

Reference: #V159103

15 December 2020

Yarra Ranges Council
PO Box 105
LILYDALE VIC 3140

Attention: Mr Damian Closs (Manager Strategic Projects)

Dear Damian

RE: LILYDALE QUARRY SITE REDEVELOPMENT – PEER REVIEW OF TRANSPORT RELATED MATTERS

I refer to your request for review of transport related documents in regard to the proposed Planning Scheme Amendment to rezone the Lilydale Quarry.

A summary of our findings and recommendations are provided in the following report.

Naturally, should you have any questions or require any further information, please do not hesitate to contact me in our Melbourne office on (03) 9851 9600.

Yours sincerely

GTA CONSULTANTS



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Introduction

A Planning Scheme Amendment is being sought by Intrapac for the rezoning of the Lilydale Quarry site.

GTA Consultants has been engaged by Yarra Ranges Council to provide a review of material as it relates to traffic and transport matters.

In this regard this report sets out a review of the following documents:

- Lilydale Quarry Urban Renewal Integrated Transport Plan Report (Cardno, October 2020)
- Lilydale Quarry Urban Renewal Supporting Traffic Impact Assessment Report (Cardno, October 2020)
- DRAFT Yarra Ranges Planning Scheme Amendment Documents
- Lilydale Quarry – Approach to Development Contributions (Urban Enterprise, October 2020)

This report has been prepared to inform Council of outstanding transport related matters that are not considered to have been appropriately addressed or require additional investigations in order to assist them in preparing a response to the proposed amendment material.

It is noted that this review is a continuation of work, previously undertaken by GTA Consultants', reviewing the 2018 Cardno Traffic Impact Assessment report & 2019 Cardno Integrated Transport Plan report.

Lilydale Quarry Urban Renewal Integrated Transport Plan

The 20-Minute Neighbourhood

The Lilydale Quarry Urban Renewal Integrated Transport Plan (ITP) identifies the site as *“a unique opportunity to provide a fully integrated mixed use development, benefitting from its strategic location along the Lilydale train line and its potential for Transit Oriented Development (TOD)”*.

It is agreed that this development has the opportunity to draw on state and local policy and create an integrated development that connects with the surrounding employment, shopping, education and transport infrastructure.

While these opportunities are real and must be capitalised upon, a balance however must be recognised with areas of the site remaining some two kilometres from the existing Lilydale retail centre and railway station. While a new railway station is being contemplated as part of the development there is no certainty that such a station will come to fruition, or at least not for some time.

A Sustainable Transport Opportunity

The proposal is identified to provide *“an ideal opportunity to integrate sustainable transport modes, incorporating TOD principles that will provide permeability within the site and encourage connectivity to the surrounding network”*.

The proposed linkages (for all modes of travel) within the site, must be provided with a focus on how these connect with strategic routes around the site and be tested to ensure that those routes contemplated are deliverable during development of the site (e.g. proposed paths can be accommodated within existing rail reserves north of Melba Avenue).

Proposed road cross sections strongly support walking and cycling modes of transport along with facilitating buses along major routes.

Lilydale Comprehensive Development Plan

The Comprehensive Development Plan identifies that the site will be developed over an extended period of time.

Public Acquisition Overlay 9 (PAO9) is reflected along the northern portion of the site to account for the future Lilydale Bypass, whilst the proposed PAO along the east side of Mooroolbark Road makes allowance for the potential future Healesville Freeway extension (i.e. the Healesville Arterial).

A road hierarchy is depicted consisting of a series of Connector and Access Street.

A series of Precincts numbered 1 through 4 are identified which are understood to reflect the probable order of development stages. The anticipated timing of the delivery of those stages is not identified.

The key road network elements within this plan represents an appropriate layout.

The proposed road hierarchy and associated road cross sections align with typical Victorian Planning Authority standards and appropriately provide quality walking and cycling elements that, where possible, are separated from vehicle movements.

The provision of development precincts provides the opportunity to consider the nature of transport generation across the site and the required staging of infrastructure upgrades.

Integrated Transport Objectives, Requirements & Guidelines

A series of objectives, requirements and guidelines are specified to inform land use and built form decision making.

In general terms the objectives and requirements are considered suitable.

The associated detail related to these requirements is discussed further in the following and requires further resolution.

Concept Masterplan

A Concept Masterplan of the future proposed development of the subject site has been prepared.

The concept Masterplan is considered to be generally satisfactory and depicts an appropriate layout for the site. It is noted that elements of detail will be resolved during detailed planning applications for each of the development stages. The Concept Masterplan however appears to provide suitable detail to guide the internal planning of the site. Further detail regarding the extent of mitigating works required beyond the boundaries of the concept masterplan is required, as discussed in the following sections.

The interfacing of the concept masterplan with the existing surrounding land uses to the east is considered appropriate in providing pedestrian connections through to Lilydale Lake and to Sharnalee Court. While a vehicular connection to Sharnalee Court could benefit residents of the Lakeview Estate and to a lesser extent the proposed development in creating greater vehicular permeability, the existing cross section of Sharnalee Court (approximate 5.0m carriageway) would not be expected to perform a higher

connector street function. As such should Council consider there to be significant benefits in connecting these two estates (in a vehicular form), it would be recommended that local engagement be undertaken with both the Kinley Estate and Lakeview communities to further consider such opportunities and establish whether upgrades to the vehicle carriageway on Sharnalee Court could be undertaken within the available road reservation.

Traffic Impact Assessment

A traffic impact assessment report has been prepared by Cardno to *"identify road network improvements, which would be required should development proceed prior to regional projects being implemented"*.

A summary of this report is provided as part of the ITP.

The review of the overall Traffic Impact Assessment has been provided later in this report rather than commentary being provided upon the summary within the ITP.

Traffic Impact Assessment Report

Existing Conditions

The report sets out transport characteristics surrounding site along with background traffic data / volumes.

Traffic data has been collected over an extended period of time, most dating to 2015. While this data could be considered to be aged, this has been as a result of the protracted amendment development process and subsequently growth factors have been applied to reflect current day volumes.

At this time, it is not proposed that additional base traffic volume data should be collected.

Proposed Development

A mixed use development is anticipated across the site comprising largely residential land uses. Commercial, civic, office, retail and education facilities are also identified.

The development is identified to occur progressively over a 20 year period noting the following with respect of the provision of transport infrastructure.

"As such, the transport network will not be required to cater for projected population immediately. The current and future road and movement network will be considered further as part of the precinct planning stages, responding to the immediate development access needs whilst still considering the ultimate transport network structure.

Development staging will be determined largely by the development proposals on land within the precinct and the availability of infrastructure services."

"This traffic impact assessment has been prepared considering the overall traffic generation of the Kinley development. It is assumed that detailed assessments will be undertaken as development progresses to meet the infrastructure upgrades requirements of each additional stage and precinct."

The identified development yield provides an appropriate breakdown of land uses and typology (particularly relating to residential dwellings) to enable consideration of the transport impacts on the site.

The development of the site is anticipated to happen over the next "20-plus year period" however there is limited explanation to how this will happen, and which works will support which stage of the development. While it is recognised that the surrounding mitigation works have been established for the ultimate development scale further assessment is required to identify how these works would likely occur and the 'Stage' trigger point which would require certain works to be completed.

Further discussion is provided in the following sections of this report relating to the extent of mitigating works required, however on the assumption of mitigating works currently identified by the Cardno report to be required / proposed these would be anticipated to be linked with the following development stages (as identified within Figure 3-1 of the Cardno report) as follows:

- Upgrades to Mooroolbark Road / Maroondah Highway intersection – To be completed prior to the opening of Development Stage 2, Precinct 1
- Upgrades to Mooroolbark Road / Hull Road intersection – To be completed prior to the opening of Development Stage 2, Precinct 1
- Signalisation of Mooroolbark Road / Churchill Drive intersection – To be completed prior to the opening of Development Stage 2, Precinct 1
- Signalisation of Mooroolbark Road / Landscape Drive intersection – To be completed prior to the opening of Development Stage 2, Precinct 1
- Signalisation of Honour Avenue / Hull Road intersection – To be completed prior to the opening of Development Stage 2, Precinct 3
- Roundabout at Hutchinson Street / Melba Avenue intersection – To be completed prior to the opening of Development Stage 2, Precinct 2
- Upgrades to Hutchinson Street / John Street intersection – To be completed prior to the opening of Development Stage 2, Precinct 2
- Upgrades to Hull Road / Swansea Road intersection – To be completed prior to the opening of Development Stage 2, Precinct 3
- Signalisation of Hutchinson Street / Maroondah Highway intersection – To be completed prior to the opening of Development Stage 2, Precinct 2

It is noted that the above commentary is provided on the general basis of proximity of development stage to intersection location and the likely impact of development stages to intersection operations as compared with detailed traffic modelling of impact. This should be undertaken by the applicant to ensure that an overall plan for infrastructure provisions is identified at this time. The above also assumes that development precincts proceed in order of 1 through 4. A change to the order and size of the delivery of precinct stages may result in the need to bring forward certain intersection works.

During the identification of more detailed staging of intersection works it is recommended that triggers be identified relating to the number of lots rather the general stage.

Car Parking Assessment

Indicative car parking requirements have been identified, primarily on the basis of car parking rate requirements specified within Column B of Table 1 to Clause 52.06 of the Yarra Ranges Planning Scheme.

The adoption of standard Planning Scheme rates at this time would be considered appropriate in order to identify the indicative future parking requirements of the site. Detailed parking requirements for individual land uses should be calculated as part of specific planning permit applications for individual land uses.

Specific commentary has been provided with respect of a number of land uses not covered by the standard planning scheme rates including the proposed Government Specialist School, Train Station and Recreational Reserve.

These parking assessments are important to inform the calculation of traffic generation, however primarily should form a consideration as part of a Planning Permit Application.

Traffic Impact Assessment

Traffic Generation

Traffic generation rates have been derived for each of the proposed land uses within the site as summarised within Table 5.7 of the Supporting Traffic Impact Assessment. The table is reproduced below as Figure 1 for reference.

Figure 1: Cardno Proposed Traffic Generation Rates

Table 5-7 Kinley Development Trip Generation Rates

Development Use		AM Peak Hour Generation	PM Peak Hour Generation
Low Density (Conventional Dwellings)		0.7 trips per dwelling	0.7 trips per dwelling
Large Medium Density		0.65 trips per dwelling	0.65 trips per dwelling
Medium Density (Townhouses)		0.5 trips per dwelling	0.5 trips per dwelling
High Density (Apartments)		0.3 trips per dwelling	0.3 trips per dwelling
Potential Future Train Station (Car Parking)		0.5 trips per space	0.5 trips per space
Proposed Government Specialist School		0.4 trips per student	0.2 trips per student
Town Centre	Civic Institution	N/A	N/A
	Retail Opportunity	10% of 8 trips per 100m ² LFA	8 trips per 100m ² LFA
	Office Commercial	1.5 trips per 100m ² NFA	1.5 trips per 100m ² NFA
Mixed Use Commercial (Super Lot)		2.2 trips per 100m ² GFA	2.2 trips per 100m ² GFA
Open Space		N/A	N/A

Residential

There are a number of components which make up the residential traffic generation considerations as follows:

- The appropriateness of traffic generation surveys undertaken at the adjacent Lakeview Estate by Cardno
- Internal and external traffic factors
- Transit Orientated Development considerations
- Low density, medium density and high density dwelling typology

Having regard to the combination of these considerations, the residential traffic generation rates adopted by Cardno, could be considered appropriate and fit for purpose.

Mixed Use Commercial Super Lot

The report indicates that the commercial development located on the corner of Maroondah Highway and Mooroolbark Road will be serviced by left in left out access to Maroondah Highway as well as an internal access road within the development. The trip generation rates adopted appear reasonable.

It is however understood that the Department of Transport has raised concerns regarding the proposed access strategy to the arterial road network. Satisfactory resolution of the proposed access strategy is required as the implication of access arrangements for this specific land parcel will have flow on effects to the distribution of traffic for the site and the level of traffic accessing the site through other site access intersections.

Potential Future Train Station

A traffic generation rate of 0.5 vehicle movements per parking space is considered reasonable and consistent with recent surveys undertaken by GTA Consultants.

Proposed Government Specialist School

It is noted that the Cardno report talks to the nature of the surrounds and the abundance of local schooling options which would give rise to the proposed school serving a very local catchment that would be made up of many non vehicular trips.

However the nature of the school being a 'specialist' school (rather than a primary school as previously described) may give rise to a different demographic of students and a broader catchment to that described by Cardno.

This would likely result in a higher traffic generation rate to that adopted within the Cardno report. The Cardno report identifies a traditional generation rate in the order of 0.75 trips per student, however, reduces this to a rate in the order of 0.4 trips per student during the AM peak and lower during the PM peak.

While some reductions to the standard trip generation rates could be expected, the extent adopted by the Cardno report for the 'Specialist School' may not be appropriate. It is however also important that a double counting of trips with those generated by residential dwellings does not occur.

Given the elements of uncertainty that may exist around the ultimate future configuration of a school (specialist or primary school), it would be recommended that further consideration be given to the appropriateness of these rates.

Town Centre

The trip generation rates adopted for the town centre (Civic, Retail & Commercial) appear reasonable and representative of the extent of traffic likely to be generated by the land uses to the external road network.

Recreational Reserve

The assumption that the recreational reserve will mainly attract traffic outside of peak times is considered reasonable.

Summary

Overall, the trip generation rates for the majority of uses presented in the report appear reasonable and could be considered to be fit for purpose. While further considerations are required for a specific uses as identified above, the impacts of changes to these traffic generation rates are likely to be minor in the context of the overall site traffic generations.

Traffic Distribution

The distribution of traffic has been undertaken having regard for different trip types likely to be generated by the development establishing the overall distribution of traffic along key arterial roads.

The adopted distributions are not dis-similar to the proportions of key turning volumes at key intersections in the vicinity of the site, and as such are generally considered to be fit for purpose.

An anomaly in the distribution of traffic however may appear in the distribution of traffic along John Street to the west of Hutchison Street.

In the first instance the distribution of traffic along John Street aligns with existing turning movement activity at the intersection of John Street and Hutchison Street, with some additional focus on traffic travelling north to the intersection of Hutchison Street and Maroondah Highway rather than turning east or west at John Street. The distribution of traffic along John Street in a manner consistent with the desire lines of existing traffic movements could be considered to represent a reasonable approach.

The continued distribution of traffic along John Street to the west of Hutchison Street, may however, have not had due regard for the potential capacity constraints of John Street (to be discussed later) and the potential desired changing nature of John Street as result of the relocation of the Lilydale Railway Station to the south of Maroondah Highway.

The relocation of the railway station creates an increasing focus on pedestrian and public transport movements along William Street and John Street compared to current. In turn this may result in a desired focus on reducing traffic capacity on John Street with a greater focus on Maroondah Highway to carry traffic flows.

As a process, the initial assignment of traffic to John Street could be considered reasonable, however this level of traffic assignment must be assessed to determine if it can be carried within the capacity of the road. If the roadway is shown to be reaching capacity and the impacts cannot be mitigated, then consideration must be given to the reassignment of traffic to appropriate routes where capacity may exist.

In this instance, the capacity of John Street and the intersection of John Street and Maroondah Highway has not been assessed within the Cardno Traffic Impact Assessment. As such the suitability of the directional assignment of traffic along John Street, as compared with along Hutchison Street to Maroondah Highway requires further consideration.

Anticipated Traffic Volumes

Post development traffic volumes have been derived by adding the site generated traffic volumes to background traffic volumes.

While noting the commentary provided above with respect of traffic distributions, the anticipated future traffic volumes could be considered fit for purpose.

Intersection Analysis

The key metrics by which to judge the performance of intersections is identified to be the Degree of Saturation (DoS), 95th Percentile Queue and Average Delay.

With respect of the DoS measure the report identifies *“It is considered acceptable for some critical movements in an intersection to operate in the range of 0.9 to 1.0 during the high peak periods, reflecting actual conditions in a significant proportion of inner-city signalised intersections”*.

While it is recognised that some inner city intersections operate with existing conditions at a DoS level of 1.0, reflecting the intersection operating at capacity, this is not considered to represent an appropriate design objective or scenario¹. The Integrated Transport Plan further identifies the following as appropriate limits for intersection operation.

“As detailed in the DoT Supplement to Austroads Guide to Traffic Management Part 3: Traffic Studies and Analysis, in evaluating intersection performance during capacity analysis and design the target maximum Degree of Saturation (DoS) of the critical (maximum) movement is:

- 0.90 (desirable) and 0.95 (maximum) for signalised intersections; and
- 0.80 (desirable) and 0.85 (maximum) for un-signalised intersections, including roundabouts.”

These limits as specified by Austroads indicate that a DoS level below 1.0 should be adopted as the maximum operating conditions of an intersection. Beyond this level queuing and delays begin to increase disproportionately.

It is recognised that the future operation of intersections must be considered in the context of the existing operating conditions, for which it is reasonable to expect future development to provide mitigating works to return intersections back to their existing levels, but also the limits of intersection operations and in some instances existing capacity can be utilised to support new development.

This must however be reasonably balanced to ensure that the concept of development contributions are considered and fairly met. These concepts of development contributions include:

- **Need:** Does the proposed development generate a need for mitigating works to be undertaken
- **Nexus:** Is there a logical link between the works and the development
- **Equity:** Is it fair in the context of the surrounds and other development for the works to be attributed to the particular development.

As such key questions that must be asked in considering the intersection operation and proposed mitigating works include:

- Are the mitigation measures appropriate and can they be supported by Council (e.g. removing parking to create additional traffic capacity and what is the subsequent impact to surrounding land holders of this decision)?
- Do the proposed works have the necessary effect?
- Do the proposed works go far enough in mitigating the impacts created by the proposed development?

Site Access Intersections

Mooroolbark Road / Site Access / Churchill Drive

The intersection is proposed to form a signalised cross intersection.

The Sidra results indicate that this intersection would operate within appropriate limits.

¹ It is recognised that in such instance the onus should not necessarily be placed on a developer to return the intersection to below this level if these existing conditions are beyond this level.

It is however noted that the signal cycle time is not consistent between the Maroondah Highway / Mooroolbark Road intersection (AM - 130 sec, PM – 100 sec) and the new site access intersections along Mooroolbark Road (85 to 90 sec). It would be expected that the Department of Transport would require consistent cycle times to be adopted to ensure these intersections can be coordinated.

While a longer cycle time would typically reduce the DoS on primary movements, increases to queuing and delays can occur. Updated intersection operational analysis should be undertaken to confirm the continued suitability of these intersections and the interaction of queuing along Mooroolbark Road.

Notwithstanding it is likely that the scale of these site access intersections would be suitable for the volume of traffic expected to be carried.

Mooroolbark Road / Site Access / Landscape Drive

The intersection is proposed to form a signalised cross intersection.

The Sidra results indicate that this intersection would operate within appropriate limits.

As per discussions regarding Churchill Drive, similar signal cycle time issues occur and require rectification.

Notwithstanding it is likely that the scale of these site access intersections would be suitable for the volume of traffic expected to be carried.

Honour Avenue / Hull Road

The intersection is proposed to form a signalised T intersection.

The Sidra results indicate that this intersection would operate within appropriate limits.

It is however noted that the signal cycle time is not consistent between the Hull Road / Mooroolbark Road intersection (AM – 70 – 115 sec) and the new site access intersection along Hull Road (60 sec). It would be expected that the Department of Transport would require consistent cycle times to be adopted to ensure these intersections can be coordinated given the spacing between these intersections.

While a longer cycle time would typically reduce the DoS on primary movements, increases to queuing and delays can occur. Updated intersection operational analysis should be undertaken to confirm the continued suitability of these intersections and the interaction of queuing along Mooroolbark Road.

Hutchinson Street / Jarlo Drive / Melba Avenue

The intersection is proposed to form a roundabout controlled T intersection.

The Sidra results indicate that this intersection would operate within appropriate limits and is considered satisfactory.

It is also understood that this intersection has been designed within the boundaries required to facilitate a future more significant intersection with the Lilydale Bypass at this location. The timing of the bypass currently remains unknown.

Existing External Intersections

Hutchinson Street / John Street

Upgrades proposed to mitigate traffic impacts caused by the proposed development at the intersection of Hutchinson Street and John Street include the provision of a dedicated right turn lane on the eastern approach,

alterations to parking restrictions on a number of approaches, extensions to right turn lanes on the western and southern approaches and alterations to the signal phasing and/or timing.

This intersection represents the key northern access point to the surrounding road network for the Kinley Estate, however is constrained by limited road reserves. The additional traffic volumes are identified to take the intersection beyond capacity however the suite of mitigating works return the intersection to an operation at its capacity limit. Long queues are expected to be created on the southern intersection approach (Hutchison Street), however delays are identified to remain reasonable.

The proposed works will require agreement from Council to a loss of on-street parking in order to be able to deliver the capacity improvements to the intersection that are required.

Having consideration for the road reserve constraints at this location, and that delays across the intersection are not significantly increased this could be considered to represent an acceptable outcome.

Victoria Road / Maroondah Highway / Mooroolbark Road

A suite of upgrades are proposed to mitigate traffic impacts caused by the proposed development at the intersection of Victoria Road, Maroondah Highway and Mooroolbark Road.

These works include the provision of a full length left turn lane on the southern approach, extension of the existing right turn lane on the southern approach, a full length departure lane on the southern leg, extension of the existing short departure lane on the eastern leg, provision of double right turns on the western approach and alterations to the signal phasing and/or timing.

The existing intersection currently operates at or close to capacity. The mitigating works seek to return the intersection to a DoS below 1.0 however does not return many approaches of the intersection its current level of operation. Queuing is increased significantly on many approaches.

Improvements to the intersection could be achieved through lengthening short turn lanes and short departure lanes on the eastern Maroondah Highway intersection approach, however it is recognised that significant topography constraints may exist which limit the ability to achieve such changes.

The suitability of the mitigating works at this intersection are deferred to DoT given that both Maroondah Highway and Mooroolbark Road fall under their control.

Mooroolbark Road / Hull Road

Upgrades proposed to mitigate traffic impacts caused by the proposed development at the intersection of Mooroolbark Road and Hull Road include the provision of extended right turn lane on the northeast (Hull Road) approach, an additional short through traffic lane on the northeast (Hull Road) approach and departure, an additional right turn lane on the northwest (Mooroolbark Road) approach, an extended left turn lane and conversion to a shared left/through lane on the southwest (Hull Road) approach and review and alteration of the signal phasing and/or timing.

While it is acknowledged that this intersection currently exceeds its operational capacity on some approaches and that significant improvements and investment has been considered for this intersection, this intersection will in the future operate with DoS levels exceeding 1.0 on all approaches in both the AM and PM peak hour periods. As such the extent of mitigating works could not be considered to be appropriate at this time.

It is recognised that additional turning lanes cannot be simply added to the intersection due to constraints created by the rail line however the further extensions to short lanes on all approaches should be further considered to more appropriately mitigate the impacts at this intersection.

Swansea Road / Hull Road

Upgrades proposed to mitigate traffic impacts caused by the proposed development at the intersection of Hull Road and Swansea Road include the conversion of the existing dedicated left turn lane on the western approach to a left / through lane and the review and alteration of the signal phasing and/or timing.

The existing intersection operates within its capacity limits however following the development of the Kinley Estate this intersection (with the proposed mitigating works) will operate above its capacity limit of 0.95 with significant increases to queues and delays on all approaches. This includes the extension of queuing within short turn lanes beyond the length of these lanes impacting the operation of through traffic vehicles.

As such the impacts to this intersection could not be considered to have been mitigated through the works proposed. Further consideration should be given to the opportunity to extend turn lanes on all intersection approaches in order to more suitably accommodate queue lengths within the short turn lane length in order to mitigate the development impacts.

Any proposed changes to cycle times at this intersection should also consider any flow on adverse impacts to the operation of linked traffic signals at the intersection of Swansea Road and Birmingham Road.

Anderson Street / Hardy Street

No works are proposed to be undertaken at this intersection.

Sidra analysis prepared by Cardno indicates that this intersection currently operates at or above capacity. The level of additional traffic generated to this intersection will continue to worsen the operation of this intersection, impacting queuing and delays on all approaches.

Detailed SIDRA outputs have not been included as part of the Cardno Transport Impact Assessment report appendix and as such it is difficult to provide further comment at this time on whether further intersection works could be undertaken to mitigate the development impacts.

Anderson Street / Maroondah Highway

No works are proposed to be undertaken at this intersection.

While the operation of this intersection will become more congested in its post development state, DoS levels will remain generally within appropriate limits along with limited increases to queuing and delays.

As such the post development operation of this intersection could be considered acceptable at this time.

Maroondah Highway / Hutchinson Street

The Cardno report identifies that *"It is understood that the Maroondah Highway / Hutchinson Road intersection will ultimately be upgraded to a signalised intersection as part of the Yarra Ranges Shire's Lilydale Integrated Transport Plan"*. As such intersection analysis has been undertaken on the basis that this intersection will be signalised in future years.

It is however unclear from the Cardno report who will be responsible for the signalisation of this intersection.

The absence of the works at this intersection from the proposed Development Contributions Plan however would indicate that the developer does not intend to fund the signalisation of this intersection.

This intersection provides an important link between the Kinley Estate and the surrounding arterial road network.

While the Integrated transport plan identifies a strategic intent that this intersection would be signalised in future years, such need to signalise this intersection is borne from the creation of a significant north-south road serving the Kinley Estate.

As such the signalisation of this intersection must be included as part of the mitigating works proposed by the Kinley Estate to provide suitable capacity for the development to access the surrounding arterial road network.

The importance of this connection for the Kinley Estate is further emphasised with the proposed Level Crossing removal works and relocation of the Lilydale Railway Station (to a location between John Street and Maroondah Highway) which will result in a likely changing function of John Street with a greater pedestrian and bus focus particularly around the station precinct which will lessen the capacity and attractiveness of vehicles travelling along John Street in order to access Maroondah Highway.

It is noted that in its signalised form this intersection would operate satisfactorily under post development conditions.

Further to the above, should this intersection not be signalised, this would likely alter the distribution of traffic at the intersection of Hutchison Street and John Street. Subsequently the extent of mitigating works at the intersection of Hutchison Street and John Street and intersections further abroad (Hardy Street and Anderson Street) would likely be required to be altered to that identified by Cardno.

Maroondah Highway / John Street

This intersection has not been assessed as part of the Cardno Traffic Impact Assessment report.

On the basis of the significant distribution of development traffic along John Street to and from Maroondah Highway by Cardno, an assessment of the Intersection of John Street and Maroondah Highway is warranted to be undertaken.

The capacity limitations of John Street in its current form (level and type of traffic currently being carried by the road) and future form (with the presence of the Railway Station increasing the road pedestrian and public transport focus) must also be suitably considered, and as relevant, traffic impacts mitigated or traffic redistributed to other routes away from John Street. In the instance of traffic being redistributed away from John Street, any associated impacts must also be suitably mitigated.

Other

Having regard to the significant traffic volumes being generated by the proposed development along Hutchison Street and Hull Road (in comparison to existing volumes) it is recommended that consideration be given to the increasing through traffic movements on the operation of the following unsignalized intersections:

- Intersection of Hull Road and Lakeside Drive (x2)
- Intersection of Hutchison Street and Lilydale Marketplace
- Intersection of Hutchison Street and Lilydale High School Car Park

Summary

While the localised site access intersections with the immediate interface of the Kinley Estate appear to have been appropriately designed, the additional works proposed at surrounding intersections do not appear, in many instances, to mitigate the impact of the development on the external road network.

As such it is recommended that further works and/or additional analysis be considered at the following intersections:

- Victoria Road / Maroondah Highway / Mooroolbark Road
- Mooroolbark Road / Hull Road
- Swansea Road / Hull Road
- Anderson Street / Hardy Street
- Maroondah Highway / John Street
- Hull Road / Lakeside Drive (x2)
- Hutchison Street / Lilydale Market Place
- Hutchison Street / Lilydale High School

In addition, the signalisation of the intersection of Maroondah Highway and Hutchison Street must be included as a project to be funded by the proposed development rather than expecting that this will be undertaken by others.

While it is recognised that in some instances physical constraints may exist which limit the ability to further extend the proposed mitigating works, such circumstance must be justified.

Planning Scheme Amendment Documents

The proposed Schedule 1 to Clause 37.02 Comprehensive Development Zone (CDZ) sets out various requirements including the need to obtain a planning permit, which may be obtained in Stages.

A permit application is required to include "A Precinct Integrated Traffic and Transport Management Plan that promotes walking, cycling and public transport".

The plan is to identify:

- *"Location of proposed roads, pedestrian, cyclist and vehicle access points;*
- *Details of how the objectives of the Former Lilydale Quarry Integrated Transport Plan, October 2020 have been addressed.*
- *An assessment of the impact of traffic generated by the precinct upon the surrounding road network.*
- *Address internal road design requirements.*
- *Predicted traffic volumes.*
- *An assessment of potential traffic mitigation works and traffic management measures that may be required within and external to the site, including the staging of the measures and external works.*
- *Details of proposed connections to the surrounding road network, where relevant*
- *Details of internal and external intersections, performance and treatments.*
- *Details of the location of and linkages to public transport*
- *An assessment of car parking demand*
- *An assessment of public transport services in the locality, existing stops and any additional stops or infrastructure prepared in consultation with the relevant Victorian public transport authority.*
- *Details of cycling and pedestrian infrastructure, including links to significant destinations and the potential future train station."*

The Schedule also identifies that an Infrastructure Contributions Agreement must be put in place prior to the granting of a permit to subdivide or construct a building or construct or carry out works.

These requirements of the Schedule to the CDZ provide the opportunity for the matters raised in the above review of the Transport Impact Assessment to be dealt with prior to the finalisation of the agreement of necessary transport mitigation measures.

However, it is noted that the granting of a permit in stages could be used to diminish the overall impact of the development on the surrounding transport network. As such it is recommended that a requirement be put in place for the site wide transport mitigation measures, particularly to the external road network be agreed separately and more holistically to the precinct plans. This will ensure that the extent of mitigation works are agreed up front and the focus of precinct plans (subject to the development scale remaining in line with that agreed) can be primarily upon the internal operations of the site.

Approach to Development Contributions

The Approach to Development Contributions report prepared by Urban Enterprise identifies the proposed mitigation measures identified by the Cardno Traffic Impact Assessment Report.

The report identifies the apportionment of these works to be solely the responsibility of the Kinley Estate development.

The report also identifies triggers for the provision of identified transport related infrastructure.

The Approach to Development Contributions report in isolation appears reasonable in its inclusion of the proposed works identified by the Cardno Traffic Impact Assessment Report.

However as identified in earlier discussions, the following matters require further resolution which will ultimately impact the outcomes of the Approach to Development Contributions report.

- The required inclusion of the signalisation of intersection of Maroondah Highway and Hutchison Street as the responsibility of the Kinley Estate development, and
- The extent of other mitigation works to surrounding intersections.

While the identified triggers provide additional detail to that identified elsewhere within the Traffic Impact Assessment report prepared by Cardno, it should be required that further analysis and justification be provided as part of the Traffic Impact Assessment Report to support the identified timing / triggers. This is required to confirm that the interim conditions and proposed levels of development can be accommodated within the staged infrastructure works.

Summary of Assessment

On the basis of the above commentary the following provides a summary of key elements:

- It is agreed that this development has the opportunity to draw on state and local policy and create an integrated development that connects with the surrounding employment, shopping, education and transport infrastructure.
- The proposed road hierarchy and associated road cross sections align with typical Victorian Planning Authority standards and appropriately provide quality walking and cycling elements that, where possible, are separated from vehicle movements.
- The adoption of standard Planning Scheme rates at this time would be considered appropriate in order to identify the indicative future parking requirements of the site. Detailed parking requirements for individual land uses should be calculated as part of specific planning permit applications for individual land uses.
- The trip generation rates for the majority of uses appear reasonable and could be considered to be fit for purpose.
- The adopted traffic distributions are generally considered to be fit for purpose with the exception of the distribution of traffic along John Street to the west of Hutchison Street which requires further consideration.
- Site access intersections are generally identified to operate appropriately, however updated intersection operational analysis should be undertaken to coordinate cycle lengths with nearby external intersections.
- The works proposed at surrounding external intersections do not appear, in many instances, to mitigate the impact of the development on the external road network. As such it is recommended that further works and/or additional analysis be considered at the following intersections:

- Victoria Road / Maroondah Highway / Mooroolbark Road
- Mooroolbark Road / Hull Road
- Swansea Road / Hull Road
- Anderson Street / Hardy Street
- Maroondah Highway / John Street
- Hull Road / Lakeside Drive (x2)
- Hutchison Street / Lilydale Market Place
- Hutchison Street / Lilydale High School
- The signalisation of the intersection of Maroondah Highway and Hutchison Street must be included as a project to be funded by the proposed development rather than expecting that this will be undertaken by others.
- The Schedule to the CDZ provides the opportunity for the matters raised in the above review of the Transport Impact Assessment to be dealt with prior to the finalisation of the agreement of necessary transport mitigation measures, however it is recommended that a requirement be put in place for the site wide transport mitigation measures, particularly to the external road network be agreed separately and more holistically.
- The Approach to Development Contributions report in isolation appears reasonable in its inclusion of the proposed works identified by the Cardno Traffic Impact Assessment Report, however as identified, the following matters require further resolution:
 - The required inclusion of the signalisation of intersection of Maroondah Highway and Hutchison Street as the responsibility of the Kinley Estate development, and
 - The extent of other mitigation works to surrounding intersections.
- Further analysis and justification should be provided as part of the Traffic Impact Assessment Report to support the identified timing / triggers identified in the Approach to Development Contributions report.