132-144 Warren Road, Smithfield (NSW)

Traffic Impact Assessment Report

Client: Polytrade Pty Ltd

Prepared by

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Rev F

1. INTRODUCTION

1.1 Purpose of this report

This report sets out an assessment of the traffic and parking implications of the proposed development, with specific consideration of the following:

- the existing conditions and a description of the proposed development;
- an assessment of the development's car parking requirements;
- adequacy of the on-site car parking supply to accommodate the development's parking requirements;
- the ability for trucks to access the loading bay areas and then exit from the site in a forward manner; and
- an assessment of the traffic anticipated to be generated by the proposal.

1.2 Referenced documents

This report has been based upon a number of sources. These include:

- Information provided by the applicant and officers from Council;
- Melways maps, nearmap and Google maps;
- AutoTURN computer software for the swept path analysis and SIDRA intersection analysis computer software;
- Australian Standards AS 2890.1 (2004), AS 2890.6 (2009) and AS 2890.2 (2018);
- Cumberland Development Control Plan (2021) and Building Code of Australia;
- Turning movement surveys undertaken on Thursday 7 April 2022 between 7 am - 9 am and between 4.30 pm - 6.30 pm;
- Letter from Cumberland City Council to NSW Department of Planning, Industry and Environment, Ref: SSD-19425495, dated 9 June 2021;
- SEARS document issued for the development site at 132-144 Warren Road Smithfield (NSW), Ref: SSD-19425495, dated 10 June 2021;
- Letter from NSW EPA to Department of Planning, Industry and Environment, Notice No. 1609506, dated 4 June 2021;
- Letter from Transport for NSW to Department of Planning, Industry and Environment, Ref: SYD21/00639, dated 9 June 2021;
- SEARs Scoping report prepared by MRA, dated 14 May 2021;
- TANSW, Guide to Traffic Generating Developments, Ver 2, 2002 and TANSW, Land Use Traffic Generation, Data and Analysis 11 – Warehouses;

- Ausgrid NS167 Positioning of Poles and Lighting Columns (document no. NW000-S0045, approved 8 November 2018);

- Letter from NSW Government Planning and Environment to Mr Tony Lyons, Ref: SSD-19425495, dated 8 July 2022; and

- Layout plan of the proposed development at 132-144 Warren Road Smithfield (NSW) prepared by Polytrade, Sheet 1 of 5, Rev 12, dated 13 July 2022.

2. EXISTING CONDITIONS

2.1 Location and Land use

The existing site is located on the south side of the Warren Road approximately 120 m west of Sturt Street. The location of the subject site is shown in **Figure 2.1**.

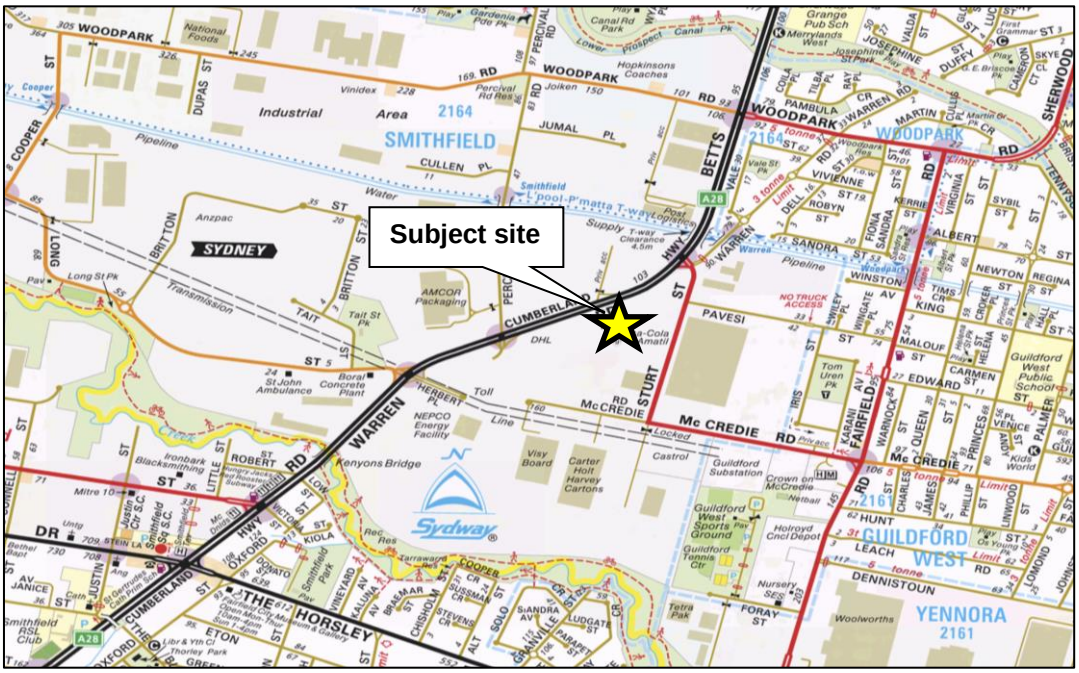

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Figure 2.1: Location of the subject site

The site, which is currently vacant, has an area of 1.9 ha. Information provided by the applicant indicates that they believed that the previous use was understood to be involved in the fabrication of steel products.

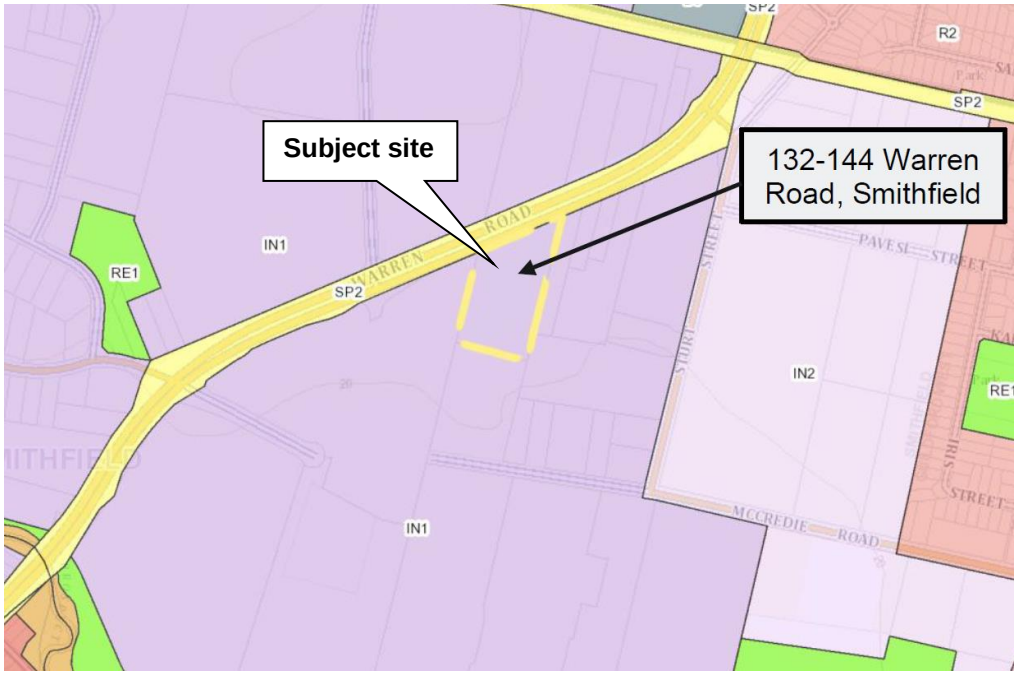
The site contains a shed (8,600 sqm), landscaped areas (1,910 sqm), car parking (1,600 sqm) and external hardstand areas for circulation (6,400 sqm).

The site is shown in **Figure 2.2.**

Source: MRA SEARs (2021)

Figure 2.2: Existing site layout

The area immediately surrounding the site is industrial in nature. The site is identified as Lot 2 of DP 1230452 in the Holroyd Local Environmental Plan (LEP) 2013 and is zoned General Industrial (IN1), as shown in **Figure 2.3**.



Source: MRA SEARs (2021)

Figure 2.3: Land Use Zoning of subject site

2.2 Road Network

Warren Road is classified as an arterial road and contains a divided cross section with three traffic lanes in each direction. No Stopping restrictions along the south side of Warren Road adjacent to and in the vicinity of the site.

Photos showing the cross section of Warren Road looking to the east and west in close proximity to the site are shown in **Figures 2.4** and **2.5**, respectively.

Source: google maps street view

Figure 2.4: Warren Road looking east

Source: google maps street view

Figure 2.5: Warren Road looking west

2.3 Existing Traffic Volumes

To establish the existing traffic movements, surveys were undertaken at the intersections of the Cumberland Highway (Warren Road) at both Sturt Street and at Percival Road on Thursday 7 April 2022 between 7 am and 9 am and between 4.30 pm and 6.30 pm.

The results of the surveys, which are summarised in **Attachment A**, indicate that, during the survey periods:

- The morning commuter peak hour occurred between 7.15-8.15 am and between 7.30-8.30 am at the two intersections and the afternoon commuter peak hour occurred between 4.45-5.45 pm at both intersections;
- Cumberland Highway (Warren Road) carries around 3,700 vehicles during the morning peak hour and 4,300 vehicles during the late afternoon commuter peak hour; and
- Sturt Street carries around 900-1,000 vehicles during both the morning peak hour and the late afternoon commuter peak hour; and

- Percival Road (north) carries around 250-300 vehicles during both the morning peak hour and the late afternoon commuter peak hour. Percival Road (South) carries up to 20 vehicles during the morning and late afternoon commuter peak hours.

2.4 Public Transport Facilities

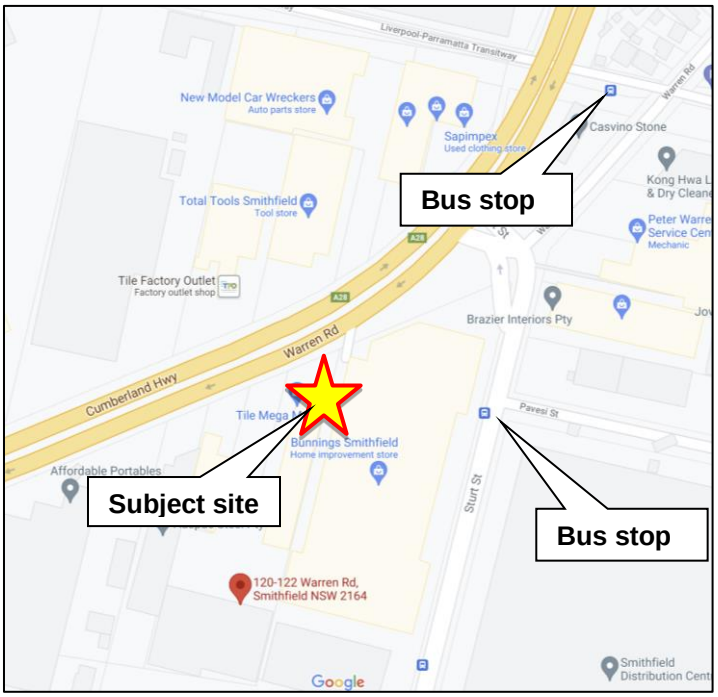
The site is well serviced by public transport services. Details of the public transport services operating in relative close proximity to the site are summarised as follows:

- Bus route T80 operates between Penrith to Parramatta via Miller, Bonnyrigg, Prairiewood, T-Way service; and

- Bus route 821 operates between Guildford and Smithfield Industrial area.

Bus stops are conveniently located in close proximity to the site. The locations of the nearby bus stops are shown in **Figure 2.6**.

The public transport services operate during times which coincide with the operating times for the proposed development during the weekday daytime and Saturday morning periods and provides convenient access for employees to the development.



Source: google maps

Figure 2.6: Public transport services in the vicinity of the subject site

2.5 Existing Operating Conditions

An assessment was undertaken of the existing operation of the signalised intersections at Cumberland Highway (Warren Road) at both Sturt St and at Percival Road during the morning and late afternoon commuter peak hours.

The assessment was undertaken using the SIDRA intersection analysis computer program (Version 9). Intersection performance is generally reported by the intersection degree of saturation (x), which provides a measure of the relationship of volume to capacity for all movements at the intersection.

The relationship between level of service criteria and degree of saturation for the various intersection types are summarised in **Table 2.1.**

Table 2.1: Relationship between level of service and degree of saturation (x)

Level of Service		Intersection Degree of Saturation (x)		
		Unsignalised intersections	Roundabouts	Signalised intersections
A	Excellent	<=0.6	<=0.6	<=0.6
B	Very good	0.6 – 0.7	0.6 – 0.7	0.6 – 0.7
C	Good	0.7 – 0.8	0.7 – 0.85	0.7 – 0.9
D	Acceptable	0.8 – 0.9	0.85 – 0.95	0.9 – 0.95
E	Poor	0.9 – 1.0	0.95 – 1.0	0.95 – 1.0
F	Very poor	>=1.0	>=1.0	>=1.0

A summary of the intersection geometry, peak hour traffic phasing (cycle length of 140 sec) adopted for the morning and late afternoon commuter peak hours are shown summarised in **Attachment B.**

The existing performance of the intersection was assessed using the SIDRA computer program, with the intersection layout and performance measures of critical degrees of saturation, average vehicle delay and 95 th % ile queue lengths shown in **Attachment C** and summarised in **Tables 2.2 and 2.3.**

Table 2.2: Existing Performance: Warren Rd/Sturt St

Peak Hour	Intersection Performance				
	Approach / Critical Movement #	Degree of Sat (x)	Average delay (sec/veh)	95 th % ile queue (m)	Level of Service
AM PEAK	North East - T	0.624	17.8	230.0	B
PM PEAK	South East - R	0.789	81.1	75.3	C

Note: # L Left, T Through, R Right, N North, S South, E East, W West

On the basis of the above analysis, the intersection currently operates at a good to very good level of operation during the am and pm commuter peak hours.

Table 2.3: Existing Performance: Warren Rd/Percival St

Peak Hour	Intersection Performance				
	Approach / Critical Movement #	Degree of Sat (x)	Average delay (sec/veh)	95 th % ile queue (m)	Level of Service
AM PEAK	East - R	0.781	57.5	37.4	C
PM PEAK	East - T	0.660	13.7	253.0	B

Note: # L Left, T Through, R Right, N North, S South, E East, W West

On the basis of the above analysis, the intersection currently operates at a good to very good level of operation during the am and pm commuter peak hours.

3. THE PROPOSAL

It is proposed to refurbish the existing buildings to provide a Material Recycling Facility (MRF).

The recycling facility has a floor area of 8,900 sqm and will be focused on processing domestic kerbside waste, that is, glass, paper, cardboard, plastics, steel, aluminium and general waste.

The recycling facility will have a processing capacity of 150,000 tonnes per annum (tpa).

The facility will operate 24/7 and will have 2 x 12 hour shifts with up to 12 shift workers per shift (total 24 shift workers). The applicant has advised that the shift changeover times will occur at 4 am and at 4 pm.

In addition, the applicant has advised that there will be one site manager, four office staff, two weighbridge operators, two shift managers and three maintenance/cleaning staff. At any one time, there will be a maximum of 36 staff on site (at shift changeover times).

Management and administrative staff will typically be on the site between 9 am and 5 pm on weekdays.

Reference to the layout plans indicates that the on-site parking areas will contain a total of 41 spaces for staff and visitors, inclusive of an accessible bay. In addition, two weighbridges are proposed to be located at the facility to accommodate both trucks arriving at the facility and trucks departing from the facility.

Access for trucks will comprise of the existing access which will accommodate all truck arrivals (and exit access for B-Doubles). The majority of trucks (up to 19 m in length) will circulate clockwise around the site and exit via the existing access adjacent to the site's western boundary.

Access to and from the on-site parking area for staff and visitors will be provided via a new access located 10 m west of the site's eastern boundary.

In addition, there will be loading dock areas within the building for trucks up to 19 m in length with the largest truck visiting the site corresponding to a 26 m B-double articulated vehicle, which will be required to prop within the accessway for unloading.

The layout of the proposed development is shown in **Attachment D**.

4. CAR PARKING CONSIDERATIONS

4.1 Car Parking Requirements

The car parking requirements for the proposal are set out in the Cumberland Development Control Plan, (2021), specifically in Part G3, Section 3.

Reference to the Table of General Parking Controls indicate that there is no applicable land use provided in the Cumberland Development Control Plan, (2021), specifically in Part G3, Section 3, for a Resource Recovery Facility.

While there is no land use which reflects the proposed resource recovery facility, following discussions with the applicant, it is considered that *warehouse* provides the best comparative land use to the proposed development, and is therefore adopted as the basis to determine the development's car parking requirements.

The Table of General Parking Controls indicates that the (minimum) car parking requirements for *Warehouse* correspond to:

- 1 space per 300 sqm

On the basis of the above, the assessment of car parking requirements indicates the proposed development has a car parking requirement for 29 spaces.

Further, reference to the Building Code of Australia indicates that there is a requirement to provide an accessible space, which is proposed to be provided.

The development's car parking requirement of 29 spaces is satisfied by the on-site parking supply of 41 spaces.

4.2 Car Park Layout

The existing car parking area will be reconfigured to provide a total of 41 car spaces. Reference to the car park layout plan indicates that:

- all parking spaces are proposed to be provided at a width of 2.6 m and a length of 5.4 m with a minimum aisle width of 6.258 m, which can accommodate either staff or visitor parking;

- the parking bay on the east side of the gate is designated as a staff space and is provided at a width of 2.7m;

- the accessible space and the adjacent shared space be provided at a width of 2.4 m and a length of 5.4 m, with the shared space containing a centrally located bollard offset by a distance of 800 mm from the edge of the accessway.

The car park layout accords with the requirements stipulated in the Australian Standards AS 2890.1:2004 and AS 2890.6:2009.

To facilitate safe access for staff and visitors between the staff/visitor car park and the entrance to the facility, a pedestrian pathway is proposed to be provided between the western side of the car park across the front of the warehouse.

The pathway is recommended to be provided at a width of 1.2 m and with yellow pavement markings. In addition, it is recommended that 'watch for trucks' signage is located on either side of Gate 1 and signage installed within the truck entry access indicating 'watch for pedestrians'.

An assessment of the proposed car park access indicates that the following gradients are required to be marked on the layout plan.

RL at southern edge of footpath: RL = 24.39 (higher RL):

- Gradient of 1:20 for length of 6 m: RL = 24.09
- Gradient of 1:11.65 for length of 12.23 m up to car park access gate: RL = 23.03

It should be noted that a traffic island is located at the entrance to the staff/visitor car park within the Warren Road/road reserve. An existing utility pole is located within the traffic island which is offset at 1.5 m from the edge of the island.

The offset clearance of 1.5 m adopted for the placement of the utility pole within the traffic island was sourced from *Ausgrid NS167 Positioning of Poles and Lighting Columns* (document no. NW000-S0045, approved 8 November 2018). This advice has also been confirmed by officers from Transport NSW in an email response received on 7 July 2022.

The ability for two vehicles to simultaneously enter and exit the car park access was assessed with the use of the AutoTURN computer software using B85 and B99 vehicles.

The results of the assessment are shown in **Attachment E** and indicates that two cars can simultaneously turn into and out of the car park access, whilst maintaining a safe clearance to the edge of the central traffic island and the existing utility pole.

5. COMMERCIAL VEHICLES

5.1 Accessibility to/from the site

Information provided by the client indicates that the trucks arriving to pick up recycled material at the processing area will be undertaken by a mixture of Council's collection vehicles, walking floor semi-trailers, small rigid/tipper trucks, truck and dog trailers and 26 m B-double trucks.

The applicant has advised that the trucks will align themselves with the respective loading docks as set out below:

- Loading dock I: 12.5 m HRV enters loading dock, reverses out then forward into Gate 1
- Loading docks B and C: 19 m and 26 m B-Double – props alongside the loading docks – forklifts used to unload goods under traffic control
- Loading docks C and D: 19 m and 26 m B-Double trucks partially reverse into loading docks, then 19 m truck exits in a clockwise manner around site to exit via Gate 2 and 26 m B-Double undertakes a left turn to exit via Gate 1
- Loading docks E and F: 19 m truck and dog trailer props between the loading docks
- Loading dock (adjacent to weighbridge 2): 19 m AV manoeuvre back to the loading dock ramp. An example of this external loading dock ramp is shown in **Figure 5.1**.

Figure 5.1: Example of external loading dock ramp

The ability for a 12.5 m HRV and 19 m AV trucks to enter/exit the site in a forward manner, manoeuvre on-site to access the various loading docks and then exit from the site in a forward manner was assessed with the use of the AutoTURN swept path computer software, the analysis of which is shown in **Attachment F**.

The analysis indicates that a 12.5 m HRV and a 19 m articulated vehicle can enter the site in a forward manner, manoeuvre on-site to access the various loading dock areas (and loading ramp) to then circulate in a clockwise direction around the site to depart from the site in a forward manner, subject to the provision of splays on either side of the truck entry crossover.

It is further noted that the AV truck propped in front of the loading ramp would restrict the passage of personnel from the fire escape door located adjacent to loading dock H and accessibility for fork-lifts to/from roller doors at loading bays G and H.

It is understood from discussions with the applicant that a new loading dock roller door and fire escape door would be constructed to provide ease of access for forklifts to the loading dock ramp facility.

A further assessment was undertaken to examine the ability for a 26 m B-Double truck to enter/exit the site in a forward manner, manoeuvre on-site and then exit from the site.

The analysis indicates that a 26 m B-double truck can enter the site in a forward manner, and manoeuvre on-site to either prop between the loading docks C and D or partially reverse into loading dock D but is unbale to physically circulate around the site in a clockwise manner. As a result, the 26 m B-Double is required to exit via Gate 1.

During the times when B-Double trucks are accessing the site, all other trucks will be restricted from accessing the abutting loading docks to provide the B-Double truck(s) with a clear area to be able to undertake a u-turn manoeuvre to then exit from the eastern access (Gate 1).

During these times, the other trucks are able to utilise the truck layover area abutting the south side of the staff/visitor car park. This layover truck facility can accommodate up to seven trucks at one time and, on this basis, minimal queuing is anticipated to occur at the site access given the provision of a bypass lane adjacent to the weighbridge, four separate loading bay facilities and a layover area capable of accommodating up to seven trucks at any one time.

The ability for a 26 m B-Double truck to enter/exit the site in a forward manner, manoeuvre on-site and then exit from the site in a forward manner was assessed with the use of the AutoTURN swept path computer software, the analysis of which is shown in **Attachment G**.

The analysis indicates that a 26 m B-Double truck can enter the site in a forward manner, manoeuvre on-site to then depart from the site in a forward manner via the existing access (Gate 1), subject to the provision of splays on either side of the entry access.

On occasions, when the trucks are required to reverse back to the loading dock areas, it is recommended that a spotter be deployed to minimise the potential for conflict with other trucks circulating within the site's accessways.

It is further noted that B-double trucks cannot exit from the existing site access whilst another truck is entering the site access, and similarly, the B-Double trucks cannot enter the site access whilst another truck is propped to exit from the site access.

As such, it is recommended that 26 m B-Double movements are minimised and are only permitted to access the site during the off-peak time periods, such as between 6 pm and 5 am.

Further, 26 m B-Double truck movements are required to be regulated and spotters used at the eastern access point to ensure that one B-Double truck arrives or departs from the site's eastern access at any one time.

The B-Double trucks will be required to communicate with the site manager, prior to arriving at the site to ensure that their arrival time occurs at an off-peak time with no other B-Double trucks on site as well as minimal truck activity on the site to minimise the potential for conflict between arriving/departing trucks.

Truck queuing will be kept to a minimum at the exit access with the vast majority of trucks, upon exiting from the loading docks will circulate in a clockwise manner around the site to depart from the site's western access via a left turn manoeuvre into Warren Road.

Information provided by the applicant indicates that there will be a maximum of two incoming and two outgoing B-Double truck movements per day, which will be restricted to occur between 6 pm and 5 am.

The vast majority of all other truck movements will occur between 5 am and 6 pm thereby minimising the potential for conflict between B-Double trucks and all other trucks.

Information provided by the applicant indicate that the truck movements forecast to be generated by the proposed development are shown summarised in **Attachment H**.

Reference to the forecast truck movements indicate that there are anticipated to be a maximum of 8 trucks during the morning commuter peak hour and 2 trucks during the late afternoon commuter peak hour which will be required to use the weighbridge at Gate 1.

During the morning commuter peak hour, the incoming trucks will arrive at an average rate of one truck each 7.5 minutes.

The applicant has further advised that the average time taken by a truck on a weighbridge, that is, a truck driving onto the weighbridge, their weight recorded and the truck exiting from the weighbridge varies between 15 seconds and 30 seconds per truck.

Adopting the upper limit of 30 seconds for a truck propped on the weighbridge at Gate 1 and, based upon an average arrival rate of one truck every 7.5 minutes, it is anticipated that there will be minimal queuing at the weighbridge facility.

Even in the event that two trucks arrive simultaneously, there is adequate provision within the entry access to safely accommodate a truck propped on a weighbridge and a truck propped within the entry access.

In the event that there is a truck propped within the entry access, whilst a truck is propped on weighbridge at Gate 1, it is recommended that traffic management personnel signal to any subsequently arriving trucks that they are to use the bypass lane at Gate 1 and then prop in the waiting bays until the weighbridge is vacant for the trucks to then manoeuvre onto the weighbridge.

5.2 Headroom clearance

AS 2890.2:21018 indicates that a minimum headroom clearance of 4.5 m required to be provided within the buildings to facilitate access to/from the loading dock areas.

Information provided by the applicant indicates that the available headroom clearance at both roller doors and within the warehouses are in excess of 4.5 m.

6. TRAFFIC IMPACT

6.1 Anticipated Vehicle Movements

The impact of the proposed development can be assessed having regard to the anticipated number of truck and car movements likely to be generated at the development access during the commuter peak periods.

Truck Movements

Based upon information provided by the applicant (refer **Attachment H)**, the number of receival truck movements anticipated to be generated by the proposed recycling facility corresponds to the following number during the morning and late afternoon commuter peak hours:

- Morning commuter peak hour (7.30-8.30 am): 15 IN, 15 OUT
- Late afternoon commuter peak hour (4.45-5.45 pm): 5 IN, 5 OUT

It is noted that Council trucks will drop off materials five days per week (Monday to Friday) and commercial waste will be dropped off seven days per week.

Offtake, that is, materials picked up from the facility, will be undertaken over a 24 hour period.

Having regard to the peak truck arrival movements, it is considered that there will be minimal queuing at the site entry access. On those occasions when several trucks arrive simultaneously, a bypass lane is provided adjacent to the weighbridge to enable arriving trucks to bypass any trucks propped on the weighbridge, if required.

Staff and Visitors

There will be a maximum of up to 12 shift worker vehicles (assuming all drive) which will arrive and depart the site at shift changeover times, that is between 3.45 am – 4.15 am and between 3.45 pm and 4.15 pm.

In addition, assuming say one visitor arriving at the site during the shift changeover times, results in a total (car) peak hour traffic generation of 25 vehicle movements between 3.30 – 4.30 am and between 3.30-4.30 pm.

During the morning commuter peak hour, that is between 7.30 am – 8.30 am, it is assumed that the office manager, four office staff and three maintenance staff will arrive at the site.

During the late afternoon commuter peak hour, that is between 4.45 pm – 5.45 pm, it is assumed that the office manager, four office staff and three maintenance staff will depart the site.

The shift changeover times will occur between 3.45 pm – 4.15 pm and will therefore not coincide with the late afternoon commuter peak hour.

As a comparison, reference to *TANSW, Guide to Traffic Generating Developments, 2002* indicates that, application of the traffic generation rates for either a factory or warehouse use, which were the land uses which were originally approved by Council for this site, generate a significantly higher number of vehicles trips than that forecast to be generated for this proposed development.

A comparative assessment is set out as follows:

The daily traffic generation corresponding to the originally approved uses on this site (based upon a floor area of 8,600 sqm) are summarised as follows:

- Factory Daily generation rate of 5 vm/100 sqm => 430 vm/day
- Warehouse Daily generation rate of 4 vm/100 sqm => 344 vm/day

Reference to the data provided by the applicant indicates that the proposed development will generate a total of 266 vehicle movements per day, which is comprised of 190 truck movements and 76 staff and visitor movements.

On the basis of the above, the level of traffic anticipated to be generated by the development site is significantly lower than that which had been originally approved to operate on the site.

6.2 Impact of additional traffic movements

Discussions between the applicant and Transport NSW indicate that, for the purpose of the analysis, the traffic generation rates for warehouse should be adopted to estimate the traffic flows for the existing use.

Reference is made to *TANSW, Guide to Traffic Generating Developments, 2002*, which states amongst other things that, the morning peak hour traffic generation rates for warehouse corresponds to 0.5 trips per 100 sqm.

Application of the peak hour generation rate to the existing warehouse (8,600 sqm) results in an anticipated morning peak hour traffic flow of 43 vehicles per hour.

Further, reference to the *TANSW, Land Use Traffic Generation, Data and Analysis 11 – Warehouses* indicates that, for comparable warehouse sites, the proportion of trucks and cars during the morning commuter peak hour corresponds to an average of 60 % (trucks) and 40 % (cars).

Therefore, based upon an existing morning peak hour traffic flow of 43 vehicle movements, it is anticipated that the existing site generated 25 truck movements and 18 car movements during the morning commuter peak hour. An assessment of the net traffic movements can be undertaken as follows:

Existing site traffic generation (Section 5.2)

AM peak hour: 18 cars (entry)
25 trucks (entry/exit)

Future development traffic generation (section 5.1)

AM peak hour 8 cars (entry)
15 trucks IN, 15 trucks OUT

Therefore there is anticipated to be a net reduction in the total number of vehicles generated by the development site in the peak morning commuter hour in comparison to what was previously generated by the existing warehouse.

Notwithstanding the above, given that there is anticipated to be a reduction in the number of cars being generated and a net increase of five trucks (between the existing site and future development), the assessment of future impact on the road network was conservatively based upon the following number of truck movements anticipated to be generated by the development site during the commuter peak hours:

- AM commuter peak hour (7.30-8.30 am): 14 trucks IN, 14 trucks OUT
- PM commuter peak hour (4.45 – 5.45 pm): 4 trucks IN, 4 trucks OUT

The distribution of vehicle movements to and from the development access can be assessed having regard to the existing turning movements at the adjoining signalised intersections on the adjacent road network.

An examination of the turning movements at the abutting signalised intersections indicates that there are minimal u-turn manoeuvres at the intersections, which suggest that vehicles travelling to and from the commercial and industrial uses along Warren Road between Percival Road and Sturt Street are using the broader road network to align themselves on the approach to and from the sites.

On the basis, it is assumed that all arriving vehicles will approach from the east and all departing vehicles will depart toward the west.

The respective movements at the adjoining intersections are show in **Figure 4.3**.

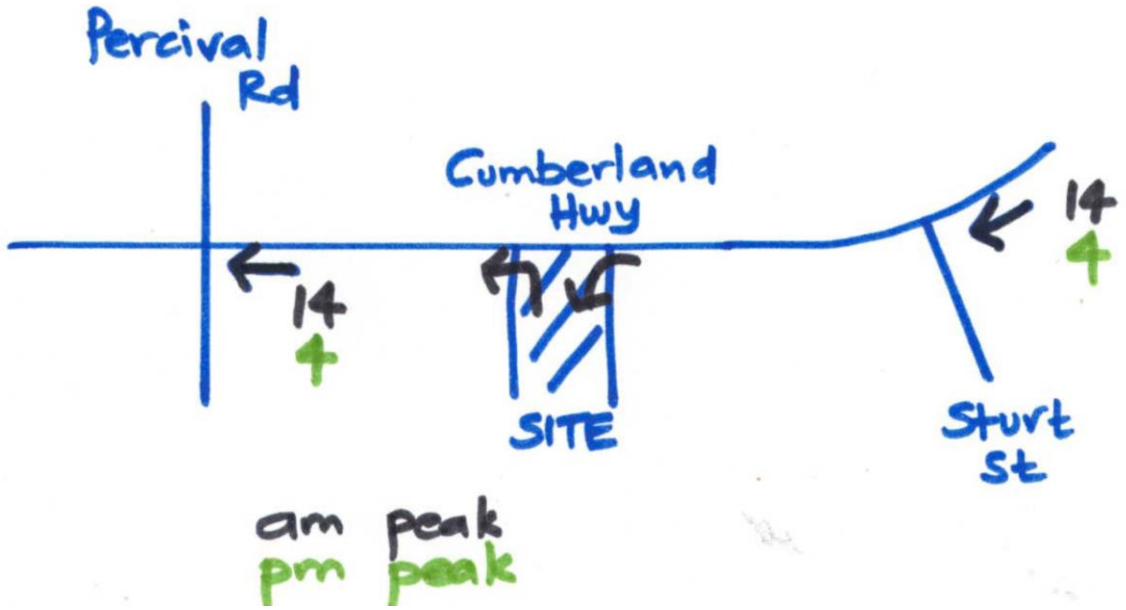


Figure 6.2: Directional distribution at site access

6.3 Traffic Impact upon adjacent intersections

The impact of the development can be determined by superimposing the traffic volumes anticipated to be generated by the proposed development upon the existing traffic volumes for the morning and late afternoon commuter peak hours.

The intersections of Cumberland Highway (Warren Road) at both Percival Road and Sturt Street were assessed using the SIDRA intersection computer program having regard to the resultant traffic distributions for the proposed development, with the performance measures of critical degrees of saturation, 95 th % ile queue lengths and average delay are shown in **Attachment J** and summarised in **Tables 6.1** and **6.2.**

Table 6.1: Future Performance: Warren Rd/Sturt St

Peak Hour	Intersection Performance				
	Approach / Critical Movement #	Degree of Sat (x)	Average delay (sec/veh)	95 th % ile queue (m)	Level of Service
AM PEAK	North East - T	0.624	17.3	229.9	B
PM PEAK	South East - R	0.789	81.1	78.3	C

Note: # L Left, T Through, R Right, N North, S South, E East, W West

On the basis of the above analysis, the intersections are forecast to operate at a good to very good level of operation for the future case during the am and pm peak hours.

Table 6.2: Future Performance: Warren Road/Percival Rd

Peak Hour	Intersection Performance				
	Approach / Critical Movement #	Degree of Sat (x)	Average delay (sec/veh)	95 th % ile queue (m)	Level of Service
AM PEAK	East - R	0.781	57.5	37.4	C
PM PEAK	East - T	0.661	13.8	254.3	B

Note: # L Left, T Through, R Right, N North, S South, E East, W West

On the basis of the above analysis, the intersections are forecast to operate at a good to very good level of operation for the future case during the am and pm peak hours.

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As a result of the above assessment, it is considered that the proposed development will have a negligible additional impact upon the operation of the intersections of Warren Road at both Percival Road and Sturt Street during the commuter peak hours.

Therefore, it is considered that the traffic flows anticipated to be generated by the proposed development will therefore not represent an adverse impact upon the operation of the adjacent road network at the peak road network times.

7. CONCLUSIONS AND RECOMMENDATIONS

Having regard to the above, it is considered that:

- The development's car parking requirement of 29 spaces is satisfied by the on-site parking supply of 41 spaces;
- The anticipated peak parking demands correspond to a maximum of up to 36 vehicles at shift changeover times, could be accommodated within the proposed parking supply of 41 spaces; and
- The level of traffic movements anticipated to be generated by the proposed development is considered minimal and is not anticipated to represent an adverse impact upon the operation of the abutting road network at the peak road network times.

Further, it is recommended that :

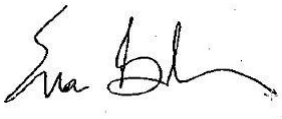
- pedestrian pathway be provided at a width of 1.2 m with yellow pavement markings;
- installation of 'watch for trucks' signage on either side of Gate 1 and signage installed within the truck entry access indicating 'watch for pedestrians';
- the following gradients are required to be marked on the layout plan.

  RL at southern edge of footpath: RL = 24.39 (higher RL):

  - Gradient of 1:20 for length of 6 m: RL = 24.09
  - Gradient of 1:11.65 for length of 12.23 m up to car park access gate: RL = 23.03

- splays be provided on either side of the entry access to facilitate safe entry/exit for 19 m AV and B-double trucks;
- during the times when B-Double trucks are accessing the site, all other trucks will be restricted from accessing the abutting loading docks;
- a spotter be deployed to minimise the potential for conflict with other trucks circulating within the site's accessways;
- A spotter would also be required to ensure that an AV could safely manoeuvre back to the loading dock ramp facility;
- (when two trucks are queued at Gate 1) traffic management personnel signal to any subsequently arriving trucks that they are to use the bypass lane at Gate 1 and then prop in the waiting bays until the weighbridge is vacant;
- either the loading dock ramp and weighbridge be relocated 2 m to the south or that a flush style of weighbridge 2 be adopted to allow improved manoeuvring in this area;
- 26 m B-Double movements are only permitted to access the site during the off-peak time periods, such as between 6 pm and 5 am;
- 26 m B-Double truck movements are required to be regulated and spotters used at the eastern access point to ensure that one B-Double truck arrives or departs from the site's eastern access at any one time; and

- a minimum headroom clearance of 4.5 m required to be provided for a 19 m articulated vehicle.



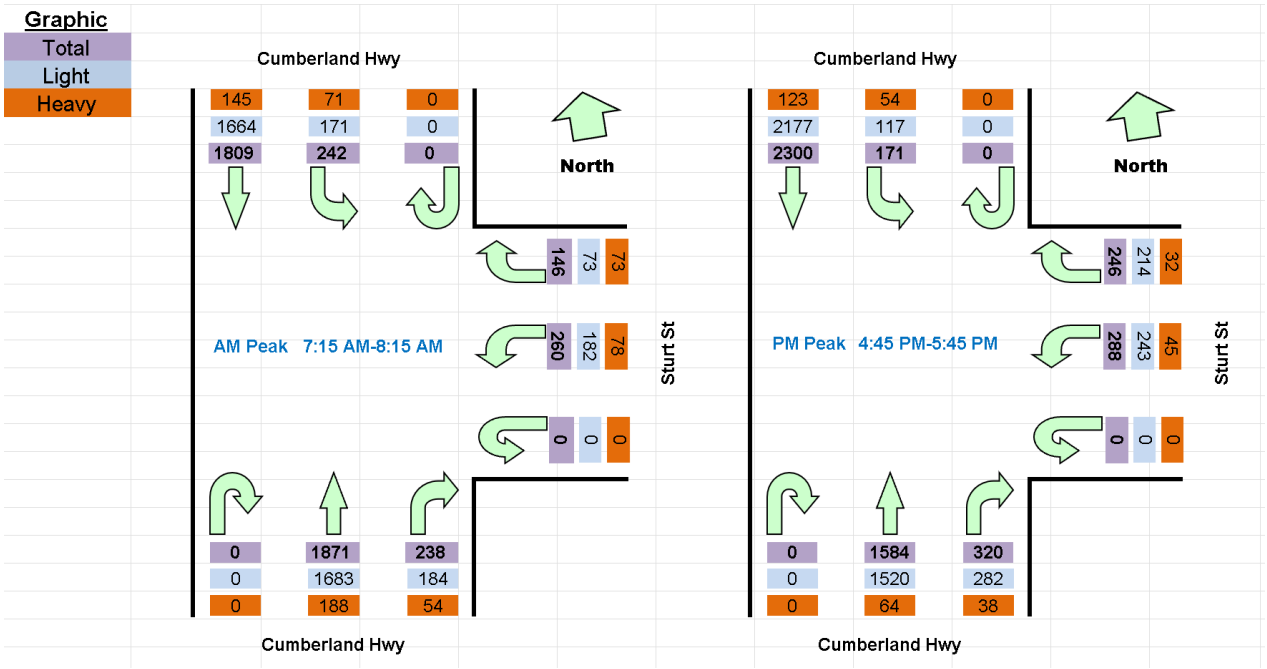
Evan Boloutis
Director
EB Traffic Solutions Pty Ltd

B.Eng (Civil), MEng Sc (Traffic), MBA

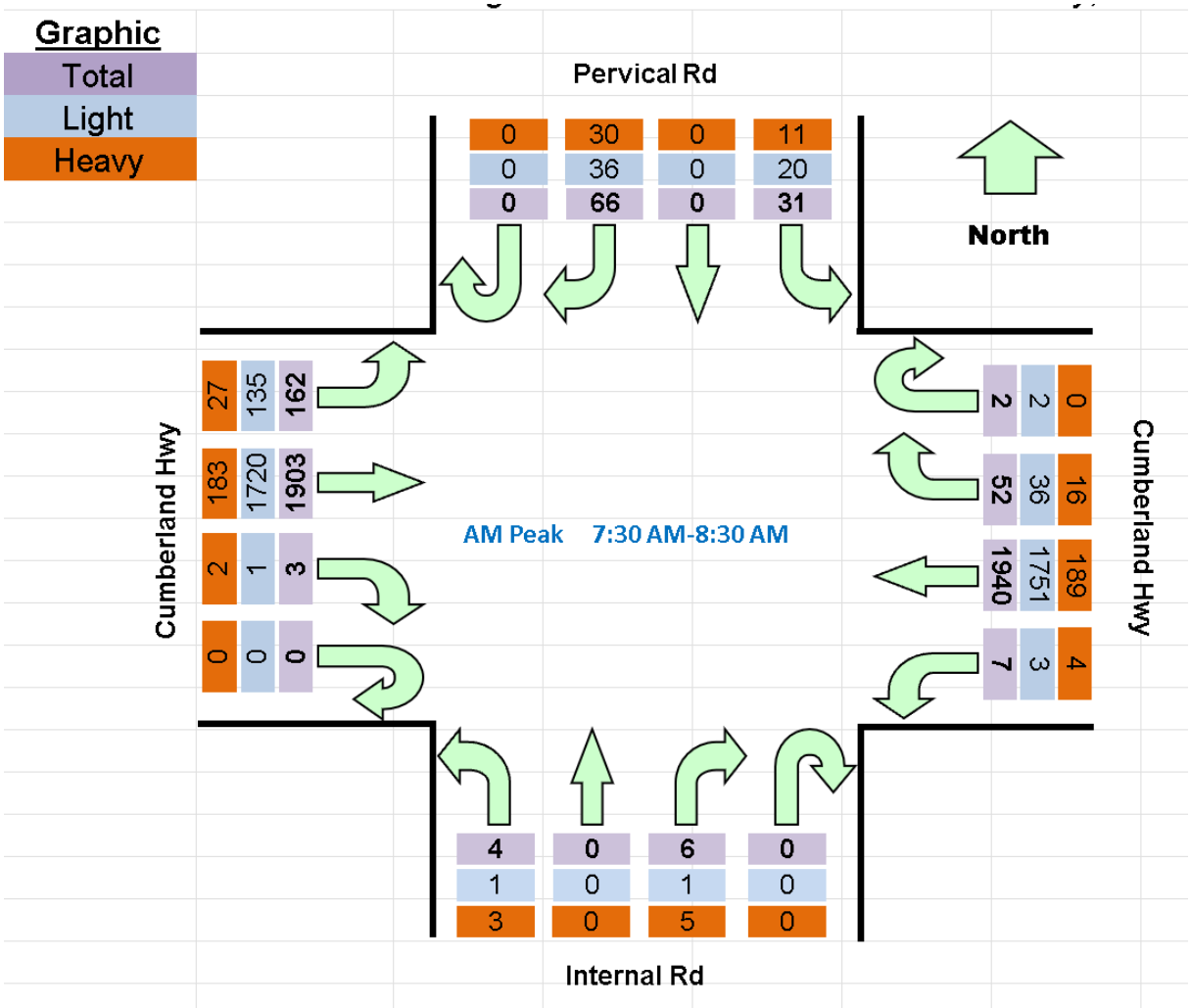
ATTACHMENTA

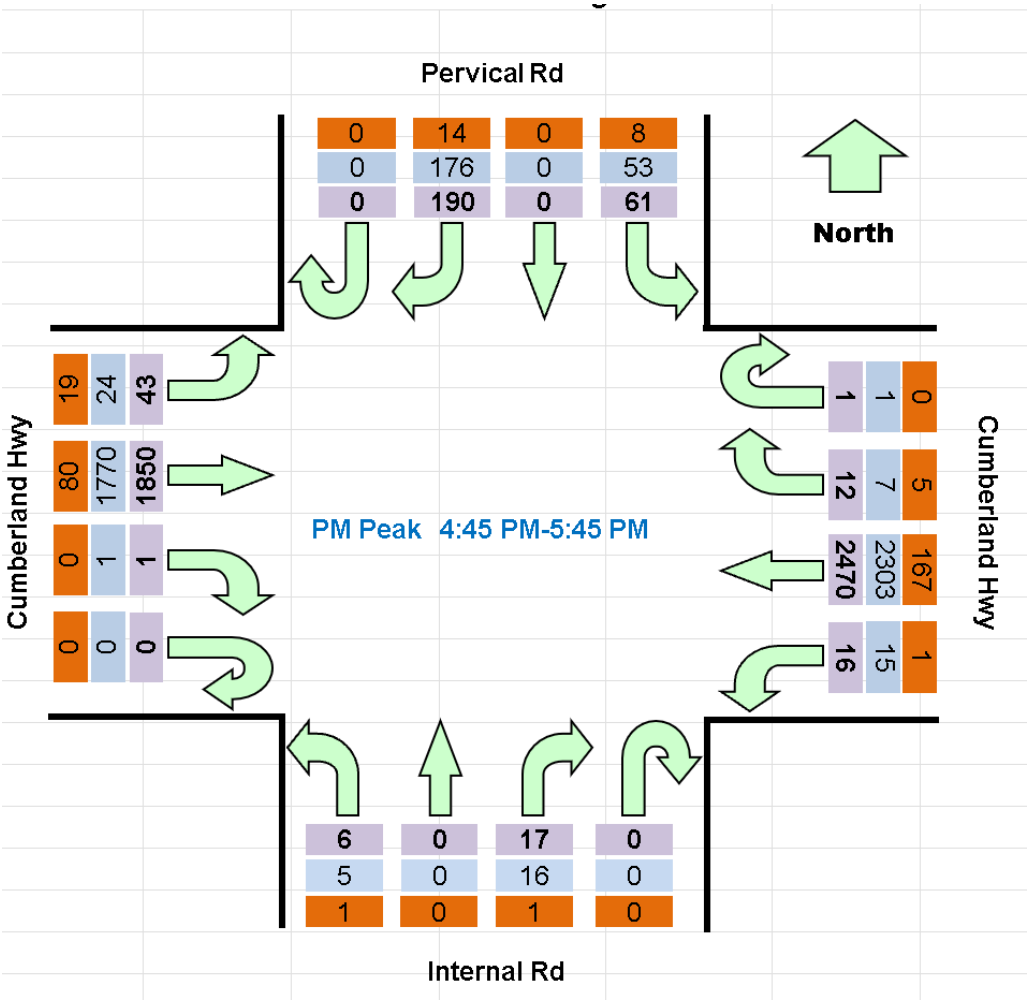
TRAFFIC VOLUME SURVEYS

Warren Road/Sturt Street



Warren Road/Percival Road

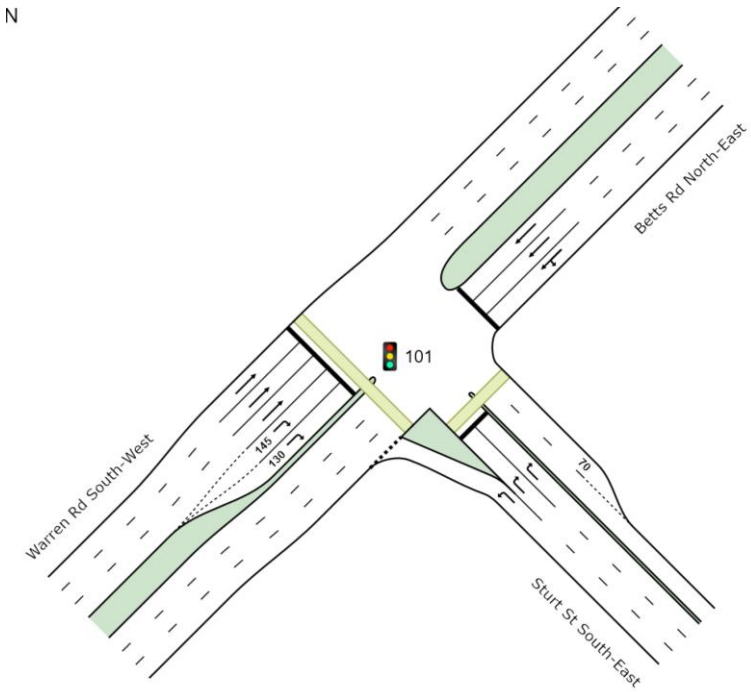


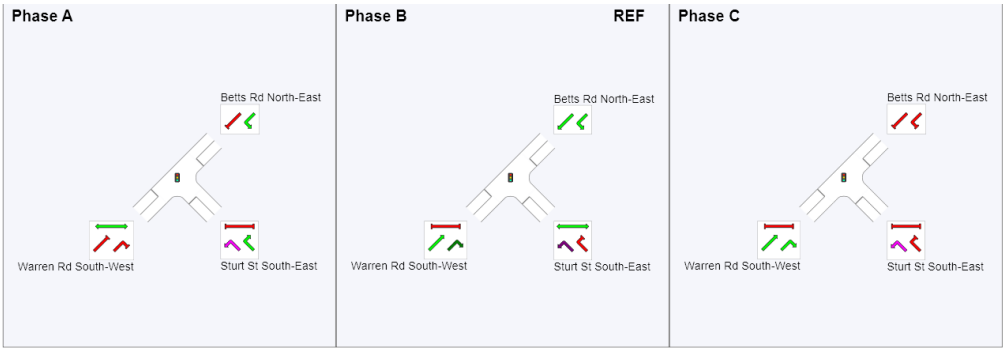

Pervical Rd
0 14 0 8
0 176 0 53
0 190 0 61
North
Cumberland Hwy
19 24 43
80 1770 1850
0 1 1
0 0 0
1 1 0
12 7 5
2470 2303 167
16 15 1
Cumberland Hwy
PM Peak 4:45 PM-5:45 PM
6 0 17 0
5 0 16 0
1 0 1 0
Internal Rd

ATTACHMENT B

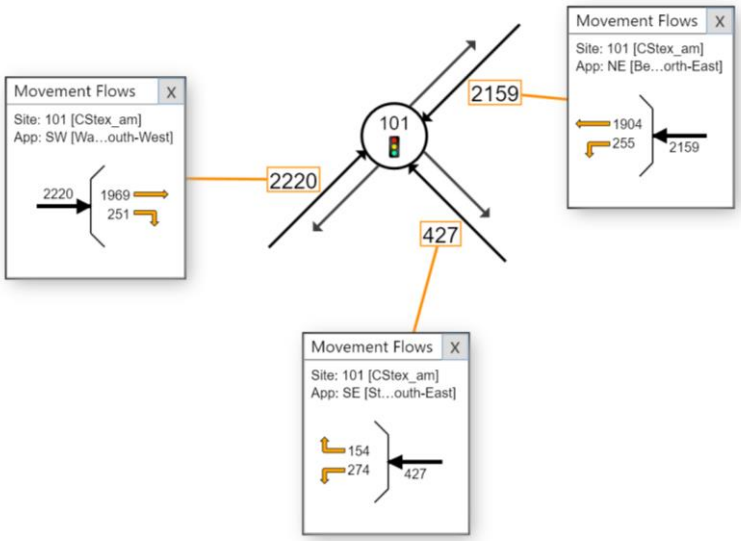
INTERSECTION LAYOUT, PHASING AND VOLUMES

Warren Road/Sturt Street

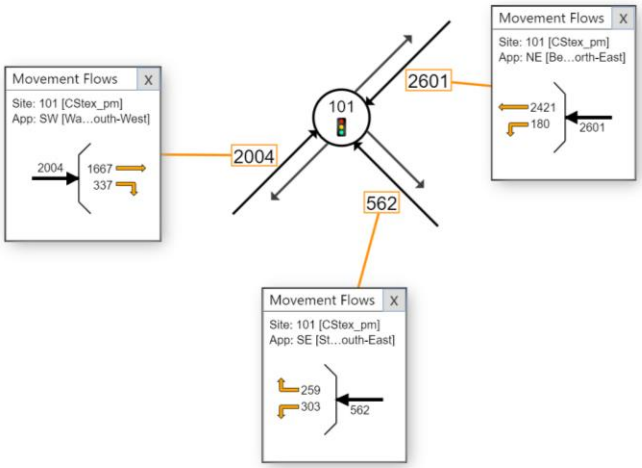




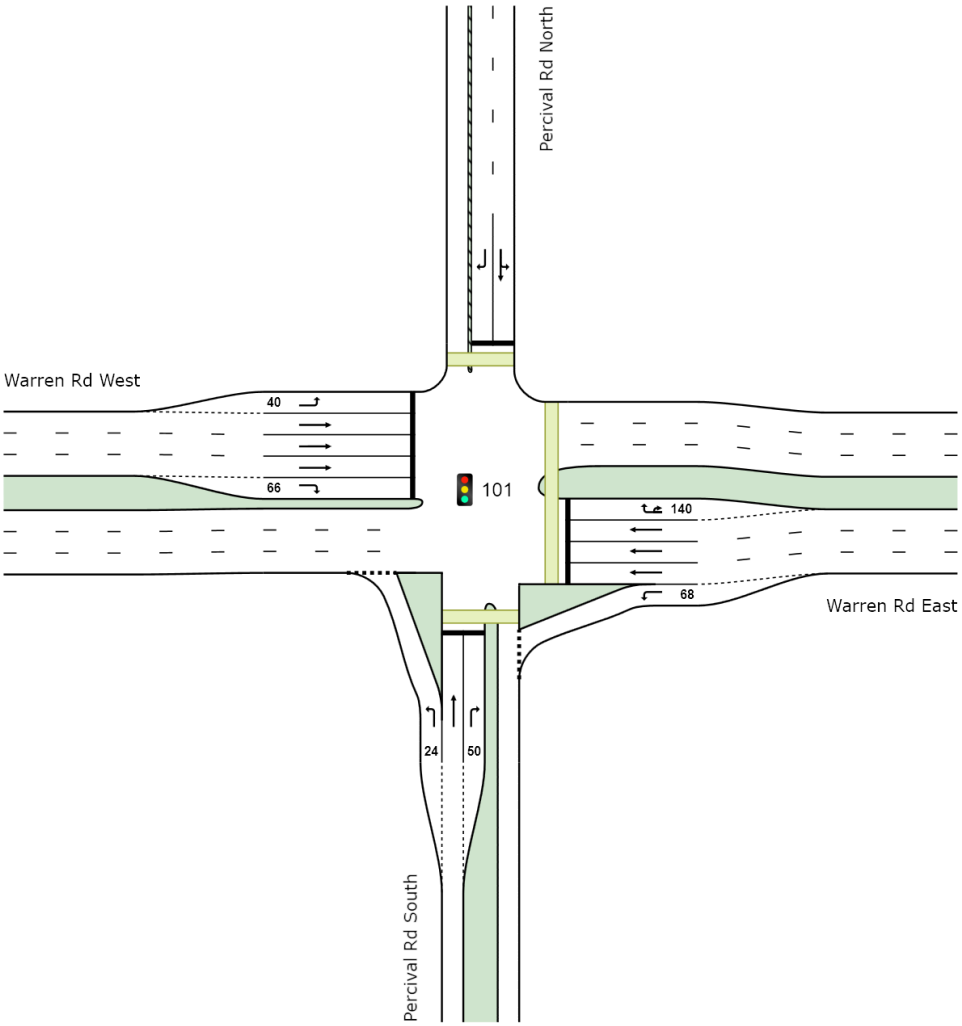
AM Peak

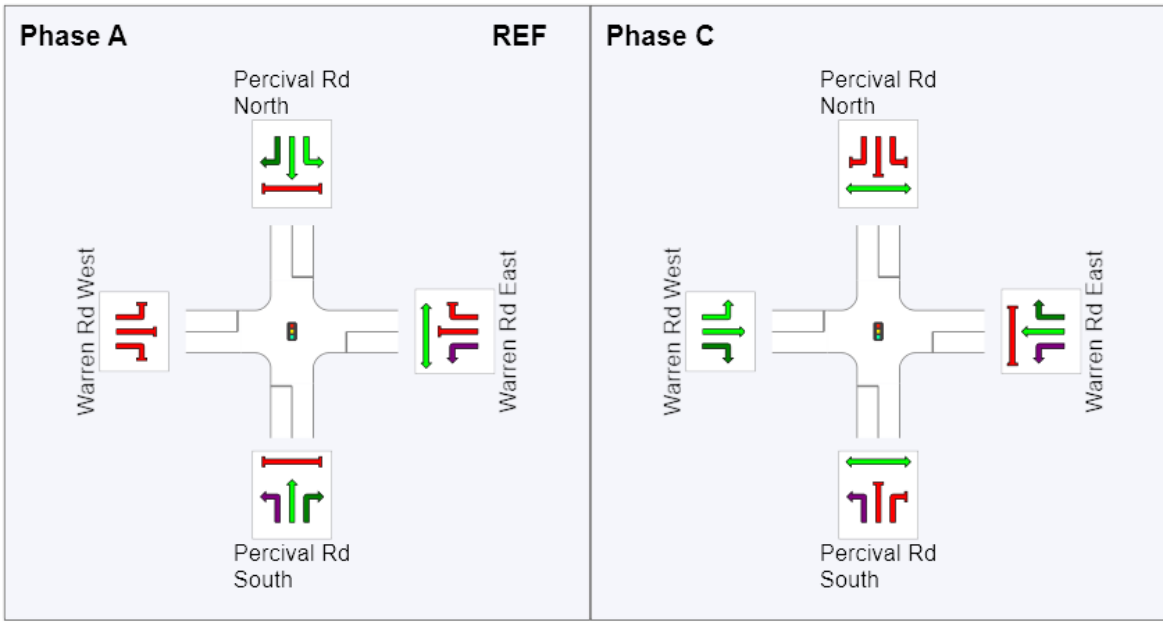


PM Peak

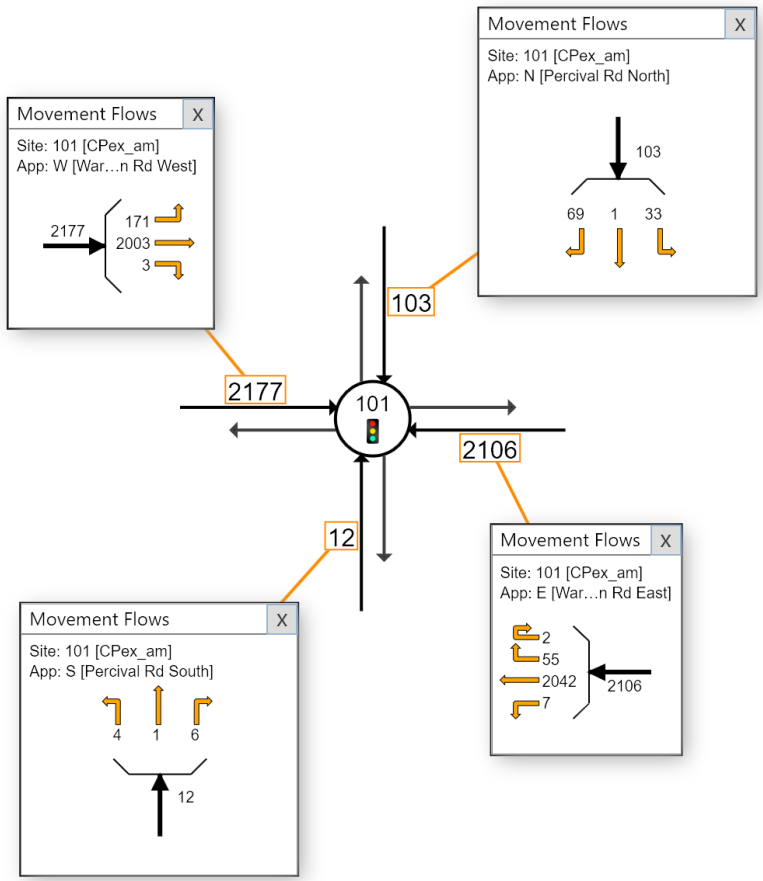


Warren Road/Percival Road

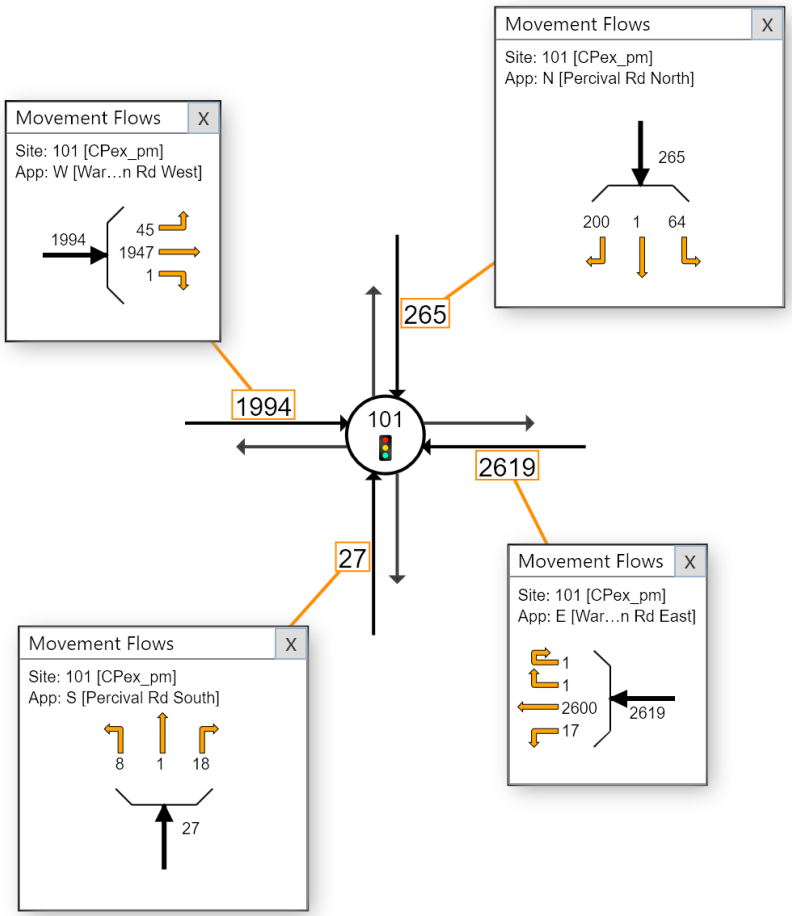



Phase A
REF
Percival Rd North
Warren Rd West
Warren Rd East
Percival Rd South
Phase C
Percival Rd North
Warren Rd West
Warren Rd East
Percival Rd South

AM Peak


Movement Flows
Site: 101 [CPex_am]
App: N [Percival Rd North]
103
69 1 33
Movement Flows
Site: 101 [CPex_am]
App: W [War…n Rd West]
2177
171
2003
3
103
2177
101
2106
12
Movement Flows
Site: 101 [CPex_am]
App: E [War…n Rd East]
2
55
2042
7
2106
Movement Flows
Site: 101 [CPex_am]
App: S [Percival Rd South]
4 1 6
12

PM Peak


Movement Flows
X
Site: 101 [CPex_pm]
App: W [War…n Rd West]
1994
45
1947
1
Movement Flows
X
Site: 101 [CPex_pm]
App: N [Percival Rd North]
265
200
1
64
1994
265
101
2619
27
Movement Flows
X
Site: 101 [CPex_pm]
App: E [War…n Rd East]
1
1
2600
17
2619
Movement Flows
X
Site: 101 [CPex_pm]
App: S [Percival Rd South]
8
1
18
27

ATTACHMENT C

INTERSECTION PEFORMANCE - EXISTING

Warren Road/Sturt Street

AM Peak

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	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
SouthEast: Sturt St South-East														
21	L2	260	78	274	30.0	0.578	18.4	LOS B	11.0	97.2	0.65	0.78	0.65	45.0
23	R2	146	73	154	50.0	*0.543	75.6	LOS E	5.4	54.0	0.99	0.78	0.99	26.1
Approach		406	151	427	37.2	0.578	39.0	LOS D	11.0	97.2	0.78	0.78	0.78	35.8
NorthEast: Betts Rd North-East														
24	L2	242	71	255	29.3	0.624	22.2	LOS C	28.3	225.1	0.64	0.71	0.64	46.0
25	T1	1809	145	1904	8.0	*0.624	17.8	LOS B	30.7	230.0	0.65	0.68	0.65	48.9
Approach		2051	216	2159	10.5	0.624	18.3	LOS B	30.7	230.0	0.65	0.68	0.65	48.5
SouthWest: Warren Rd South-West														
31	T1	1871	188	1969	10.0	0.441	5.2	LOS A	13.1	99.7	0.32	0.41	0.32	59.3
32	R2	238	54	251	22.7	*0.612	51.7	LOS D	11.8	98.3	0.95	0.97	0.95	32.0
Approach		2109	242	2220	11.5	0.612	10.5	LOS B	13.1	99.7	0.39	0.48	0.39	54.1
All Vehicles		4566	609	4806	13.3	0.624	16.5	LOS B	30.7	230.0	0.54	0.59	0.54	49.3

PM Peak

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	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
SouthEast: Sturt St South-East														
21	L2	288	45	303	15.6	0.579	25.6	LOS C	14.0	111.1	0.74	0.80	0.74	41.6
23	R2	246	32	259	13.0	*0.789	81.1	LOS F	9.7	75.3	1.00	0.88	1.19	25.4
Approach		534	77	562	14.4	0.789	51.2	LOS D	14.0	111.1	0.86	0.84	0.95	32.2
NorthEast: Betts Rd North-East														
24	L2	171	54	180	31.6	0.778	28.8	LOS C	43.5	333.2	0.81	0.80	0.81	43.1
25	T1	2300	123	2421	5.3	*0.778	23.9	LOS C	45.8	335.1	0.81	0.79	0.81	45.3
Approach		2471	177	2601	7.2	0.778	24.3	LOS C	45.8	335.1	0.81	0.79	0.81	45.1
SouthWest: Warren Rd South-West														
31	T1	1584	64	1667	4.0	0.356	4.6	LOS A	9.7	70.1	0.27	0.38	0.27	59.9
32	R2	320	38	337	11.9	*0.646	59.5	LOS E	15.2	117.4	0.95	0.99	0.95	30.1
Approach		1904	102	2004	5.4	0.646	13.8	LOS B	15.2	117.4	0.39	0.48	0.39	51.3
All Vehicles		4909	356	5167	7.3	0.789	23.1	LOS C	45.8	335.1	0.65	0.68	0.66	45.3

Warren Road/Percival Road

AM Peak

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	INPUT VOLUMES HV] veh/h	DEMAND FLOWS [Total veh/h	DEMAND FLOWS HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	95% BACK OF QUEUE Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Percival Rd South														
1	L2	4	3	4	75.0	0.027	7.6	LOS A	0.0	0.6	0.25	0.53	0.25	46.5
2	T1	1	0	1	0.0	0.005	60.6	LOS E	0.1	0.4	0.92	0.55	0.92	29.1
3	R2	6	5	6	83.3	0.064	71.1	LOS E	0.4	5.0	0.95	0.66	0.95	25.7
Approach		11	8	12	72.7	0.064	47.1	LOS D	0.4	5.0	0.69	0.60	0.69	31.1
East: Warren Rd East														
4	L2	7	4	7	57.1	0.007	5.3	LOS A	0.0	0.3	0.10	0.49	0.10	48.3
5	T1	1940	189	2042	9.7	0.456	5.1	LOS A	13.4	101.4	0.32	0.42	0.32	59.3
6	R2	52	16	55	30.8	*0.781	57.5	LOS E	4.3	37.4	0.70	0.99	1.17	28.8
6u	U	2	0	2	0.0	0.781	59.7	LOS E	4.3	37.4	0.70	0.99	1.17	29.1
Approach		2001	209	2106	10.4	0.781	6.5	LOS A	13.4	101.4	0.33	0.43	0.34	57.6
North: Percival Rd North														
7	L2	31	11	33	35.5	0.226	69.5	LOS E	2.2	19.9	0.96	0.73	0.96	26.2
8	T1	1	0	1	0.0	0.226	64.6	LOS E	2.2	19.9	0.96	0.73	0.96	27.2
9	R2	66	30	69	45.5	*0.505	72.2	LOS E	4.7	45.9	0.99	0.78	0.99	25.8
Approach		98	41	103	41.8	0.505	71.3	LOS E	4.7	45.9	0.98	0.76	0.98	25.9
West: Warren Rd West														
10	L2	162	27	171	16.7	0.126	7.5	LOS A	2.3	18.7	0.22	0.60	0.22	47.4
11	T1	1903	183	2003	9.6	0.458	5.1	LOS A	13.5	102.2	0.32	0.41	0.32	59.4
12	R2	3	2	3	66.7	0.051	12.5	LOS B	0.1	0.8	0.32	0.57	0.32	43.8
Approach		2068	212	2177	10.3	0.458	5.3	LOS A	13.5	102.2	0.31	0.43	0.31	58.2
All Vehicles		4178	470	4398	11.2	0.781	7.5	LOS A	13.5	102.2	0.34	0.44	0.34	56.2

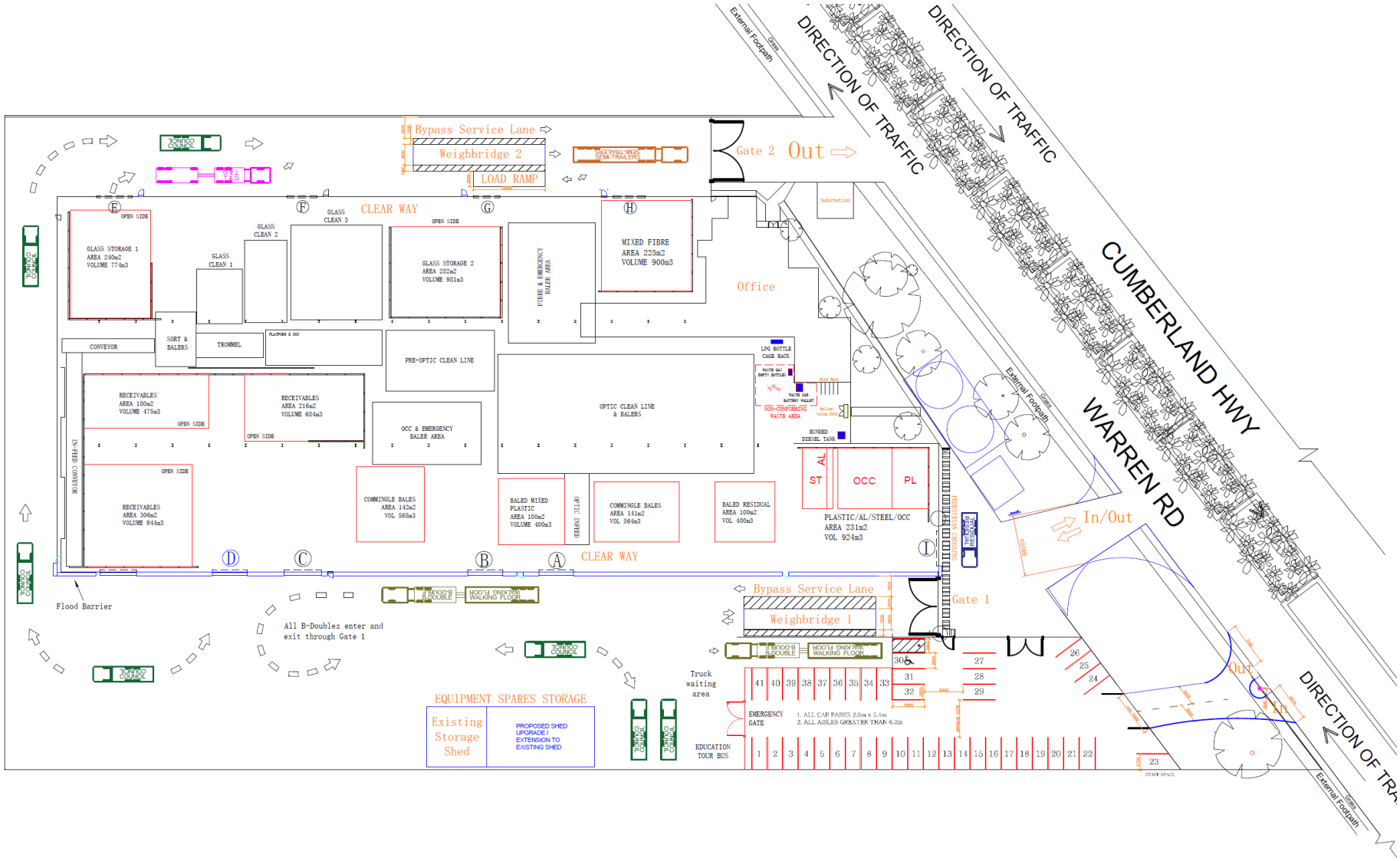
PM Peak

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	INPUT VOLUMES HV] veh/h	DEMAND FLOWS [Total veh/h	DEMAND FLOWS HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	95% BACK OF QUEUE Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Percival Rd South														
1	L2	8	3	8	37.5	0.046	15.1	LOS B	0.2	2.0	0.49	0.61	0.49	43.2
2	T1	1	0	1	0.0	0.003	48.5	LOS D	0.1	0.4	0.80	0.49	0.80	32.2
3	R2	17	1	18	5.9	0.070	58.8	LOS E	1.1	8.0	0.85	0.69	0.85	28.9
Approach		26	4	27	15.4	0.070	45.0	LOS D	1.1	8.0	0.74	0.66	0.74	32.3
East: Warren Rd East														
4	L2	16	1	17	6.3	0.011	4.8	LOS A	0.0	0.4	0.08	0.51	0.08	50.0
5	T1	2470	167	2600	6.8	*0.660	13.7	LOS B	34.2	253.0	0.60	0.63	0.60	52.1
6	R2	1	0	1	0.0	0.024	21.8	LOS C	0.1	0.5	0.47	0.65	0.47	41.4
6u	U	1	0	1	0.0	0.024	24.2	LOS C	0.1	0.5	0.47	0.65	0.47	41.2
Approach		2488	168	2619	6.8	0.660	13.7	LOS B	34.2	253.0	0.59	0.63	0.59	52.0
North: Percival Rd North														
7	L2	61	8	64	13.1	0.180	56.5	LOS E	3.9	30.3	0.86	0.74	0.86	29.1
8	T1	1	0	1	0.0	0.180	51.8	LOS D	3.9	30.3	0.86	0.74	0.86	30.0
9	R2	190	14	200	7.4	*0.648	63.3	LOS E	13.5	100.8	0.97	0.83	0.97	27.9
Approach		252	22	265	8.7	0.648	61.6	LOS E	13.5	100.8	0.94	0.81	0.94	28.1
West: Warren Rd West														
10	L2	43	19	45	44.2	0.045	11.9	LOS B	1.0	9.4	0.32	0.61	0.32	44.2
11	T1	1850	80	1947	4.3	0.494	11.4	LOS B	21.3	154.4	0.48	0.54	0.48	53.9
12	R2	1	0	1	0.0	0.016	30.5	LOS C	0.0	0.3	0.57	0.61	0.57	37.1
Approach		1894	99	1994	5.2	0.494	11.4	LOS B	21.3	154.4	0.48	0.54	0.48	53.6
All Vehicles		4660	293	4905	6.3	0.660	15.5	LOS B	34.2	253.0	0.57	0.60	0.57	50.1

ATTACHMENT D

LAYOUT OF THE PROPOSED DEVELOPMENT

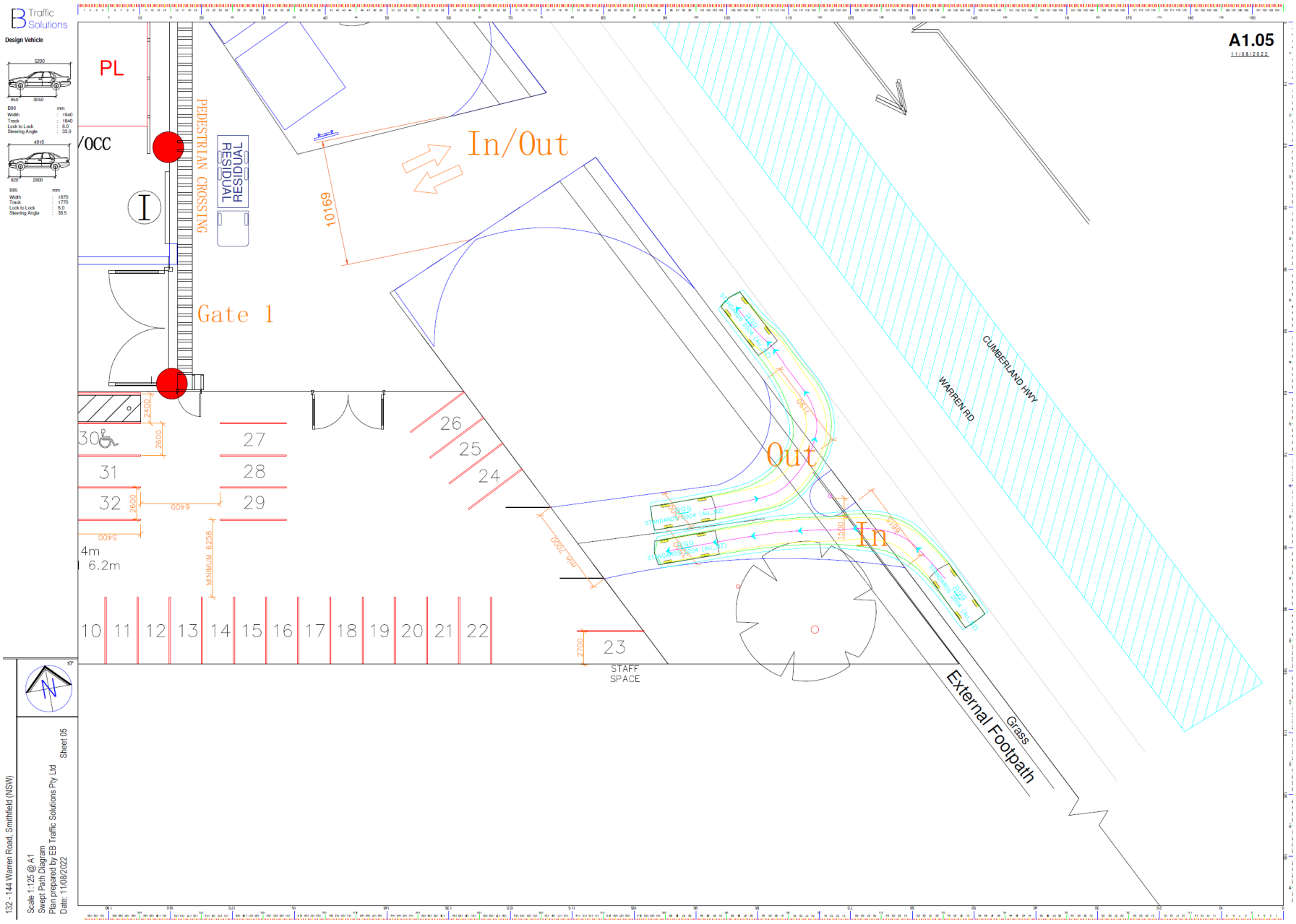


THIS SCALE IN METRES

0 5 10 20 50

ATTACHMENT E

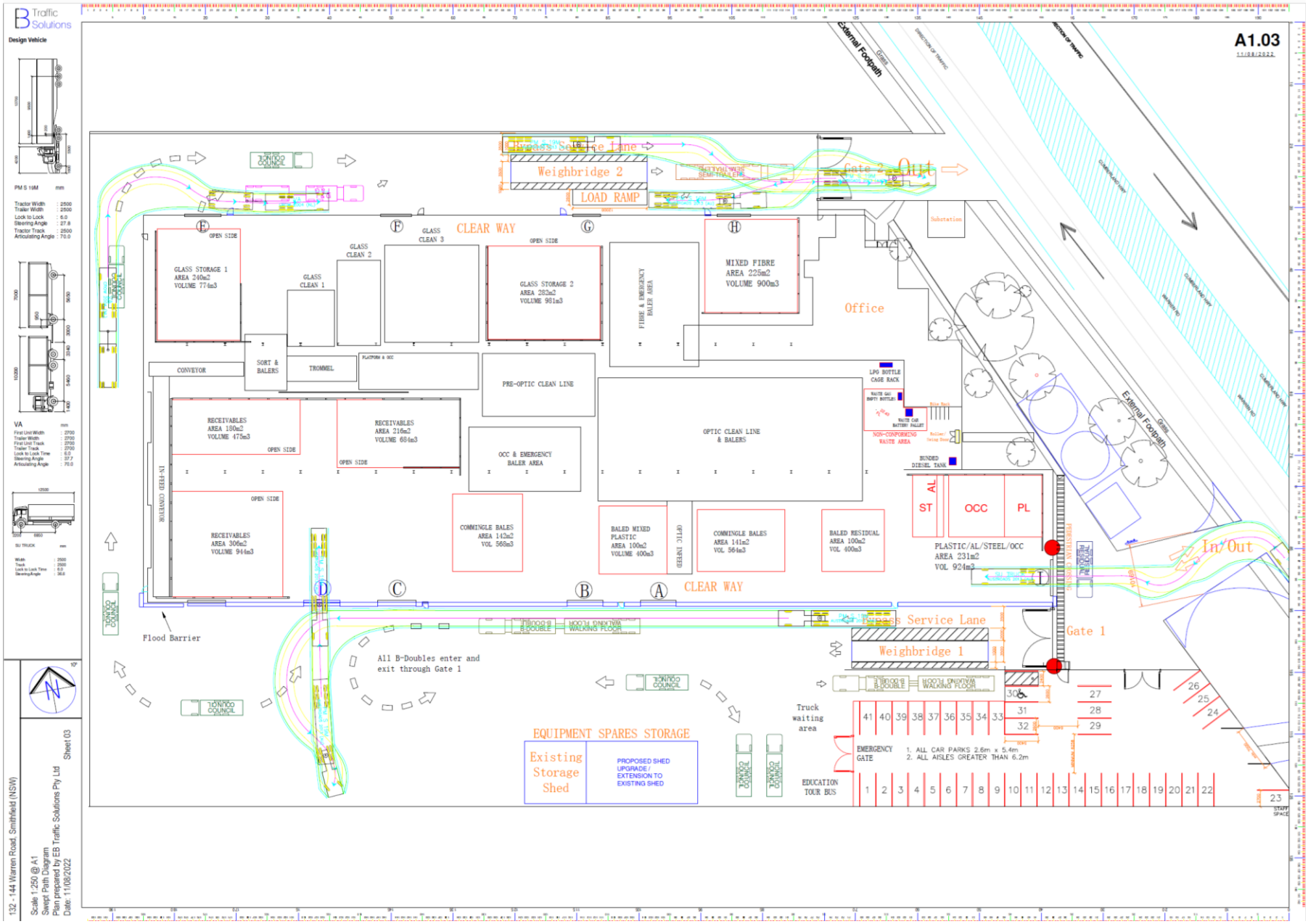
SWEPT PATH ANALYSIS (B85/B99 CARS)

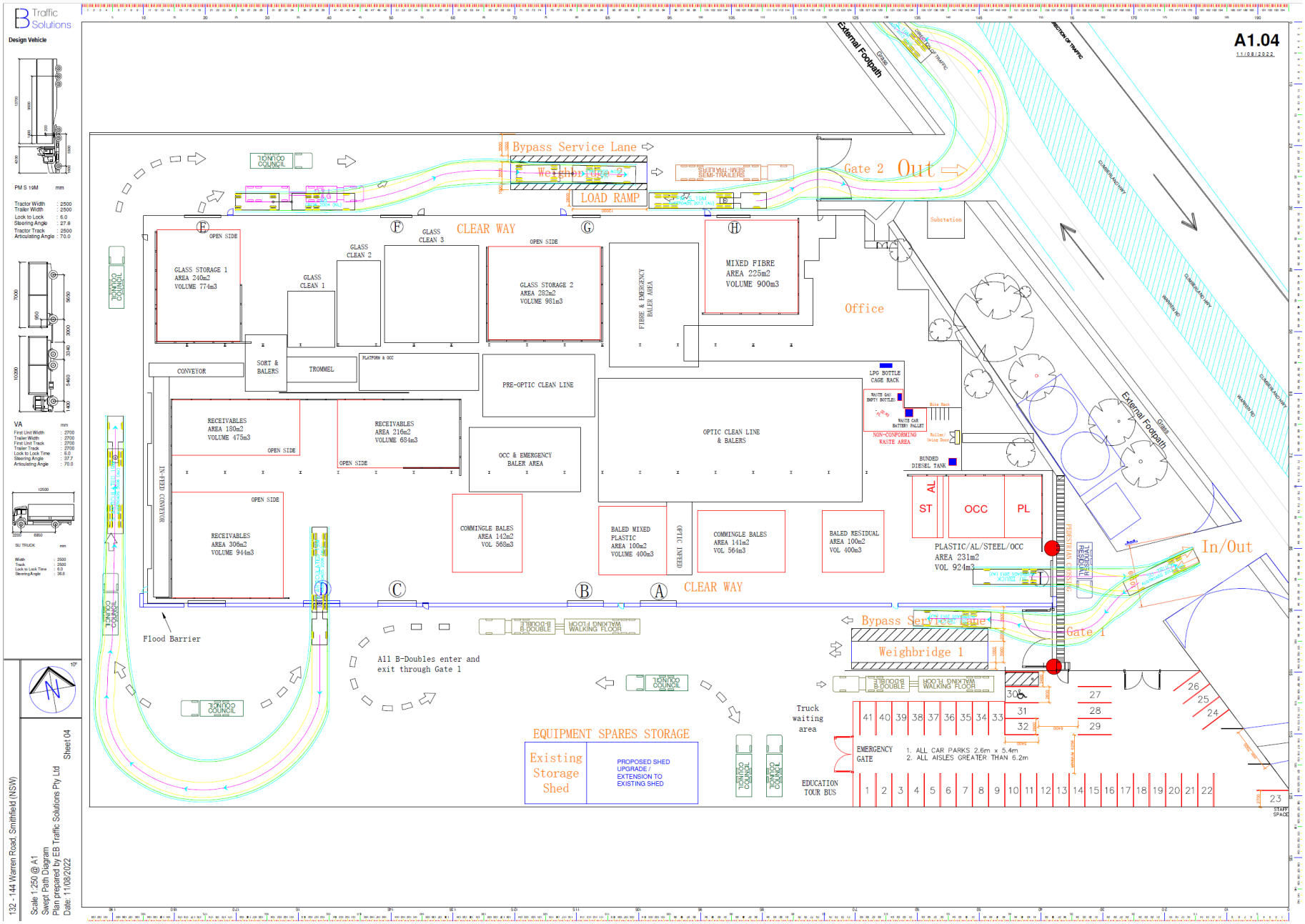

A1.05
11/08/2022
Design Vehicle
PL
/OCC
PEDESTRIAN CROSSING
RESIDUAL
RESIDUAL
In/Out
10169
Gate 1
CUMBERLAND HWY
WARREN RD
Out
In
26
25
24
27
28
29
30
31
32
2400
2600
6400
5400
4m
6.2m
MINIMUM 6258
10 11 12 13 14 15 16 17 18 19 20 21 22
23
STAFF SPACE
2700
7000
7190
1500
External Footpath
Grass
132 - 144 Warren Road, Smithfield (NSW)
Scale 1:125 @ A1
Swept Path Diagram
Plan prepared by EB Traffic Solutions Pty Ltd
Date: 11/08/2022
Sheet 05

ATTACHMENT F

SWEPT PATH ANALYSIS (12.5 m HRV AND 19 M SEMI TRAILER)

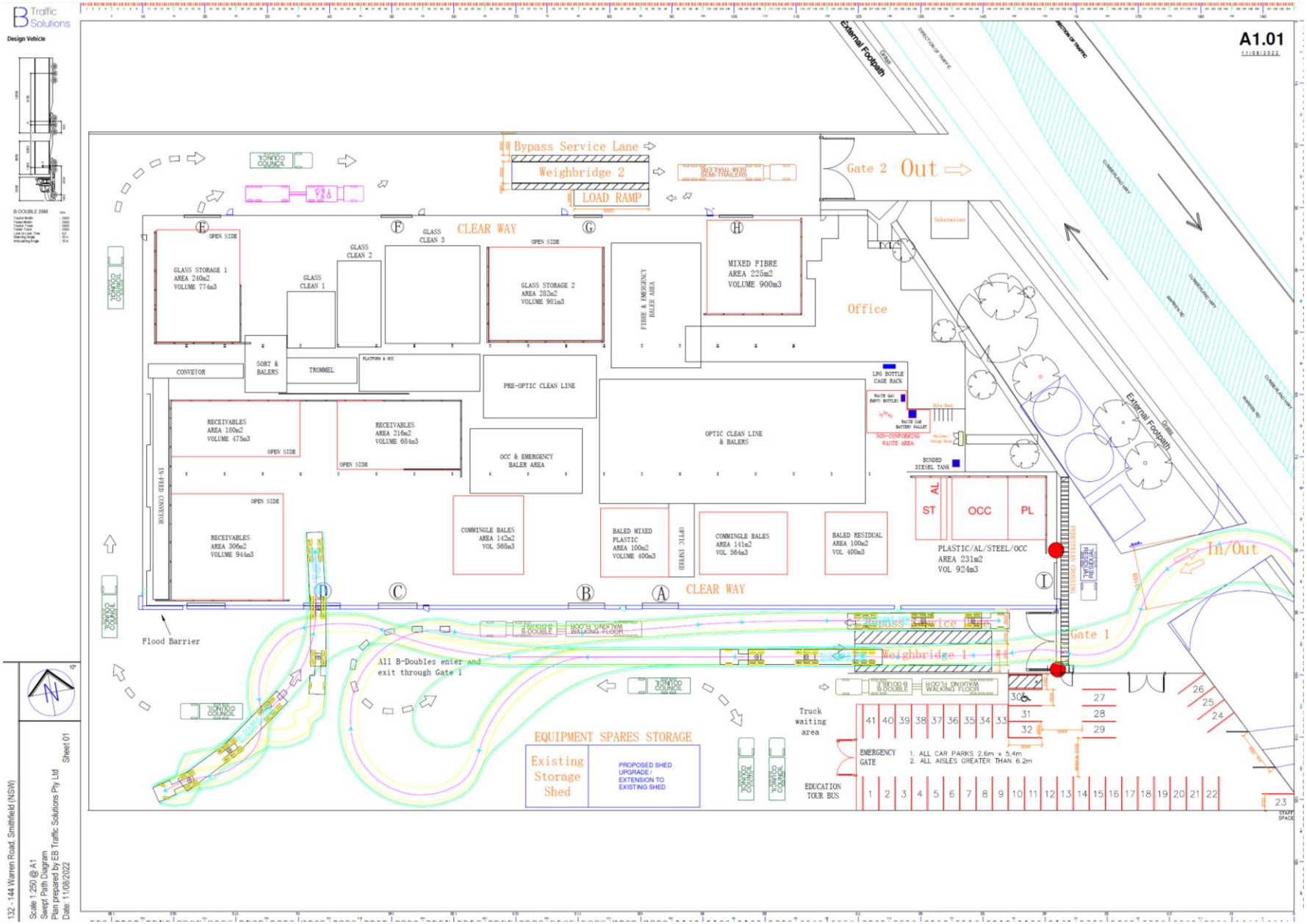
Traffic Solutions

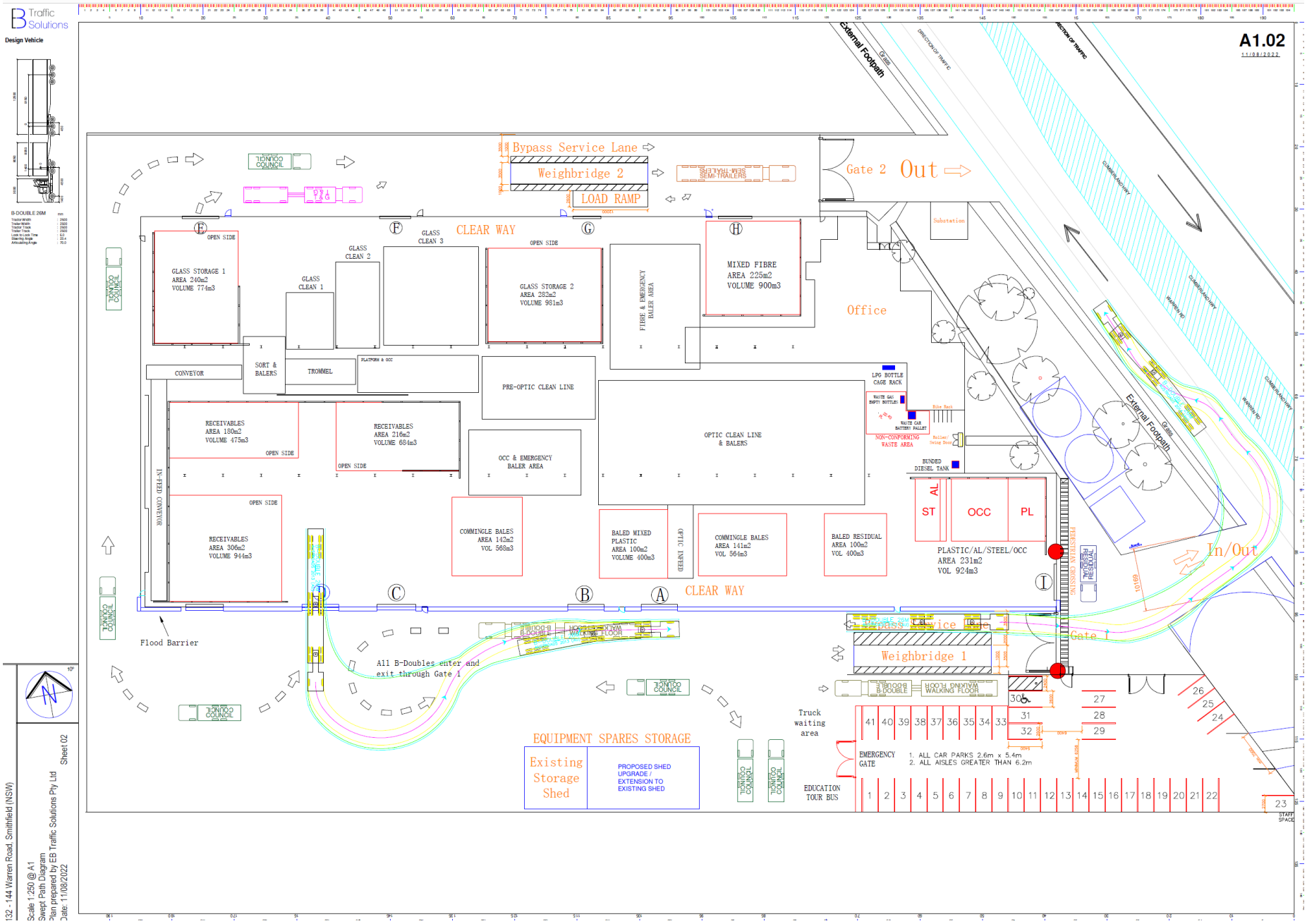



Traffic Solutions
Design Vehicle
PM S 19M
mm
Tractor Width : 2500
Trailer Width : 2500
Lock to Lock Time : 6.0
Steering Angle : 27.8
Tractor Track : 2500
Articulating Angle : 70.0
VA
mm
First Unit Width : 2700
Trailer Width : 2700
First Unit Track : 2700
Trailer Track : 2700
Lock to Lock Time : 6.0
Steering Angle : 37.7
Articulating Angle : 70.0
SU TRUCK
mm
Width : 2500
Track : 2500
Lock to Lock Time : 8.0
Steering Angle : 36.6
A1.04
11/08/2022
External Footpath
Bypass Service Lane
Weighbridge 2
LOAD RAMP
Gate 2 Out
CLEAR WAY
GLASS STORAGE 1
AREA 240m2
VOLUME 774m3
GLASS CLEAN 1
GLASS CLEAN 2
GLASS CLEAN 3
GLASS STORAGE 2
AREA 282m2
VOLUME 981m3
FIBRE & EMERGENCY BALER AREA
MIXED FIBRE
AREA 225m2
VOLUME 900m3
Office
Subtation
CONVEYOR
SORT & BALERS
TROMMEL
PLATFORM & OCC
PRE-OPTIC CLEAN LINE
OPTIC CLEAN LINE & BALERS
LPG BOTTLE CAGE RACK
WASTE GAS/ EMPTY BOTTLES
WASTE CAR BATTERY PALLET
NON-CONFORMING WASTE AREA
BUNDED DIESEL TANK
RECEIVABLES
AREA 180m2
VOLUME 475m3
RECEIVABLES
AREA 216m2
VOLUME 684m3
RECEIVABLES
AREA 306m2
VOLUME 944m3
OPEN SIDE
IN-FEED CONVEYOR
OCC & EMERGENCY BALER AREA
COMMINGLE BALES
AREA 142m2
VOL 568m3
BALED MIXED PLASTIC
AREA 100m2
VOLUME 400m3
OPTIC LINEED
COMMINGLE BALES
AREA 141m2
VOL 564m3
BALED RESIDUAL
AREA 100m2
VOL 400m3
ST
AL
OCC
PL
PLASTIC/AL/STEEL/OCC
AREA 231m2
VOL 924m3
In/Out
Flood Barrier
All B-Doubles enter and exit through Gate 1
Bypass Service Lane
Weighbridge 1
Gate 1
Truck waiting area
EQUIPMENT SPARES STORAGE
Existing Storage Shed
PROPOSED SHED UPGRADE / EXTENSION TO EXISTING SHED
EMERGENCY GATE
1. ALL CAR PARKS 2.6m x 5.4m
2. ALL AISLES GREATER THAN 6.2m
EDUCATION TOUR BUS
STAFF SPACE
132 - 144 Warren Road, Smithfield (NSW)
Scale 1:250 @ A1
Swept Path Diagram
Plan prepared by EB Traffic Solutions Pty Ltd
Date: 11/08/2022
Sheet 04

ATTACHMENT G

SWEPT PATH ANALYSIS (26 M B-DOUBLE)


A1.01
11/08/2022
Design Vehicle
B-DOUBLE 26M
Bypass Service Lane
Weighbridge 2
LOAD RAMP
Gate 2 Out
CLEAR WAY
GLASS STORAGE 1
AREA 240m2
VOLUME 774m3
GLASS CLEAN 1
GLASS CLEAN 2
GLASS CLEAN 3
GLASS STORAGE 2
AREA 282m2
VOLUME 981m3
FIBRE & EMERGENCY BALER AREA
MIXED FIBRE
AREA 225m2
VOLUME 900m3
Office
Substation
CONVEYOR
SORT & BALERS
TROMMEL
PRE-OPTIC CLEAN LINE
OPTIC CLEAN LINE & BALERS
RECEIVABLES
AREA 180m2
VOLUME 475m3
RECEIVABLES
AREA 216m2
VOLUME 684m3
RECEIVABLES
AREA 306m2
VOLUME 944m3
OCC & EMERGENCY BALER AREA
COMMINGLE BALES
AREA 142m2
VOL 568m3
BALED MIXED PLASTIC
AREA 100m2
VOLUME 400m3
COMMINGLE BALES
AREA 141m2
VOL 564m3
BALED RESIDUAL
AREA 100m2
VOL 400m3
LPG BOTTLE CAGE RACK
NON-CONFORMING WASTE AREA
BUNDED DIESEL TANK
AL
ST
OCC
PL
PLASTIC/AL/STEEL/OCC
AREA 231m2
VOL 924m3
External Footpath
In/Out
Gate 1
Weighbridge 1
Flood Barrier
All B-Doubles enter and exit through Gate 1
Truck waiting area
EQUIPMENT SPARES STORAGE
Existing Storage Shed
PROPOSED SHED UPGRADE / EXTENSION TO EXISTING SHED
EMERGENCY GATE
1. ALL CAR PARKS 2.6m x 5.4m
2. ALL AISLES GREATER THAN 6.2m
EDUCATION TOUR BUS
STAFF SPACE
132 - 144 Warren Road, Smithfield (NSW)
Scale 1:250 @ A1
Swept Path Diagram
Plan prepared by EB Traffic Solutions Pty Ltd
Date: 11/08/2022
Sheet 01


A1.02
11/08/2022
Design Vehicle
B-DOUBLE 26M
Bypass Service Lane
Weighbridge 2
LOAD RAMP
Gate 2 Out
External Footpath
CLEAR WAY
GLASS STORAGE 1
AREA 240m2
VOLUME 774m3
GLASS CLEAN 1
GLASS CLEAN 2
GLASS CLEAN 3
GLASS STORAGE 2
AREA 282m2
VOLUME 981m3
FIBRE & EMERGENCY BALER AREA
MIXED FIBRE
AREA 225m2
VOLUME 900m3
Office
Substation
CONVEYOR
SORT & BALERS
TROMMEL
PRE-OPTIC CLEAN LINE
OPTIC CLEAN LINE & BALERS
LPG BOTTLE CAGE RACK
WASTE GAS EMPTY BOTTLES
WASTE CAR BATTERY PALLET
NON-CONFORMING WASTE AREA
BUNDED DIESEL TANK
RECEIVABLES
AREA 180m2
VOLUME 475m3
RECEIVABLES
AREA 216m2
VOLUME 684m3
OCC & EMERGENCY BALER AREA
RECEIVABLES
AREA 306m2
VOLUME 944m3
COMMINGLE BALES
AREA 142m2
VOL 568m3
BALED MIXED PLASTIC
AREA 100m2
VOLUME 400m3
OPTIC UNFEED
COMMINGLE BALES
AREA 141m2
VOL 564m3
BALED RESIDUAL
AREA 100m2
VOL 400m3
ST
AL
OCC
PL
PLASTIC/AL/STEEL/OCC
AREA 231m2
VOL 924m3
In/Out
Flood Barrier
All B-Doubles enter and exit through Gate 1
Bypass Service
Gate 1
Weighbridge 1
Truck waiting area
EQUIPMENT SPARES STORAGE
Existing Storage Shed
PROPOSED SHED UPGRADE / EXTENSION TO EXISTING SHED
EMERGENCY GATE
1. ALL CAR PARKS 2.6m x 5.4m
2. ALL AISLES GREATER THAN 6.2m
EDUCATION TOUR BUS
STAFF SPACES
132 - 144 Warren Road, Smithfield (NSW)
Scale 1:250 @ A1
Swept Path Diagram
Plan prepared by EB Traffic Solutions Pty Ltd
Date: 11/08/2022
Sheet 02

ATTACHMENT H

ANTICIPATED TRAFFIC MOVEMENTS (LOADS)

Inbound Loads for 150,000 tpa						Outbound Loads for 150,000 tpa						
	Heavy Vehicles	Local commingle	Local commingled (Containers only)	Other customers	Total Entry/Exit Movements	Baled OCC plastics metals	Mixed paper to Visy or Export	Glass course	Glass fines	Waste out	Total Entry/Exit Movements	Total Truck Movements
5am	1	4			10						0	10
6am	1	4			10			1			2	12
7am	1	6			14	1					2	16
8am	1	4	1		12			1			2	14
9am	1	4			10	1	1		1		6	16
10am	1	4	1		12		1				2	14
11am	1	6			14	1	1				4	18
12pm	1	4	1		12		1	1			4	16
1pm	1	4			10	1	1				4	14
2pm	1	5	1		14		1				2	16
3pm	1	5			12	1				1	4	16
4pm	1		1		4			1			2	6
5pm	1				2					1	2	4
6pm				1	2			1			2	4
7pm	1				2		1				2	4
8pm				1	2		1				2	4
9pm	1				2		1				2	4
10pm				1	2						0	2
11pm					0						0	0
	15	50	5	3	146	5	9	5	1	2	44	190

ATTACHMENT J

INTERSECTION PEFORMANCE

FUTURE DEVELOPMENT

Warren Road/Sturt Street

AM Peak

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	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
SouthEast: Sturt St South-East														
21	L2	260	78	274	30.0	0.593	18.6	LOS B	11.2	98.6	0.66	0.78	0.66	44.9
23	R2	146	73	154	50.0	*0.581	77.1	LOS E	5.5	54.8	1.00	0.79	1.02	25.9
Approach		406	151	427	37.2	0.593	39.6	LOS D	11.2	98.6	0.78	0.78	0.79	35.5
NorthEast: Betts Rd North-East														
24	L2	242	71	255	29.3	0.624	21.7	LOS C	28.2	224.7	0.63	0.70	0.63	46.3
25	T1	1823	159	1919	8.7	*0.624	17.3	LOS B	30.6	229.9	0.65	0.67	0.65	49.2
Approach		2065	230	2174	11.1	0.624	17.8	LOS B	30.6	229.9	0.64	0.67	0.64	48.8
SouthWest: Warren Rd South-West														
31	T1	1871	188	1969	10.0	0.437	4.9	LOS A	12.6	96.0	0.30	0.40	0.30	59.6
32	R2	238	54	251	22.7	*0.613	51.6	LOS D	11.8	98.4	0.95	0.97	0.95	32.0
Approach		2109	242	2220	11.5	0.613	10.2	LOS B	12.6	98.4	0.38	0.47	0.38	54.3
All Vehicles		4580	623	4821	13.6	0.624	16.2	LOS B	30.6	229.9	0.53	0.59	0.53	49.5

PM Peak

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	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
SouthEast: Sturt St South-East														
21	L2	288	45	303	15.6	0.579	26.1	LOS C	14.1	112.1	0.75	0.81	0.75	41.4
23	R2	246	32	259	13.0	*0.789	81.1	LOS F	9.7	75.3	1.00	0.88	1.19	25.4
Approach		534	77	562	14.4	0.789	51.5	LOS D	14.1	112.1	0.86	0.84	0.95	32.1
NorthEast: Betts Rd North-East														
24	L2	171	54	180	31.6	0.780	28.9	LOS C	43.7	334.9	0.81	0.80	0.81	43.1
25	T1	2304	127	2425	5.5	*0.780	24.0	LOS C	45.9	336.8	0.82	0.80	0.82	45.3
Approach		2475	181	2605	7.3	0.780	24.3	LOS C	45.9	336.8	0.82	0.80	0.82	45.1
SouthWest: Warren Rd South-West														
31	T1	1584	64	1667	4.0	0.356	4.6	LOS A	9.7	70.1	0.27	0.38	0.27	59.9
32	R2	320	38	337	11.9	*0.646	59.8	LOS E	15.2	117.4	0.95	0.99	0.95	30.0
Approach		1904	102	2004	5.4	0.646	13.8	LOS B	15.2	117.4	0.39	0.48	0.39	51.3
All Vehicles		4913	360	5172	7.3	0.789	23.2	LOS C	45.9	336.8	0.66	0.68	0.66	45.2

Warren Road/Percival Road

AM Peak

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	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: Percival Rd South														
1	L2	4	3	4	75.0	0.027	7.6	LOS A	0.0	0.6	0.25	0.53	0.25	46.5
2	T1	1	0	1	0.0	0.005	60.6	LOS E	0.1	0.4	0.92	0.55	0.92	29.1
3	R2	6	5	6	83.3	0.064	71.1	LOS E	0.4	5.0	0.95	0.66	0.95	25.7
Approach		11	8	12	72.7	0.064	47.1	LOS D	0.4	5.0	0.69	0.60	0.69	31.1
East: Warren Rd East														
4	L2	7	4	7	57.1	0.007	5.3	LOS A	0.0	0.3	0.10	0.49	0.10	48.3
5	T1	1954	203	2057	10.4	0.461	5.2	LOS A	13.6	103.3	0.32	0.42	0.32	59.3
6	R2	52	16	55	30.8	*0.781	57.5	LOS E	4.3	37.4	0.70	0.99	1.17	28.8
6u	U	2	0	2	0.0	0.781	59.7	LOS E	4.3	37.4	0.70	0.99	1.17	29.1
Approach		2015	223	2121	11.1	0.781	6.6	LOS A	13.6	103.3	0.33	0.43	0.34	57.6
North: Percival Rd North														
7	L2	31	11	33	35.5	0.226	69.5	LOS E	2.2	19.9	0.96	0.73	0.96	26.2
8	T1	1	0	1	0.0	0.226	64.6	LOS E	2.2	19.9	0.96	0.73	0.96	27.2
9	R2	66	30	69	45.5	*0.505	72.2	LOS E	4.7	45.9	0.99	0.78	0.99	25.8
Approach		98	41	103	41.8	0.505	71.3	LOS E	4.7	45.9	0.98	0.76	0.98	25.9
West: Warren Rd West														
10	L2	162	27	171	16.7	0.126	7.5	LOS A	2.3	18.7	0.22	0.60	0.22	47.4
11	T1	1903	183	2003	9.6	0.458	5.1	LOS A	13.5	102.2	0.32	0.41	0.32	59.4
12	R2	3	2	3	66.7	0.051	12.5	LOS B	0.1	0.8	0.32	0.57	0.32	43.8
Approach		2068	212	2177	10.3	0.458	5.3	LOS A	13.5	102.2	0.31	0.43	0.31	58.2
All Vehicles		4192	484	4413	11.5	0.781	7.5	LOS A	13.6	103.3	0.34	0.44	0.34	56.2

PM Peak

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	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: Percival Rd South														
1	L2	8	3	8	37.5	0.046	15.1	LOS B	0.2	2.0	0.49	0.61	0.49	43.2
2	T1	1	0	1	0.0	0.003	48.5	LOS D	0.1	0.4	0.80	0.49	0.80	32.2
3	R2	17	1	18	5.9	0.070	58.8	LOS E	1.1	8.0	0.85	0.69	0.85	28.9
Approach		26	4	27	15.4	0.070	45.0	LOS D	1.1	8.0	0.74	0.66	0.74	32.3
East: Warren Rd East														
4	L2	16	1	17	6.3	0.011	4.8	LOS A	0.0	0.4	0.08	0.51	0.08	50.0
5	T1	2474	171	2604	6.9	*0.661	13.8	LOS B	34.3	254.3	0.60	0.63	0.60	52.0
6	R2	1	0	1	0.0	0.024	21.8	LOS C	0.1	0.5	0.47	0.65	0.47	41.4
6u	U	1	0	1	0.0	0.024	24.2	LOS C	0.1	0.5	0.47	0.65	0.47	41.2
Approach		2492	172	2623	6.9	0.661	13.7	LOS B	34.3	254.3	0.59	0.63	0.59	52.0
North: Percival Rd North														
7	L2	61	8	64	13.1	0.180	56.5	LOS E	3.9	30.3	0.86	0.74	0.86	29.1
8	T1	1	0	1	0.0	0.180	51.8	LOS D	3.9	30.3	0.86	0.74	0.86	30.0
9	R2	190	14	200	7.4	*0.648	63.3	LOS E	13.5	100.8	0.97	0.83	0.97	27.9
Approach		252	22	265	8.7	0.648	61.6	LOS E	13.5	100.8	0.94	0.81	0.94	28.1
West: Warren Rd West														
10	L2	43	19	45	44.2	0.045	11.9	LOS B	1.0	9.4	0.32	0.61	0.32	44.2
11	T1	1850	80	1947	4.3	0.494	11.4	LOS B	21.3	154.4	0.48	0.54	0.48	53.9
12	R2	1	0	1	0.0	0.016	30.5	LOS C	0.0	0.3	0.57	0.61	0.57	37.1
Approach		1894	99	1994	5.2	0.494	11.4	LOS B	21.3	154.4	0.48	0.54	0.48	53.6
All Vehicles		4664	297	4909	6.4	0.661	15.5	LOS B	34.3	254.3	0.57	0.60	0.57	50.1