

# Creamery Road PSP

## Review of Villawood Designs

Final

Prepared for: City of Greater Geelong

Date: 19 September 2025

Ref: 300305978

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Issue | Final

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Revision	Description	Author	Date	Quality Check	Date
A-Draft	Draft	Lucy Farmer	25/08/25	Reece Humphreys	25/08/25
V2	Draft	Lucy Farmer	04/09/25	Reece Humphreys	04/09/25
V3	Final	Lucy Farmer	19/09/25	Reece Humphreys	19/09/25

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# 1. Introduction

## 1.1 Background

The Creamery Road Precinct Structure Plan (PSP) is located in the Western Geelong Growth Area (WGGA). The PSP is bordered by Midland Highway to the South, Geelong Ring Road to the east, Ballarat Railway Line to the north and Geelong – Ballan Road to the west. The PSP is the first in the WGGA and will have approximately 3,500 dwellings, supporting significant residential growth in the region.

A Standing Advisory Committee (SAC) held roundtable discussions in April 2025 to discuss the following specific matters:

- *The extent of developable land in the draft Creamery Road PSP, having regard to land required for active and passive open space, conservation reserves, schools and community facilities, transport infrastructure and drainage assets (a net developable area of 57 per cent is proposed).*
- *The development infrastructure levy, including the design, cost and apportionment of infrastructure items (in particular, the ‘Clever and Creative Corridor’ and drainage assets), as proposed in the draft Creamery Road DCP (a development infrastructure levy of approximately \$1.6 million per net developable hectare is proposed).*

The SAC then prepared a Volume 1 report that has been released publicly and recommended further work to be undertaken including the following items related to this report:

1. **Redesign and repurpose the proposed Clever and Creative Corridor as an Urban Connector street, including associated intersections, and revise the Future Urban Structure, land take and costs accordingly.**
3. **Review the road design parameters and design for Evans Road in the Creamery Road Precinct, and revise the Future Urban Structure, land take and costs accordingly.**

The City of Greater Geelong have been working collaboratively with Villawood and their consultants with respect to the aforementioned items that are explored as part of this report.

## 1.2 Scope of Report

Stantec has been engaged by the City of Greater Geelong to undertake an independent review of the following materials:

### **Villawood Materials supplied documents including:**

- DCP Intersections Cost Sheet, Villawood
- 200426 – G110 Evans Road Alternative Layout
- 230514MEM003D-F-All\_sml (Creamery Road Precinct Structure Plan Traffic Engineering Advice, One Mile Grid)
- 230514SID00 SIDRA Outputs
- CoGG – Transport Review Inception Meeting Minutes, 8-Aug-2025
- D25-293475\_Northern\_&\_Western\_Geelong\_Growth\_Area\_SAC\_Referral\_1\_-\_Vol\_2
- Villawood\_FUS\_options\_-\_7-Aug-2025
- other documents as nominated in the report.

### **Assessment of SIDRA Analysis prepared by Consultants One Mile Grid**

- 230514SID00 SIDRA Outputs
- 230514CLP300-307g (One Mile Grid Creamery Road PSP Intersection Layouts)

The aforementioned materials have been reviewed to provide advice on the transport network within the FUS and to identify opportunities for improvement from a transport perspective. This includes:

- Reviewing network connectivity and integration with surrounding infrastructure.
- Assessing multimodal access, including walking, cycling, public transport, and freight.



- Identifying potential efficiencies, such as route rationalisation, improved access to key destinations, and alignment with movement and place classifications.

### 1.2.1 Consultation

As part of the preparation of this report, Stantec met with:

- Representatives from the movement and access team at the Department of Transport and Planning (South Barwon) dated the 19<sup>th</sup> of August, 2025.
- Representatives of the Villawood team including consultants Villawood and One Mile Grid dated the 21<sup>st</sup> of Augst 2025.

The meetings provided an opportunity to clarify assumptions, discuss findings, and alignment with local priorities and planning frameworks. These discussions have helped to inform recommendations and ensure the review reflects stakeholder perspectives.

## 1.3 References

In preparing this report, reference has been made to a number of background documents and submissions including the following:

- City of Greater Geelong Planning Scheme
- Creamery Road Precinct Structure Plan August 2024, The City of Greater Geelong
- 20250512 – Attachment\_A, Attachment\_B, Attachment\_C
- 20250512-C450-THE\_Head,\_TfV-PPV\_SAC\_Supplementary\_Submission
- 230514CLP300-307g (One Mile Grid Creamery Road PSP Intersection Layouts)
- 230514MEM003D-F-All\_sml (Creamery Road Precinct Structure Plan Traffic Engineering Advice, One Mile Grid)
- 230514SID00 SIDRA Outputs
- CoGG – Transport Review Inception Meeting Minutes, 8-Aug-2025
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- Villawood\_FUS\_options\_-\_7-Aug-2025
- other documents as nominated in the report.



## 2. SAC Referral 1 Report - Volume 1

### 2.1 Key Findings

As mentioned in Section 1, the SAC provided a number of recommendations that pertain to the Clever and Creative Corridor (CCC). The report also provides the following findings:

The Committee finds:

- *Redesigning and repurposing the section of the realigned CCC through the Precinct as an Urban Connector street presents a significant opportunity to increase NDA and decrease the DIL.*
- *Further work should be undertaken to redesign and cost the new connector street and its intersections, including a cost benefit analysis of intersection designs, and redesign of its intersection with Midland Highway to a T-intersection.*
- *The Urban Connector street typologies in the PSP should be updated to reflect Villawood's 'Reframed CCC' cross section, with lot access limited along the side with the bicycle path.*
- *There is benefit in completing the GGATIS project to inform transport infrastructure requirements for the NWGGA, but its completion is not critical before this Precinct proceeds, on the basis that adequate supporting information is included with the draft Amendment to justify specific infrastructure items (see Chapter 5.2).*

And also recommends that the following further work be undertaken:

- *Redesign and repurpose the proposed Clever and Creative Corridor through the Precinct as an Urban Connector street, including associated intersections, and revise the Future Urban Structure, land take and costs accordingly.*
- *Amend the Creamery Road Precinct Structure Plan and Development Contributions Plan to incorporate changes resulting from redesigning and repurposing the proposed Clever and Creative Corridor as an Urban Connector street.*

The report also notes the following with respect to the connection of the CCC between Evans Road and the Batesford North PSP:

*Transport experts agreed:*

- *Council's Day 1 FUS showing the alignment of the CCC through both Batesford North and Creamery Road PSP "differs from the Framework Plan in that there are two north south routes for the CCC. The plan shows that the connection of the CCC through the Creamery Road PSP appears to terminate at Midland Highway and no longer continues through to Batesford South".*
- *Based on the Day 1 alignment there is no need for the CCC through the Precinct, apart from the section connecting to Batesford North Precinct (between CC\_IN\_12 and IN\_01) Sand Evans Road.*
- *If the CCC is delivered in the Precinct it could be as a standard connector street reservation with shared bus lanes.*

These considerations have informed the review of the Villawood materials.

### 2.2 Clever and Creative Corridor

The active travel network within the CCC is a defining feature of the precinct's commitment to sustainable and inclusive mobility. These routes are designed to prioritise walking and cycling, offering safe, direct, and comfortable connections between key destinations such as schools, parks, community facilities, and public transport nodes.

As outlined in the SAC Referral 1 Report (Page 64), *"The Committee considers it preferable to limit disruption to the key active transport (bicycle and primary footpath). However, it can see no reason to prohibit lot access on the other side of the street."* This statement reinforces the importance of maintaining a continuous and unobstructed active transport corridor along the CCC, particularly for cyclists and pedestrians.

In line with this, the recommendation on Page 67 of the same report states: *"The Urban Connector street typologies in the PSP should be updated to reflect Villawood's 'Reframed CCC' cross section, with lot access limited along the side with the bicycle path."* This supports a design approach that restricts direct lot access on the side of the corridor where the bikepath is located, helping to reduce potential conflict points and preserve the safety and efficiency of the active transport route.



This is a key consideration that Villawood will need to address in its detailed design. Restricting access along the bike path side is not intended to limit development potential, but rather to balance access needs with transport function, ensuring the CCC remains a high-quality, low-conflict corridor for walking and cycling. Access is still able to be provided on the opposite side of the street, maintaining connectivity for residents and businesses while protecting the integrity of the active transport network.

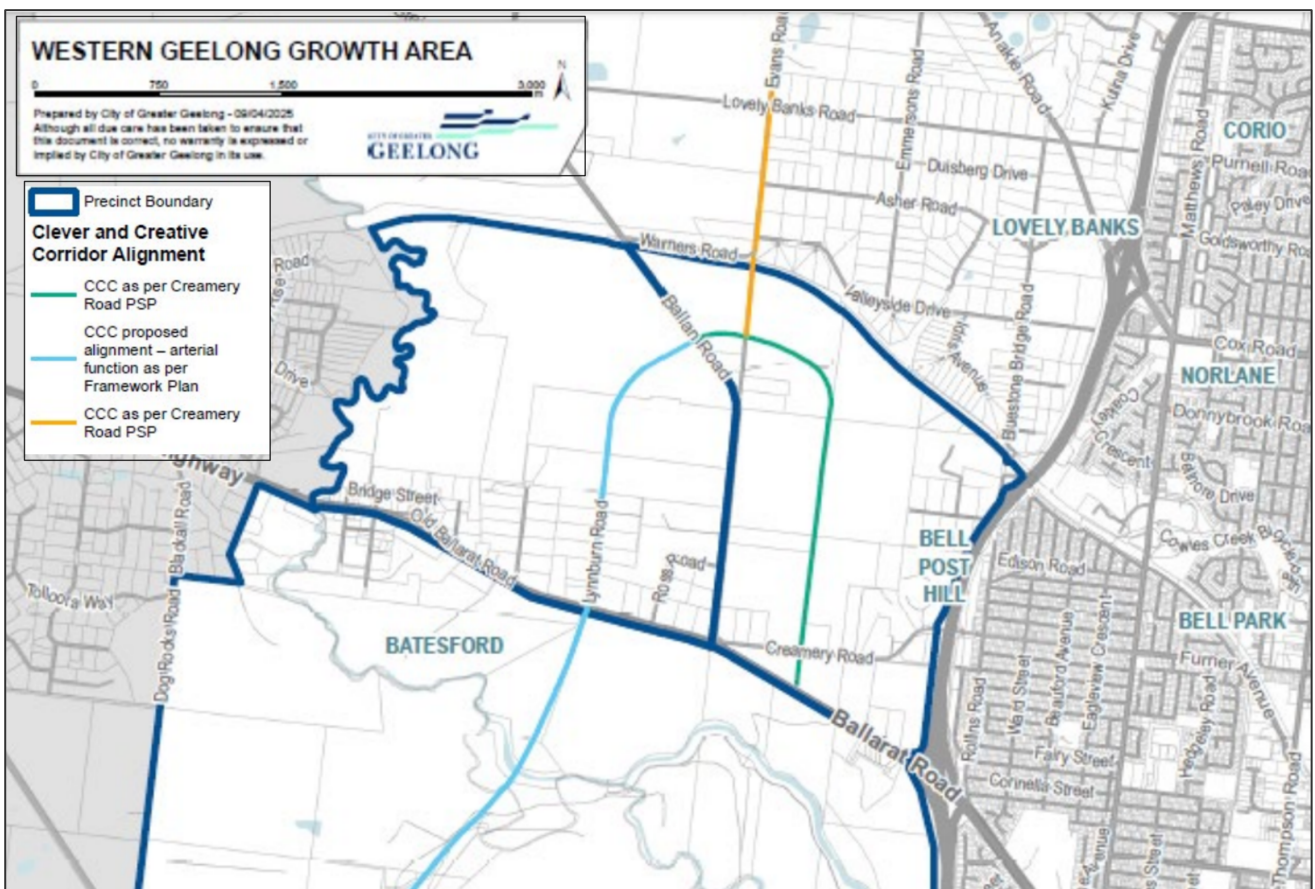
## 2.3 Evans Road

### 2.3.1 Role and Function

Whilst the SAC report indicates the removal of the CCC from the PSP, it does not go in so far as to recommend its role and function along Evans Road. To understand its intent, the latest CCC Alignment plan in

Figure 2-1: CCC alignment plan provided by The City at the SAC prepared by the City on the 9<sup>th</sup> of April 2025.

Figure 2-1: CCC alignment plan provided by The City at the SAC



Specifically, the plan identifies Evans Road as the “CCC as per the Creamery Road PSP”. Indeed, this indicates that the role and function of the CCC along Evans Road should be maintained. Whilst the SAC has provided clear recommendations on design of the CCC along Evans Road, it will be important that the broader role of the CCC be protected. This is also identified by Villawood as per page 66 of the SAC report which states:

*‘No party disputed this, with Villawood noting that the “CCC within the Creamery Road precinct does not prejudice the planning for the broader precinct”.’*

The Committee recommended further work “in relation to the CCC including a better understanding of its value proposition and updating its alignment in the Framework Plan” which would assist in informing its role along Evans Road. Notwithstanding, it is noted that this work “should not prevent the Creamery Road PSP from proceeding.”

In order to protect the role of the CCC beyond the precinct boundary on Evans Road and into the North Growth Area, it is recommended that bus priority be included on its approach to the CCC within the PSP (i.e. at CC\_12). This ensures that public transport functionality is protected and enhanced, even as broader network planning continues to evolve. This could be delivered as part of an 'ultimate' arrangement whereby the land required for the delivery of bus lanes be provided in the DCP only. This approach allows for flexibility in staging, ensuring that interim designs do not preclude future upgrades, while also reinforcing the strategic importance of Evans Road as a key public transport corridor linking two major growth areas.

### 2.3.2 Design Parameters

The SAC report includes discussion on the design parameters for Evans Road, in particular the vertical grade and design speed:

- With respect to the Grade, the Committee “sees no reason why a 9 percent grade could not be used over a short section of the road.”
- The design speed of 60km/hr is also recommended by the committee.

Ultimately, the design of the road will require sign off and approval from the City as part of the updates to the DCP whereby the aforementioned parameters will be assessed against.

What is not commented on, or assessed by the Committee, are the specific nuances of the design which was previously commented on as part of the hearing in the evidence prepared by Reece Humphreys. These comments are reproduced below:

- *The maximum grade of the vertical alignment, at chainage 220 to 240 is 10% and between chainage 320 and 340 is 9%. This is significantly higher than the Austroads and DTP guidance of 6% to provide for public transport. Providing a gradient of 10% would limit the ability for the road to achieve its role as a PT link in the CCC.*
- *There is also concern at the location of the proposed shared path crossing point at chainage 140.*
- *Creo's design has a grade change of 19% over a distance of 80m, which results in a sag “K” value of approximately 4.2 being achieved. A “K” value is a ratio of the change in grade for a vertical curve over a specific distance. The standard value for a 70km design speed in the Austroads Guide to Road Design is greater than 7.*
- *The key challenge with adopting a grade of 10% adjacent to a sharp sag point is that it considerably limits the available sight distance to both intersections (Safe Intersection Sight Distance) and vehicles generally (Stopping Sight Distance). In this instance, a minimum 151m SISD and 92m SSD is required by Austroads Guide to Road Design for a 70 km/h speed limit, both of which are not achieved in Creo's design.*
- *A grade of 10% would also impact on the shared path gradient which has a maximum grade requirement of 5% in accordance with the Austroads Guide to Road Design Guidelines*

Further commentary on the compliance of the Villawood submission with respect to these items is provided in Section 3.



# 3. Review of Villawood Materials

## 3.1 Introduction

A review of the of the Villawood materials has focused on the traffic and transport related items for consideration. These items have focused on the following themes:

1. Future Urban Structure (FUS) and its changes between the Councils FUS (adopted August 2024).
2. The proposed cross sections for connector roads and the reframed CCC
3. The Evans Road design parameters
4. The concept designs prepared by Consultants One Mile Grid
5. The SIDRA analysis prepared by Consultants One Mile Grid

These are explored in the following sections along with an assessment of their criticality as presented in Table 1 below.

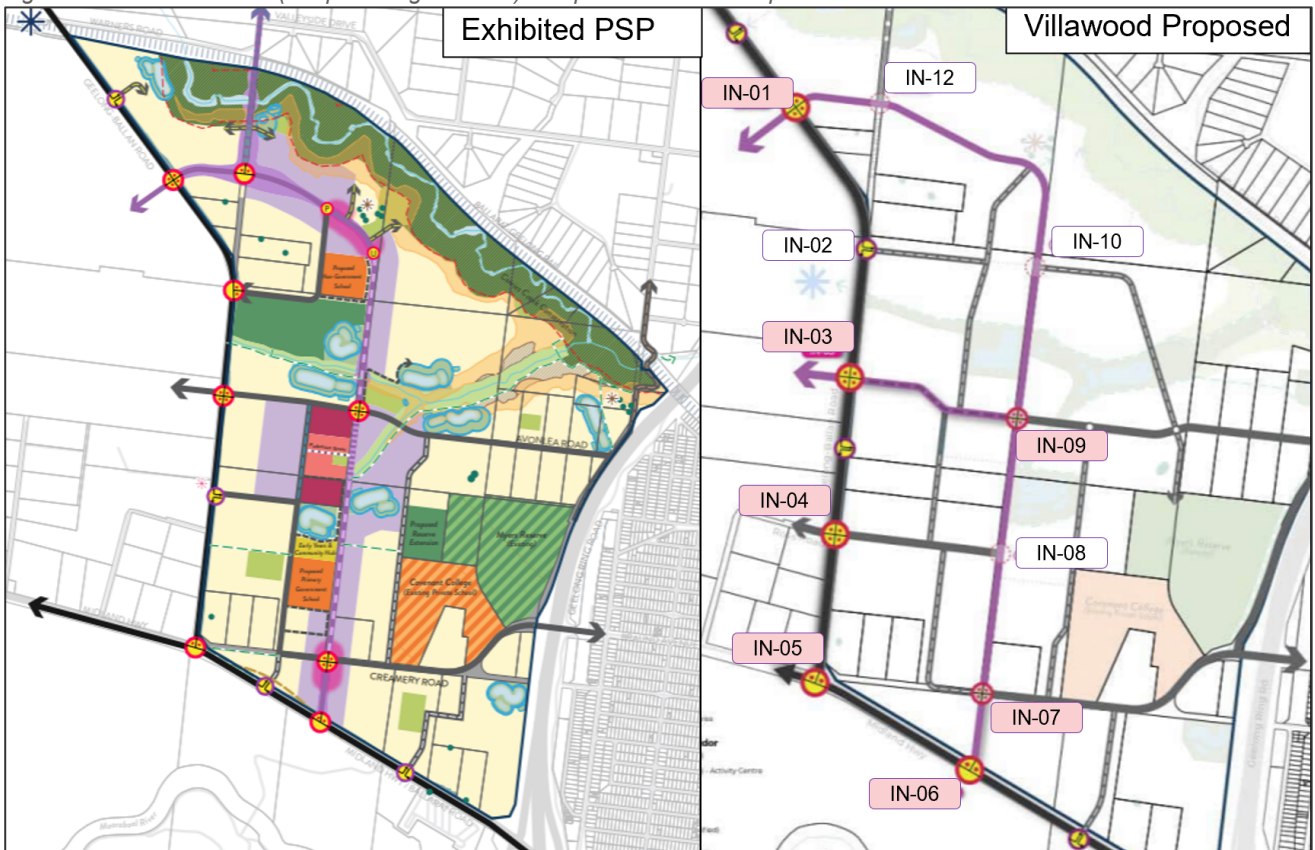
Table 1. Classification rating of comments provided in this review

Rating	Description
	Critical Issue
	Recommended update
	Discussion Item
	Supported Item

## 3.2 Future Urban Structure (FUS)

The Future Urban Structure Plan sets out the land uses and primary street network planned for the precinct. The Councils FUS (adopted August 2024) and the latest version of the Villawood Proposed FUR have been reproduced in Figure 3-1.

Figure 3-1: Councils FUS (adopted August 2024) compared with the Proposed Villawood FUS



Some of the key differences between the two layouts include:

- Removal of Left-in-left-out (LILO) Intersection Between IN\_05 and IN\_06. The LILO access originally shown in the PSP FUS has been removed in the Villawood version.
- CC\_08 has been added along the CCC in the Villawood FUS, which was not included in the Councils FUS (adopted August 2024).
- CC\_10 is also newly introduced into the Villawood FUS, along with a new eastbound local connector road. It is not clear if this is to be a DCP item or not.
- Between IN\_03 and IN\_04 a new left-in left-out intersection has been added.
- The PSP FUS shows CC\_12 as a signalised T-intersection, whereas the Villawood FUS proposes an unsignalized intersection but they have also provided designs for a fully signalised intersection.
- IN\_04 has been upgraded from a left-in left-out to a signalized intersection.
- The Villawood FUS includes a revised road layout configuration in the vicinity of the activity centre.
- The Villawood FUS shows a modified alignment of the CCC between CC\_10 and CC\_12, reflecting the removal of provisions for C and U-turns, which were considered in the PSP FUS.
- The Villawood FUS includes the reframed CCC between CC\_09 and IN\_03 and beyond into the Batesford North PSP.
- The location of CC\_12 is located further south in the Villawood proposed FUS compared with the Councils FUS (adopted August 2024).

Table 2 provides a summary of the key items identified in a review of the Hybrid FUS prepared by Villawood, including a rating on their impact.

*Table 2. Review of key items within the proposed FUS*

Location	Issue / opportunity	Commentary / recommendation
IN_12	Councils FUS (adopted August 2024) identifies this location as an unsignalised T-intersection; however, the OneMile design includes the intersection with signalisation.	Whilst there is some discrepancy between the FUS and documentation provided, it is understood through discussions with Villawood that this is intended to be a signalised intersection.  <u>The intersection be confirmed as signalised for safety, access and performance.</u>
IN_10	The addition of this new link will provide improved connectivity to the east.	This change is supported.
IN_10	This new link will likely result in a crossing of the Cowies creek.	<u>The City to explore whether an additional culvert will be required to the DCP associated with this link.</u>
IN_04	The City's revised DCP included the provision for one signalised intersection on the Geelong – Ballan Road between IN_01 and IN_05.  The inclusion of a signalised intersection would result in increased accessibility between the PSP and Batesford North and is supported.	The inclusion of an additional intersection would result in a redistribution of traffic and associated traffic volumes.  <u>It is recommended that the finalised FUS be re-analysed to confirm traffic volumes and intersection lane lengths, noting that some may reduce in length.</u>
IN_03 and IN_04	Between these two intersections there has been the addition of LILO intersection.	This change is supported as it provides improved connectivity west of the CCC.
IN_06 & IN_07	The left-in left-out between IN_05 and IN_06 was included in the PSP to facilitate movements between the Midland Highway and the Creamery Road bridge.	The removal of this link is expected to redistribute traffic volumes toward and through intersection IN-06 and CC_07. This reallocation of traffic patterns should be considered in the One Mile Grid analysis to ensure the intersection is designed appropriately.



Location	Issue / opportunity	Commentary / recommendation
		It is recommended that One Mile Grid update the analysis of IN-06 and CC07 to include consideration of the removal of the left in / left out.
Reframed CCC between CC_09 and IN_03	Road classification	<p>It is proposed to include an additional 'branch' of the reframed CCC to connect between CC_09 and IN_03. This is a new alignment for the CCC and is not consistent with the framework plan and in the City's updated CCC plan shown in Figure 2-1.</p> <p>It is recommended that the link be reclassified as a Connector Road or Local Road. It is understood that this has been updated on the latest FUS provided by Villawood to the City.</p>

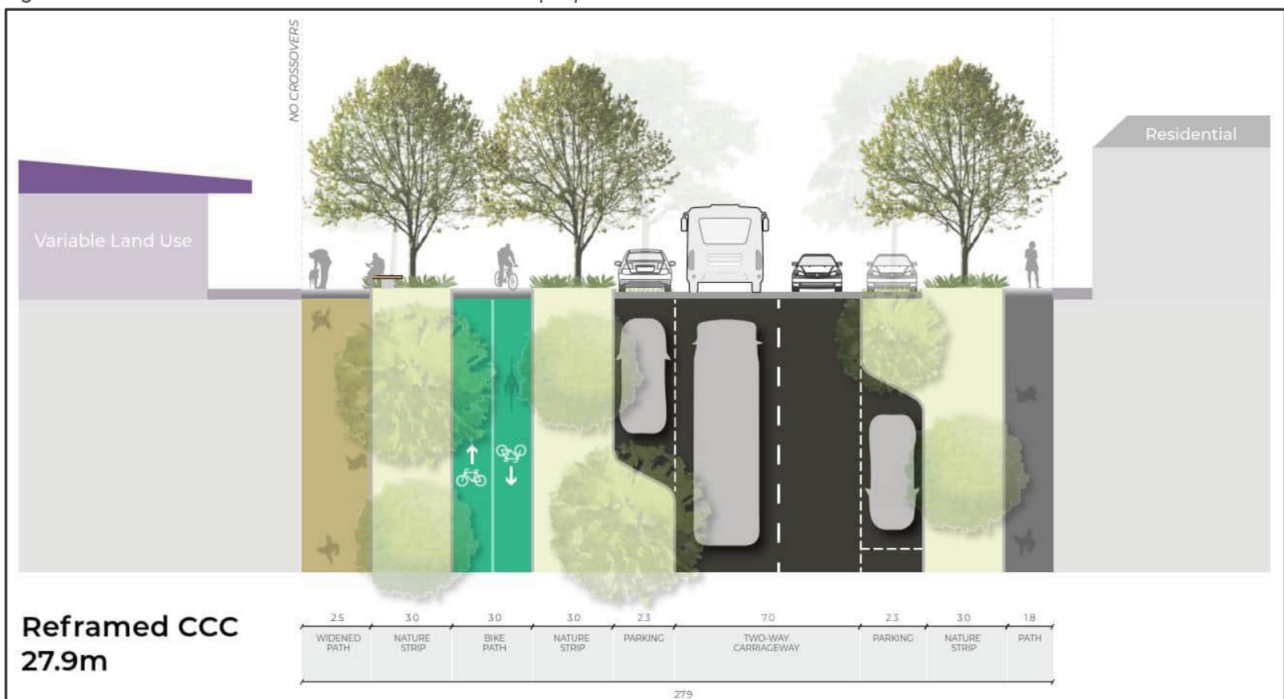
### 3.3 Cross Sections

#### 3.3.1 The CCC cross section

The Council FUS (adopted in August 2024) outlines a clear vision for the CCC as a multimodal spine, incorporating dedicated public transport infrastructure and high-quality pedestrian facilities. The CCC is envisioned as a human-centred connection route that prioritises people, place and accessibility. More than a transport corridor, the CCC is designed to integrate walking, cycling, and public transport with high-quality public spaces, tree canopy, and active frontages. Its role is to link neighbourhoods, activity centres, schools, and open spaces in a way that encourages social interaction, sustainable transport choices, and a strong sense of place.

A 'reframed CCC' has been developed by Villawood as part of submissions and ongoing collaboration with the City. Figure 3-2 shows the cross section of the reframed CCC proposed by Villawood.

Figure 3-2: CCC Road Reserve 27.9m - Villawood proposed cross section



The Villawood Design utilises a 27.9-metre-wide road reserve, reflecting the removal of dedicated public transport lanes, which eliminated the corridor's capacity to accommodate midblock bus lanes, consistent with the direction of the SAC. The design provides only a 1.8-metre-wide footpath on one side of the road and a widened path the same side as a dedicated bidirectional bicycle lane.

Noting the position of the SAC which states: “The Urban Connector street typologies in the PSP should be updated to reflect Villawood’s ‘Reframed CCC’ cross section, with lot access limited along the side with the bicycle path.” It is clear that the cross section proposed delivers on this direction.

### 3.3.2 Connector Road Cross Section

The Connector Road is intended to support multimodal transport, active travel, and a high-quality public realm. Villawood are proposing that the connector roads within the development incorporate bidirectional bicycle lanes and direct access to properties that would result in multiple vehicular crossovers. This reflects their intent to support active transport while maintaining flexible access for residential driveways and internal circulation.

Figure 3-3 and Figure 3-4 illustrate the differences between the Villawood preferred and the Councils FUS (adopted August 2024) cross sections.

Figure 3-3: Connector Road 25m Road Reserve - Villawood Preferred

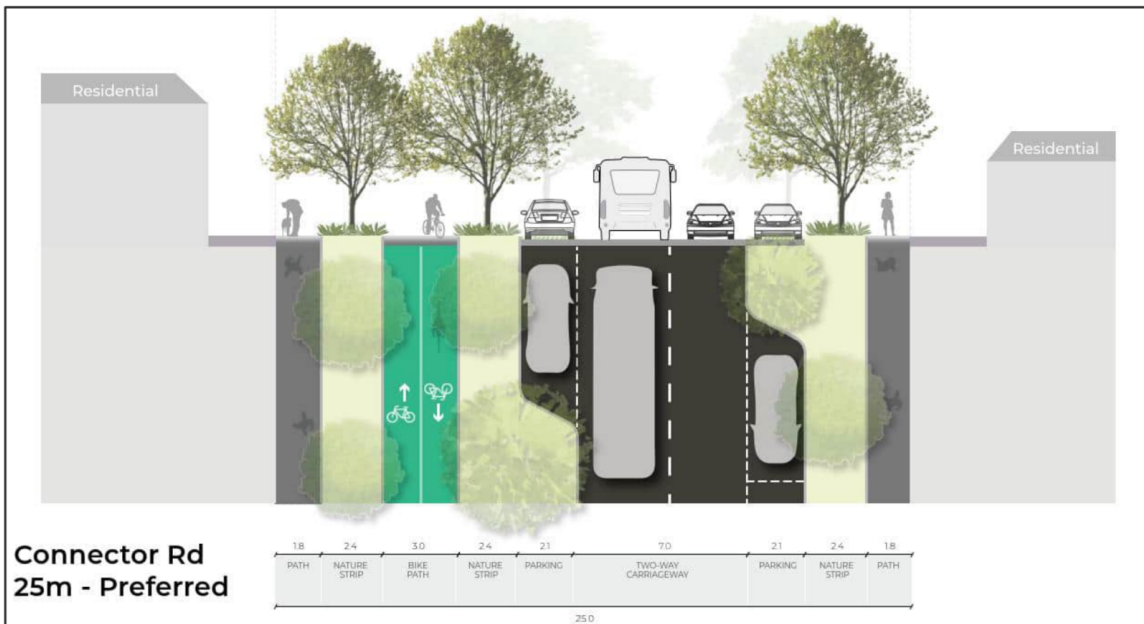
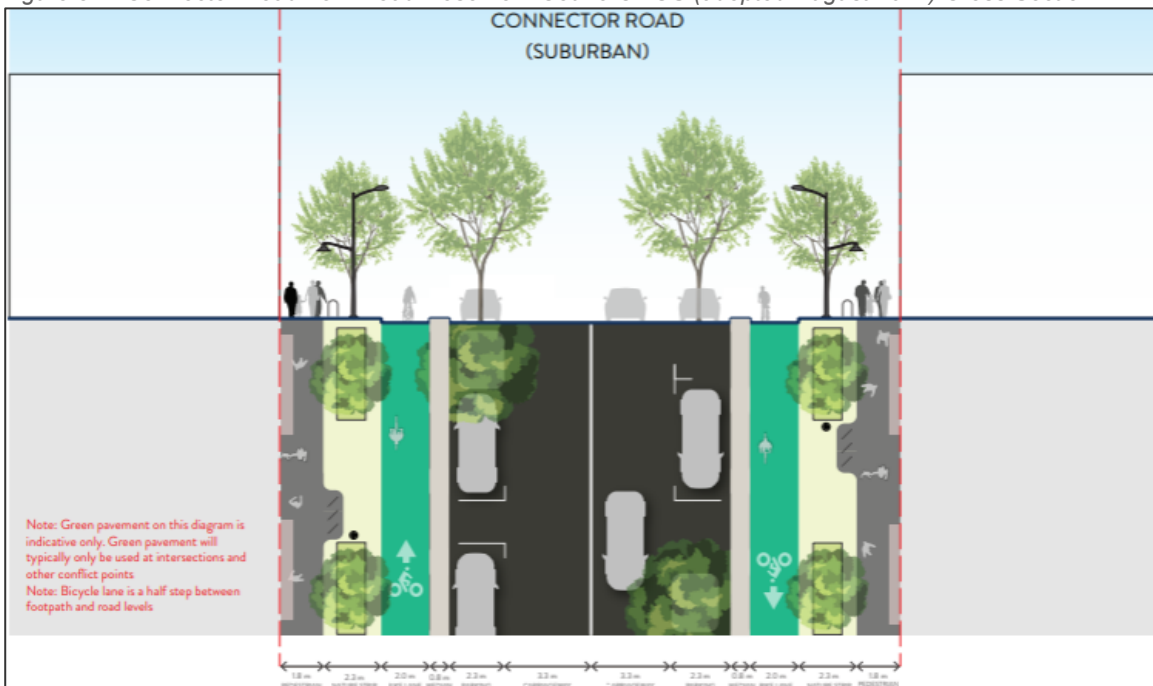


Figure 3-4: Connector Road 25m Road Reserve – Councils FUS (adopted August 2024) Cross Section



The key differences between the City’s preferred cross-section and the Villawood-preferred cross section are summarised in Table 3.

Table 3. Comparison of Connector Road cross sections

Element	Councils FUS (adopted August 2024)	Villawood Proposed
Bicycle Infrastructure	Dedicated 2.0m-wide bicycle lanes on both sides of the road.	Replaces dual lanes with a 3.0m-wide shared path, potentially reducing clarity and safety for cyclists and pedestrians.
Parking Bays	<b>2.3m-wide parking bays</b> , allowing safe clearance from footpaths and bicycle lanes.	<b>2.1m-wide parking bays</b> , increasing risk of vehicle overhang into adjacent paths.
Footpaths	<b>1.8m-wide footpaths on both sides</b> , supporting high pedestrian volumes and accessibility.	<b>1.8m-wide footpath on the eastern side only</b> , which may not meet accessibility or shared use standards.
Nature Strip / Verge	<b>4.4 m nature strip space</b> , designed for landscaping, tree planting, and public realm features.	<b>7.2m nature strip</b> , aimed at improving canopy coverage.

These differences highlight the need for further review and alignment with the PSP’s strategic intent, particularly to ensure the Connector Road supports safe, accessible, and future-ready transport infrastructure.

With respect to the bidirectional or unidirectional bike lanes, consideration of relevant transport planning and safety practices should be sought to determine the preferred approach.

Whilst it is recognized that both treatments provide a strong outcome for cyclists, a comparison of the needs of each user group result in unidirectional bike lanes generally preferred in urban environments due to their intuitive design, fewer intersection conflicts, and simpler signal operations. This is also supported in Section 3 of the VicRoads Supplement to AGRD Part 6A: Paths for Walking and Cycling (2021), which indicates that separated unidirectional cycle lanes are better for all cycle user classes for “light commuting and/or local access” purposes. They offer clearer network integration, safer driveway interactions, and easier transitions to other cycling infrastructure.

The NACTC ([National Association of City Transportation Officials](#)) guidance document summarises the key benefits of unidirectional bike lanes as opposed to bidirectional, a snippet from the document is noted in Figure 3-5.

Figure 3-5: Benefits of Unidirectional Bike Lanes – NACTC

- Provide clear and direct connections with the overall transportation network;
- Require fewer modifications to signal operations at intersections;
- Present fewer conflicts at driveways and unsignalized intersections;
- Transition more easily to other bikeways; and
- Limit the potential for conflict between people riding in opposite directions.

The proposed Villawood design provides a bidirectional bike path located on one side of the corridor. While bidirectional bicycle paths can be beneficial in constrained corridors or low-conflict environments, they introduce greater complexity at intersections and driveways, often requiring additional signalisation and careful design to manage safety and flow. They may also reduce accessibility to properties on the opposite side of the road and complicate pedestrian crossings.

Given the original PSP intent and the operational advantages of unidirectional paths, this report recommends reconsidering the bidirectional treatment with unidirectional bicycle paths to better support safety, connectivity, and long-term network integration.

## Tree Canopy

During the meeting with Villawood as part of this review process, the Villawood team indicated that the decision to adopt a bidirectional bicycle path along the CCC was driven by an inability to meet tree canopy cover requirements under the



original unidirectional layout. While this rationale reflects a valid urban development perspective, our review considers the implications that this would have on the transport objectives of the CCC and broader growth areas.

From a transport planning standpoint, unidirectional bicycle paths are generally preferred in urban contexts due to their lower conflict risk, better integration with intersections, and clearer directional flow for cyclists as outlined above. Prioritising canopy coverage at the expense of cycling safety and functionality has the potential to undermine the networks strategic intent to prioritise active transport. It is important to give further consideration to anticipated cycling volumes, particularly in the context of encouraging a modal shift away from private vehicle use, noting the intent of the CCC will provide facilities for cyclists on longer commutes.

While the revised Villawood design may achieve greater canopy coverage for Connector Roads, it also introduces wide-verged areas that could unintentionally encourage informal car parking directly outside of residents properties. This has been observed in locations across Melbourne and Geelong, where vehicles park on wide verges and encroach onto the bicycle path, creating safety hazards and reducing the amenity and usability of the cycling infrastructure.

This is a critical issue that will need to be carefully considered in the next stage of design. Without appropriate access controls, verge treatments, or enforcement mechanisms, the risk of verge parking could significantly compromise the safety and effectiveness of the roads broader active transport aspirations. There is also a risk that vehicles parked in residential driveways may encroach onto the adjacent cycleway. This could obstruct the path, creating safety hazards for cyclists and reducing the overall effectiveness of the active transport corridor. To mitigate this, driveway design and placement should be carefully considered during planning, with potential measures such as physical separation, signage, or enforcement to ensure the cycleway remains unobstructed and safe for users.

An example of this already occurring in Armstrong Creek is provided in Figure 3-6.

Figure 3-6: Armstrong Creek Example of Verge Parking Encroaching on Cycleway



With respect to the verge widths, there are examples in Maribryngong as shown in Figure 3-7 below that include tree planting within a separator of 1.2m, indicating it is possible to achieve (noting that the City should consult its urban design team to confirm its acceptability).

Figure 3-7: Tree Canopy on a 1.2m Verge



It is understood that the City has specific verge requirements for tree planting and that smaller verges for tree planting may not be achieved. Notwithstanding, tree planting can be achieved on Connector Roads at the expense of car parking spaces which is a good outcome to reduce car reliability thus meeting sustainability objectives.

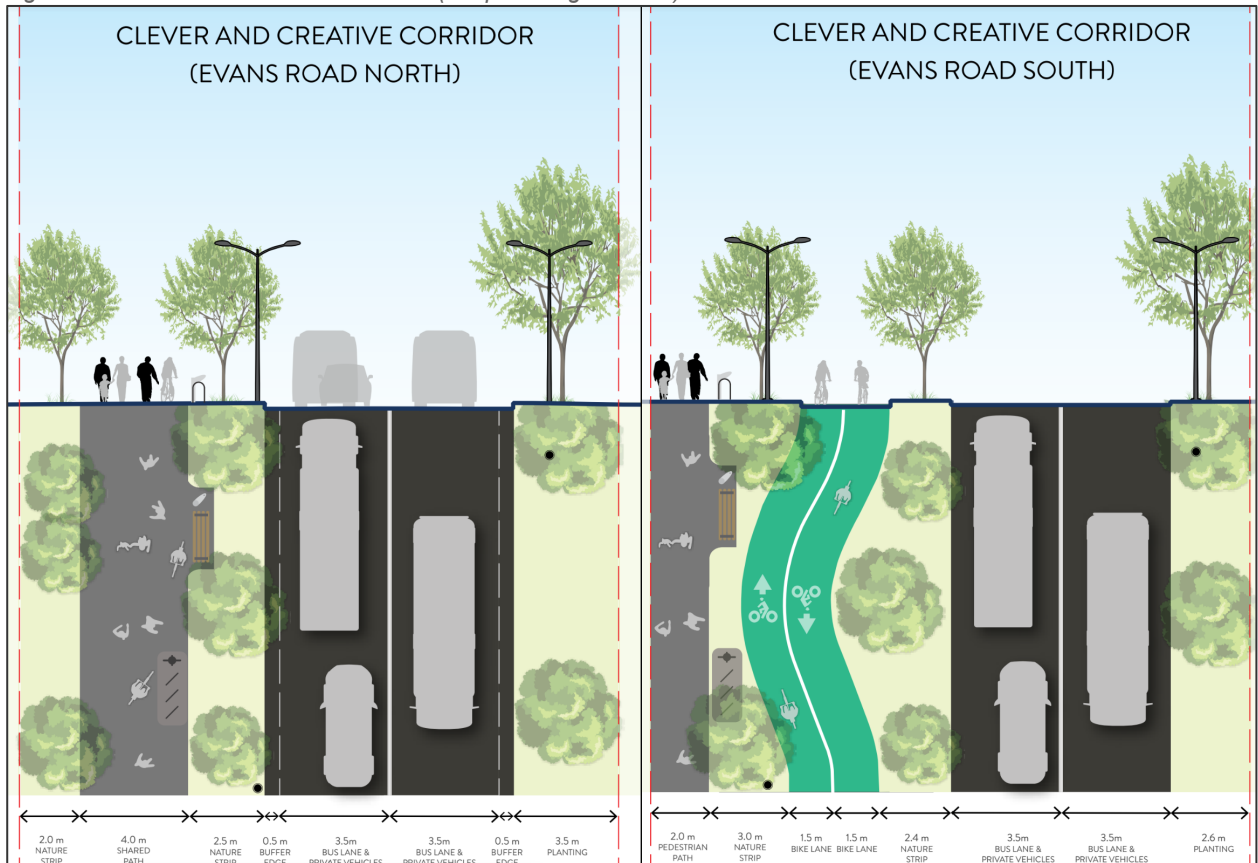
### 3.3.3 Evans Road cross section

Evans Road plays a key role in the Villawood Proposed FUS, acting as a primary connector within the precinct. Its alignment and integration with surrounding intersections reflect Villawood's intent to streamline traffic flow and enhance accessibility across the development. The proposed Villawood cross section is shown in Figure 3-8 and the Council FUS cross section is shown in Figure 3-9.

Figure 3-8: Evans Road - Villawood Proposed Cross Section



Figure 3-9: Evans Road – Councils FUS (adopted August 2024) Cross Section



The key differences between the Evans Road cross section in the Councils FUS (adopted August 2024) and the Villawood cross section are highlighted below and within Table 4.

Table 4. Comparison of Evans Road cross sections

Element	Councils FUS (adopted August 2024)	Villawood Proposed
Road Segmentation	<b>Divides Evans Road into northern and southern</b> sections with tailored cross-sections.	Applies a <b>single cross-section</b> for the corridor within the PSP.
Shared Path (outside of PSP Boundary)	Includes a <b>4.0m wide shared path</b> with a 0.5m buffer edge lane.	Proposes a <b>3.0m wide shared path</b> , combining pedestrian and cyclist movements.
Shared Path (inside PSP Boundary)	Features a <b>3.0m wide designated bicycle lane</b> and a <b>2.0m wide footpath</b> .	Proposes a <b>3.0m wide shared path</b> , combining pedestrian and cyclist movements.
Footpath Provision	Specifies <b>footpaths on both sides</b> , with widths tailored to section function.	Includes a <b>1.8m footpath only on the eastern side</b> , which is not specified in the PSP.
Parking Bays	None	Proposes <b>2.3m wide parking bays</b> , not detailed in the PSP cross-section.
Nature Strip	Allocates a <b>larger nature strip</b> , with 0.6m more width than the OneMile design.	Reduces nature strip width, potentially impacting landscaping and canopy targets.

Evans Road will play an important role in connecting the Northern and Western Growth Areas and ensuring that it has the appropriate elements to deliver on its role and function will be important. Ultimately, Evans Road will from part of the CCC and cater for traffic volumes in excess of 14,000 vehicles per day and it will be important to ensure that its broader role and function is not compromised.

### 3.3.4 Review of CCC, Connector Road and Evans Road Cross Sections

Table 5 provides a summary of the key items identified in a review of the cross sections prepared by Consultants Villawood on behalf of Villawood, including a rating on their impact.

Table 5. Review of proposed Connector Road, CCC and Evans Road Cross Sections

Location	Issue / opportunity	Commentary / recommendation
Connector Road Shared Path	The omission of dedicated bicycle lanes on both sides of the carriageway, may reduce safety and will discourage active transport use.  Cycling infrastructure should be provided on both sides of the road to allow direct access to destinations and support safe, convenient movement. This approach aligns with Austroads guidance and is particularly important in areas with multiple side roads, where bidirectional paths can be less effective. Protected, shaded cycling lanes positioned between the parking lane and traffic flow are preferred.	The NATC guidance recommends unidirectional bicycle lanes due to safety and their connectivity.  <u>It is recommended that the bicycle lanes be provided as unidirectional to increase the attractiveness for cyclists to use and access adjacent land uses along the corridor.</u>
Connector Road parking bay width	There appears to be a notable inconsistency in Villawood's treatment of parking widths across different road types. A 2.1m wide parking width has been included in the Connector Road cross section, reduced from 2.3m in the CCC cross section. A width of 2.3m is preferred by the City as part of its subdivisional requirements as this provides improved safety and accessibility.  This narrower provision may compromise safety and usability, particularly in areas with higher residential density or active transport interfaces. The variation raises questions	<u>It is recommended that 2.3m wide parking bays be provided. This additional area could be taken from the verge.</u>



Location	Issue / opportunity	Commentary / recommendation
	about the rationale behind the reduced standard and whether it adequately supports consistent design outcomes across the precinct.	
Tree canopy	It is understood that a key consideration for the Villawood cross section for the Connector Road is the need to meet the tree canopy requirement for the street. It is also understood that the tree planting require wider verges than 1.0m.	Reference is provided to 115 Victoria Street and 160 Victoria Street, Seddon as shown in Figure 3-6 above which both provide trees on a verge of just 1.2m. It is noted that the recent IDM requires canopy trees located next to a footpath to have a minimum 2.5m median. However perhaps this needs to be considered on a case-by-case basis—for example, specific design elements that may require agreement or approval outside the standard guidelines to help promote engagement with sustainable transport.  <u>It is recommended that The City explore the ability for reduced verge widths to facilitate tree planting. Alternatively, tree planting be provided with reduced on street car parking provision.</u>
Evans Road Shared path	The shared path along Evans Road is supported. A wider verge, within and outside of the PSP boundary, could be considered to provide the flexibility for potential widening enabling dedicated bicycle lanes in the future if required.	<u>Given the limited property access on Evans Road, both within the PSP and north of the PSP, it is recommended that a wider verge be provided.</u>

### 3.4 Evans Road Design

It is recognised that the proposed vertical grade provided as part of the Villawood materials for Evans Road is an improvement from the previously provided design and generally meets the requirements outlined in the SAC. A key element that is missing from the design is the delivery of a shared and footpath both through the PSP and beyond its boundary.

Table 6 provides a summary of the key items identified in a review of the Evans Road design provided by Crelo and One Mile Grid, including a rating on their impact.

Table 6. Review of Evans Road Design

Location	Issue / opportunity	Commentary
Evans Road	It is noted that a maximum grade of 9% is provided on Evans Road either side of the culvert crossing Cowies Creek.	This outcome is supported.
Evans Road	A sag “K” value of 5.66 is provided across Cowies Creek.	<u>It is recognised that this is an improvement from the previous design, however further justification as to the use of this value less than 7 is recommended to be provided.</u>  <u>It is noted that this will require approval from the City’s engineers.</u>
Evans Road	The design shows that a sight stopping distance of 73m is provided with the revised design.	This outcome is supported in line with the design speed of 60km/hr.
Evans Road	Proposed shared user path crossing point located at CH 180 / DDA compliance	The proposed crossing location of the path is on a section with a 9% grade (crossfall) on Evans Road which does not allow for DDA compliance.  <u>It is also recommended that the vertical grade be updated to ensure that the crossfall at the</u>



Location	Issue / opportunity	Commentary
		<u>pedestrian crossing point be updated to achieve DDA compliance. It is important that pedestrians and cyclists of all disabilities are able to cross the roads safely.</u>
Evans Road	Vertical grading of shared user path	<p>The shared paths shown along Evans Road between CH 150 and CH 180 are located in a section where the road alignment is 9%.</p> <p>This does not meet DDA compliance which has a preferred crossfall of 5% and a maximum of 7.14%. Given the 9% grade that is achieved for the road, and to avoid creating level differences between the path and Evans Road, landings/handrails would be required, which present a risk to both cyclists and road users.</p> <p>For cyclists, AGRD Part 6a identifies that grades steeper than 5% should not be provided due to likelihood of fast downhill speeds and difficulty for cyclists travelling uphill. The sharp turn at the bottom of the steep path sections is also not advisable by AGRD.</p> <p>As the shared path will be used by both cyclists and pedestrians, the 9% gradient presents a risk to pedestrians using the path adjacent to cyclist at high speeds (AGRD guidance states speeds on moderate gradients can be over 50 km/h).</p> <p><u>It is recommended that the design be updated to ensure that the shared path achieves DDA compliance and that grades for cyclists meet AGRD standards.</u></p>
Evans Road	Alternative alignment of shared paths	As per the above comment, consideration should be given to locating the shared paths north of the PSP boundary. This would present opportunities to: flatten the longitudinal grade, introduce curvature or other safety features to the shared path alignment with the aim of slowing cyclists down.
Evans Road	Safe Intersection Sight Distance (SISD)	<p>SISD for cars at 60 km/h per AGRD Part 4a is approx. 123m (without grade adjustment). The location of the proposed connector road at CH 145 on Evans Road is unlikely to achieve required sight distance for vehicles travelling northbound and southbound. Further, the SISD requirement for buses travelling at 60 km/h will be higher and unlikely to be achieved.</p> <p><u>It is recommended that the designer demonstrate that the SISD is achieved.</u></p>
Evans Road	Stopping Sight Distance (SSD) for buses	It is noted that SSD values for cars have been used as the design criteria, however SSD requirements for buses are higher and in the order of 128m (without grade adjustment) given their lower coefficient of deceleration (d=0.15 based on AGRD Part 3 Table 5.3). The current design does not appear to satisfy the SSD requirements for buses.



Location	Issue / opportunity	Commentary
		<u>Given the strategic role of Evans Road as the CCC connecting to the WGA, a SSD of 128 is recommended to be provided.</u>

### 3.5 Concept Designs

The review of the concept designs focused on elements that have the potential to impact on safety, or elements that would impact on the cost of the DCP (i.e. number of lanes etc.). It is recognised that further design and development will be required through the implementation process and that this would require design approvals from DTP and the City.

Table 7 provides a summary of the key items identified in a review of the concept design prepared by One Mile Grid, including a rating on their impact.

Table 7. Review of proposed concept designs prepared by One Mile Grid

Location	Issue / opportunity	Commentary
IN_09	To ensure cyclist safety at the CCC Activity Centre, please confirm that the signal phasing prevents vehicles from turning across an active bike lane. The design should incorporate a protected turning phase for vehicles that does not overlap with the green phase for cyclists. This will help avoid potential conflicts and maintain safe and efficient movement for all road users.	<u>It is recommended that the analysis be updated to include a protected turning phase for vehicles that does not overlap with the green phase for cyclists.</u>
Connector to reframed CCC intersections	Bus jump lanes	The provision of bus jump lanes on the reframed CCC is supported as this meets the objectives of the corridor.
CCC Reframed / Key Local Road Intersection (CC_10)	The proposed intersection design does not include a safe pedestrian or bicycle crossing.	A safe crossing is recommended at this location as it connects the key local road with the bicycle route on the CCC Reframed corridor.  The crossing should be offset and raised to enhance visibility and reduce vehicle speeds. <u>It is recommended to provide a safe crossing at this location.</u>
IN_05	A raised pedestrian crossing is provided on the left turn slip lane with volumes exceeding 450 vehicles per hour.	The intersection of Geelong-Ballan Road and the Midland Highway is the junction of two arterial roads that are freight routes poses a significant safety risk to cyclists and pedestrians.  <u>Whilst ultimately any arrangement would require DTP approval, it is recommended that the design and analysis be updated to include the crossing as signalised.</u>
IN_05	A u-turn lane is provided on the west approach to the intersection.	<u>Given the need to provide basic and essential designs, it is recommended that One Mile Grid remove the u-turn from the design and subsequent analysis.</u>
IN_06	Signalised crossings are currently provided on both the eastern and western approaches to the intersection.	The southern leg of the intersection has now been removed which results in a typical t intersection being provided at this location.  <u>It is recommended to remove the western pedestrian leg as this would provide improved intersection performance and increased safety by removing the conflict of right turn movements into pedestrians.</u>



Location	Issue / opportunity	Commentary
IN_01 & CC_12	It is recognised that the proposed location of CC_12 is further south than Councils FUS (adopted August 2024). The design of IN_01 could be compromised due to the angle of the north south CCC road.	The designs prepared by Crelo consulting do not align with the designs prepared by One Mile Grid.  <u>It is recommended that these be updated to confirm that it is geometrically possible for the intersections to match accordingly, both vertically and horizontally.</u>
CC_12	Bus Priority on Evans Road	Evans Road will form part of the CCC and will require the provision of dedicated bus priority, similar to what is provided on the reframed CCC.  <u>It is recommended that the designs be updated to include provision for dedicated bus lanes on the north approach to the intersection.</u>

## 3.6 SIDRA analysis

### 3.6.1 Assumptions

The assumptions that were incorporated into the SIDRA analysis to determine the intersection layouts for the DCP items used a number of assumptions that aligned with DTP / VicRoads guidance and were agreed by DTP and the City of Greater Geelong.

A review of the One Mile Grid SIDRA analysis has identified a number of assumptions that vary to those used in the analysis, including:

- Phase times along the corridor in the order of 120 seconds.
- The use of dedicated bus and bicycle phases at intersections along the CCC. These are critically important along the reframed CCC to encourage bicycle use along the corridor.
- Staged pedestrian crossing phases have been provided for movements crossing the Midland Highway and Geelong-Ballan Road. The design of intersections in greenfield locations such as these should always adopt full crossing due to safety reasons to reduce the likelihood of pedestrians requiring to refuge within the intersection.

The above elements deviate from standard design practice and may present safety and operational concerns. Variation of the above parameters will ultimately require DTP acceptance as the road authority.

### 3.6.2 Review

Table 8 provides a summary of the key items identified in a review of the SIDRA Analysis prepared by One Mile Grid, including a rating on the impact

*Table 8. Review of proposed SIDRA analysis prepared by One Mile Grid*

Location	Issue / opportunity	Commentary
IN_05	Staged pedestrian crossings have been proposed, which can increase crossing times and reduce pedestrian priority.	<u>It is recommended that the analysis be updated with the phase arrangements for pedestrians to cross in a single movement which is consistent with planning for growth area planning. It is also noted that designs on Midland Highway will require approval from DTP.</u>
IN_05	A single right-turn lane for the Midland Highway, despite volumes exceeding 350 vehicles per hour, may result in queuing and operational inefficiencies for such a high movement.	<u>It is recommended that DTP confirm acceptance of a single right turn movement to cater for the high volume of turning vehicles expected.</u>
IN_05	As per Comment in Section 3.5, the U-turn movement is not required and is recommended to be removed.	<u>It is recommended to update the analysis with the removal of the U-turn lane.</u>



Location	Issue / opportunity	Commentary
IN_06	There are opportunities to improve intersection performance by removing the pedestrian crossing on the western leg which will also improve safety.	<u>Update the analysis with the removal of the western leg pedestrian crossing.</u>
IN_06	198 right turning vehicles in a single lane pushes the envelope of what a lane can accommodate, however DOS values are suitable.	<u>It is recommended that DTP confirm acceptance of a single right turn movement to cater for a high volume.</u>
CC_07	A cycle time of 60 and 70 seconds has been adopted in the current modelling; however, given the intersection's proximity to IN_06, a cycle time that is coordinated with this time should be adopted.	<u>It is recommended that the cycle time assumption be updated to ensure that it is coordinated with IN_06. This will likely require a 120-second cycle time.</u>
CC_12 & IN_01	<p>It is also noted that CC_12 was assessed with increased levels of through movement volumes to account for the impact of additional movements along the corridor. The results indicated that the proposed layout would approach its capacity.</p> <p>However, the analysis indicates that the intersection is expected to experience a queue length of 320 meters on the west approach which will impact on the performance of IN_01, potentially causing spillback and operational inefficiencies.</p>	<p>The intersection is operating close to the ideal performance threshold (v/c ratio of 0.95), and several design and modelling issues have been identified that require attention.</p> <p><u>It is recommended that One Mile Grid update the analysis to a SIDRA Network that includes IN_01 to ensure that residual queueing from the intersection can be accurately assessed and accounted for in the analysis and design of IN_01.</u></p>
CC_12	A cycle time of 90 seconds has been adopted in the current modelling; however, given the intersection's proximity to IN_01, a 120-second cycle time is more likely to be implemented in practice as it will likely be a SCATS linked intersection.	<u>It is recommended that the cycle time assumption be updated to ensure that it is coordinated with IN_01. This will likely require a 120-second cycle time.</u>
CC_12	Bus jump lanes on the north approach are missing from the design, despite being a key component of the Clever and Creative Corridor (CCC).	<p>Given the broader role of the CCC with respect to the NWGGA, it is important to protect the ability to provide public transport priority into the future.</p> <p><u>It is recommended that the intersection be designed to ensure that bus lanes can be provided on the north approach. These can be provided as part of the land requirements but can be excluded from the DCP.</u></p>



## 4. Summary

Stantec has undertaken an independent review of the Villawood Materials and supporting documentation provided by Crelo and One Mile Grid. The work has identified a range of items that are recommended to be addressed in order for the designs to meet the required standards.

Key recommendations to consider in the development of the design are:

1. The reframed CCC cross sections with bus priority at intersctions are supported.
2. The role of Evans Road that includes the CCC connecting the two growth areas needs to be maintained. As such the intersection of Evans Road and the CCC (CC\_12) should include the ability to provide dedicated bus lanes on the north approach.
3. The vertical grading of the shared path on Evans Road are reccomended to be updated to meet AGRD requirments and DDA compliance.
4. The Connector Road cross sections are reccomended to include uni-directional cycle lanes on both sides of the road. This is a safer outcome for cyclists in the context of the urban environment.
5. The SIDRA analysis be updated to reflect the reccomendations within the report, including the changes in FUS and resultant travel patterns.



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