Traffix Group

Traffic Engineering Assessment

Proposed Fuel Sales & Car Wash

2420 Warburton Highway, Yarra Junction

Prepared for
Warburton Highway Developments Pty Ltd

April 2022

G29996R-02B

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 Warburton Highway Developments Pty Ltd to undertake a traffic engineering assessment of the proposed fuel sales and car wash development at 2420 Warburton Highway, Yarra Junction.

This report provides a traffic engineering assessment for the proposed development with particular attention to parking and traffic impacts.

2. Existing Conditions

2.1. Subject Site

The subject site is located on the south side of Warburton Highway west of Station Street in Yarra Junction, as shown in the locality map at Figure 1 below.

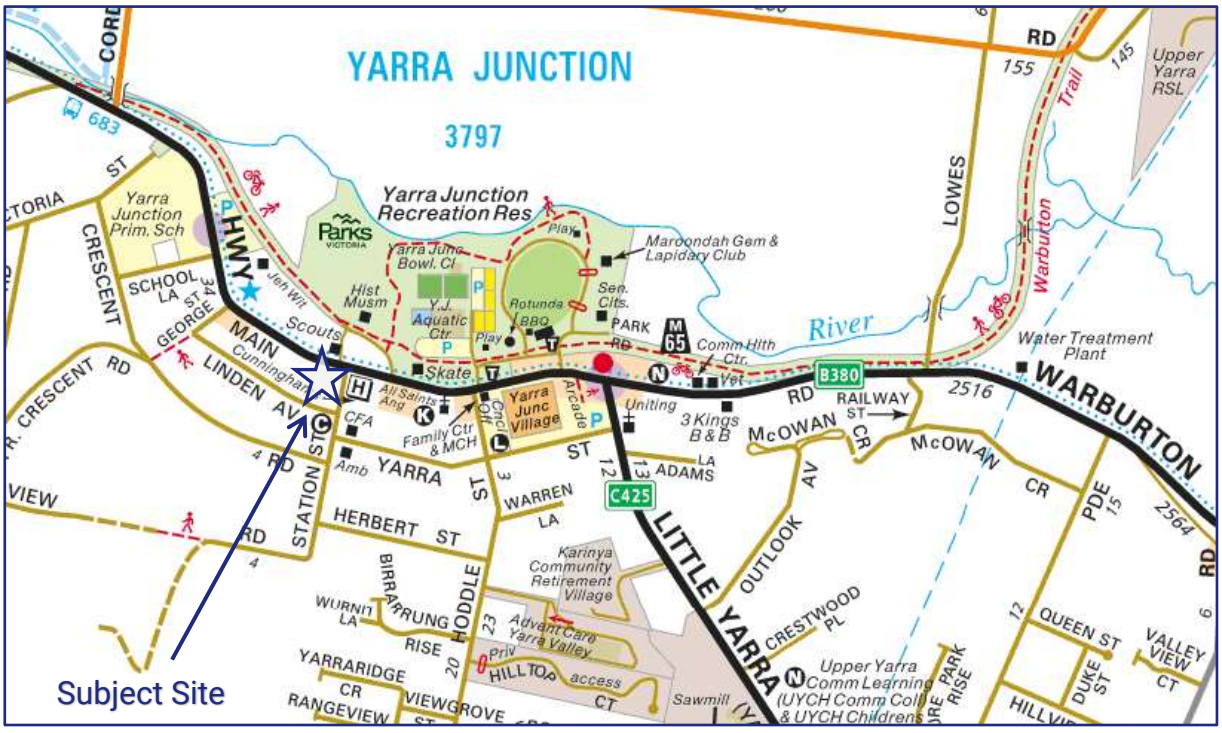


Figure 1: Locality Map

The subject site comprises two land parcels and is irregular in shape with a total area of approximately 2,043m^2, and frontages to Warburton Highway, Station Street and Linden Avenue of approximately 28m, 41m and 39.5m respectively.

The eastern parcel is currently occupied by an automotive and tyre service centre. The western land parcel is a drainage easement and is currently used as driveway access and circulation for both the eastern and western parcels.

Existing vehicular access is provided via two crossovers to Warburton Highway, with the eastern and western crossovers being approximately 5.8m wide and 15.8m wide respectively. An existing single width crossover is also provided to Station Street approximately 35m south of Warburton Highway. There is an existing gate providing access to the rear of the western lot via Linden Avenue.

An aerial view of the site is provided at Figure 2 below.

Figure 2: Aerial View of Subject Site (Nearmap: February 2021)

2.2. Land Use

The site is located within the General Residential Zone – Schedule 1 (GRZ1) as shown in the Land Use Zoning Map at Figure 3 below. The site is also affected by the following overlays:

- Bushfire Management Overlay (BMO) extends along the northern part of the site,
- Design and Development Overlay – Schedule 8 (DDO8) covers the entire site,
- Significant Landscape "Overlay – Scehdule 22 (SLO22) covers the entire site, and
- the site is within a Designated Bushfire Prone Area.

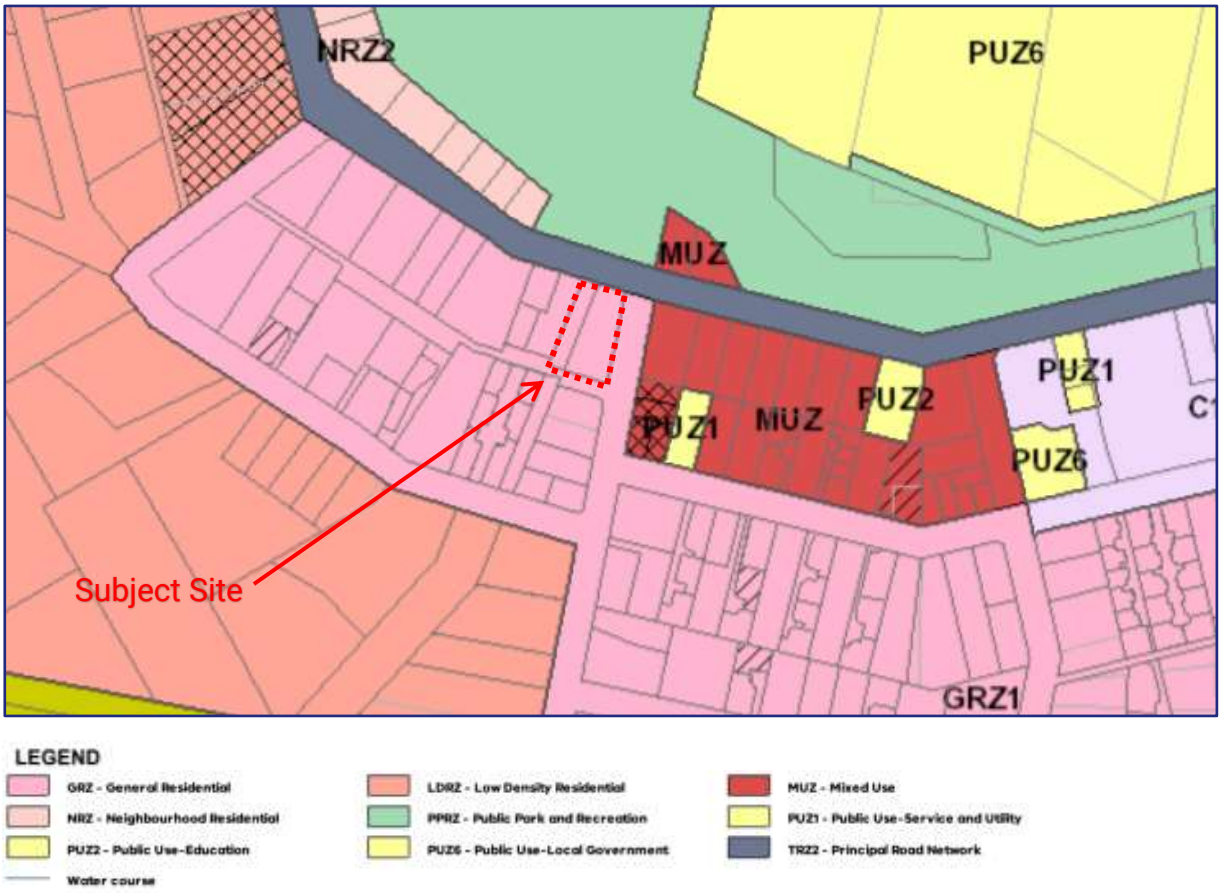


Figure 3: Land Use Zoning Map

Surrounding land uses include:

- a glazier on the land parcel immediately to the west,
- a childcare centre to the south,
- residential dwellings to the west and south,
- Yarra Junction Recreation Reserve to the north which includes a Scout Hall opposite the site, a museum, aquatic centre, bowls club, sporting oval and the Yarra River, and
- commercial uses to the east fronting Warburton Highway including Cunningham's Hotel opposite the site on the east side of Station Street.

2.3. Road Network

Warburton Highway

Warburton Highway (Route B380) is within a Transport Zone 2 (TRZ2) and is under the control of the Department of Transport (DoT). It extends approximately 34km east from Lilydale to Warburton. To the east of Warburton it continues as Woods Point Road.

In the vicinity of the site, Warburton Highway is configured with a 13m wide carriageway line-marked with one traffic lane in each direction with a kerbside parallel parking lane on both sides, within a 20m road reservation. On-street parking is unrestricted and a concrete footpath is provided on the south side adjacent to the site frontage.

A posted speed limit of 50km/h applies.

Figure 4: Warburton Highway Looking West Towards Station Street

Station Street

Station Street is classified as a local street under Council's Register of Public Roads and extends approximately 320m in a north-south direction between Warburton Highway and View Street.

At its intersection with Warburton Highway, Station Street is constructed with an 8.6m wide carriageway carrying one traffic lane in each direction, within a 20m road reservation. Immediately south of the intersection, Station Street widens on the east side with a carriageway width of 12.5m providing eleven marked 45-degree angled indented parking bays. To the south of Linden Avenue, unrestricted kerbside parallel parking is permitted on the west side.

The default urban 50km/h speed limit applies.

Figure 5: Station Street Looking North

Linden Avenue

Linden Avenue is classified as a local street under Council's Register of Public Roads and extends approximately 260m in an east-west direction between Station Street and George Street.

Linden Avenue has an irregular road reservation width which is approximately 10.3m wide at its intersection with Station Street, narrowing to 5.3m wide adjacent to the drainage easement. It is constructed with a nominal 3m wide crushed rock carriageway and operates two-way with no formal passing bays along its length.

Figure 6: Linden Avenue Looking West From Station Street

2.4. Existing Traffic Volumes

The Department of Transport (DOT) Open Data Hub provides indicative Average Annual Daily Traffic (AADT) volumes for arterial roads within Victoria. AADT is the sum of all traffic using the road for a year, divided by 365. Daily volumes on working weekdays are usually higher than on weekends in urban areas. In Melbourne, a typical weekday is 5% higher, Saturday 10% lower and Sunday 20% lower than AADT.

The 2020 indicative AADT traffic volumes on Warburton Highway in the vicinity of Station Street are 8,100 vehicles per day (two-way) with 9.8% commercial vehicles (CV).

There is no AADT data for Station Street on the DOT Open Data Hub because Station Street is not an arterial road.

2.5. Public Transport

Bus Route 683 operates along Warburton Highway past the site frontage, providing a connection between Chirnside Park Shopping Centre and Warburton via Lilydale Railway Station and Seville.

The nearest bus stop is located immediately east of Station Street within 40m walking distance of the site.

3. Proposal

The proposal is for the development of a fuel sales (non-manned credit card only), carwash, vacuum bays two dog wash bays in accordance with the following schedule of uses.

Table 1: Schedule of Uses

Use	Number
Fuel Sales (non-manned)	6 bowers
Auto Car Wash Bays	2 bays
Vacuum Bays	4 bays
Dog Wash Bays	2 bays

One on-site parking space is proposed, for staff use.

In addition, two “waiting spaces” are provided in a tandem arrangement behind each of the auto car wash bays for vehicles waiting to use the car wash.

Vehicle access is proposed as follows:

- entry via a relocated and widened crossover to Station Street, and
- egress via the existing crossover to Warburton Highway.

A copy of the proposed development plans prepared by TMC Building Design Group dated April 2022 is attached at Appendix A.

4. Car Parking Assessment

4.1. Statutory Car Parking Requirements

Clause 52.06 of the Planning Scheme sets out the car parking requirements for new developments.

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.*

Clause 52.06-5 states that Column B car parking rates apply 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 PPTN and accordingly Column A rates apply.

There is no car parking rate specified for an unmanned "Fuel Sales" use, "Car Wash" or a "Dog Wash" in the Table to Clause 52.06.

Under the land use definitions at Clause 73.03 of the Planning Scheme, the selling of motor vehicle fuel from bowsers meets the definition of a Service Station[1], and a Car Wash is included under the broader land-use term of Service Industry, which is included under the "Industry" land use term as shown in Table 2 below.

[1] *There is no car parking rate specified for a Service Station use under Clause 52.06 where there is no attached manned convenience shop.*

Table 2: Clause 73.03 Land Use Terms

Land Use Term	Definition	Includes	Included In
Service Industry	Land used to launder, repair, service or wash articles, machinery, or vehicles.	**Car Wash** Dry Cleaner Motor Repairs	Industry
Industry	Land used for any of the following operations: a) any process of manufacture; b) dismantling or breaking up of any article; c) treating waste materials; d) winning clay, gravel, rock, sand, soil, stone, or other materials (other than mineral, stone or soil extraction); e) laundering, repairing, servicing or washing any article, machinery, or vehicle, other than on-site work on a building, works, or land; or f) any process of testing or analysis. If on the same land as any of these operations, it also includes: a) storing goods used in the operation or resulting from it; b) providing amenities for people engaged in the operation; c) selling by wholesale, goods resulting from the operation; and d) accounting or administration in connection with the operation. If materials recycling, goods resulting from the operation may be sold by retail.	Materials Recycling Refuse Disposal Transfer Station Research and Development Centre Rural Industry Service Industry	
Service Station	Land used to sell motor vehicle fuel from bowsers, and lubricants. It may include the: a) selling of motor vehicle accessories or parts; b) selling of food, drinks and other convenience goods; c) hiring of trailers; d) servicing or washing of motor vehicles; and e) installing of motor vehicle accessories or parts.		

A dog is not considered to be an article, machinery or vehicle, and accordingly the "Dog Wash" component is an innominate use.

Clause 52.06-6 states that … *"where a use of land is not specified … before a new use commences … car parking spaces must be provided to the satisfaction of the responsible authority."*

There is no statutory car parking rate for "Service Industry" use in the Table to Clause 52.06. The following rate applies to the "Industry" land use:

- *2.9 spaces to each 100 sq m of net floor area*

Net floor area is defined under Clause 73.01 of the Victorian Planning Provisions as … *"the total floor area of all floors of all buildings on a site. It includes half the width of any party wall and the full width of all other walls. It does not include the area of stairs, loading bays, accessways or car parking areas, or any area occupied by machinery required for air conditioning, heating, power supply, or lifts."*

The plant room is occupied by machinery and the car wash bays form part of the accessways within the site, and accordingly only the secure storeroom and the dog wash bays count towards the site's net floor area.

The storeroom has a floor area of 20m^2 and the two dog wash bays have a combined floor area of 11m^2. Based on a total floor area of 31m^2, the statutory car parking requirement is zero spaces[2].

[2] The calculated requirement is 0.9 spaces. Clause 52.06-5 states that … *"If in calculating the number of car parking spaces the result is not a whole number, the required number of car parking spaces is to be rounded down to the nearest whole number"*.

4.2. Car Park Demand Assessment

The “Industry” land use term is very broad and covers a wide range of uses which are likely to have varying car parking generation profiles.

Patrons accessing a car wash do not require a separate dedicated car parking space, as they will only park in wash/vacuum bays, or queue waiting to use them if they are occupied.

Accordingly, the car parking requirements for a car wash are limited to staff parking demands, which will be minimal noting that only automated wash and self-serve vacuum bays are proposed at this site.

We do not expect more than one staff will be on-site at any one time and accordingly the proposed car parking provision of a single staff parking space will adequately meet the peak demand.

Similarly, patrons utilising unmanned credit-card only (pay at the pump) fuel bowsers do not require a separate dedicated car parking space, as they will only park in the fill spaces or queue waiting to use them if they are occupied.

Dedicated marked waiting bays are proposed behind each of the car wash bays, and adequate space is available behind each fill parking space to accommodate a vehicle queuing on-site waiting to use each fuel bowser, and this is expected to meet the queuing demand.

Dog wash customers will be instructed to park in vacuum bays.

Accordingly, we are satisfied that adequate provision is made on-site and there will not be any adverse off-site parking impacts.

4.3. Car Parking Layout and Access

The proposed car parking layout and access arrangements have been assessed under the relevant sections of the Planning Scheme and the relevant Australian Standards.

Key elements of the design include:

Design Standard 1 – Accessways

- The accessways are in excess of 3m wide.
- All vehicles that can reasonably be expected to enter the site can enter and exit the site in a forwards direction.
- Adequate pedestrian sight triangles are provided at the egress point.

Design Standard 2 – Car Parking Spaces

- The proposed staff parking space is 2.6m wide x 5.4m long and accessed via an aisle greater than 6.4m wide.
- A dedicated DDA car space is not required on the site for the use proposed.

Design Standard 3 – Gradients

- The accessway grades are not steeper than 1:10 within 5m of the frontage.
- The grades within the accessway to the auto wash bays do not exceed 1:20, including within queuing areas behind the wash bays.
- There are no locations where the grades of the sight exceed 1:8 and accordingly no transitions are required to be provided on the site.
- The grades are compliant with Design Standard 3 of Clause 52.06-9.

Traffix Group has prepared swept path diagrams, attached at Appendix B, which show access to the car parking spaces and to the car wash and vacuum bays.

Based on the foregoing, we are satisfied that the proposed car parking layout and access arrangements are acceptable and will provide for safe and efficient vehicle movements.

Queuing

At peak times, the proposed fuel sales and car wash may have all bays fully occupied with additional vehicles queuing to be washed or to purchase fuel.

The site layout has been designed to allow for:

- at least five vehicles to queue on-site for the auto wash bays without obstructing access to other parts of the site, and
- at least one vehicle to queue behind each of the six fuel fill points without obstructing access to the wash bays or vacuum bays.

Provision on-site for queuing is shown in Figure 7 below.

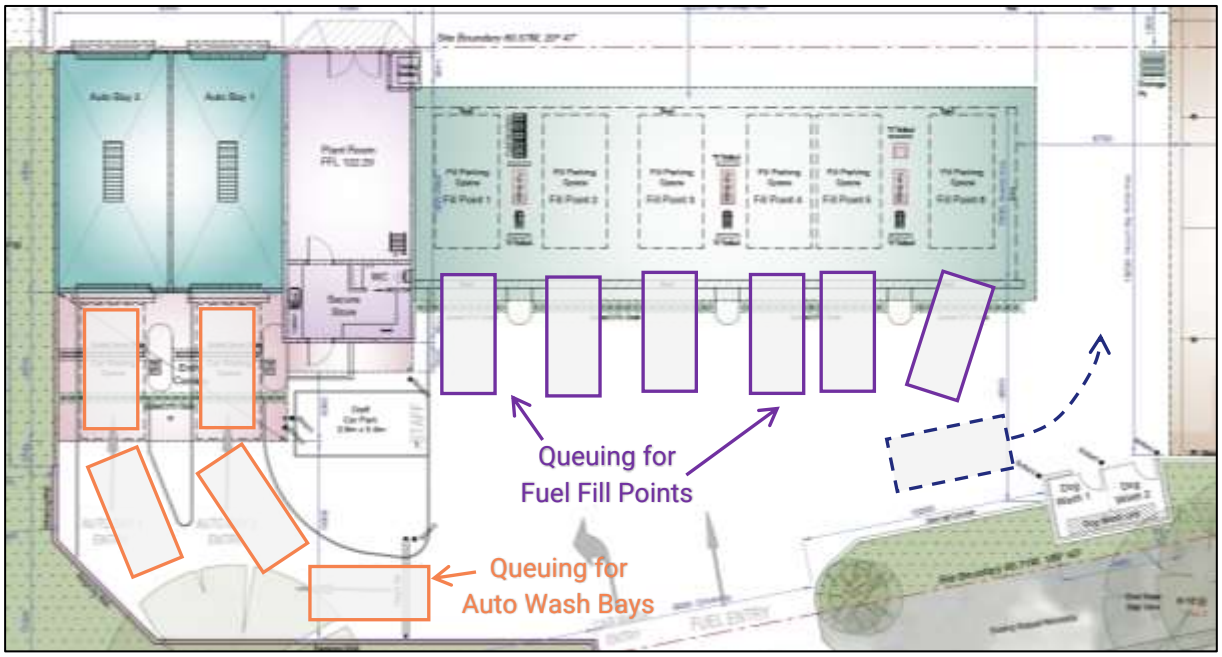


Figure 7: Queuing Provision On-Site

The proposed provision for queuing on-site is appropriate and there is not expected to be any off-site queuing impacts. Notably, having regard to the servicing time for each vehicle in the wash bays, patrons are unlikely to choose to queue on-street, and would simply drive on and come back at another time.

Circulation

When vehicles are parked in the waiting bays, vehicular access and circulation around the site is not impacted.

5. Traffic Engineering Assessment

5.1. Traffic Generation

In order to provide a robust assessment, the maximum traffic generation to the site in a given hour is assumed to be equal to the maximum throughput of vehicles that can be serviced.

To assess the maximum level of traffic that may pass through the site, the following assumptions have been made:

- the automatic car wash bays can service up to 10 cars per hour per bay,
- the pay-at-the-pump fuel dispensers will service 10 cars per hour per bay,
- the vacuum bays will not generate any additional traffic, i.e. it is assumed that vehicles using the vacuum bays will generally also have used an on-site wash bay, and
- each dog wash bay will accommodate washing up to four dogs per hour (15 minutes per dog).

Based on these assumptions, the maximum number of vehicles that could be expected to access the site in a single hour is 8, including 60 for the fuel bowsers, 20 for the automatic wash bays and 8 for the dog wash bays. Accordingly, we anticipate that the maximum level of traffic that could be generated by the proposed development is 176 vehicle movements per hour (88 inbound and 88 outbound movements).

This is a conservative estimate as it is based on 100% utilisation of all fuel and wash bays on the site and also assumes that vehicles attending the site to wash dogs are not also washing their cars while on-site (no linked trips).

Additionally, the assessment conservatively assumes that each dog wash customer only brings one dog, with each dog generating two vehicle movements (one entering and one exiting). It is likely that some customers utilising the dog wash will bring more than one dog to be washed, reducing the overall number of trips associated with the dog wash component in any given hour.

5.2. Traffic Distribution

A significant proportion of traffic accessing the site is expected to be generated by passing trade, with minimal "new" traffic movements generated on Warburton Highway.

Vehicles will enter the site via the side road (Station Street) and exit to Warburton Highway.

Having regard to the site's use and locality, we have assumed the following peak hour traffic distributions:

- 50% entering and 50% exiting,
- 60% left-in/left-out, and
- 40% right-in/right-out.

The expected distribution is shown diagrammatically at Figure 8 below.

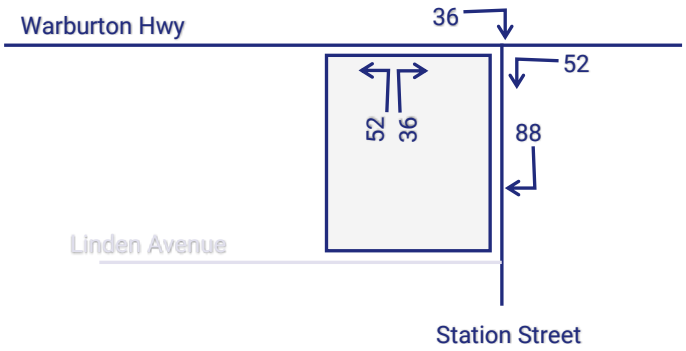


Figure 8: Site Generated Peak Hour Traffic Distribution

5.3. Traffic Impact

The proposed development is expected to generate up to 176 peak hour traffic movements to/from the subject site.

Traffic generation of this magnitude represents a single vehicle movement entering the site every 41 seconds on average during the peak hour.

At the Station Street/Warburton Highway intersection, there are bus stops located opposite Station Street and immediately east of Station Street. These bus stops effectively provide a left turn lane into Station Street and an auxiliary right-turn lane into Station Street from the highway.

If operating at full capacity, this corresponds to one vehicle turning right into Station Street every 1.7 minutes.

There is more than adequate capacity at the intersection for the additional traffic and no mitigating works are necessary as the intersection will continue to operate well.

6. Access Assessment

Clause 52.29 of the Planning Scheme sets out the requirements for altering or amending access to land in a Transport Zone 2. The purpose of Clause 52.29 is:

- *To ensure appropriate access to the Principal Road Network or land planned to form part of the Principal Road Network.*
- *To ensure appropriate subdivision of land adjacent to Principal Road Network or land planned to form part of the Principal Road Network.*

Clause 52.29-2 states that a permit is required to create or alter access to a road in a Transport Zone 2.

The proposal seeks to utilise an existing crossover to Warburton Highway, which is in a Transport Zone 2. The number of peak hour traffic movements utilising the crossover during the road network peak hour is expected to increase compared with the site's former use, which constitutes an alteration of access and accordingly, a permit is required.

The crossover to Warburton Highway will operate as an "egress" only, with no vehicles entering via the crossover. Accordingly, there is no need to consider turn warrants.

Up to 88 vehicle movements could exit the site in a single hour based on full utilisation of all wash bays on the site. This corresponds to a single vehicle exiting the site to Warburton Highway via the existing crossover every 41 seconds on average.

An assessment of the site egress point has been undertaken using SIDRA Intersection software based on the following assumptions:

- peak hour traffic movements on Warburton Highway corresponding to 10% of daily traffic (810 vehicle movements during the peak hour),
- Warburton Highway traffic distributed 60% eastbound and 40% westbound during the road network PM peak hour, and
- Warburton Highway traffic distributed 50% eastbound and 50% westbound during the Saturday peak hour.

The results of the SIDRA analysis are summarised in Table 2 below. Full SIDRA output is presented at Appendix C.

Table 3: SIDRA Output

Approach	Degree of Saturation		Average Delay (sec)		95th Percentile Queue	
	PM Peak	Sat Peak	PM Peak	Sat Peak	PM Peak	Sat Peak
Site Egress	0.123	0.126	7.0 sec	7.2 sec	3.0m	3.1m
Warburton Hwy (E)	0.186	0.233	0.1 sec	0.1 sec	0.0m	0.0m
Warburton Hwy (W)	0.279	0.233	0.1 sec	0.1 sec	0.0m	0.0m

Table 3 indicates that the site egress point to Warburton Highway will operate well within acceptable limits with negligible delays, and queues within the site not exceeding a single vehicle waiting to exit at any one time.

7. Loading

Clause 65 of the Planning Scheme states:-

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

The development plan shows large amounts of hardstand where deliveries could take place. Deliveries will occur outside of the peak operating times with vans up to 6.4m in length.

A 6.4m rigid delivery vehicle can access the site and prop in Fill Point 1 closest to the plant room.

Additionally, access and circulation through the site has been checked for a 19m semi and a 20m B-double (petrol tanker) turning right into Station Street from Warburton Highway, circulating through the site (across Fill Points 2/3) and turning left out of the site onto Warburton Highway. A 5m minimum headroom clearance is provided under the canopy, which is sufficient to accommodate a petrol tanker delivering fuel to the site.

Accordingly, we believe that the loading and fuel delivery can be undertaken satisfactorily on-site and that there will not be any adverse impacts to traffic flow or safety.

8. Conclusions

Having undertaken a detailed traffic engineering assessment of the proposed fuel sales and car wash at 2420 Warburton Highway, Yarra Junction, we are of the opinion that:

a) the Car Wash use falls under the “industry” land use term for the purposes of statutory car parking requirements,

b) the car wash use is expected to generate a parking demand for one (staff) space which is met by the on-site provision,

c) there is no statutory car parking requirement for pay-at-the-pump fuel bowers where no separate on-site convenience shop is provided,

d) the proposed car parking provision meets the statutory Clause 52.06 requirement,

e) the dog wash component is an innominate use and accordingly parking provision for this component is required to be to the satisfaction of the responsible authority,

f) dog wash customers will be advised to park in the vacuum bays,

g) the proposed car parking layout meets the relevant statutory requirements and importantly will work well,

h) adequate provision is made on-site for circulation and queuing and there will not be any adverse off-site impacts,

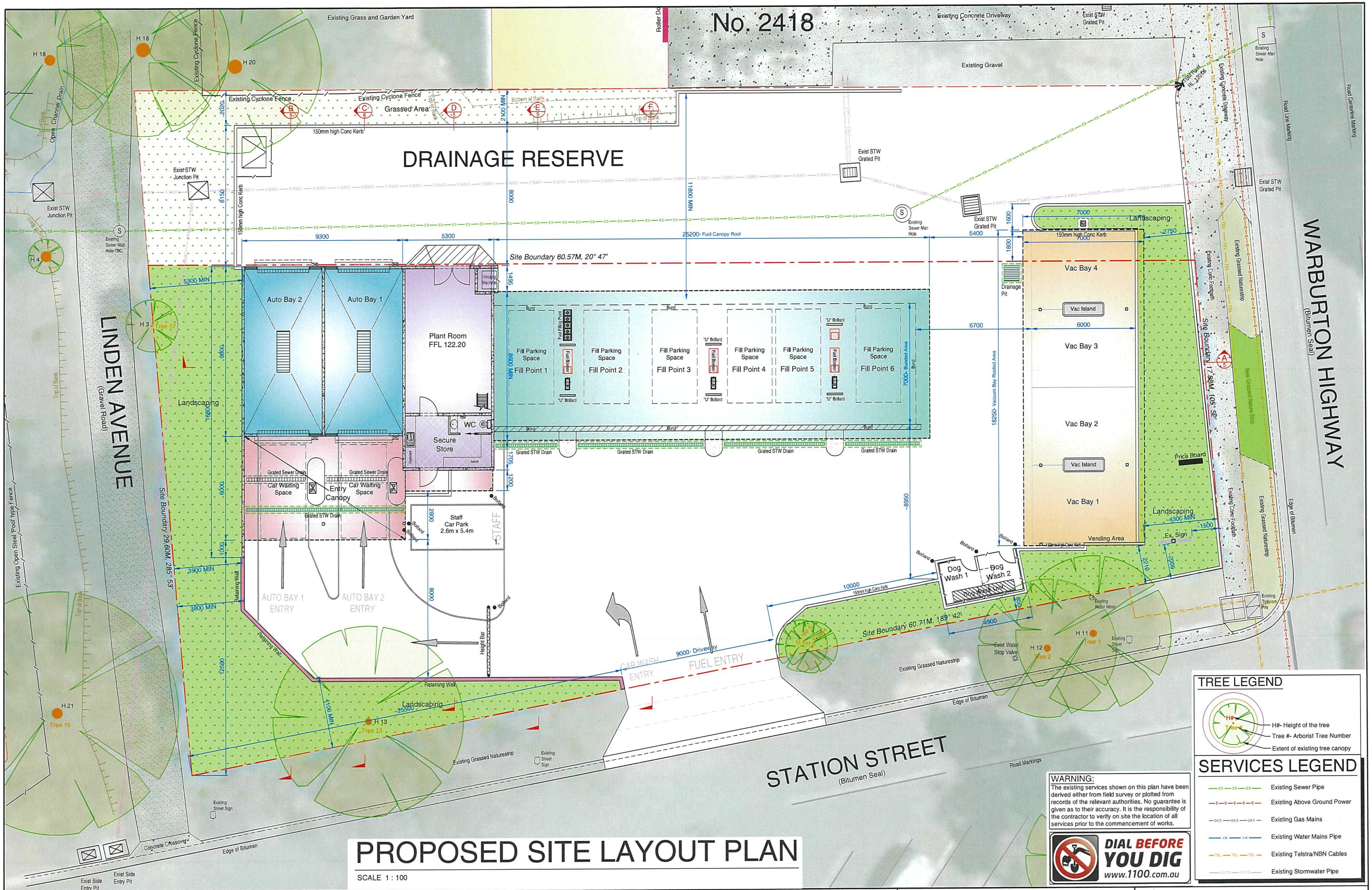
i) traffic generated by the proposed development can be accommodated on the surrounding road network and intersections without any adverse impacts,

j) there is adequate space for deliveries to be made on the land, including petrol tankers delivering fuel without impacting the flow or safety of traffic, and

k) there are no traffic engineering reasons why a planning permit for the proposed fuel sales, car wash and dog wash at 2420 Warburton Highway, Yarra Junction should not be granted.

Appendix A

Proposed Development Plans



No. 2418
Existing Grass and Garden Yard
Existing Concrete Driveway
Existing Gravel
Existing Cyclone Fence
Grassed Area
150mm high Conc Kerb
DRAINAGE RESERVE
Exist STW Junction Pit
Exist STW Grated Pit
Existing Sewer Man Hole
Site Boundary 60.57M, 20° 47'
25200- Fuel Canopy Roof
Auto Bay 2
Auto Bay 1
Plant Room
FFL 122.20
WC
Secure Store
Entry Canopy
Car Waiting Space
Grated Sewer Drain
Grated STW Drain
Staff Car Park 2.6m x 5.4m
STAFF
Fill Parking Space
Fill Point 1
Fill Point 2
Fill Point 3
Fill Point 4
Fill Point 5
Fill Point 6
"U" Bollard
Vac Bay 4
Vac Bay 3
Vac Bay 2
Vac Bay 1
Vac Island
Vending Area
Landscaping
Price Board
Ex. Sign
Drainage Pit
18250- Vacuum Bay Roofed Area
Dog Wash 1
Dog Wash 2
AUTO BAY 1 ENTRY
AUTO BAY 2 ENTRY
CAR WASH ENTRY
FUEL ENTRY
9000- Driveway
Height Bar
Retaining Wall
Site Boundary 60.71M, 189° 42'
Site Boundary 29.60M, 285° 53'
Site Boundary 17.88M, 105° 52'
LINDEN AVENUE
(Gravel Road)
WARBURTON HIGHWAY
(Bitumen Seal)
STATION STREET
(Bitumen Seal)
Existing Grassed Naturestrip
Edge of Bitumen
Concrete Crossover
Existing Open Steel 'Pool' type Fence
Open Channel Drain
Road Centreline Marking
Road Line Marking
New Grassed Nature Strip
Existing Conc Footpath
H 18
H 20
H 4
H 3
Tree 17
H 21
Tree 16
H 13
Tree 13
H 12
Tree 2
H 11
Tree 1
TREE LEGEND
H#- Height of the tree
Tree #- Arborist Tree Number
Extent of existing tree canopy
SERVICES LEGEND
Existing Sewer Pipe
Existing Above Ground Power
Existing Gas Mains
Existing Water Mains Pipe
Existing Telstra/NBN Cables
Existing Stormwater Pipe
WARNING:
The existing services shown on this plan have been derived either from field survey or plotted from records of the relevant authorities. No guarantee is given as to their accuracy. It is the responsibility of the contractor to verify on site the location of all services prior to the commencement of works.
DIAL BEFORE YOU DIG
www.1100.com.au
PROPOSED SITE LAYOUT PLAN
SCALE 1 : 100

ISSUE	DESCRIPTION	DATE
A	Issued For Council Planning Approval	7-01-2022

REVISIONS

TC 11 Apr 2022 1:23PM - T:\TMC\2021\21-037 Robert Pacel- Yarra Junction, VIC\21-037 TP Prelim V1. dwg

PRELIMINARY DRAWING
NOT TO BE USED FOR CONSTRUCTION PURPOSES

NORTH

PROPOSED CAR WASH DEVELOPMENT

AT: 2420 WARBURTON HIGHWAY, YARRA JUNCTION, VIC, 3797.

FOR: ECO WASH AUSTRALIA PTY LTD

Drawn: T. MICHAELS
Designed: T. MICHAELS

Design Matters National — The peak body for the building design profession — Member

TMC | Building Design Group
P.O. Box 3494, Mornington, VIC, 3931. Phone No. 0416 114 573
E-mail- tracey@tmcdesign.com.au

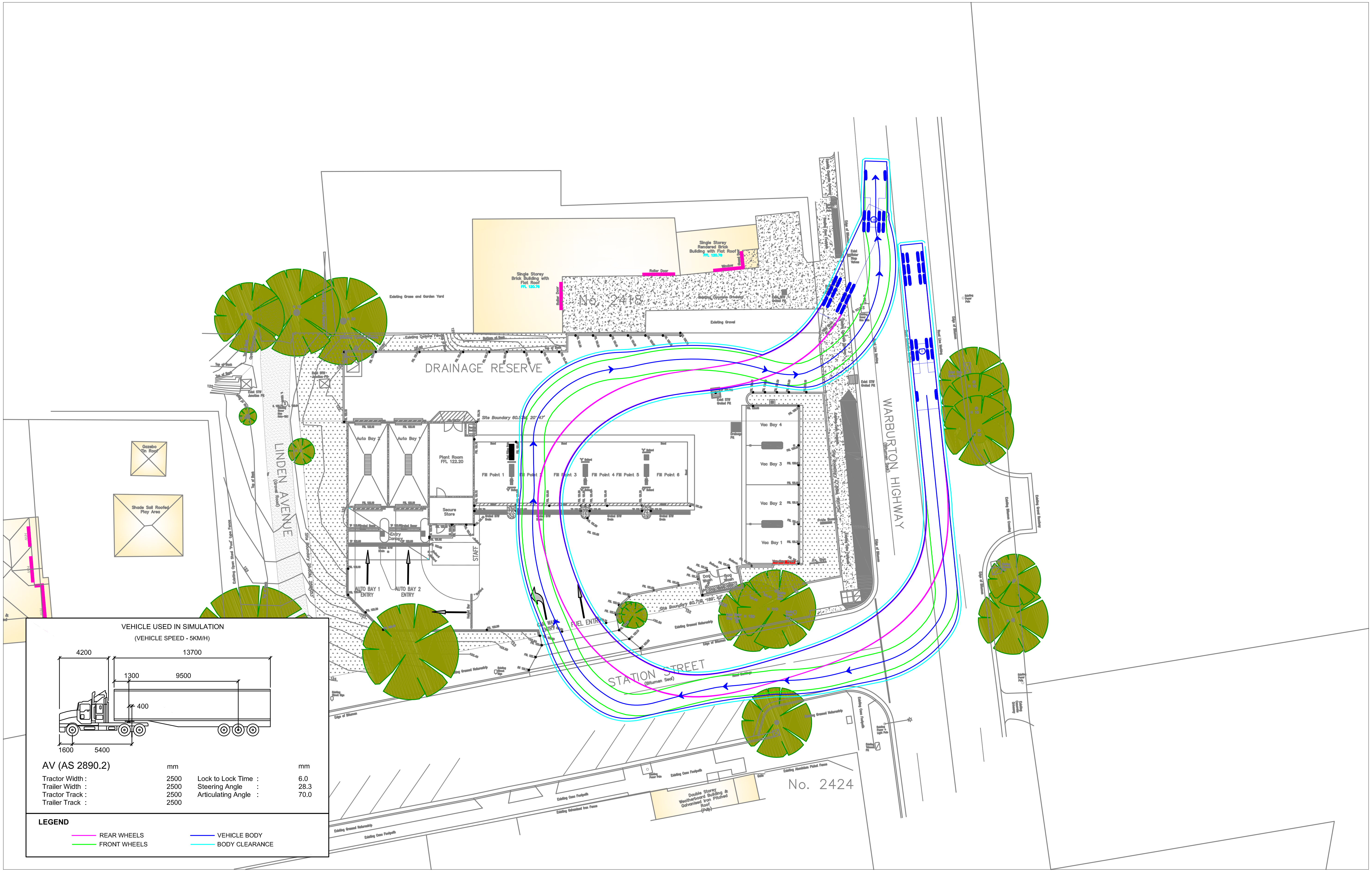
Scale: 1:100 (A1) | Date: APRIL 2022 | Issue: A
Sheet No: 2 of 5. | Job No: 21-037 TP

Document Set ID: 7116138
Version: 1, Version Date: 02/05/2022

Appendix B

Swept Path Diagrams

REFUELLING



REV	DATE	NOTES	DESIGNED BY	CHECKED BY
A	12/04/2022		D. MILDER	J. PLACE

2420 WARBURTON HIGHWAY, YARRA JUNCTION

PROPOSED FUEL SALES AND CAR WASH

GENERAL NOTES:

FILE NAME: G29996-02

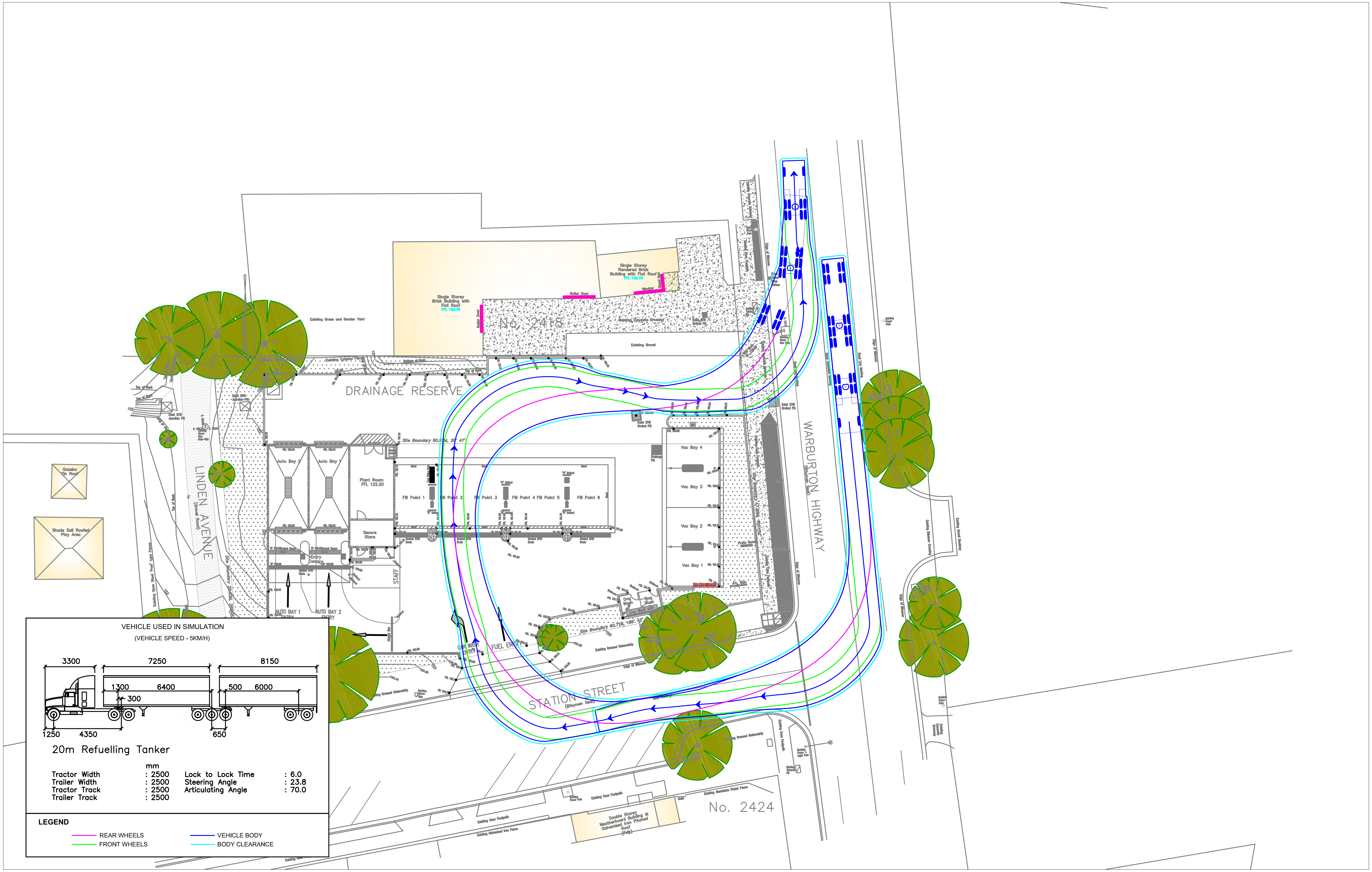
SHEET NO.: 01

N

SCALE: 1:400 (A3) 0 4 8

Traffix Group
Level 28, 459 Collins St, MELBOURNE VIC 3000
T: (03) 9822 2888
www.traffixgroup.com.au

REFUELLING



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A	12/04/2022		D. MILDER	J. PLACE

2420 WARBURTON HIGHWAY, YARRA JUNCTION

PROPOSED FUEL SALES AND CAR WASH

GENERAL NOTES:

FILE NAME: G29996-02

SHEET NO.: 02

N

SCALE: 1:400 (A3)

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Traffix Group
Level 28, 459 Collins St, MELBOURNE VIC 3000
T: (03) 9822 2888
www.traffixgroup.com.au

Appendix C

SIDRA Output

MOVEMENT SUMMARY

Site: 101 [Warburton Hwy/Site Egress - PM Peak Hour (Site Folder: General)]

Warburton Hwy/Site Egress
Peak Hour
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Site Egress														
1	L2	52	0.0	55	0.0	0.123	5.2	LOS A	0.4	3.0	0.48	0.70	0.48	47.7
3	R2	36	0.0	38	0.0	0.123	9.7	LOS A	0.4	3.0	0.48	0.70	0.48	46.7
Approach		88	0.0	93	0.0	0.123	7.0	LOS A	0.4	3.0	0.48	0.70	0.48	47.3
East: Warburton Hwy														
5	T1	324	10.0	341	10.0	0.186	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach		324	10.0	341	10.0	0.186	0.1	NA	0.0	0.0	0.00	0.00	0.00	59.9
West: Warburton Hwy														
11	T1	486	10.0	512	10.0	0.279	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.8
Approach		486	10.0	512	10.0	0.279	0.1	NA	0.0	0.0	0.00	0.00	0.00	59.8
All Vehicles		898	9.0	945	9.0	0.279	0.8	NA	0.4	3.0	0.05	0.07	0.05	59.0

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

MOVEMENT SUMMARY

Site: 101 [Warburton Hwy/Site Egress - Sat Peak Hour (Site Folder: General)]

Warburton Hwy/Site Egress
Peak Hour
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Site Egress														
1	L2	52	0.0	55	0.0	0.126	5.7	LOS A	0.4	3.1	0.51	0.74	0.51	47.5
3	R2	36	0.0	38	0.0	0.126	9.5	LOS A	0.4	3.1	0.51	0.74	0.51	46.5
Approach		88	0.0	93	0.0	0.126	7.2	LOS A	0.4	3.1	0.51	0.74	0.51	47.1
East: Warburton Hwy														
5	T1	405	10.0	426	10.0	0.233	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach		405	10.0	426	10.0	0.233	0.1	NA	0.0	0.0	0.00	0.00	0.00	59.9
West: Warburton Hwy														
11	T1	405	10.0	426	10.0	0.233	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach		405	10.0	426	10.0	0.233	0.1	NA	0.0	0.0	0.00	0.00	0.00	59.9
All Vehicles		898	9.0	945	9.0	0.233	0.8	NA	0.4	3.1	0.05	0.07	0.05	59.0

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