Traffix Group

Traffic Engineering Report

Proposed Commercial Development – Master Plan

34 Clayton Road, Clayton

Prepared for
Hacer Group Pty Ltd

March, 2021

G27660R-01D

Level 28, 459 Collins St
Melbourne Victoria 3000

T: 03 9822 2888
admin@traffixgroup.com.au

Traffix Group Pty Ltd
ABN: 32 100 481 570

traffixgroup.com.au

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1. Introduction

Traffix Group has been engaged by Hacer Group Pty Ltd to undertake a Traffic Engineering Report for the Master Plan associated with the proposed commercial development at 34 Clayton Road, Clayton.

The following report provides a detailed traffic engineering assessment of the relevant matters for considerations at the Master Planning Stage and addresses the following matters:

- Car parking provisions,
- Vehicle access arrangements,
- Bicycle parking,
- Loading and waste collection, and
- Traffic impacts on external road network.

2. Proposal

Development Plan

A development plan that identifies the current ground floor configuration of the indicative development is attached at Appendix A.

The proposal is to develop the site for the purpose of a multi storey commercial development that accommodates primarily office uses with some complimentary showroom, retail, food and drink, childcare centre and residential hotel components.

All the existing warehouse tenancies on the site would be removed as part of the proposed development.

Whilst the ultimate floor areas and building envelopes are yet to be finalised for the purpose of this assessment a maximum of approx. 2,250 car parking spaces have been adopted as the car parking supply within the development site.

The development provides car parking at a rate of 3.2 car spaces to each 100m^2 of net floor area based on the 'office' net floor area of approximately 70,150m^2. In practice the ultimate uses within each building would vary.

Car parking for the development would be provided within a large consolidated basement with various at grade car parking areas provided around the various buildings and internal accessways.

A development summary based on individual buildings is provided in the following table.

Table 1: Indicative Development Summary

Building	Land Use	Size
Building A	Residential Hotel	153 Hotel Suites (includes restaurant/bar)
Building B	Office	7,436.1m^2
	Showroom	709.3m^2
	Food and Drink Premises	187
Building C	Office	6,257.4m^2
	Showroom	709.3m^2
	Food and Drink Premises	187.8m^2
Building D	Office	15,172.6m^2
	Showroom	311.3m^2
	Food and Drink Premises	258.6m^2
Building E	Office	17,258.3m^2
	Showroom	493.7m^2
Building F	Office	12,485.5m^2
	Food and Drink Premises	204.4m^2
Building G	Office	6,638.6
	Food and Drink Premises	297.5m^2
	Fitness Centre (Indoor Recreation)	347.7m^2
Building H	Showroom	422.7m^2
	Childcare	150 places

Primary Vehicle Access

The primary vehicle access to the development is proposed to occur via the creation of a new set of traffic signals on Clayton Road.

The traffic signals would include the provision of formal left-turn deceleration and right-turn deceleration lanes. Exit lanes will include a double right-turn out arrangements with a separate lane for left-turn movements.

Pedestrian refuges have been provided in association with the internal leg of the intersection.

Secondary Vehicle Access

Additional secondary access points would be created to the north and south of this accessway towards the northern and southern boundaries of the site. These crossovers would include for left-in and left-out only movements in accordance with the preference of Department of Transport.

We note that the provision of the additional crossovers is important to release pressure on the traffic signals and in this regard are deemed essential.

Pedestrian Access

Pedestrian access to the development would occur via various connections to the footpath along the site's frontage. The traffic signals would provide for a controlled crossing option of Clayton Road (southern leg only).

Connections through the site at ground level would be available for the public to access Carlson Avenue Reserve via the at grade connection made available through the site.

Loading

Service and loading areas are provided at various locations through the site for each building. These areas will accommodate loading and waste collection activities for the various buildings.

Courier style vehicles would also utilise the at grade car parking areas as required.

A copy of the development plans are attached at Appendix A.

3. Existing Conditions

3.1. Subject Site

The subject site is located on the east side of Clayton Road in Croydon approximately 250m south of Ferntree Gully Road. An aerial photograph of the site is provided at Figure 1 with a locality plan provided at Figure 2.

The site is currently occupied by a series of large scale warehouse/industry tenancies. Current tenants include Comdain, Aussie Farmers Direct, and John Sands.

Vehicle Access to the site is provided via in the order of 6 separate vehicle crossovers that accommodated two-way traffic movements.

The site is located within Special Use Zone – Schedule 6 (SUZ6). The site is located within the Monash Technology Precinct which forms part of the Monash National Employment and Innovation Cluster (NEIC). The cluster has leading education, health, research and commercialisation facilities.

The development of the Monash NEIC as a major employment precinct is a key policy direction of Plan Melbourne 2017-2050, the current metropolitan strategy. Planning will focus on diversifying job choices, making better use of existing infrastructure, and supporting the growth of associated businesses and industries (Policy 1.1.4, Plan Melbourne 2017-2050). The Victorian Planning Authority (VPA) – a State Government authority – is planning for the development of the precinct in conjunction with the City of Monash and a number of other government agencies and departments. The VPA has prepared a draft Framework Plan, March 2017 for the Monash NEIC which forecasts a doubling of jobs in the precinct.

At the local level, the Monash Planning Scheme (MPS) includes the Monash Technology Precinct local policy (Clause 22.02) sets out a range of objectives seeking to facilitate the intensification of employment uses and development within the precinct and highlights the importance of the ongoing development of the precinct.

Nearby land use is generally residential to the west with commercial uses to the east. Monash university Clayton Campus is located south-east of the site.

Figure 1: Aerial Photograph

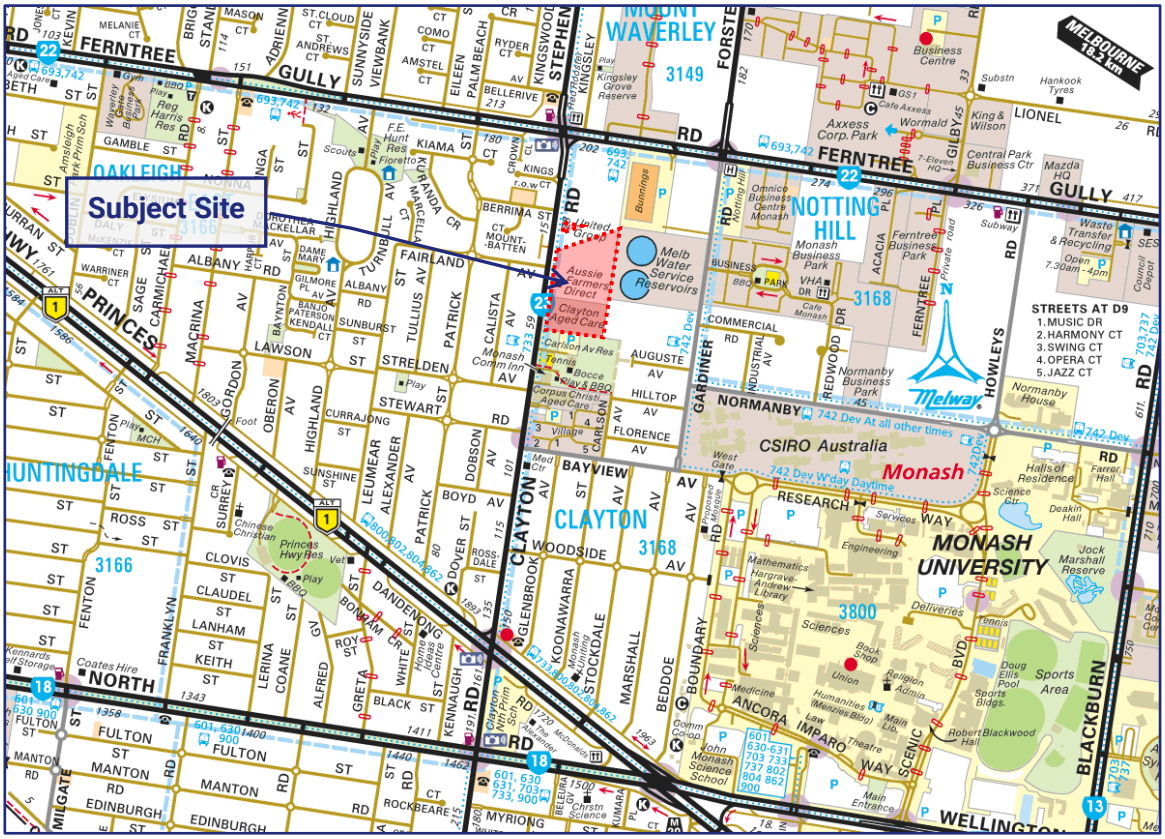


Figure 2: Locality Plan

3.2. Road Network

Clayton Road is a VicRoads declared Arterial Road and a Road Zone Category 1 under the Planning Scheme and is aligned in a north-south direction between Ferntree Gully Road in the north and Heatherton Road in the south.

In the vicinity of the site, Clayton Road provides two lanes of traffic in each direction. Unrestricted kerbside parking is available along both sides of Clayton Road outside of Clearway times.

A posted speed limit of 60km/h applies to Clayton Road in the vicinity of the site.

Photographs of Clayton Road adjacent to the site's frontage are provided below.

Figure 3: Clayton Road – view south

Figure 4: Clayton Road – view north

3.2.1. Existing Traffic Conditions

Traffic surveys of Clayton Road adjacent to the site have been undertaken in order to ascertain the traffic impacts associated with the proposed development. The surveys were undertaken on Thursday 28th November, 2019 between 7:00am-10:00am and 3:30pm-6:30pm.

The surveys include traffic movements at the following locations:

Clayton Road/Fairland Avenue, and

Clayton Road/Various Site Access Points

A figure below identifies the recorded AM and PM peak hour traffic conditions.

Significantly, the surveys identified:

- Clayton Road – carries in the order of 880-1116 vehicle movements per hour in each direction
- Development Site:
  - 96 veh/hour during AM peak hour, and
  - 81 veh/hour during the PM peak hour.
  - Higher proportion of traffic to and from the north.

Traffic Growth

The VicRoads traffic volume database identifies that minimal growth has occurred along Clayton Road between 2007 and 2017.

Accordingly, we are satisfied that there would not be significant additional growth in traffic volumes along this section of Clayton Road in the near future.

Notwithstanding, for the purpose of sensitivity in traffic impact analysis, we have applied a 1%pa growth to the through traffic volumes along Clayton Road. These amended traffic volumes are provided at Figure 6.

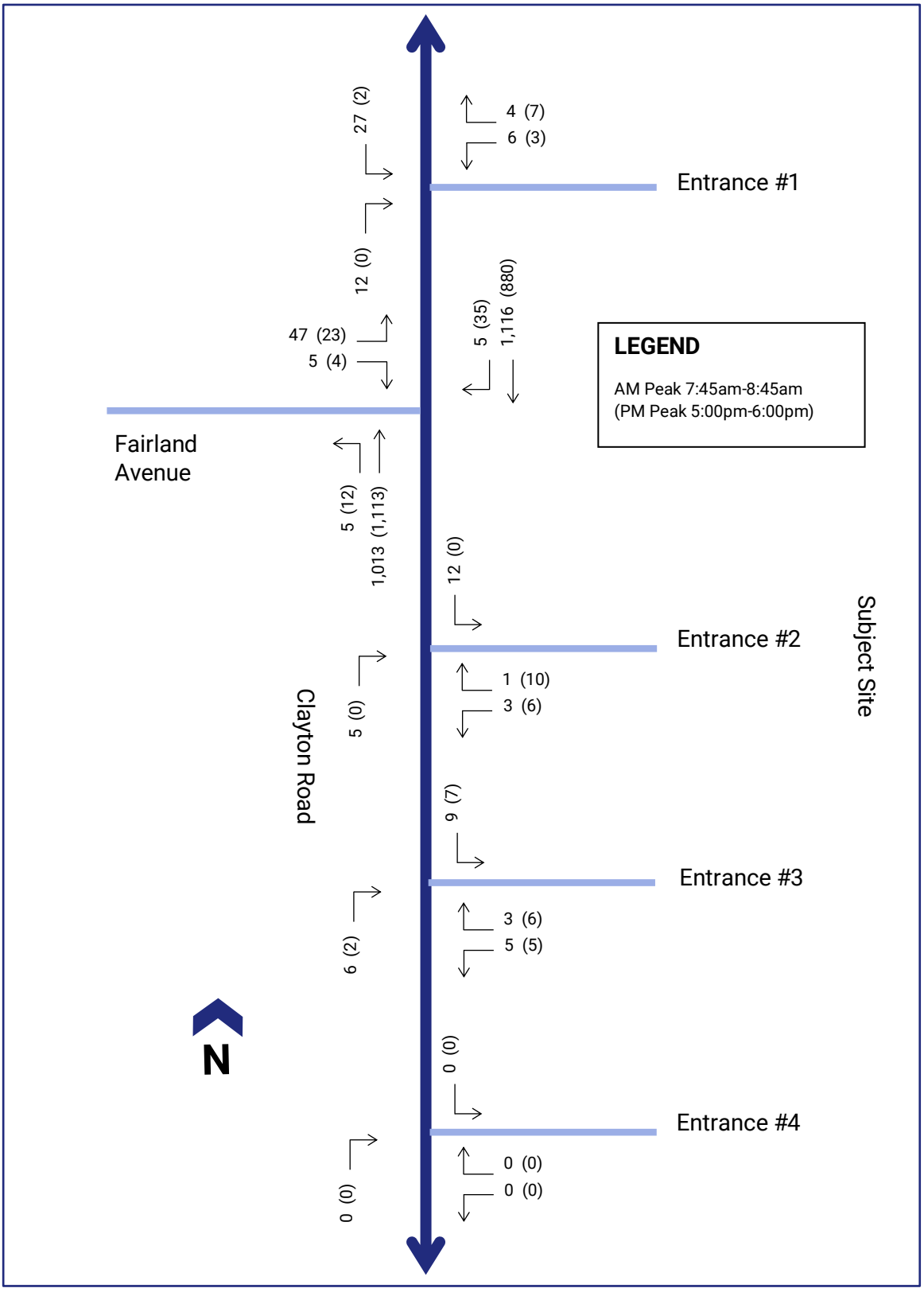


Figure 5: Turning Movement Counts of Existing Conditions

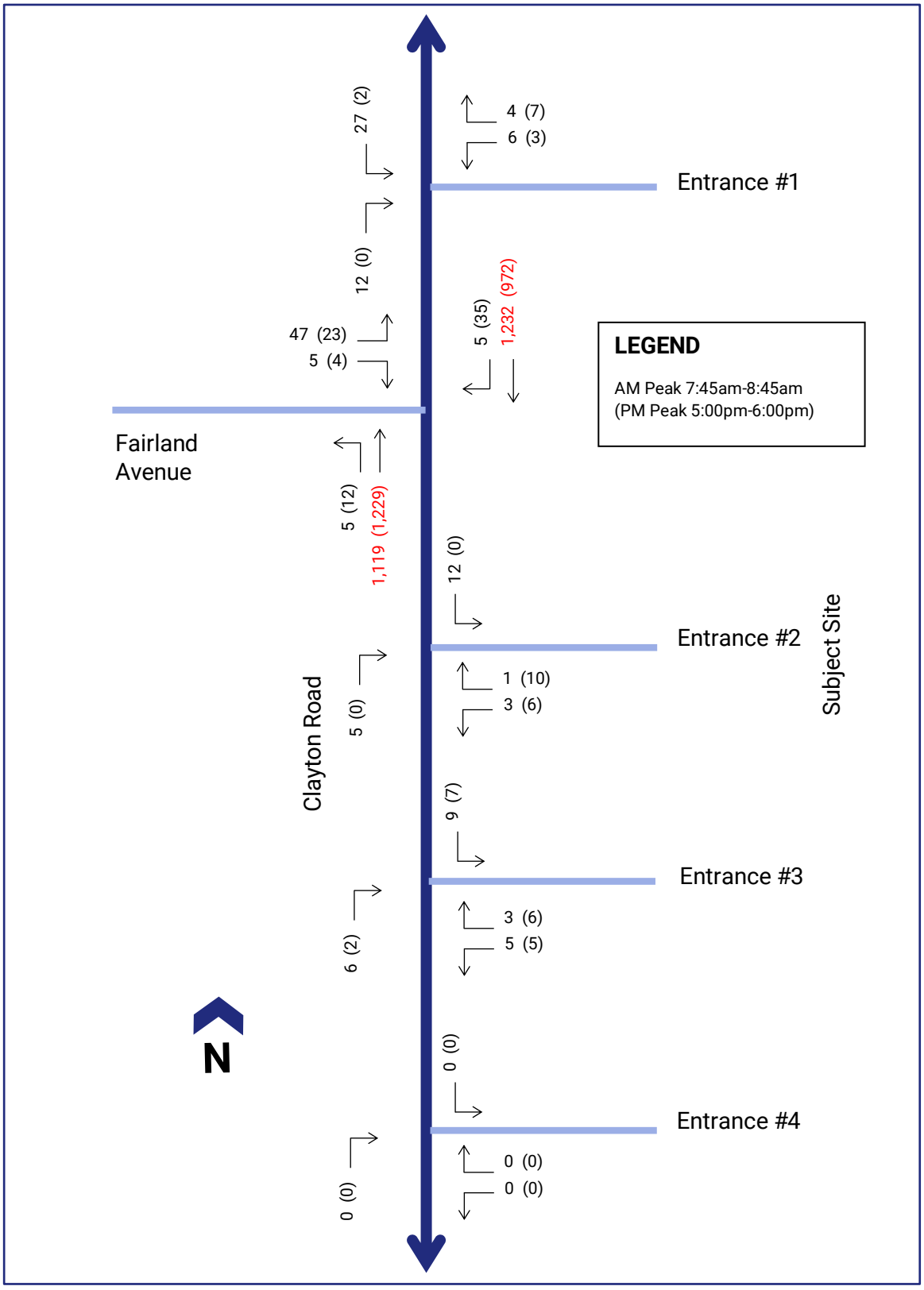


Figure 6: Turning Movement Counts of Existing Conditions – 10 year growth applied to Clayton Road (1% p/a)

3.3. Public Transport

The site has access to existing public transport services include bus services that operate along the site's frontage.

A figure that identifies the nearby public transport routes is provided below. Of significance:

- Bus Route 733, operates along the site's frontage to Clayton Road, and
- Bus Routes 693 and 742 operate along Ferntree Gully Road, approximately 350m north of the site.
- Two smart bus services, Route 900 and Route 703 operated along North Road approximately 1.3km walking distance south of the site. These services provide services at higher frequencies.
- Extensive additional bus services are available via the Monash University Bus Interchange, located 1.6km walking distance south-east of the site (Routes 601, 630, 631, 737, 802, 804, 862).

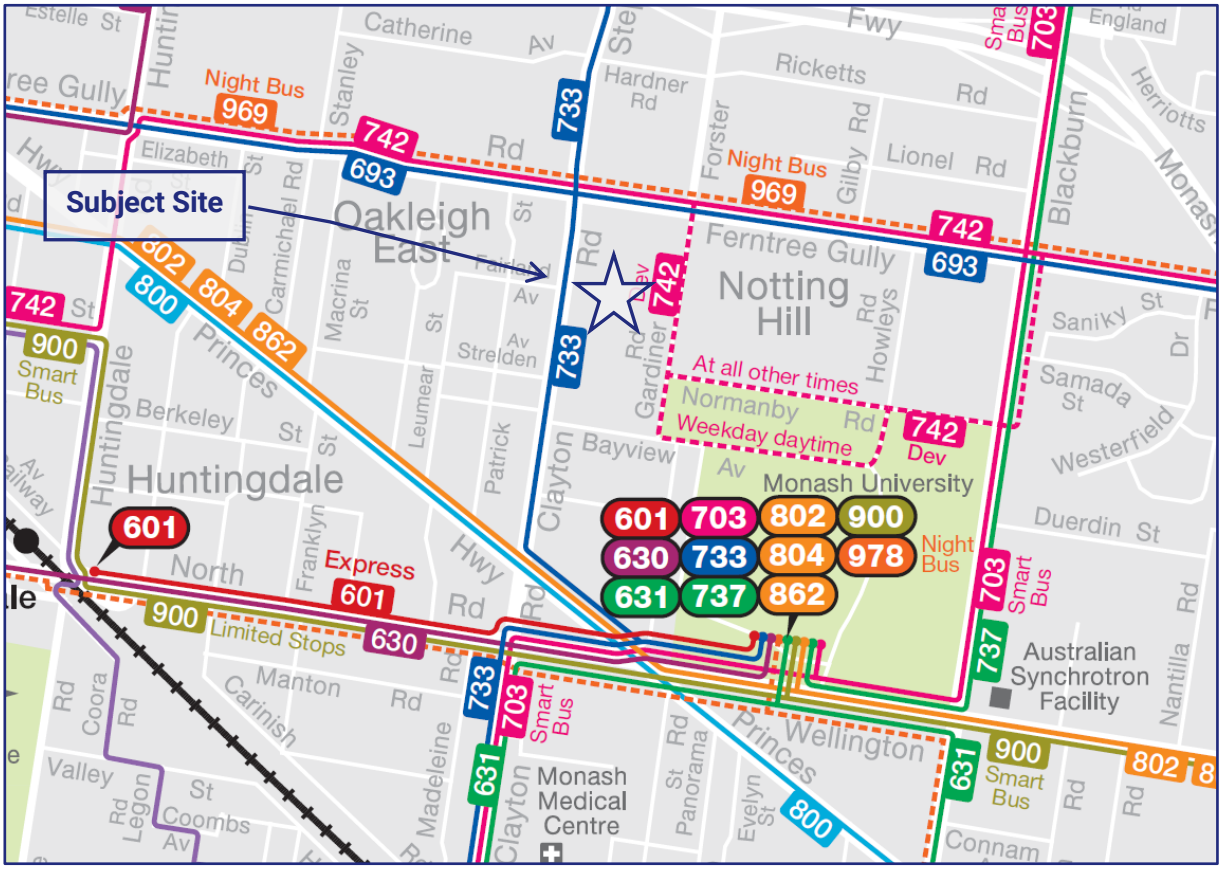


Figure 7: Nearby Public Transport Services

4. Car Parking Provisions

The Planning Scheme sets out the parking requirements for new developments under Clause 52.06.

The purpose of Clause 52.06 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 adversely 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.*

The car parking requirements for the proposed use are set out under Clause 52.06 and the car parking table at Clause 52.06-5 of the Planning Scheme.

Clause 52.06-5 states:

> *Column B applies if:*
>
> - *any part of the land is identified as being within the Principal Public Transport Network Area as shown on the Principal Public Transport Network Area Maps (State Government of Victoria, August 2018); or*
> - *a schedule to the Parking Overlay or another provision of the planning scheme specifies that Column B applies.*

The site is not located within the Principal Public Transport Network Area and accordingly, the Column A rates set out at Table 1 of Clause 52.06-5 apply to the site.

The master plan drawings identify a total of approximately 2,250 car spaces for the commercial net floor area of 70,150m^2. This equates to a total of 3.2 car spaces to each 100m^2.

From a practical perspective the majority of the floor areas associated with the various buildings would be office use, attracting a car parking rate of 3.5 car spaces to each 100m^2 of net floor area set out under Clause 52.06-5 of the Planning Scheme. Car parking requirements for other uses that may be included as part of development schemes are detailed as follows:

- Residential Hotel – No Rate (to satisfaction of Responsible Authority)
- Indoor Recreation Facility - No Rate (to satisfaction of Responsible Authority)
- Childcare Centre – 0.22 car spaces to each child
- Food and Drink Premises – 4.0 car spaces to each 100m^2 of leasable floor area

- Restricted Retail Premises (Showroom) – 3.0 car spaces to each 100m^2 of leasable floor area.

An assessment of the statutory car parking requirements for each building within the development is provided as follows.

Building	Land Use	Size	Statutory Rate	Requirement
Building A	Residential Hotel	153 Hotel Suites (inc rest/bar)	No Rate	To satisfaction of Responsible Authority
Building B	Office	7,436.1m^2	3.5 spaces / 100m^2	260 spaces
	Showroom	709.3m^2	3.0 spaces / 100m^2	21 spaces
	F+D Premises	187.0m^2	4.0 spaces / 100m^2	7 spaces
Building C	Office	6,257.4m^2	3.5 spaces / 100m^2	218 spaces
	Showroom	709.3m^2	3.0 spaces / 100m^2	21 spaces
	F+D Premises	187.8m^2	4.0 spaces / 100m^2	7 spaces
Building D	Office	15,172.6m^2	3.5 spaces / 100m^2	531 spaces
	Showroom	311.3m^2	3.0 spaces / 100m^2	9 spaces
	F+D Premises	258.6m^2	4.0 spaces / 100m^2	10 spaces
Building E	Office	17,258.3m^2	3.5 spaces / 100m^2	604 spaces
	Showroom	493.7m^2	3.0 spaces / 100m^2	14 spaces
Building F	Office	12,485.5m^2	3.5 spaces / 100m^2	436 spaces
	F+D Premises	204.4m^2	4.0 spaces / 100m^2	8 spaces
Building G	Office	6,638.6	3.5 spaces / 100m^2	225 spaces
	F+D Premises	297.5m^2	4.0 spaces / 100m^2	11 spaces
	Indoor Recreation	347.7m^2	No Rate	To satisfaction of Responsible Authority
Building H	Showroom	422.7m^2	3.5 spaces / 100m^2	14 spaces
	Childcare	150 places	0.22 spaces per place	33 spaces

Based on the table above, the statutory car parking requirement for each building will be:

- Building A – Car parking to the satisfaction of the Responsible Authority
- Building B – 288 spaces
- Building C – 246 spaces
- Building D - 550 spaces
- Building E – 624 spaces
- Building F - 444 spaces
- Building G – 236 spaces, plus car parking for Fitness Centre to satisfaction of Responsible Authority
- Building H – 47 car spaces
- **TOTAL – 2,435 car spaces**

Overall, based on the minimum statutory car parking requirements and (2,435 spaces) and allocation of car parking (2,250 car spaces) a car parking reduction will be required under Clause 52.06-7.

An assessment of the appropriateness of the car parking reduction is provided as follows.

4.1. Reducing the Requirement for Car Parking

Clause 52.06-7 allows for the statutory car parking requirement to be reduced (including to zero). An application to reduce (including reduce to zero) the number of car spaces required under Clause 52.06-5 or in a schedule to the Parking Overlay must be accompanied by a Car Parking Demand Assessment.

Clause 52.06-7 sets out that a Car Parking Demand Assessment must have regard to the following key factors:

- *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 proposed occupants (residents or employees) of the land.*
- *Any empirical assessment or case study.*

Planning Practice Note 22 (June, 2015) specifies that the provisions for reducing the car parking requirement draw a distinction between the assessment of likely demand for parking

spaces (the Car Parking Demand Assessment), and whether it is appropriate to allow the supply of fewer spaces than assessed by the Car Parking Demand Assessment. These are two separate considerations, one technical while the other is more strategic. Different factors are taken into account in each consideration.

Accordingly, the applicant must satisfy the responsible authority that the provision of car parking is appropriate on the basis of a two-step process, which has regard to:

- *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 site.*

An assessment of the appropriateness of reducing the car parking provision below the statutory requirement is set out below.

4.2. Car Parking Demand Assessment

The following Car Parking Demand Assessment has had regard to the above factors as appropriate.

Office

An 'office' is one land-use that is particularly conducive (and important to target) in achieving a mode shift away from private cars to public transport, cycling, walking, etc. This is particularly the case as journey to work trips for office uses are typically made during the commuter peak hours and predominantly involve single occupant vehicles.

The timing of these trips has the greatest impact on traffic congestion on the road network and occurs when public transport services operate at high frequencies (and offer express services in some cases). This is in contrast to an industrial use, for example, where staff may work shifts, travel outside of peak periods and have more limited access to public transport, making it more difficult to achieve a mode shift.

The majority of car parking demands associated with the office use will be long-term staff demands. The peak time for the office demands will be during the day, with negligible demands expected after-hours on weekdays and weekends.

It is important to take a forward looking approach to decreasing reliance on car-based travel and to encourage alternate modes for office land uses. This is particularly relevant in areas where public transport accessibility and access to other services is well provided for and will continue to improve in line with government initiatives.

For the subject site, whilst public transport is currently limited to bus services within 1.5km (including 2 SmartBus services) it is anticipated that public transport services would significantly increase as the Monash National Employment and Innovation Cluster is developed. In this regard the Monash National Employment and Innovation Cluster -Draft Framework Plan (March 2017) identifies the following strategic outcome:

> ***Strategic Outcome 3: TRANSFORM THE TRANSPORT NETWORK TO SUPPORT ECONOMIC GROWTH OF THE CLUSTER***
>
> *Good transport connections to and within the Monash Cluster are critical to its success. The precinct will require a substantial shift to more walking, cycling and public transport*

patronage to alleviate congestion, promote commercial activity and ensure the cluster is a destination of international standing. Congestion impacts productivity and detracts from a precinct's ability to attract employment.

With a place making role and a focus on the 10km radius of connectivity, the transport vision for the cluster and other clusters in metropolitan Melbourne will form an overlapping network within the polycentric city.

A regular mile grid and network of north-south and east-west arterial roads, the Cranbourne Pakenham railway line as well as shuttle and Smart Bus routes in the cluster offer an excellent foundation on which to overlay more convenient connections and new transport modes. A range of significant infrastructure projects complemented by small scale interventions will be required to ensure that the economic performance of the area does not decline.

In regard to public transport links the draft framework identifies Clayton Road, Ferntree Gully Road and Princes Highway as arterial links that are to form the *"focal point for intensification and high-capacity public transport"*. Accordingly, it is reasonable to assume that the public transport accessibility of the site would be significantly improved in the future. This arrangement will support a reduction in the provision of car parking for staff.

Based on the above, we are satisfied that the provision of office staff parking at a rate of 3.45-car spaces per 100m^2 is acceptable for the office use as the on-street car parking areas within the are regulated via appropriate restrictions. Any balance of long-term car parking will be required to use alternative transport modes. This arrangement encourages employees to use the available public transport services and active modes which are readily available.

Food and Drink Premises

Any food and drink premises that are provided as part of the overall development would primarily serve employees from within the precinct only. In this regard, the car parking demands for these uses would typically consist of staff only at rates of around 1 space to each 100m^2 with negligible additional car parking demands associated with customers.

Child Care Centre

Similar to the food and drink premises any childcare centre included as part of the development would be anticipated to serve a significant number of the employees within the precinct. Accordingly, we are satisfied that reduced demands are appropriate for this use in this scenario.

4.3. Appropriateness of Providing Fewer Spaces than the Number Likely to be Generated

The second step is to consider whether it is appropriate to allow fewer spaces to be provided than the number likely to be generated by the site as assessed by the Car Parking Demand Assessment.

Clause 52.06-7 sets out a series of car parking provision factors that should be considered when assessing the appropriateness of providing fewer car spaces on the site than are likely to be generated by the use. The car parking provision factors are as follows, with the most relevant factors highlighted:

- ***The Car Parking Demand Assessment.***
- *Any relevant local planning policy or incorporated plan.*
- ***The availability of alternative car parking in the locality of the land, including:***
  - ***Efficiencies gained from the consolidation of shared car parking spaces.***
  - *Public car parks intended to serve the land.*
  - *On street parking in non residential zones.*
  - *Streets in residential zones specifically managed for non-residential parking.*
- *On street parking in residential zones in the locality of the land that is intended to be for residential use.*
- *The practicality of providing car parking on the site, particularly for lots of less than 300 square metres.*
- *Any adverse economic impact a shortfall of parking may have on the economic viability of any nearby activity centre.*
- *The future growth and development of any nearby activity centre.*
- *Any car parking deficiency associated with the existing use of the land.*
- *Any credit that should be allowed for car parking spaces provided on common land or by a Special Charge Scheme or cash-in-lieu payment.*
- *Local traffic management in the locality of the land.*
- *The impact of fewer car parking spaces on local amenity, including pedestrian amenity and the amenity of nearby residential areas.*
- *The need to create safe, functional and attractive parking areas.*
- ***Access to or provision of alternative transport modes to and from the land.***
- *The equity of reducing the car parking requirement having regard to any historic contributions by existing businesses.*
- *The character of the surrounding area and whether reducing the car parking provision would result in a quality/positive urban design outcome.*
- *Any other matter specified in a schedule to the Parking Overlay.*
- *Any other relevant consideration.*

The highlighted factors are considered below.

Car Parking Demands Assessment

As previously detailed within this assessment we are satisfied that car parking demands for the various uses will be reduced compared to the default statutory rates.

Local Traffic Management

As discussed previously, an 'office' use is one land-use that is particularly conducive (and important to target) in achieving a mode shift away from private cars to public transport, cycling, walking, etc. This also applies to staff parking for most commercial businesses.

This is particularly the case as journey to work trips for office uses are typically made during the commuter peak hours and predominantly involve single occupant vehicles. The timing of these trips has the greatest impact on traffic congestion on the road network and occurs when public transport services operate at high frequencies (and offer express services in some cases).

The lower provision of car parking assists in reducing the traffic impacts of the development on the local and broader road network and encourages sustainable transport choices. If provided with the full statutory office requirement, traffic generated by the development would be significantly higher than what is proposed.

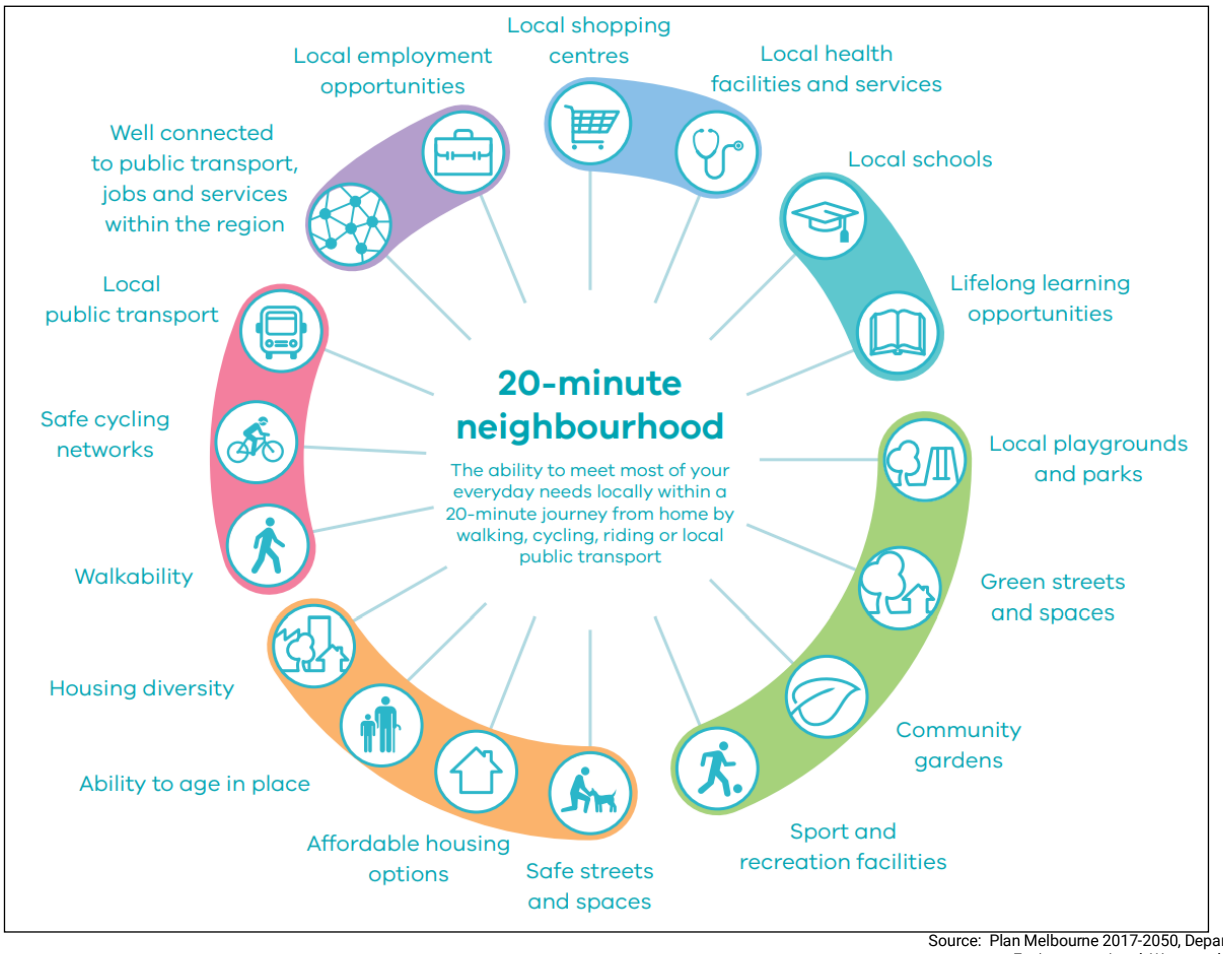
Plan Melbourne is a long-term vision to ensure that Melbourne grows more sustainable, productive and liveable as its population approaches 8 million. It is a long-term plan designed to respond to the statewide, regional and local challenges and opportunities Victoria faces between now and 2050.

Plan Melbourne 2017-2050 (Direction 5.1) states that a 20-minute neighbourhood must:

- *be safe, accessible and well connected for pedestrians and cyclists to optimise active transport.*
- *offer high-quality public realm and open space.*
- *provide services and destinations that support local living.*
- *facilitate access to quality public transport that connects people to jobs and higher-order services.*
- *deliver housing/population at densities that make local services and transport viable.*
- *facilitate thriving local economies.*

The integral factors of creating a 20-minute neighbourhood are detailed at Figure 8.

The creation of new employment opportunities/office space within an Activity Centre which is well connected via quality public transport and bicycle facilities accords with the vision of Plan Melbourne 2017-2050 in terms of creating a '20-minute neighbourhood', in particular local employment opportunities which are well connected to public transport services. The low provision of car parking also aims to reduce congestion by promoting alternative sustainable modes of transport to and from the site.



Source: Plan Melbourne 2017-2050, Department of Environment, Land, Water and Planning

Figure 8: The 20-minute neighbourhood

A recent Red Dot VCAT decision relating to a planning application for a residential development at No. 31-37 Stewart Street and 12-20 Hardy Street, Brunswick, *Ronge v Moreland CC (Red Dot) [2017] VCAT 550 (9 May 2017)*, provided the following relevant commentary in regards to the provision of car parking in the future.

What does the future hold for Melbourne in the coming decades?

15 *Melbourne is rapidly changing and the metropolitan area in future will be a very different place from the past or the present. On 31 March 2017, the new metropolitan planning strategy was released and changes made to all Planning Schemes in Victoria. Plan Melbourne 2017-2050 in essence updates and revises Plan Melbourne released in 2014.*

16 *Underpinning the whole strategy is the necessity to accommodate a population which is projected to increase from approximately 5 million to 8 million people by 2050. Aside from population growth, listed key challenges are remaining competitive in a changing economy, providing housing that is affordable and accessible, keeping up with the growing transport needs of the city, and mitigating and adapting to climate change.*

17 *In summary, the strategies set out in Plan Melbourne 2017-2050 include an intention to constrain the outward spread of the urban area and to focus employment, services and*

development in national employment and innovation clusters, urban renewal precincts and activity centres linked by public transport.

18 *It is anticipated that Melbourne will require an additional 1.6 million homes by 2050 and that the northern region, which includes Moreland, will need to accommodate approximately 175,000 to 180,000 new dwellings in established areas.*[1]

19 *Specifically there is an intention to locate medium and higher density development near services, jobs and public transport to support objectives concerning urban consolidation and housing choice. There is support for new housing in activity centres and other places that offer good access to jobs, services and public transport. There is still an intention to create 20-minute neighbourhoods to enable residents to walk, cycle or catch public transport rather than rely on longer trips and the use of private motor vehicles with benefits in reduced travel costs, traffic congestion and carbon emissions.*[2]

20 *Whilst many, if not most, of these strategies are not new, they emphasise that the whole metropolitan area will be subject to change, even outside urban renewal areas and activity centres which are to be the focus for higher density development. Large redundant industrial sites, such as the one we are considering in Stewart and Hardy Streets, cannot be quarantined from significant development simply because they are surrounded by single and double storey dwellings, mostly built in times past when Melbourne was facing different economic, social and environmental circumstances and different community expectations.*

21 *For example, it is hard to envisage any circumstances today where the existing industrial uses and buildings on the review site would be allowed to establish on a site surrounded on all sides by houses. But that was accepted half a century or more ago and is commonplace across suburbs such as Brunswick and Preston. It is no longer accepted. This is why, without exception, Council and all respondents acknowledge the benefits of redeveloping the review site for housing. The primary question in dispute is the intensity and form of that new housing.*

64 *We have already referred to what can only be described as the massive increase in Melbourne's population projected through until 2050. Our roads are already congested and will be unimaginably so if a 'business-as-usual' approach is accepted through until 2050. The stark reality is that the way people move around Melbourne will have to radically change, particularly in suburbs so well served by different modes of public transport and where cycling and walking are practical alternatives to car based travel.*

65 *State and Local planning policies are already acknowledging the change that is required with Plan Melbourne 2017-2050 and State policies referring to 20-minute neighbourhoods. At the municipal level, Moreland has long been recognised as being at*

1 Pages 44 to 59

2 Pages 98 and 99.

> *the forefront of encouraging less reliance on car based transport. For example, the Moreland Integrated Transport Strategy 2010 includes a key principle that walking and cycling are the preferred modes of transport.*

Our reading of the above commentary is that as a result of a large increase expected in Melbourne's population in the nearby future, development cannot simply continue to provide car parking at the statutory rate for all uses, especially in areas which are well served by alternative modes of transport to private car usage. The alternative to this will be congested roadways, amongst other related issues. This proposal provides a lower car parking rate for the proposed office tenancies than that specified by Clause 52.06 of the Planning Scheme and the relevant car parking overlay under Clause 45.09. We are of the view that this lower provision of car parking will aim to satisfy the objectives of *Plan Melbourne 2017-2050* by reducing traffic impacts in a location where access to alternative modes of transport will be increased in the future.

Sharing of Car Parking Spaces

The proposed development includes significant opportunities for the sharing of car parking spaces enabling flexibility in the allocation of car parking between various tenants and building.

This arrangement allows for those tenants that require higher levels of car parking to be off-set by building tenants that may require lower levels of car parking.

Public Transport Accessibility

The subject site has access to alternative transport modes as set out at Section 3.3, including:

- Bus Route 733, operates along the site's frontage to Clayton Road, and
- Bus Routes 693 and 742 operate along Ferntree Gully Road, approximately 350m north of the site.
- Two smart bus services, Route 900 and Route 703 operated along North Road approximately 1.3km walking distance south of the site. These services provide services at higher frequencies.
- Extensive additional bus services are available via the Monash University Bus Interchange, located 1.6km walking distance south-east of the site (Routes 601, 630, 631, 737, 802, 804, 862).

Improvements to the pubic transport services in the nearby area are expected to occur in the future as the areas is developed in line with the

We are satisfied that a reduction of car parking requirements under the decision guidelines of Clause 52.06-7 is acceptable and that the proposed development is unlikely to result in unreasonable impacts upon the provision of car parking in the locality.

5. Bicycle Parking Requirements

The statutory bicycle parking requirements are detailed under Clause 52.34. Whilst bike parking areas and End of Trip facilities are identified, the layout of these areas are not detailed on the plans. Notwithstanding the full statutory requirements will be adequately accommodated on-site.

The sustainability management plan identifies that bicycle parking and end of trip facilities will be provided in accordance with the following:

> *Masterplan:*
>
> *The public realm areas will be provided with visitor bike parking facilities at a rate of one per 20 peak visitors to the precinct.*
>
> *Future Buildings/Lots:*
>
> *The development(s) will include the following facilities to support active transport:*
>
> - *Secure bicycle parking spaces in each building for use by regular occupants/staff, at a rate of one per 13 regular occupants; and*
> - *Change facilities, including showers and lockers provided in accordance with the current Green Star criteria.*

It is expected that following the applications of these rates will result in the statutory bicycle parking rates under Clause 52.34 being satisfied. The following statutory rates apply to the various uses proposed.

Table 2: Applicable Bicycle Parking Rates (Clause 52.34)

Use	Visitor Requirement	Staff Requirement
Office	1 to each 1,000m^2	1 to each 300m^2
Retail (inc. Showroom and F+D Premises)	1 to each 500m^2	1 to each 300m^2
Residential Hotel	1 to each 10 lodging rooms	1 to each 10 lodging rooms
Recreation Facility	No Rate	No Rate
Childcare	No Rate	No Rate

An assessment of the statutory requirements for each building is provided in the following table.

Table 3: Statutory Bike Parking Requirement

Building	Land Use	Size	Requirement - Visitor	Requirement - Staff
Building A	Residential Hotel	153 Hotel Suites (inc rest/bar)	15	15
	TOTAL		**15**	**15**
Building B	Office	7,436.1m^2	7	24
	Showroom	709.3m^2	1	2
	F+D Premises	187.0m^2	0	1
	TOTAL		**8**	**27**
Building C	Office	6,257.4m^2	6	21
	Showroom	709.3m^2	1	2
	F+D Premises	187.8m^2	0	1
	TOTAL		**7**	**24**
Building D	Office	15,172.6m^2	15	51
	Showroom	311.3m^2	1	1
	F+D Premises	258.6m^2	1	1
	TOTAL		**18**	**59**
Building E	Office	17,258.3m^2	17	57
	Showroom	493.7m^2	1	2
	TOTAL		**18**	**59**
Building F	Office	12,485.5m^2	12	42
	F+D Premises	204.4m^2	0	1
	TOTAL		**12**	**43**

Building	Land Use	Size	Requirement - Visitor	Requirement - Staff
Building G	Office	6,638.6	7	22
	F+D Premises	297.5m^2	1	1
	Indoor Recreation	347.7m^2	0	0
	TOTAL		**8**	**23**
Building H	Showroom	422.7m^2	1	1
	Childcare	150 places	0	0
	TOTAL		**1**	**1**

Each building will include dedicated bicycle parking areas and end of trip facilities at ground level. Shared facilities for visitors would be provided throughout the site.

Overall, we are satisfied that suitable bicycle parking facilities will be provided as part of the development and the minimum requirements under Clause 52.34 satisfied.

6. Building Staging

It is expected that the development would occur over a number of stages. The staging plan identifies the following buildings within each stage:

The Staging of the development is proposed to include:

- Stage 1 – Road Works, Building C and Building H
- Stage 2 – Building D and Building E
- Stage 3 – Building F and Building G
- Stage 4 – Building A and Building B

An assessment of the car parking requirements during each stage and the approximate level of car parking provided is detailed in the following table.

Table 4: Staging Car Parking Requirements and Approx. Provisions

Stage	Statutory Parking Req.	Approx. Parking Provision
Stage 1 (Building C and H)	293 spaces	555 spaces
Stage 1-2 (Buildings C-E and H)	1,467 spaces	1,070 spaces
Stage 1-3 (Buildings C-G and H)	2,147 spaces	1,500 spaces
Stage 1-4 (All Buildings)	2435 spaces	2,250 spaces

Based on the above, car parking areas may need to be expanded under Stage 2 and Stage 3 in order to more closely meet the statutory requirements. This requirement could be determined as part of the detailed design and included as condition of permit if required.

7. Internal Car Parking Layout

7.1.1. Car Parking Layouts

The proposed parking layout and vehicle access arrangements shall be designed to accord with the following guidelines:

- Clause 52.06-9 of the Planning Scheme (Design standards for car parking),
- AS2890.1-2004 – Part 1: Off-Street car parking (where relevant), and
- AS2890.6-2009 – Part 6: Off-street Parking for People with Disabilities (where relevant).

The typical car parking modules shall accord with the standard modules provided at Table 2 of Clause 52.06-9.

Angle of car parking spaces to access way	Accessway width	Car space width	Car space length
60°	4.9 m	2.6 m	4.9 m
90°	6.4 m	2.6 m	4.9 m
	5.8 m	2.8 m	4.9 m
	5.2 m	3.0 m	4.9 m
	4.8 m	3.2 m	4.9 m

7.1.2. Internal Access Roads

The internal access roads accessing through the development are 6.0m wide carriageways that will adequately accommodate two-way traffic movements.

Ramps to the basements have been provided with clear widths that accord with the minimum requirements of AS2890.1-2004.

Care shall be taken around changes in direction within the road network in order to ensure that emergency and waste collection vehicles are accommodated. This would be addressed as part of the detailed design noting that our assessment for service vehicles identifies that suitable circulation opportunities are available.

7.1.3. Multiple Access to Basement

Multiple access points to the basement car parking areas are provided in order to control queuing and delays associated with access into the basement car parking.

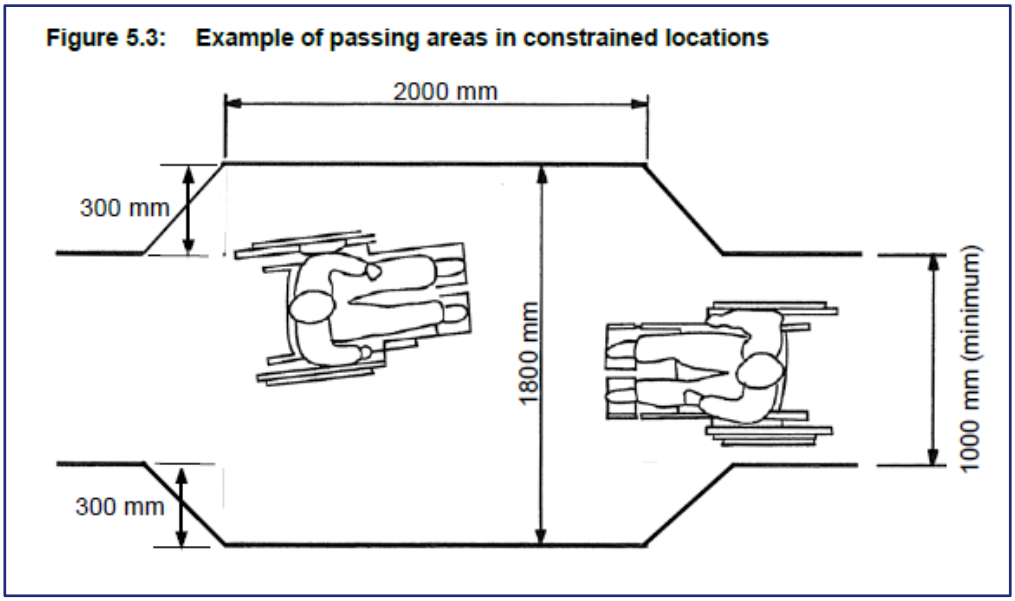
Detailed design associated with the security control points within the basement access would occur at a later stage. Based on the size of the site there is ample opportunities for suitable circulation and queuing areas to be created as required.

A detailed car parking management plan would be prepared as part of detailed design stages. This plan would identify all internal line marking, signages and car parking control devices.

7.1.4. Pedestrian Connectivity

Pedestrian connections are provided throughout the site at ground level with connections provided between each building to the adjacent road network and reserve located to the south of the site.

Any footpaths shall be provided with a clear width of 1.2m with suitable passing areas for two-wheel chairs provided at reasonable intervals (50m). The design of passing areas for wheelchairs is provided below.



Source: Guide to Road Design Part 6A: Paths for Walking and Cycling

8. Loading and Waste Collection

Loading

Clause 65.01 of the Planning Scheme specifies that:

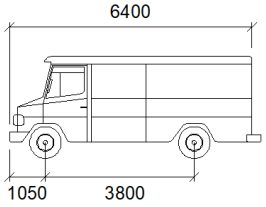
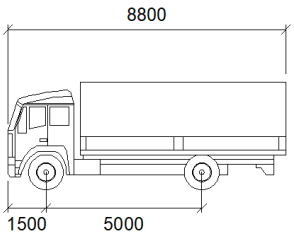
> *Before deciding on an application or approval of a plan, the responsible authority must consider, as appropriate:*
>
> - *The adequacy of loading and unloading facilities and any associated amenity, traffic flow and road safety impacts.*

Loading demands for the offices would typically be limited office supplies and some deliveries associated with courier vehicles (i.e. parcel delivery). In this regard we are satisfied that most deliveries to the site would be limited to smaller delivery vehicles.

We are satisfied that the loading activities could be accommodated within the internal road network as required or within the visitor car parking areas.

Table 5sets out the requirements of the two truck sizes most likely to be required to undertake the loading activities for the various buildings. The Small Rigid Vehicle (SRV) includes all vans and small trucks, including the 'mini' waste truck (6.4m long, 2.08m high). The Medium Rigid Vehicle (MRV) includes medium sized trucks and a typical waste truck (8.8m long, 4.0m height clearance).

Table 5: Review of truck requirements

Truck Size	Dimensions	Headroom Clearance	Ramp Gradients	Notes
Small Rigid Vehicle (SRV)	 6.4m SRV	3.5m	Maximum – 1:6.5 Transitions – 1:12 over 4m	Covers all vans and the small waste truck.
Medium Rigid Vehicle (MRV)	 8.8m MRV	4.5m	Maximum – 1:6.5 Transitions – 1:16 over 7m	Covers the 'standard' sized waste truck

Emergency Services

Ambulances and MFB fire fighting appliances will need to circulate the internal private road network.

We are satisfied that suitable access is available noting that the width of the internal roads at 6.0m wide is adequate to accommodate the relevant emergency vehicles.

Design of the vehicle access at changes in direction would be addressed at the detailed design stages, however, we note that access through the site has been reviewed for the 8.8m long service vehicle and found to be adequate.

Waste Collection

Waste collection will be undertaken via a private contractor. We are satisfied that suitable circulation options are available for an appropriately sized waste collection vehicles

Waste collection arrangements would be formalised via a Waste Management Plan at the detailed design stages.

Swept paths that demonstrate vehicle access across the site to the various service areas by the 6.4m SRV and 8.8m MRV as presented in AS2890.2-2004 is provided at Appendix B.

9. External Vehicle Access Considerations

9.1.1. Site Access Strategy

Given the scale of the development and car parking yield it has been determined that the primary access to the site will need to be created via a set of new traffic signals. The traffic signals would be centrally located along the site's frontage.

The development would utilise secondary vehicle access points to the northern and south of the proposed traffic signals. These access points would not include dedicated turn lanes as they cannot be readily accommodated as a result of the road reserve overall. The secondary access points are intended to assist in relieving some pressure from the central traffic signals.

We have assumed that access to the secondary crossovers would be limited to left-in/left-out only, however, there would be some capacity benefit in allowing for right-in and right-out movements noting that right-in movements occur at other local streets and private access along this section of Clayton Road.

Figure 9 identifies the indicative vehicle access strategy for the development site.

Figure 9: Indicative Site Access Strategy

9.1.2. Concept Functional Layout

A concept functional layout plan which identifies the traffic signals has been prepared by our office and is attached Appendix C. The plan identifies:

- 40m centreline separation between site access and Fairland Avenue,
- 120m right-turn lane entry lane (including taper),
- 65m left-turn deceleration lane (including taper),
- dual right-turn exit lanes onto Clayton Road (includes 60m internal turning lane), and
- 60m left-turn exit/slip lane onto Clayton Road.
- Relocated bus stops have been identified.

Pedestrian access across the left-turn slip lanes will be provided via formal zebra crossings with signalised crossing of Clayton Road available from the southern leg only.

10. Traffic Impact Assessment

10.1.1. Traffic Generation

The application proposes an approximate provision of 2,250 car spaces for the various commercial uses proposed (approx. 70,150m^2 Net Floor Area).

It is typical for commercial office developments to adopt a traffic generation of 50% of the available parking supply filling in the morning peak hour and 50% vacating during the afternoon peak hour. It is also assumed that a further 10% of the peak volume will occur in the counter peak direction.

It is therefore projected the development will generate up to 1,238 vehicle trips per hour, comprising:

- AM Peak Hour – 1,125 veh/h arrivals and 113 veh/h departures
- PM Peak Hour – 113 veh/h arrivals and 1,125 veh/h departures

Based on the developments anticipated primary use as offices, traffic generation outside of the peak hours would be significantly reduced.

RTA Traffic Assessment

In regard to the adopted traffic generation, Department of Transport have previously provided the following commentary:

> *Justification on why traffic generation rates are not adopted from the RTA guide and why 50% of parking supply is considered as a "typical" traffic generation rate for office developments is required.*

In response, a review of the RTA rates has been provided as follows. In regard to the traffic generation for offices the most relevant document is considered to be the *RTA Technical Direction TDT2013/04 (May 2013)* that provides updated traffic surveys and rates for various uses, including office developments.

The overall summary findings from these surveys in regard to office block developments is detailed as follows:

Office blocks

Ten surveys were conducted in 2010. Eight of the surveys were conducted within the Sydney urban area and one each in Newcastle and Wollongong. The Sydney sites provided a range of locations with two inner ring sites, four middle ring sites and two outer ring sites. Most had access to the rail network. Summary trip generation rates were as follows:

Daily vehicle trips = 11 per 100 m^2 gross floor area
Morning peak hour vehicle trips = 1.6 per 100 m^2 gross floor area.
Evening peak hour vehicle trips = 1.2 per 100 m^2 gross floor area.

The current development schedule associated with the development nominates a total of approximately 70,150m^2 of net floor area associated with the offices. Application of this rate to the development would equate to traffic impacts as follows:

- AM Peak Hour – 1,225 vehicle trips / hour

  - Represents a marginal increase in comparison to the traffic generation rates adopted by our office.
- PM Peak Hour – 842 vehicle trips / hour
  - Represents a traffic impacts reduction in comparison to the traffic generation rates adopted by our office.

The GFA and NFA ratios within individual building would always vary and similarly so the provision of car parking depending on site's location. Accordingly, we have undertaken further consideration of the raw data provided within the *RTA Technical Direction TDT2013/04 (May 2013)* as it relates to car parking supply and traffic generation rates as follows.

Site	OB1	OB2	OB3	OB4	OB5	OB6	OB7	OB8	OB9	OB10
Car Parking	136	150	902	66	269	402	28	83	220	133
AM Traffic	52	105	505	93	119	185	70	33	126	123
AM Rate (vte/car space)	0.38	0.70	0.56	1.41	0.44	0.46	2.50	0.40	0.57	0.92
PM Traffic	44	86	481	60	106	166	48	14	139	100
PM Rate (vte/car space)	0.32	0.57	0.53	0.91	0.39	0.41	1.71	0.17	0.63	0.75

The data identifies that for those office buildings with large car parking areas the traffic generation rate on a per car spaces basis is generally consistent with that adopted by our assessment. Specifically:

- OB3 Sydney Olympic Park (34,131m^2 and 902 car spaces) – 0.56 vte/car space during AM peak and 0.53 vte/car space during AM peak
- OB6 Parramatta (27,000m^2 and 402 car spaces) - 0.46 vte/car space during AM peak and 0.41 vte/car space during AM peak

These rates are considered most relevant to the proposed development which will include a significant level of office floor area and associated car parking.

Local Office Case Study

Traffix Group has undertaken peak hour traffic generation surveys of an existing office building at 8 Redfern Road, Camberwell. The building surveyed included approximately 7,540m^2 NFA of office and 297 car parking spaces.

The traffic surveys were undertaken between 7:30-10:30am and 3:00-6:30pm on Thursday 13th September, 2018.

During the surveys a peak occupancy of 188 car parking spaces was recorded. Accordingly, for the purpose of determining a traffic generation rate this was adopted as car parking supply rather than the 297 car parking spaces supplied overall as part of the development.

The surveys recorded AM and PM peak hour traffic generation of:

- AM Peak hour – 78 vehicle trip ends equating to 0.41 vehicle trips/car space
- PM Peak hour – 84 vehicle trip ends equating to 0.45 vehicle trips/car space

Summary

Based on the above, we are satisfied that the traffic generation rates and distributions adopted by our office are appropriate and represent a reasonably accurate representation of the traffic impacts associated with the indicative development scheme.

10.1.2. Traffic Distribution

In determining the distribution of traffic from the development site, we have considered the following.

Current Site Traffic Distribution

The existing distribution of traffic from the current commercial uses at the site, noting that the majority of traffic movements are associated with staff movements.

A review of the traffic generation from all vehicle access points to the site was undertaken this analysis identified a north-south distribution of approximately 63% to/from the north and 37% to/from the south.

Origin-Destination Consideration

Consideration of the origin of employees within City of Monash has been sourced from https://profile.id.com.au/monash/workers.

A figure which identifies the place of residence for various workers within City of Monash is detailed in the figure below. This figure identifies that other than the 22% of employees that reside within Monash the employee catchment is generally evenly distributed in the nearby area.

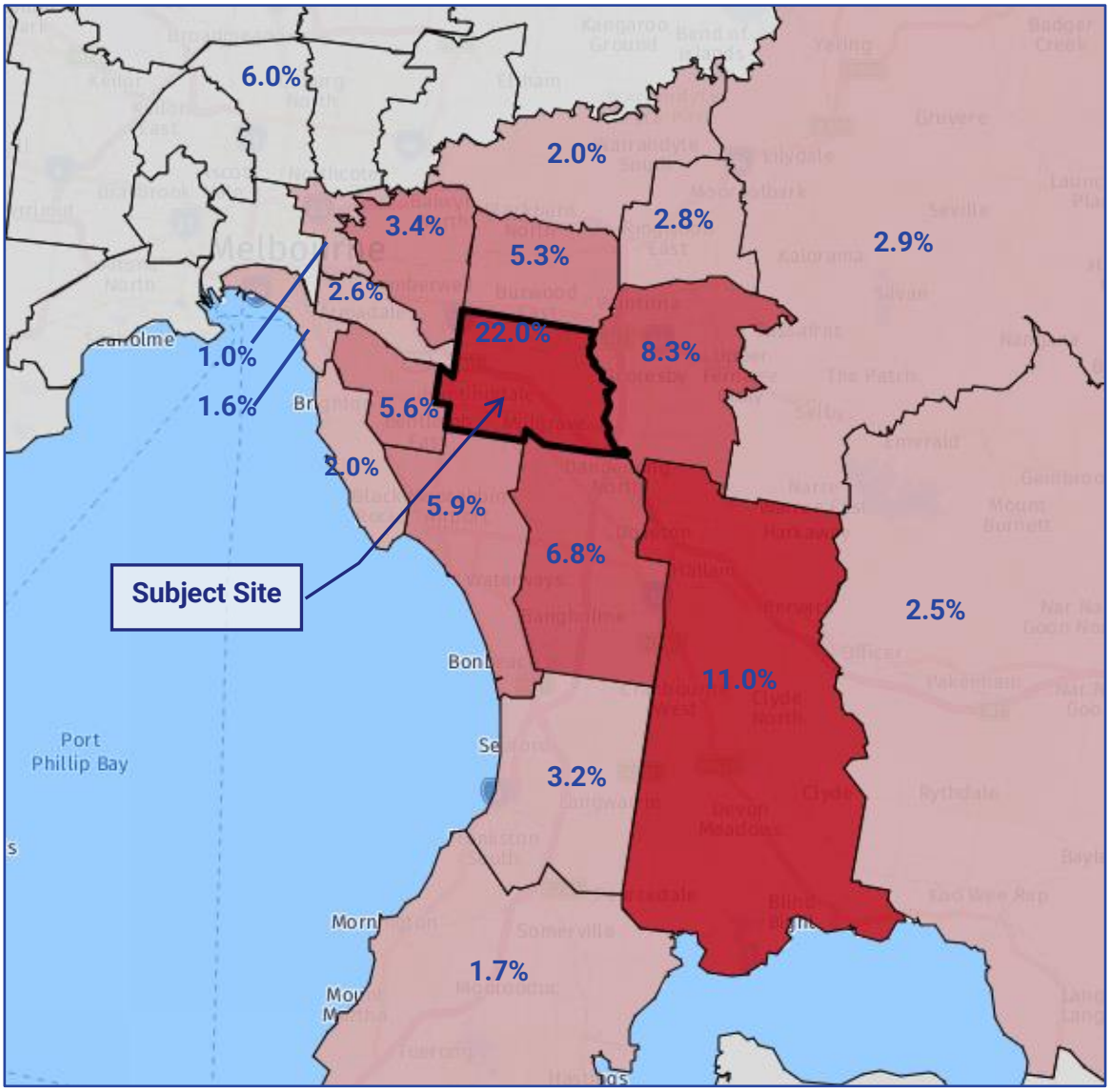


Figure 10: City of Monash – Worker Place of Residence

Adopted Traffic Distribution

A figure which identifies the traffic distribution adopted by our office for the purpose of assessing the impacts on the nearby road network is provided below.

This figure considers the recorded distribution from the site under existing conditions, the employee catchment for City of Monash and the arterial road network and associated connections (i.e. connections to Monash Freeway).

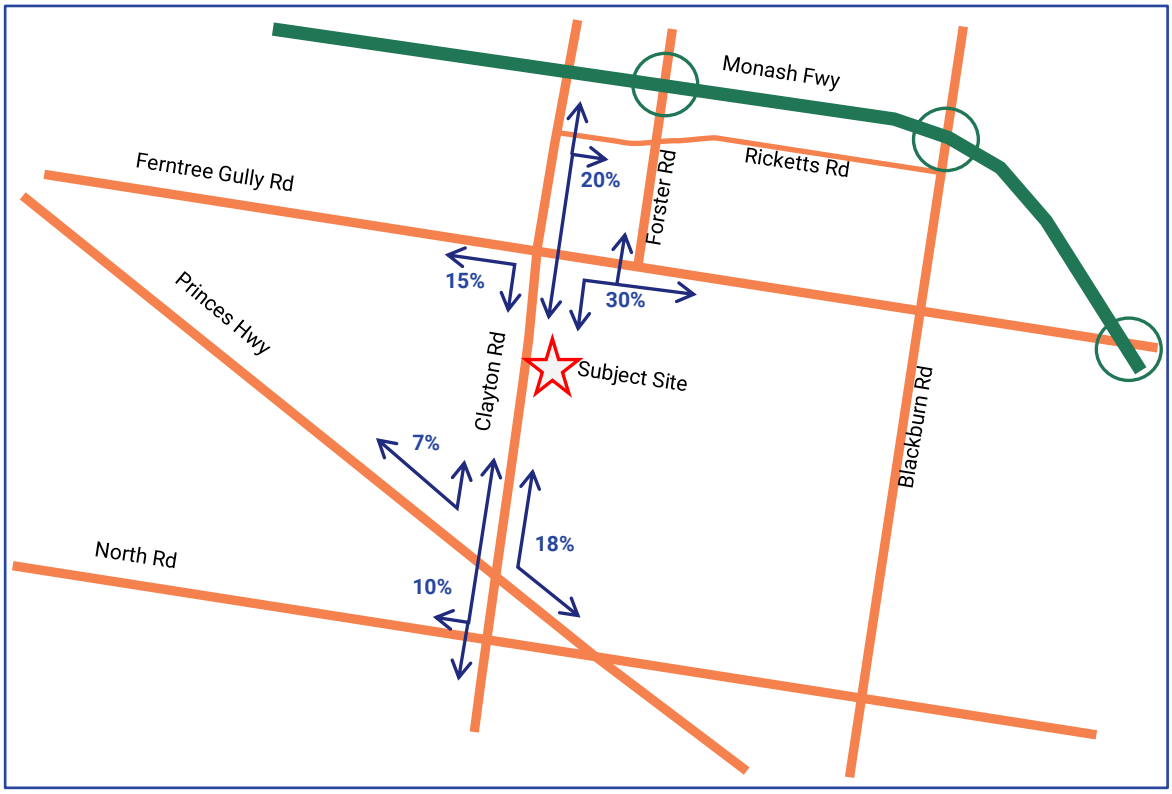


Figure 11: Adopted Traffic Distribution

We are satisfied that the traffic distribution adopted are acceptable and supported on the basis of:

- Locally sourced case study of staff movements from the existing commercial tenancies at the site, and
- Consideration of access to the wider arterial road network (i.e. Monash Freeway) from which more convenient connections are available via the links provided to the north.

In our opinion a distribution of 50/50 between north and south is overly simplistic and does not take into consideration the above matters.

10.1.3. Traffic Impacts

Adoption of the traffic generation and distribution method detailed above would result in traffic impacts from the proposed development as detailed in the following figures.

We have generally adopted that 65% of entering traffic arriving from the north would utilise the primary signalised vehicle access noting that this access will provide the most direct access to the basement car parking areas.

Similarly, we have adopted that 65% of departing traffic heading towards the south would utilise the traffic signals.

The figures separately present the traffic impacts at the site access to Clayton Road including northern and southern secondary crossovers (Figure 12) and the intersections between Clayton Road/Ferntree Gully Road and Clayton Road/Dandenong Road (Figure 13).

These assumptions are considered reasonable.

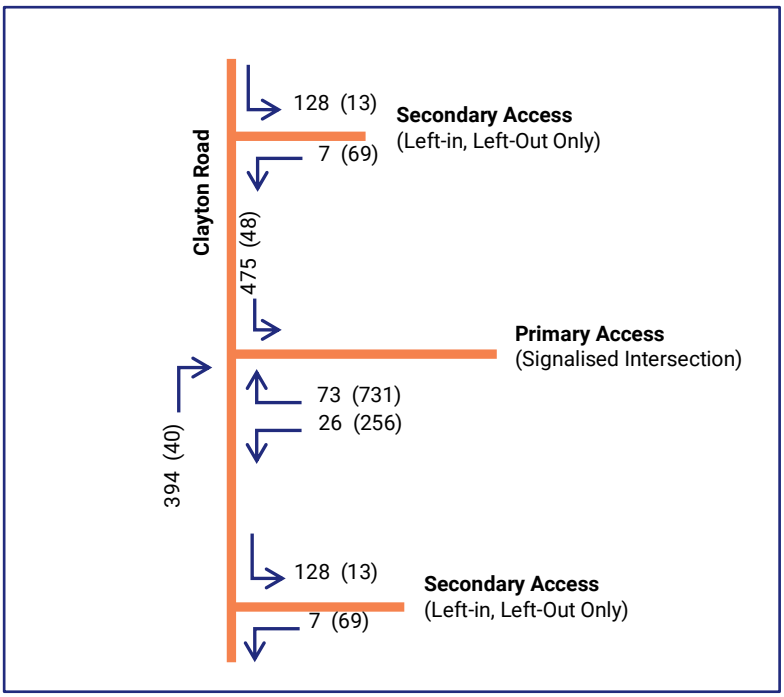


Figure 12: Traffic Impacts as Site Access from Clayton Road

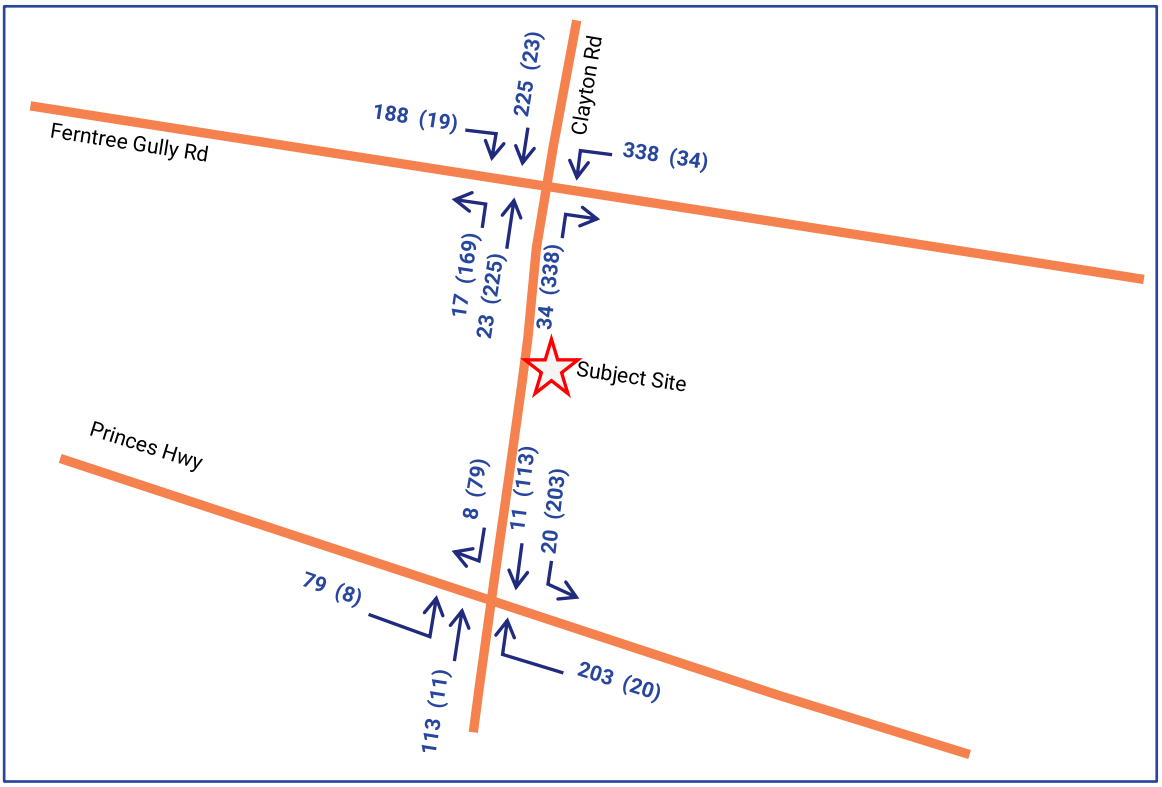


Figure 13: Traffic Impacts at Intersection Between Clayton Road/Princes Highway and Clayton Road/Ferntree Gully Road

11. Traffic Impact Analysis

11.1. Sidra Analysis - Site Access

A Sidra assessment of the site access has been undertaken for the post development conditions at the proposed site access to Clayton Road.

As per the DOT request, a growth factor of 1% pa has been applied to the though traffic volumes along Clayton Road. A separate assessment adopting an increase in traffic along Clayton Road is also provided.

The traffic signals adopt the volumes detailed in the previous figure. The detailed Lane Summary SIDRA output for the AM and PM peak hours are attached at Appendix D.

The key results of the analysis identify:

Existing Traffic Conditions (No Traffic Growth)

AM Peak Hour

- Intersection DOS – 0.819 (Level of Service C)
- 95th percentile queue of 236m on northern leg, 29.6m on southern leg
- 100 second cycle time (user given phases)
- Right-turn in 95th percentile queue of 96m accommodated within 100m turn lane

PM Peak Hour

- Intersection DOS – 0.794 (Level of Service C)
- 95th percentile queue of 132m on northern leg, 125.8m on southern leg
- 95Th Percentile queue of 68.2m on the internal intersection leg
- 76 second cycle time (user given phases)
- Right-turn in 95th percentile queue of 9.9m accommodated within turn lane

1% pa Growth to Clayton Road over 10 years

AM Peak Hour

- Intersection DOS – 0.9 (Level of Service C)
- 95th percentile queue of 317.7m on northern leg, 34m on southern leg
- 100 second cycle time (user given phases)
- Right-turn in 95th percentile queue of 97.3m accommodated within turn lane

PM Peak Hour

- Intersection DOS – 0.874 (Level of Service C)
- 95th percentile queue of 166.3m on northern leg, 152.6m on southern leg
- 95Th Percentile queue of 68.2m on the internal intersection leg
- 76 second cycle time (user given phases)

- Right-turn in 95th percentile queue of 10.2m accommodated within turn lane

Overall, we are satisfied that the traffic impacts associated with the proposed development can be accommodated by a new signalised intersection with Clayton Road with acceptable level of delays and queuing along this road.

11.2. Strategic Support for External Traffic Impacts

It is acknowledged that the change in use and proposed development would result in traffic congestion impacts onto the wider road network. This includes increases in the delays and queue lengths at the intersections between Clayton Road/Ferntree Gully Road and to a lesser degree Clayton Road/Princes Highway.

As previously detailed, the traffic impacts associated with the new traffic signals are expected to result in maximum queuing lengths of 110-148m. The traffic signals at Ferntree Gully Road and Princes Highway are located approximately 400m and 900m from the new signals, respectively. Accordingly, any network impact on the capacity at these locations is unlikely and isolated assessments of these locations would be appropriate.

Detailed assessment of the wider network would typically occur as part of the traffic impact assessment required as part of the planning application.

In this regard to the assessments for intersections beyond the site we also note the following:

- The site is located within an area nominated as part of the Monash National Employment and Innovation Cluster. A significant increase in the employment density is anticipated to occur within this area in the future ('forecasted doubling of jobs in the Monash Cluster' as per VPA Draft Framework Plan, March 2017).

  Under the Draft Framework Plan, the site is located within an area nominated as providing high density employment within a future business town centre (centred along Ferntree Gully Road).

  Based on the above, it is reasonable to assume that an increase in traffic within the area as a while may increase into the future irrespective of this development site.

- Beyond changes to the signal phasing that may assist in alleviating some of the impacts there is limited capacity increases that could be undertaken by the applicant without acquisition of land. Intersections are typically constructed to the full road reserve capacity.

  Any large scale improvements to the arterial road network will require direction and changes to be facilitated by the Department of Transport.

- Increase in traffic and congestion on Clayton Road is likely to result in existing traffic along potentially adopting an alternative route where available (i.e. Gardiner Road or Blackburn Road).

A series of Strategic Outcomes regarding the transport network and supporting economic growth of the cluster are outlined within the Draft Framework Plan, presented in the following figure.

These out-comes are proposed to occur over short-term and long-term and would assist in driving some mode of transport changes within this area.

	Actions	Time frame	Lead agencies
3.1	Plan for a range of high-frequency and high-capacity public transport solutions to be developed in the short to long term, including: **a)** Investigate high-capacity public transport options to serve Monash University as well as the associated health, education and research institutions, and the Monash Technology Precinct; **b)** Boost bus services along key arterial roads and connect major destinations (employment areas, activity centres and residential areas); **c)** Prioritise links between key employment, retail and residential areas with the broader rail network; and **d)** High-quality modal interchanges at railway stations and key destinations.	Short-Long	TfV VPA
3.2	Accelerate the Westall Road preferred freight route connection to Monash Freeway, ensuring adequate levels of access in order to support the growth of local jobs.	Short	VicRoads
3.3	Develop a high quality walking and cycling network to achieve the following: **a)** Connect high demand destinations; **b)** Recreational and commuter routes including continuous Cranbourne-Pakenham railway line shared path and along arterial routes connecting to the broader region; and **c)** Expanding the local bike share scheme from Monash University to the surrounding areas to enable efficient and low-cost movement between key destinations.	Short-Medium	TfV MCC KCC GDCC

Figure 14. Transport Initiatives Actions – Monash National Employment and Innovation Cluster Draft Framework Plan (March 2017)

Figure 15. Transport Plan – Monash National Employment and Innovation Cluster Draft Framework Plan (March 2017)

Suburban Rail Loop

The Suburban Rail Loop *'is a 90-kilometre rail ring around Melbourne's middle suburbs that will connect every metropolitan train line from Cheltenham to Werribee, via Melbourne Airport'*.

The proposed loop will include new station within the Monash University Precinct.

This new station would be expected to assist in driving modal change for existing visitors to this area (i.e. Monash University) and assist in reducing traffic congestion in general.

12. Conclusions

Having undertaken a traffic engineering assessment of the masterplan associated with the commercial development at 34 Clayton Road, Clayton, we are of the opinion that:

a) the proposed land uses generate statutory car parking requirement for 2,435 car spaces, plus car parking for the residential hotel and fitness centre to the satisfaction of the Responsible Authority,

b) a reduction in car parking against the default rates at Clause 52.06 is acceptable on the basis of:

   i. Car parking demand assessment,

   ii. Access to alternate transport modes,

   iii. Sharing of car parking spaces,

   iv. Limitation of traffic impacts on the wider road network, and

   v. State-wide policies that encourage mode shift towards alternate transport modes.

c) car parking for staff of the buildings will be provided within the secure shared basement areas with adequate access and security arrangements,

d) car parking at ground level would primarily be available for the shared use of visitors and short-term demands from various uses within the site,

e) bicycle parking areas will be provided on-site with provisions according with the minimum requirements of Clause 52.34, including end of trip facilities,

f) loading and waste collection demands for the various uses will be accommodate on-site as required within the various service areas and at grade car parking,

g) suitable access for emergency vehicles will be available around the ground level accessways as required,

h) on-site car parking areas will be designed in accordance with the requirements under Clause 52.06-9 and AS2890.1-2004 with appropriate circulation and vehicle access achieved,

i) the site represents a significant redevelopment opportunity supported by Metropolitan Strategy as part of the Monash NEIC,

j) based on the scale of the development traffic signals represent the appropriate form of vehicles access from the arterial road network with secondary access to compliment as required,

k) a suitable signalised intersection can be created along the site's frontage to provide the primary access point, suitable length storage and turn lanes as demonstrated by the attached concept plan,

l) any secondary vehicle access would be limited to left-in/left-out movement only,

m) a total of 2,250 on-site car parking spaces can be accommodated with an acceptable level of traffic impacts on Clayton Road adjacent to the development site,

n) the traffic generation rates adopted within this report are appropriate and generally consistent with the rates presented in the RTA guidelines,

o) the adopted traffic distribution is supported on the basis of local case study and access to the wider arterial road network,

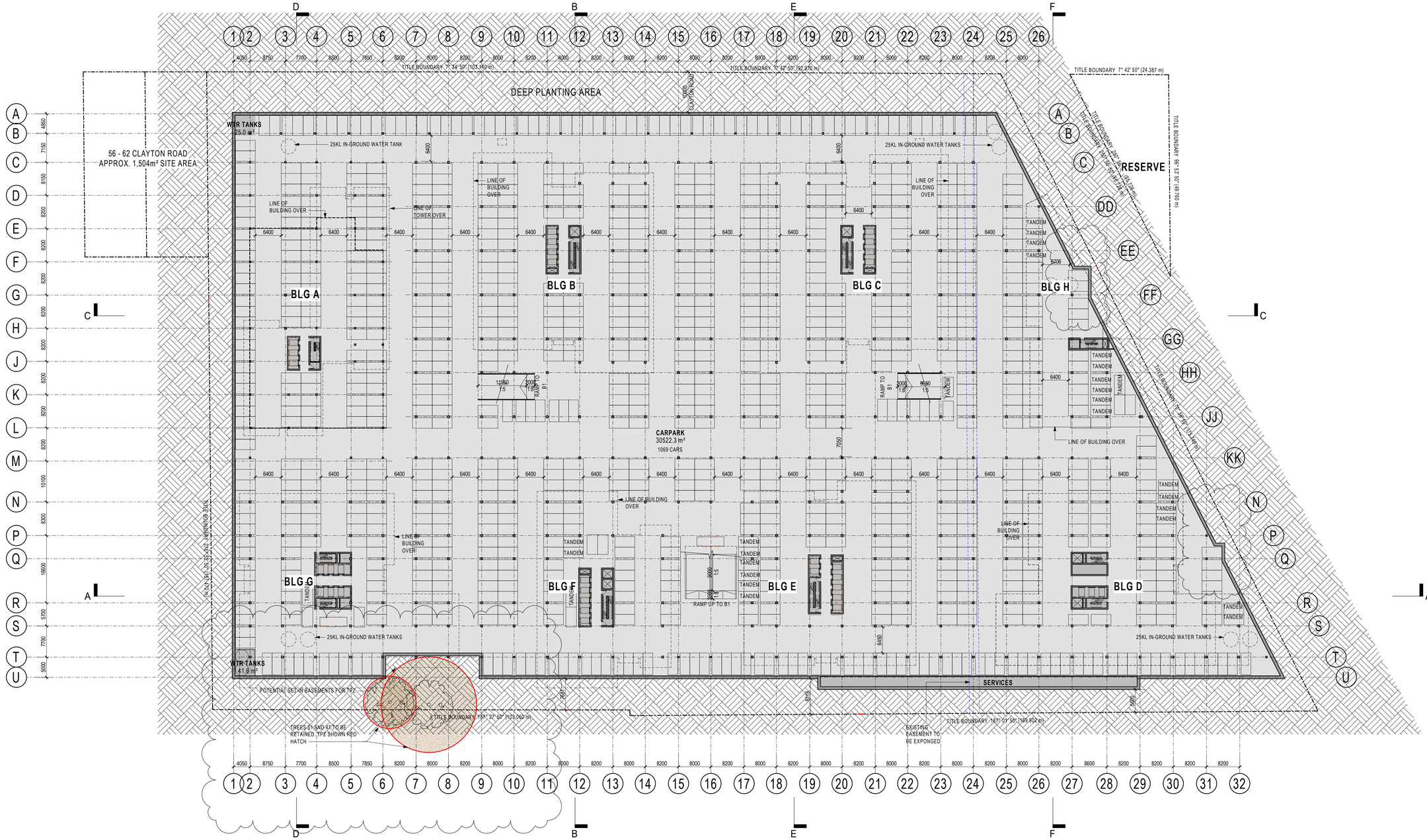
p) the level of traffic generated as a result if a proposal accommodating 2,250 car parking spaces and 70,150m^2 Net Floor Area (approx.) can be accommodated through new traffic signals with minimal impacts to the delays of traffic along Clayton Road,

q) there is limited capacity increases that could be undertaken by the applicant without acquisition of land. Intersections are typically constructed to the full road reserve capacity, and

r) any large scale improvements to the arterial road network will require direction and changes to be facilitated by the Department of Transport as part of the strategies detailed under the Monash NEIC Framework and other policies.

Appendix A

Development Plans



TOWNPLANNING

Revisions			
-	12.08.2020	TP ISSUE	HB
A	26.11.2020	RFI	NW

7/12/2020 2:56:15 PM

Project: **Proposed Development**
Drawing: **Basement 2 Floor Plan**
Project No: **219047**
Date: **08.10.19**
Author: **NC**
Scale: @ A1 **1 : 500**
Drawing No.: **TP01.01 A**

34-54 Clayton Road
Clayton VIC 3168

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Brisbane, Melbourne, Sydney
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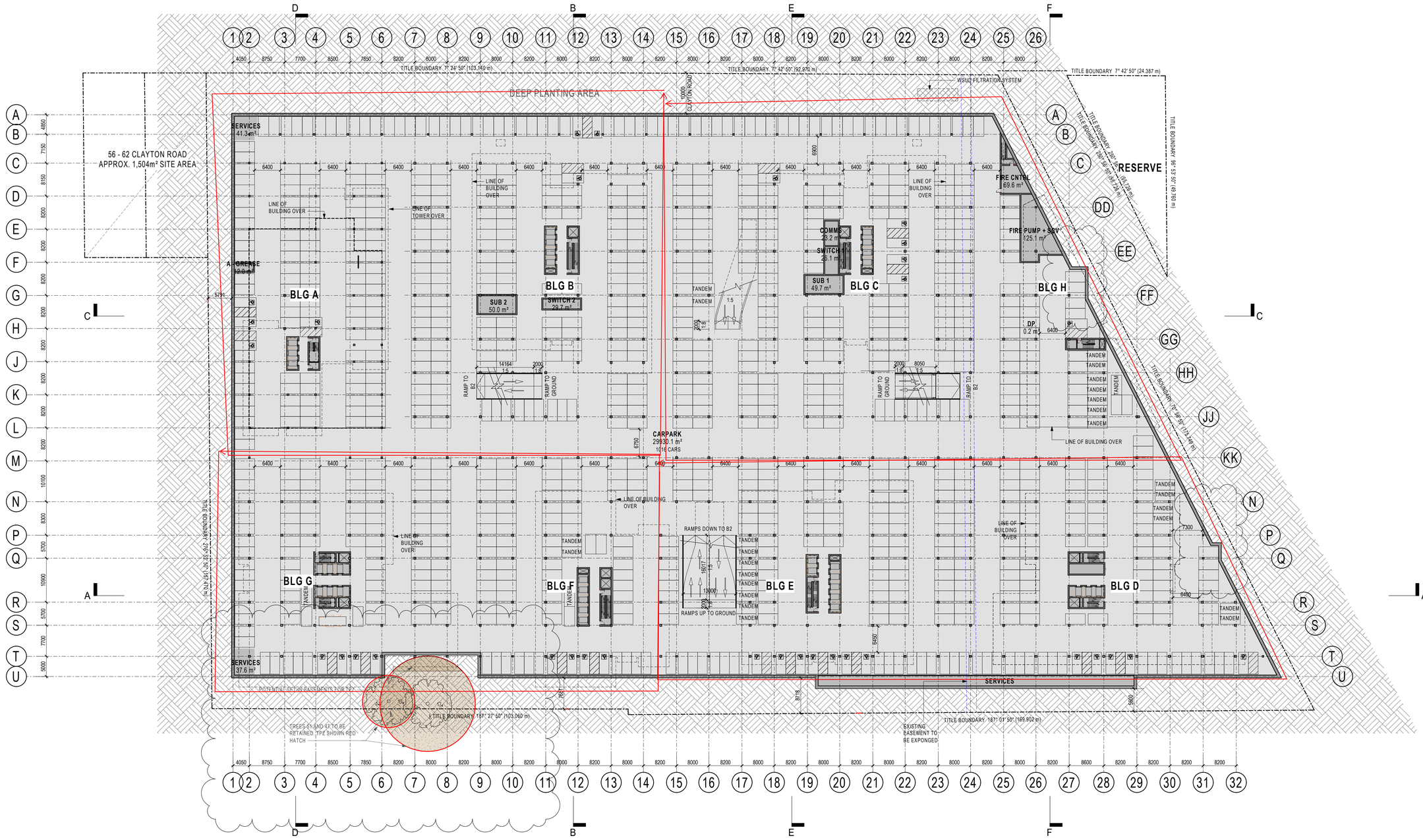

TOWNPLANNING

Revisions			
-	12.08.2020	TP ISSUE	HB
A	26.11.2020	RFI	NW

7/12/2020 2:56:18 PM

Project: **Proposed Development** | Drawing: **Basement 1 Floor Plan** | Project No: **219047** | Date: **08.10.19** | Author: **NC** | Scale: @ A1 **1 : 500** | Drawing No: **TP01.02 A**

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Clayton VIC 3168

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67 CLAYTON ROAD SINGLE STOREY BRICK RESIDENTIAL
65 CLAYTON ROAD TWO STOREY BRICK RESIDENTIAL
63 CLAYTON ROAD SINGLE STOREY BRICK RESIDENTIAL
61 CLAYTON ROAD TWO STOREY BRICK RESIDENTIAL
59 CLAYTON ROAD SINGLE STOREY BRICK RESIDENTIAL
57 CLAYTON ROAD SINGLE STOREY BRICK RESIDENTIAL
55 CLAYTON ROAD SINGLE STOREY BRICK RESIDENTIAL
53 CLAYTON ROAD SINGLE STOREY WEATHERBOARD RESIDENTIAL
51 CLAYTON ROAD SINGLE STOREY BRICK RESIDENTIAL
49 CLAYTON ROAD SINGLE STOREY BRICK RESIDENTIAL
47 CLAYTON ROAD SINGLE STOREY WEATHERBOARD RESIDENTIAL
45 CLAYTON ROAD SINGLE STOREY WEATHERBOARD RESIDENTIAL
43 CLAYTON ROAD SINGLE STOREY WEATHERBOARD RESIDENTIAL
41 CLAYTON ROAD SINGLE STOREY BRICK RESIDENTIAL
FAIRLAND AVE
41 FAIRLAND AVE SINGLE STOREY BRICK RESIDENTIAL
39 CLAYTON ROAD SINGLE STOREY BRICK RESIDENTIAL
37 CLAYTON ROAD SINGLE STOREY BRICK RESIDENTIAL
35 CLAYTON ROAD TWO STOREY BRICK RESIDENTIAL
33 CLAYTON ROAD SINGLE STOREY BRICK RESIDENTIAL
31 CLAYTON ROAD SINGLE STOREY WEATHERBOARD RESIDENTIAL
BERRIMA ST

BUS STOP
CLAYTON ROAD
INDICATIVE LOCATION OF GAS ENCLOSURE TO BE INTEGRATED WITH LANDSCAPING
PROPOSED NEW TITLE BOUNDARY LOCATION
LOCATION OF IN-GROUND WSUD FILTRATION SYSTEM
INDICATIVE LOCATION OF WATER METERS TO BE INTEGRATED WITH LANDSCAPING
TITLE BOUNDARY 7° 24' 50" (103.140 m)
TITLE BOUNDARY 7° 42' 50" (92.970 m)
TITLE BOUNDARY 7° 42' 50" (24.387 m)
RL 95.480
RL 94.700
RL 93.40
RL 91.820
STAIRS DOWN TO FIRE CONTROL ROOM
INDICATIVE LOCATION FOR FIRE BOOSTER ASSEMBLY
PROPOSED 3 STOREY RESIDENTIAL DEVELOPMENT
56 - 62 CLAYTON ROAD
APPROX. 1,504m² SITE AREA
TENNIS COURTS
WAYFINDING SIGNAGE
20m SETBACK
20.0 m SETBACK
RESERVE
TITLE BOUNDARY 250° 56' 50" (50.728 m)
TITLE BOUNDARY 96° 53' 50" (49.780 m)
CARPARK
32 CLAYTON ROAD THREE STOREY CONCRETE COMMERCIAL BUILDING
LOADING
GAS
WTR
FIRE
45M @ 1:40
24M @ 1:40
68M @ 1:76
20M @ 1:40
94.2M @ 1:40
RL 95.125
LINE OF BUILDING OVER
LINE OF TOWER OVER
DROP OFF ZONE
RL 95.585
VISITOR BIKES
RL 95.825
LOUNGE
SFL 96.035
OFFICE
BLG A
FEATURE STAIR TO L1
HOTEL
BOH 152.1 m²
LOBBY 696.2 m²
LOADING/ UNLOADING
RESTAURANT & BAR 551.0 m²
SFL 96.035
RL 95.825
NEW FENCE TO BOUNDARY
CARPARK
74-76 CLAYTON ROAD SINGLE STOREY BRICK CLUBHOUSE
F&B OUTDOOR AREA
RL 95.125
OUTDOOR GYM
LINK TO CARLSON RESERVE
CRICKET NETS
TITLE BOUNDARY 10° 05' 20" (10.470 m)
A
VISITOR BLEACHERS
CARLSON AVENUE RESERVE
PROPOSERED SOCCER PITCHED SHOWN DASHED
RL 95.700
SUBJECT SITE
34 - 40 CLAYTON ROAD
APPROX. 37,032m² SITE AREA
RL 96.125
RL 94.895
LINE OF BUILDING OVER
RL 93.77
RL 96.455
RL 96.325
VISITOR BIKES
LOBBY 343.3 m²
SHOWROOM 339.3 m²
SFL 96.035
SHOWROOM 370.0 m²
BLG B
EOT 90.5 m²
BOH 67.2 m²
F & B 187.8 m²
TIERED SEATING
F&B OUTDOOR AREA
FEATURE PAVILION
SHOWROOM 339.3 m²
LOBBY 343.3 m²
SFL 93.500
SHOWROOM 370.0 m²
BLG C
BOH 67.2 m²
EOT 90.5 m²
F & B 187.8 m²
RL 93.20
RL 93.325
SHOWROOM 422.7 m²
BLG H
SFL 93.250
LOBBY 47.4 m²
CHILDCARE 256.2 m²
TERRACE 256.8 m²
LIGHT APERTURE ABOVE
TITLE BOUNDARY 70° 05' 50" (175.749 m)
MANAGEMENT OF LANDSCAPE TO EXISTING LEASED LAND TO BE NEGOTIATED WITH LAND OWNER
SFL 93.57
F&B OUTDOOR AREA
F & B 279.5 m²
LOBBY 359.8 m²
SFL 96.535
RL 96.455
LINE OF BUILDING OVER
BLG G
FITNESS CENTRE 347.7 m²
EOT 266.9 m²
LOADING / BOH 217.1 m²
LOBBY 394.1 m²
BLG F
F&B 204.4 m²
SFL 96.535
BOH 162.8 m²
EOT 129.3 m²
LOADING/ UNLOADING
COMMUNITY GARDEN
COMMUNITY SHED
SFL 94.120
RL 93.90
LOBBY 406.1 m²
SFL 94.000
BLG E
SHOWROOM 493.7 m²
BOH/LOADING 94.4 m²
EOT 177.9 m²
LOBBY 391.6 m²
SFL 94.000
F&B 258.6 m²
BLG D
SHOWROOM 311.3 m²
BOH 113.5 m²
EOT 251.1 m²
RL 94.100
RL 93.730
TITLE BOUNDARY 187° 27' 50" (103.060 m)
TITLE BOUNDARY 187° 01' 50" (169.902 m)
TREES 51 AND 47 TO BE RETAINED. TPZ SHOWN DASHED
EXISTING FENCE
EXISTING EASEMENT TO BE EXPONGED
1 GARDINER ROAD MELBOURNE WATER RESERVOIR
WATER TANK
WATER TANK
232-256 FERNTREE GULLY RD DOUBLE HEIGHT STEEL COMMERCIAL
B
C
D
E
F

TOWNPLANNING

Revisions			
-	12.08.2020	TP ISSUE	HB
A	26.11.2020	RFI	NW

7/12/2020 2:56:35 PM

Project: Proposed Development
Drawing: Ground Floor Plan
Project No: 219047
Date: 08.10.19
Author: NC
Scale: @ A1: 1 : 500
Drawing No.: TP01.03 A

34-54 Clayton Road
Clayton VIC 3168

rothelowman
Brisbane, Melbourne, Sydney
www.rothelowman.com.au

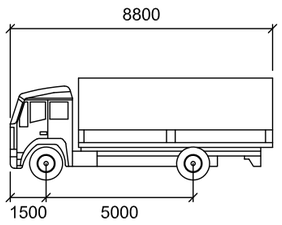
Appendix B

Swept Path Assessment

SITE CIRCULATION - 8.8m MEDIUM RIGID VEHICLE

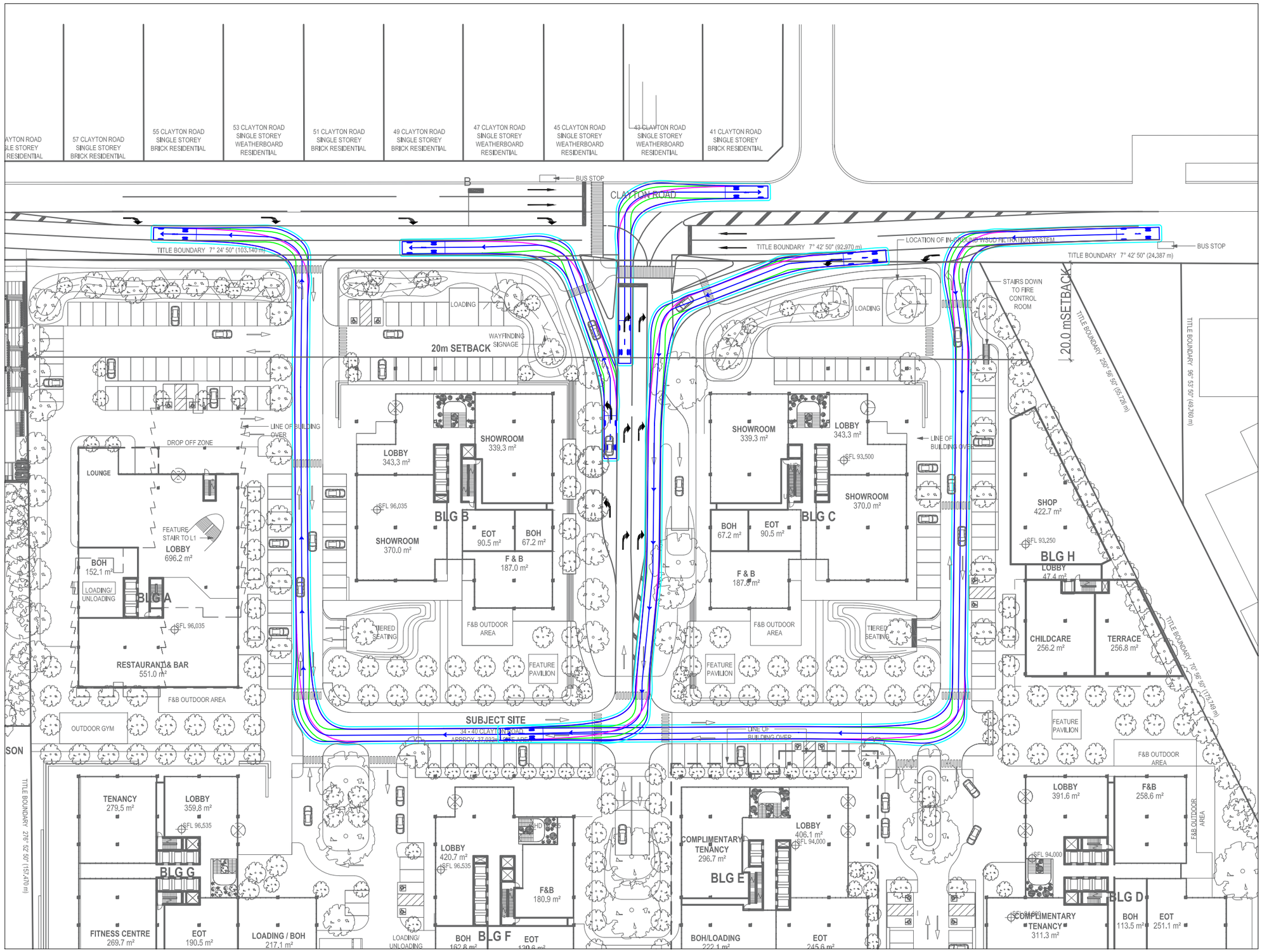
VEHICLE USED IN SIMULATION

(VEHICLE SPEED - 5KM/H)



MRV (AS 2890.2)		mm
Width	:	2500
Track	:	2500
Lock to Lock Time	:	6.0
Steering Angle	:	34.0

LEGEND
- REAR WHEELS
- FRONT WHEELS
- VEHICLE BODY
- BODY CLEARANCE



N

PRELIMINARY ONLY
NOT FOR CONSTRUCTION

REV.	REVISION NOTES	REVISION DATE

GENERAL NOTES:
INFORMATION BASED ON "TP01.03-Ground Floor Plan(P8).dwg"

DESIGNED BY:	M,. HUYNH	31 JUL 2020
CHECKED BY:	M. O'SHEA	31 JUL 2020
FILE NAME:	G27660-01	ISSUE: A

Traffix Group
Level 28, 459 Collins Street
MELBOURNE VICTORIA 3000
TEL : (03) 9822-2888

34 CLAYTON ROAD, CLAYTON

8.8m MEDIUM RIGID VEHICLE SWEPT PATHS

PROPOSED MIXED USE DEVELOPMENT

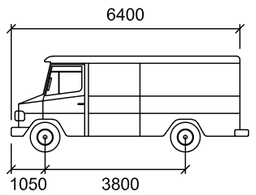
SCALE: 1:800 (A3) 0 8 16

SHEET NO.: 01/05

JOB NO.: 27660

VEHICLE USED IN SIMULATION

(VEHICLE SPEED - 5KM/H)



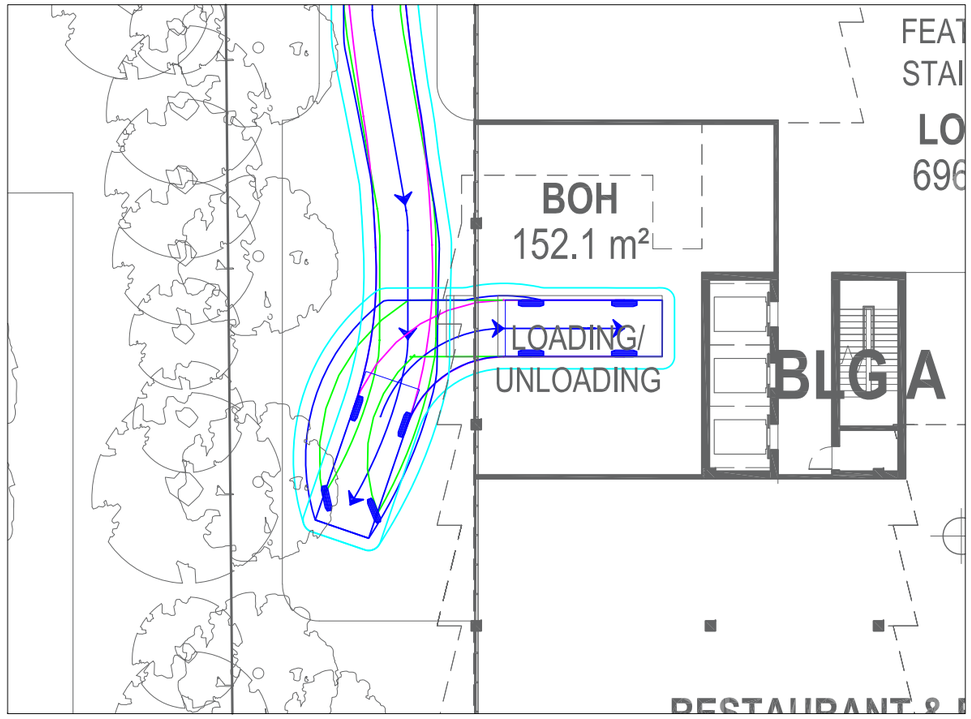
SRV (AS 2890.2) mm

Width	:	2300
Track	:	2300
Lock to Lock Time	:	6.0
Steering Angle	:	38.0

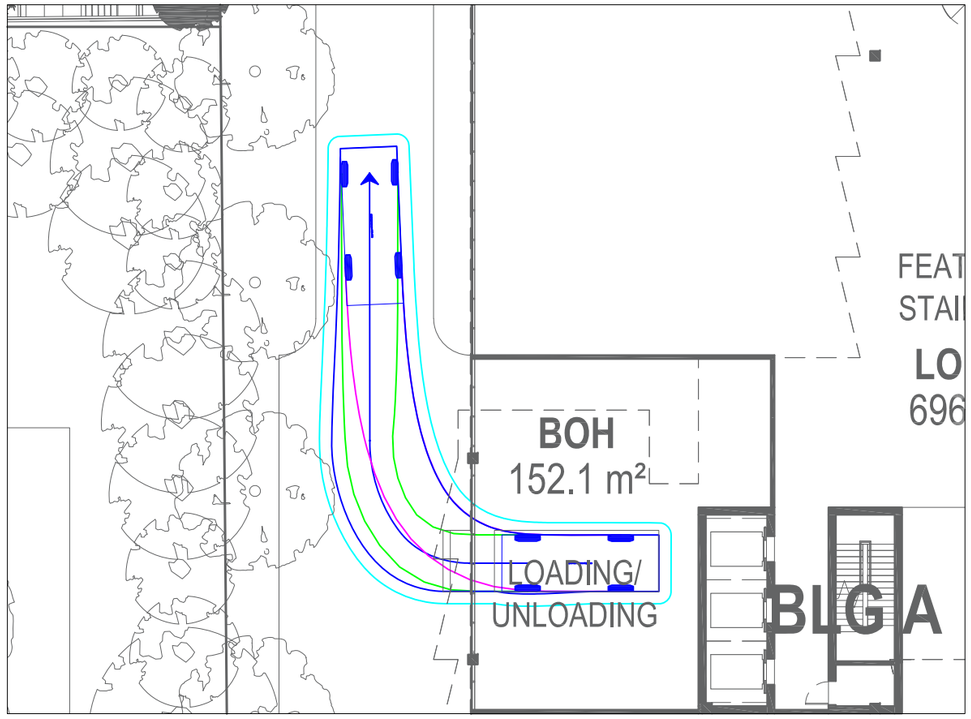
LEGEND

- REAR WHEELS
- FRONT WHEELS
- VEHICLE BODY
- BODY CLEARANCE

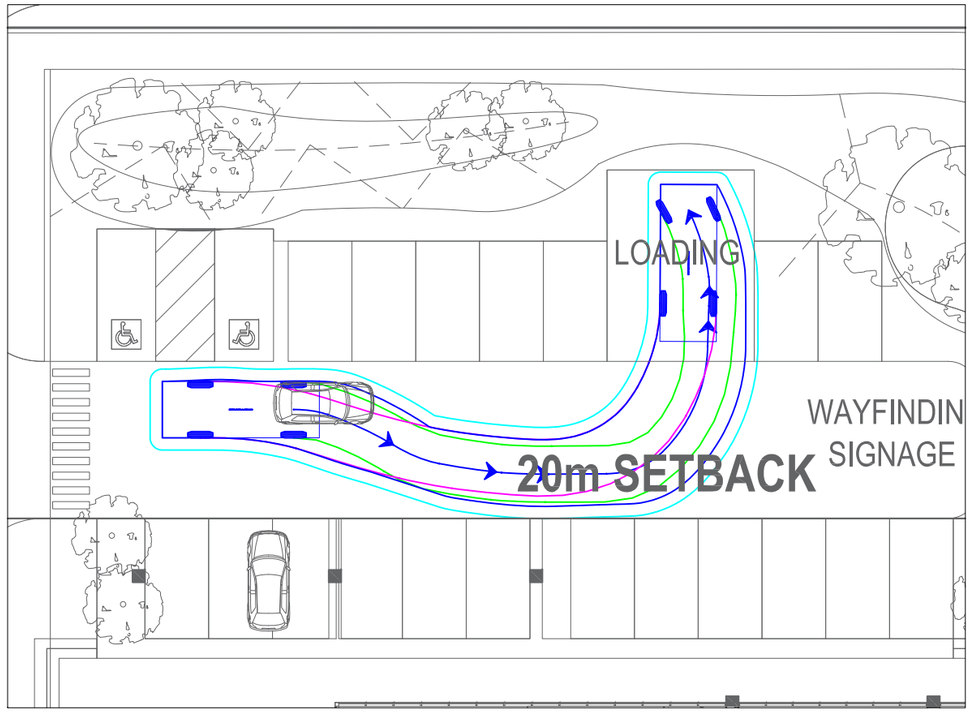
BUILDING A - LOADING BAY - INGRESS



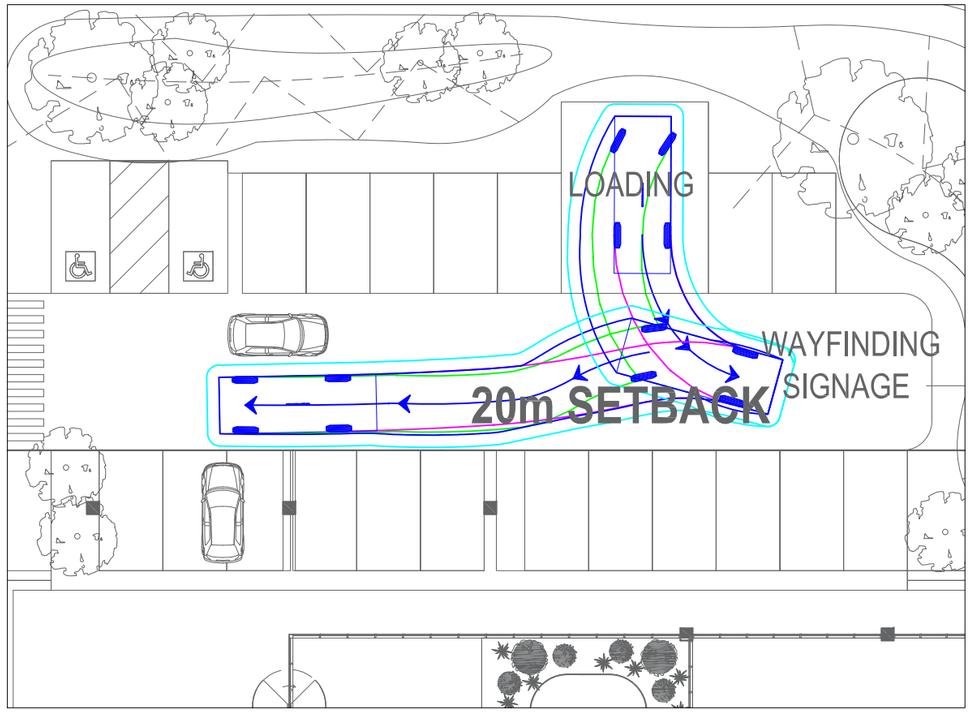
BUILDING A - LOADING BAY - EGRESS



BUILDING B - LOADING BAY - INGRESS



BUILDING B - LOADING BAY - EGRESS



N

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REV.	REVISION NOTES	REVISION DATE

GENERAL NOTES:
INFORMATION BASED ON "TP01.03-Ground Floor Plan(P8).dwg"

DESIGNED BY: M,. HUYNH 31 JUL 2020

CHECKED BY: M. O'SHEA 31 JUL 2020

FILE NAME: G27660-01

ISSUE: A

Traffix Group
Level 28, 459 Collins Street
MELBOURNE VICTORIA 3000
TEL : (03) 9822-2888

34 CLAYTON ROAD, CLAYTON

6.4m SMALL RIGID VEHICLE SWEPT PATHS

PROPOSED MIXED USE DEVELOPMENT

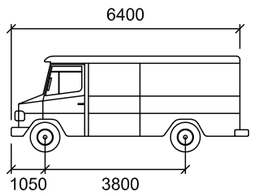
SCALE: 1:250 (A3) 0 2.5 5

SHEET NO.: 02/05

JOB NO.: 27660

VEHICLE USED IN SIMULATION

(VEHICLE SPEED - 5KM/H)



SRV (AS 2890.2)		mm
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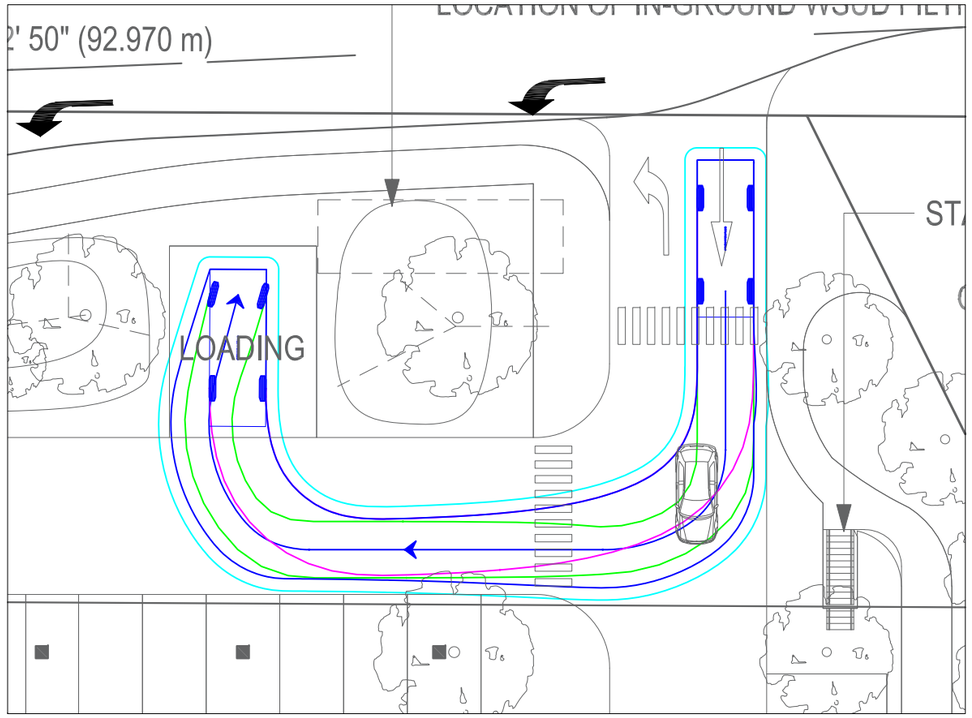
Track	:	2300
Lock to Lock Time	:	6.0
Steering Angle	:	38.0

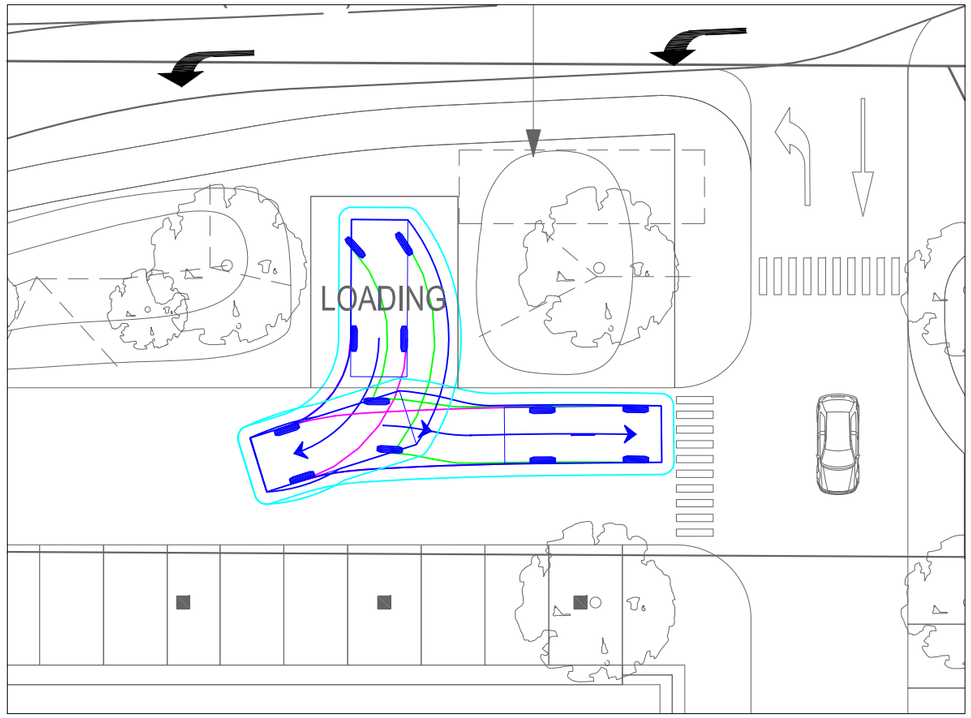
LEGEND

- REAR WHEELS
- FRONT WHEELS
- VEHICLE BODY
- BODY CLEARANCE

BUILDING C - LOADING BAY - INGRESS



BUILDING C - LOADING BAY - EGRESS



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REV.	REVISION NOTES	REVISION DATE

GENERAL NOTES:
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ISSUE: A

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TEL : (03) 9822-2888

34 CLAYTON ROAD, CLAYTON

6.4m SMALL RIGID VEHICLE SWEPT PATHS

PROPOSED MIXED USE DEVELOPMENT

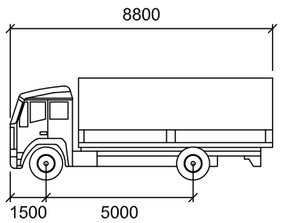
SCALE: 1:250 (A3) 0 2.5 5

SHEET NO.: 03/05

JOB NO.: 27660

VEHICLE USED IN SIMULATION

(VEHICLE SPEED - 5KM/H)



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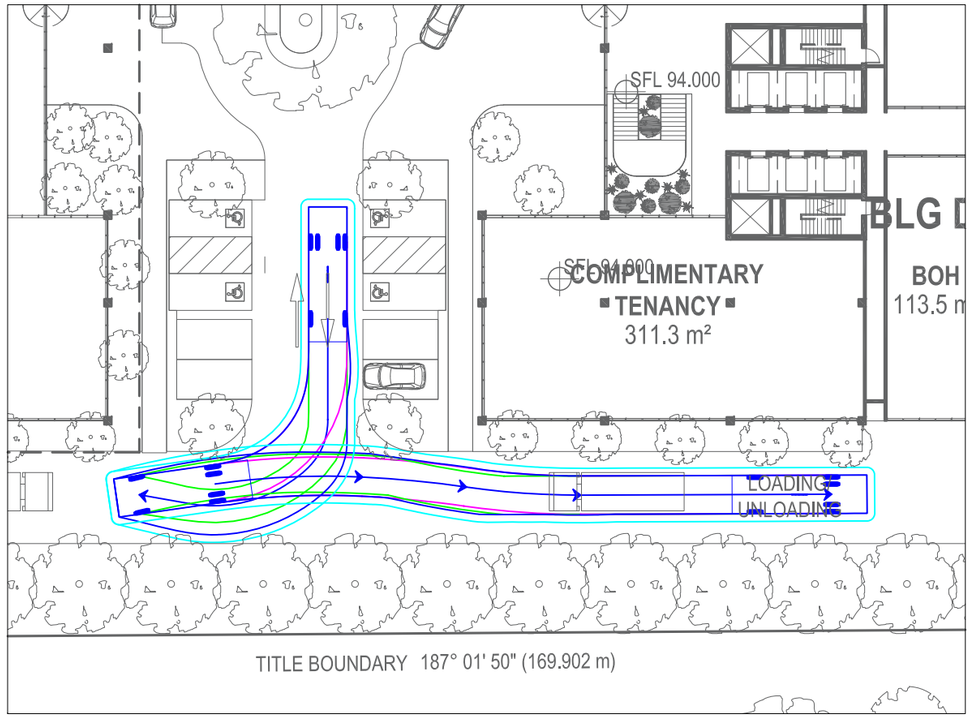
Track	:	2500
Lock to Lock Time	:	6.0
Steering Angle	:	34.0

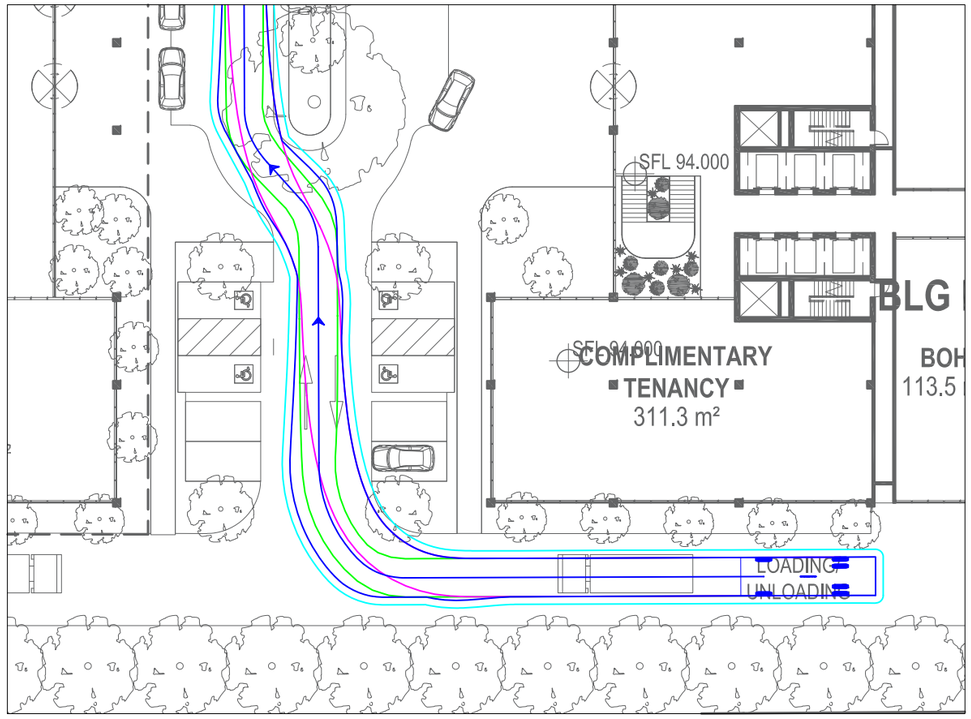
LEGEND

- REAR WHEELS
- FRONT WHEELS
- VEHICLE BODY
- BODY CLEARANCE

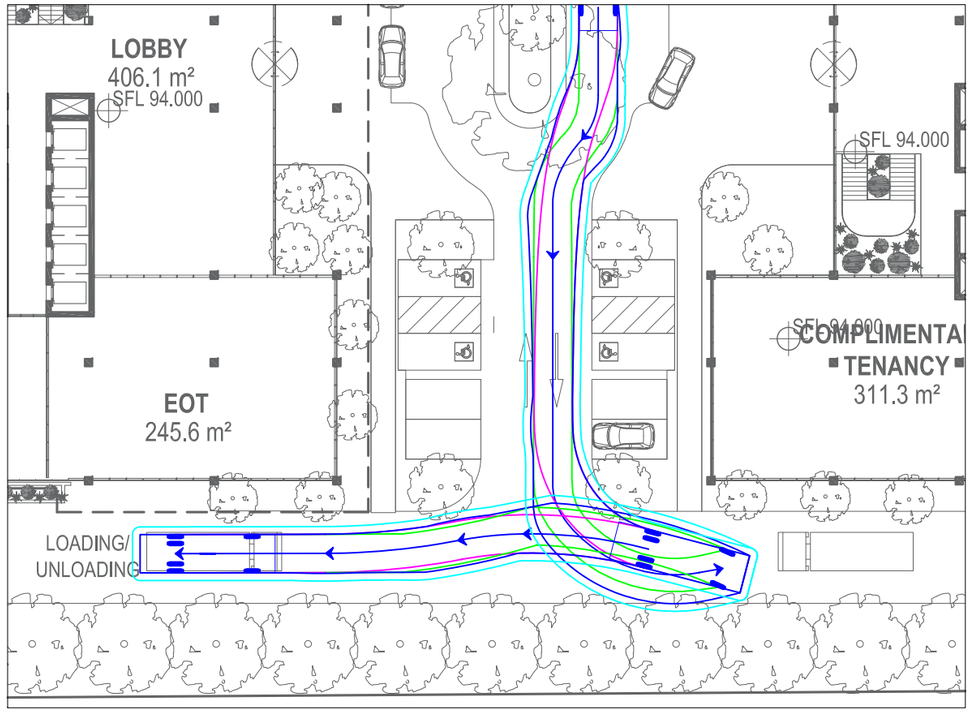
BUILDING D - LOADING BAY - INGRESS



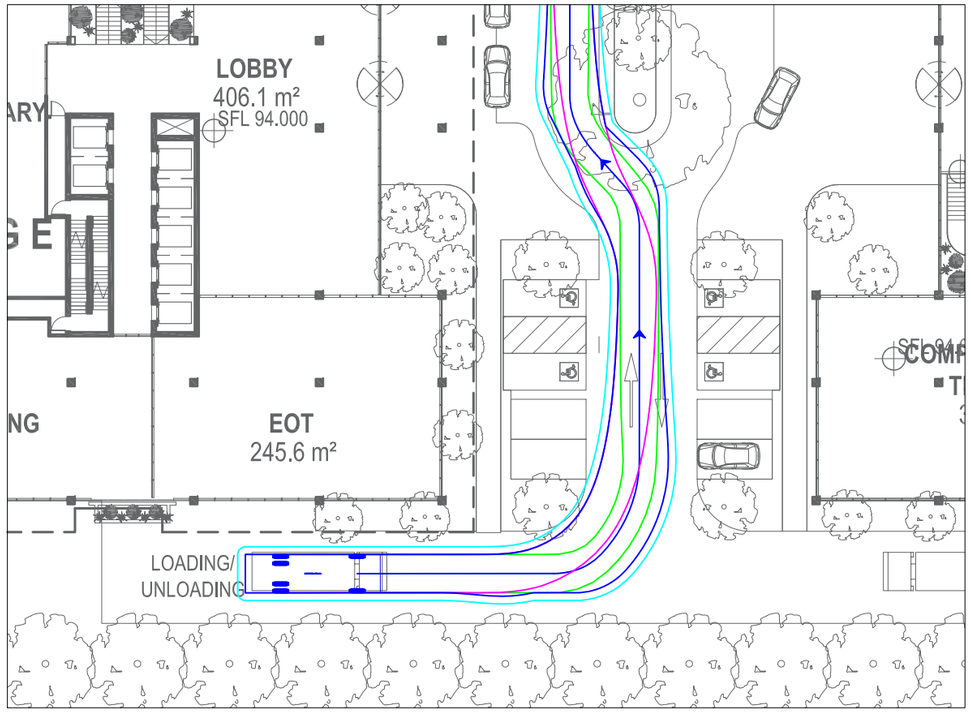
BUILDING D - LOADING BAY - EGRESS



BUILDING E - LOADING BAY - INGRESS



BUILDING E - LOADING BAY - EGRESS



N

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REV.	REVISION NOTES	REVISION DATE

GENERAL NOTES:
INFORMATION BASED ON "TP01.03-Ground Floor Plan(P8).dwg"

DESIGNED BY: M,. HUYNH	31 JUL 2020	
CHECKED BY: M. O'SHEA	31 JUL 2020	
FILE NAME: G27660-01		ISSUE: A

Traffix Group
Level 28, 459 Collins Street
MELBOURNE VICTORIA 3000
TEL : (03) 9822-2888

34 CLAYTON ROAD, CLAYTON

8.8m MEDIUM RIGID VEHICLE SWEPT PATHS

PROPOSED MIXED USE DEVELOPMENT

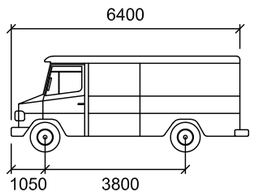
SCALE: 1:400 (A3) 0 4 8

SHEET NO.: 04/05

JOB NO.: 27660

VEHICLE USED IN SIMULATION

(VEHICLE SPEED - 5KM/H)



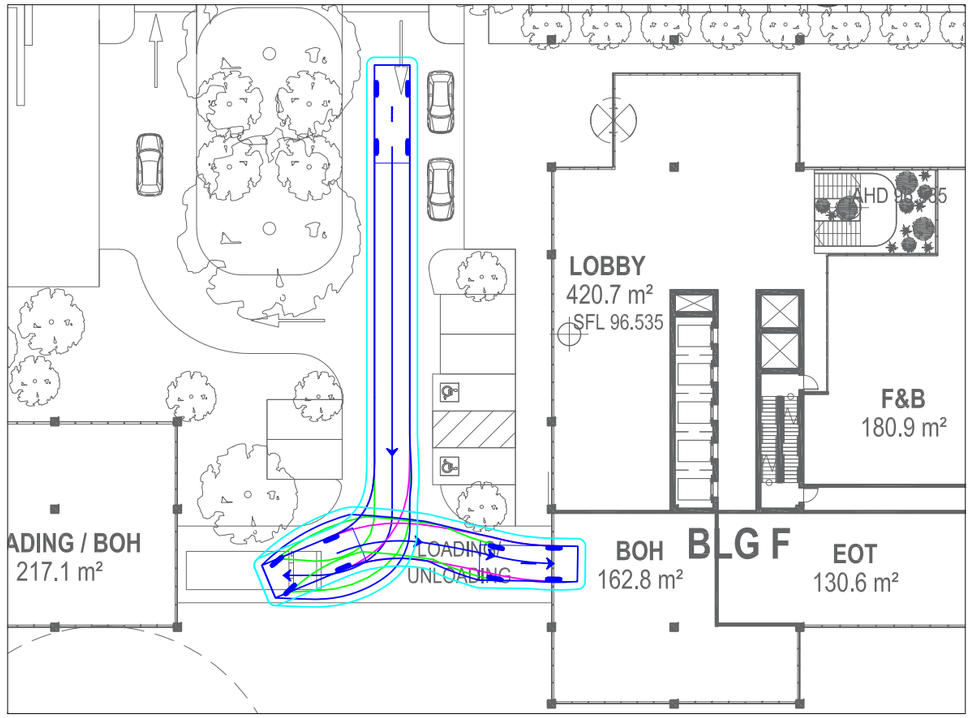
SRV (AS 2890.2) mm

Width	:	2300
Track	:	2300
Lock to Lock Time	:	6.0
Steering Angle	:	38.0

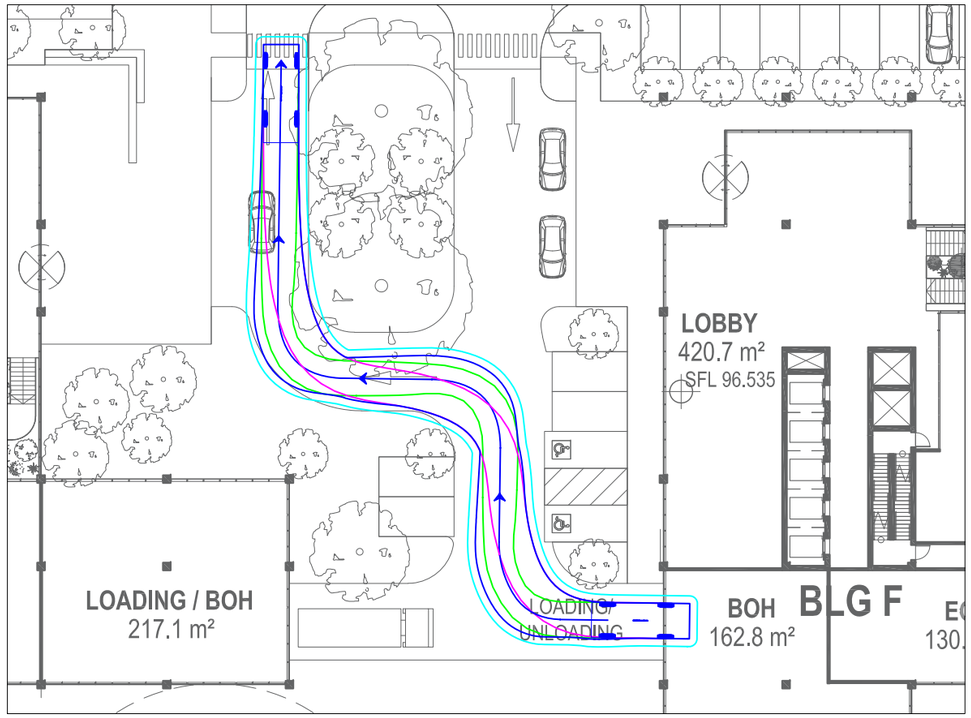
LEGEND

- REAR WHEELS
- FRONT WHEELS
- VEHICLE BODY
- BODY CLEARANCE

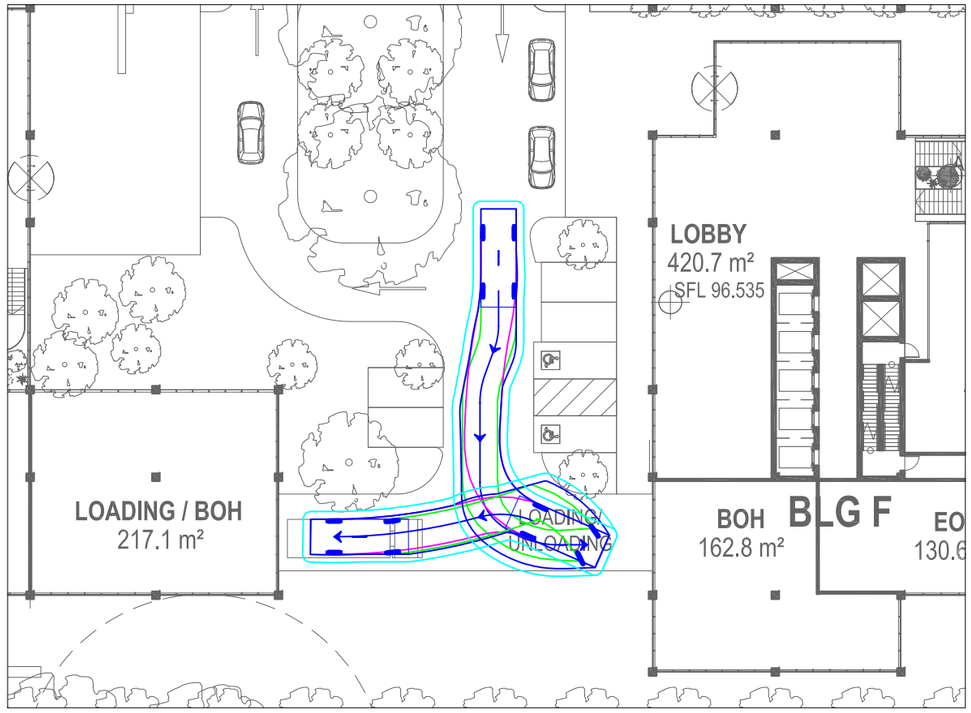
BUILDING F - LOADING BAY - INGRESS



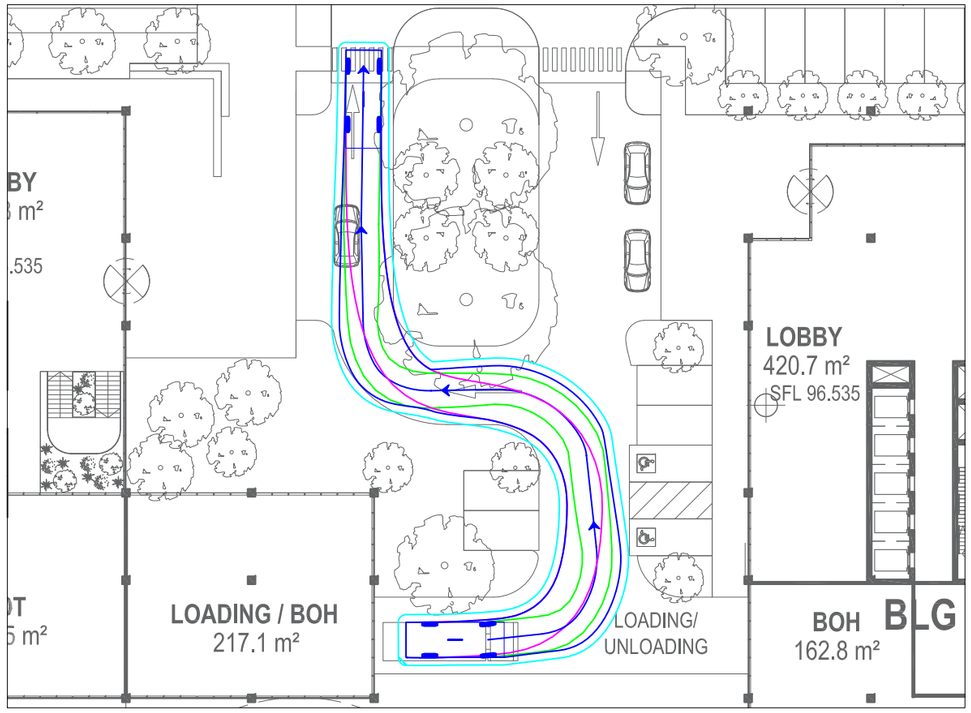
BUILDING F - LOADING BAY - EGRESS



BUILDING G - LOADING BAY - INGRESS



BUILDING G - LOADING BAY - EGRESS



N

PRELIMINARY ONLY
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REV.	REVISION NOTES	REVISION DATE

GENERAL NOTES:
INFORMATION BASED ON "TP01.03-Ground Floor Plan(P8).dwg"

DESIGNED BY: M,. HUYNH	31 JUL 2020	
CHECKED BY: M. O'SHEA	31 JUL 2020	
FILE NAME: G27660-01	ISSUE: A	

Traffix Group
Level 28, 459 Collins Street
MELBOURNE VICTORIA 3000
TEL : (03) 9822-2888

34 CLAYTON ROAD, CLAYTON

6.4m SMALL RIGID VEHICLE SWEPT PATHS

PROPOSED MIXED USE DEVELOPMENT

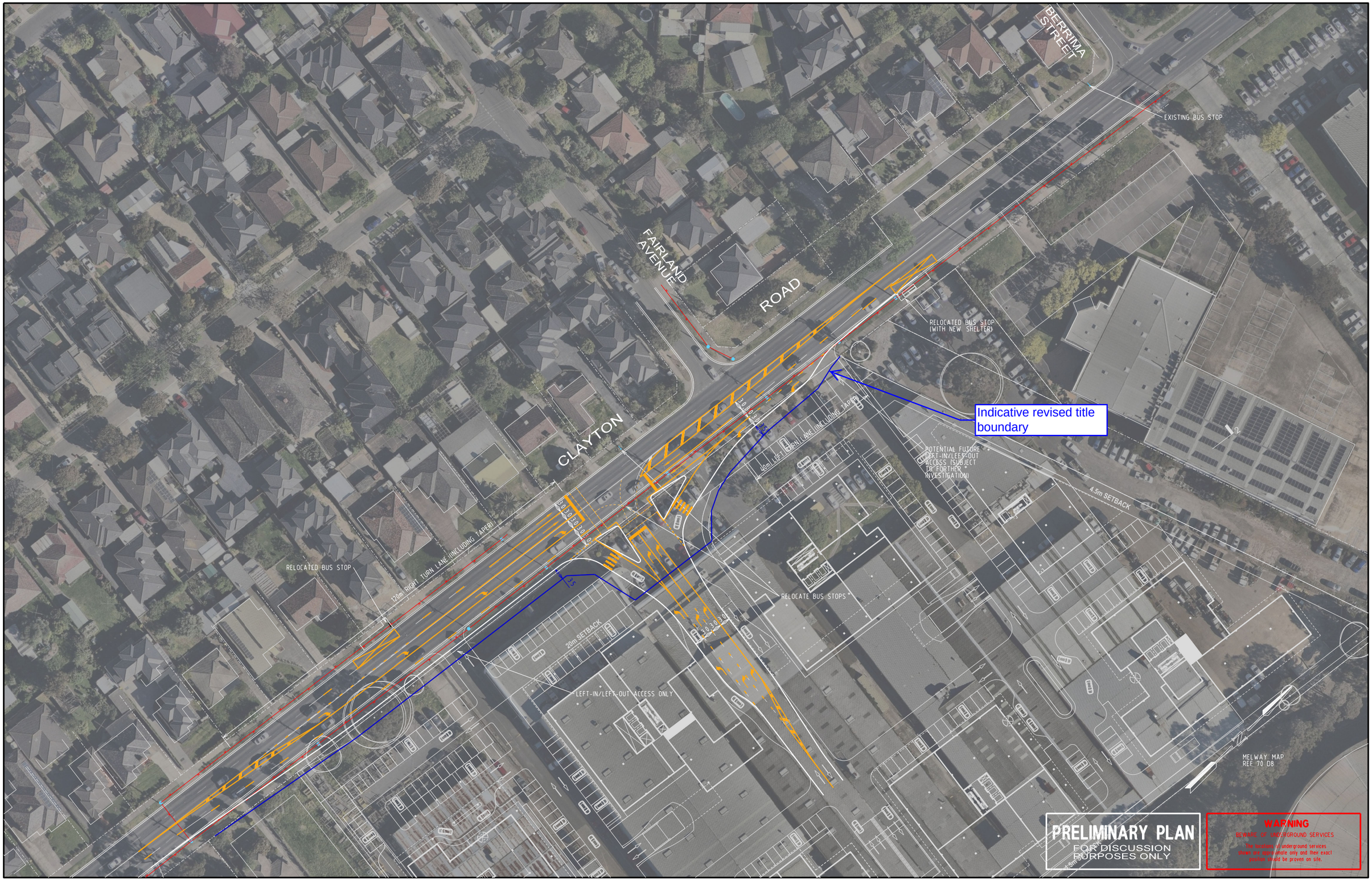
SCALE: 1:400 (A3) 0 4 8

SHEET NO.: 05/05

JOB NO.: 27660

Appendix C

Functional Layout



ISSUE	ISSUE DESCRIPTION	ISSUE DATE
A	PLAN UPDATED TO SHOW RELOCATED BUS STOPS	19 MARCH 2020
B	UPDATED TO REFLECT DoT COMMENTS	25 MAY 2020

GENERAL NOTES
1 BASE INFORMATION FROM ARCHITECTS PLAN / AERIAL PHOTOGRAPH (SOURCE NEARMAP 24 OCT 2019)
2 ALL DIMENSIONS ARE TO FACE OF KERB & CHANNEL
3 MAIN ROAD - CLAYTON ROAD (SPEED ZONE 60km/h)
4 ALL PROPOSED FOOTPATHS AND PRAM CROSSINGS ARE TO BE CONSTRUCTED WITH TACTILE GROUND SURFACE INDICATORS TO DDA COMPLIANCE GUIDELINES REFER TO AS 1428.4-2009

DESIGNED
G RAKITA 26 NOV 2019

CHECKED/APPROVED
M O'SHEA 26 NOV 2019

FILE NAME
G27660-00-00.dgn

Traffix Group
Level 28, 459 Collins Street
Melbourne, Victoria 3000
+61 3 9822 2888
www.traffixgroup.com.au

34 CLAYTON ROAD, CLAYTON
PROPOSED DEVELOPMENT
MONASH CITY
CONCEPT PLAN

SCALE 1:1000 (A3) 0 5 10 15 20
SHEET No.
DWG No. G27660-01-01

ISSUE	ISSUE DESCRIPTION	ISSUE DATE

GENERAL NOTES

1 BASE INFORMATION FROM ARCHITECTS PLAN / AERIAL PHOTOGRAPH (SOURCE:NEARMAP 24 OCT 2019)
2 ALL DIMENSIONS ARE TO FACE OF KERB & CHANNEL
3 MAIN ROAD - CLAYTON ROAD (SPEED ZONE 60km/h)
4 ALL PROPOSED FOOTPATHS AND PRAM CROSSINGS ARE TO BE CONSTRUCTED WITH TACTILE GROUND SURFACE INDICATORS TO DDA COMPLIANCE GUIDELINES REFER TO AS 1428.4:2009

DESIGNED
G RAKITA 20 MAY 2020

CHECKED/APPROVED
M O'SHEA 20 MAY 2020

FILE NAME
G27660-00-00 dgn

Traffix Group
Level 28, 459 Collins Street
Melbourne, Victoria 3000
+61 3 9822 2888
www.traffixgroup.com.au

34 CLAYTON ROAD, CLAYTON
PROPOSED DEVELOPMENT
MONASH CITY
SWEPT PATH DIAGRAM

SCALE 1:500 (A3) 0 5 10
SHEET No.
DWG No. G27660-01-02

Appendix D

Sidra Assessments

LANE SUMMARY

Site: 101 [Main Access/Clayton Road - AM PostDev - 2250 spaces]

Main Access/Clayton Road
Site Category: (None)
Signals - Fixed Time Isolated Cycle Time = 100 seconds (Site User-Given Phase Times)

Lane Use and Performance

	Demand Flows		Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	Total	HV						Veh	Dist				
	veh/h	%	veh/h	v/c	%	sec			m		m	%	%
South: Clayton Road (Southern Leg)													
Lane 1	536	0.0	1716	0.312	100	1.0	LOS A	4.2	29.6	Full	500	0.0	0.0
Lane 2	536	0.0	1716	0.312	100	1.0	LOS A	4.2	29.6	Full	500	0.0	0.0
Lane 3	415	0.0	738	0.562	100	30.2	LOS A	13.8	96.4	Short	95	0.0	NA
Approach	1486	0.0		0.562		9.2	LOS A	13.8	96.4				
East: Site Access													
Lane 1	27	0.0	1727	0.016	100	5.9	LOS A	0.1	0.6	Short	58	0.0	NA
Lane 2	38	0.0	93	0.414	100	59.4	LOS A	2.0	13.8	Full	500	0.0	0.0
Lane 3	38	0.0	93	0.414	100	59.4	LOS A	2.0	13.8	Short	60	0.0	NA
Approach	104	0.0		0.414		45.4	LOS A	2.0	13.8				
North: Clayton Road (Northern Leg)													
Lane 1	500	0.0	1022	0.489	100	11.4	LOS A	7.0	48.9	Short	60	0.0	NA
Lane 2	550	0.0	671[1]	0.819	100	25.8	LOS C	21.9	153.4	Full	500	0.0	0.0
Lane 3	767	0.0	936	0.819	100	26.6	LOS C	33.8	236.3	Full	500	0.0	0.0
Approach	1817	0.0		0.819		22.2	LOS C	33.8	236.3				
Intersection	3407	0.0		0.819		17.2	LOS C	33.8	236.3				

Site Level of Service (LOS) Method: Degree of Saturation (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Lane LOS values are based on degree of saturation per lane.
Intersection and Approach LOS values are based on worst degree of saturation for any lane.
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.

1 Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Some upstream delays at entry to short lanes are not included.

PHASING SUMMARY

Site: 101 [Main Access/Clayton Road - AM PostDev - 2250 spaces]

Main Access/Clayton Road
Site Category: (None)
Signals - Fixed Time Isolated Cycle Time = 100 seconds (Site User-Given Phase Times)

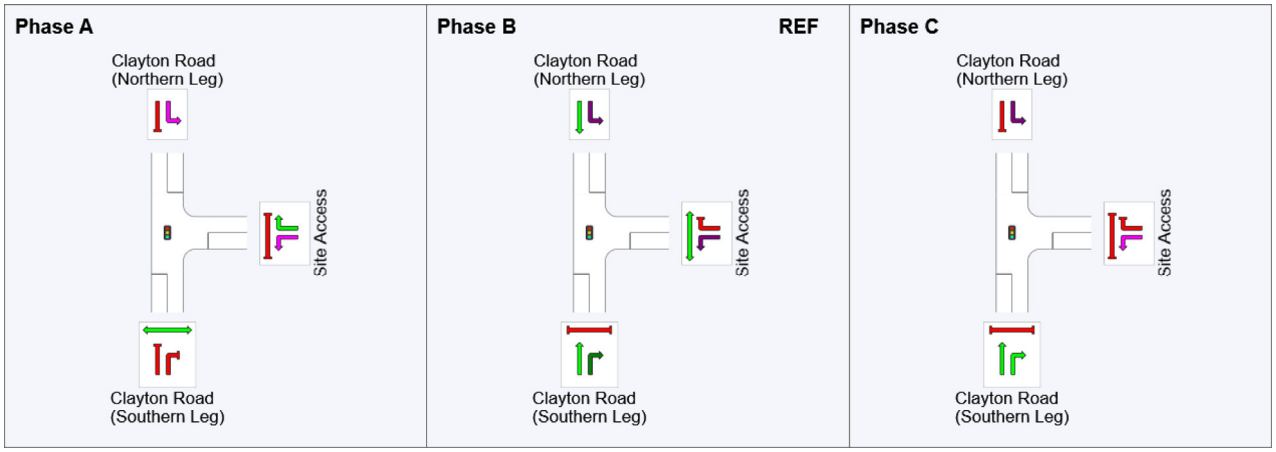
Timings based on settings in the Site Phasing & Timing dialog
Phase Times specified by the user
Phase Sequence: Variable Phasing
Reference Phase: Phase B
Input Phase Sequence: A, B, C
Output Phase Sequence: A, B, C

Phase Timing Summary

Phase	A	B	C
Phase Change Time (sec)	89	0	49
Green Time (sec)	5	48	34
Phase Time (sec)	6	54	40
Phase Split	6%	54%	40%

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

Normal Movement	Permitted/Opposed
Slip/Bypass-Lane Movement	Opposed Slip/Bypass-Lane
Stopped Movement	Turn On Red
Other Movement Class (MC) Running	Undetected Movement
Mixed Running & Stopped MCs	Continuous Movement
Other Movement Class (MC) Stopped	Phase Transition Applied

LANE SUMMARY

Site: 101 [Main Access/Clayton Road - PM PostDev - 2250 spaces]

Main Access/Clayton Road
Site Category: (None)
Signals - Fixed Time Isolated Cycle Time = 76 seconds (Site User-Given Phase Times)

Lane Use and Performance

	Demand Flows		Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	Total	HV						Veh	Dist				
	veh/h	%	veh/h	v/c	%	sec			m		m	%	%
South: Clayton Road (Southern Leg)													
Lane 1	592	0.0	847	0.699	100	18.9	LOS B	18.0	125.8	Full	500	0.0	0.0
Lane 2	592	0.0	847	0.699	100	18.9	LOS B	18.0	125.8	Full	500	0.0	0.0
Lane 3	42	0.0	175	0.240	100	35.5	LOS A	1.4	9.9	Short	95	0.0	NA
Approach	1226	0.0		0.699		19.5	LOS B	18.0	125.8				
East: Site Access													
Lane 1	269	0.0	1139	0.237	100	10.9	LOS A	4.1	28.7	Short	58	0.0	NA
Lane 2	385	0.0	855	0.450	100	20.6	LOS A	9.7	68.2	Full	500	0.0	0.0
Lane 3	385	0.0	855	0.450	100	20.6	LOS A	9.7	68.2	Short	60	0.0	NA
Approach	1039	0.0		0.450		18.1	LOS A	9.7	68.2				
North: Clayton Road (Northern Leg)													
Lane 1	51	0.0	1492	0.034	100	5.9	LOS A	0.2	1.1	Short	60	0.0	NA
Lane 2	503	0.0	634[1]	0.794	100	28.6	LOS C	18.6	130.0	Full	500	0.0	0.0
Lane 3	509	0.0	641	0.794	100	28.6	LOS C	18.9	132.0	Full	500	0.0	0.0
Approach	1063	0.0		0.794		27.5	LOS C	18.9	132.0				
Intersection	3328	0.0		0.794		21.6	LOS C	18.9	132.0				

Site Level of Service (LOS) Method: Degree of Saturation (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Lane LOS values are based on degree of saturation per lane.
Intersection and Approach LOS values are based on worst degree of saturation for any lane.
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.

1 Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Some upstream delays at entry to short lanes are not included.

PHASING SUMMARY

Site: 101 [Main Access/Clayton Road - PM PostDev - 2250 spaces]

Main Access/Clayton Road
Site Category: (None)
Signals - Fixed Time Isolated Cycle Time = 76 seconds (Site User-Given Phase Times)

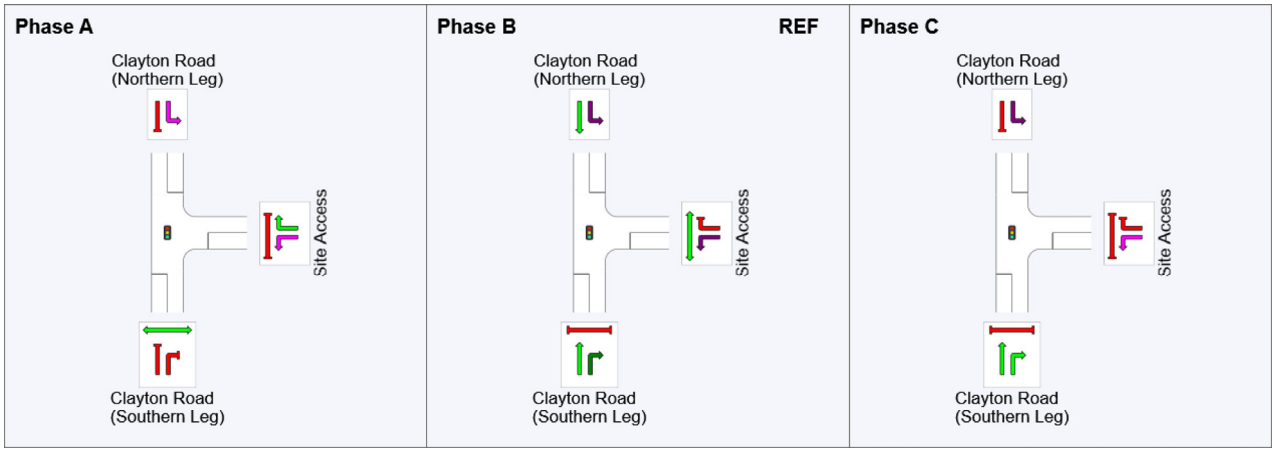
Timings based on settings in the Site Phasing & Timing dialog
Phase Times specified by the user
Phase Sequence: Variable Phasing
Reference Phase: Phase B
Input Phase Sequence: A, B, C
Output Phase Sequence: A, B, C

Phase Timing Summary

Phase	A	B	C
Phase Change Time (sec)	39	0	31
Green Time (sec)	35	25	2
Phase Time (sec)	41	31	4
Phase Split	54%	41%	5%

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

Normal Movement	Permitted/Opposed
Slip/Bypass-Lane Movement	Opposed Slip/Bypass-Lane
Stopped Movement	Turn On Red
Other Movement Class (MC) Running	Undetected Movement
Mixed Running & Stopped MCs	Continuous Movement
Other Movement Class (MC) Stopped	Phase Transition Applied

LANE SUMMARY

Site: 101 [Main Access/Clayton Rd - AM PostDev - 2250 spaces - 1% Growth 10 year]

Main Access/Clayton Road
Site Category: (None)
Signals - Fixed Time Isolated Cycle Time = 100 seconds (Site User-Given Phase Times)

Lane Use and Performance

	Demand Flows		Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	Total	HV						Veh	Dist				
	veh/h	%	veh/h	v/c	%	sec			m		m	%	%
South: Clayton Road (Southern Leg)													
Lane 1	592	0.0	1716	0.345	100	1.1	LOS A	4.9	34.0	Full	500	0.0	0.0
Lane 2	592	0.0	1716	0.345	100	1.1	LOS A	4.9	34.0	Full	500	0.0	0.0
Lane 3	415	0.0	721	0.575	100	32.3	LOS A	13.9	97.3	Short	95	0.0	NA
Approach	1598	0.0		0.575		9.2	LOS A	13.9	97.3				
East: Site Access													
Lane 1	27	0.0	1727	0.016	100	5.9	LOS A	0.1	0.6	Short	58	0.0	NA
Lane 2	38	0.0	93	0.414	100	59.4	LOS A	2.0	13.8	Full	500	0.0	0.0
Lane 3	38	0.0	93	0.414	100	59.4	LOS A	2.0	13.8	Short	60	0.0	NA
Approach	104	0.0		0.414		45.4	LOS A	2.0	13.8				
North: Clayton Road (Northern Leg)													
Lane 1	500	0.0	1122	0.446	100	10.2	LOS A	7.4	51.8	Short	60	0.0	NA
Lane 2	597	0.0	664[1]	0.900	100	38.3	LOS C	29.3	205.1	Full	500	0.0	0.0
Lane 3	842	0.0	936	0.900	100	37.7	LOS C	45.4	317.7	Full	500	0.0	0.0
Approach	1939	0.0		0.900		30.8	LOS C	45.4	317.7				
Intersection	3641	0.0		0.900		21.7	LOS C	45.4	317.7				

Site Level of Service (LOS) Method: Degree of Saturation (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Lane LOS values are based on degree of saturation per lane.
Intersection and Approach LOS values are based on worst degree of saturation for any lane.
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.

1 Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Some upstream delays at entry to short lanes are not included.

PHASING SUMMARY

Site: 101 [Main Access/Clayton Rd - AM PostDev - 2250 spaces - 1% Growth 10 year]

Main Access/Clayton Road
Site Category: (None)
Signals - Fixed Time Isolated Cycle Time = 100 seconds (Site User-Given Phase Times)

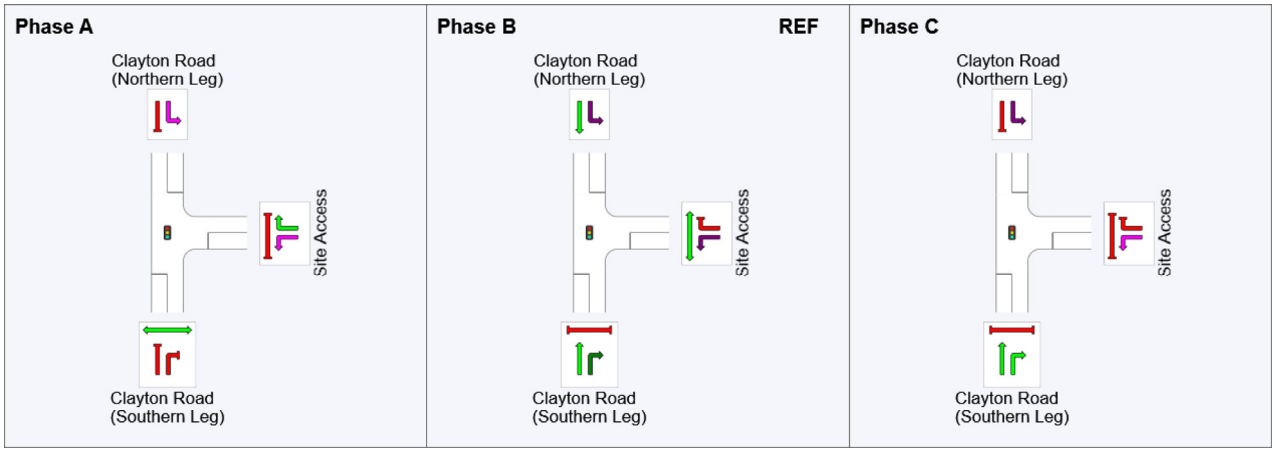
Timings based on settings in the Site Phasing & Timing dialog
Phase Times specified by the user
Phase Sequence: Variable Phasing
Reference Phase: Phase B
Input Phase Sequence: A, B, C
Output Phase Sequence: A, B, C

Phase Timing Summary

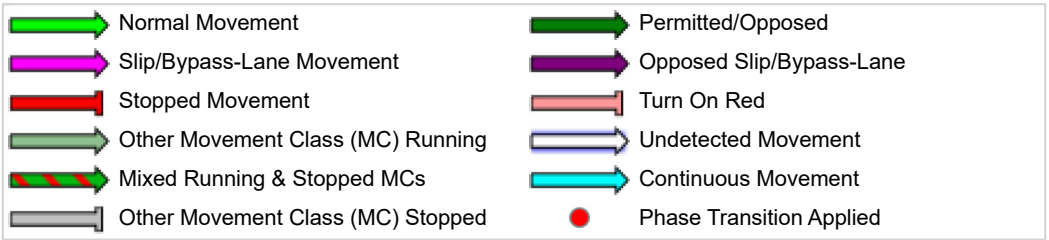
Phase	A	B	C
Phase Change Time (sec)	89	0	49
Green Time (sec)	5	48	34
Phase Time (sec)	6	54	40
Phase Split	6%	54%	40%

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



LANE SUMMARY

Site: 101 [Main Access/Clayton Rd - PM PostDev - 2250 spaces - 1% Growth 10 year]

Main Access/Clayton Road
Site Category: (None)
Signals - Fixed Time Isolated Cycle Time = 76 seconds (Site User-Given Phase Times)

Lane Use and Performance

	Demand Flows		Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	Total	HV						Veh	Dist				
	veh/h	%	veh/h	v/c	%	sec			m		m	%	%
South: Clayton Road (Southern Leg)													
Lane 1	653	0.0	847	0.771	100	21.6	LOS C	21.8	152.6	Full	500	0.0	0.0
Lane 2	653	0.0	847	0.771	100	21.6	LOS C	21.8	152.6	Full	500	0.0	0.0
Lane 3	42	0.0	160	0.263	100	37.5	LOS A	1.5	10.2	Short	95	0.0	NA
Approach	1348	0.0		0.771		22.1	LOS C	21.8	152.6				
East: Site Access													
Lane 1	269	0.0	1114	0.242	100	11.8	LOS A	4.4	30.9	Short	58	0.0	NA
Lane 2	385	0.0	855	0.450	100	20.6	LOS A	9.7	68.2	Full	500	0.0	0.0
Lane 3	385	0.0	855	0.450	100	20.6	LOS A	9.7	68.2	Short	60	0.0	NA
Approach	1039	0.0		0.450		18.3	LOS A	9.7	68.2				
North: Clayton Road (Northern Leg)													
Lane 1	51	0.0	1507	0.034	100	5.9	LOS A	0.2	1.1	Short	60	0.0	NA
Lane 2	549	0.0	628[1]	0.874	100	35.5	LOS C	23.2	162.1	Full	500	0.0	0.0
Lane 3	561	0.0	641	0.874	100	35.5	LOS C	23.8	166.3	Full	500	0.0	0.0
Approach	1160	0.0		0.874		34.2	LOS C	23.8	166.3				
Intersection	3547	0.0		0.874		25.0	LOS C	23.8	166.3				

Site Level of Service (LOS) Method: Degree of Saturation (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
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1 Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Some upstream delays at entry to short lanes are not included.

PHASING SUMMARY

Site: 101 [Main Access/Clayton Rd - PM PostDev - 2250 spaces - 1% Growth 10 year]

Main Access/Clayton Road
Site Category: (None)
Signals - Fixed Time Isolated Cycle Time = 76 seconds (Site User-Given Phase Times)

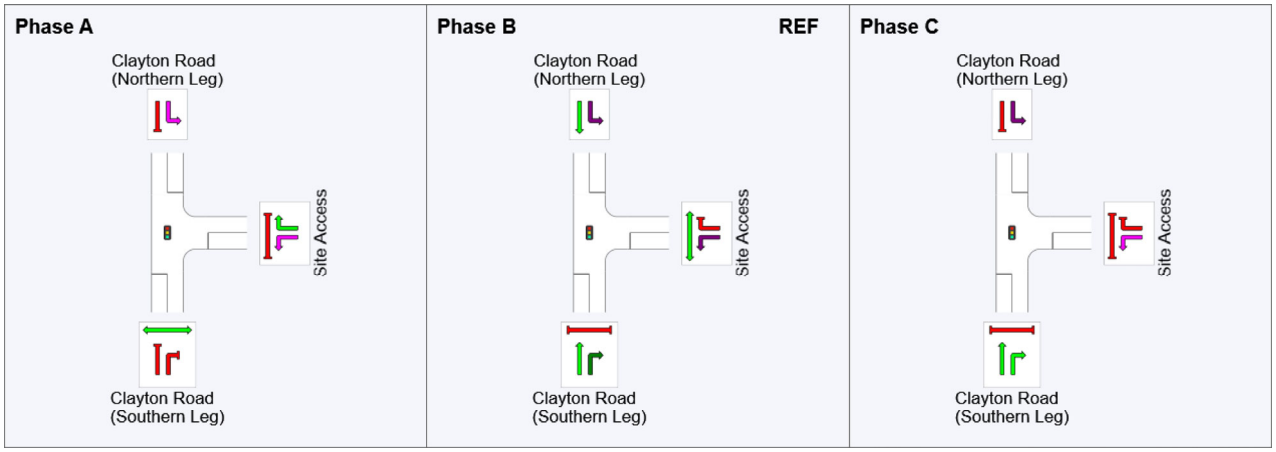
Timings based on settings in the Site Phasing & Timing dialog
Phase Times specified by the user
Phase Sequence: Variable Phasing
Reference Phase: Phase B
Input Phase Sequence: A, B, C
Output Phase Sequence: A, B, C

Phase Timing Summary

Phase	A	B	C
Phase Change Time (sec)	39	0	31
Green Time (sec)	35	25	2
Phase Time (sec)	41	31	4
Phase Split	54%	41%	5%

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

Normal Movement	Permitted/Opposed
Slip/Bypass-Lane Movement	Opposed Slip/Bypass-Lane
Stopped Movement	Turn On Red
Other Movement Class (MC) Running	Undetected Movement
Mixed Running & Stopped MCs	Continuous Movement
Other Movement Class (MC) Stopped	Phase Transition Applied