

Report Prepared for
Podium 1 Pty Ltd

11 November 2019

ratio:

**Proposed Motorsport Education
Facility**

21, 75 & 115 Key Lane and 335
McGregor Road, Pakenham –
Cardinia Motorsports Precinct

traffic:impact

r:

Version	Date	Reason for Issue	Prepared By	Checked By
D01	12/04/2019	Draft	N. Chewta S. Naik	B. Young
D02	07/05/2019	Draft	N. Chewta S. Naik	B. Young
F01	16/05/2019	Final	N. Chewta S. Naik	B. Young
F02	05/08/2019	Final	N. Chewta	B. Young
F03	15/10/2019	Final (minor updates)	N. Chewta S. Naik	B. Young
REP04-F01	1/11/2019	Final (DoT updates)	N. Chewta	B. Young
REP04-F02	11/11/2019	Final (DoT updates)	N. Chewta	B. Young

Directory Path	Y:\15501-16000\15633T - 335 McGregor Road, Pakenham\Work\Reports\Development Plan TP Application\15633T-REP04-F02.docx
----------------	--

ratio:consultants pty ltd

This work is copyright. Apart from any use as permitted under Copyright Act 1963, no part may be reproduced without written permission of **ratio:consultants** pty ltd.

Disclaimer: neither **ratio:consultants** pty ltd nor any member or employee of **ratio:consultants** pty ltd takes responsibility in anyway whatsoever to any person or organisation (other than that for which this report is being prepared) in respect of the information set out in this report, including any errors or omissions therein. **ratio:consultants** pty ltd is not liable for errors in plans, specifications, documentation or other advice not prepared or designed by **ratio:consultants** pty ltd.

Table of contents:

Chapter / Section	Page No.
1 Introduction:	5
2 Existing Conditions:	6
2.1 Site Locale	6
2.2 Existing Road Network.....	9
2.3 Future Road Network Upgrades	9
2.4 Sustainable Transport.....	10
2.5 Traffic Conditions.....	11
3 The Proposal:	12
3.1 Development Schedule	12
3.2 Car Parking & Access Arrangements.....	12
4 Car Parking Considerations:	16
4.1 Clause 52.06 Statutory Car Parking Requirements	16
4.2 Car Parking Demand Assessment.....	17
4.3 Allowing Fewer Spaces to be Provided	21
4.4 Adequacy of the Parking Provision	21
5 Event Management Considerations:	22
5.1 Event Management Plans.....	22
5.2 Roles and Responsibilities	24
5.3 Parking Management.....	24
5.4 Traffic Flow & Management	25
5.5 Pedestrian and Cycle Considerations.....	26
6 Loading & Waste Collection:	27
6.1 Loading & Waste Collection Arrangements	27
7 Traffic Considerations:	28
7.1 Road Network Access	28
7.2 Traffic Generation	30
7.3 Traffic Impact	34
7.4 Access Scenario 1.....	34
7.5 Access Scenario 2.....	38
7.6 Access Scenario 3.....	43
7.7 Access Summary.....	46
8 Recommendations:	48
9 Conclusion:	49

Appendices:

Appendix A	Development Plan
Appendix B	Car Parking Arrangements
Appendix C	SIDRA Results



Appendix D Concept Layout Plans



1 Introduction:

Ratio Consultants has been commissioned by Podium 1 Pty Ltd to assess the car parking and traffic aspects of the proposed development plan for a motorsports and education facility at 21, 75 & 115 Key Lane and 335 McGregor Road, in Pakenham. A copy of the Development Plan is attached to Appendix A.

The following report aims to address all relevant car parking and traffic matters, with an emphasise to guide future planning applications for specific works. This report responds to the following traffic-related items specified within Development Plan Overlay – Schedule 16 (DPO16).

- *“Proposed traffic and access arrangements and associated works.*
- *The location and capacity of all car parking areas and access to and from them.*
- *The location and design of all pedestrian and vehicle access ways.*
- *Provision for the loading and unloading of vehicles associated with the development and use of the land.”*

In addressing the above DPO16 items, and associated parking and traffic considerations of the proposed Development Plan, this report has been prepared based on surveys commissioned by our firm and collected by others, field observations in the vicinity of the site and our experience with other similar developments.

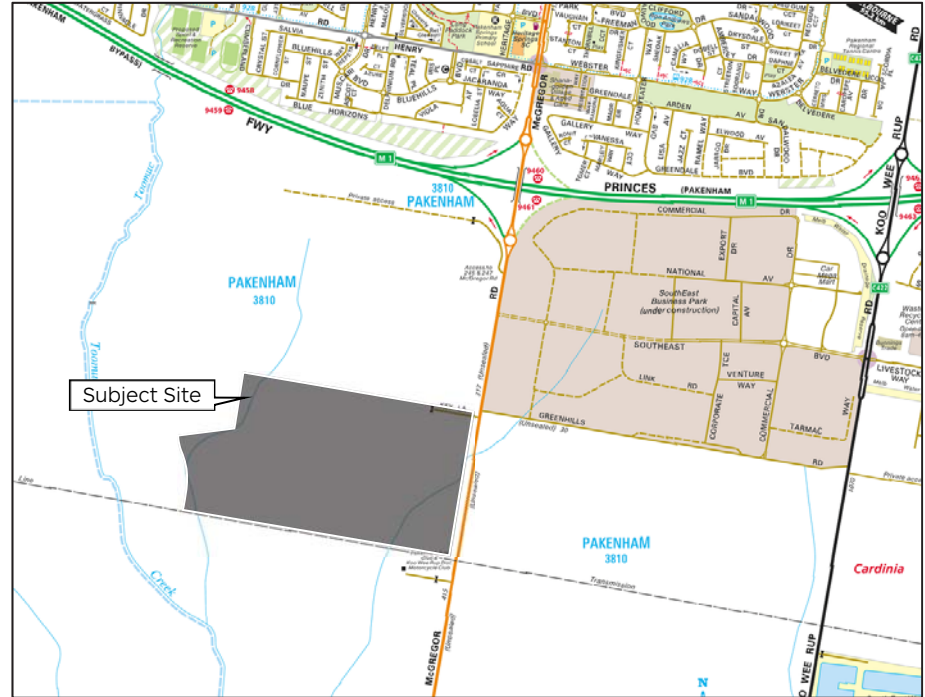
Future stages of the project will be assessed in greater detail via planning permit application traffic impact assessments (TIA), which should be prepared with reference to the endorsed Development Plan.

2.1 Site Locale

The subject land, addressed as 21, 75 & 115 Key Lane and 335 McGregor Road, Pakenham, Pakenham, is located generally on the southwest corner of the McGregor Road / Key Lane intersection in Pakenham, approximately 60 kilometres southeast of Melbourne's CBD.

The site's location relative to the surrounding road network is shown at Figure 2.1 following.

Figure 2.1 Site Location and Surrounding Road Network



Source: www.online.melway.com.au

The land at 21, 75 & 115 Key Lane and 335 McGregor Road, Pakenham is a large parcel of land located on the south-west corner of the McGregor Road and Key Lane intersection in Pakenham. The subject land also includes a reservation for a future bypass (Koo Wee Rup Bypass – Stage 2) which bisects the land in the north to south direction.

The subject site is irregular in shape and has a site area of approximately 130 hectares.

The subject site is generally bound by the Key Lane road reservation to the north McGregor Road to the east, green wedge zoning to the south and urban growth zoning to the west.

The site is currently occupied by a single dwelling and outbuildings, accessible via Key Lane. Toomuc Creek also runs near to, or on the western property boundary. A transmission line easement runs along the southern boundary of the DPO area.

The site, however, is predominantly host to the Pakenham Auto Club and Koo Wee Rup District Motorcycle Club and associated tracks, which is provided with vehicular access via an unnamed access road, located south of the transmission line easement.

The subject site is currently zoned Special Use Zone 5 (SUZ5), is subject to a Development Plan Overlay – Schedule 16 (DPO16), Inundation Overlay (LSIO), Floodway Overlay (FO) and Public Acquisition Overlay 1 Schedule (PAO). Land uses surrounding the site is a mix of urban growth zones,

industrial zones and business parks and green wedge zones for agriculture and farming.

Some of the major land features around the site include:

- South East Business Park located on the northeast corner of the Greenhills Road and McGregor Road intersection;
- South East Water Pakenham Treatment Plant located approximately 1.6 kilometres east of the site;
- Victorian Livestock Exchange located approximately 2.6 kilometres northeast of the site;
- Pakenham Train Station located approximately 3.7 kilometres northeast of the site; and
- Princes Freeway (Pakenham Bypass) located approximately 1.0 kilometres north of the site.

Notably, the land directly to the north of the site and south of the Princes Freeway is earmarked to be developed as the Pakenham West Employment Precinct, however the commencement of this Precinct Structure Plan (PSP) has not been scheduled.

To the west, the Cardinia Road Employment Precinct PSP was approved by the Planning Minister in 2010.

The land immediately to the east, has been identified as the Pakenham South Employment Precinct, a PSP which is being undertaken by Council.

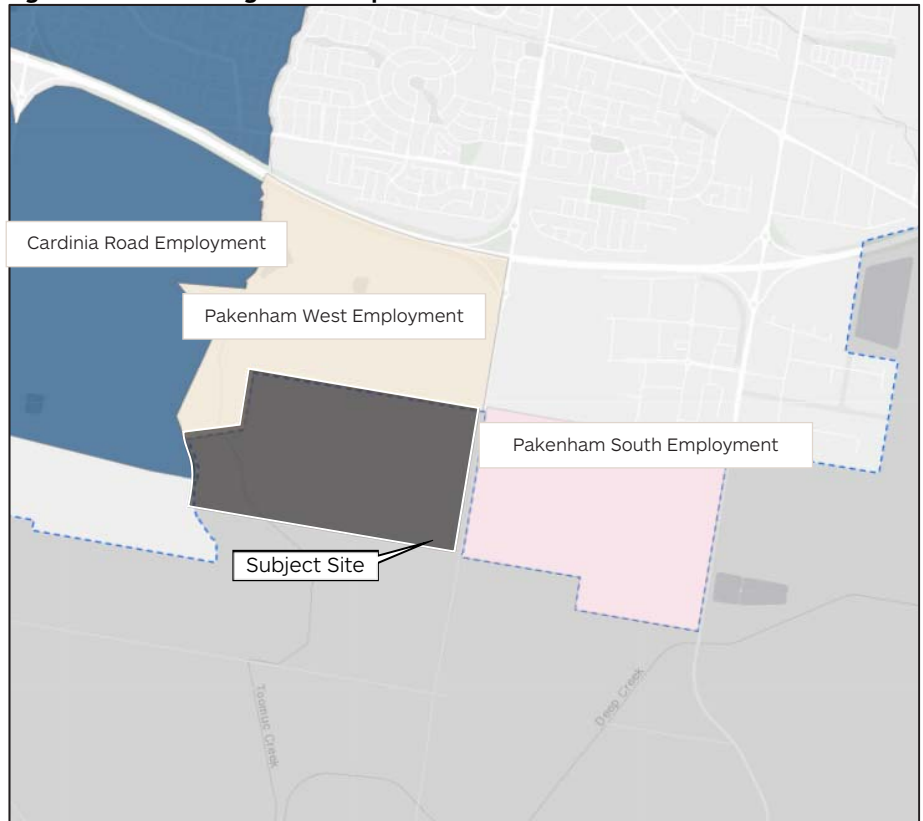
An aerial view of the site in the context of its surroundings is provided at Figure 2.2.

Figure 2.2 Aerial Photograph of the Site and Surrounds



Source: www.nearmap.com

Figure 2.3 VPA Planning Status Map



2.2 Existing Road Network

McGregor Road, adjacent the site, is classified as a major road under the management of Council.

Aligned generally in a north to south direction, it provides a connection between Princes Highway in the north with Rythdale Road / Soldiers Road in the south.

Adjacent to the subject land, McGregor Road has an unsealed carriageway of approximately 6.5 metres wide, with grassy shoulders, centrally located within a road reservation of approximately 21.5 metres.

McGregor Road is sealed approximately 150 metres south of the Pakenham Bypass interchange to the north, which has a posted speed limit of 70km/h.

The unsealed section of McGregor Road is subject to the default non-built up rural speed limit of 100km/hr.

Key Lane, adjacent the site, is a local road under the care of Council, providing access to a single dwelling.

Key Lane is offset by approximately 20 metres to the south of Greenhills Road.

Key Lane extends approximately 215 metres west of McGregor Road, and then leads into a driveway to a dwelling. At this junction, Key Lane is gated at its terminus and beyond this point, is disused and has become vegetated. The road reservation of Key Lane extends just beyond the northwest corner of the subject site near Toomuc Creek.

Unnamed Access Road, is a local access road abutting southern boundary of DPO area. In the site's vicinity, the road is constructed, albeit is unsealed for approximately 1.3 kilometres west of McGregor Road, where it then forms the driveway into/out of the Koo Wee Rup Motorcycle Club. Beyond these extents, the road is unformed, disused or vegetated.

2.3 Future Road Network Upgrades

McGregor Road, under the VPA South East Growth Corridor Plan, is identified as a future arterial road between the Princes Highway and Watson Road. However, we are instructed by Council that discussions have been held with VicRoads regarding its status between Greenhills Road and Watsons Road, and understand that this section of McGregor Road will be managed and designed to Council standard.

It is understood that the arterial section of McGregor Road, would ultimately be configured generally as a 4-6 lane arterial with auxiliary turn lanes at major intersections. Signalisation of the Southeast Boulevard / McGregor Road and Greenhills Road / McGregor Road intersections is also contemplated.

Roundabouts at key intersection / access points have also been considered along McGregor Road.

The alignment of a future **Koo Wee Rup Bypass** (the Bypass), is proposed to bisect the site, which may create two (2) separately distinct land parcels. The Bypass is proposed with an interchange at McGregor Road, and is likely to be constructed above the future Thompsons Road alignment.

Key Lane (Thompsons Road / Greenhills Road), is currently a local road. Under the VPA South East Growth Corridor Plan, Key Lane will ultimately become subservient/redundant when Thompsons Road is constructed.

Thompsons Road is proposed to be a dual carriageway, arterial road connecting the Western Port Highway and Koo Wee Rup Road.

The required road reservation for the future Thompsons Road alignment falls within the land currently earmarked for the Pakenham West PSP, north of the site.

Thompsons Road (west of McGregor Road) will also form part of the Principal Freight, and Principal Public Transport Networks. Ultimately, Thompsons Road will be upgraded to a six lane arterial road, and be signalised at its interchange with the proposed Bypass.

2.4 Sustainable Transport

Public Transport

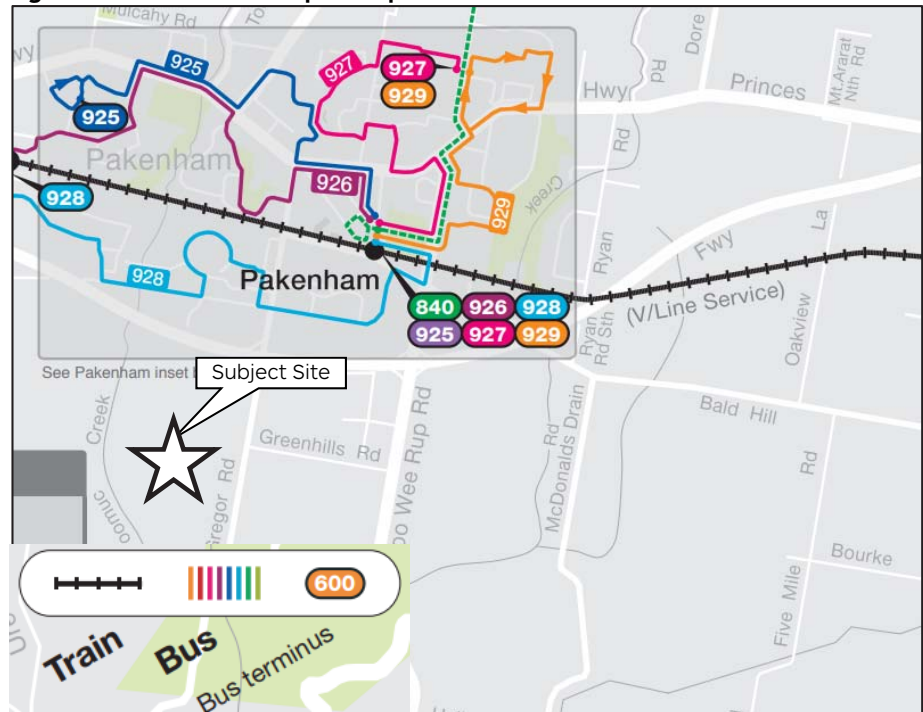
The site currently has limited access to public transport. The closest transportation available to the site, Bus Route 928 operates on Henry Road / Webster Way just north of the Princes Freeway. This bus route operates between Pakenham Station and Cardinia Road Station.

Approximately 3.7 kilometres northeast of the site, Pakenham city centre (Pakenham Place Shopping Centre and Marketplace Shopping Centre) is serviced by Pakenham Railway Station and several bus services including bus routes 840 and routes 925-929. V/Line services operate beyond Pakenham Railway Station to the east.

Thompsons Road (west of McGregor Road) will also form part of the Principal Freight, and Principal Public Transport Networks as informed by the VPA South East Growth Corridor Plan

The abovementioned services are illustrated in Figure 2.4 following.

Figure 2.4 PTV Public Transport Map



Source: ptv.vic.gov.au

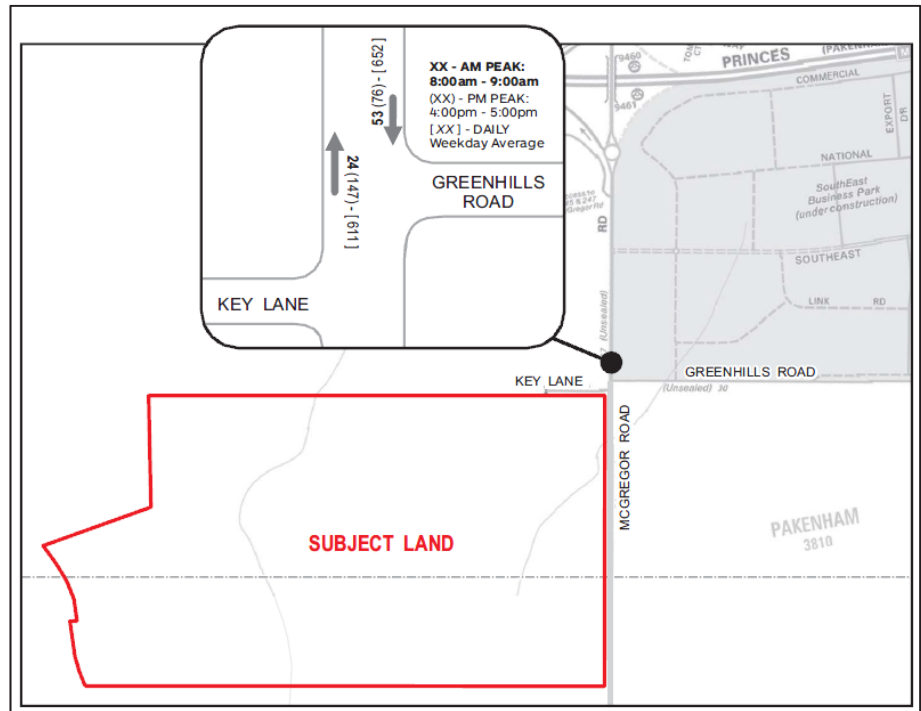
2.5 Traffic Conditions

Traffic Surveys

To understand the prevailing traffic conditions of McGregor Road, Ratio Consultants commissioned pneumatic tube counts for the period 14 November to 20 November 2018, north of Greenhills Road.

The average weekday peak and daily traffic volumes are presented in Figure 2.5 following.

Figure 2.5 Existing Traffic Volumes



Land to the south of the subject site is largely undeveloped and is predominantly agricultural in nature. Whilst some traffic will travel to/from the south to access the Pakenham Auto Club and Koo Wee Rup District Motorcycle Club, it is not expected that McGregor Road is carrying a significant amount of traffic south of Greenhills Road.

Much of the recorded traffic is therefore expected to have been generated by land uses within the South East Business Park.

3.1 Development Schedule

The Development Plan contemplates, by and large, the construction of a motor racetrack facility with supporting uses, hotel and offices.

A summary of the uses generally contemplated by the Development Plan is presented at Table 3.1 following. A detailed assessment of uses to be constructed will be provided in future town planning applications to follow, which may broadly reflect the schedule below.

Table 3.1: Proposed Development Plan Schedule

Use	Approx. Size / Number	Comments
Day to Day Operations		
Commercial Offices	250-1,500sqm	Dedicated parking provided for the office
Warehouse/Restaurant /Brewery	250-1,500sqm (up to 175 patrons)	Dedicated parking provided for these uses
Hotel	70-300 rooms	Dedicated parking provided for the hotel
Kart Track	100-200 patrons	
Shooting Club	40-80 patrons	~10 staff members
Driver Experience Centre	10-30 patrons	9am-5pm Mon-Sun ~3-5 staff members
Functions, Exhibitions, Programs	250-500 patrons	~25 staff members
Events		
Motorsport Facility (includes race track, pit building, private and public car storage units, ancillary offices)	up to 60,000 patrons	5-10 events per year
Shooting Club	500 patrons	1-2 events per year
Concerts	~10,000 patrons	Potentially more patrons permissible with ticketing and transport strategy
Exhibitions	up to 1,000 patrons	~25 staff members

3.2 Car Parking & Access Arrangements

General

Car parking for the day to day operations should be provided on site near to the respective facility/use, allowing them to operate in their own right.

During events, spectator parking is proposed to be provided on vacant land located within the Development Plan area, external to the main race track. It is estimated that the space available for car parking, external to the race track, has an approximate area of 46 hectares as per the diagram in Appendix B.

Based on an assumed rate of one (1) car space per 30 square metres of land, it is anticipated that this area could provide up to approximately 15,000 car spaces to accommodate overflow car parking. A plan showing where overflow parking could be accommodated at various locations surrounding the motorsport facility is attached to this report at Appendix B.

An Event Management Plan (EvMP) will be prepared by the Relevant Operator to the satisfaction of the Responsible Authority prior to an event. The EvMP should have consideration to parking management strategies and include areas that will be relied upon for overflow parking, and outline strategies to be implemented to facilitate access and traffic on the surrounding roads and intersections which could include the provision of alternative transport such as buses and park and ride facilities

EvMPs shall be tailored and implemented based on the event type and expected patronage, which will influence the event's parking demands and management of accessways and nearby intersections. This is further discussed in Section 5 below.

All events outside of day to day operations, are likely to require local traffic management to be employed, which will need to be submitted and approved by the Relevant Authority prior to the commencement of the event.

Access to Key Lane & Thompson Road

Under the interim scenario, the Development Plan proposes to upgrade Key Lane to a 7.4 metre wide sealed carriageway with 1.0 metre wide shoulders on both sides with an appropriate road drainage system. The extent of the upgrade works is proposed to be undertaken to the westernmost access point to/from the site.

The development proposes a minimum of three main access points to Key Lane, and ultimately to Thompson Road. The access points will be adequately spaced to allow for the appropriate turn lane treatments into the site.

Informal accesses to/from the unnamed access road, detailed as follows and graphically shown in Figure 3.1 and Figure 3.2. Future planning application stages will provide access design details and confirm their exact locations.

- **Key Lane/Thompson Road Eastern Access:** The eastern access may provide entry and exit for the commercial office, hotel, and driver experience centre uses.
- **Key Lane/Thompson Road Central Access:** The central access may primarily provide entry and exit for the pit building and driving facility.
- **Key Lane/Thompson Road Western Access:** The western access may provide entry and exit for spectators during event days, waste vehicles, delivery vehicles and heavy vehicles used to transport race cars. This should be the primary access point for motorsports events.

This access is not proposed to be signalised prior to the Thompsons Road upgrade. This arrange should be resolved at the time of the Thompsons Road upgrade.

- **Unnamed Road Access:** The southern access points are proposed to provide an ancillary access for the motorsports park, and is intended to be used only for emergency and maintenance purposes, until the construction of the Bypass.

The unnamed access road will continue to service the current Pakenham Auto Club and Koo Wee Rup District Motorcycle Club until the clubs are relocated to the new site on the corner of McGregor Road and Key Lane (subject to on-going discussions with Council and Clubs). The access arrangements of the new site should be determined by a traffic engineering assessment, and the design should take into consideration the access design requirements of the relevant road authority including sight distance, turning facilities and existing road and traffic conditions.

Figure 3.1 Proposed Key Lane Access Locations (indicative)

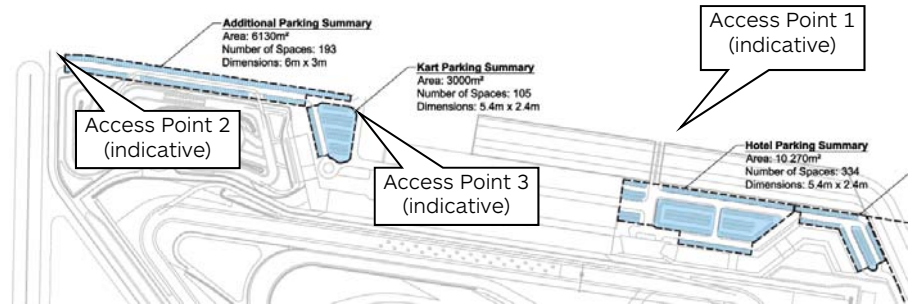
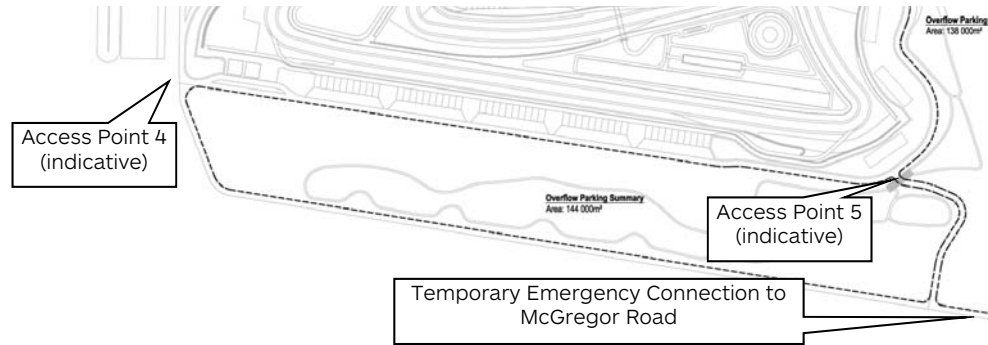


Figure 3.2 Proposed Unnamed Road Access Location (indicative)

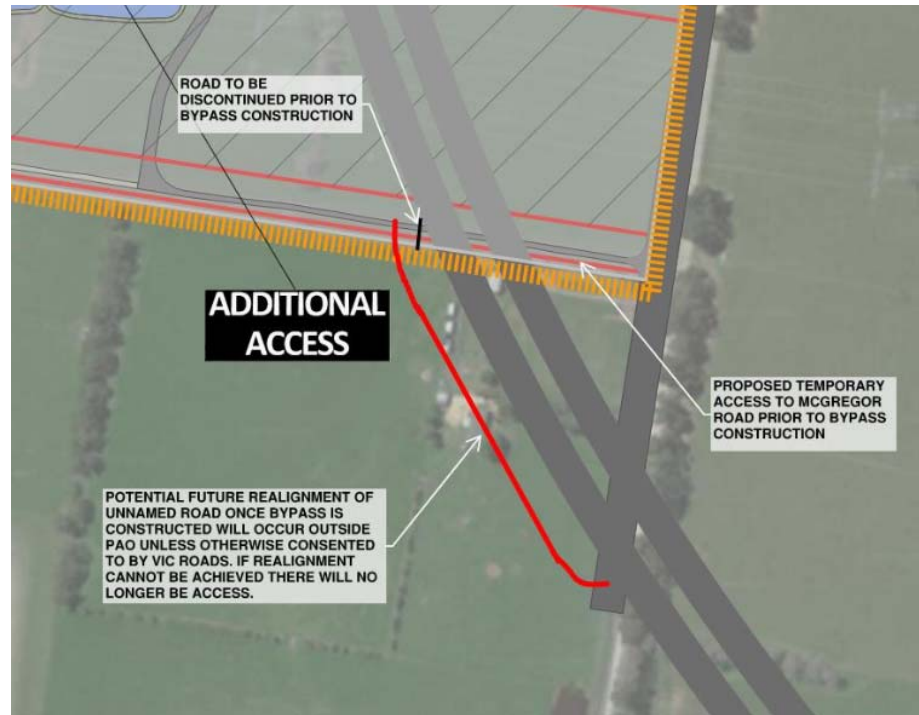


During planning stages of the Bypass through this corridor (or earlier), planning for an alternate alignment of the unnamed road should also occur. Once construction of the Bypass commences, the unnamed road shall be terminated on the west side of the bypass and be realigned. We understand at this stage that there is a proposal to connect into McGregor Road further to the south.

DoT (roads) Note: Realignment will occur outside the PAO once the Bypass is constructed unless otherwise consented to by DoT (roads). If realignment cannot be achieved, there will no longer be access to McGregor Road.

Figure 3.3 illustratively shows the proposed realignment of the unnamed road.

Figure 3.3 Proposed Unnamed Road Deviation (indicative and subject to future planning)



4.1 Clause 52.06 Statutory Car Parking Requirements

Parking requirements for a range of uses are set out under Clause 52.06 of the Cardinia Planning Scheme. The purpose of the Clause, among other things, is:

- *To ensure that car parking is provided in accordance with the Municipal Planning Strategy and the Planning Policy Framework.*
- *To ensure the provision of an appropriate number of car parking spaces having regard to the demand likely to be generated, the activities on the land and the nature of the locality.*
- *To support sustainable transport alternatives to the motor car.*
- *To promote the efficient use of car parking spaces through the consolidation of car parking facilities.*
- *To ensure that car parking does not affect the amenity of the locality.*
- *To ensure that the design and location of car parking is of a high standard, creates a safe environment for users and enables easy and efficient use.*

Of relevance, a motor racing track (and ancillary uses), the driver experience centre and shooting range are considered to be broadly nested under the land use term of 'leisure and recreation/minor sports and recreation facility'.

This land use term is not specified by Table 1 to Clause 52.06-5. In this regard, the car parking provision for these uses must be provided to the satisfaction of the Responsible Authority Clause 52.06-6 of the Cardinia Planning Scheme.

The number of car parking spaces required for the specified uses is listed under Clause 52.06-5.

The development for day to day operations is anticipated to meet its car parking requirements within the proposed race track site, and where the statutory car parking requirement is not met, a car parking demand assessment shall be provided via a planning permit application.

For events requiring informal car parking external to the race track site, a CPEvMP shall be prepared to identify car parking areas and access management strategies. The area/s identified for overflow car parking should be adequate to meet the projected car parking demands of the event.

The development plan intends to provide car parking to meet the statutory car parking requirements for the day to day uses unless otherwise stated in this development plan.

The following provides some guidance on potential parking demands expected to be generated by the motor race track for events, and recommendations to car parking provisions for the day to day uses. These rates should be confirmed by detailed traffic engineering assessments undertaken for future planning applications.

Under the provisions of Clause 52.06, the responsible authority should assess whether the provision of car parking is appropriate on the basis of:

- *The car parking demand likely to be generated by the use;*
- *Whether it is appropriate to allow fewer spaces to be provided than the number likely to be generated by the use.*

An assessment of the expected parking demand and the appropriateness of the proposed parking provisions for the proposed development should have consideration to the following key criteria.

4.2 Car Parking Demand Assessment

In accordance with Clause 52.06-6, an assessment of car parking demand likely to be generated by the use must have regard to the following factors, considered relevant to the proposal.

- *The likelihood of multi-purpose trips within the locality which are likely to be combines with a trip to the land in connection with the proposed use.*
- *The variation of car parking demand likely to be generated by the proposed use over time.*
- *The short-stay and long-stay car parking demand likely to be generated by the proposed use.*
- *The availability of public transport in the locality of the land.*
- *The convenience of pedestrian and cyclist access to the land.*
- *The provision of bicycle parking and end of trip facilities for cyclists in the locality of the land.*
- *The anticipated car ownership rates of likely or proposed visitors to or occupants (residents or employees) of the land.*
- *Any empirical assessment or case study.*

Future planning applications should have regard to the factors listed above and any other relevant factor that is likely to influence the car parking demand generated by the proposal.

Likelihood of Multi-Purpose Trips

The hotel is likely to attract guests that may also be spectators to the motor racing track activities and visitors to the driver experience centre. On some occasions, the office may attract interstate and international employees that may also require short-term accommodation.

Variation of Car Parking Demand Over Time

The demand for car parking will vary considerably on a day to day basis versus event days.

On a day to day basis, employees and visitors to the office would generate car parking demands during business hours, whilst visitors to the leisure and recreation facilities are expected to generate greater parking demands typically outside of these hours.

Short Stay / Long Stay Car Parking Demand

On a day to day basis, the leisure and recreation uses are likely to generate duration of stays by visitors, typically in the order of 2-3 hours, and be relatively short-term in nature.

The hotel is likely to generate car parking demands that are long-term in nature, consistent with the length of stay of guests and staff shift times.

The same demand would typically occur for the commercial offices, with the majority of parking demand being staff who require long-term parking and a small supply of parking for visitors.

The Availability of Alternate Modes of Transport, Cycling and Walking Facilities

As discussed in Section 2.4, the site currently has limited access to alternate modes of transportation and is not yet serviced by walking or cycling infrastructure.

For events, the relevant operator of the event should seek to employ an active Car Parking and Traffic Management Plan as part of the Event Management Plan. This should include consideration to, and promotion of various forms of transportation linking the site to major transport hubs, including rail and bus, and provide the opportunity for walking and cycling trips, particularly to and from proposed parking areas.

Further information regarding the management of transport flow is outlined in Section 5.4 of this report.

Provision of Bicycle Parking & End of Trip Facilities

The development could generate some demand for bicycle parking spaces particularly in the future once development of land surrounding the subject site is fully developed. Future planning applications should consider bicycle parking and end of trip facilities to cater for staff and patrons that may ride to the site.

Whilst high levels of cycling trips to the site under current bicycle network conditions are unlikely, future proofing possible cycling trips is recommended. In this regard, the proposed development should consider provision of bicycle parking rails and end of trip facilities to satisfy the requirements of the Cardinia Planning Scheme.

Empirical Assessment

OFFICE / HOTEL / WAREHOUSE / BREWERY / RESTAURANT

The parking provisions for these uses should meet the statutory car parking rates outlined by the Planning Scheme.

LEISURE & RECREATION USES

Motor Racing Track / Function Centre / Exhibitions

Under normal operating conditions, the motor race track facilities may potentially be used for education programmes, functions, minor exhibition events and/or private hire.

The above uses are generally considered as 'place of assembly' type uses. Future planning applications should consider whether this rate is specifically appropriate for the intended operation and nature of the use, and if providing additional parking for staff is required. This should include consideration to car parking requirements for activities such as set up days.

The motor racing track is proposed to hold approximately 5-10 event days throughout the year. During these events, the site could potentially generate in the order of 60,000 patrons for an event.

In the context of event days, car parking rates will be largely dependent on the attractiveness of getting to and from the site via alternate modes of transport, and the effectiveness of the Car Parking Event Management Plan. It is recommended that significant campaigning is invested into alternate transport arrangements (chartered and tour buses, event concessions on public transport, event management etc.), other modes with multi-occupancy vehicle trips, rideshare, drop-off and pick-up transportation (taxis) etc.

By way of parking provision, a land area of 46 hectares could potentially provide for up to approximately 15,000 car spaces. If no other land is available, a car parking event management plan should aim to accommodate approximately 17% of trips undertaken by non-private vehicle modes. This is equivalent to circa 10,000 patrons arriving to the site via alternate transport modes.

Imposing restrictions to car parking, by ticketing parking spaces, should be considered to appropriately manage car parking demands for event days, depending on the land that is available of overflow car parking. This is further detailed in Section 5 below. A Car Parking Management Plan should take into consideration the land that is available for parking, and advise on the number of parking passes that are available for sale.

Kart Track

The Kart Track will operate as a public kart racing facility but will also be available for club use on occasion. Car parking demands for this type of use will typically be in line with the 'place of assembly' rate of 0.3 spaces per patron.

Shooting Club

Under standard operating conditions, we are advised that the shooting club is likely to accommodate in the order of 40-80 patrons at any one time, and approximately up to 10 staff members.

This use broadly nests under the land use term of 'minor sports and recreation facility', which is an innominate use under the Planning Scheme and therefore parking should be provided to the satisfaction of the relevant authority. Planning applications should consider typical day to day operations and the parking demand that may be generated by prospective staff and members.

We are instructed that the shooting club may hold 1-2 events throughout the year. These events would not coincide with event days for the motor racing track. It is understood the capacity of the shooting club events is in the order of 500 patrons. Any event attracting more than the day to day patron numbers however, should consider a parking and/or traffic management plan.

Driver Experience Centre

The driver experience centre will operate daily and be closed to the general public during events held by the motor racing track. The experience centre is expected to attract in the order of up to 30 patrons on-site at any one time during operating hours, and be staffed by approximately three employees.

This use broadly nests under the land use term of 'minor sports and recreation facility', which is an innominate use under the Planning Scheme and therefore parking should be provided to the satisfaction of the relevant authority. Planning applications should consider typical day to day operations and the parking demand that may be generated by prospective staff and visitors.

Car parking associated with the driver experience centre should be provided proximate to the centre and its facilities.

Car Parking Summary

Based on the above, the recommended provisional car parking rates for any future planning permit applications, and event management triggers have been summarised in Table 4.1 below.

Table 4.1: Car Parking Summary

Use	Estimated Area/No.	Recommended Car Parking Rate	Mgt. Plans?	Other Suggested Considerations
Motor Racing Track	50,000-60,000 patrons	0.3 spaces per patron	Yes	Traffic and/or Parking Management Plans in place during events as part of an Event Management Plan.
Kart Track	100-200 patrons	0.3 spaces per patron	No	
Functions, Exhibitions, Programmes	250-500 patrons	0.3 spaces per patron	Subject to patron numbers	Parking and/or Traffic Management Plan should be considered for events expected to attract more than 500 patrons (total, for uses with patron based parking rates).
Office	250-1,500sqm	3.5 spaces to each 100sq.m of net floor area	No	
Warehouse/Restaurant/Brewery	250-1,500sqm	Warehouse: 2 spaces per premises plus 1.5 spaces per 100sqm LFA Restaurant/Brewery: 0.4 spaces per patron permitted	No	
Hotel (Residential)	70-300 beds	1 to each unit, and one to each manager dwelling, plus 50% of the relevant requirement of any ancillary use*	No	Consider parking demands associated with staff.
Shooting Club	40-500 patrons	To the satisfaction of the relevant authority	Subject to patron numbers	Parking and/or Traffic Management Plan should be

				considered for events expected to attract more than 500 patrons (total, for uses with patron based parking rates).
Driver Experience Centre	10-30 patrons	To the satisfaction of the relevant authority	No	Consider parking demands associated with staff.

In essence, a parking management plan should be considered when the proposed on-site activities are likely to generate a parking demand that will exceed its formal supply, and a traffic management should be considered when an event is likely to generate traffic in excess of the volumes assessed at Section 7.2.

4.3 Allowing Fewer Spaces to be Provided

Clause 52.06-6 sets out a range of factors to be considered when determining the appropriateness of allowing fewer car parking spaces to be provided. Some of the relevant factors are:

- *The car parking demand assessment;*
- *The availability of alternative car parking in the locality of the land;*
- *Any relevant considerations.*

4.4 Adequacy of the Parking Provision

Availability of Car Parking

Car parking for the day to day operations i.e. commercial office, hotel, shooting club, driver experience centre, is envisaged to be accommodated on site and near to the respective facility/use, allowing them to operate in their own right. Plans indicatively illustrating where this parking is located are attached to Appendix B.

During events, spectator parking is proposed to be provided within areas identified and approved as part of the Event Management Plan (EvMP) approvals process.

Car parking areas, subject to relevant permissions, and parking management plans shall be prepared by the event operator to the satisfaction of Council and prior to an event.

For event days, this dynamic approach to car parking is required due to the significance of certain high profile events, the level of car parking demand and traffic that is typically generated, the different mix of vehicles and users the event attracts, and the need for a coordinated approach to facilitate safe and efficient pedestrian and traffic flow.

The coordination and management of parking for these events will need to consider a number of matters as discussed in the following section.

5.1 Event Management Plans

For motor race track events, an event planning process shall be undertaken by the Event Manager/Team. It is expected that event planning should commence **at least 6 months prior** to proposed event dates, and may include consultation with other stakeholders such as Council, VicRoads, Victorian Police and Public Transport Victoria (now Department of Transport).

The Event Management Plan (EvMP) should determine whether the car parking and traffic impacts associated with the event is likely to be contained on Council roads or if the impact is likely to extend to arterial roads or freeways which are managed by VicRoads. This will determine if whether the EvMP should be reviewed by Council and/or VicRoads for approval.

The EvMP should have due consideration to the following with respect to proposed events:

- The size of the events, and suitability of the management regime;
- Parking management, and adequacy of the area available to accommodate projected car parking demands for the event;
- Ticketing of car parking spaces in order to restrict car parking demands to the land available for overflow car parking;
- Access arrangements, definition including routes, signage and separation of access for different vehicles and users;
- Local area traffic management (LATM) and traffic management along major all routes to and from the site, and within the site, to direct traffic to direct traffic to site access points; ability to
- Local Area Traffic Management; Traffic management procedures and personnel, particularly at access points and intersections (internally and externally);
- Timing of the events and the management of impacts on the surrounding road network, particularly during peak times;
- Bus and other transportation scheduling;
- Public awareness campaign; and
- Contingency plans in case of emergencies.

Some of these considerations are further detailed below.

In order to implement speed limit reductions in accordance with VicRoads Events & Filming Processes, a traffic impact assessment, accompanied by a Risk Assessment Plan, a completed Memorandum of Authorisation (MOA) form, and Traffic Guidance Scheme, prepared in accordance with the VicRoads' *Code of Practice Worksite Safety – Traffic Management (August 2010)* is required to be submitted to VicRoads at least 3 working weeks prior to the event date.

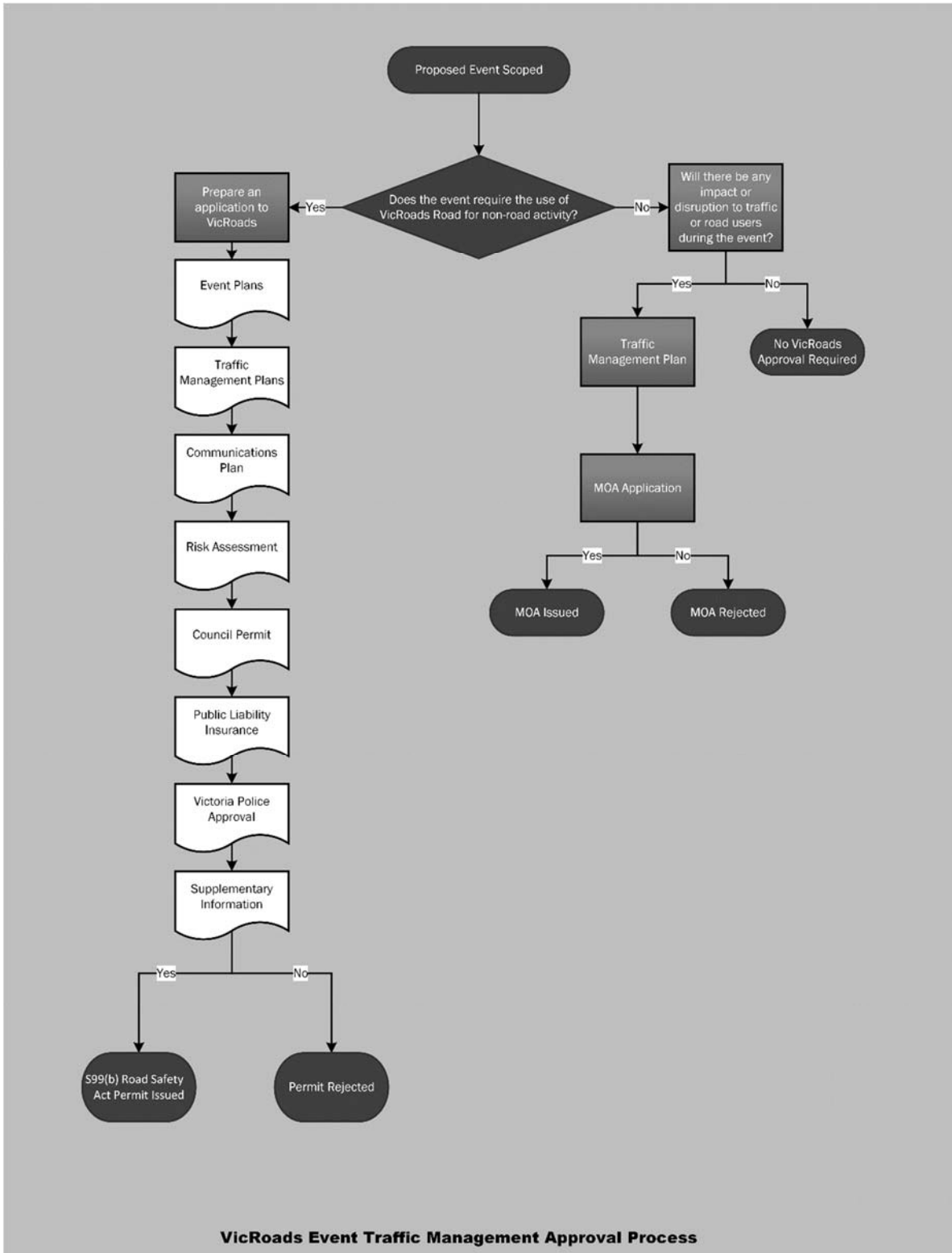
The Events and Filming Team at VicRoads have previously advised that if the same traffic management arrangement is required on a more regular / seasonal basis, VicRoads can issue yearly / seasonal MOA for implementation on an as required basis, similar to the arrangement made for the sports precinct in and around the MCG and Rod Laver Arena.

The process is generally in accordance with Figure 1 Hazard Assessment Methodology outlined in Part 2 of the VicRoads Code of Practice Worksite Safety – Traffic Management. The MOA is for the use of Major and Minor Traffic Control Devices along a VicRoads managed arterial road.

(<https://www.vicroads.vic.gov.au/traffic-and-road-use/events-and-filming-on-our-roads>)

For reference, the VicRoads event approval process is summarised and outlined in Figure 5.1. This process may be subject to change from time to time as VicRoads updates / evolves its processes.

Figure 5.1: VicRoads Event Traffic Management Approval Process



5.2 Roles and Responsibilities

Site Contact – Pakenham Motorsports Representative

Typical events will be managed by a designated Event Co-ordinator / Team.

Traffic Controllers and Marshalls

Event specific traffic management plans should be prepared by a suitably qualified, VicRoads pre-qualified, Traffic Management Contractors and Traffic Controllers to ensure the display of traffic management signage meets AS1742.3-2009 Traffic control for works on roads, and VicRoads Code of Practice Worksite Safety – Traffic Management (August 2010).

Parking marshals should also be utilised during an event to assist with the management of drop-off and pick-up areas and provide direction to on and off site parking facilities.

5.3 Parking Management

Public / Council Owned Car Parks & Land Owned by Others

Land will be secured for overflow parking as identified by an approved EvMP specifically tailored to an event, as appropriate.

The amount of land that is to be made available for car parking during events, should take into consideration the event type, patronage and initiatives that would be employed to transport spectators to and from the site.

Not excluding other parking areas, a total of approximately 7,200+ overflow parking spaces could be accommodated within the land surrounding the main race track area within the Development Plan area.

Areas used for overflow parking should ideally be located conveniently near to spectator seating and entrance gates and where required, provided with transportation between parking areas and pedestrian entrances.

Parking Restrictions

Parking restrictions should be considered in areas that need to be protected from event parking, or in areas restricted to event personnel. It is noted that any restrictions proposed should consider the words 'authorised vehicles excepted' to allow parking by vehicles required to manage an event.

These restrictions will ensure that the parking spaces/areas are not used by spectators and the general public, and to ensure efficient and convenient circulation and access is provided on event day.

Signage

Appropriate event signage and way-signage should be provided at all major internal and external intersections. Signs should be used to inform and direct motorists to site access points, and car parking areas. Permanent way-signage should be implemented for day to day functions, regular events, and on-site services like waste collection and hotel drop-offs and pick-ups.

Marshals should be considered to facilitate traffic flow, provide clear direction for different patron types and mitigate delays to multi-patron transport modes.

Directional signage and/or marshals should also be posted at access gates to direct patrons seeking car parking to appropriate entrances for car parking. The preceding will assist with reducing double-backing and vehicle turnaround during event mode.

It is the Event Manager/Team and the appointed Traffic Management Contractors' responsibility to install, maintain, adjust and install additional signage where required, and remove the signage proposed on the day of (or soon after the end of) the event.

5.4 Traffic Flow & Management

Vehicles

Vehicle and pedestrian routes and paths will need to be demarcated as much as practical during event mode to avoid conflicts. Consideration should be given to prioritising and restricting motorists to the site based on trip type and purpose, drop-off and pick-up trips, persons with special access needs, event buses, emergency and other authorised vehicles

Chartered Buses

Buses should be provided with a designated drop-off and pick-up zone (north of the site) and parking. Where possible, site access for buses should be separated from general public access.

Source: Phillip Island MotoGP Brochure



ISLAND SHUTTLE BUS
A shuttle bus service will operate to and from the circuit and around Phillip Island & San Remo. Up until 7:00pm the circuit shuttle stop will be located at Gate 1. From 7:00pm the shuttle service from the circuit will pick-up/drop-off from the Visitors Centre Car Park to cater for campground patrons.

The Island Shuttle service will operate from approximately 7:30am to 2:00am on Friday, Saturday and Sunday at approximately 15 minute intervals. Patrons can either purchase a day ticket which provides unlimited travel between 7:30am and 2:00am or a one-way ticket which allows travel between 4:00pm and 2:00am. Tickets can be purchased from ticket sellers at selected bus stops or from the bus driver on the day.

COST: Island Shuttle Service..... \$15.00 (Unlimited day ticket)
One-way Ticket..... \$10:00 (per trip)

Telephone South Coast Bus Lines on (03) 5952 2500 for your nearest pick-up point.



CLEELAND BUS LINES
Cleeland Bus Lines operate a shuttle bus service from your accommodation (house, motel or caravan park) in Cowes and also from the corner of the Esplanade and Bass Avenue EXPRESS to the circuit at Gate 3. Phone bookings are essential on (03) 5952 1042 or 0417 360 370.



CATCH-A-COACH
Forget petrol prices, parking costs and designated drivers. Just sit back, relax in 5-star coach comfort and be driven straight to the track and back again. Return services depart from Melbourne each day of the event and from outer Melbourne/regional centres on Sunday only. For more information or to book your seat visit motogp.com.au or call Ticketmaster on 1800 100 030.

Drop-off and pick-up zones should be managed to accommodate mass transiting of patrons generated between the city and other major transport nodes.

It is envisaged that chartered buses will be provided with priority access or access via an alternate entrance to reduce delays associated with arrival and departure queues.

Incentives should be considered to encourage patrons to travel to and from the site via buses and alternate modes of transport. Where all car parking spaces have been sold, this should be made known to the general public, and alternative transport options should be presented to patrons for consideration.

Source: Phillip Island MotoGP Brochure

5.5 Pedestrian and Cycle Considerations

Pedestrians

Pedestrian activity will mostly be concentrated at entrance gates, bus drop-off and pick-up zones and major car parking areas. Pedestrian movements on event days should be separated from vehicle movements as much as possible, and appropriately managed at crossings with major vehicle routes to avoid disruption to vehicle movements and resultant queuing onto the adjacent road network.

In cases where pedestrian movements are expected to be significant across major access roads, consideration should be given to pedestrian underpasses and/or overpasses.

Pedestrian routes should be signed and managed in a way to ensure delays to both foot and road traffic is mitigated.

Bicycles & Motorcycle

There is an expectation that some patrons may travel to and from the site on bicycles and motorcycles on event days.

It is recommended that the event management plan discusses parking arrangements for bicycles and motorcycles to avoid bicycles / motorcycles being parked in areas designated for car parking, and to provide end of trip facilities / changerooms / storage for personal items.

Information regarding parking areas for bicycles and motorcycles should be provided on an information pack or transport guide.



IMPORTANT INFORMATION
RETURN DESTINATION PARKING

TYPE	BIKE	SECURE BIKE	CAR
Friday	\$5	\$10	\$10
Saturday	\$5	\$15	\$15
Sunday	\$5	\$15	\$15
Sat & Sun	\$10	\$30	\$30
All 3 Days	\$15	\$40	\$40

Cash purchases only. No other form of payment will be accepted. Secure bike parking includes storage of one helmet. \$3.50 per extra item stored.

Source: Phillip Island MotoGP Brochure

6.1 Loading & Waste Collection Arrangements

Clause 65.01 'Decision Guidelines' of the Cardinia Planning Scheme outlines the provision of loading requirements, and states the following:

"Before deciding on an application or approval of a plan, the responsible authority must consider, as appropriate:

- *The adequacy of loading and unloading facilities and any associated amenity, traffic flow and road safety impacts."*

All waste collection is proposed to be collected on-site by private waste collection. A waste management plan (WMP) should be prepared as part of future planning applications to determine frequency of collections, and vehicle required to undertake collections.

A WMP should be prepared within or in conjunction with an EvMP to detail the waste collection strategy and arrangements for all events.

Service vehicles can utilise car parks on non-event days and during off peak times or designated loading areas provided adjacent to each facility. Areas specifically designated for loading will be controlled by signage and/or demarcation.

Loading and unloading activities associated with the motor race track, is likely to generate B-double movements to and from the site.

A B-double (or heavy vehicle) access strategy plan will be prepared to inform the site manager and drivers on preferred/mandatory access, circulation and routes for heavy / B-double vehicles.

Designated heavy vehicle / B-double routes shall be designed to appropriately accommodate satisfactory access and turning space for these vehicles. Consideration should be given to scheduling heavy vehicle / B-double arrivals and departures on non-event days and outside of peak commuter hours.

7.1 Road Network Access

The following outlines concepts prepared for intersection and road upgrades in the vicinity of the site as part of the following works:

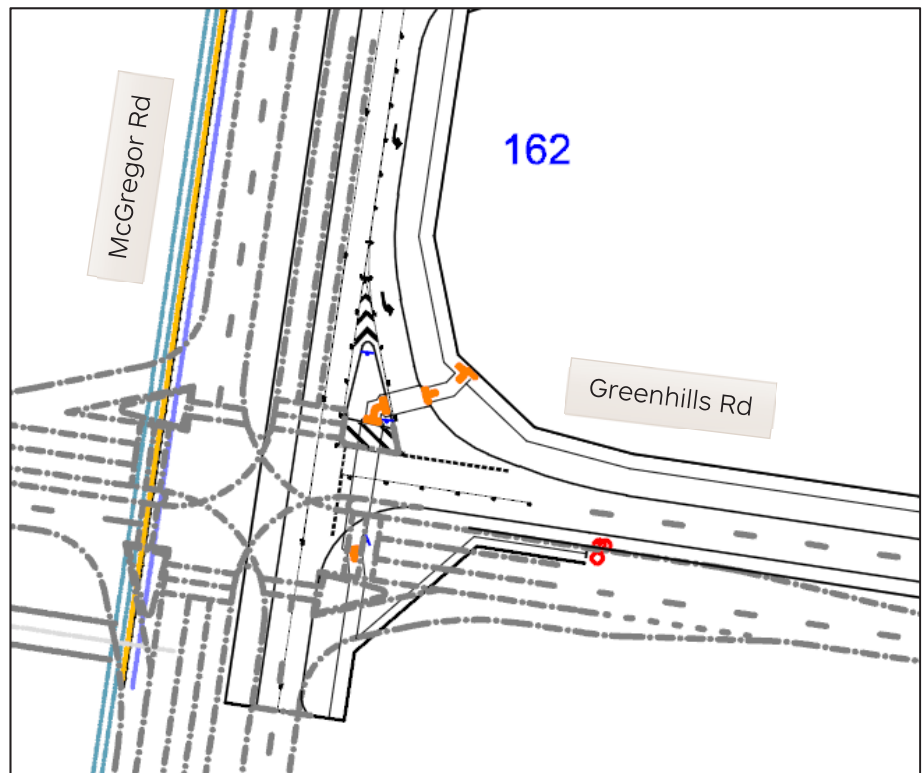
- South East Business Park (SEBP)
- Pakenham South Employment Precinct (PSEP)
- Pakenham Bypass
- Pakenham West Employment Precinct

South East Business Park (SEBP) (Plans Prepared by TTM Consulting) – Interim Access Stage A

We understand that the west end of the South East Business Park (SEBP) will be completed mid to late 2020. As part of the development of this precinct, McGregor Road is expected to be upgraded between the Princes Freeway interchange to Greenhills Road, which proposes to formalise the intersection to a standard T-intersection, with priority afforded to McGregor Road.

The intersection will formally provide for a single stand up lane on each leg, and a left turn slip lane on the northern approach to the intersection.

Figure 7.1 TTM SEBP Concept Plan – McGregor Road / Greenhills Road Intersection



Pakenham South Employment Precinct (PSEP) (Plans Prepared by Traffic Works) – Interim Access Stage B

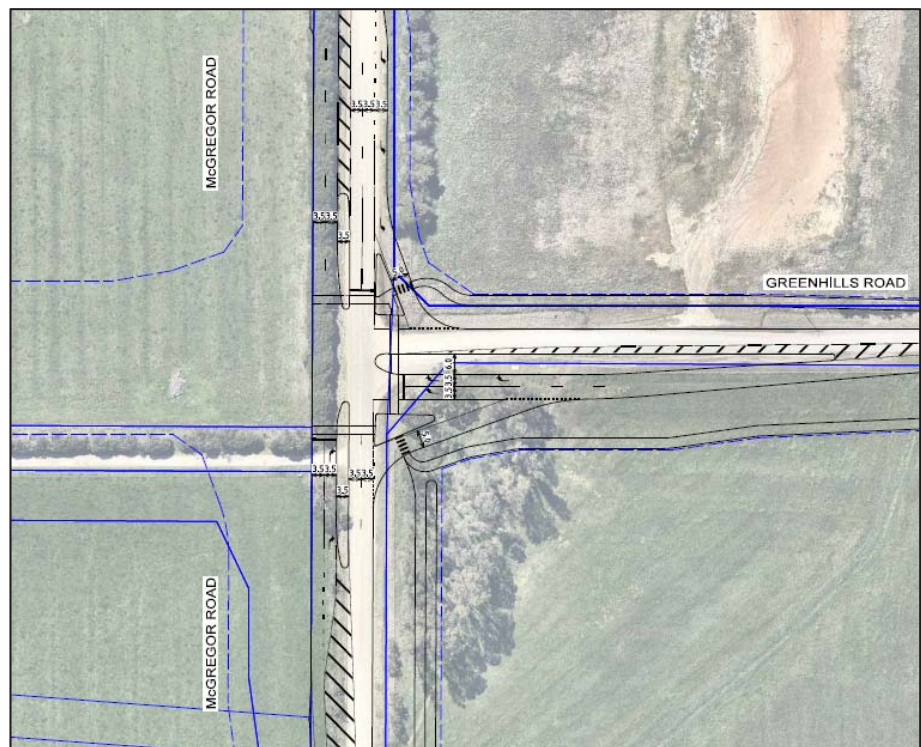
The intersection of McGregor Road and Greenhills Road will be signalised, upgraded and configured with two (2) stand up lanes on the south approach and three (3) stand up lanes on the north and east approaches.

Left turns are facilitated by slip lanes on the north and east approaches.

Currently, plans do not show access to Key Lane from the north, with the McGregor Road carriageway separated by a central median at its intersection with Key Lane.

The intersection has been designed to accommodate B-double vehicles generated by the broader Pakenham Business and Employment Precincts, particularly along the section of McGregor Road between the Pakenham Bypass and to the southern boundary of the subject site.

Figure 7.2 Traffic Works Interim Concept Plan – McGregor Road / Greenhills Road Intersection



Ultimate Intersection Arrangement - Thompsons Road / McGregor Road

We are advised that the proposed construction of Thompsons Road identified by the southeast growth corridor plan (Growth Areas Authority, 09 August 2012), is not likely to occur for at least another 8-10+ years.

The upgrade of Thompsons Road proposes to realign Key Lane to the north (effectively to be in line with Greenhills Road), and duplication of the carriageway to three (3) through lanes in each direction separated by a central median.

A plan, provided at Figure 7.3 and Figure 7.4, conceptually shows the proposed alignment and configuration of Thompsons Road adjacent to the subject land and the ultimate configuration of the Thompsons Road and McGregor Road intersection, respectively.

Figure 7.3 Beveridge Williams Ultimate Thompsons Road Alignment Concept Plans and interchange with Pakenham Bypass

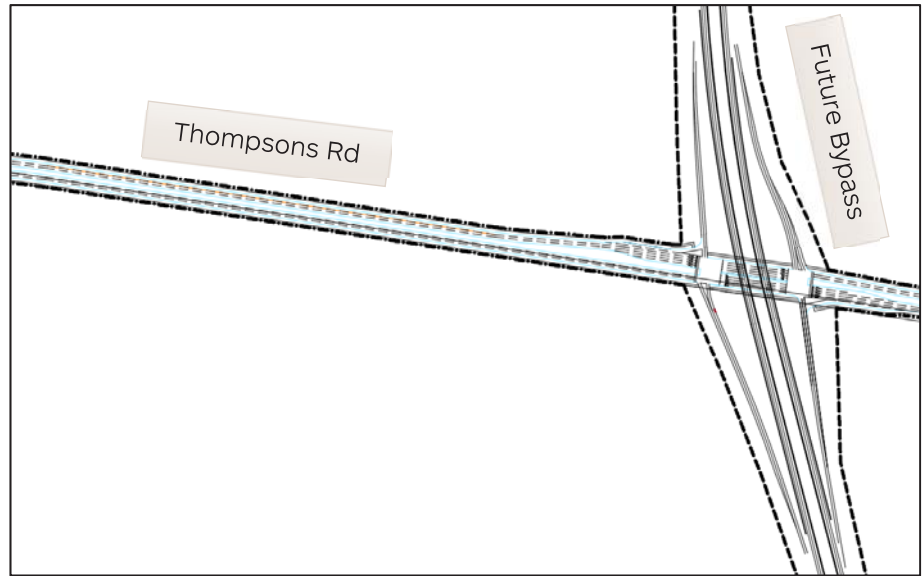
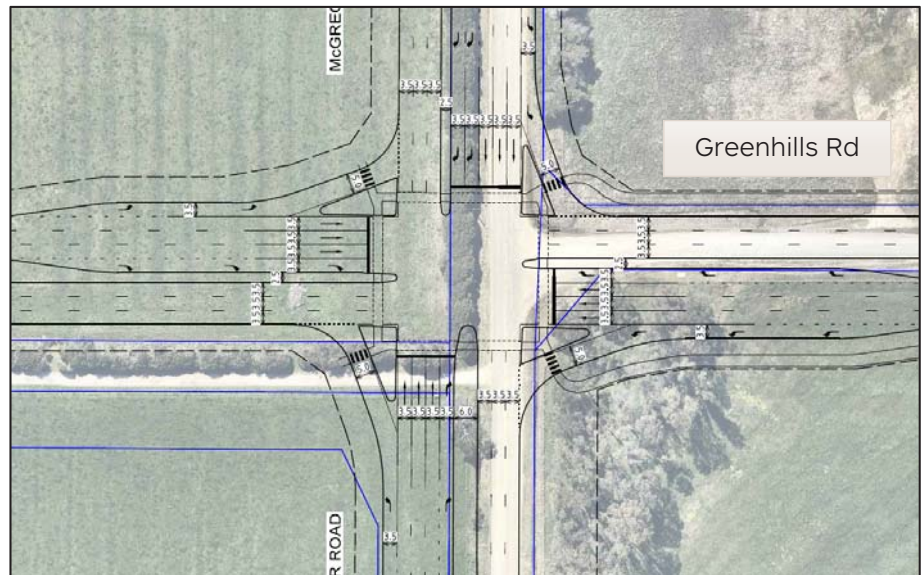


Figure 7.4 Traffic Works Ultimate Intersection Concept Plans- Thompsons Road / McGregor Road Intersection



7.2 Traffic Generation

7.2.1 Event Days

To manage traffic generated by the motor race track on event days, event traffic management to the satisfaction of relevant authority/ies shall be prepared generally in accordance with Section 5 of this report.

7.2.2 Non-Event Days

Indicative staffing and patron data for day to day operations has been provided for the proposed uses. This information has been summarised at Table 7.1 following.

Table 7.1: Estimated Staff and Patron Numbers for Non-Event Day Operations

Use	Estimated Area/No.	Recommended Car Parking Rate	Estimated Parking Provision	Comments
Functions, Exhibitions, Programmes	250-500 patrons	0.3 spaces per patron	100-175 spaces	Any event beyond the upper limit of patrons will require/should consider an EvMP and/or overflow parking. Parking numbers are inclusive of staff parking.
Kart Track	100-200 patrons	0.3 spaces per patron	30-60 spaces	
Office	250-1,500sqm	3.5 spaces to each 100sq.m of net floor area	50 spaces	
Warehouse/R restaurant/Brewery	250,1,500sqm	Warehouse: 2 spaces per premises plus 1.5 spaces per 100sqm LFA Restaurant/Brewery: 0.4 spaces per patron permitted	70 Spaces for 175 patrons (assuming worst case of all 1,500sqm going to brewery/restaurant)	
Hotel (Residential)	70-300 beds	1 to each unit, and one to each manager dwelling, plus 50% of the relevant requirement of any ancillary use*	70-300 spaces	
Shooting Club	40-80 patrons	To the satisfaction of the relevant authority	approximately 50-90 spaces	Any event beyond the upper limit of patrons will require/should consider an EvMP and/or overflow parking
Driver Experience Centre	10-30 patrons	To the satisfaction of the relevant authority	approximately 35 spaces	Parking numbers are inclusive of staff parking.

Motor Race Track, Shooting Club, Driver Experience Centre, Function/Exhibition Centre - Staff

For the purposes of the assessment, we have assumed that 80% of staff associated with the motor race track, function/exhibition centres and shooting club are likely to arrive and depart during the morning and afternoon peak periods, respectively.

Based on the above, the motor race track and all other race track uses are projected to generate a total of in the order of 30 staff arrivals and departures in the morning and afternoon peak periods, respectively.

With regards to the driver experience centre, all staff are expected to arrive and depart the site during respective peak periods.

Motor Racetrack - Patrons

With regard to the motor race track and supporting facilities (education programmes, exhibition events, and/or private hire), it is anticipated that these uses would operate between the hours of 6.00am and 10.00pm across the week. Patronage is likely to be, for the majority of days, on the lower end of the anticipated ranges for day to day operations. On occasions where patron numbers are expected to be at the higher end of the range, an EvMP will be employed for patron numbers that are expected to reach the limits described at Table 4.1.

Kart Track

During the morning peak period, traffic activity associated with the kart track will be low, with traffic movements likely to be limited to staff only.

The evening commuter peak period will likely coincide with the peak time for the kart track. Kart sessions typically take one hour, with a half hour break in between. It is assumed that 50% of patrons will generate trips during the afternoon peak hour.

Function/Exhibition Centre/Shooting Club - Patrons

Traffic associated with these components of the development will vary and be largely spread throughout the day and peak generally outside of typical commuter peak hours.

Peak patronage times for the shooting club are not expected to occur until around 11.00am when the club is hired for private use, and 3.00pm when training and practise typically commences. During peak periods, a portion of trips may be generated by members who casually attend after work.

Conservatively assuming that the majority of patrons will arrive during the peak hour periods, a traffic generation rate of 0.6 trips per patron should be adopted for the purposes of the assessment. It is noted that this rate is exclusive of staff trips.

We have nominally applied this rate to 500 patrons that could be expected across the proposed function, exhibitions, programmes and shooting club activities. This results in a projected traffic generation of 300 trips during each peak hour, which has been assumed to be split 70/30 between arrivals and departures.

Driver Experience Centre - Patrons

We are advised that the driver experience centre could have corporate hire and events held between 9.00am and 5.00pm. For the purposes of a conservative assessment, we have assumed that 30 arrival trips will be generated during the morning peak period and 30 departure trips will be generated in the afternoon peak period.

Office

The development plan could provide up to 50 car spaces for staff of the office within the development site. It is typically assumed that 50% of spaces will fill in the morning peak hour and 50% of car spaces will vacate in the afternoon peak hour.

Application of this rate to the office component results in a projected traffic generation of 25 arrivals, and 25 departures in the morning and afternoon peak periods, respectively.

Brewery / Restaurant / Warehouse

The worst case traffic generation scenario for this component would be if all 1,500sqm were to be established as a brewery or restaurant use. This scenario corresponds to up to 175 patrons across this level of floor area, with 70 spaces provided for this level of patronage. A trip generation rate of 0.6 trips per patron is a reasonable estimate for the level of traffic generated by these uses, which equates to 104 vehicle trips two-way. These trips would be distributed 50% inbound / 50% outbound.

Residential Hotel

Traffic generated by residential hotels generally occurs outside of typical commuter peak times, with check-ins typically available from the early afternoon and check-outs are typically required in the late morning.

The RTA Guide to Traffic Generating Development (RTA Guide) specifies an evening peak period traffic generation rate of 0.4 vehicle trips per room for a motel, which is considered appropriate in this particular circumstance.

For the purposes of this assessment, this rate has been applied to the proposed 300 room hotel with an assumed occupancy rate of 85% (255 rooms), which is considered appropriate in this circumstance and generally accepted by the RTA Guide. In this regard, the assessment assumes up to 40 percent of rooms will turn over in the weekday PM peak period.

During the weekday AM peak period, it will be assumed that 20 percent (half of the peak PM rate) of car parking spaces will turnover.

Based on the preceding, the hotel is estimated to generate up to 51 vehicle movements during the weekday AM peak period and up to 102 vehicle movements during the weekday PM peak period.

It is expected the vehicle trips will be biased 60/40 to favour departures in the morning peak period, and arrivals in the afternoon peak period.

Total

A summary of the traffic generation and peak hour distributions is provided in Section 7.2.

It is noted that patron numbers for each of the respective patron based uses (function/exhibition/shooting club/driver experience centre) will fluctuate day to day, and the uses may operate at different times, or may not even operate at the same time.

In this regard, this nominal patron number should be viewed as a combined total for all patron based uses for traffic purposes.

It is anticipated that all traffic will generally be distributed to and from the north via McGregor Road at the Key Lane intersection. We are advised that the timing of the full diamond interchange of the McGregor Road / Pakenham Bypass is uncertain, however Federal Government funding has been committed.

In this regard, we have assumed that the majority of traffic arriving and departing to/from the site via McGregor Road, with a small percentage of traffic arriving and departing to/from Greenhills Road for the purposes of the assessment.

Table 7.2: Estimated Traffic Generation for Daily Track Operations Summary

Use	AM PEAK		PM PEAK	
	Arrivals	Departures	Arrivals	Departures
Function/Exhibition Centre	182vph	78vph	78vph	182vph
Office	25vph	-	-	25vph
Brewery/Restaurant/Warehouse	52vph	52vph	52vph	52vph
Kart Track	80vph	20vph	20vph	80vph
Shooting Club	20vph	20vph	20vph	20vph
Driver Experience Centre	30vph	-	-	30vph
Hotel (Residential)	20vph	31vph	61vph	41vph
TOTAL	409vph	201vph	231vph	430vph

7.3 Traffic Impact

In understanding the potential implications of the above traffic to access and the adjacent road network, an analysis of the McGregor Road/Greenhills Road/Key Lane intersection has been undertaken.

To date, concept plans prepared for the future upgrade of the intersection in response to traffic impacts of other development proposals in the surrounding area, have not duly considered access into and out of Key Lane for the scale and nature of the proposed under the development plan.

In this regard, a series of strategies have been tested to understand the:

- Impacts of the proposed development from day to day operations;
- Adequacy of the intersection under unsignalised conditions;
- Time at which the intersection is required to be signalised, taking into consideration development in the surrounding area; and
- Roadworks required to accommodate the projected traffic volumes.

The requirement for a staged approach is also necessitated due to constraints presented by existing road reservations and requirement for land acquisition, timing of development in the surrounding area, and anticipated construction timeframes for the various stages of development facilitated by this development plan.

The following sections of the report, or words to that effect, provides consideration of the various access scenarios that could be utilised to facilitate access to the land within the Development Plan area.

7.4 Access Scenario 1

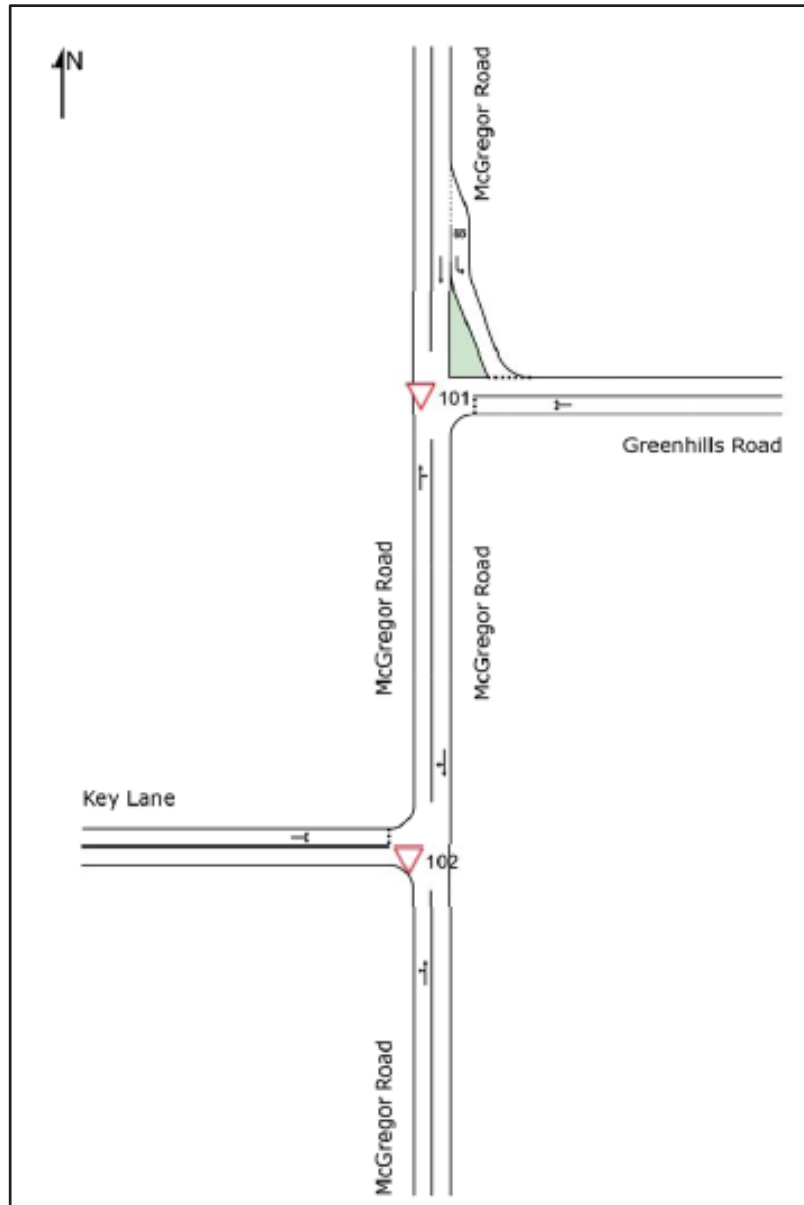
Unsignalised Staggered X-Intersection with Full Build Out of The South East Business Park

This option seeks to provide access to the site via Key Lane. Roadworks will include the widening and sealing of Key Lane and formalisation of the McGregor Road / Key Lane intersection. The proposed roadworks will

have due consideration to the proposed works associated with, and traffic generated by the South East Business Park (SEBP). A concept layout of the intersection is provided at Figure 7.5 below.

The proposed roadworks and intersection treatments shall cater for the traffic volumes generated by the subject site when operating under typical conditions. During event days, the precinct will be subject to an Event Management Plan, as detailed in Section 5 of the report.

Figure 7.5: Scenario 1 Proposed Intersection Layout



McGregor Road / Key Lane / Greenhills Road

To understand the potential impact of the development generated traffic to the intersection layout under Scenario 1 conditions, the traffic estimations undertaken by TTM Consulting for the SEBP, have been adopted.

The traffic estimations for this scenario considers the full build out of the SEBP, and traffic volumes generated by the subject site on a typical day.

The following assumptions have been made in the assessment:

- The traffic data collected by the pneumatic tube counts were north of the McGregor Road / Greenhills Road intersection, which would have included traffic volumes turning into and out of Greenhills Road. The majority of traffic is likely to have travelled to and from Greenhills Road and therefore 80% of the recorded southbound traffic has been presumed to turn left into Greenhills Road and 80% of the recorded northbound traffic has been presumed to have turned right out from Greenhills Road;
- The percentage of turning movements assigned for the McGregor Road / Greenhills Road intersection by the TTM traffic report prepared in February 2018 has been adopted;
- With consideration to Council's RFI (for application T170658, detailed within the TTM Traffic Impact Assessment reference: 9703R7725) regarding the traffic sensitivity analysis, the traffic generation rates have been increased by 100% for the purposes of a conservative assessment. In this regard, the AM peak traffic rate of 20vph and PM peak traffic rate of 12.4vph per 100sqm of developable land has been adopted in the following assessment;
- With consideration to the funding announcement of the Pakenham Bypass / McGregor Road freeway ramps, the majority of development traffic has been assessed as being attracted to and from the north on McGregor Road, via Key Lane; and
- 10% of development generated traffic movements will turn right onto Greenhills Road when departing the site under Scenario 1.

Based on the preceding assumptions, the predicted post-development traffic volumes for the intersection of McGregor Road, Greenhills Road and Key Lane are shown at Figure 7.6.

To understand the potential future operation and performance of the unsignalised staggered intersection, the estimated peak hour traffic volumes detailed in Figure 7.6, have been input to SIDRA and analysed.

The results of the SIDRA analysis are summarised in Table 7.3 and

Approach	Movement	Projected AM Peak			Projected PM Peak		
		D.O.S.	95%ile Queue (m)	Avg Delay (s)	D.O.S.	95%ile Queue (m)	Avg Delay (s)
South: McGregor Road	Through	0.131	0.7	0.3	0.283	1.5	0.2
	Right	0.131	0.7	4.8	0.283	1.5	4.0
East: Greenhills Road	Left	0.076	0.8	7.3	0.271	3.2	6.9
	Right	0.076	0.8	9.7	0.271	3.2	12.0
North: McGregor Road	Left	0.030	0.4	5.8	0.044	0.6	5.9
	Through	0.225	0.0	0.0	0.132	0.0	0.0

Table 7.4. The results reveal that the projected day to day traffic generated by the subject site is expected to be satisfactorily accommodated by the proposed staggered T-intersection without the need for signalisation, operating in the 'excellent' categories during the morning and afternoon peak periods.

The results indicate that the day to day operations of the motor race track will not adversely impact the operation or performance of the intersection, and the delays and queues are not unreasonably increased when compared to the assessment undertaken by TTM Consultants for both peak periods.

Figure 7.6: Estimated Post-Development Traffic Volumes (Scenario 1)

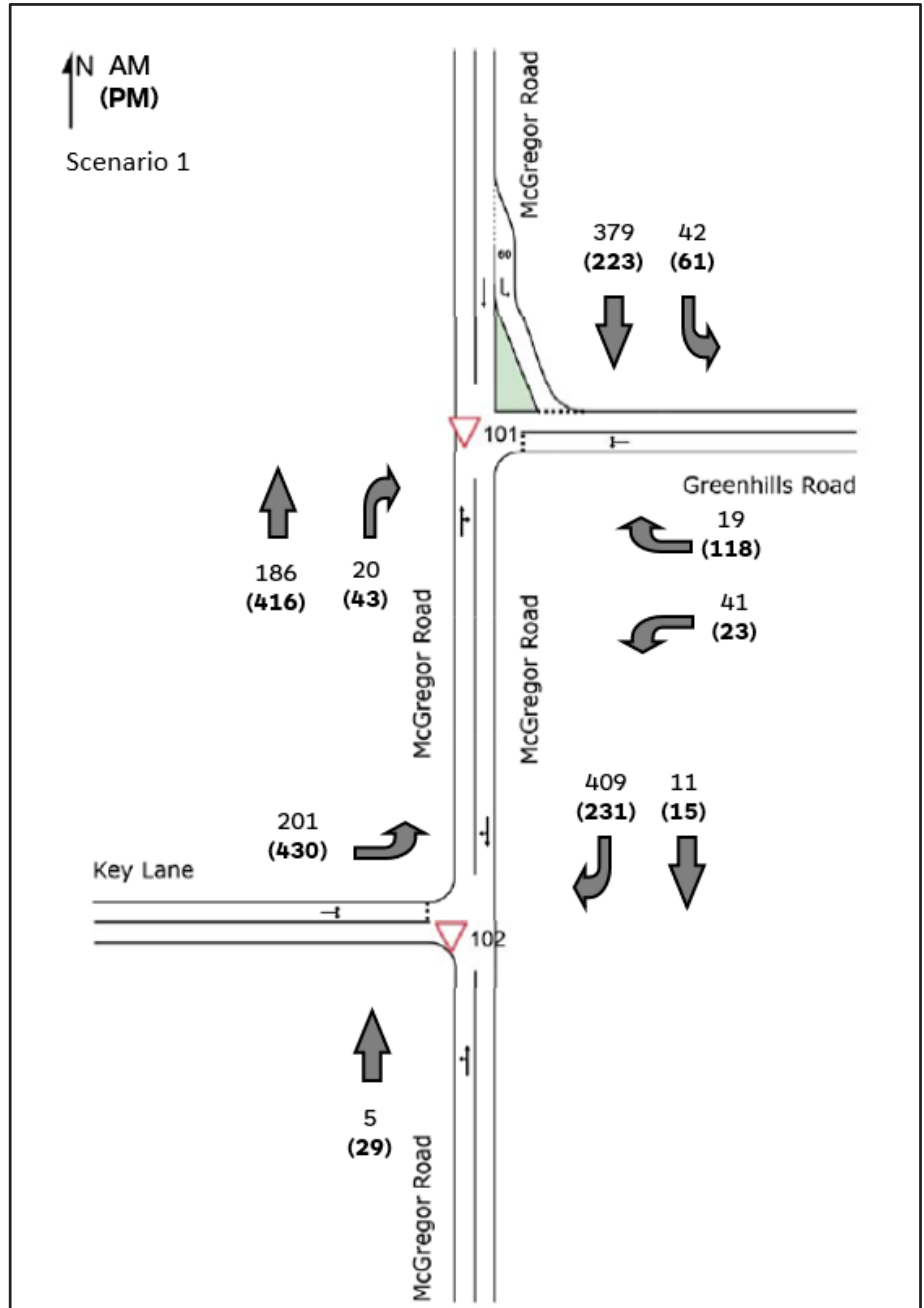


Table 7.3: SIDRA Results – McGregor Road/Greenhills Road (Int. 1) Future Conditions

Approach	Movement	Projected AM Peak			Projected PM Peak		
		D.O.S.	95%ile Queue (m)	Avg Delay (s)	D.O.S.	95%ile Queue (m)	Avg Delay (s)
South: McGregor Road	Through	0.131	0.7	0.3	0.283	1.5	0.2
	Right	0.131	0.7	4.8	0.283	1.5	4.0
East: Greenhills Road	Left	0.076	0.8	7.3	0.271	3.2	6.9
	Right	0.076	0.8	9.7	0.271	3.2	12.0
North: McGregor Road	Left	0.030	0.4	5.8	0.044	0.6	5.9
	Through	0.225	0.0	0.0	0.132	0.0	0.0

Table 7.4: SIDRA Results – McGregor Road/Key Lane (Int. 2) Future Conditions

Approach	Movement	Projected AM Peak			Projected PM Peak		
		D.O.S.	95%ile Queue (m)	Avg Delay (s)	D.O.S.	95%ile Queue (m)	Avg Delay (s)
South: McGregor Road	Left	0.004	0.0	5.6	0.018	0.0	5.6
	Through	0.004	0.0	0.0	0.018	0.0	0.0
North: McGregor Road	Through	0.253	4.3	0.0	0.151	2.3	0.1
	Right	0.253	4.3	2.7	0.151	2.3	2.8
West: Key Lane	Left	0.134	1.8	5.6	0.293	4.5	5.7
	Right	0.134	1.8	8.0	0.293	4.5	7.2

Detailed SIDRA results are presented in Appendix C.

7.5 Access Scenario 2

Signalised Staggered X-Intersection with Full Build Out of The South East Business Park & Pakenham South Employment Precinct

It is understood the build out for the Pakenham South Employment Precinct (PSEP) is expected to occur sometime within the next 10 years.

The PSP is currently being prepared by Cardinia Shire Council, and is expected to accommodate approximately 184 hectares of land, developed for industrial and restricted industrial uses and open space.

A draft traffic engineering report has been prepared by Council's traffic consultant, Traffic Works, has predicted that the employment precinct will generate in the order of 31,000vpd, inclusive of some 4,300vph in each peak hour, which triggers the requirement for intersection upgrades to

the McGregor Road / Greenhills Road intersection including signalisation, turn treatments and additional stand-up lanes.

The traffic report suggests approximately 57% of the PSEP generated traffic will utilise McGregor Road to head north and west.

Given the proposed staggered configuration of the intersection, and demand for right turn movements into Key Lane, and left turn movements out of Key Lane during the AM and PM peaks, respectively, it is recommended that:

- a right turn ban into Greenhills Road is imposed on development generated traffic turning left out onto McGregor Road from Key Lane; and
- 10% of development generated traffic wishing to head east via Greenhills Road will undertake a U-turn at the future roundabout proposed to the north (constructed as part of the SEBP) and then turn left at Greenhills Road.

To understand the potential impacts of the motor race track proposal at the McGregor Road / Greenhills Road intersection, the projected development plan traffic volumes summarised in Table 7.2 have been superimposed on the future traffic volumes estimated for the SEBP and PSEP (shown at Figure 6 of Traffic Works TIA Report Reference No. 170169 dated 31/07/2018).

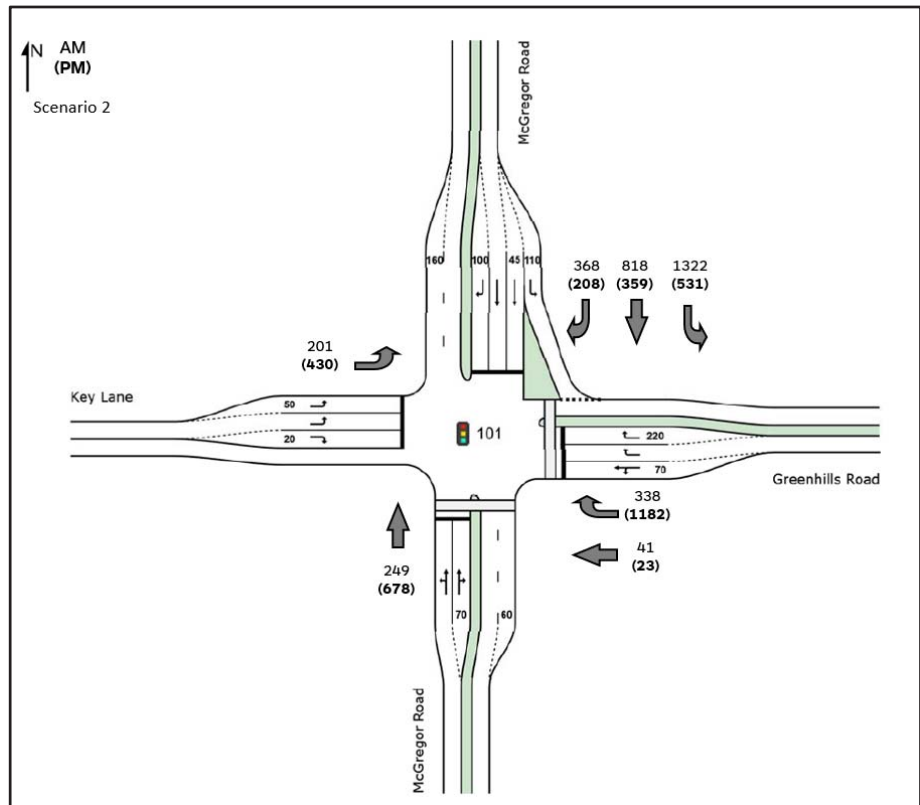
The traffic volumes estimated by Traffic Works take into consideration a base case scenario, which includes:

- Existing two-way traffic data provided by Cardinia Shire Council;
- Estimated traffic volumes from VicRoads prepared for the Pakenham South PSP (Feb 2016) for the year 2028;
- Estimated growth traffic volumes for the SEBP; and
- Traffic distribution for the intersection of McGregor Road and Greenhills Road.

The base case volumes were added to the projected PSEP traffic volumes, and the post development traffic volumes have been used for assessment of the signalised intersection.

The ultimate Scenario 2 traffic volumes, capturing the above traffic volumes, are presented at Figure 7.7 following.

Figure 7.7: Estimated Post-Development Traffic Volumes (Scenario 2)



The concept intersection design prepared by Traffic Works (reference: 170169-CTP-02) illustrates an upgraded signalised T-intersection. The plan however does not allow full-turn access to Key Lane due to a central median. Ratio Consultants has prepared a modified concept plan, allowing full turning movements into and out of Key Lane to/from McGregor Road.

The intersection is proposed to operate similarly to a X-intersection with staggered right turn movements to better manage conflicts associated with the proposed arrangement.

Through movements into Greenhills Road from Key Lane (west) have been restricted so as to improve the operation of the intersection. This is not expected to impact on traffic movements departing the site due to the low number of movements that would seek to depart in this direction.

The proposed signal phasing and sequencing has been attached at Appendix A, illustrating how the intersection could be programmed to accommodate the Key Lane access.

To understand the potential future operation and performance of the proposed intersection configuration, the projected traffic volumes detailed in Figure 7.7, have been input to SIDRA and analysed.

The results of the SIDRA analysis are summarised in Figure 7.5. The results reveal that the intersection would need to be upgraded to accommodate the projected day to day traffic generated by the subject site. Namely, the upgrades include:

- Extension of the left turn lane on the north approach, to approximately 110m in length;
- Extension of the second right turn lane on the east approach to 220m in length;

- Provision of an additional stand-up lane on the Key Lane west approach, approximately 50 metres in length;
- Addition of a right turn lane on the northern approach into Key Lane;
- Upgrade to the signal software/hardware to include the fourth leg and proposed phasing sequences;
- Right turn movements will be banned for development generated traffic turning left out onto McGregor Road. Development traffic wishing to travel east on Greenhills Road will need to do so via a U-turn at the future SEBP roundabout to the north, and then make a left turn at Greenhills Road.

Subject to the above, the intersection is expected to be acceptably accommodated by the proposed signalisation of the staggered T-intersection.

The results indicate that all other movements, with the inclusion of the day to day traffic volumes generated by the proposed development plan area can be acceptably accommodated by the proposed intersection layout and staggered configuration.

Table 7.5: SIDRA Results – McGregor Road/Greenhills Road/Key Lane Intersection Future Conditions

Approach	Movement	Projected AM Peak			Projected PM Peak		
		D.O.S.	95%ile Queue (m)	Avg Delay (s)	D.O.S.	95%ile Queue (m)	Avg Delay (s)
South: McGregor Road	Left	0.744	49.0	52.7	0.863	140.0	50.8
	Through	0.744	49.0	47.1	0.863	140.0	45.2
	Right	0.744	49.0	57.4	0.863	140.0	55.4
East: Greenhills Road	Left	0.704	16.1	65.0	0.086	7.1	47.2
	Through	0.704	16.1	65.0	0.086	7.1	47.2
	Right	0.595	61.9	42.6	0.893	260.6	38.3
North: McGregor Road	Left	0.899	276.0	17.0	0.375	19.3	6.4
	Through	0.603	101.3	13.2	0.879	91.2	47.2
	Right	0.399	72.2	22.9	0.837	77.2	58.1
West: Key Lane	Left	0.107	16.0	22.0	0.879	84.9	62.9
	Right	0.006	0.3	45.3	0.003	0.3	36.2

Detailed SIDRA results are presented in Appendix C.

Further discussions regarding the responsibility of any financial contributions of land holders should take place with all relevant stakeholders regarding Infrastructure Contributions Plan (ICP), or similar, for the Cardinia Motorsports Park, SEBP and PSEP PSP.

The owner/operator of the Cardinia Motorsports Park must be consulted during the PSP process to ensure that all future infrastructure works within the immediate vicinity of the development plan are constructed with due consideration to the car parking, traffic and access requirements of the proposed development plan area.

7.6 Access Scenario 3

Upgraded Signalised X-Intersection with Full Build Out of the SEBP, PSEP and Pakenham West PSP

As discussed previously in the report, the VPA South East Growth Corridor Plan intends to extend the Thompsons Road duplicated carriageway to the east, north of the Key Lane alignment. The timing is not yet understood with respect to its construction relative to the development of the Pakenham West PSP, however both are likely to occur after the development considered under Scenario 2.

The planning for the Pakenham West PSP however should consider the ultimate alignment of Thompsons Road, and the configuration of the ultimate intersection layout of McGregor Road and Greenhills Road (to be ultimately renamed to Thompsons Road). The construction and/or duplication of Thompsons Road will also need to factor in the access requirements for the Development Plan and assess whether there is a nexus for signalisation / upgrading of access points to facilitate all access and turning requirements of the development area.

Should the Thompsons Road duplication be required before development of the Pakenham West PSP, it is anticipated that land will be acquired by the relevant authority for the Thompsons Road alignment, and the ultimate build out of the McGregor Road / Thompsons Road intersection would occur.

Should the Pakenham West PSP be developed prior to Thompsons Road, the land provisioned for the Thompsons Road duplication and its intersections with local roads should be vested to the Relevant Road Authority. Upgrades, including alignment and widening of the western leg, to the McGregor Road / Greenhills Road should be considered at this time, which could be funded by the ICP.

Pakenham Bypass to South Gippsland Highway Freeway Connection “Koo Wee Rup Bypass”.

It is understood that the timing for the construction of the Koo Wee Rup Bypass is unconfirmed, and will be subject to the availability of Government funding. On and off ramps to serve the broader SEBP, PSEP and proposed Cardinia Motorsports Park and Recreation Facility is unlikely to be constructed until such time the Thompsons Road duplication occurs, or if traffic studies of McGregor Road suggests that additional capacity and/or a diversion of traffic is required along the corridor at the time of its construction.

VicRoads prepared an options assessment for the Healesville – Koo Wee Rup Road Connection from the Pakenham Bypass to the South Gippsland Highway

A number of strategic directions were adopted by VicRoads in 2005, as follows:

- *Healesville-Koo Wee Rup Road is to be developed as one of the primary high standard inter-regional routes between the Princes Freeway and the South Gippsland Highway.*
- *Further planning for Healesville-Koo Wee Rup Road between the Pakenham Bypass and the South Gippsland Highway is to be on the basis that this section of the route will be developed in the long term to freeway standard with a limited number of widely spaced interchanges with no intermediate access connections.*

- *The general form of the proposed Pakenham Bypass interchange at Healesville-Koo Wee Rup Road will be retained but possible longer term options will be investigated to improve the movement of traffic between the Pakenham Bypass and Healesville-Koo Wee Rup Road to the south.*
- *Further planning will be undertaken for Healesville-Koo Wee Rup Road between the Pakenham Bypass and the South Gippsland Highway to define the future road reservation requirements. This will include the investigation of options for the long term development of the route, including a bypass of Koo Wee Rup.*

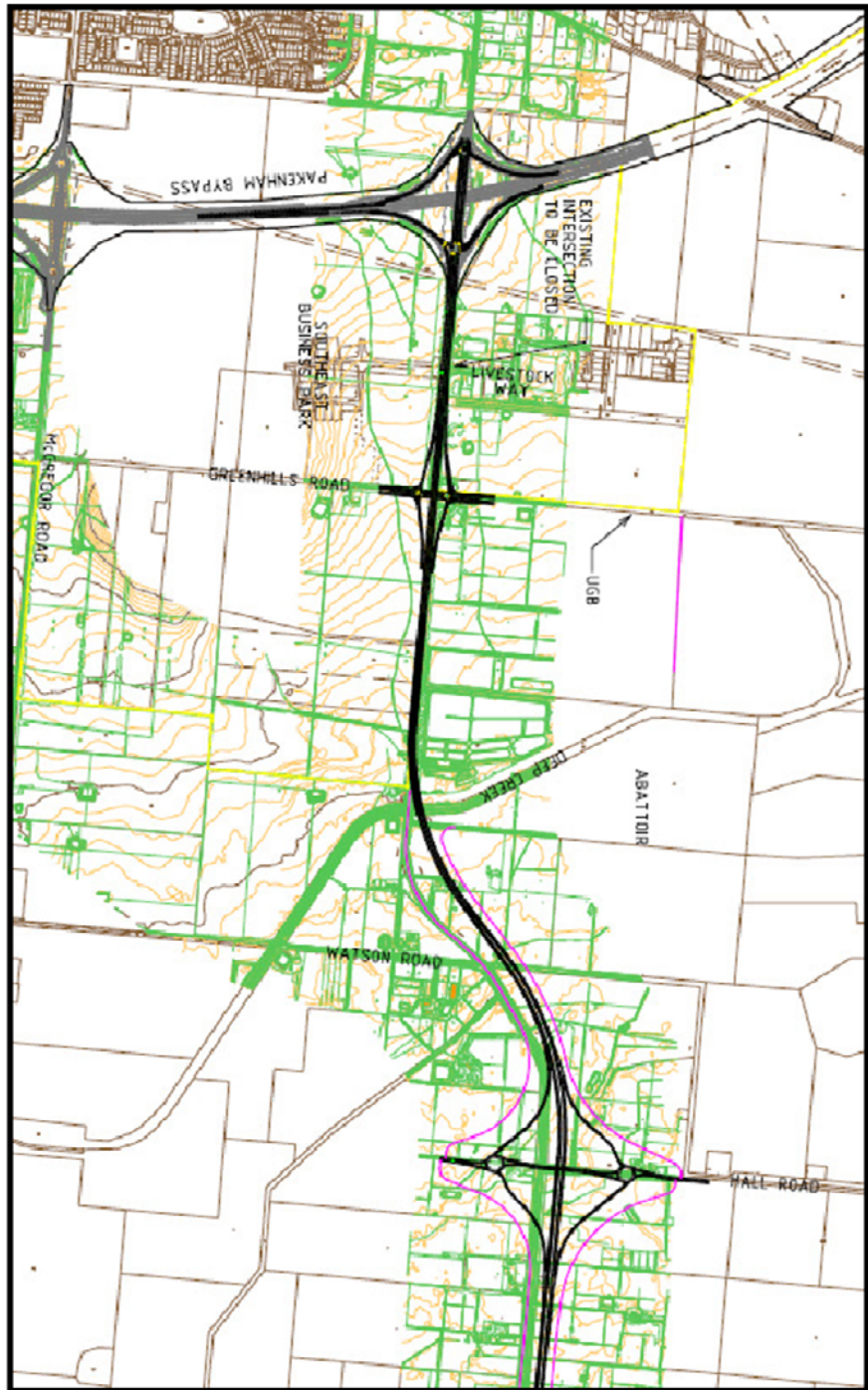
A planning study was undertaken on two (2) options, which forecasted traffic volumes and impacts for 2031. With respect to the land adjacent the subject site, there were two (2) 'longer-term' development options were investigated for the Pakenham Road – Hall Road section.

In essence, Option 1 explores the retention of the existing Healesville-Koo Wee Rup Road alignment and upgrade of this section of road to freeway standard. More specifically, it would include:

- Widening of Healesville-Koo Wee Rup Road;
- Construction of signalised intersections at ramp terminals with multiple turn lanes;
- Construction of an interchange at Greenhills Road and the closure of the existing signalised intersection at Livestock Way/South East Boulevard.

The general alignment of this option is shown at Figure 7.8 following.

Figure 7.8 Freeway Option 1 – Pakenham Bypass to Hall Road Section

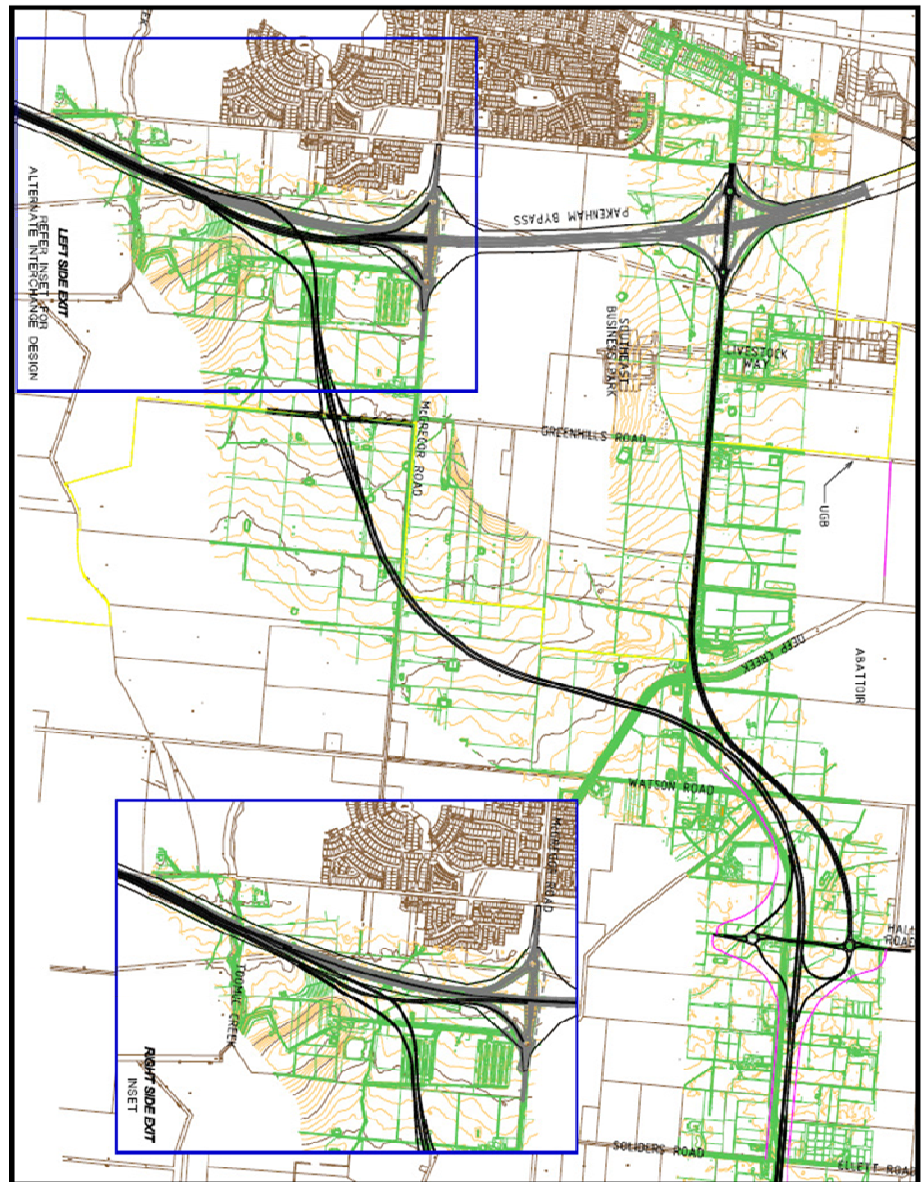


Option 2 explored a freeway to freeway interchange with the Pakenham Bypass west of McGregor Road. The proposal contemplates a new road alignment within the Urban Growth Boundaries south of the Pakenham Bypass, and create a new interchange with Greenhills Road (east of the motorsports park).

The option would also require the realignment of the Pakenham Bypass between Toomuc Creek and McGregor Road, north of the subject land.

The general alignment of this option is shown at Figure 7.9 following.

Figure 7.9 Freeway Option 2 – Pakenham Bypass to Hall Road Section



7.7 Access Summary

The above access strategies to facilitate vehicle movements into and out of the site, broadly across the next decade has been summarised in Table 7.6 following.

The summary provided at Table 7.6 is based on current conditions, information available, and government priorities at this point in time, and is therefore subject to change due to a range of factors, including Government funding on infrastructure and priority for development in the surrounding area and broader south-eastern corridor.

Table 7.6: Summary of Access Strategies and Their Timing

Milestone	Description	Estimated Timing / Potential Triggers	Funding
	Freeway ramps on the eastern side of the McGregor Road interchange at Pakenham Bypass listed.	~2021	Federal/State Government
Access Scenario 1	Unsignalised staggered X-Intersection. Road upgrade and sealing of McGregor Road between the Pakenham Bypass and Key Lane	Constructed as part of build out of the SEBP	Developer funded with consideration to any incorporated DCP/ICP
	Key Lane to be sealed and upgraded to 7.4m wide with 1.0m shoulder widening. Works to connect Key Lane to McGregor Road including localised widening to cater for all vehicle movements.	Prior to occupation of Motorsport site	Operators of motorsports facility to construct and fund.
Access Scenario 2	Signalised Staggered X-Intersection.	Part or full build out of the PSEP	DCP/ICP – delivered as part of Pakenham South PSP to retain Key Lane access to McGregor Road.
	Provision of an additional stand-up lane on the Key Lane west approach, approximately 50 metres in length; Extension of the right turn lane on the northern approach into Key Lane; and Upgrade to the signal software/hardware to include the fourth leg and proposed phasing sequences.	Part or full build out of the PSEP	Operators of motorsports facility to fund as part of the above delivery.
Access Scenario 3	Delivery of Thompsons Road and upgraded signalised X-Intersection. Land acquisition required. Access to motorsports site to be taken from Thompsons Road and Key Lane access to McGregor to be discontinued. The nexus for signalisation/upgrading of site access points to Thompson Road is subject to a detailed traffic assessment as part of planning of the future Thompson Road duplication works. The detailing of the appropriate access treatments and associated infrastructure should be captured in the assessment. The assessment shall be done to the satisfaction of the relevant road authority.	Part or full build out of the Pakenham West PSP	DCP/ICP – delivered as part of Pakenham West PSP.
Other Access Considerations	Further upgrade and duplication of Thompsons Road.	Unknown, subject to funding and traffic volumes. Est. 10+ years	Federal/State Government
	Koo Wee Rup Bypass	Unknown, subject to funding and traffic volumes	Federal/State Government
	Temporary access to/from the unnamed road discontinued at the Bypass, and deviated to the south.	During planning for the Bypass and subject to planning requirements.	Operators of motorsports facility to construct and fund.

8 Recommendations:

The following recommendations aim to assist the assessment of future planning applications that are prepared for the Cardinia Motorsports Park Recreation Facility. Any proposed development requiring a planning permit application should consider:

- The statutory car parking rates outlined within the Cardinia Planning Scheme, and rates within Table 4.1 of this report, and where relevant, provide a car parking demand assessment to justify any innominate use or variations to the Planning Scheme requirement;
- Defining the anticipated level of staff and patron numbers associated with, and operational details of any use proposed;
- Affirming whether the use triggers the need for an event management plan (EvMP). An EvMP should have regard for car parking and traffic management plans to facilitate car parking and access for the specific event.
- The EvMP shall consider whether impacts of the event will be contained to Council roads, or if they will extend to arterial roads and freeways. Should an EvMP be required, the preparation of this document should have due consideration to:
 - The size of the event, and suitability of the management regime;
 - Parking management strategies, identification of the areas available for parking, and adequacy of this/these area/s available to accommodate projected car parking demands for the event;
 - Where appropriate, ticketing of car parking spaces in order to restrict car parking demands to the land available for overflow car parking;
 - Access arrangements, including routes, signage and separation of access for different vehicles and users;
 - Local area traffic management (LATM) along all routes to and from the site to direct traffic to site access points;
 - Traffic management procedures and personnel, particularly at access points and intersections (internally and externally);
 - Approximate times for arrivals and departures;
 - Bus and other transportation scheduling; and
 - Contingency plans in case of emergencies.
- Where there is an event proposed, the EvMP should also have consideration to providing alternate forms of transportation to ameliorate car parking and traffic impacts caused by the event.

It should also outline internal access and circulation routes for all types of movement, including pedestrians and cyclists, and areas dedicated for parking, loading, turnaround/circulation for each movement type, as appropriate;

- A waste management plan, and consideration to loading should be provided as part of any town planning application. They should also assess any impacts to nearby intersections and adequacy of their design to accommodate relevant vehicles; and
- Future planning applications, should assess whether the traffic generated, and impact of the proposal is generally consistent with the assessment undertaken in this report.
- Involvement/engagement in the PSP processes for the surrounding land.

9 Conclusion:

Having assessed the car parking and traffic merits of the motorsport and education facility development proposed at 21, 75 & 115 Key Lane and 335 McGregor Road, Pakenham, it is concluded that:

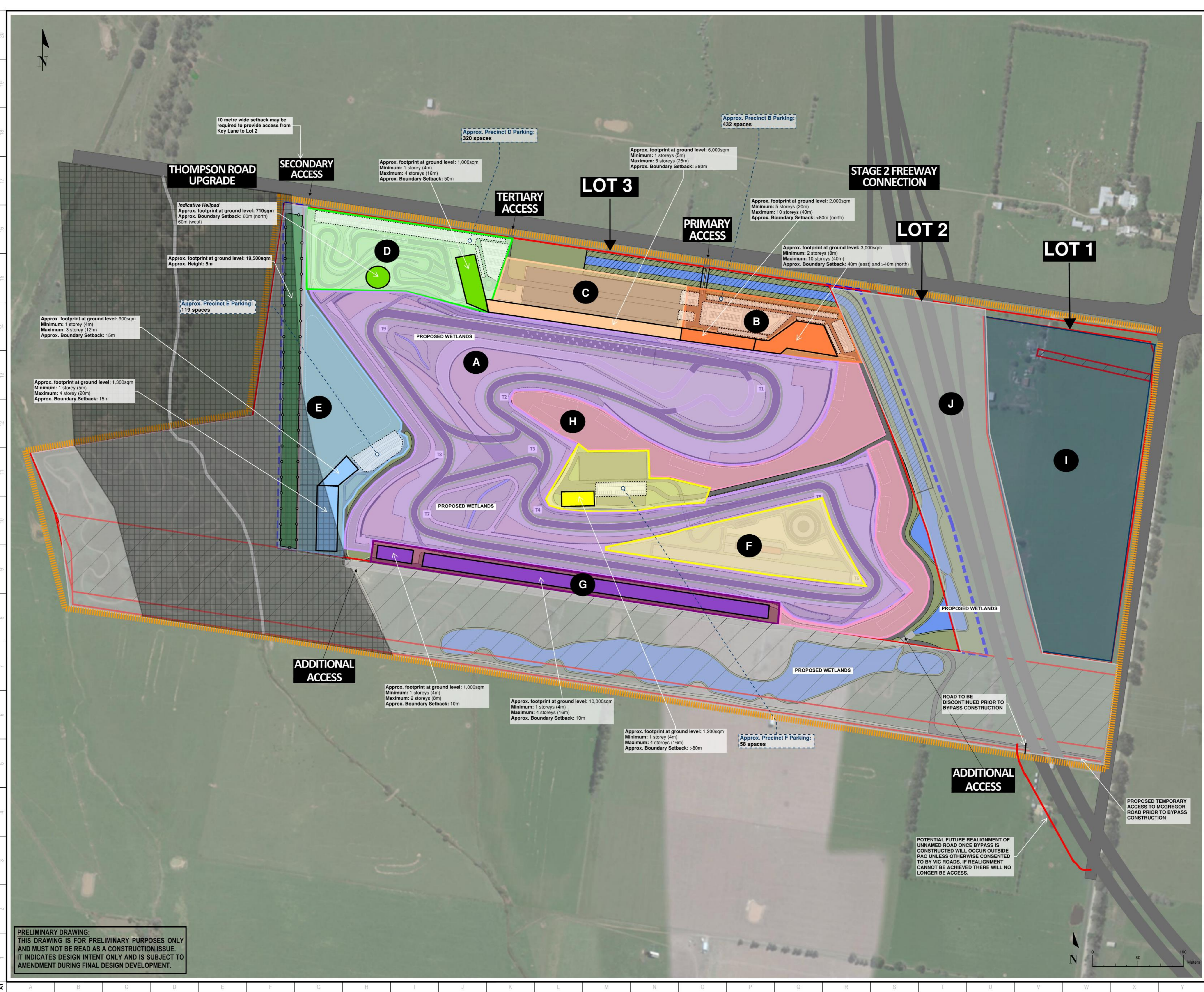
- The development plan contemplates development of the site for the purposes of a function/exhibition centre, driver experience centre, offices, shooting club and hotel, i.e. day to day operations.
- On occasion, the site will be used to hold events including motor racing, concerts, exhibitions and club competitions.
- Car parking demands for the day to day operations are proposed to be accommodated on the site, and be provided near to each of the proposed uses. A Car Parking Demand Assessment shall be undertaken to vary the requirements of car parking, or to justify parking demands of innominate uses as part of a TIA of any planning permit application.
- During event mode, car parking and traffic management plans will form part of the documentation within an EvMP. These documents will outline the areas relied upon for overflow spectator car parking, and detail any initiatives to limit/restrict car parking and encourage the use of alternate modes of transport. The recommendations outlined within this report should be used as a basis to form the plans.
- The TTM concept plans for the McGregor Road / Greenhills Road intersection should be modified to include fully directional access to Key Lane in order to accommodate the projected traffic movements generated by day to day operations of the development plan area.
- The traffic assessment assumes that the roadworks and upgrades to McGregor Road between the Pakenham Bypass and Key Lane will be completed prior to occupation of the development plan uses as part of the SEBP development.
- The traffic assessment assumes that the roadworks and upgrades to Key Lane between McGregor Road and proposed development plan access points will be completed prior to occupation of the development plan uses.
- Modifications to the proposed McGregor Road / Greenhills Road intersection are required under Access Scenario 2 in order to accommodate the projected Development Plan generated traffic movements. The plans attached at Appendix D.

- C should be substituted in order to provide appropriate access for the proposed Development Plan.
- Future ICPs/DCPs prepared for surrounding developments must be prepared in consultation with Podium 1 and/or other relevant stakeholders to ensure that access is maintained throughout PSP development in the area.
- Traffic assessments that are undertaken for the McGregor Road / Greenhills Road and Key Lane intersection undertaken as part of any planning permit application, should affirm whether traffic generated to the intersection triggers a requirement for signalisation prior to the development of the PSEP. Otherwise, signalisation should occur as part of the PSEP PSP.

On the basis of the assessment above, the proposed development plan is considered to be acceptable from a traffic engineering perspective and, subject to the recommendations above, will not adversely impact the car parking or traffic conditions in the area.

Appendix A Development Plan





LEGEND

- DPO16
- LOT BOUNDARIES
- INTERNAL ROADS (indicative alignments)
- PRECINCT A: CIRCUIT
- PRECINCT B: COMMERCIAL & ACCOMODATION
- PRECINCT C: PIT BUILDING
- PRECINCT D: DRIVING FACILITY #1
- PRECINCT E: SPORT SHOOTING FACILITY
- PRECINCT F: DRIVING FACILITY #2
- PRECINCT G: VEHICLE STORAGE
- PRECINCT H: MULTI-PURPOSE AREA
- PRECINCT I: AUTO CLUB
- PRECINCT J: MOTORCYCLE CLUB, SECONDARY ACCESS & DRAINAGE
- WETLANDS
- EARTH BERM
- PRECINCT CAR PARKING AREAS
NOTES: -CAR SPACE DIMENSIONS AS PER PLANNING SCHEME - 2.6m X 4.9m, ACCESSED VIA A 6.4 METRE WIDE AISLE
- AREA WITHIN 200M OF TOOMUC CREEK, NOT TO SCALE
- TRANSMISSION LINE EASEMENT AREA

PRELIMINARY DRAWING:
THIS DRAWING IS FOR PRELIMINARY PURPOSES ONLY AND MUST NOT BE READ AS A CONSTRUCTION ISSUE. IT INDICATES DESIGN INTENT ONLY AND IS SUBJECT TO AMENDMENT DURING FINAL DESIGN DEVELOPMENT.

DISCLAIMER:
TRACK LAYOUTS SHOWN WITHIN THIS DEVELOPMENT PLAN IS INDICATIVE ONLY AND SUBJECT TO CHANGE

WETLANDS ARE INDICATIVE - REFER TO APPENDIX F (STORMWATER MANAGEMENT STRATEGY) & APPENDIX Q (INTERIM STORMWATER MANAGEMENT STRATEGY)

WORKS WITHIN 200M OF TOOMUC CREEK (HATCHED AREA) ARE SUBJECT TO APPROVAL FROM THE RELEVANT AUTHORITIES

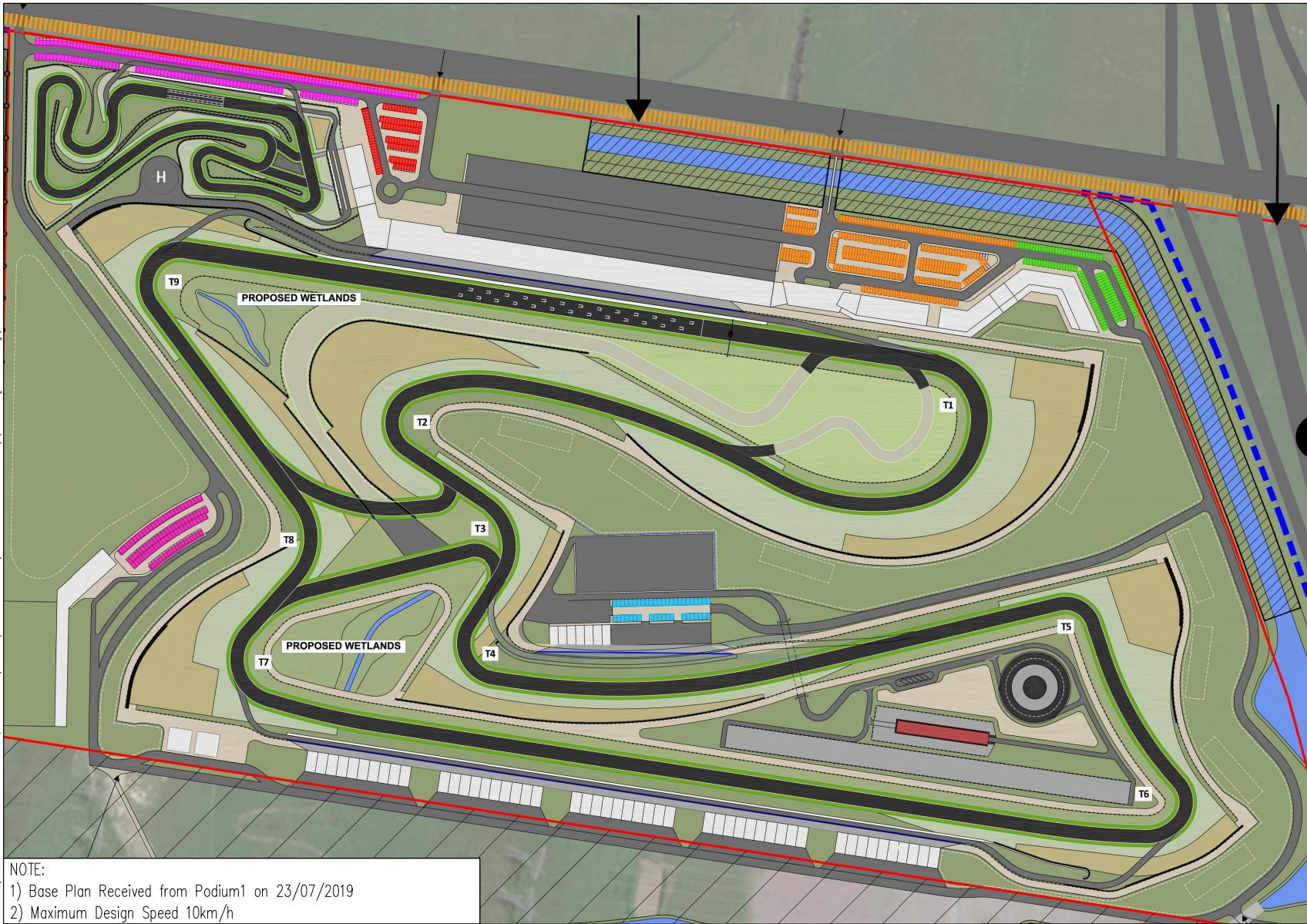
OVERFLOW PARKING AS SHOWN IN TRAFFIC IMPACT ASSESSMENT IN APPENDIX M

PRECINCT J IS SUBJECT TO SEPERATE PLANNING PERMIT APPLICATIONS AND CONSENT FROM THE RELEVANT ACQUIRING/ROAD AUTHORITY

Appendix B Car Parking Arrangements



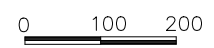
Y:\15501-6000\15633T - 335 MCGREGOR ROAD, PAKENHAM DESIGN\SKETCH ADVICE (INCLUDING SWEEP PATHS)\SK03 - [2019.07.23]\15633T SK03.DWG



PARKING AREA CAPACITY

- Approx. 223 cars
 - Approx. 97 cars
 - Approx. 312 cars
 - Approx. 120 cars
 - Approx. 58 cars
 - Approx. 119 cars
- TOTAL = Approx. 929 cars

NOTES:
 - CAR SPACE DIMENSIONS AS PER PLANNING SCHEME : 2.6m X 4.9m, ACCESSED VIA A 6.4 METRE WIDE AISLE

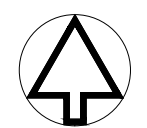


NOTE:
 1) Base Plan Received from Podium1 on 23/07/2019
 2) Maximum Design Speed 10km/h

ratio:

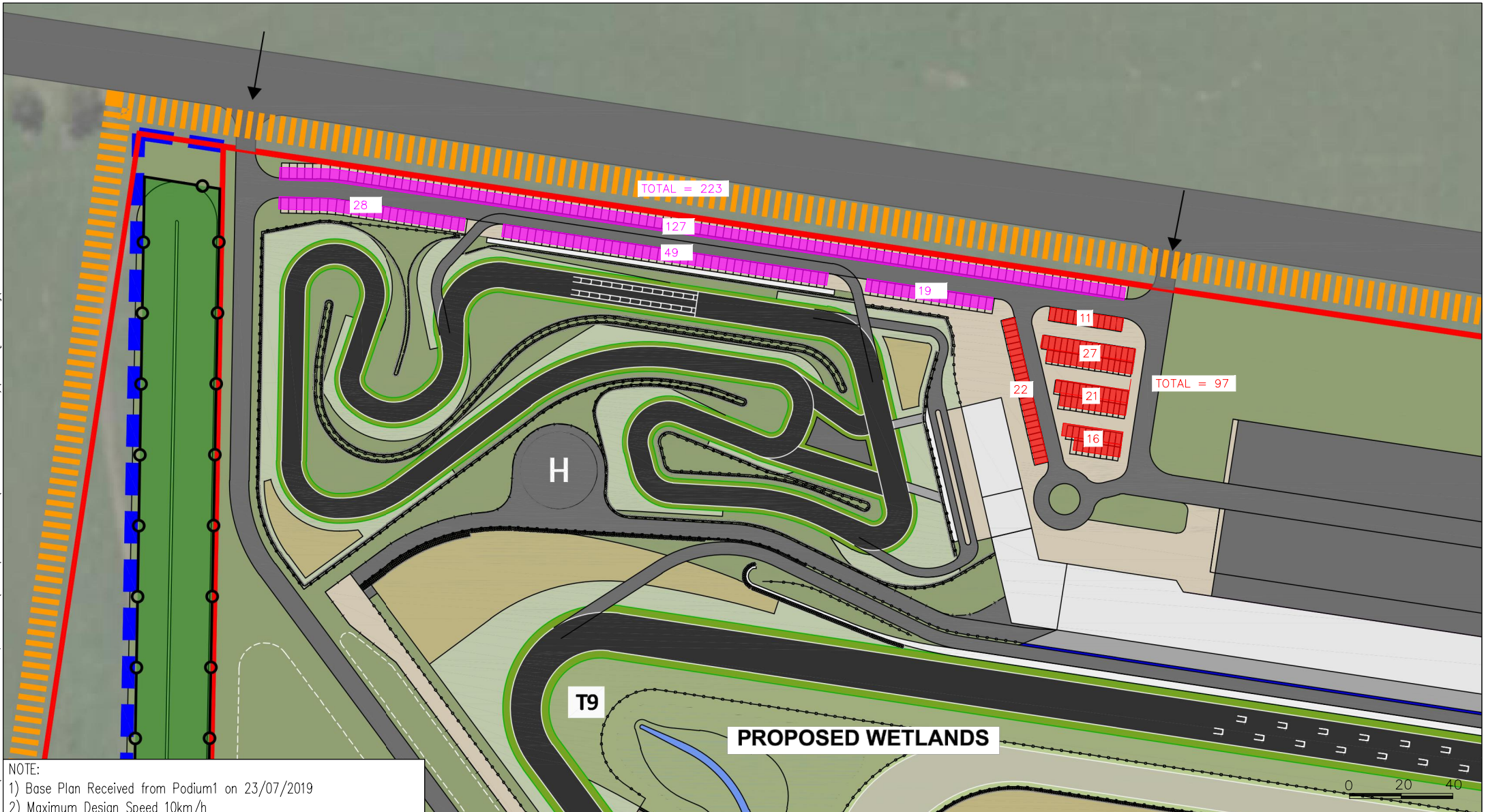
RATIO CONSULTANTS PTY LTD
 ABN 005 422 104
 8 GWYNNE STREET
 CREMORNE, VICTORIA 3121
 TELEPHONE (03)9429 3111
 FACSIMILE (03)9429 3011

Proposed Motorsports Centre Development
 335 McGregor Road, Pakenham
 Indicative On-Site Parking Capacity



RATIO REFERENCE 15633T SK03/EY	SHEET No. 1 of 4	SCALE 1:5@A4	DATE 23/07/2019
-----------------------------------	---------------------	-----------------	--------------------

Y:\15631-6000\15633T - 335 MCGREGOR ROAD, PAKENHAM\DESIGN\SKETCH ADVICE (INCLUDING SWEEP PATHS)\SK03 - [2019.07.23]\15633T SK03.DWG
23/07/2019 4:06:27 PM



NOTE:
1) Base Plan Received from Podium1 on 23/07/2019
2) Maximum Design Speed 10km/h

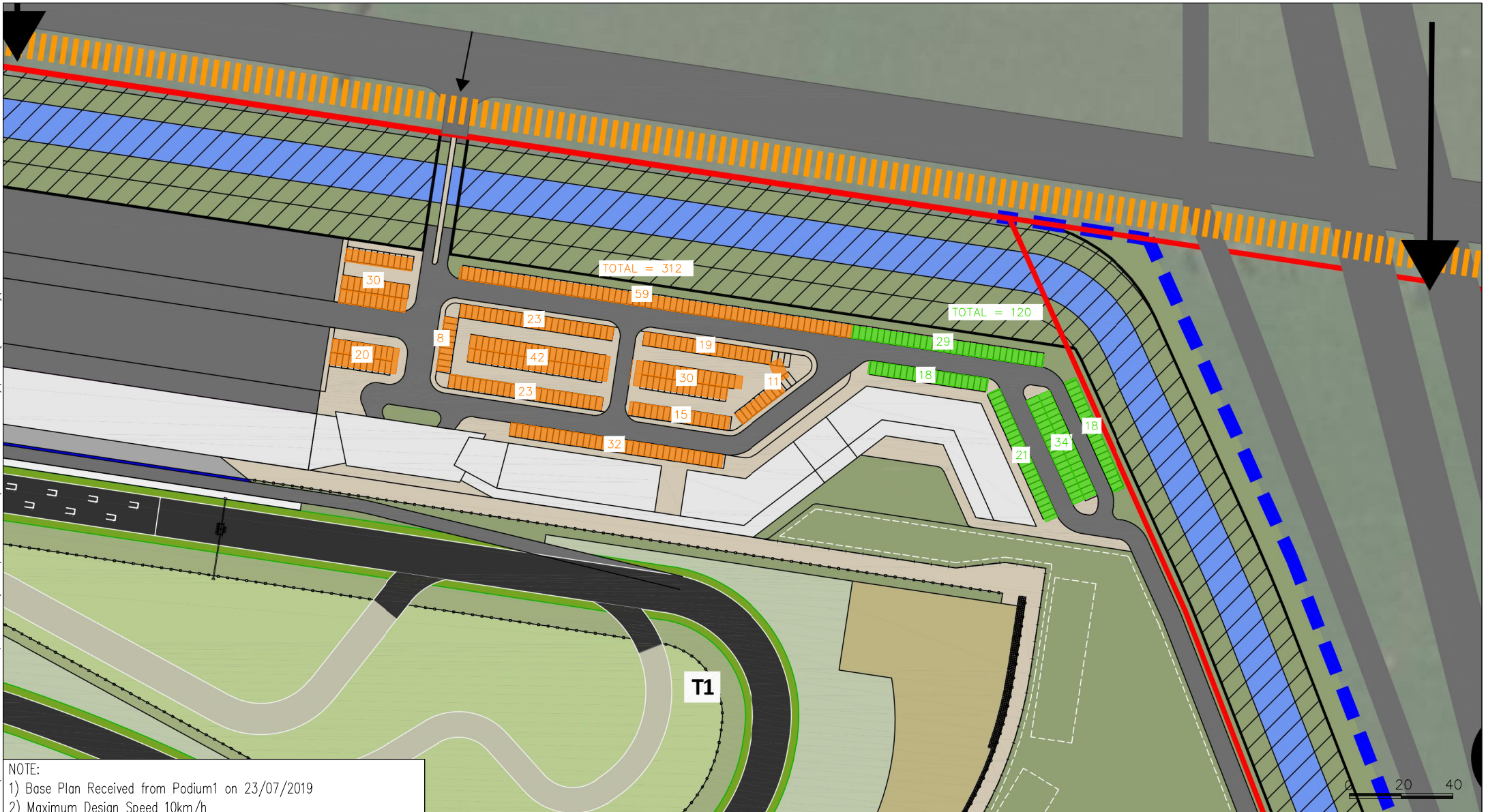
ratio:
RATIO CONSULTANTS PTY LTD
ABN 005 422 104
8 GWYNNE STREET
CREMORNE, VICTORIA 3121
TELEPHONE (03)9429 3111
FACSIMILE (03)9429 3011

Proposed Motorsports Centre Development
335 McGregor Road, Pakenham
Indicative On-Site Parking Capacity

RATIO REFERENCE	SHEET No.	SCALE	DATE
15633T SK03/EY	2 of 4	1:20A4	23/07/2019



Y:\15631-6000\15633T - 335 MCGREGOR ROAD, PAKENHAM DESIGN\SKETCH ADVICE (INCLUDING SWEEP PATHS)\SK03 - [2019.07.23]\15633T SK03.DWG
 23/07/2019 4:06:31 PM




NOTE:
 1) Base Plan Received from Podium1 on 23/07/2019
 2) Maximum Design Speed 10km/h

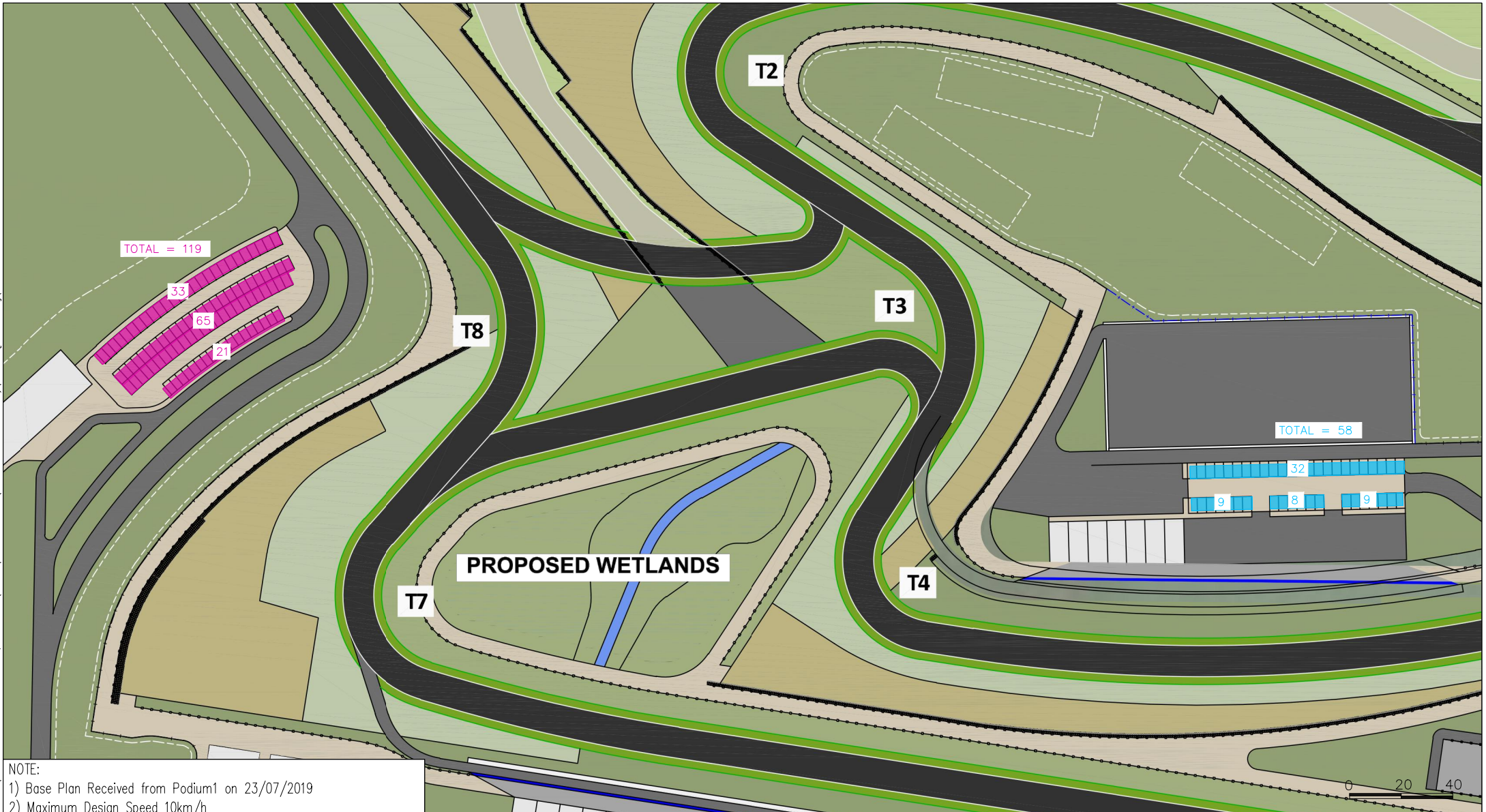
ratio:
 RATIO CONSULTANTS PTY LTD
 ABN 005 422 104
 8 GWYNNE STREET
 CREMORNE, VICTORIA 3121
 TELEPHONE (03)9429 3111
 FACSIMILE (03)9429 3011

Proposed Motorsports Centre Development
 335 McGregor Road, Pakenham
 Indicative On-Site Parking Capacity

RATIO REFERENCE 15633T SK03/EY	SHEET No. 3 of 4	SCALE 1:2@A4	DATE 23/07/2019
-----------------------------------	---------------------	-----------------	--------------------



Y:\15633T-6000\15633T - 335 MCGREGOR ROAD, PAKENHAM DESIGN\SKETCH ADVICE (INCLUDING SWEEP PATHS)\SK03 - [2019.07.23]\15633T_SK03.DWG
23/07/2019 4:06:33 PM

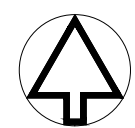


NOTE:
1) Base Plan Received from Podium1 on 23/07/2019
2) Maximum Design Speed 10km/h

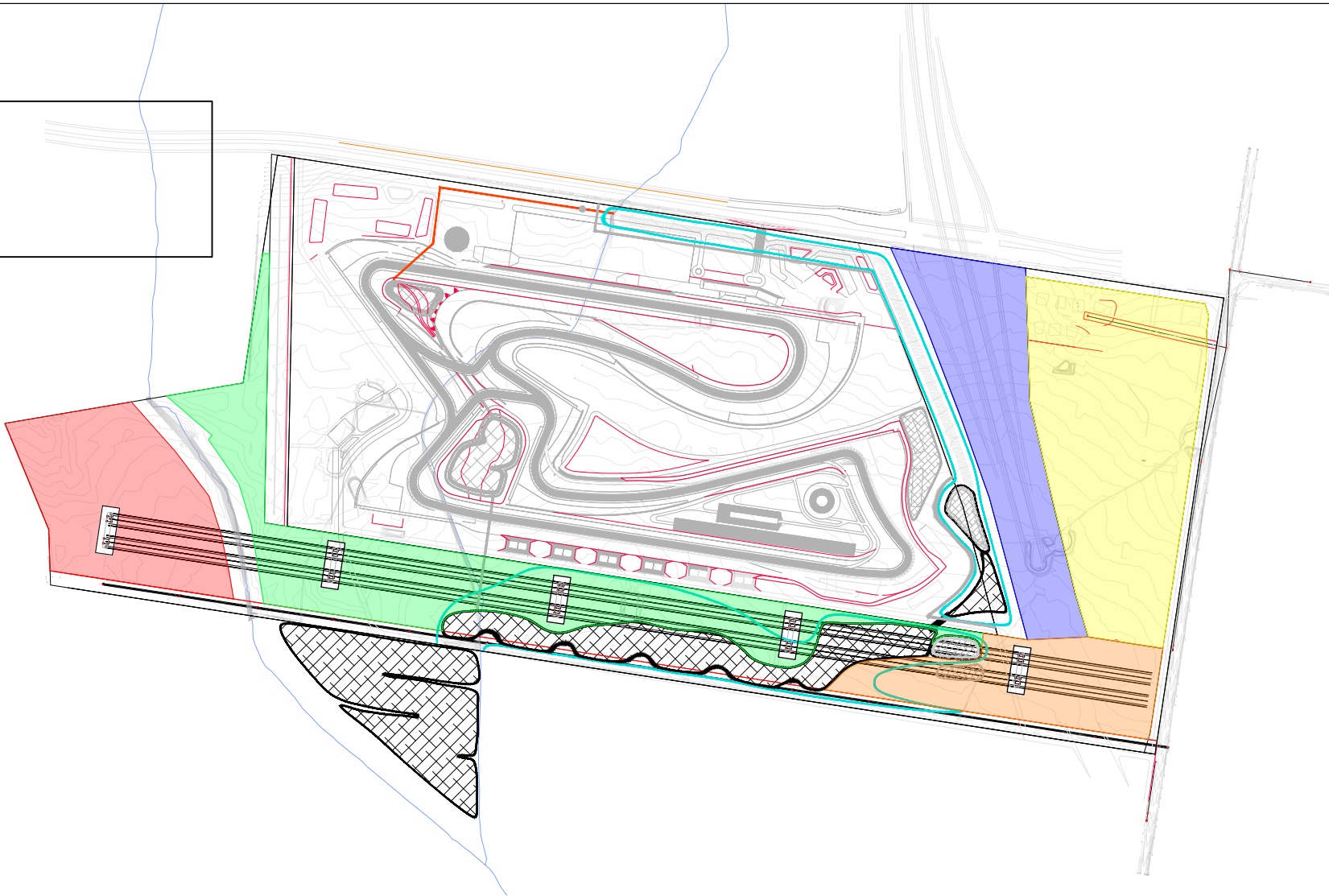
ratio:
RATIO CONSULTANTS PTY LTD
ABN 005 422 104
8 GWYNNE STREET
CREMORNE, VICTORIA 3121
TELEPHONE (03)9429 3111
FACSIMILE (03)9429 3011

Proposed Motorsports Centre Development
335 McGregor Road, Pakenham
Indicative On-Site Parking Capacity

RATIO REFERENCE	SHEET No.	SCALE	DATE
15633T SK03/EY	4 of 4	1:2@A4	23/07/2019



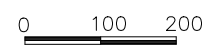
Y:\15631-6000\15633T - 335 MCGREGOR ROAD, PAKENHAM\DESIGN\SKETCH ADVICE (INCLUDING SWEEP PATHS)\SK02 - [2019.07.22]\15633T SK02.DWG
 05/08/2019 11:16:44 AM



PARKING AREA CAPACITY

	75,396 m ²	Approx. 2,510 cars
	114,339 m ²	Approx. 3,810 cars
	55,802 m ²	Approx. 1,860 cars
	80,429 m ²	Approx. 2,680 cars
	133,540 m ²	Approx. 4,450 cars

NOTES:
 -10m CLEARANCE HAS BEEN PROVIDED FROM TRANSMISSION POLES
 -20m CLEARANCE HAS BEEN PROVIDED FROM EITHER SIDE OF TOOMUC CREEK
 -CALCULATIONS BASED ON A SINGLE CAR PARK REQUIRING 30m² OF SPACE.



NOTE:
 1) Base Plan Prepared by Stormy Water Solutions dated 08/03/2019
 2) Maximum Design Speed 10km/h

ratio:

RATIO CONSULTANTS PTY LTD
 ABN 005 422 104
 8 GWYNNE STREET
 CREMORNE, VICTORIA 3121
 TELEPHONE (03)9429 3111
 FACSIMILE (03)9429 3011

Proposed Motorsports Centre Development
 335 McGregor Road, Pakenham
 Potential Overflow Car Parking



RATIO REFERENCE 15633T SK02/EY	SHEET No. 1 of 1	SCALE 1:10@A4	DATE 05/08/2019
-----------------------------------	---------------------	------------------	--------------------

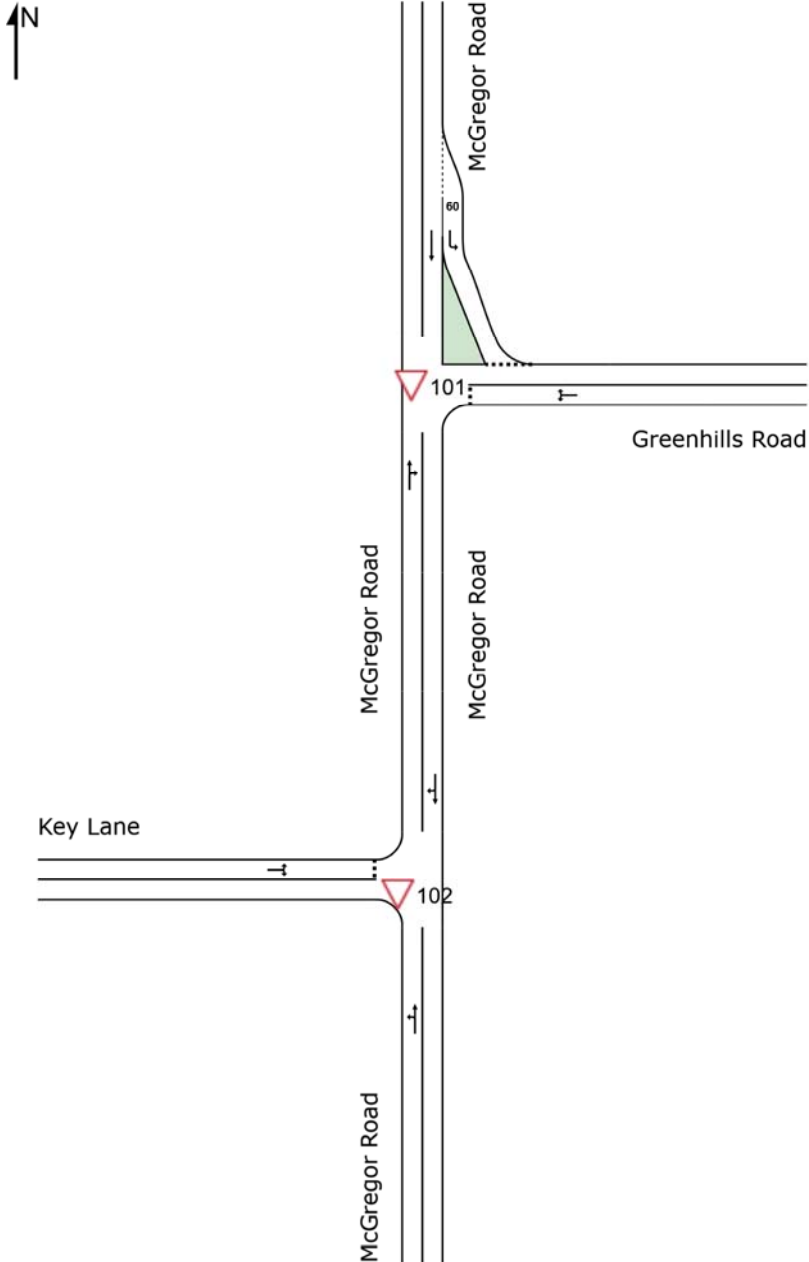
Appendix C SIDRA Results



NETWORK LAYOUT

Network: N101 [Scenario 1 AM]

New Network
 Network Category: (None)



SITES IN NETWORK		
Site ID	CCG ID	Site Name
▽101	NA	McGH_Int (AM)
▽102	NA	McKL_Int (AM)

MOVEMENT SUMMARY

Site: 101 [McGH_Int (AM)]

Network: N101 [Scenario 1 AM]

McGregor Road / Greenhills Road
 AM Peak Hour Conditions
 Site Category: Scenario 1
 Giveaway / Yield (Two-Way)

Movement Performance - Vehicles														
Mov ID	Turn	Demand Flows		Arrival Flows		Deg. Satn	Average Delay	Level of Service	Aver. Back of Queue		Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		Total veh/h	HV %	Total veh/h	HV %				Vehicles	Distance m				
South: McGregor Road														
2	T1	196	15.0	196	15.0	0.131	0.3	LOS A	0.1	0.7	0.13	0.06	0.13	58.6
3	R2	21	15.0	21	15.0	0.131	4.8	LOS A	0.1	0.7	0.13	0.06	0.13	53.3
Approach		217	15.0	217	15.0	0.131	0.8	NA	0.1	0.7	0.13	0.06	0.13	58.0
East: Greenhills Road														
4	L2	43	5.0	43	5.0	0.076	7.3	LOS A	0.1	0.8	0.47	0.69	0.47	47.7
6	R2	20	15.0	20	15.0	0.076	9.7	LOS A	0.1	0.8	0.47	0.69	0.47	51.0
Approach		63	8.2	63	8.2	0.076	8.1	LOS A	0.1	0.8	0.47	0.69	0.47	49.2
North: McGregor Road														
7	L2	44	15.0	44	15.0	0.030	5.8	LOS A	0.0	0.4	0.08	0.52	0.08	53.4
8	T1	399	15.0	399	15.0	0.225	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach		443	15.0	443	15.0	0.225	0.6	LOS A	0.0	0.4	0.01	0.05	0.01	58.6
All Vehicles		723	14.4	723	14.4	0.225	1.3	NA	0.1	0.8	0.08	0.11	0.08	57.3

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
 Vehicle movement LOS values are based on average delay per movement.
 Minor Road Approach LOS values are based on average delay for all vehicle movements.
 NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
 SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
 Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
 HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 102 [McKL_Int (AM)]

Network: N101 [Scenario 1 AM]

McGregor Road / Key Lane
 AM Peak Hour Conditions
 Site Category: Scenario 1
 Giveaway / Yield (Two-Way)

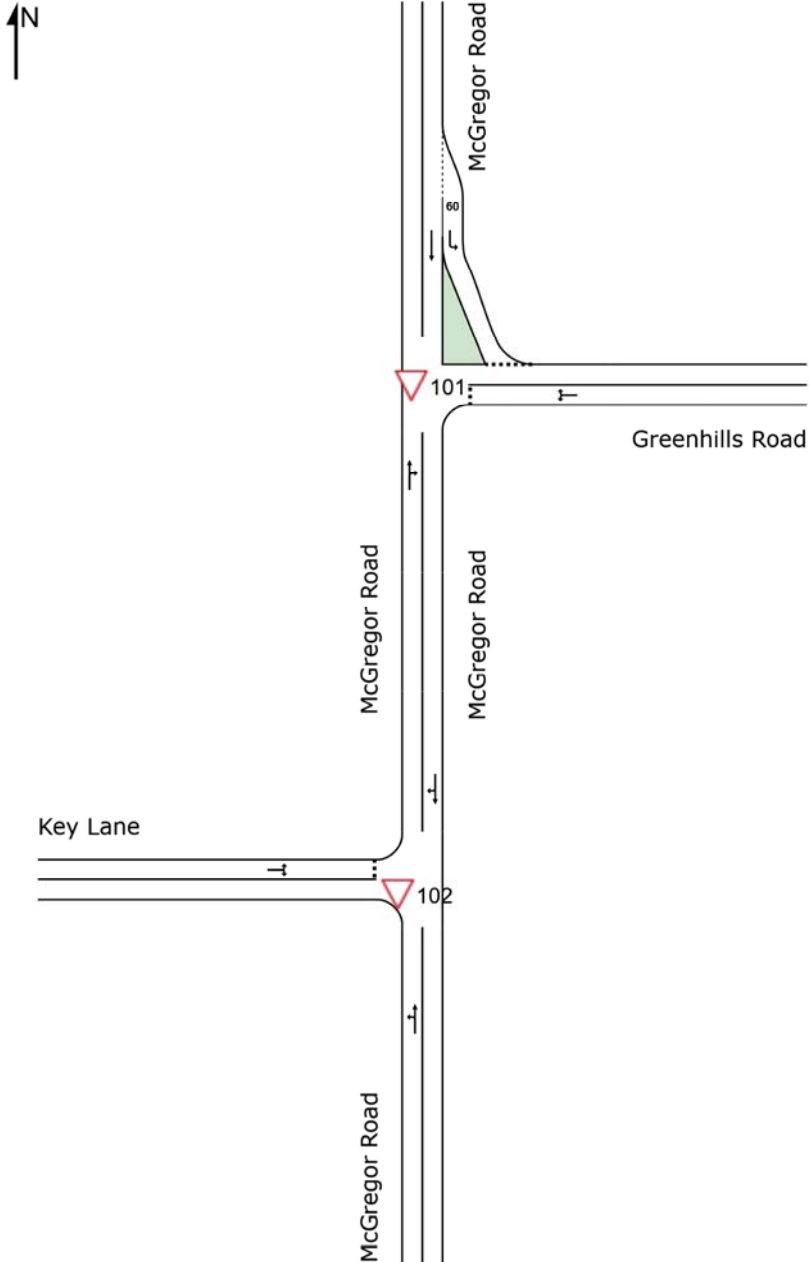
Movement Performance - Vehicles														
Mov ID	Turn	Demand Flows		Arrival Flows		Deg. Satn	Average Delay	Level of Service	Aver. Back of Queue		Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		Total veh/h	HV %	Total veh/h	HV %				Vehicles	Distance m				
South: McGregor Road														
1	L2	1	5.0	1	5.0	0.004	5.6	LOS A	0.0	0.0	0.00	0.10	0.00	57.2
2	T1	5	15.0	5	15.0	0.004	0.0	LOS A	0.0	0.0	0.00	0.10	0.00	58.1
Approach		6	13.3	6	13.3	0.004	0.9	NA	0.0	0.0	0.00	0.10	0.00	57.8
North: McGregor Road														
8	T1	12	15.0	12	15.0	0.253	0.0	LOS A	0.6	4.3	0.05	0.50	0.05	55.3
9	R2	431	5.0	431	5.0	0.253	2.7	LOS A	0.6	4.3	0.05	0.50	0.05	51.4
Approach		442	5.3	442	5.3	0.253	2.6	NA	0.6	4.3	0.05	0.50	0.05	51.5
West: Key Lane														
10	L2	212	5.0	212	5.0	0.134	5.6	LOS A	0.2	1.8	0.03	0.56	0.03	50.7
12	R2	1	5.0	1	5.0	0.134	8.0	LOS A	0.2	1.8	0.03	0.56	0.03	52.8
Approach		213	5.0	213	5.0	0.134	5.6	LOS A	0.2	1.8	0.03	0.56	0.03	50.7
All Vehicles		661	5.3	661	5.3	0.253	3.6	NA	0.6	4.3	0.04	0.52	0.04	51.3

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
 Vehicle movement LOS values are based on average delay per movement.
 Minor Road Approach LOS values are based on average delay for all vehicle movements.
 NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
 SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
 Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
 HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

NETWORK LAYOUT

Network: N102 [Scenario 1 PM]

New Network
 Network Category: (None)



SITES IN NETWORK		
Site ID	CCG ID	Site Name
▽101	NA	McGH_Int (PM)
▽102	NA	McKL_Int (PM)

MOVEMENT SUMMARY

Site: 101 [McGH_Int (PM)]

Network: N102 [Scenario 1 PM]

McGregor Road / Greenhills Road
 AM Peak Hour Conditions
 Site Category: Scenario 1
 Giveaway / Yield (Two-Way)

Movement Performance - Vehicles														
Mov ID	Turn	Demand Flows		Arrival Flows		Deg. Satn	Average Delay	Level of Service	Aver. Back of Queue		Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		Total veh/h	HV %	Total veh/h	HV %				Vehicles	Distance m				
South: McGregor Road														
2	T1	438	15.0	438	15.0	0.283	0.2	LOS A	0.2	1.5	0.10	0.05	0.10	59.0
3	R2	45	15.0	45	15.0	0.283	4.0	LOS A	0.2	1.5	0.10	0.05	0.10	53.6
Approach		483	15.0	483	15.0	0.283	0.5	NA	0.2	1.5	0.10	0.05	0.10	58.5
East: Greenhills Road														
4	L2	24	5.0	24	5.0	0.271	6.9	LOS A	0.4	3.2	0.58	0.82	0.65	44.2
6	R2	124	15.0	124	15.0	0.271	12.0	LOS B	0.4	3.2	0.58	0.82	0.65	48.9
Approach		148	13.4	148	13.4	0.271	11.2	LOS B	0.4	3.2	0.58	0.82	0.65	48.4
North: McGregor Road														
7	L2	64	15.0	64	15.0	0.044	5.9	LOS A	0.1	0.6	0.13	0.51	0.13	53.2
8	T1	235	15.0	235	15.0	0.132	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
Approach		299	15.0	299	15.0	0.132	1.3	LOS A	0.1	0.6	0.03	0.11	0.03	57.4
All Vehicles		931	14.7	931	14.7	0.283	2.5	NA	0.4	3.2	0.15	0.19	0.17	55.4

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
 Vehicle movement LOS values are based on average delay per movement.
 Minor Road Approach LOS values are based on average delay for all vehicle movements.
 NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
 SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
 Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
 HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 102 [McKL_Int (PM)]

Network: N102 [Scenario 1 PM]

McGregor Road / Key Lane
 PM Peak Hour Conditions
 Site Category: Scenario 1
 Giveaway / Yield (Two-Way)

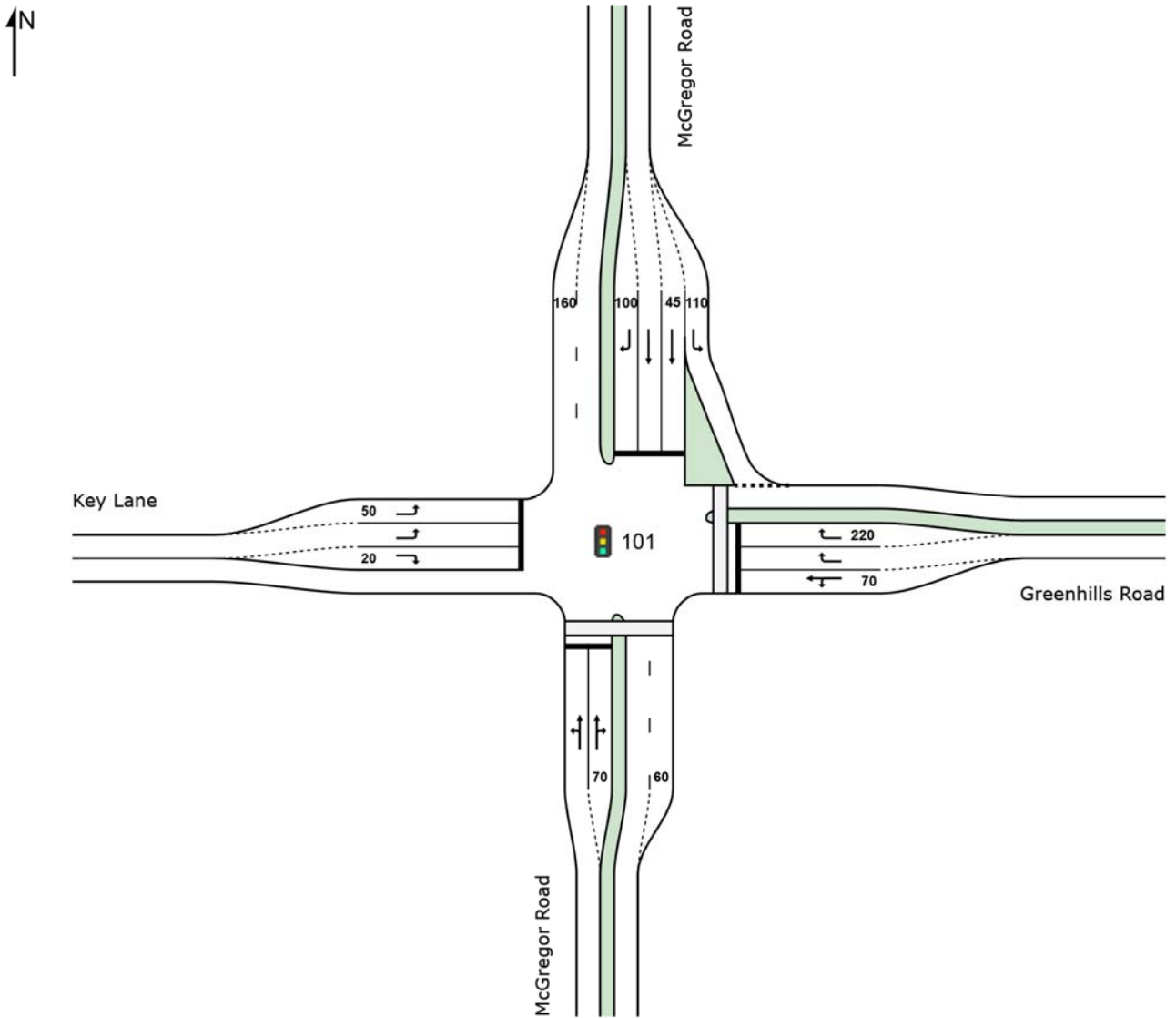
Movement Performance - Vehicles														
Mov ID	Turn	Demand Flows		Arrival Flows		Deg. Satn	Average Delay	Level of Service	Aver. Back of Queue		Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		Total veh/h	HV %	Total veh/h	HV %				Vehicles	Distance m				
South: McGregor Road														
1	L2	1	5.0	1	5.0	0.018	5.6	LOS A	0.0	0.0	0.00	0.02	0.00	57.9
2	T1	31	15.0	31	15.0	0.018	0.0	LOS A	0.0	0.0	0.00	0.02	0.00	59.6
Approach		32	14.7	32	14.7	0.018	0.2	NA	0.0	0.0	0.00	0.02	0.00	59.5
North: McGregor Road														
8	T1	16	15.0	16	15.0	0.151	0.1	LOS A	0.3	2.3	0.12	0.47	0.12	55.2
9	R2	243	5.0	243	5.0	0.151	2.8	LOS A	0.3	2.3	0.12	0.47	0.12	51.3
Approach		259	5.6	259	5.6	0.151	2.6	NA	0.3	2.3	0.12	0.47	0.12	51.5
West: Key Lane														
10	L2	453	5.0	453	5.0	0.293	5.7	LOS A	0.6	4.5	0.13	0.54	0.13	50.2
12	R2	1	5.0	1	5.0	0.293	7.2	LOS A	0.6	4.5	0.13	0.54	0.13	52.5
Approach		454	5.0	454	5.0	0.293	5.7	LOS A	0.6	4.5	0.13	0.54	0.13	50.2
All Vehicles		744	5.6	744	5.6	0.293	4.4	NA	0.6	4.5	0.12	0.50	0.12	51.0

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
 Vehicle movement LOS values are based on average delay per movement.
 Minor Road Approach LOS values are based on average delay for all vehicle movements.
 NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
 SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
 Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
 HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

SITE LAYOUT

 Site: 101 [McGHKLn_(AM)]

McGregor Road / Greenhills Road / Key Lane
PM Peak Hour Conditions
Site Category: AM
Signals - Fixed Time Isolated



MOVEMENT SUMMARY

 Site: 101 [McGHKLn_(AM)]

McGregor Road / Greenhills Road / Key Lane

PM Peak Hour Conditions

Site Category: AM

Signals - Fixed Time Isolated Cycle Time = 90 seconds (Site User-Given Phase Times)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Back of Queue Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: McGregor Road												
1	L2	1	5.0	0.744	52.7	LOS D	6.2	49.0	1.00	0.88	1.20	34.1
2	T1	262	15.0	0.744	47.1	LOS D	6.2	49.0	1.00	0.88	1.20	34.7
3	R2	1	15.0	0.744	57.4	LOS E	6.2	49.0	1.00	0.88	1.20	34.8
Approach		264	15.0	0.744	47.2	LOS D	6.2	49.0	1.00	0.88	1.20	34.7
East: Greenhills Road												
4	L2	1	15.0	0.704	65.0	LOS E	2.2	16.1	1.00	0.81	1.28	29.9
5	T1	43	5.0	0.704	65.0	LOS E	2.2	16.1	1.00	0.81	1.28	30.0
6	R2	356	15.0	0.595	42.6	LOS D	7.8	61.9	0.96	0.81	0.96	34.7
Approach		400	13.9	0.704	45.1	LOS D	7.8	61.9	0.96	0.81	0.99	34.1
North: McGregor Road												
7	L2	1392	15.0	0.899	17.0	LOS B	34.9	276.0	0.54	0.80	0.63	46.1
8	T1	861	15.0	0.603	13.2	LOS B	12.8	101.3	0.65	0.57	0.65	49.8
9	R2	389	5.0	0.399	22.9	LOS C	9.9	72.2	0.62	0.81	0.62	44.6
Approach		2642	13.5	0.899	16.7	LOS B	34.9	276.0	0.59	0.73	0.64	47.1
West: Key Lane												
10	L2	209	5.0	0.107	22.0	LOS C	2.2	16.0	0.51	0.77	0.51	45.2
12	R2	1	5.0	0.006	45.3	LOS D	0.0	0.3	0.92	0.59	0.92	33.7
Approach		211	5.0	0.107	22.1	LOS C	2.2	16.0	0.51	0.77	0.51	45.1
All Vehicles		3517	13.2	0.899	22.5	LOS C	34.9	276.0	0.66	0.75	0.71	43.9

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Movement Performance - Pedestrians									
Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Back of Queue Distance m	Prop. Queued	Effective Stop Rate	
P1	South Full Crossing	53	39.3	LOS D	0.1	0.1	0.94	0.94	
P2	East Full Crossing	53	39.3	LOS D	0.1	0.1	0.94	0.94	
All Pedestrians		105	39.3	LOS D			0.94	0.94	

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

Pedestrian movement LOS values are based on average delay per pedestrian movement.

Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

PHASING SUMMARY

 **Site: 101 [McGHKLn_(AM)]**

McGregor Road / Greenhills Road / Key Lane

PM Peak Hour Conditions

Site Category: AM

Signals - Fixed Time Isolated Cycle Time = 90 seconds (Site User-Given Phase Times)

Timings based on settings in the Site Phasing & Timing dialog

Phase Times specified by the user

Phase Sequence: Split Phasing

Reference Phase: Phase A

Input Phase Sequence: A, B, C, D

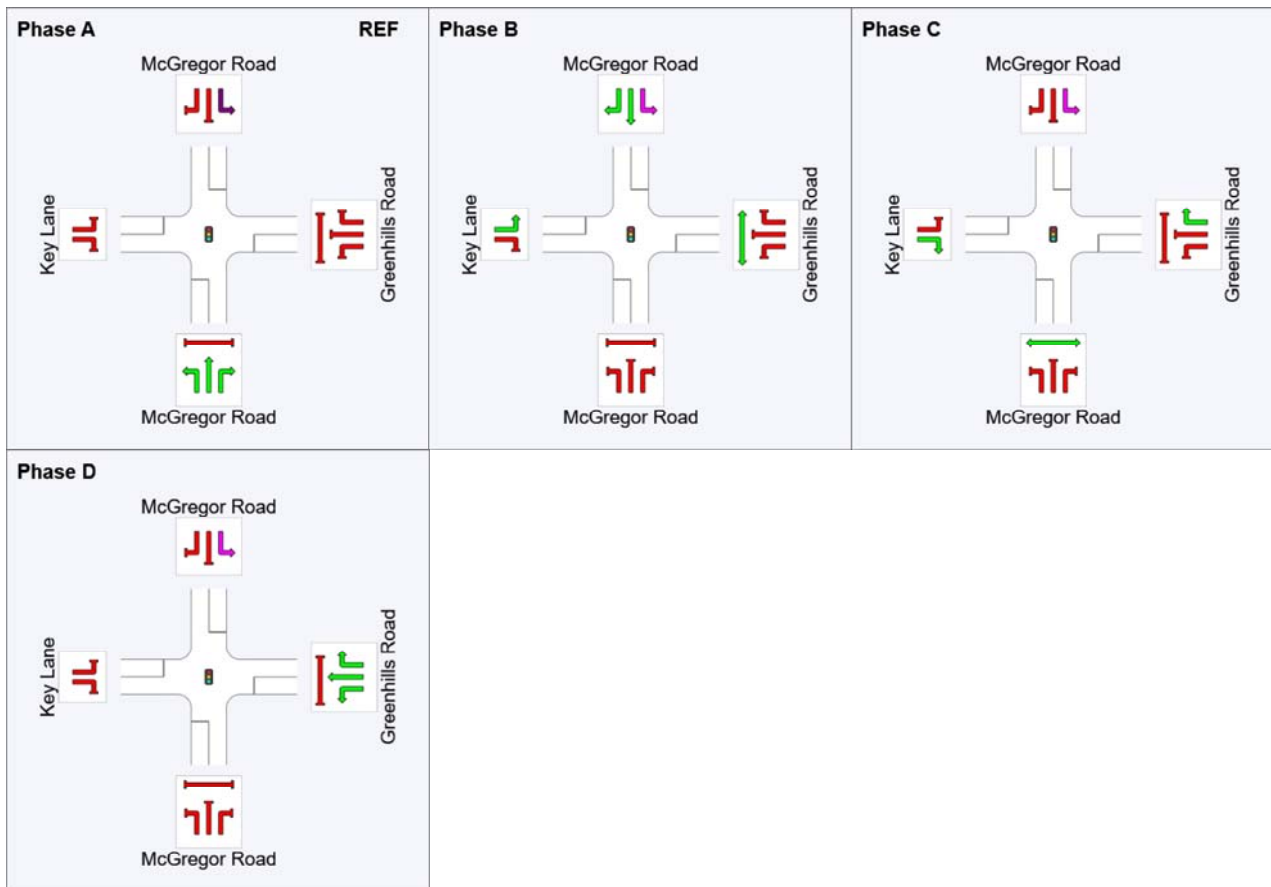
Output Phase Sequence: A, B, C, D

Phase Timing Summary

Phase	A	B	C	D
Phase Change Time (sec)	0	12	67	84
Green Time (sec)	9	49	11	3
Phase Time (sec)	15	55	14	6
Phase Split	17%	61%	16%	7%

See the Phase Information section in the Detailed Output report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

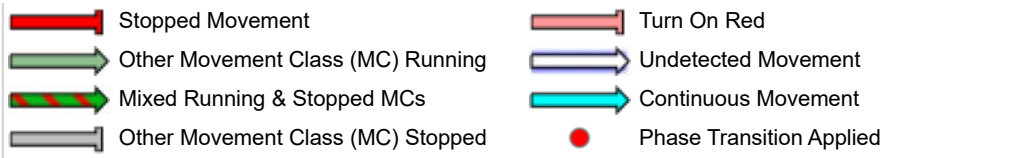
Output Phase Sequence



REF: Reference Phase

VAR: Variable Phase



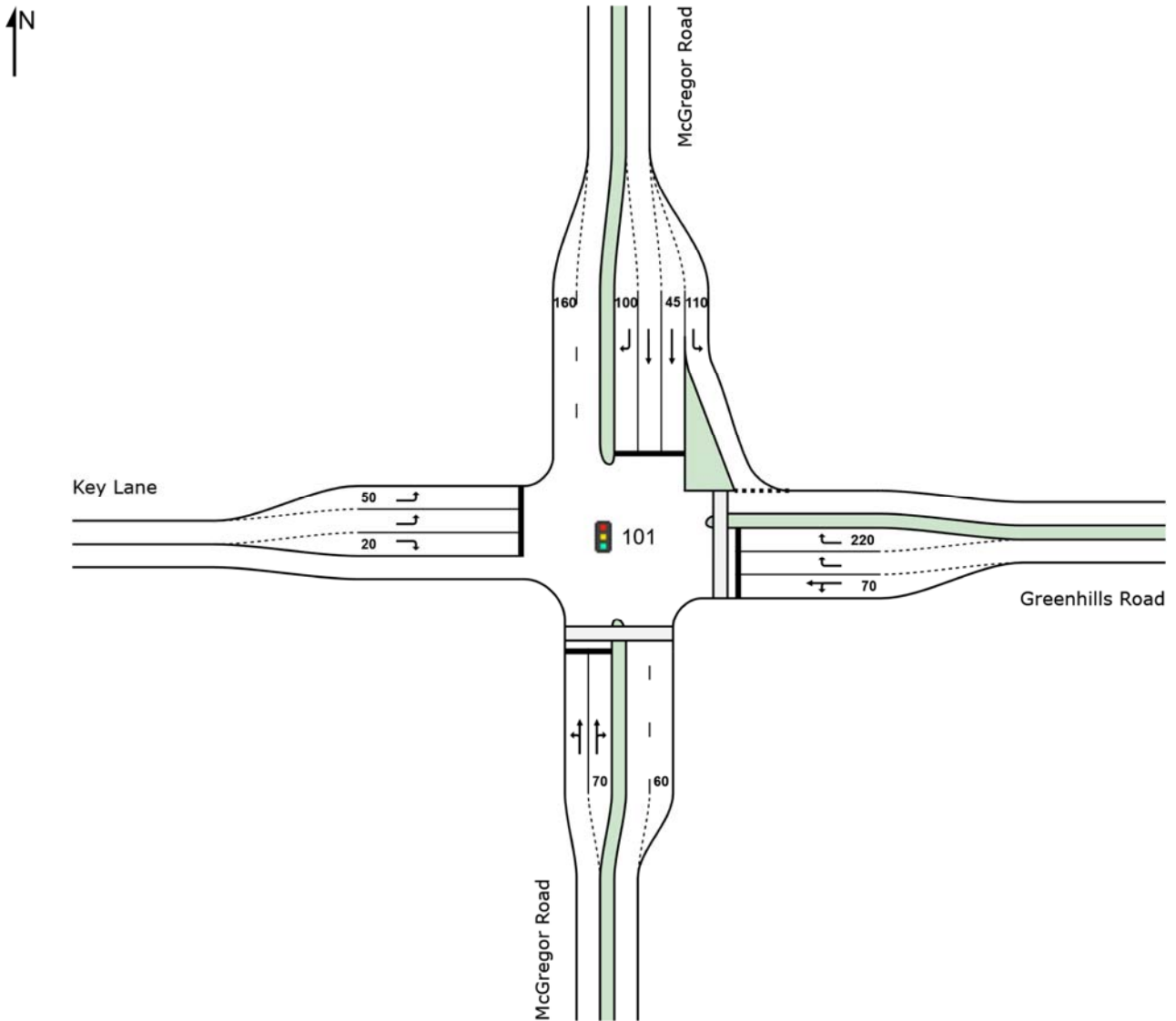


SIDRA INTERSECTION 8.0 | Copyright © 2000-2019 Akcelik and Associates Pty Ltd | sidrasolutions.com
Organisation: RATIO CONSULTANTS PTY LTD | Processed: Wednesday, 2 October 2019 1:35:50 PM
Project: Y:\15501-16000\15633T - 335 McGregor Road, Pakenham\Work\SIDRA\October 2019\15633T-SID08.sip8

SITE LAYOUT

 Site: 101 [McGHKLn_(PM)]

McGregor Road / Greenhills Road / Key Lane
PM Peak Hour Conditions
Site Category: PM
Signals - Fixed Time Isolated



MOVEMENT SUMMARY

 Site: 101 [McGHKLn_(PM)]

McGregor Road / Greenhills Road / Key Lane

PM Peak Hour Conditions

Site Category: PM

Signals - Fixed Time Isolated Cycle Time = 90 seconds (Site User-Given Phase Times)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Back of Queue Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: McGregor Road												
1	L2	1	5.0	0.863	50.8	LOS D	17.7	140.0	1.00	1.04	1.28	34.7
2	T1	714	15.0	0.863	45.2	LOS D	17.7	140.0	1.00	1.04	1.28	35.3
3	R2	1	15.0	0.863	55.4	LOS E	17.7	140.0	1.00	1.04	1.28	35.4
Approach		716	15.0	0.863	45.2	LOS D	17.7	140.0	1.00	1.04	1.28	35.3
East: Greenhills Road												
4	L2	1	15.0	0.086	47.2	LOS D	1.0	7.1	0.89	0.72	0.89	34.7
5	T1	24	5.0	0.086	47.2	LOS D	1.0	7.1	0.89	0.72	0.89	34.8
6	R2	1244	15.0	0.893	38.3	LOS D	33.0	260.6	0.95	0.95	1.11	36.2
Approach		1269	14.8	0.893	38.5	LOS D	33.0	260.6	0.95	0.95	1.11	36.2
North: McGregor Road												
7	L2	559	15.0	0.375	6.4	LOS A	2.4	19.3	0.21	0.61	0.21	53.0
8	T1	378	15.0	0.879	47.2	LOS D	11.5	91.2	0.99	0.94	1.24	34.7
9	R2	217	5.0	0.837	58.1	LOS E	10.6	77.2	1.00	0.95	1.30	31.6
Approach		1154	13.1	0.879	29.5	LOS C	11.5	91.2	0.62	0.78	0.75	40.6
West: Key Lane												
10	L2	455	5.0	0.879	62.9	LOS E	11.6	84.9	1.00	0.99	1.41	30.5
12	R2	1	5.0	0.003	36.2	LOS D	0.0	0.3	0.82	0.60	0.82	36.8
Approach		456	5.0	0.879	62.9	LOS E	11.6	84.9	1.00	0.99	1.41	30.5
All Vehicles		3595	13.1	0.893	40.0	LOS D	33.0	260.6	0.86	0.92	1.06	36.4

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Movement Performance - Pedestrians									
Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Back of Queue Distance m	Prop. Queued	Effective Stop Rate	
P1	South Full Crossing	53	39.3	LOS D	0.1	0.1	0.94	0.94	
P2	East Full Crossing	53	39.3	LOS D	0.1	0.1	0.94	0.94	
All Pedestrians		105	39.3	LOS D			0.94	0.94	

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

Pedestrian movement LOS values are based on average delay per pedestrian movement.

Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

PHASING SUMMARY

 **Site: 101 [McGHKLn_(PM)]**

McGregor Road / Greenhills Road / Key Lane

PM Peak Hour Conditions

Site Category: PM

Signals - Fixed Time Isolated Cycle Time = 90 seconds (Site User-Given Phase Times)

Timings based on settings in the Site Phasing & Timing dialog

Phase Times specified by the user

Phase Sequence: Split Phasing

Reference Phase: Phase A

Input Phase Sequence: A, B, C, D

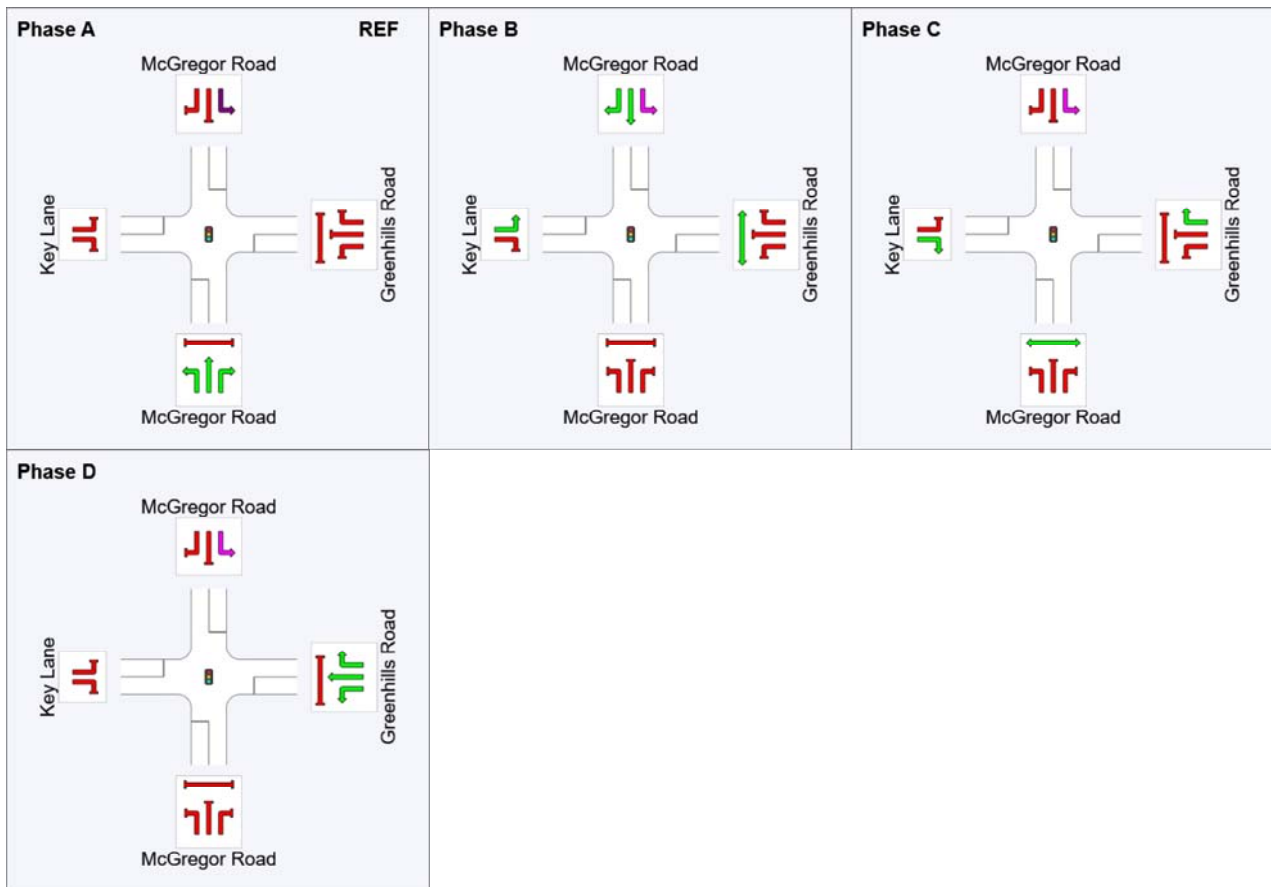
Output Phase Sequence: A, B, C, D

Phase Timing Summary

Phase	A	B	C	D
Phase Change Time (sec)	0	27	46	70
Green Time (sec)	21	13	20	14
Phase Time (sec)	27	17	26	20
Phase Split	30%	19%	29%	22%

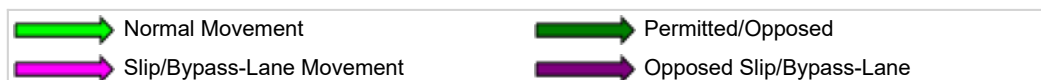
See the Phase Information section in the Detailed Output report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

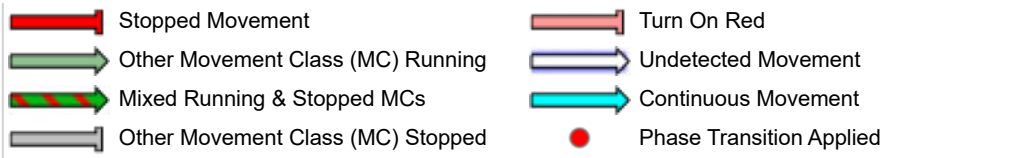
Output Phase Sequence



REF: Reference Phase

VAR: Variable Phase





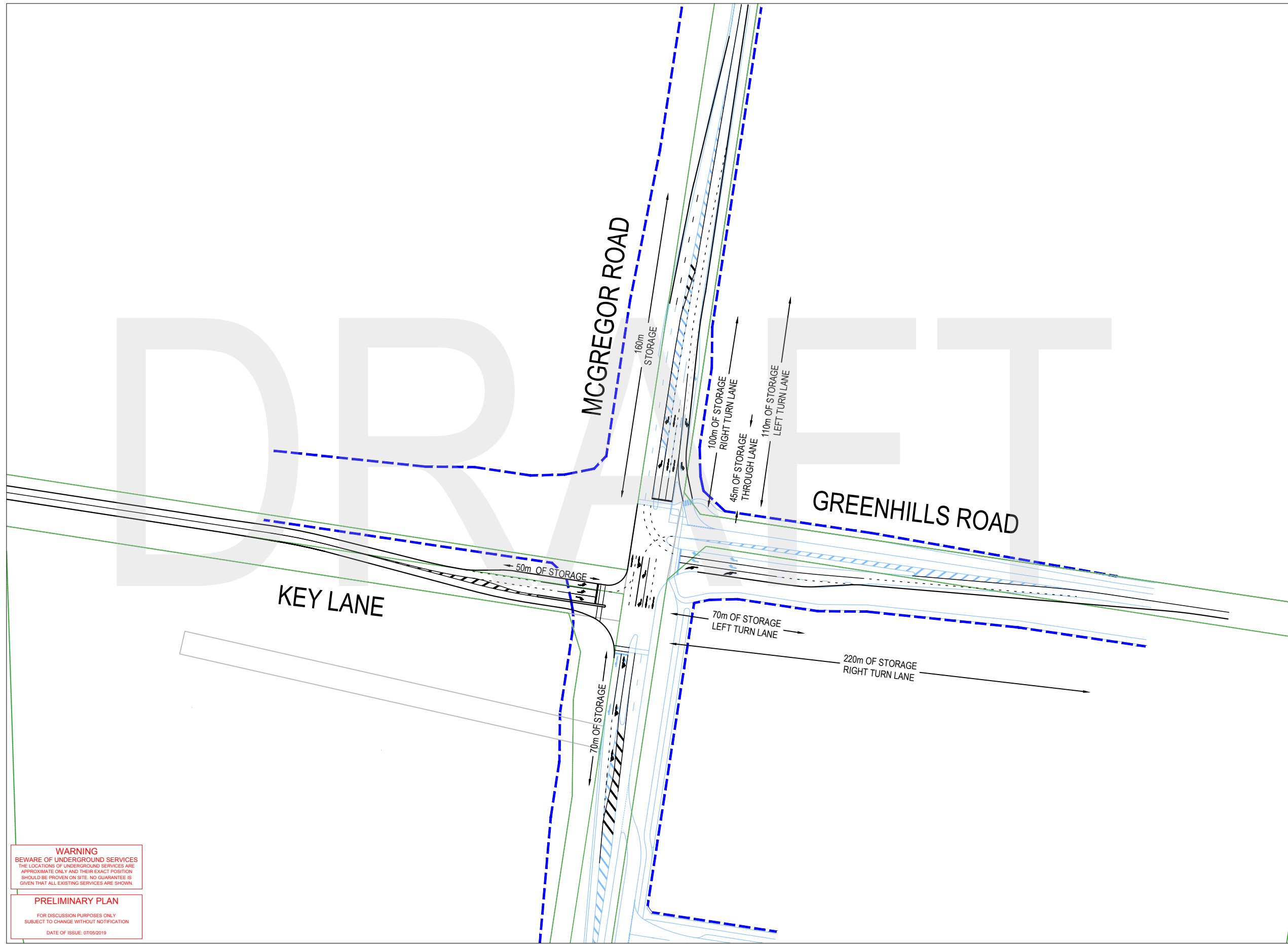
SIDRA INTERSECTION 8.0 | Copyright © 2000-2019 Akcelik and Associates Pty Ltd | sidrasolutions.com
Organisation: RATIO CONSULTANTS PTY LTD | Processed: Wednesday, 2 October 2019 1:35:50 PM
Project: Y:\15501-16000\15633T - 335 McGregor Road, Pakenham\Work\SIDRA\October 2019\15633T-SID08.sip8

Appendix D Concept Layout Plans

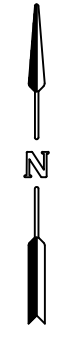


This plan (or the data transmitted herewith) has been prepared to facilitate the construction and should not be used for any other purpose. Ratio accepts no responsibility whatsoever for the use of unapproved plans in any construction or for any commercial purposes. Set-Out dimensions of all design lines, grid lines, control lines, recovery marks and bench marks should be verified and confirmed against the latest information at construction. Ratio is to be notified immediately of any error or discrepancy and the matter resolved prior to the commencement or continuation of any work. This note is an integral part of this plan/data. Reproduction of this plan or any part of it without this note being included in full will render the information shown on such reproduction invalid and not suitable for use.
 DISCLAIMER - Ratio therefore disclaims any liability whatsoever and howsoever caused for loss or damage arising from a third party's misuse of the plan/data (whether inadvertent or not) caused by the failure to inform any such third party of the limitations which apply to the information contained in this plan/within the accompanying data.

LEGEND	
	EXISTING
	MAJOR CONTOUR
	MINOR CONTOUR
	TITLE BOUNDARY
	ROAD RESERVE
	ELECTRICITY
	TELECOM
	WATER
	DRAIN
	SEWER
	GAS
	TOP OF BANK
	TOE OF BANK
	FUTURE DEVELOPMENT
	EXISTING DEVELOPMENT
	PROPOSED LINE MARKING
	PROPOSED KERB



DRAFT



WARNING
 BEWARE OF UNDERGROUND SERVICES
 THE LOCATIONS OF UNDERGROUND SERVICES ARE APPROXIMATE ONLY AND THEIR EXACT POSITION SHOULD BE PROVEN ON SITE. NO GUARANTEE IS GIVEN THAT ALL EXISTING SERVICES ARE SHOWN.

PRELIMINARY PLAN
 FOR DISCUSSION PURPOSES ONLY
 SUBJECT TO CHANGE WITHOUT NOTIFICATION
 DATE OF ISSUE: 07/05/2019

V:\15501-16000\15633T-CLP-002\15633T-CLP-002-C.DWG 02/08/2019 4:39:39 PM

ISSUE	APP'D	DATE	COMMENTS
C	C.H.	02/08/2019	Updated SIDRA lane lengths
B	C.H.	15/07/2019	Updated Plans
A	C.H.	16/05/2019	Initial Issue

GENERAL NOTES	
1.	
2.	
3.	
4.	
5.	
6.	
7.	

DESIGNED	E.Y.	15/07/19
CHECKED	C.H.	15/07/19
AUTHORISED	C.H.	15/07/19
SCALE	1:2000 @ A3	

ratio:
 RATIO CONSULTANTS PTY LTD
 ACN 005 422 104
 8 GWYNNE STREET
 CREMORNE, VICTORIA 3121
 TELEPHONE (03)9429 3111
 FACSIMILE (03)9429 3011

335 McGregor Road, Pakenham Cardinia Shire Council Proposed Intersection Configuration Concept Layout Plan			
DATE	SHEET NO.	DRAWING NO.	ISSUE
15/07/2019	1 of 1	15633T-CLP-002	C