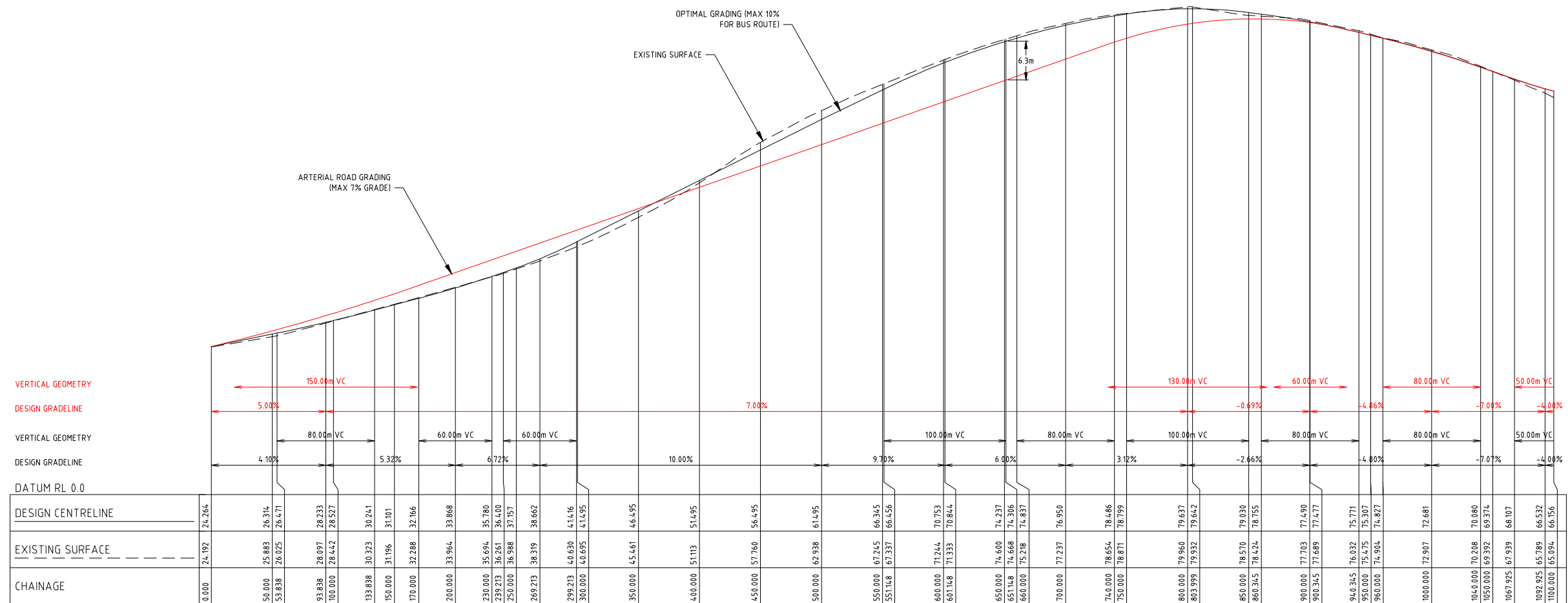
Appendix A: Elcho Road Horizontal Design



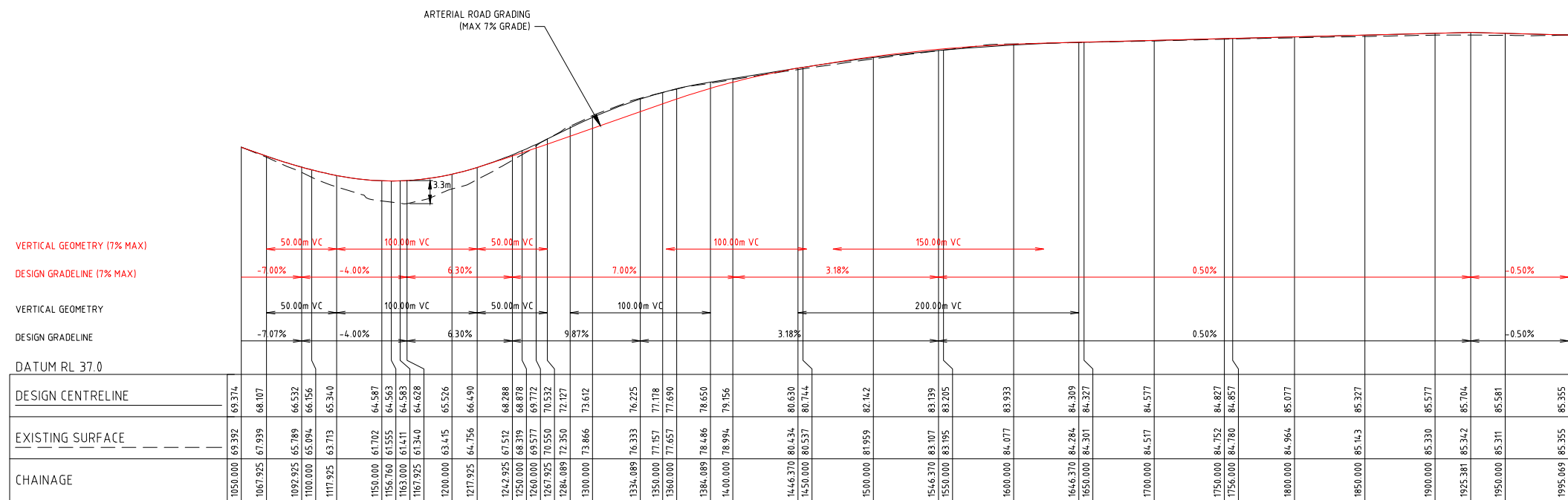




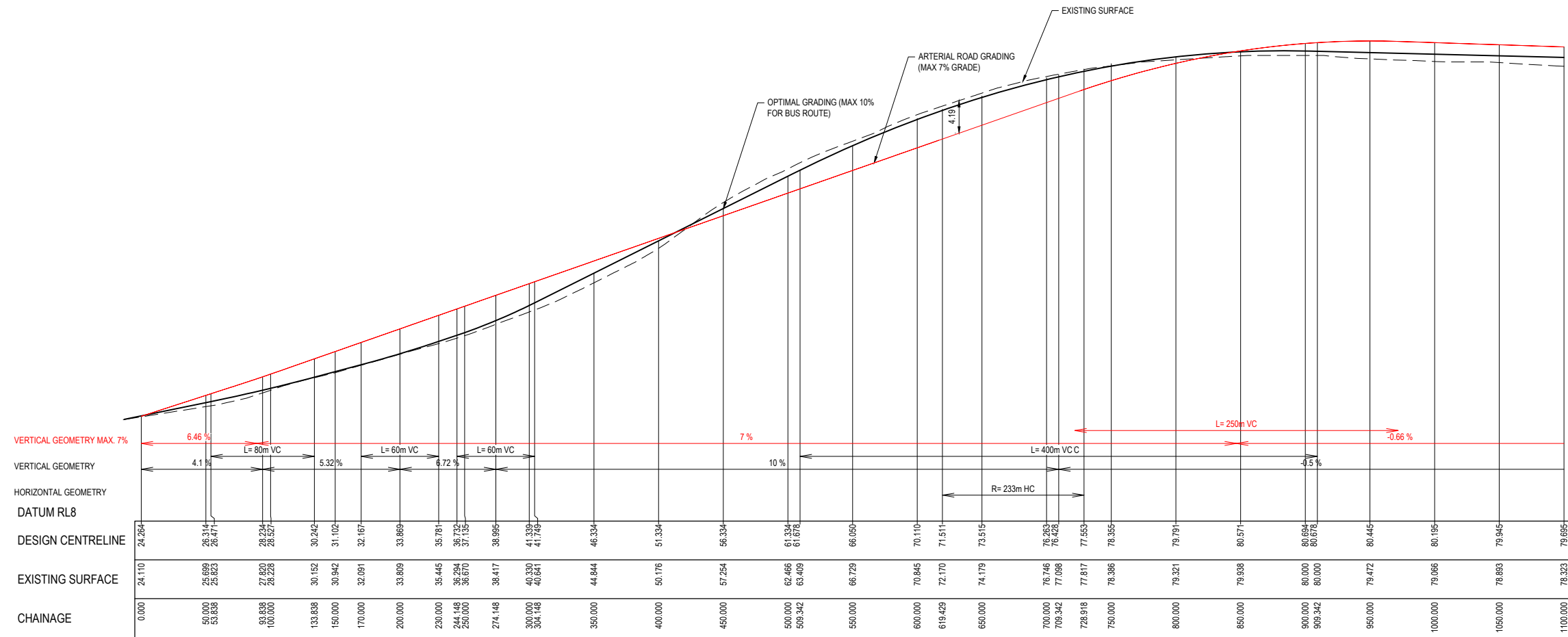
Appendix B: Elcho Road Vertical Design:



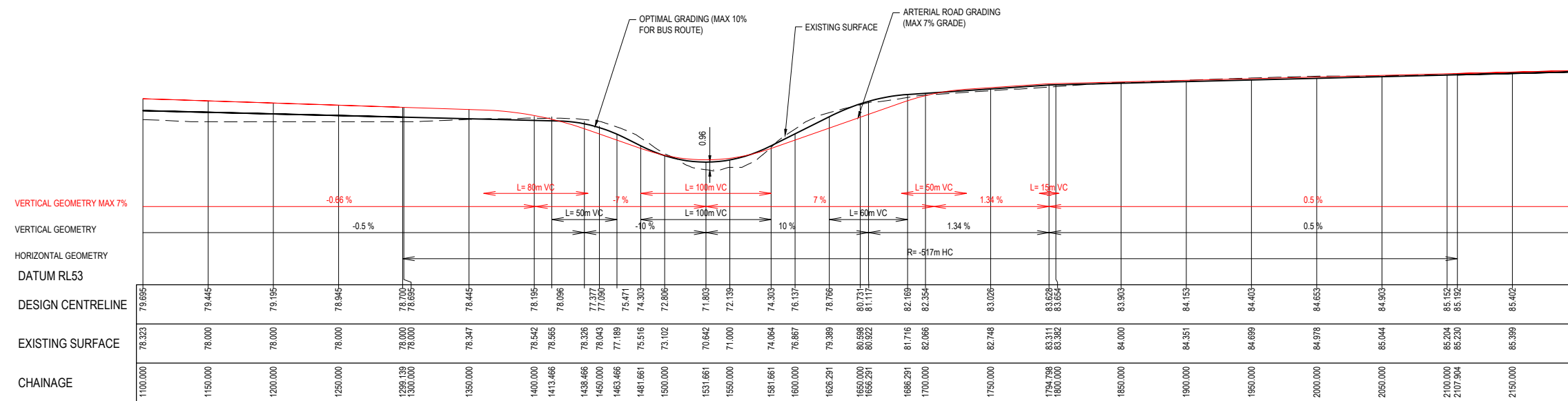
ELCHO ROAD



ELCHO ROAD



ELCHO ROAD LONGITUDINAL SECTION



ELCHO ROAD LONGITUDINAL SECTION