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Palmers Road Corridor EES

Access Management (Western Freeway to Calder Freeway)

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Client: VicRoads

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Quality Information

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Reviewed by Catherine Wilms

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			Name/Position	Signature
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Executive Summary

AECOM previously prepared *Palmers Road PSA Access Management Strategy* in February 2009 for the full length of the Palmers Road Corridor from Calder Freeway to Dunnings Road in Point Cook. The previous study was to support the Planning Scheme Amendment (PSA), and to ensure a satisfactory road reservation to implement a future upgrade to six-lane divided carriageway arterial road standard.

AECOM has now been commissioned by VicRoads to update the existing Access Management Strategy in accordance with *Austroads Guide to Traffic Management Part 5: Road Management* and to address the Environment Effects Act 1978 (EES) Scoping Requirement.

The provision of a bridge over Kororoit Creek is subject to the outcome of the EES. The impact onto surrounding road network has been assessed based on the transport modelling undertook by AECOM. The following four scenarios are covered in the report:

1) Palmers Road Corridor with two lanes (one lane each direction) and no provision of Kororoit Creek Bridge
2) Palmers Road Corridor with two lanes (one lane each direction) with the provision of Kororoit Creek Bridge
3) Palmers Road Corridor with four lanes (two lanes each direction) with the provision of Kororoit Creek Bridge
4) Palmers Road Corridor with six lanes (three lanes each direction) with the provision of Kororoit Creek Bridge

Palmers Road EES Access Management (Western Highway to Calder Freeway) defines, at a strategic level, the intentions of VicRoads with regard to achieving access for the abutting land that will integrate and connect with the Palmers Road Corridor. By clearly defining this strategy, VicRoads intends for all participants in the development of this area to understand their design objectives and reasons behind controlling and coordinating access arrangements along the corridor. This will assist in guiding future decision making to achieve a high standard road from an operational, safety and network perspective that will provide for the future requirements of Melbourne's western suburbs.

As part of the Victorian Government's Victorian Travel Plan (VTP), *SmartRoads* has been developed to improve the long-term operational management of arterial roads across Victoria. The VTP provides the operational direction that supports broader strategies around land use and transport. The Road User Hierarchy for Palmers Road Corridor has been identified as "Future Preferred Traffic Route" and a 1.6km section between Rockbank Middle Road and Ballarat Road as "Bus Priority Route". The Access Management Strategy and Road Use Hierarchy should be in alignment to ensure a consistent planning and operational framework.

Decisions about the allocation of road space needs to be based on an integrated approach with the aim of improving the current level of service for different types of road users (i.e. pedestrians, cyclists and public transports) to meet the mobility, accessibility, safety and priority needs of road users.

There are three distinct actions that VicRoads completes to achieve access management of a road corridor. They are as follows:

- Declare a road as an "Arterial Road" (Section 14 of the RMA).
- Declare an Arterial Road to be a "controlled access road" (Section 42 of the RMA) and assign the Arterial Road to be Category 2A.
- Rezone to Road Zone Category 1 (RDZ1).

Category 2A has been recommended for the majority of the route given that generally the space between intersections is greater than 600m which is likely to provide the preferred deceleration/acceleration lane lengths. This is likely to mean that through traffic will have priority and minimise delays given traffic queues can be catered within the storage lanes and not queue into through lanes. Additionally the distance between intersections minimises the number of intersections that through traffic will encounter, again reducing the delays to through traffic.

The decision to classify the corridor as per Austroads Guidelines will influence the existing and future access of abutting land and municipal roads to the corridor. It is recommended that:

- Access directly to the corridor to be avoided.
- Minor municipal roads to be limited to left-in / left-out arrangement. This will be dependent on the traffic flow likely from these roads, and the ability to make turns elsewhere on the road network.

U-turn bays be avoided at signalised intersection but may be required at appropriate mid-block locations in the median to reduce or eliminate U-turn volumes at major traffic signal controlled intersections. Ideally, U-turn bays are provided shortly prior to intersections at which other traffic will enter and leave the major road.

Palmers Road Corridor has been assessed against its ability to meet the Landscape Planning Objectives for both with and without mitigation measures. The assessment has been based on the rating scale used by VicRoads. The rating for the four scenarios proposed for Palmers Road Corridor is shown below.

Scenario	Rating	Definition
Base Case – two lanes	Poor	Policy non-compliance, mostly negative impacts or minor positive impacts
Interim Case – two lanes	Neutral	Some policy compliance, equal positive and negative impacts
Interim Case – four lanes	Well	Good policy compliance, mostly positive impacts or minor negative impacts
Ultimate Case – six lanes	Very Well	High level of compliance, major positive impacts or negligible negative impacts

1.0 Introduction

1.1 Background

The proposal is to reserve land in the City of Brimbank and City of Melton planning schemes to enable the future upgrade of the Palmers Road Corridor in the long term to a six lane divided road with off-road shared bicycle and pedestrian facilities on both sides of the road. Two existing railway crossings are proposed to be grade separated (the Melbourne-Bendigo rail line with Calder Park Drive and the Melbourne-Ballarat rail line with Robinsons Road). The provision of a bridge over Kororoit Creek is subject to the outcome of the EES. Therefore, this report will assess the corridor with and without the provision of Kororoit Creek Bridge.

The Palmers Road Corridor comprises of the following individual roads:

- Robinsons Road (City of Melton and City of Brimbank).
- Westwood Drive (City of Melton).
- Calder Park Drive (City of Melton and City of Brimbank).

The Palmers Road Corridor is shown as a dotted red line in Figure 1. SKM has been engaged by VicRoads to prepared concept design for the Palmers Road Corridor between Western Freeway and Calder Freeway. The Corridor is discussed in more detail in Section 3.0 and Section 4.0.

1.2 EES Scoping Requirements for Palmers Road Corridor

The Victorian Minister for Planning has determined under the Environment Effects Act (EEA) 1978 that an Environment Effects Statement (EES) needs to be prepared by VicRoads for the Palmers Road Corridor. The Scoping Requirements were finalised following the consideration of public comments.

The EES Scoping Requirements is prepared on the basis that the Palmers Road Corridor will provide an additional new three lane bridge over Kororoit Creek which was referred under the EEA, and are subject of the Minister for Planning's decision to require an EES for the project.

Clause 4.2 of the EES Scoping Requirements specified the requirements of road safety and capacity for Palmers Road Corridor. The objective of Clause 4.2 is to:

'Improve the road-based transport capacity and connectivity in western Melbourne, by developing a six-lane dual carriageway arterial road along the Palmers Road Corridor between Western Freeway and Calder Freeway, while maintaining the connectivity of the existing local transport routes.'

The EES Scoping Requirements identified the following:

1.2.1 Key Issues

- Exacerbation of congestion on the existing road network in the absence of an arterial route
- Inefficient linkages with the road network exacerbate congestion at key nodes
- Disruption to pedestrian movements, bicycle connectivity, public transport, motor vehicle traffic during the project construction

1.2.2 Priorities for characterising the existing environment

- Characterise current traffic conditions within the existing road network in the project area
- Provide modelling projections of road network traffic flows in the absence of the project

1.2.3 Design and mitigation measures

- Potential design solutions to optimise linkages with the existing road network and maintain or enhance pedestrian and bicycle access at junctions of the operating project

1.2.4 Assessment of likely effects

- Assess the effects of the project on the transport network (including in terms of road traffic volumes and travel time outcomes) and accessibility and safety for users (vehicles, pedestrians and cyclists)

1.2.5 Approach to manage performance

- Briefly describe principles or approach to management of traffic conditions during the project's construction, including as part of the Environmental Management Framework (EMF)

1.3 Purpose of this Report

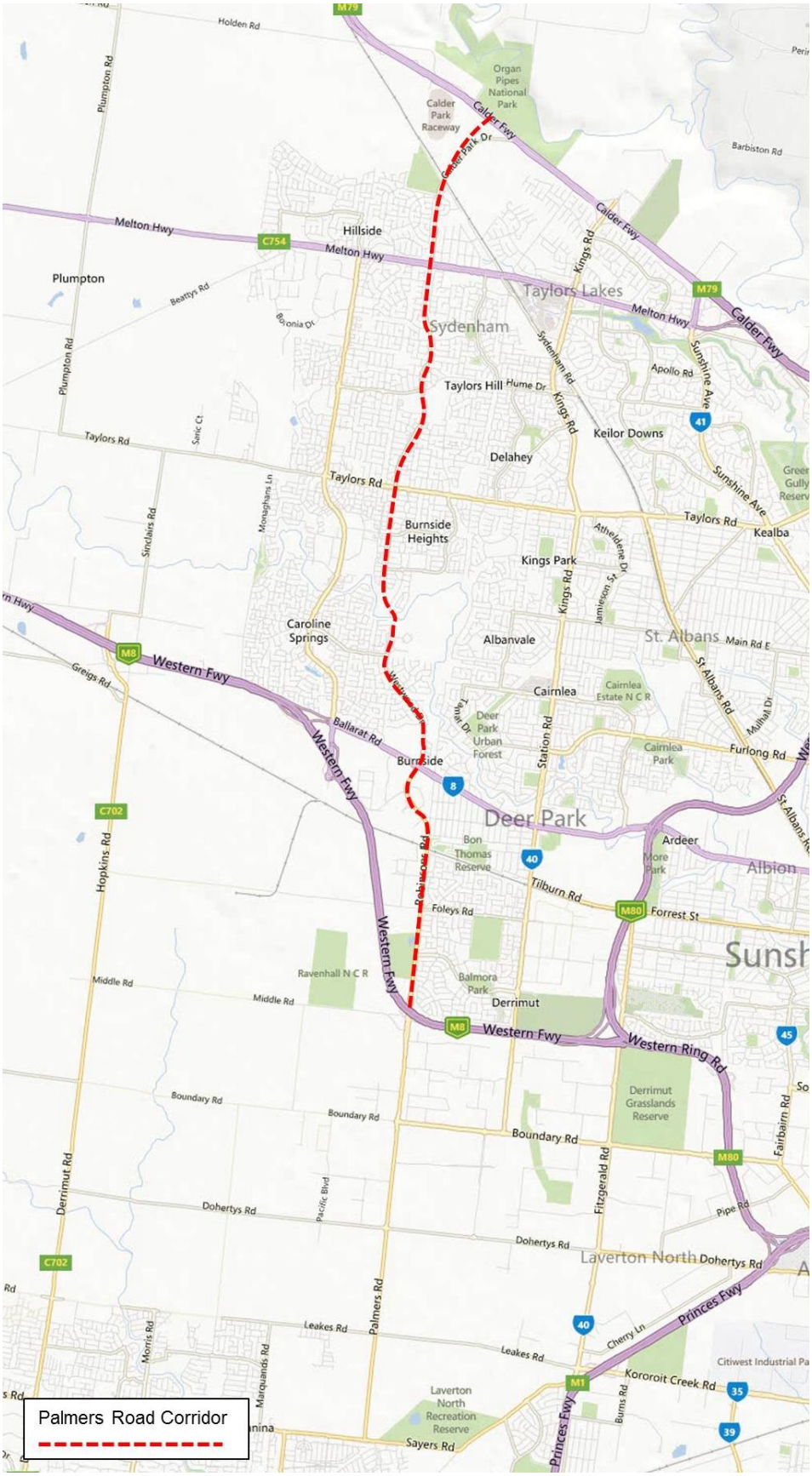
Palmers Road EES Access Management (Western Highway to Calder Freeway) defines, at a strategic level, the intentions of VicRoads with regard to achieving access for the abutting land that will integrate and connect with the Palmers Road Corridor. By clearly defining this strategy, VicRoads intends for all participants in the development of this area to understand their design objectives and reasons behind controlling and coordinating access arrangements along the corridor. This will assist in guiding future decision making to achieve a high standard road from an operational, safety and network perspective that will provide for the future requirements of Melbourne's western suburbs.

This report will refer to the *Austroads Guide to Traffic Management Part 5: Road Management* as the guiding source for access management strategies and will addresses the Environment Effects Act 1978 (EES) Scoping Requirement.

There are three distinct actions that VicRoads completes to achieve access management of a road corridor. They are as follows:

- Declare a road as an "Arterial Road" (Section 14 of the RMA).
- Declare an Arterial Road to be a "controlled access road" (Section 42 of the RMA) and assign the Arterial Road to be Category 2 road.
- Rezone to Road Zone Category 1 (RDZ1).

Figure 1 Palmers Road Corridor between Western Freeway and Calder Freeway



1.4 Report Structure

This report defines the Access Management Strategy that will be applied to the Palmers Road Corridor between Western Freeway and Calder Freeway. In particular this report:

- Lists the access management guidelines for Category 2 roads under *Austroads Guide to Traffic Engineering Part 5: Road Management* (Section 2.0).
- Discusses the road space requirements for pedestrians, cyclists and public transport (Section 3.0).
- Provides recommendations for access management along each section (Section 4.0) and discusses the concept design prepared by SKM for the Palmers Road Corridor.

It should be noted that individual property access changes that will be incurred as part of the corridor upgrade will need to be considered on a case by case basis, with due regard to the principles of the access strategy defined within this report.

2.0 Access Management Characteristics

Table 2.1 of *Austroads Guide to Traffic Management Part 5: Road Management* recommends access management tools appropriate to road category. Category 2 has been considered the most relevant category for Palmers Road Corridor given the land use and purpose of the road. For Category 2A and Category 2B roads, the access management tools are summarised in Table 1.

Table 1 Access Management Tools for Category 2A Roads under Austroads Guide to Traffic Management Part 5

Item	Access Management Tools	Austroads Guide to Traffic Management Part 5	
		Category 2A	Category 2B
1	Speed Limit	80 km/h and above	70 – 80 km/h
2	Cross Section	Divided carriageway with a median separating the directions of travel	
3	Intersections	Access spacings between 400m and 800m.	Access spacings between 200m and 500m.
4	Turning Movements	Right turns and U-turns are controlled by medians and median breaks	
5		Desirable design standards including deceleration/acceleration lanes, consistent with higher speed and higher quality traffic operation	Desirable with consideration of minimum design standards, consistent with intermediate speed and moderate traffic service
6	Site Access	Generally no direct access to a major road except via intersecting major or minor roads, service road exits/entries, or driveways constructed as intersections.	
7	Parking	Parking should not impede the flow of through traffic. Parking be provided off-street or on service roads. Clearway will be considered to restrict on-street parking.	

Category 2A road is designed for moving people and goods whereas Category 2B road is more appropriate when local traffic needs to get onto the arterial road and hence deceleration and acceleration could not be provided.

Given that Palmers Road is proposed to be three lanes in either direction, intersections that provide all turning movements should be signalised intersections only. Uncontrolled cross intersections should not be designed based on safety concerns. Other local road intersections are considered to be left in / left out arrangements.

As indicated in Table 1, the key differences between Category 2A and Category 2B roads are:

- **Item 1:** Applicable speed limits on the roads
- **Item 3:** Spacing between access points or intersections

The State Government is considering removing 70 km/h and 90 km/h speed limits as it attempts to make roads safer and more consistent. Therefore, the design speed limit for the Palmers Road Corridor between Western Freeway and Calder Freeway would be 80 km/h. This indicates that either Category 2A or 2B roads could be used.

Proposed roads are either Category 2A or Category 2B depending on the spacing between access points or intersection. SKM has prepared concept design for the Palmers Road Corridor. The recommendation for the selection of Category 2A or Category 2B roads for Palmers Road Corridor and access management strategy are discussed in Section 4.0.

3.0 Integrated Road Use

3.1 SmartRoads

VicRoads and other relevant stakeholders would use *SmartRoads* to inform decisions that affect the way the arterial road network operates. *SmartRoads* would inform decisions about a number of aspects of the network including:

- allocating public transport priority.
- allocating road space to competing transport modes.
- improving traffic flow at highly congested intersections.
- responding to traffic incidents.
- controlling access to and from the arterial network.
- supporting events and community activities.
- managing parking.
- planning for growth areas.
- planning for the development of activity centres.

The Road User Hierarchy for Palmers Road Corridor has already been identified as “Future Preferred Traffic Route” and a 1.6km section between Rockbank Middle Road and Ballarat Road as “Bus Priority Route”, which means that general traffic has highest priority along the route. That said, this does not mean that other modes of transport (pedestrian, cyclists and public transport) are ignored or not provided for, they just take a lower priority. The level of priority may also change depending on the time of day which is setout in the Network Operating Plans. Additionally when an intersecting road with other priorities meets, these conflicting priorities need to be taken into consideration. The Access Management Plan and Road Use Hierarchy for the road network should be in alignment to ensure a consistent planning and operational framework.

3.2 Transport Integration Act 2010 (TIA)

Consideration is required of the requirements of the Transport Integration Act both in terms of the role and purpose of the Palmers Road Corridor, and its ability to support future transport and land use in line with the principles of the Act.

3.3 Overview of Other Road User Requirements

Austroads Guide to Traffic Engineering Part 5: Road Management provides a summary of the road space requirements for different road user group. Decisions about the allocation of road space need to be based on an integrated approach with the aim of improving the current level of service for different types of road users to meet the mobility, accessibility, safety and priority needs of road users.

Section 3.4 to Section 3.6 provides additional information regarding pedestrians, cyclists and public transport requirements. These sections outline the traffic management guidelines for urban arterial roads that could be applied to the Palmers Road Corridor between Western Freeway and Calder Freeway and the concept design prepared by SKM for the Palmers Road Corridor between Western Freeway and Calder Freeway.

3.4 Pedestrians

Pedestrian space should adequately cater for the needs of all types of users in particular, provision should be made for pedestrians who are impaired with respect to vision or mobility. Mid block crossing of divided roads usually requires provision of higher level pedestrian facilities such as:

- grade separations.
- signalised pedestrian crossings.
- pedestrian fencing to direct pedestrians to the mid block or intersection crossing facility.

- bus stop should be located to assist pedestrian safety in crossing roads (e.g. near crossing facilities and adequate sight lines).

Crossing facilities away from the signalised intersections to assist pedestrians across the Palmers Road corridor will be determined closer to construction. Investigation of the potential future pedestrian/community attractors and cross corridor desire lines along Palmers Road Corridor will be identified at a later date closer to construction. This will enable the need for additional pedestrian crossing facilities to be confirmed and implemented as appropriate.

Detailed design should be referred to *Austroads Guide to Traffic Management Part 6: Intersections, Interchanges and Crossings* and *Austroads Guide to Road Design Part 6A: Pedestrian and Cyclist Paths.*

Palmers Road corridor should have route lighting installed to Category V3 to V1 according to Australian Standards.

3.5 Cyclists

Austroads Guide to Traffic Management Part 5: Road Management has no specific requirements for the provision of bicycle lanes. Bicycle lanes could be provided either on-road or off-road. Detailed design should be referred to VicRoads Cycle Notes, *Cycling Aspects of Austroads Guides, Austroads Guide to Road Design Part 6A: Pedestrian and Cyclists Paths* and other relevant guidelines.

Austroads Guidelines recommends that a shared pedestrian and bicycle facilities may be appropriate where:

- demand exists for both a pedestrian path and a bicycle path but where the intensity of use is not expected to be sufficiently great to provide separate facilities.
- an existing low use path can be satisfactory modified (e.g provide appropriate width and signage) to provide for cyclists.

3.5.1 Bicycle Networks for transport

The Principal Bicycle Network (PBN) is a network of proposed and existing cycle routes that help people cycle for transport (work, school, shopping, visiting friends etc), and provide access to major destinations in the Melbourne metropolitan area. The PBN is used to guide State investment in the development of transport bicycle network. The designated PBN along the Palmers Road Corridor and surrounding area has been obtained from VicRoads website, as illustrated in Figure 2.

3.5.2 Existing Bicycle Network

The existing on-road cycle paths and off-road shared pedestrian and cyclist paths along the Palmers Road Corridor and intersecting roads were sourced from VicRoads 'Metropolitan Trail Network', Parks Victoria, Bicycle Network Victoria, City of Brimbank 'Walking and Cycling Strategy', and Melton City Council's 'Walking and Cycling' maps. The existing cycle paths are illustrated in Figure 3.

3.5.3 Proposed Bicycle Network

Based on the concept design prepared by SKM, it is proposed to provide a 2.5 to 4.0 metres wide off-road shared pedestrian and cyclist paths along the Palmers Road Corridor. The proposed off-road shared paths and existing off-road shared path intersecting Palmers Road Corridor are shown in Figure 4.

The connections between the existing off-road shared paths crossing the Palmers Road corridor to assist pedestrians and cyclists have not been fully considered at this stage. Investigation of the connectivity of the proposed and existing off-road shared paths will be confirmed and developed at a later date closer to construction.

The City of Brimbank 'Cycling and Walking Strategy' has proposed on-road bicycle facilities on Westwood Drive and Robinsons Road. Although it has been agreed with Councils that provision will be off-road, consideration should be made that some cyclists will still remain on-road. Intersections layouts should consider both the on and off road cycle movements.

Figure 2 Principal Bicycle Network along Palmers Road Corridor and Intersecting Roads

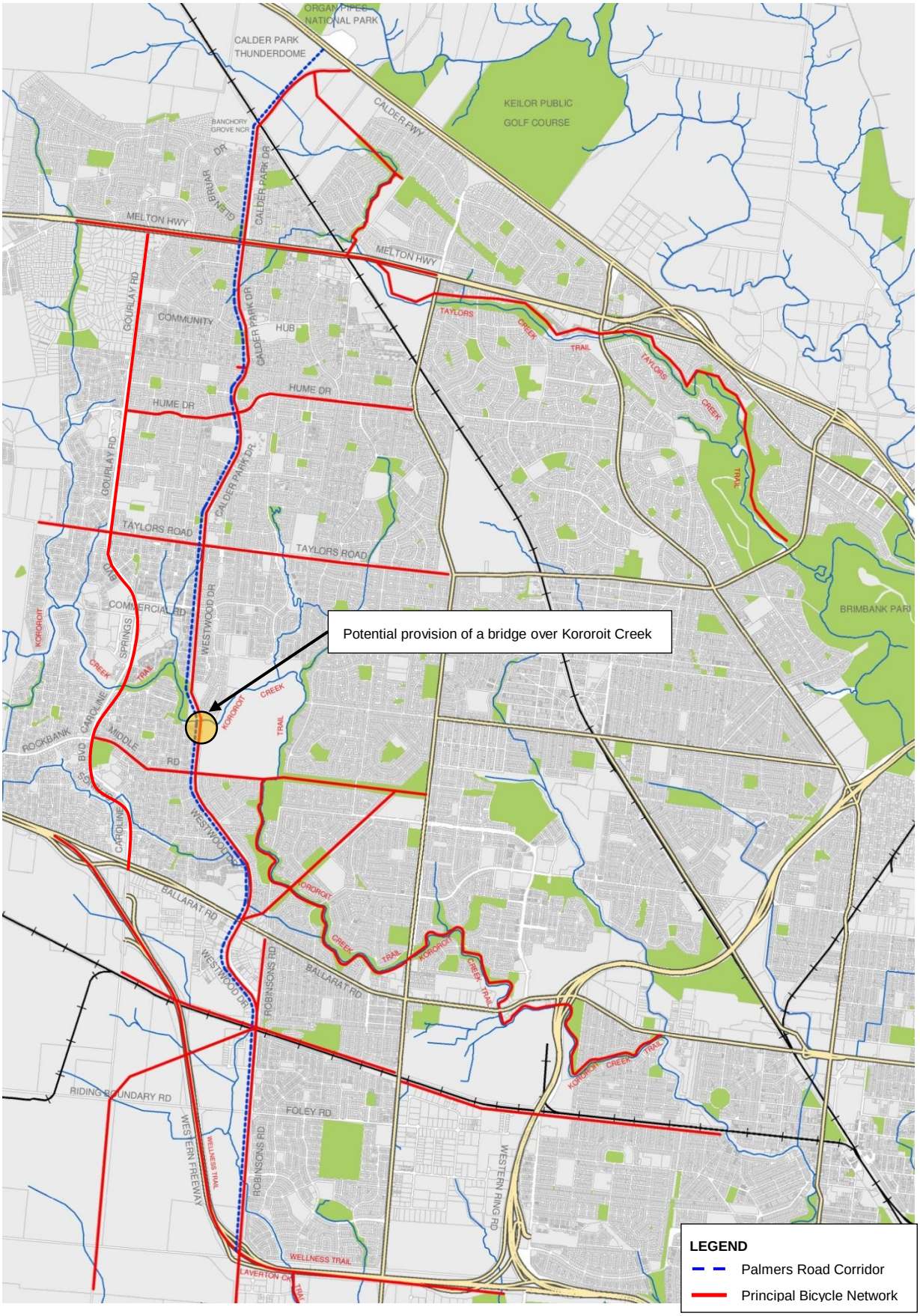


Figure 3 Existing On-Road and Off-Road Bicycle Paths along Palmers Road Corridor and Intersecting Roads

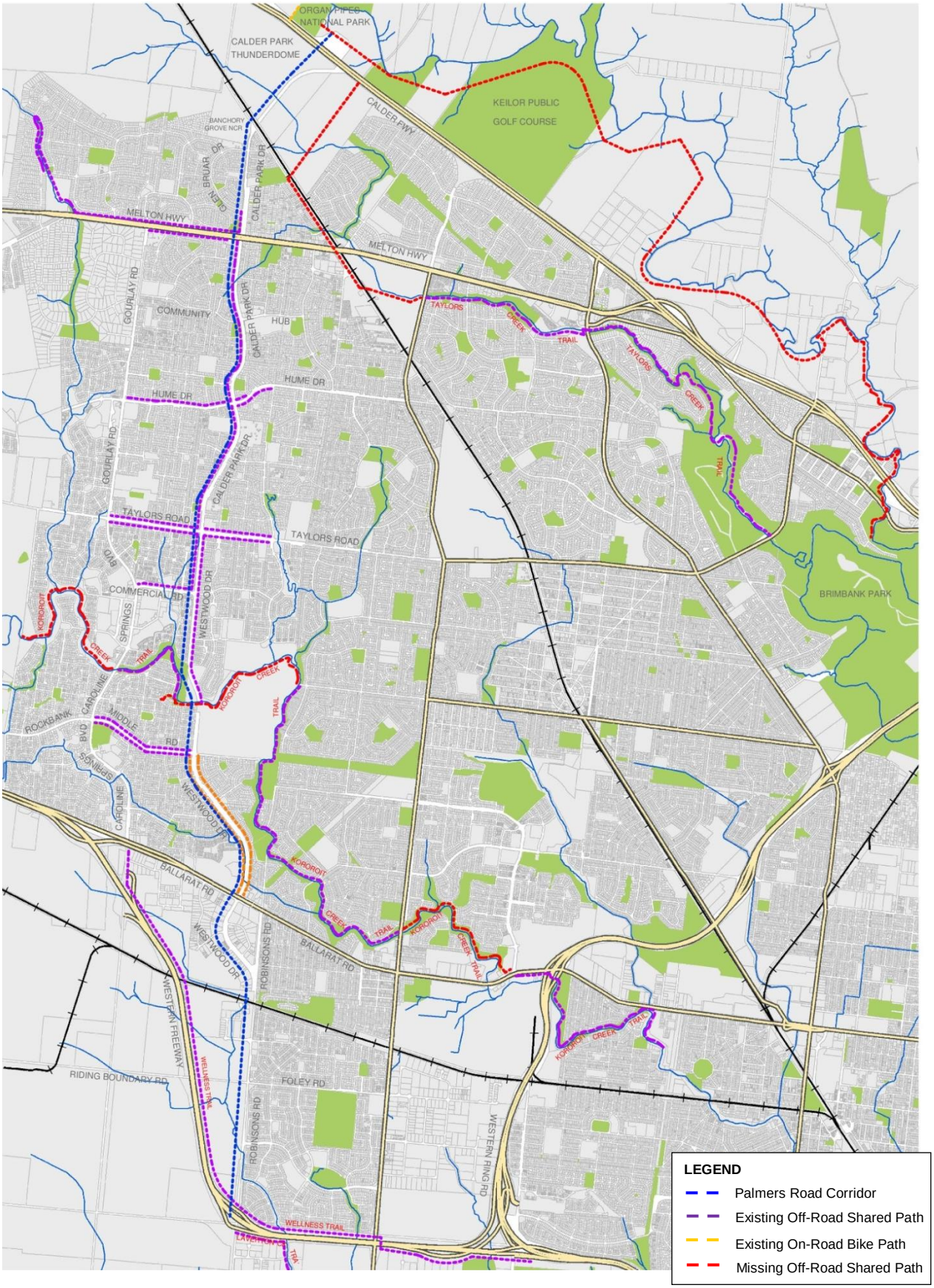
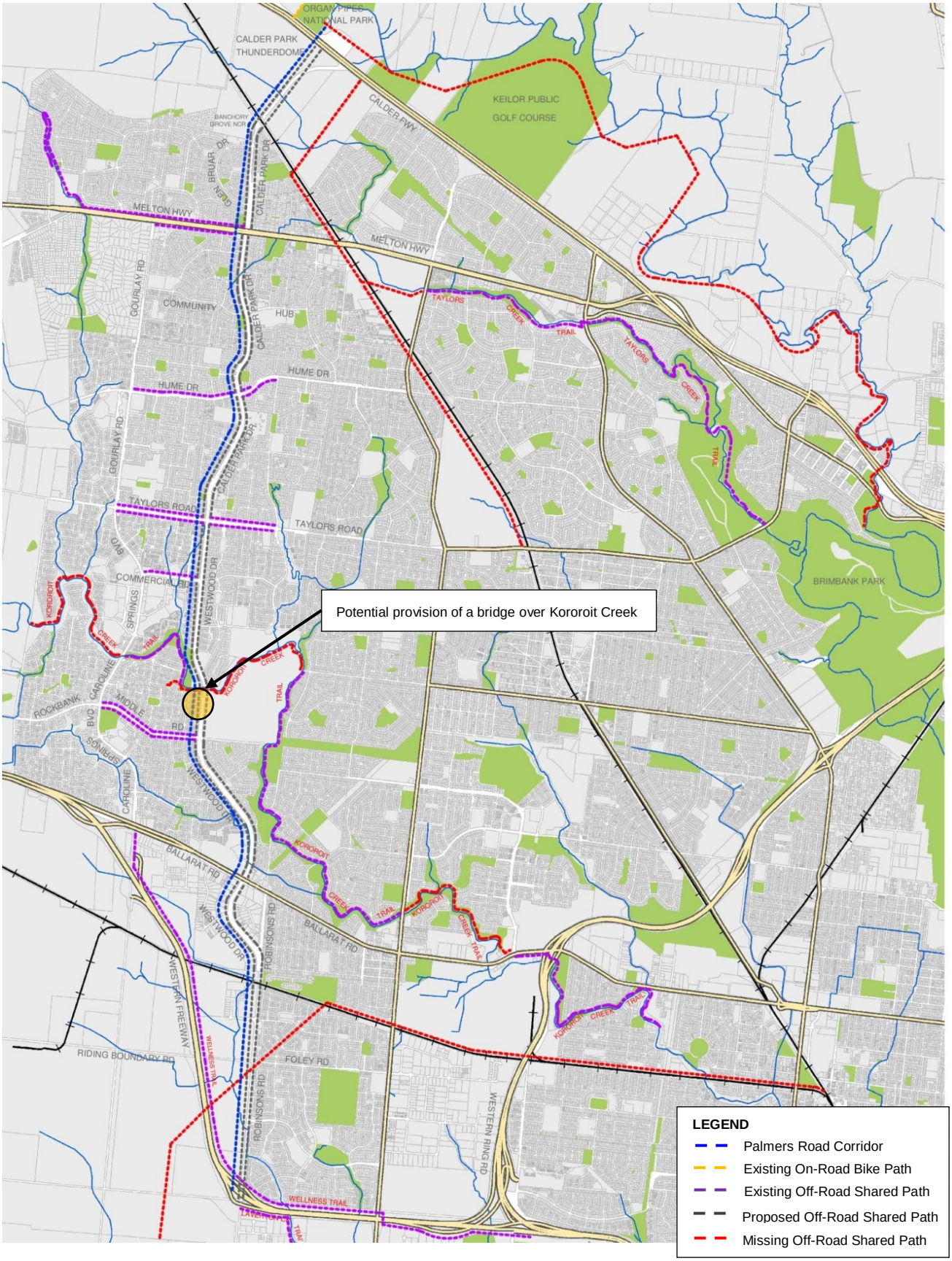


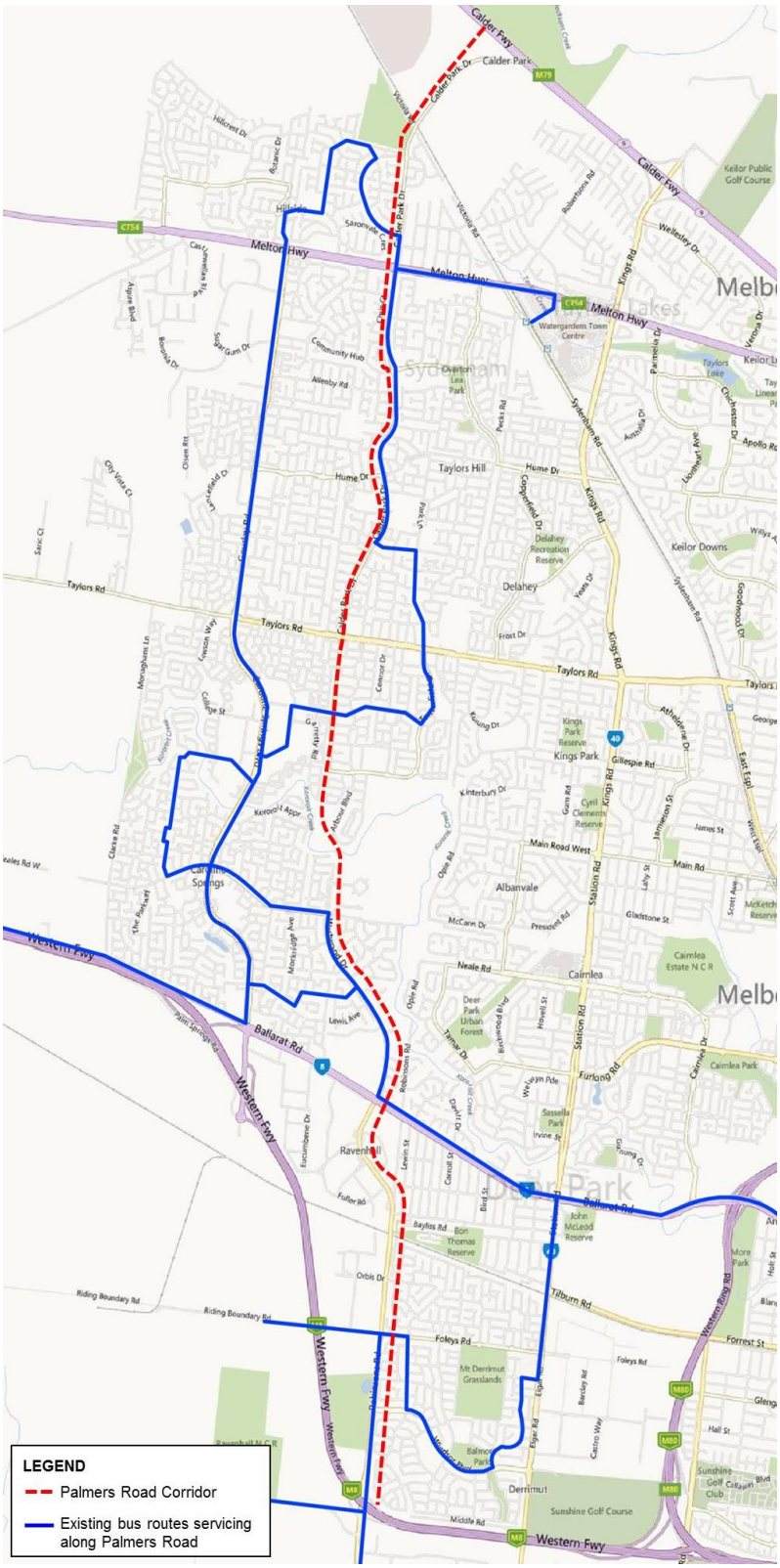
Figure 4 Proposed Off-Road Bicycle Paths along Palmers Road Corridor and Existing Off-Road Bicycle Paths intersecting Palmers Road Corridor



3.6 Public Transport

Public Transport Victoria (PTV) has advised that buses operate along Palmers Road Corridor, as illustrated in Figure 5.

Figure 5 Bus Routes servicing along Palmers Road Corridor



For bus services operating on urban arterial roads, the traffic management guidelines recommend:

- where bus routes on arterial roads share traffic lanes with general traffic, priority should be considered at intersections including provision of short 'queue jump lanes', traffic signal priority, and efficient bus stops.
- on bus priority routes, bus only lanes should be provided for the exclusive use of buses enabling buses to travel through congested sections of road without being held up by general traffic. The bus lane may be operated on a time of day basis, corresponding to the periods of peak congestion with appropriate signing and marking.

Bus stops should be:

- located to provide safe and convenient pedestrian access
- designed in compliant with Disability Discrimination Act (DDA) which provides equitable access to persons who have a disability.
- located within a 400 metres walking distance.
- indented for high usage bus stops.
- designed with adequate sight distance to the stop and to passengers moving across the road prior to boarding the bus or after alighting from the bus.

VicRoads has their own 'Bus Stop Guidelines' that limit the use of indented bus stop bays. The guidelines recommend *'bus bays are not constructed in 80km/h zones unless there are only one or two lanes in the bus direction, or the stop is close to the departure side of a signalised intersection'*. On this basis, for the Palmers Road Corridor, which is proposed to be a three lane road in each direction, provision of on-road bus stopping areas are recommended.

The location of bus stops along Palmers Road Corridor has not been considered at this stage. Investigation of the potential location of bus stops will be subject to confirmation of bus routes closer to the date of construction. Any alterations to the bus services will be referred to Public Transport Victoria (PTV).

The location and design of bus stops at major intersections should be referred to *Austroads Guide to Traffic Management Part 6: Intersections, Interchanges and Crossings* and *VicRoads 'Bus Stop Guidelines'.*

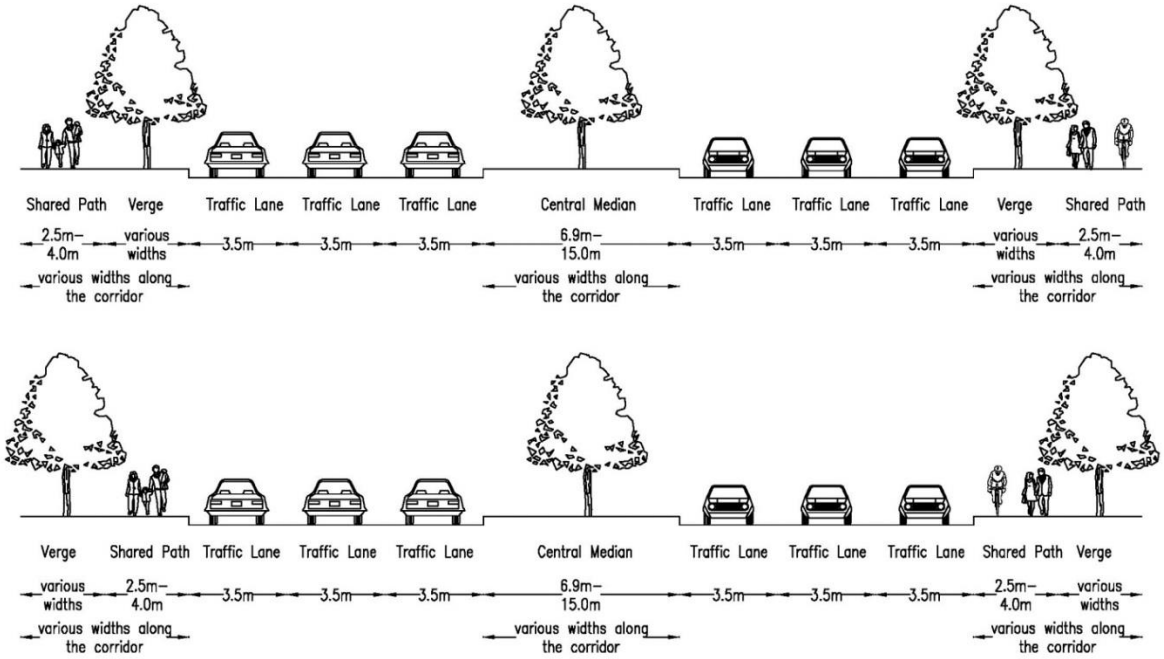
4.0 Palmers Road Corridor Access Management Strategy

4.1 Overview

The Palmers Road Corridor between Western Freeway and Calder Freeway is located within the City of Melton and City of Brimbank. The road is currently undivided and comprises one traffic lane in each direction. The existing corridor terminates at the Kororoit Creek and does not provide a direct link to the north and south.

VicRoads engaged SKM to prepare a concept design for the Palmers Road Corridor. The concept design indicates that it is proposed to upgrade the road through the entire length of the corridor to accommodate three traffic lanes and a bicycle lane in each direction divided by a central median. The proposed cross-section of the ultimate road is shown in Figure 6.

Figure 6 Proposed cross section of the road for Palmers Road Corridor



Concept design prepared by SKM for the Palmers Road Corridor for each section is discussed in Section 4.2 to Section 4.6.

4.2 Western Freeway to Foleys Road

4.2.1 Existing Conditions

The current land uses to the east of this corridor are predominately residential and to the west is undeveloped (refer Figure 7).

Three signalised intersections that connect to the Palmers Road Corridor are:

- Western Freeway
- Windsor Boulevard
- Riding Boundary Road / Foleys Road

Vehicle access to/from the east of this corridor is limited to Robinsons Road and Windsor Boulevard intersection and Robinsons Road and Riding Boundary Road / Foleys Road intersection. No service roads or direct property access is provided along this section.

Buses operate along this section of Palmers Road Corridor however, no bus stops are provided on either side of the road.

4.2.2 Proposed Conditions

It is proposed to retain the three existing signalised intersections that connect to the Palmers Road Corridor. The location and spacing of signalised intersections for this section of Robinsons Road is illustrated in Figure 7.

Figure 7 Proposed location and spacing of signalised intersections between Western Freeway and Riding Boundary Road / Foleys Road

4.2.3 Access to/from Wellness Trail

The proposed provision of off-road pedestrian and cyclist shared path along this section of Palmers Road Corridor will provide a connection to Wellness Trail which is located on the northern side of Western Freeway.

4.2.4 Access to/from Ravenhall Nature Conservation Reserve (NCR)

Access to Ravenhall NCR is provided via Riding Boundary Road. The proposed Palmer Road Corridor will not change the existing access. The proposed provision of off-road shared path along this section of Palmers Road Corridor will provide a better opportunity for pedestrians and cyclists to travel north-south along the corridor.

4.2.5 Access to/from the proposed East-West Shared Path

Bicycle Network Victoria has identified the section between Deer Park Bypass to Sunshine could be built now due to the high population density, flat, Zone One ticket at Sunshine which will be strong drivers for this off-road pedestrian and cyclist paths. The proposed off-road shared paths generally runs in an east-west orientation, parallel to the Melbourne - Ballarat Railway Line then runs in a north-east and south-west orientation intersecting Robinsons Road and Riding Boundary Road/ Foleys Road intersection and continue to the west. This off-road share path is illustrated in Figure 7.

4.2.6 Recommended Access Management Strategy

- As the proposed spacing between intersections ranging between 700 to 800 metres, Category 2A roads requirements should be applied. Given that this is the current access arrangement, therefore no further connections to Palmers Road Corridor is recommended. Access should be provided by municipal road connections and service roads.
- It is recommended that acceleration and deceleration lanes at intersections and interchanges be designed in accordance with the requirements of Austroads Guide to Road Design Part 4: Intersections and Crossings.

4.3 Foleys Road to Ballarat Road (Western Highway)

4.3.1 Existing Conditions

The Palmers Road Corridor continues north of Robinsons Road until the Melbourne Ballarat Railway. Between the Melbourne Ballarat Railway and the Western Highway, the Palmers Road Corridor will follow the existing Westwood Drive alignment (refer Figure 8).

The current land uses to the east of this corridor are a mixture of residential and commercial uses. To the west of this corridor are generally commercial uses and undeveloped. Vehicle access to/from this corridor is currently provided via:

- one-way service lanes that runs parallel to Robinsons Road between Foleys Road and Hatchlands Drive / Orbis Drive.
- direct access to the corridor for commercial uses fronting Westwood Drive.
- signalised intersections at:
    - Robinsons Road and Riding Boundary Road / Foleys Road intersection.
    - Robinsons Road and Orbis Drive / Hatchlands Drive intersection.
    - Westwood Drive and Ballarat Road (Western Highway) intersection.
- unsignalised intersections at:
    - Westwood Drive and Quinn Street intersection.
    - Westwood Drive and Waigani Avenue intersection.
    - Westwood Drive and Vanessa Drive intersection.
    - Westwood Drive and Fuller Road intersection.

Bus services do not operate along this section of Palmers Road Corridor.

4.3.2 Proposed Conditions

The location and spacing of signalised intersections for this section of Robinsons Road and Westwood Drive is illustrated in Figure 8. Based on the concept design prepared by SKM, it is proposed to:

- retain the one-way service lanes between Foleys Road and Hatchlands Drive / Orbis Drive.
- retain the existing signalised intersections at:
    - Robinsons Road and Riding Boundary Road / Foleys Road intersection.
    - Robinsons Road and Hatchlands Drive / Orbis Drive intersection.
    - Westwood Drive and Ballarat Road (Western Highway) intersection.
- remove the intersection of Robinsons Road and Quinn Street. Access to Quinn Street will be via the intersection of Robinsons Road and Deer Street, where access would be limited to left-in / left-out arrangements.
- other municipal roads that provide access to this corridor would be limited to left-in / left-out arrangements.
- provide one-way service lane on both sides that runs parallel to Westwood Drive which would provide access to commercial uses fronting Westwood Drive.
- provide signalised intersections at:
    - Westwood Drive and Waigani Avenue intersection.
    - Westwood Drive and Vanessa Drive intersection.

The intersection of Robinsons Road and the Melbourne - Ballarat Railway Line will be grade separated where the road will traverse under the rail line.

Figure 8 Proposed location and spacing of signalised intersections between Riding Boundary Road / Foleys Road and Western Highway

4.3.3 Access to/from the proposed East-West Shared Path

As discussed in Section 4.2.5, Bicycle Network Victoria has identified the section between Deer Park Bypass to Sunshine could be built now due to the high population density, flat, Zone One ticket at Sunshine which will be strong drivers for this off-road pedestrian and cyclist paths. The proposed off-road shared paths generally runs in an east-west orientation, parallel to the Melbourne - Ballarat Railway Line then runs in a north-east and south-west orientation intersecting Robinsons Road and Riding Boundary Road/ Foleys Road intersection and continue to the west. This off-road share path is illustrated in Figure 8.

4.3.4 Recommended Access Management Strategy

- The section between Vanessa Drive and Waigani Avenue does not meet the Austroads Guidelines for Category 2A or 2B roads as it is only 140 metres. In practice, the close proximity is likely to result in the intersections operating as a single staggered site. An alternative consideration could be given by relocating the proposed traffic signal at Waigani Avenue to Fuller Road north section. This will create spacing between signalised intersection of 420 metres between Ballarat Road and Fuller Road, and 320 metres between Fuller Road and Vanessa Drive. Given the spacing are generally less than 500 metres, it is recommended that the section between Ballarat Road and Vanessa Drive be designed in accordance with the Austroads Guidelines for Category 2B roads.
- It is recommended that the section between Vanessa Drive and Foleys Road be designed in accordance with the Austroads Guidelines for Category 2A roads, given the spacing are generally greater than 400 metres and exceeded 800 metres.
- It is recommended that no further connections to Palmers Road Corridor should be allowed other than what is discussed above. Access should be provided by municipal road connections and service roads only.

- It is recommended that U-turn bays be avoided at signalised intersection but may be required at appropriate mid-block locations in the median to reduce or eliminate U-turn volumes at major traffic signal controlled intersections. Ideally, U-turn bays are provided shortly prior to intersections at which other traffic will enter and leave the major road.
- It is recommended that acceleration and deceleration lanes at intersections and interchanges be designed in accordance with the requirements of Austroads Guide to Road Design Part 4: Intersections and Crossings.

4.4 Ballarat Road (Western Highway) to Taylors Road

4.4.1 Existing Conditions

Retail and commercial uses are located on the north-eastern corner of Western Highway and Westwood Drive, to the east of the corridor. Burnside Shopping Centre is located to the west of the corridor between Landy Court and Wenden Court. Otherwise the surrounding land uses are predominately residential.

The Corridor terminates at the Kororoit Creek. There are no provision of crossing for vehicles, pedestrians and cyclists.

Residential properties fronting Westwood Drive to the south of Kororoit Creek are generally accessed directly off Westwood Drive. Access to/from the west of this corridor is generally via service lanes and unsignalised intersections. To the north of Kororoit Creek, access to/from this corridor has been designed with minimal connections to the Palmers Road Corridor.

Vehicle access to/from this corridor is currently provided via:

- one-way service lanes that runs parallel to Westwood Drive to the west of this corridor
- direct access to the corridor for residential uses fronting Westwood Drive, to the east of this corridor
- signalised intersection at:
  - Westwood Drive and Ballarat Road (Western Highway) intersection.
  - Westwood Drive and Commercial Road / Inglewood Drive intersection.
- roundabouts at:
  - Westwood Drive and Wenden Court intersection.
  - Westwood Drive and Landy Court / Burnside Shopping Centre car park intersection.
  - Westwood Drive and Rockbank Middle Bank intersection.
  - Westwood Drive / Calder Park Drive and Taylors Road intersection.
- unsignalised intersections at other municipal roads that provide access to this corridor.

Signalised pedestrian crossing is located on Westwood Drive between landy Court and Elliott Court.

Bus services operate along this section of Palmers Road Corridor. The location of the existing bus stops is illustrated in Figure 9.

4.4.2 Proposed Conditions

The location and spacing of signalised intersections for this section of Westwood Drive is illustrated in Figure 9.

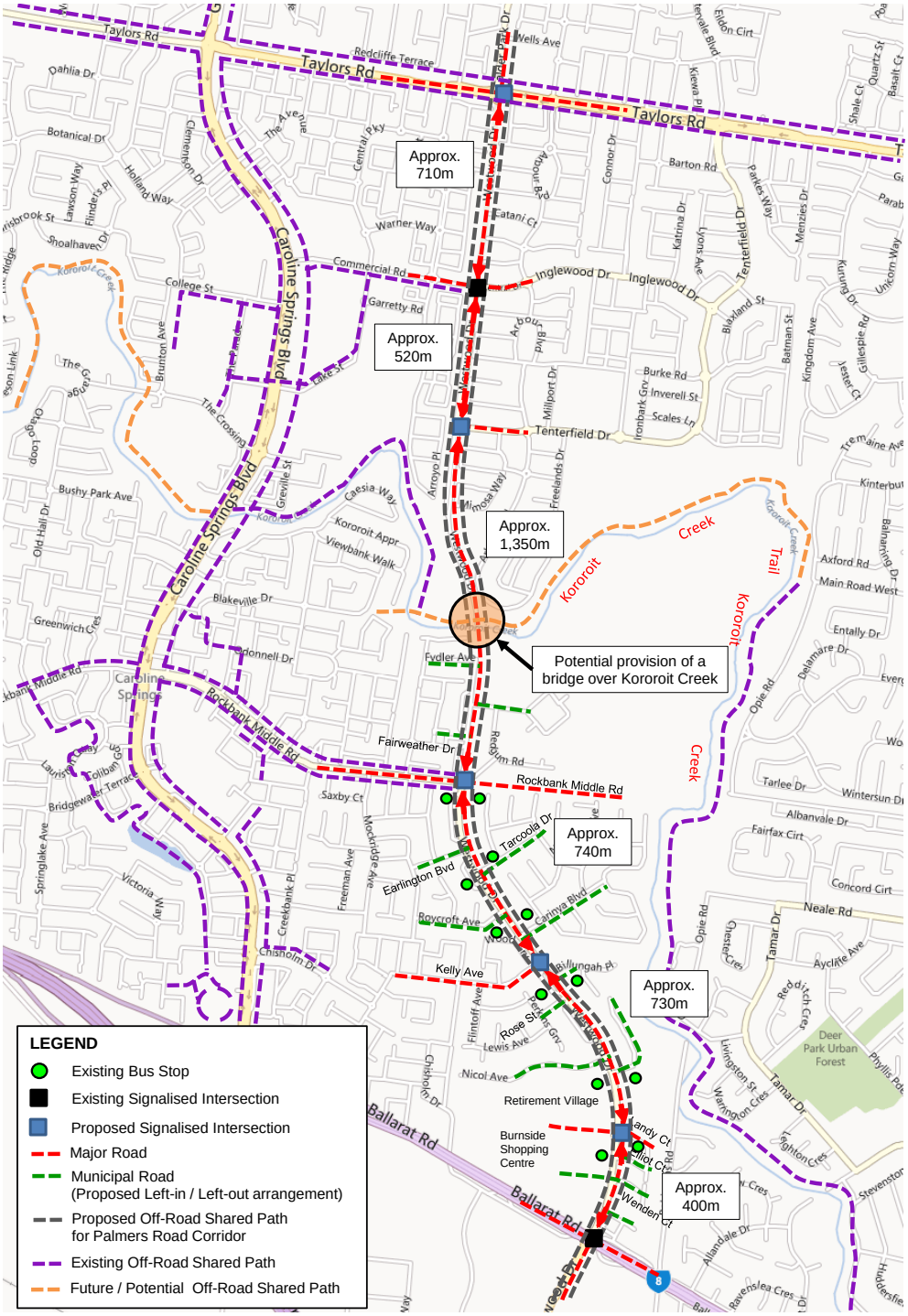
Based on the concept design prepared by SKM, it is proposed to:

- provide one-way service lane on both sides that runs parallel to Westwood Drive which would provide access to/from this corridor.
- retain the existing signalised intersection at Westwood Drive and Ballarat Road (Western Highway) intersection.
- convert the existing roundabouts to signalised intersections at:
  - Westwood Drive and Landy Court / Burnside Shopping Centre car park intersection.
  - Westwood Drive and Rockbank Middle Road intersection.

- Westwood Drive / Calder Park Drive and Taylors Road intersection.

- provide signalised intersections at:
  - Westwood Drive and Kellys Avenue intersection.
  - Westwood Drive and Tenterfield Drive intersection.
  - Westwood Drive and Commercial Road / Inglewood Drive intersection.
- other municipal roads that provide access to this corridor would be limited to left-in / left-out arrangements.

Figure 9 Proposed location and spacing of signalised intersections between Westwood Drive – Ballarat Road and Taylors Road



4.4.3 Base Case based on no provision of Kororoit Creek Bridge

The construction of Kororoit Creek Bridge is subject to outcome of the EES. Given that this is the case, the access management without the provision of Kororoit Creek Bridge has been treated as a Base Case.

AECOM has undertaken transport modelling of the Palmers Road Corridor between the Western Freeway and the Calder Freeway. The modelling involved running the Victorian Integrated Transport Model (VITM) for a future year base case of 2046 and testing road network including the following four scenarios:

1) Palmers Road Corridor with two lanes (one lane each direction) and no provision of Kororoit Creek Bridge

2) Palmers Road Corridor with two lanes (one lane each direction) with the provision of Kororoit Creek Bridge

3) Palmers Road Corridor with four lanes (two lanes each direction) with the provision of Kororoit Creek Bridge

4) Palmers Road Corridor with six lanes (three lanes each direction) with the provision of Kororoit Creek Bridge

Under the Base Case scenario, traffic volumes are relatively low when compared to the alternative north-south routes of Kings Road, Caroline Springs Boulevard and Gourlay Road. Traffic is higher to the south of Kororoit Creek but is generally lower than alternative north-south routes.

The significant amount of traffic being distributed onto Caroline Springs Road would have negative impact on the Caroline Springs designated Major Activity Centre.

Cyclists and pedestrians will have no direct access to the north-south of Palmers Road Corridor and will have to seek alternative paths such as shared path on Caroline Springs Boulevard and Gourlay Road (refer Figure 9).

4.4.4 Interim Case based on provision of Kororoit Creek Bridge

The Interim Case for the Palmers Road Corridor will be the provision of one traffic lane in each direction with shared path for pedestrians and cyclists on the east side.

The analysis of the traffic modelling shows that introducing a bridge across Kororoit Creek increases traffic on the Palmers Road Corridor. Upgrading the Palmers Road Corridor from two to four lanes will significantly improve the network performance. While, upgrading from four to six lanes will enable further improvement in network performance and further facilitate strategic north-south movements. The two and four lanes options operate with significant congestion with over half the vehicle kilometres travelled in the peak direction being in congested conditions. The six lane option provides a level of service with significantly less congestion in the peak period than the four lane and two lane options. With six lanes, the Palmers Road Corridor will become the major north-south route located between the Outer Metropolitan Ring Road (OMRR) and the Western Ring Road.

It can also be seen that traffic is drawn from Caroline Springs Boulevard, the Western Freeway, Kings Road, Gourlay Road and to a lesser extent from Hopkins Road and the OMRR. Notwithstanding that, the provision of shared path on both sides will provide a better opportunity for pedestrians and cyclists to travel north-south along the corridor.

4.4.5 Access to/from Kororoit Creek Trail

As illustrated in Figure 3, the proposed east-west Kororoit Creek Trail intersecting the Palmers Road Corridor is currently not provided. If the Kororoit Creek Trail is constructed in future, it will provide a better opportunity for pedestrians and cyclists to travel north-south and east-west.

4.4.6 Recommended Access Management Strategy

- In the section between Tenterfield Drive and Rockbank Middle Road does not meet the Austroads Guidelines for Category 2A or 2B roads as the spacing between signalised intersections exceeds 800m. It is noted that this section of Westwood Drive has minimal connections to the Palmers Road corridor and hence the proposed spacing between signalised intersections is considered reasonable in this case.
- Given the number of municipal roads that provide access to the Palmers Road Corridor, this would prohibit the provision of acceleration lane in accordance with Category 2A roads. Therefore it is recommended that this section of the Palmers Road Corridor be designed in accordance with the Austroads Guidelines for Category 2B instead of Category 2A roads. Minimum design standards in accordance with the requirements of Austroads Guide to Road Design Part 4: Intersections and Crossings for the provision of acceleration and deceleration lanes at intersections and interchanges should be considered.

- It is recommended that no further connections to Palmers Road Corridor should be allowed other than what is discussed above. Access should be provided by municipal road connections and service roads only.
- It is recommended that U-turn bays be avoided at signalised intersection but may be required at appropriate mid-block locations in the median to reduce or eliminate U-turn volumes at major traffic signal controlled intersections. Ideally, U-turn bays are provided shortly prior to intersections at which other traffic will enter and leave the major road.

4.5 Taylors Road to Melton Highway

4.5.1 Existing Conditions

The current land uses to the east and west of this corridor are predominately residential. This section of Calder Park Drive has minimal connections to the Palmers Road corridor.

Vehicle access to/from this corridor is currently provided via:

- unsignalised intersections at:
  - Calder Park Drive and Wells Avenue intersection.
  - Calder Park Drive and Contursi Drive intersection.
  - Calder Park Drive and Meade Way intersection.
  - Calder Park Drive and Catherine Drive intersection.
- roundabouts at:
  - Westwood Drive / Calder Park Drive and Taylors Road intersection.
  - Calder Park Drive and Loddon Drive / George Street intersection.
  - Calder Park Drive and Hume Drive intersection.
  - Calder Park Drive and Community Hub intersection.
- signalised intersection at Calder Park Drive and Melton Highway intersection.

Bus services operate along this section of Palmers Road Corridor. Bus stops are provided for buses travelling northbound but no provision of bus stops for buses travelling southbound. The location of the existing bus stops is illustrated in Figure 10.

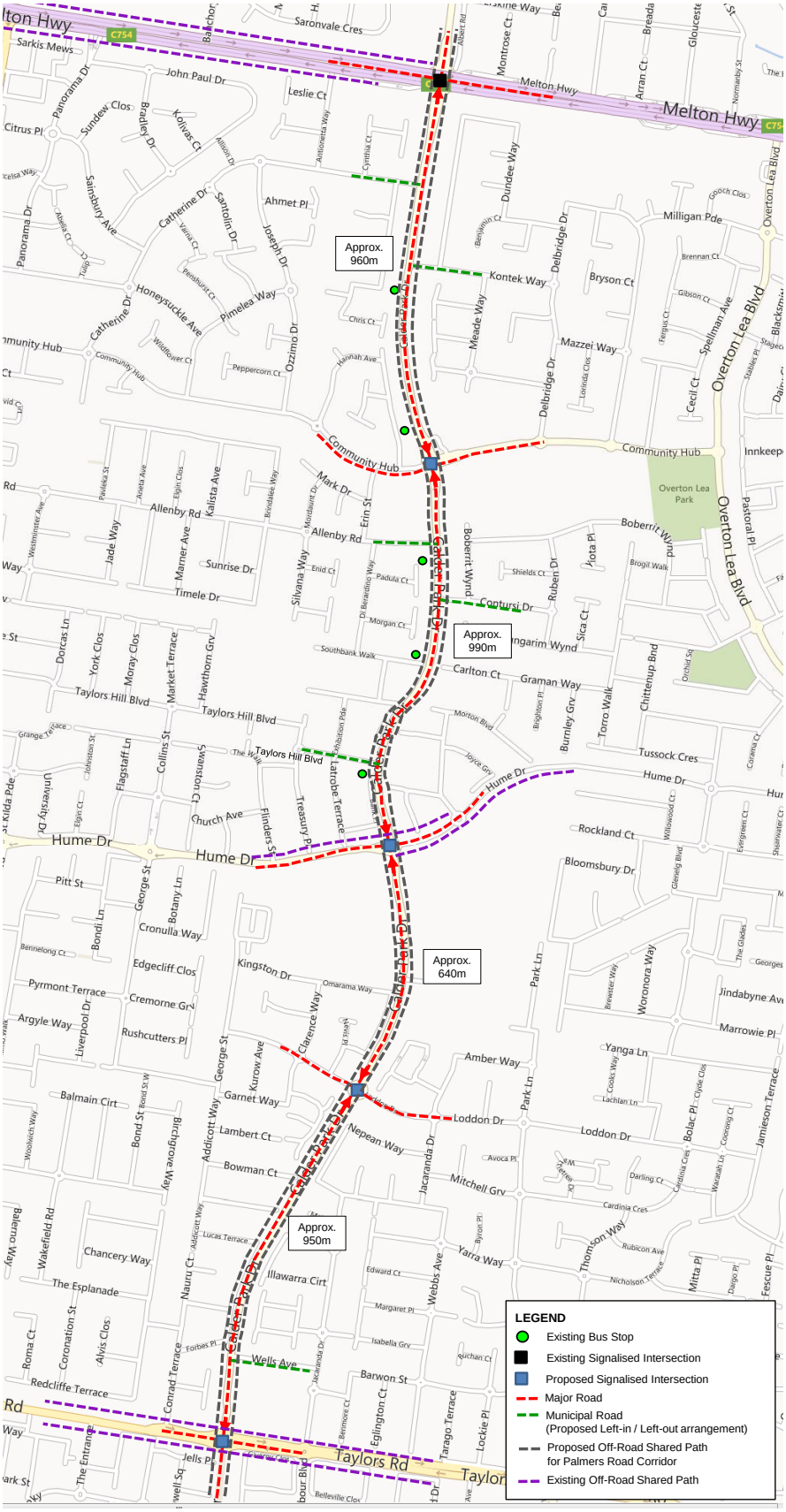
4.5.2 Proposed Conditions

The location and spacing of signalised intersections for this section of Calder Park Drive is illustrated in Figure 10.

Based on the concept design prepared by SKM, it is proposed to:

- convert the existing roundabouts to signalised intersections at:
  - Westwood Drive / Calder Park Drive and Taylors Road intersection.
  - Calder Park Drive and Loddon Drive / George Street.
  - Calder Park Drive and Hume Drive.
  - Calder Park Drive and Community Hub.
- retain the existing signalised intersection at Calder Park Drive and Melton Highway intersection.
- other municipal roads that provide access to this corridor would be limited to left-in / left-out arrangements.

Figure 10 Proposed location and spacing of signalised intersections between Taylors Road and Melton Highway



4.5.3 Recommended Access Management Strategy

- The proposed spacing between intersections for this section of Calder Park Drive is as per the existing conditions which does not comply with the requirements of Austroads Guidelines for Category 2A or Category 2B roads. Given that this is the current access arrangement, therefore no further connections to Palmers Road Corridor is recommended. Access should be provided by municipal road connections and service roads only.
- It is recommended that this section of the Palmers Road Corridor be designed in accordance with the Austroads Guidelines for Category 2A roads, given the spacing are generally greater than 400 metres.
- It is recommended that U-turn bays be avoided at signalised intersection but may be required at appropriate mid-block locations in the median to reduce or eliminate U-turn volumes at major traffic signal controlled intersections. Ideally, U-turn bays are provided shortly prior to intersections at which other traffic will enter and leave the major road.
- It is recommended that acceleration and deceleration lanes at intersections and interchanges be designed in accordance with the requirements of Austroads Guide to Road Design Part 4: Intersections and Crossings.

4.6 Melton Highway to Calder Freeway

4.6.1 Existing Conditions

The current land uses to the east and west of this corridor are predominately residential. Calder Park Motorsports Complex is located to the north of the Melbourne-Bendigo railway line. Directly opposite to Calder Park Motorsports Complex is generally undeveloped. This section of Calder Park Drive has minimal connections to the Palmers Road Corridor.

Vehicle access to/from this corridor is currently provided via:

- signalised intersection at Calder Park Drive and Melton Highway intersection.
- unsignalised intersections at:
    - Calder Park Drive and Erskine Way intersection.
    - Calder Park Drive and Glenbruar Drive intersection.
    - Calder Park Drive and Manchester Drive intersection.
    - Calder Park Drive and Victoria Road intersection.
    - Calder Park Drive and Calder Freeway intersection.
- roundabout at Calder Park Drive and Glenbruar Drive / Manchester Drive intersection.

Bus services operate along this section of Palmers Road Corridor between Melton Highway and Glenbruar Drive. No bus stops are provided on either side of the road.

The location and spacing of signalised intersections and roundabouts for this section of Calder Park Drive is illustrated in Figure 11.

4.6.2 Proposed Conditions

Based on the concept design prepared by SKM, it is proposed to:

- retain the existing signalised intersection at Calder Park Drive and Melton Highway intersection.
- convert the existing roundabout to signalised intersection at Calder Park Drive and Glenbruar Drive and Manchester Drive intersection.
- restrict other municipal roads that provide access to this corridor to be limited to left-in / left-out arrangements.
- remove the level crossing with the Melbourne-Bendigo Railway line as part of the corridor upgrade and construct a bridge to provide a grade separation between the Palmers Road Corridor and the railway line.
- signalise the access point to Calder Park Motorsports Complex car park on Calder Park Drive.
- change the intersection of Calder Park Drive and Calder Freeway to a grade separated interchange which includes a roundabout for ramp control and signalise the Calder Freeway outbound off-ramp.

Figure 11 Proposed location and spacing of signalised intersections between Calder Park Drive and Melton Highway and Calder Freeway

4.6.3 Calder Park Motorsports Complex (CPMC)

4.6.3.1 Existing Conditions

Access to CPMC is currently provided via seven access points, four via Calder Freeway and three via Calder Park Drive. The current condition of the access points into CPMC are:

- Gate 1 (permanent) onto Calder Freeway is the existing day to day entrance
- Gate 2 (temporary) onto the Calder Freeway is sealed with short slip lanes
- Gate 3 (temporary) onto the Calder Freeway is not used for any major events and is blocked by a slip lane into a service station
- Gate 4 (temporary) onto Calder Freeway is very poor with a gate in the fence and no formed driveway
- Gate 5 (temporary) onto Calder Park Drive is very poor with a gate in the fence and no formed driveway
- Gate 6 and Gate 7 (temporary) onto Calder Park Drive are dirt tracks with formed driveways
- Additional gates onto the vacant land on the east side of Calder Park Drive which is used as an overflow car park only for events in excess of 26,500 spectators

4.6.3.2 Future Conditions

The Palmers Road Corridor design includes the following proposal:

- retain and signalise Gate 3 on Calder Park Drive to service CPMC and the potential industrial park to the east of Palmers Road Corridor
- retain Gate 1 on Calder Freeway for major events
- remove all other access points on Calder Park Drive and Calder Freeway

A minimum 3.0 metres wide shared path is proposed on both sides of the Palmers Road Corridor.

4.6.4 Access to/from Banchory Grove Grassland Nature Conservation Reserve (NCR) and Victoria Road (south of the Melbourne – Bendigo Railway Line)

Based on the concept design prepared by SKM, it is proposed to remove the level crossing with the Melbourne-Bendigo Railway line as part of the corridor upgrade and construct a bridge to provide a grade separation between the Palmers Road Corridor and the railway line.

Access to Banchory Grove NCR and Victoria Street to the east of Palmers Road Corridor will be affected by the proposed grade separation. Access to the affected properties will be diverted via Manchester Drive, Nottingham Way and Victoria Street.

4.6.5 Access to/from Organ Pipes National Park

The concept design prepared by SKM indicates that:

- the off-road shared path on the eastern side of the Palmers Road Corridor will terminate at the proposed Calder Freeway interchange.
- the off-road shared path on the western side of the Palmers Road Corridor will continue and connect to the Organ Pipes National Park (refer Figure 11).

4.6.6 Access Arrangements for the Organ Pipes National Park

4.6.6.1 Existing Access

Access for vehicle and cyclists to the Organ Pipes National Park is provided directly from Calder Freeway (both left and right and turns allowed).

4.6.6.2 Base Case access if the Palmers Road Corridor project does not proceed

Access to the Organ Pipes National Park will be restricted to left-in and left-out arrangements. This is due to growing traffic volumes and safety conditions on Calder Freeway.

4.6.6.3 Proposed project access

Close existing direct access from Calder Freeway and restore access via local road that connects into the proposed Calder Park Drive freeway interchange (400 metres to the east of the current entrance). The proposed Calder Park Drive interchange has east and west off ramps onto the Calder Freeway.

4.6.6.4 Improved safety

The restoration of the proposed access is significantly safer than the existing direct access on to the Calder Freeway.

4.6.6.5 Pedestrian and Cycling access

Existing: Access for pedestrian and cyclist is provided via the north side of Calder Freeway. However, some cyclists may prefer to cycle on the freeway.

Proposed: It is proposed to provide off-road shared pedestrian and cyclist path from the south side of the Calder Freeway.

4.6.6.6 Mitigation signage

Signage will be erected:

- before the Calder Park Drive interchange advising drivers that this is the exit for Organ Pipes National Park.
- at Calder Park Drive interchange advising drivers that this is the exit for Organ Pipes National Park.

4.6.7 Recommended Access Management Strategy

- The proposed spacing between intersections for this section of Calder Park Drive is as per the existing conditions which generally do not comply with the requirements of Austroads Guidelines for Category 2A or Category 2B roads. Given that this is the current access arrangement, therefore no further connections to Palmers Road Corridor is recommended. Access should be provided by municipal road connections and service roads only.
- It is recommended that this section of the Palmers Road Corridor be designed in accordance with the Austroads Guidelines for Category 2A roads, given the spacing are generally greater than 400 metres.
- It is recommended that U-turn bays be avoided at signalised intersection but may be required at appropriate mid-block locations in the median to reduce or eliminate U-turn volumes at major traffic signal controlled intersections. Ideally, U-turn bays are provided shortly prior to intersections at which other traffic will enter and leave the major road.
- It is recommended that acceleration and deceleration lanes at intersections and interchanges be designed in accordance with the requirements of Austroads Guide to Road Design Part 4: Intersections and Crossings.
- Access capacity into and exiting the CPMC be maintained at existing level.

4.7 Summary of Recommended Access Management Strategy and Assessment Against Clause 4.2 of EES Scoping Requirements

The recommendations for the Palmers Road Corridor between Western Freeway and Calder Freeway and assessment against Clause 4.2 of EES Scoping Requirements are summarised in Table 2.

Table 2 Recommendations for the Palmers Road Corridor between Western Freeway and Calder Freeway

Corridor Sections	Recommendations	Assessment Against Clause 4.2 of EES Scoping Requirements
Western Highway to Foleys Road	- As the proposed spacing between intersections ranging between 700 to 800 metres, Category 2A roads requirements should be applied. Given that this is the current access arrangement, therefore no further connections to Palmers Road Corridor is recommended. Access should be provided by municipal road connections and service roads. - It is recommended that acceleration and deceleration lanes at intersections and interchanges be designed in accordance with the requirements of Austroads Guide to Road Design Part 4: Intersections and Crossings.	- Meets the EES Scoping Requirements to reduce congestion on the existing road network, provide north-south connectivity for pedestrians, cyclists, public transport and motor vehicle. - Provide easier and better access to community facilities along the route, reduced travel times, reduced traffic volumes and congestion through the Major Activity Centre on Caroline Springs Boulevard. - Future works to include Traffic Management Plan (TMP) to ensure vehicles are diverted to the surrounding road network where needed, traffic impact assessment to vehicles, pedestrians, cyclists during the construction. However these plans would be developed closer to construction and based on needs at the time of construction.

Corridor Sections	Recommendations	Assessment Against Clause 4.2 of EES Scoping Requirements
Foleys Road to Ballarat Road (Western Highway)	- The section between Vanessa Drive and Waigani Avenue does not meet the Austroads Guidelines for Category 2A or 2B roads as it is only 140 metres. In practice, the close proximity is likely to result in the intersections operating as a single staggered site. An alternative consideration could be given by relocating the proposed traffic signal at Waigani Avenue to Fuller Road north section. This will create spacing between signalised intersection of 420 metres between Ballarat Road and Fuller Road, and 320 metres between Fuller Road and Vanessa Drive. Given the spacing are generally less than 500 metres, it is recommended that the section between Ballarat Road and Vanessa Drive be designed in accordance with the Austroads Guidelines for Category 2B roads. - It is recommended that the section between Vanessa Drive and Foleys Road be designed in accordance with the Austroads Guidelines for Category 2A roads, given the spacing are generally greater than 400 metres and exceeded 800 metres. - It is recommended that no further connections to Palmers Road Corridor should be allowed other than what is discussed above. Access should be provided by municipal road connections and service roads only. - It is recommended that U-turn bays be avoided at signalised intersection but may be required at appropriate mid-block locations in the median to reduce or eliminate U-turn volumes at major traffic signal controlled intersections. Ideally, U-turn bays are provided shortly prior to intersections at which other traffic will enter and leave the major road. - It is recommended that acceleration and deceleration lanes at intersections and interchanges be designed in accordance with the requirements of Austroads Guide to Road Design Part 4: Intersections and Crossings.	- Meets the EES Scoping Requirements to reduce congestion on the existing road network, provide north-south connectivity for pedestrians, cyclists, public transport and motor vehicle. - Provide easier and better access to community facilities along the route, reduced travel times, reduced traffic volumes and congestion through the Major Activity Centre on Caroline Springs Boulevard. - Future works to include Traffic Management Plan (TMP) to ensure vehicles are diverted to the surrounding road network where needed, traffic impact assessment to vehicles, pedestrians, cyclists during the construction. However these plans would be developed closer to construction and based on needs at the time of construction.

Corridor Sections	Recommendations	Assessment Against Clause 4.2 of EES Scoping Requirements
Ballarat Road (Western Highway) to Taylors Road	- In the section between Tenterfield Drive and Rockbank Middle Road does not meet the Austroads Guidelines for Category 2A or 2B roads as the spacing between signalised intersections exceeds 800m. It is noted that this section of Westwood Drive has minimal connections to the Palmers Road corridor and hence the proposed spacing between signalised intersections is considered reasonable in this case. - Given the number of municipal roads that provide access to the Palmers Road Corridor, this would prohibit the provision of acceleration lane in accordance with Category 2A roads. Therefore it is recommended that this section of the Palmers Road Corridor be designed in accordance with the Austroads Guidelines for Category 2B instead of Category 2A roads. Minimum design standards in accordance with the requirements of Austroads Guide to Road Design Part 4: Intersections and Crossings for the provision of acceleration and deceleration lanes at intersections and interchanges should be considered. - It is recommended that no further connections to Palmers Road Corridor should be allowed other than what is discussed above. Access should be provided by municipal road connections and service roads only. - It is recommended that U-turn bays be avoided at signalised intersection but may be required at appropriate mid-block locations in the median to reduce or eliminate U-turn volumes at major traffic signal controlled intersections. Ideally, U-turn bays are provided shortly prior to intersections at which other traffic will enter and leave the major road.	- Under Base Case scenario, when there are two traffic lanes with no provision of Kororoit Creek Bridge, this section of Palmers Road Corridor does not meet the EES Scoping Requirements. Traffic volumes are relatively low when compared to the alternative north-south routes of Kings Road, Caroline Springs Boulevard and Gourlay Road. Traffic is higher to the south of Kororoit Creek but is generally lower than alternative north-south routes. - Under Interim Case scenario, when Kororoit Creek Bridge is constructed, this section of Palmers Road Corridor will meet the EES Scoping Requirements to reduce congestion on the existing road network, provide north-south connectivity for pedestrians, cyclists, public transport and motor vehicle. The transport modelling indicates that under the Interim Case scenario, it is clear that by introducing Kororoit Creek Bridge, the Palmers Road Corridor becomes a more attractive alternative for north-south travel. Traffic is significantly reduced from Caroline Springs Boulevard, Gourlay Road, the Western Freeway and Kings Road. Provides easier and better access to community facilities along the route, reduced travel times, reduced traffic volumes and congestion through the Major Activity Centre on Caroline Springs Boulevard. - Future works to include Traffic Management Plan (TMP) to ensure vehicles are diverted to the surrounding road network where needed, traffic impact assessment to vehicles, pedestrians, cyclists during the construction. However these plans would be developed closer to construction and based on needs at the time of construction.

Corridor Sections	Recommendations	Assessment Against Clause 4.2 of EES Scoping Requirements
Taylors Road to Melton Highway	- The proposed spacing between intersections for this section of Calder Park Drive is as per the existing conditions which does not comply with the requirements of Austroads Guidelines for Category 2A or Category 2B roads. Given that this is the current access arrangement, therefore no further connections to Palmers Road Corridor is recommended. Access should be provided by municipal road connections and service roads only. - It is recommended that this section of the Palmers Road Corridor be designed in accordance with the Austroads Guidelines for Category 2A roads, given the spacing are generally greater than 400 metres. - It is recommended that U-turn bays be avoided at signalised intersection but may be required at appropriate mid-block locations in the median to reduce or eliminate U-turn volumes at major traffic signal controlled intersections. Ideally, U-turn bays are provided shortly prior to intersections at which other traffic will enter and leave the major road. - It is recommended that acceleration and deceleration lanes at intersections and interchanges be designed in accordance with the requirements of Austroads Guide to Road Design Part 4: Intersections and Crossings.	- Meets the EES Scoping Requirements to reduce congestion on the existing road network, provide north-south connectivity for pedestrians, cyclists, public transport and motor vehicle. - Provide easier and better access to community facilities along the route, reduced travel times, reduced traffic volumes and congestion through the Major Activity Centre on Caroline Springs Boulevard. - Future works to include Traffic Management Plan (TMP) to ensure vehicles are diverted to the surrounding road network where needed, traffic impact assessment to vehicles, pedestrians, cyclists during the construction. However these plans would be developed closer to construction and based on needs at the time of construction.

Corridor Sections	Recommendations	Assessment Against Clause 4.2 of EES Scoping Requirements
Melton Highway to Calder Freeway	- The proposed spacing between intersections for this section of Calder Park Drive is as per the existing conditions which generally do not comply with the requirements of Austroads Guidelines for Category 2A or Category 2B roads. Given that this is the current access arrangement, therefore no further connections to Palmers Road Corridor is recommended. Access should be provided by municipal road connections and service roads only. - It is recommended that this section of the Palmers Road Corridor be designed in accordance with the Austroads Guidelines for Category 2A roads, given the spacing are generally greater than 400 metres. - It is recommended that U-turn bays be avoided at signalised intersection but may be required at appropriate mid-block locations in the median to reduce or eliminate U-turn volumes at major traffic signal controlled intersections. Ideally, U-turn bays are provided shortly prior to intersections at which other traffic will enter and leave the major road. - It is recommended that acceleration and deceleration lanes at intersections and interchanges be designed in accordance with the requirements of Austroads Guide to Road Design Part 4: Intersections and Crossings. - Access capacity into and exiting the CPMC be maintained at existing level.	- Meets the EES Scoping Requirements to reduce congestion on the existing road network, provide north-south connectivity for pedestrians, cyclists, public transport and motor vehicle. - Provide easier and better access to community facilities along the route, reduced travel times, reduced traffic volumes and congestion through the Major Activity Centre on Caroline Springs Boulevard. - Future works to include Traffic Management Plan (TMP) to ensure vehicles are diverted to the surrounding road network where needed, traffic impact assessment to vehicles, pedestrians, cyclists during the construction. However these plans would be developed closer to construction and based on needs at the time of construction. - The Palmers Road upgrade maintains existing access capacity into and exiting the CPMC.

4.8 Assessment Against Planning Objectives

Palmers Road Corridor has been assessed against its ability to meet the Landscape Planning Objectives for both with and without mitigation measures. The assessment has been based on the rating scale used by VicRoads. The rating for the four scenarios proposed for Palmers Road Corridor is summarised in Table 3.

Table 3 Palmers Road Corridor proposal against the EES Scoping Objective 4.2 Planning Objectives

Scenario	Rating	Definition
Base Case – two lanes	Poor	Policy non-compliance, mostly negative impacts or minor positive impacts
Interim Case – two lanes	Neutral	Some policy compliance, equal positive and negative impacts
Interim Case – four lanes	Well	Good policy compliance, mostly positive impacts or minor negative impacts
Ultimate Case – six lanes	Very Well	High level of compliance, major positive impacts or negligible negative impacts

5.0 Conclusion

Based on the considerations outlined in this report, it is concluded that:

- *SmartRoads* has identified the Road User Hierarchy for Palmers Road Corridor as "Future Preferred Traffic Route" and a 1.6km section between Rockbank Middle Road and Ballarat Road as "Bus Priority Route", The Access Management Plan and Road Use Hierarchy for the road network should be in alignment to ensure a consistent planning and operational framework.
- Consideration is required of the requirements of the Transport Integration Act both in terms of the role and purpose of the Palmers Road Corridor, and its ability to support future transport and land use in line with the principles of the Act. The content of this report demonstrates that VicRoads has given due consideration to access and transport in relation to the Transport Integration Act.
- Pedestrian space should adequately cater for the needs of all types of users in particular, provision should be made for pedestrians who are impaired with respect to vision or mobility. Additional crossing facilities away from the signalised intersections to assist pedestrians across the Palmers Road corridor have not been identified at this stage. Investigation of the potential future pedestrian/community attractors and cross corridor desire lines along Palmers Road Corridor will be identified at a later date closer to construction. This will enable the need for additional pedestrian crossing facilities to be confirmed and implemented as appropriate. Detailed design should be referred to *Austroads Guide to Traffic Management Part 6: Intersections, Interchanges and Crossings* and *Austroads Guide to Road Design Part 6A: Pedestrian and Cyclist Paths.*
- Palmers Road corridor should have route lighting installed to Category V3 to V1 according to Australian Standards.
- The connections between the existing off-road shared paths crossing the Palmers Road corridor to assist pedestrians and cyclists have not been fully considered at this stage. Investigation of the connectivity of the proposed and existing off-road shared paths will be confirmed and developed at a later date closer to construction.
- The concept design prepared by SKM has included access for pedestrians and cyclists from the Palmers Road Corridor to/from Wellness Trail, Ravenhall NCR, East-West shared path (parallel to the Melbourne – Ballarat Railway Line), Kororoit Creek Trail, Banchory Grove NCR, and Organ Pipes National Park. The proposed provision of off-road shared path along Palmers Road Corridor will provide a better opportunity for pedestrians and cyclists to travel north-south along the corridor.
- The City of Brimbank 'Cycling and Walking Strategy' has proposed on-road bicycle facilities on Westwood Drive and Robinsons Road. Although it has been agreed with Councils that provision will be off-road, considerations should be made that some cyclists will still remain on-road. Intersections layouts should consider both the on and off road cycle movements. Detailed design should be referred to VicRoads Cycle Notes, *Cycling Aspects of Austroads Guides, Austroads Guide to Road Design Part 6A: Pedestrian and Cyclists Paths* and other relevant guidelines.
- VicRoads has their own 'Bus Stop Guidelines' that limit the use of indented bus stop bays. The guidelines recommend *'bus bays are not constructed in 80km/h zones unless there are only one or two lanes in the bus direction, or the stop is close to the departure side of a signalised intersection'*. On this basis, for the Palmers Road Corridor, which is proposed to be a three lane road in each direction, provision of on-road bus stopping areas are recommended.
- The location of bus stops along Palmers Road Corridor has not been considered at this stage. Investigation of the potential location of bus stops will be subject to confirmation of bus routes closer to the date of construction. Any alterations to the bus services will be referred to Public Transport Victoria (PTV). The location and design of bus stops at major intersections should be referred to *Austroads Guide to Traffic Management Part 6: Intersections, Interchanges and Crossings* and *VicRoads 'Bus Stops Guidelines'.*
- Category 2A has been recommended for the majority of the route given that generally the length between intersections is greater than 600m which is likely to provide the preferred deceleration/acceleration lane lengths. This is likely to mean that through traffic will have priority and minimise delays given traffic queues can be catered within the storage lanes and not queue into through lanes. Additionally the distance between intersections minimises the number of intersections that through traffic will encounter, again reducing the delays to through traffic. Acceleration and deceleration lanes at intersections and interchanges be designed

in accordance with the requirements of *Austroads Guide to Road Design Part 4: Intersections and Crossings.*

The section between Vanessa Drive and Waigani Avenue does not meet the Austroads Guidelines for Category 2A or 2B roads as it is only 140 metres. In practice, the close proximity is likely to result in the intersections operating as a single staggered site. An alternative consideration could be given by relocating the proposed traffic signal at Waigani Avenue to Fuller Road north section. This will create spacing between signalised intersection of 420 metres between Ballarat Road and Fuller Road, and 320 metres between Fuller Road and Vanessa Drive. Given the spacing are generally less than 500 metres, it is recommended that the section between Ballarat Road and Vanessa Drive be designed in accordance with the Austroads Guidelines for Category 2B roads.

- In the section between Westwood Drive between Ballarat Road (Western Highway) and Taylors Road, the number of municipal roads that provide access to the Palmers Road Corridor would prohibit the provision of acceleration lane in accordance with Category 2A roads. Therefore it is recommended that this section of the Palmers Road Corridor be designed in accordance with the Austroads Guidelines for Category 2B instead of Category 2A roads. Minimum design standards in accordance with the requirements of Austroads Guide to Road Design Part 4: Intersections and Crossings for the provision of acceleration and deceleration lanes at intersections and interchanges should be considered.
- It is recommended that no further connections to Palmers Road Corridor should be allowed other than what is discussed above. Access should be provided by municipal road connections and service roads only.
- It is recommended that U-turn bays be avoided at signalised intersection but may be required at appropriate mid-block locations in the median to reduce or eliminate U-turn volumes at major traffic signal controlled intersections. Ideally, U-turn bays are provided shortly prior to intersections at which other traffic will enter and leave the major road.
- Under Base Case scenario, when there are two traffic lanes with no provision of Kororoit Creek Bridge, the section of Palmers Road Corridor between Ballarat Road and Taylors Road does not meet the EES Scoping Requirements. Traffic volumes on Palmers Road Corridor are relatively low when compared to the alternative north-south routes of Kings Road, Caroline Springs Boulevard and Gourlay Road. Traffic is higher to the south of Kororoit Creek but is generally lower than alternative north-south routes.
- Under Interim Case scenario, when Kororoit Creek Bridge is constructed, the whole Palmers Road Corridor will meet the EES Scoping Requirements. The transport modelling indicates that under the Interim Case scenario, it is clear that by introducing Kororoit Creek Bridge, the Palmers Road Corridor becomes a more attractive alternative for north-south travel. Traffic is significantly reduced from Caroline Springs Boulevard, Gourlay Road, the Western Freeway and Kings Road. Provides easier and better access to community facilities along the route, reduced travel times, reduced traffic volumes and congestion through the Major Activity Centre on Caroline Springs Boulevard.
- Future works on Palmers Road Corridor should include Traffic Management Plan (TMP) to ensure vehicles are diverted to the surrounding road network where needed, traffic impact assessment to vehicles, pedestrians, cyclists during the construction. However these plans would be developed closer to construction and based on needs at the time of construction.
- The Palmers Road upgrade maintains existing access capacity into and exiting the Calder Park Motor Sports Complex (CPMC).
- Palmers Road Corridor has been assessed against its ability to meet the EES Scoping Objective 4.2 Planning Objectives for both with and without mitigation measures. The assessment has been based on the rating scale used by VicRoads. Under Base Case scenario, the proposal is rated poor where most of the proposal will be non-compliance to the policy, and mostly negative impacts or minor positive impacts. When Kororoit Creek Bridge is proposed under Interim Case scenario, the rating for the proposal shows progressive improvement and compliance to the policy. The proposal is rated moderately well under two traffic lanes scenario, well under four traffic lanes scenario and very well under six traffic lanes scenario.