Mortlake Elders

Transport Impact Assessment

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12 July 2024

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one*mile****grid*** *operates from Wurundjeri Woiworung Country of the Kulin nation. We acknowledge and extend our appreciation to the Wurundjeri People, the Traditional Owners of the land. We pay our respects to leaders and Elders past, present and emerging for they hold the memories, the traditions, the culture, and the hopes of all Wurundjeri Peoples.*

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1 INTRODUCTION

onemile**grid** has been requested by Outlook Property Services Pty Ltd to undertake a Transport Impact Assessment of the proposed restricted retail development at Lot 1/TP960462, Hopkins Highway, Mortlake.

As part of this assessment the subject site has been inspected with due consideration of the development proposal, traffic data has been sourced, and relevant background information has been reviewed.

2 EXISTING CONDITIONS

2.1 Site Location

The subject site is parcelled as Lot 1/TP960462, and is located on the northwestern corner of the intersection between Hopkins Highway and Sagnols Lane as shown in Figure 1. The site is trapezoidal in shape and contains road frontages of approximately 540 m to Hopkins Highway, and 50 m to Sagnols Lane.

Figure 1 Site Location

Source: OpenStreetMap

The site is currently vacant. An unsealed service road to Hopkins Highway is currently situated adjacent the eastern boundary of the site. Vehicular access is currently provided via a service road which circulates one-way between a southern ingress point and a northern egress point.

Land use in the immediate vicinity of the site is typically farmland in nature, and includes some industrial uses to the northwest and residential development and the Mortlake Town Centre to the northeast.

An aerial view of the subject site is provided in Figure 2.

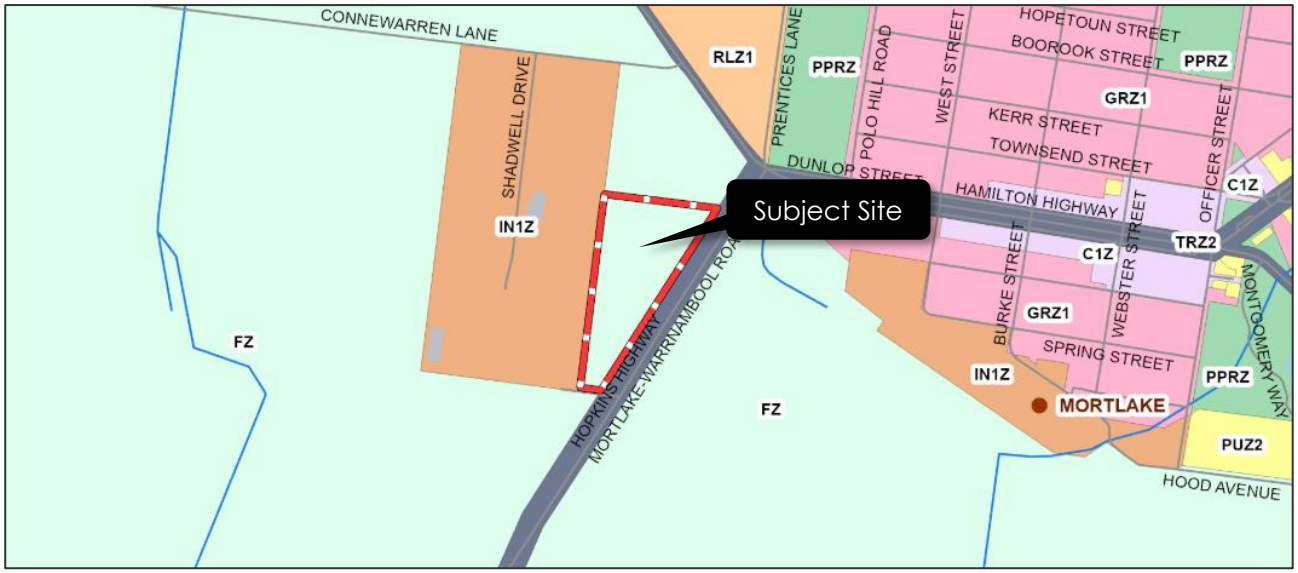
Figure 2 Site Context

Copyright Google Maps

2.2 Planning Zones and Overlays

It is shown in Figure 3 that the site is located within a Farming Zone (FZ). Additionally, the site abuts Hopkins Highway, which is within a Transport Zone (TRZ2), designating the Principal Road Network.

Figure 3 Planning Scheme Zones



2.3 Road Network

2.3.1 Hopkins Highway

Hopkins Highway is a Department of Transport and Planning (DTP) controlled arterial road generally aligned north-south, running between Hamilton Highway in the north, and Cramer Street in the south. Hopkins Highway provides a single traffic lane and paved shoulder in each direction across a 7.3 m wide carriageway, adjacent to the site.

An informal service road for Hopkins Highway is currently provided adjacent the eastern property boundary of the site, and currently provides ingress access from the south, and egress to the north.

An 80 km/h speed limit applies to Hopkins Highway along the northern portion of the site's frontage and increases to a 100 km/h speed limit along the southern portion of the site's frontage.

The cross-section of Hopkins Highway at the frontage of the site is shown in Figure 4.

Figure 4 Hopkins Highway, looking north from adjacent to the subject site

2.3.2 Sagnols Lane

Sagnols Lane is a local road generally aligned east-west, running from Hopkins Highway in the east, and terminating approximately 140 m to the west. Sagnols lane facilitates two-way movements in each direction adjacent to the site, across a 5.5 m wide pavement. Sagnols Lane currently provides vehicle access to the single property addressed as 24 Sagnols Lane.

The default 50 km/h speed limit applies to Sagnols Lane in the vicinity of the site.

The cross-section of Sagnols Lane at the frontage of the site is shown in Figure 5.

Figure 5 Sagnols Lane, looking west from adjacent to the subject site

2.4 Traffic Volumes

Traffic volume, speed and classification surveys were undertaken by Trans Traffic Survey on behalf of **one**mile**grid** on Hopkins Highway adjacent the site, for a one-week period from Wednesday 5th June 2024 to Tuesday 11th June 2024 inclusive. The results of the surveys are summarised in Table 1.

Table 1 Traffic Volume and Speed Surveys

Time Period	*Direction*	*Traffic Volume (vpd)*	*Average Speed (km/h)*	*85th Percentile Speed (km/h)*
Weekday Average	Northbound	1,016	74.3	81.9
	Southbound	1,032	77.5	86.3
	Both Directions	2,048	75.7	83.7
7 Day Average	Northbound	936	75.1	82.6
	Southbound	959	78.3	86.7
	Both Directions	1,895	76.7	84.7
Weekday AM Peak Hour (11:00am)	Northbound	89		
	Southbound	69		
	Both Directions	158		
Weekday PM Peak Hour (3:00pm)	Northbound	85		
	Southbound	108		
	Both Directions	193		
Weekend Peak Hour (11:00am)	Northbound	75		
	Southbound	80		
	Both Directions	154		

2.5 Sustainable Transport

It is shown that public transport in the area is limited to the following bus services, shown below in Table 2. SmartBus routes provide high-frequency and high-speed services, with bus priority measures along the route, and real-time information at bus stops.

Table 2 Public Transport Provision

Route	*Nearest Stop*
Mortlake-Warrnambool via Ballangeich, Ellerslie	Dunlop Street
Ballarat – Warrnambool via Skipton	
Casterton – Melbourne via Warrnambool	

3 PROPOSAL

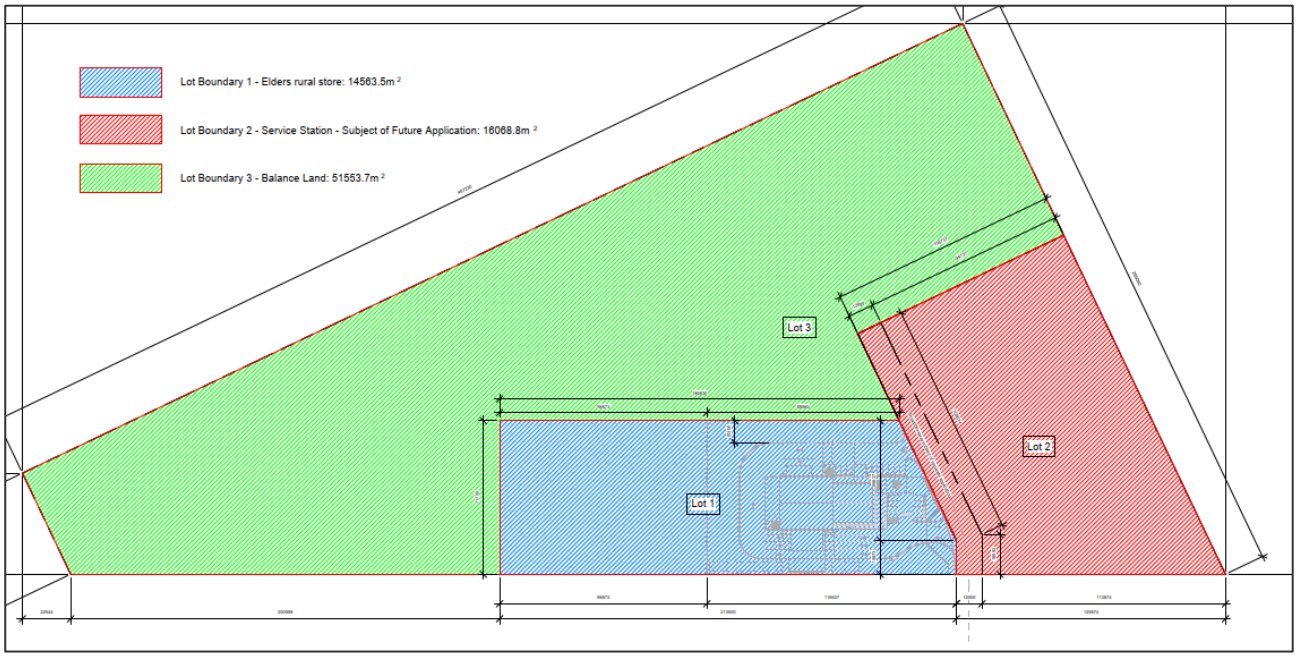
3.1 General

As part of the masterplan for the overall site, the site is broken up into 3 separate areas for the purpose of separate development of each area. The area boundary plan summarised in Table 3, and illustrated in Figure 6.

Table 3 Area Summary

Area	*Proposed*
Area 1 (Blue)	Elders Restricted Retail (this application)
Area 2 (Red)	Petrol Station (subject to separate application)
Area 3 (Green)	Vacant

Figure 6 Area Boundary Plan



As part of this application, it is proposed to develop Area 1 for the purposes of an Elders facility which is summarised below in Table 4.

Table 4 Proposed Development – Area 1

Use	*Component*	*No./Area*
Elders	Restricted Retail	944 m²

3.2 Car Parking and Vehicular Access

Vehicular access is proposed via a fully directional access point from Hopkins Highway, and a 12 m wide east-west two-way internal roadway.

The proposed vehicle access for the subject site will be provided via two access points to 12 m wide roadway, with the eastern access point facilitating two-way movements, and the western access restricted to exit movements only.

It is expected that the 12 m wide internal roadway will be delivered prior to the construction of the proposed development on the subject site, as access to Area 1 relies upon this internal roadway.

A total of 18 car spaces are proposed on-site, with 8 spaces (including 1 x accessible space) provided within a car parking area on the southern portion of the accessway, and 10 spaces provided along the northern portion of the accessway.

Both access points will feature double gates to secure the site outside of opening hours. The gates are set back from the edge of the east-west internal roadway.

3.3 Loading Facilities

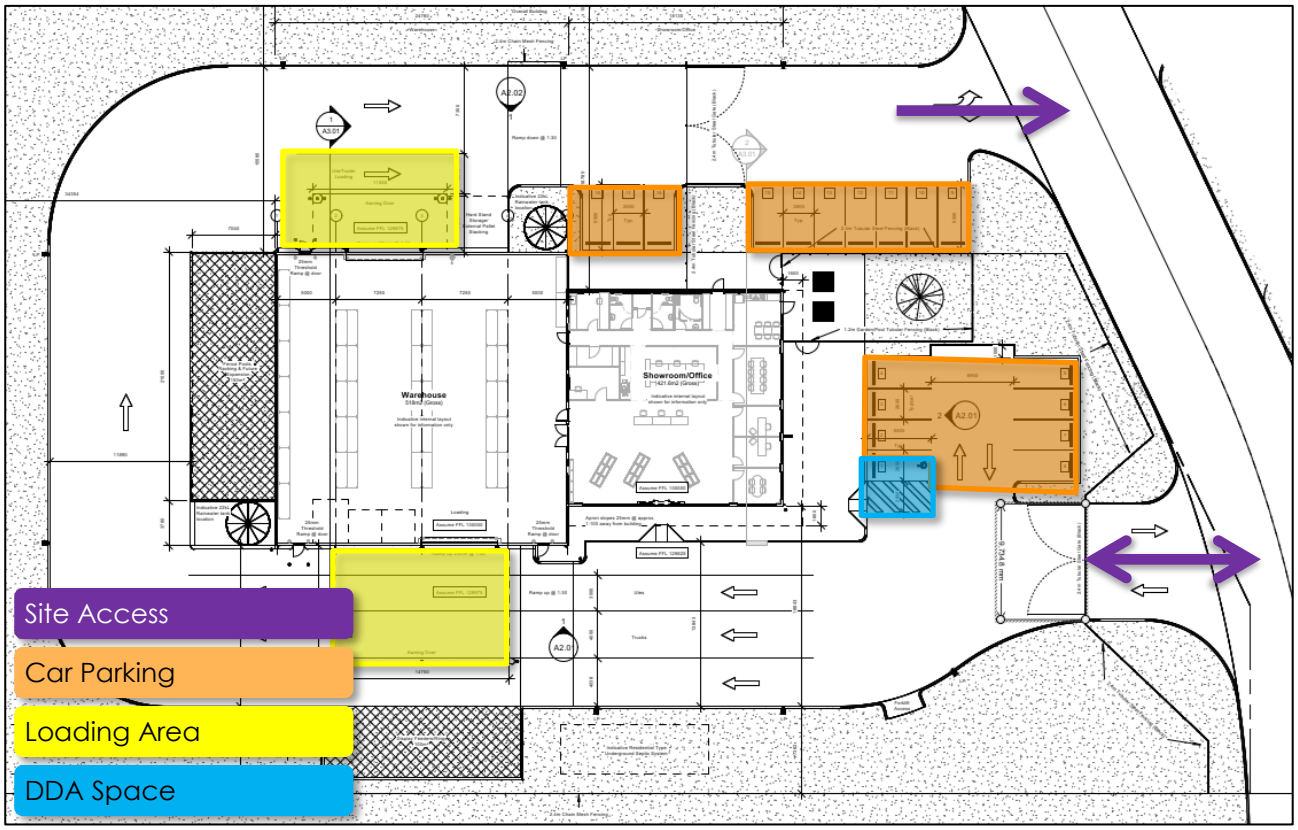
The site provides a 2 in to 1 drive-through lane for loading/unloading goods along the accessway for vehicles such as utility vehicles and trucks. A roller shutter door is provided to both the eastern and western sides of the building, to assist with loading for customers.

Loading vehicles will generally circulate between the two access points in a clockwise direction.

A bypass lane is also provided to allow vehicles to circulate past the drive through lanes.

A view of the proposed site layout is shown in Figure 7.

Figure 7 Proposed Site Layout



4 DESIGN ASSESSMENT

4.1 Moyne Planning Scheme – Clause 52.06

onemile**grid** has undertaken an assessment of the car parking layout and access for the proposed development with due consideration of the Design Standards detailed within Clause 52.06-9 of the Planning Scheme. A review of those relevant Design Standards is provided in the following sections.

4.1.1 Design Standard 1: Accessways

A summary of the assessment for Design Standard 1 is provided in Table 5.

Table 5 Clause 52.06-9 Design Assessment – Design Standard 1

Requirement	*Comments*
Be at least 3 metres wide.	Satisfied – minimum width of accessway is 6.9 metres
Have an internal radius of at least 4 metres at changes of direction or intersection or be at least 4.2 metres wide.	Satisfied
Allow vehicles parked in the last space of a dead-end accessway in public car parks to exit in a forward direction with one manoeuvre.	Satisfied
Provide at least 2.1 metres headroom beneath overhead obstructions, calculated for a vehicle with a wheelbase of 2.8 metres.	Satisfied
If the accessway serves four or more car spaces or connects to a road in a Transport Zone 2 or Transport Zone 3, the accessway must be designed so that cars can exit the site in a forward direction.	Satisfied
Provide a passing area at the entrance at least 6.1 metres wide and 7 metres long if the accessway serves ten or more car parking spaces and is either more than 50 metres long or connects to a road in a Transport Zone 2 or Transport Zone 3.	Satisfied
Have a corner splay or area at least 50 per cent clear of visual obstructions extending at least 2 metres along the frontage road from the edge of an exit lane and 2.5 metres along the exit lane from the frontage, to provide a clear view of pedestrians on the footpath of the frontage road. The area clear of visual obstructions may include an adjacent entry or exit lane where more than one lane is provided, or adjacent landscaped areas, provided the landscaping in those areas is less than 900 mm in height.	N/A – No pedestrian footpath is provided along the frontage of Area 1
If an accessway to four or more car parking spaces is from land in a Transport Zone 2 or Transport Zone 3, the access to the car spaces must be at least 6 metres from the road carriageway.	Satisfied

4.1.2 Design Standard 2: Car Parking Spaces

All standard car spaces on-site are proposed with a minimum width of 2.6 m, length of 5.5 m and are provided with an aisle width of greater than 6.4 m. The Planning Scheme requires parking spaces to be a minimum 4.9 m in length, therefore, car parking spaces are essentially accessed from an aisle no less than 8.1 m. In this regard, all spaces are in accordance with Design Standard 2 of the Planning Scheme.

The accessible bay is provided with a length of 5.5 m and a width of 2.6 m, and an adjacent shared area of the same dimensions, which exceeds the requirements of the Australian Standard for Parking facilities, Part 6: Off-street parking for people with disabilities (AS 2890.6:2022).

4.1.3 Design Standard 3: Gradients

A summary of the assessment for Design standard 3 is provided in Table 6.

Table 6 Clause 52.06-9 Design Assessment – Design Standard 3

Requirement	*Comments*
Accessway grades must not be steeper than 1:10 (10 per cent) within 5 metres of the frontage to ensure safety for pedestrians and vehicles. The design must have regard to the wheelbase of the vehicle being designed for; pedestrian and vehicular traffic volumes; the nature of the car park; and the slope and configuration of the vehicle crossover at the site frontage. This does not apply to accessways serving three dwellings or less.	Satisfied
Ramps (except within 5 metres of the frontage) must have the maximum grades as outlined in Table 3 (of Design standard 3) and be designed for vehicles travelling in a forward direction.	Satisfied
Where the difference in grade between two sections of ramp or floor is greater that 1:8 (12.5 per cent) for a summit grade change, or greater than 1:6.7 (15 per cent) for a sag grade change, the ramp must include a transition section of at least 2 metres to prevent vehicles scraping or bottoming.	Satisfied

The ramped areas along the accessway do not exceed a 1:30 grade over a 4.5 m section.

4.2 Loading and Garbage

The site has been designed to accommodate vehicles up to a 12.5 m Single Unit Truck (SU). Swept paths have been prepared illustrating a 12.5 m Single Unit Truck (SU) circulating between access points. These swept paths are provided in Appendix B.

5 LOADING

Clause 65 (Decision Guidelines) of the Moyne Planning Scheme identifies that "*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.*"

The proposed development provides significant area for loading and unloading along the accessway, specifically designed for the proposed use, and therefore appropriate for the proposed development.

6 BICYCLE PARKING

The proposed restricted retail tenancies fall under the land use terms for a 'Shop' use for which the Planning Scheme identifies the appropriate bicycle parking requirements to be calculated.

Clause 52.34 of the Moyne Planning Scheme specifies the following requirements for a Shop, which are calculated as:

- 1 employee space to each 600 m^2 of leasable floor area if the leasable floor area exceeds 1000 m^2 ; and
- 1 visitor space to each 500 m^2 of leasable floor area if the leasable floor area exceeds 1000 m^2.

As the total leasable floor area does not exceed 1000 m^2, the proposed development does not generate a bicycle parking requirement.

Therefore, no bicycle parking facilities are required to service the proposed development.

7 CAR PARKING

7.1 Statutory Car Parking Requirements

The car parking requirements for the subject site are identified in Clause 52.06 of the Moyne Planning Scheme, which specifies the following requirements for a restricted retail land use.

It is expected that the office component will operate ancillary to the proposed restricted retail facility.

Table 7 Clause 52.06 – Car Parking Requirements

Use	*No/Area*	*Rate*	*Car Parking Measure*	*Total*
Restricted retail premises	944 m²	3	to each 100 m² of leasable floor area	28
Total				**28**

Based on the above calculations, a total of 28 parking spaces are required for the proposed development.

It is proposed to provide a total of 18 car parking spaces on-site, which equates to a shortfall of 10 spaces when compared to the Planning Scheme requirements.

Clause 52.06-7 of the Moyne Planning Scheme indicates that an application to reduce (including reduce to zero) the requirement for car spaces must be accompanied by a Car Parking Demand Assessment. The Assessment must assess the car parking demand likely to be generated by the proposed development, having consideration to:

- The likelihood of multi-purpose trips within the locality which are likely to be combined 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.

7.2 Car Parking Demand Assessment

Case studies undertaken by **one**mile**grid** and other traffic engineering consultancies have regularly identified parking demand rates for restricted retail and bulky goods uses below the statutory provision rates from Clause 52.06.

In this respect, reference is made to a study (*Trip Generation and Parking Generation Surveys: Bulky Goods / Hardware Stores Analysis Report, 2009*) undertaken by Hyder Consulting on behalf of the New South Wales Roads and Traffic Authority (now Transport for NSW) to inform updates to the Guide to Traffic Generating Developments reference document commonly used throughout Australia to assess parking and traffic generation of new developments.

This study surveyed parking and traffic generation at six bulky goods and restricted retail developments across NSW to establish use-specific traffic and parking rates to assist practitioners and authorities in assessing the suitability of development proposals.

This study identified average peak parking generation rates of 1.33 spaces per 100 m^2 on a weekday, and 1.40 spaces per 100 m^2 on a weekend.

For the purposes of a conservative assessment, a rate of 1.5 spaces per 100 m^2 will be adopted to calculate the peak parking demand, equating to projected peak demand for 14 spaces at any given time.

In this regard, given the provision for 18 parking spaces on-site, the proposed development (944 m^2) provides car parking at a rate of 1.91 spaces per 100 m^2, exceeding the adopted conservative demand rate mentioned above.

Therefore, the provision of 18 spaces for the proposed development exceeds the expected peak parking demand generated by the site and is considered appropriate.

Furthermore, the proposed restricted retail premises features two drive through lanes, which are both in excess of 50 m in length. Conservatively allowing 7.0 m per vehicle (including generous clearance at the front and rear), the car lane could accommodate a further 7 vehicles. Allowing up to 15.0 m per vehicle, the truck lane could accommodate a further 3 vehicles. Additionally, there is a trailer/ute loading area at the west side of the building which could accommodate a further 1 vehicle. When considering all of these parking locations, the supply exceeds the statutory requirement, as outlined in Table 8.

Table 8 Parking Provision

Parking Type	*Provision*		*Statutory Req.*	*Difference*
Formal Parking Spaces	18 spaces	29 spaces	28 spaces	+1 space above PS requirements
Car Drive Through	7 spaces			
Ute/Trailer Drive Loading	1 space			
Truck Drive Through	3 spaces			

7.3 Accessible Car Parking

The National Construction Code specifies the minimum requirements for provision of accessible car parking.

The proposed restricted retail component, classified as a Class 6 building, requires provision of one accessible car space for every 50 car parking spaces or part thereof for the first 1,000 spaces, and then 1 space per 100 car parking spaces or part thereof in excess of 1,000 spaces.

Noting the proposed provision of 18 car spaces on-site, the National Construction Code (NCC) requires at least one accessible car space on-site.

The proposed provision of one accessible space satisfies the NCC requirements, and is considered appropriate.

8 TRAFFIC

8.1 Traffic Generation

8.1.1 Area 1 – Restricted Retail Facility (Subject Application)

Reference is again made to the Guide to Traffic Generating Developments reference document which included recommended peak hour traffic generation rates for a weekday and weekend. The average peak traffic generation rates are summarised in Table 9.

Table 9 Bulky Goods Retail Average Traffic Generation Rates – NSW Guide to Traffic Generating Developments (per 100 m²)

Day	Period	Metropolitan	Non-Metropolitan	All Areas
Weekday	AM Peak Hour	N/A – AM peak hour outside of opening hours		
	Site Peak Hour	2.44 vph	2.92 vph	2.68 vph
	PM Peak Hour	1.01 vph	1.51 vph	1.31 vph
Weekend	Site Peak	3.75 vph	3.94 vph	3.85 vph
	Road Network Peak	2.24 vph	2.72 vph	2.48 vph

We have adopted the average PM peak hour generation rate for the non-metropolitan rate, noting that it is higher than the average metropolitan and 'all areas' rate. We have also adopted a rate of 0.25 movements per 100 m² during the AM Peak to account for staff arriving at the site.

During the PM peak hour, we have adopted that the vehicle movements will be distributed as 25% inbound and 75% outbound, noting that the tenancies will be closing and staff and customers generally leaving the site.

Application of the above rates to the proposed development results in the weekday peak hour volumes detailed in Table 10.

Table 10 Anticipated Traffic Generation – Restricted Retail

Period	Inbound	Outbound	Total
AM Peak	2	0	2
PM Peak	4	11	15

8.1.2 Area 2 – Service Station (Separate Application)

8.1.2.1 Overview

As discussed above, as part of a separate application, it is proposed to develop Area 2 for the purposes of a Service Station.

To allow for a robust assessment of the operations of the proposed intersection with Hopkins Highway, this assessment will consider the traffic volumes expected to be generated by both the restricted retail premises that forms this application, and the petrol station which will also ultimately share the access but itself is subject to a separate application.

To this end other traffic engineering firms have conducted surveys of traffic movements generated by similar service station developments at several locations including sites on major urban arterial roads. These surveys show traffic generation typically varies between 100 and 180 movements during the weekday commuter peak hours.

Considering the location of the site in proximity to arterial routes and ongoing development in the area, it will be assumed the site generates 100 movements during both peak hours, equally split between inbound and outbound movements as summarised in Table 11 below.

Table 11 Service Station Traffic Generation (Area 2)

	AM Peak	*PM Peak*
Inbound	50	50
Outbound	50	50
Total	**100**	**100**

8.1.2.2 Diverted Trips

It is commonly acknowledged that a high proportion of vehicle trips to a petrol station are as a result of diverted trips, resulting from a vehicle which is already on the road network as part of another trips (i.e. a vehicle diverting to a service station on the way from work to home).

In order to ascertain the proportion of unique trips versus diverted trips generated by the proposed development, data collected as part of the most recently available Victorian Integrated Survey of Travel and Activity (VISTA) data was analysed specifically for petrol stations, with the results shown in Table 12 below.

Table 12 Diverted Trips Proportion – VISTA 2013

Use	*Daily*	*Peak*
Petrol Station	86%	91%

It is shown above that a high proportion of daily trips generated to a petrol station are diverted trips, and further, during the peak hours, the percentage of diverted trips increases. Consequently, the number of unique vehicles trips generated by Area 2 will be much lower than the total traffic generation of the site.

8.1.2.3 Unique Traffic Generation

As noted in the previous section, a significant proportion of traffic generated by the service station are trips diverted from an existing trip or undertaken as part of a linked trip to a separate destination.

For the purposes of this assessment and in consistence with generally accepted rates, it will be assumed that 80% of service station traffic movements are diverted from already existing trips along Hopkins Highway. The remainder of unique trips are assumed to be distributed in equal proportion to existing traffic flows in the vicinity. It should be noted that this represents a conservative assessment compared with the diverted trips proportion surveyed for petrol stations by VISTA in 2013.

Table 13 outlines the unique traffic movements generated by Area 2.

Table 13 Unique Traffic Generation – Service Station (Area 2)

Direction	*Weekday AM Peak*	*Weekday PM Peak*
Inbound	10	10
Outbound	10	10
Total	**20**	**20**

8.1.3 Total Anticipated Traffic Generation

Based on the above, the total anticipated traffic generated by both Areas 1 & 2 is shown in Table 14.

Table 14 Total Anticipated Traffic Generation

Direction	*Weekday AM Peak*	*Weekday PM Peak*
Inbound	52	54
Outbound	50	61
Total	**102**	**115**

8.1.4 Total Unique Traffic Generation

Based on the above, the total unique traffic generated by both Areas 1 & 2 is shown in Table 15.

Table 15 Total Unique Traffic Generation

Direction	*Weekday AM Peak*	*Weekday PM Peak*
Inbound	12	14
Outbound	10	21
Total	**22**	**35**

8.2 Traffic Distribution

Considering the location of the site in relation to the arterial road network, and the expected origin/destinations for site generated traffic, the directional distribution shown in Table 16 has been adopted.

Table 16 Adopted Directional Traffic Distribution

Origin/Destination	*Percentage*
Hamilton Highway – Northwest	30%
Hamilton Highway – East	30%
Hopkins Highway - South	40%

8.3 Site Generated Traffic Volumes

Based on the anticipated traffic distribution, the following traffic volumes shown in Figure 8 and Figure 9 are expected to be generated by Areas 1 & 2 at the intersection of Hopkins Highway and the proposed Site Access Road.

Figure 8 Site Generated Traffic Volumes – AM Peak Hour

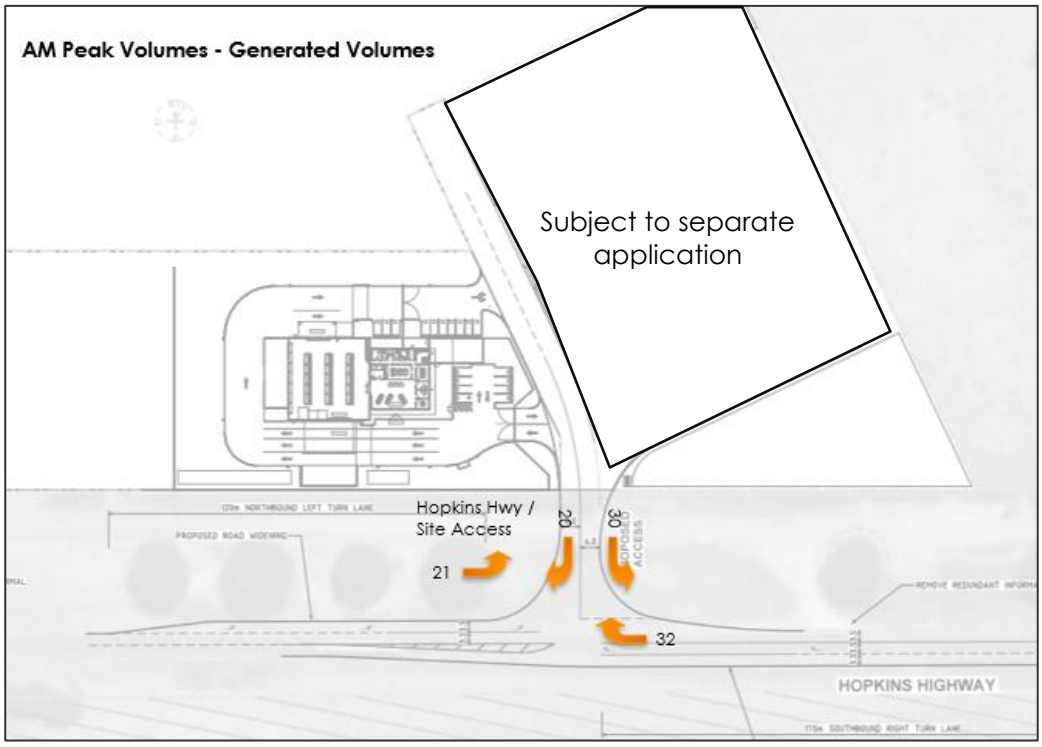
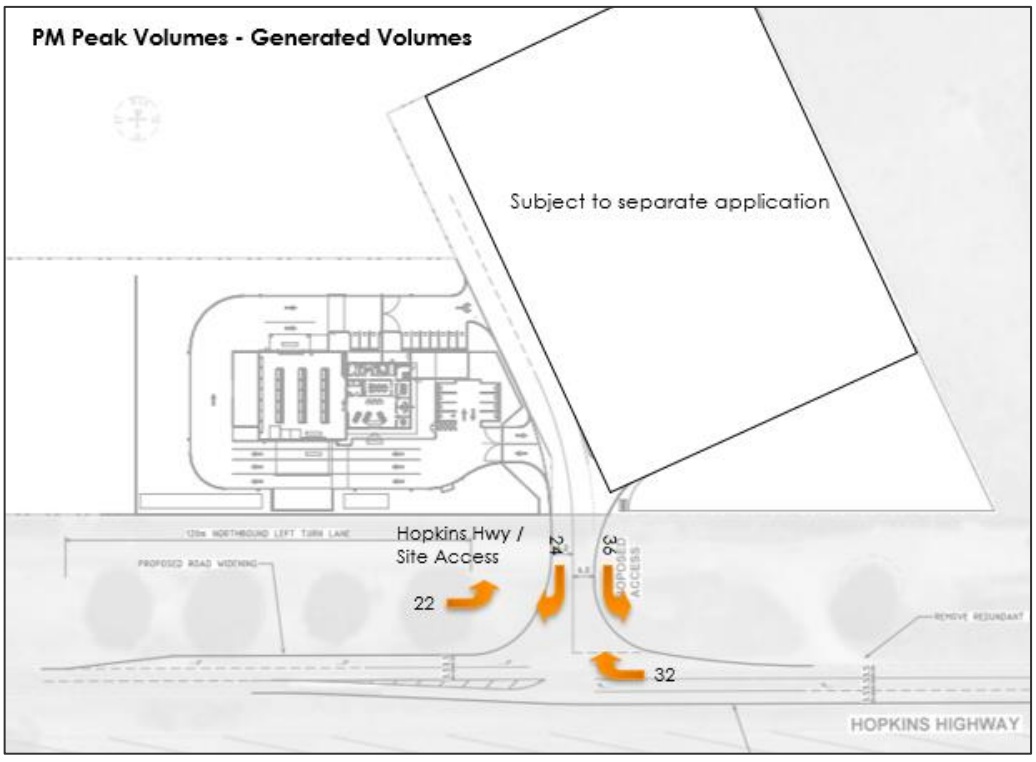


Figure 9 Site Generated Traffic Volumes – PM Peak Hour



8.4 Post-Development Traffic Volumes

Based on the above, the post-development intersection volumes at the intersection of Hopkins Highway and the proposed Site Access Road can be calculated by superimposing the traffic anticipated to be generated by both Areas to the existing through traffic volumes along Hopkins Highway.

The post-development peak hour traffic volumes are shown in Figure 10 and Figure 11.

Figure 10 Post-development Traffic Volumes – AM Peak Hour

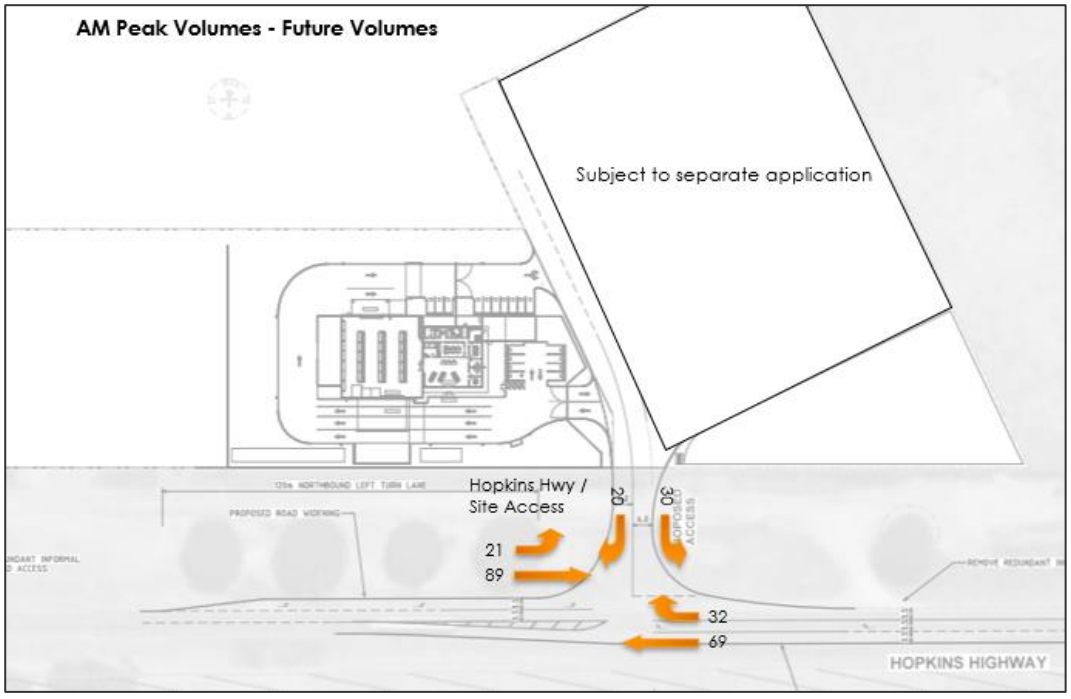
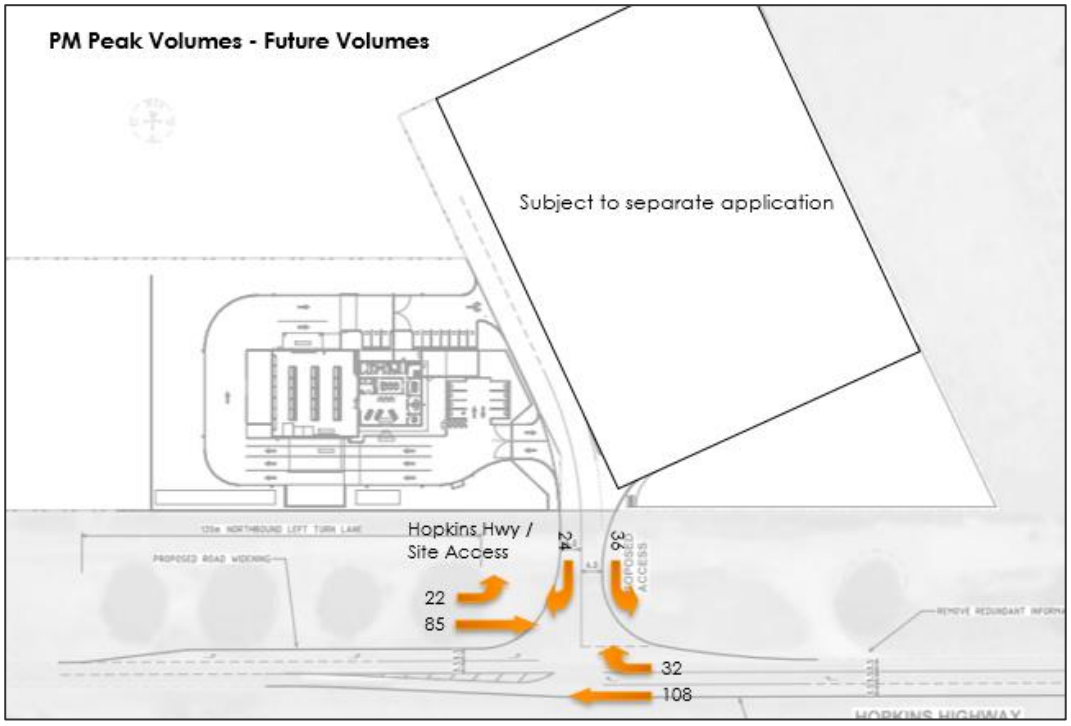


Figure 11 Post-development Traffic Volumes – PM Peak Hour



8.5 Traffic Impact

The unique traffic generation for the proposed development is generally low in traffic engineering terms and equates to approximately 1 movement every 3 minutes during the peak periods. This highlights that the proposed development will have a negligible impact to Hopkins Highway or the surrounding road network.

Based on the above, the level of traffic generated by the proposed development and the neighbouring application are not expected to create significant impact on the surrounding road network.

Notwithstanding, to assess the operation of the proposed intersection, the traffic volumes have been input into SIDRA intersection, a traffic modelling software package.

The SIDRA Intersection software package has been developed to provide information on the capacity of an intersection with regard to a number of parameters. Those parameters considered relevant are, Degree of Saturation (DoS), 95th Percentile Queue, and Average Delay, and Level of Service (LoS), as described in Table 17 below.

Table 17 SIDRA Intersection Parameters

<table>
<tr><th>Parameter</th><th>Description</th></tr>
<tr><td>Degree of Saturation (DoS)</td><td>The DoS represents the ratio of the traffic volume making a particular movement compared to the maximum capacity for that particular movement. The value of the DoS has a corresponding rating depending on the ratio as shown below.
<table>
<tr><th>Degree of Saturation</th><th>Rating</th></tr>
<tr><td>Up to 0.60</td><td>Excellent</td></tr>
<tr><td>0.61 – 0.70</td><td>Very Good</td></tr>
<tr><td>0.71 – 0.80</td><td>Good</td></tr>
<tr><td>0.81 – 0.90</td><td>Fair</td></tr>
<tr><td>0.91 – 1.00</td><td>Poor</td></tr>
<tr><td>Above 1.00</td><td>Very Poor</td></tr>
</table>
It is noted that whilst the range of 0.91 – 1.00 is rated as ‘poor’, it is acceptable for critical movements at an intersection to be operating within this range during high peak periods, reflecting actual conditions in a significant number of suburban signalised intersections.</td></tr>
<tr><td>Average Delay (seconds)</td><td>Average delay is the time delay that can be expected for all vehicles undertaking a particular movement in seconds. This includes time taken to accelerate or decelerate, time taken to undertake the manoeuvre, and delay at a hold line or stop line.</td></tr>
<tr><td>95th Percentile (95%ile) Queue</td><td>95%ile queue represents the maximum queue length in metres that can be expected in 95% of observed queue lengths in the peak hour.</td></tr>
<tr><td>Level of Service (LoS)</td><td>A qualitative measure of sign-controlled intersection performance, based on the average delay experienced by a driver. A LoS of A, B, C or D suggests acceptable intersection performance. A LoS of E or F suggests mitigation measures or upgrades may be warranted.</td></tr>
</table>

The value of the average delay and Level of Service for a sign-controlled intersection has a corresponding rating, as shown in Table 18 below.

Table 18 Rating of Delay and V/C Ratio, and Level of Service

Rating	*Delay &V/C Ratio*	*Level of Service*
Excellent	≤ 10 seconds	A
Very Good	10 – 15 seconds	B
Good	15 – 25 seconds	C
Fair	20 – 35 seconds	D
Poor	30 – 50 seconds	E
Very Poor	50+ seconds	F

The results of the analysis are provided in Table 19.

Table 19 Proposed Hopkins Highway / Site Access Intersection

Approach	*DoS*	*Avg. Delay (sec)*	*Queue (m)*	*Level of Service*
AM Peak				
Hopkins Highway South – Left Turn	0.013	5.7	0.0	A
Hopkins Highway South - Through	0.051	0.0	0.0	A
Hopkins Highway North – Through	0.039	0.0	0.0	A
Hopkins Highway North – Right Turn	0.028	6.1	0.8	A
Site Access – Left Turn	0.054	6.1	1.5	A
Site Access - Right	0.054	7.4	1.5	A
PM Peak				
Hopkins Highway South – Left Turn	0.013	5.7	0.0	A
Hopkins Highway South - Through	0.048	0.0	0.0	A
Hopkins Highway North – Through	0.061	0.0	0.0	A
Hopkins Highway North – Right Turn	0.028	6.1	0.8	A
Site Access – Left Turn	0.067	6.1	1.9	A
Site Access - Right	0.067	7.8	1.9	A

As shown above the proposed Hopkins Highway / Site Access intersection is expected to operate under excellent conditions during both the AM and PM peak hours with minimal queues and delays experienced by motorists. In view of the foregoing, the proposed arrangement is considered satisfactory.

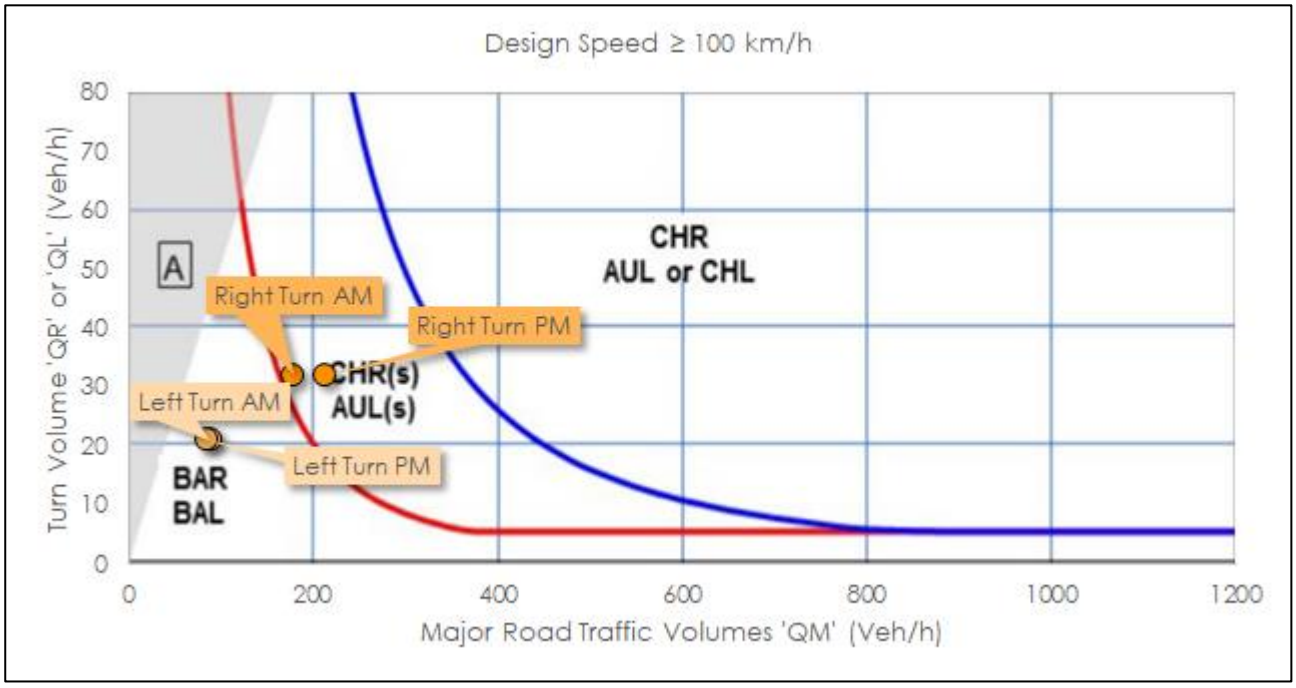
8.6 Austroads Turn Lane Warrants

In determining an appropriate intersection configuration, the anticipated post-development peak hour volumes were assessed against the turn lane treatment warrants specified in the *Austroads Guide to Traffic Management Part 6: Intersections, Interchanges and Crossings.*

Noting the low post-development traffic volumes against the Austroads turn lane warrants suggests, a review of the warrants suggest that the proposed development requires a basic left-turn (BAL) and a short channelised right-turn (CHR(s)) provision on Hopkins Highway.

Based on the anticipated post-development traffic volumes (as shown Figure 8 and Figure 9), the turn lane requirements for the Hopkins Highway access are demonstrated in Figure 12.

Figure 12 Austroads Turn Treatment Warrants



It is proposed to provide and auxiliary left-turn lane (AUL) and a channelised right-turn lane (CHR) along Hopkins Highway, which satisfies the above requirements.

Concept layout plans have been prepared and is attached in Appendix A.

9 CONCLUSIONS

As part of this application, it is proposed to develop Area 1 for the purposes of an Elders facility, which includes 18 car parking spaces.

Considering the analysis presented above, it is concluded that:

- The car parking layouts and accesses have been designed generally in accordance with the requirements of the Planning Scheme and are considered appropriate;
- The proposed development provides significant area for loading and unloading along the accessway, and therefore appropriate for the proposed development;
- No bicycle parking facilities are required to service the proposed development;
- Based on the Planning Scheme requirements for a restricted retail land use, the proposed development triggers a requirement for 28 car parking spaces;
- Based on case study data, the expected peak demand for the proposed development is 14 spaces at any given time;
- The provision of 18 spaces for the proposed development exceeds the expected peak parking demand generated by the site;
- Considering the potential parking opportunities along the drive through lanes and associated loading area, the supply of parking exceeds the statutory requirement;
- The proposed provision of one accessible space satisfies the NCC requirements, and is considered appropriate;
- The level of traffic generated by the proposed development and the neighbouring application are not expected to create significant impact on the surrounding road network;
- The proposed Hopkins Highway / Site Access intersection is expected to operate under excellent conditions during both the AM and PM peak hours with minimal queues and delays experienced by motorists;
- It is proposed to provide and auxiliary left-turn lane (AUL) and a channelised right-turn lane (CHR) along Hopkins Highway, which satisfies the Austroads Turn Lane requirements; and
- There are no traffic engineering reasons which would preclude a permit from being issued for this proposal.

Appendix A Concept Layout Plan

N

LIBERTY SITE

ELDERS SITE

HAMILTON HIGHWAY

120m NORTHBOUND LEFT TURN LANE

PROPOSED ROAD WIDENING

6.0

6.0

PROPOSED ACCESS

REMOVE REDUNDANT INFORMAL SERVICE ROAD ACCESS

REMOVE REDUNDANT INFORMAL SERVICE ROAD ACCESS

3.5

3.5

3.5

3.5

MATCH INTO EXISTING EDGE OF ROADWAY

MODIFY EXISTING TRAFFIC ISLAND NOSE

HOPKINS HIGHWAY

170m SOUTHBOUND RIGHT TURN LANE

PROPOSED ROAD WIDENING

RELOCATE EXISTING "GIVEWAY" HOLD LINE MARKING

CAD File: N:\Projects\2024\240326\Drawings\240326CLP100.dgn

Date Plotted: 12-07-2024 12:10:10

*onemilegrid operates from Wurundjeri Woiwurung Country of the Kulin nation.
We acknowledge and extend our appreciation to the Wurundjeri People, the Traditional Owners of the land.
We pay our respects to leaders and Elders past, present and emerging for they hold the memories, the traditions, the culture, and the hopes of all Wurundjeri Peoples.*

Aerial Photography
Aerial photography provided by Nearmap

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Phone (03) 9939 8250

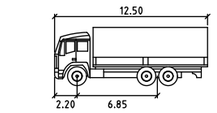
Scale
1:1500 @ A3
0 7.5 15 30

Drawing Title
MORTLAKE COMMERCIAL DEVELOPMENT
HOPKINS HIGHWAY ACCESS TREATMENT
CONCEPT LAYOUT PLAN

Designed	Approved	Melway Ref
TCW	VG	

Project Number	Drawing Number	Revision
240326	CLP100	E

Appendix B Swept Path Diagrams



SU TRUCK meters

Width	: 2.50
Track	: 2.50
Lock to Lock Time	: 6.0
Steering Angle	: 36.6

SWEPT PATH LEGEND

- — — — — DESIGN VEHICLE SWEPT PATHS SHOWN DASHED
- - - - - - - - - 300mm CLEARANCE ENVELOPE SHOWN DOTTED

CAD File: N:\Projects\2024\240326\Drawings\240326SPA103.dgn

Date Plotted: 12-07-2024 12:17:04 PM

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Drawing Title
MORTLAKE COMMERCIAL DEVELOPMENT
HOPKINS HIGHWAY ACCESS TREATMENT
SWEPT PATH ANALYSIS

Designed	Approved	Melway Ref
TCW	VG	

Scale 1:750 @ A3 (0 3.75 7.5 15)

Project Number	Drawing Number	Revision
240326	SPA103	E