Traffic Impact Assessment

Proposed Warehouse Facility Lot 3, Bungarribee Industrial Estate, Eastern Creek

Toll IPEC Freight Transport Facility

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1. Introduction

1.1 Introduction

TRAFFIX has been commissioned by Goodman Property Services (Aust) Pty Ltd to undertake a traffic impact assessment in support of a proposed Toll IPEC freight transport facility and associated warehouse development on Lot 1 and partial Lot 4 Bungarribee Industrial Estate, Eastern Creek. The development is located within the Blacktown Council LGA, however site specific design controls have been established as part of the precinct planning for the site and approved by the NSW Department of Planning.

This report documents the findings of our investigations and should be read in the context of the Statement of Environmental Effects (SEE) prepared separately. The development relates to an industrial floor area of 61,460m^2 which and 700 parking spaces located on 18Ha of site area and has been classed as a State Significant Development and will therefore be assessed by the Department of Planning and Infrastructure..

The report is structured as follows:

- Section 2: Describes the site and its location
- Section 3: Documents existing traffic conditions
- Section 4: Describes the proposed development
- Section 5: Assesses the parking requirements
- Section 6: Assesses traffic impacts
- Section 7: Discusses access and internal design aspects
- Section 8: Details the construction impacts and management
- Section 9: Provides a summary of the responses to the Director General's Requirements
- Section 10. Presents the overall study conclusions

1.2 Planning Context

The site lies within the Bungarribee Industrial Estate precinct which has been the subject of a number of previous assessments as a Part 3A development (MP 08_0225), including a subsequent application for the Metcash development (MP10_0140) to the south of the subject site. In this regard, reference should also be made to the following:

- *Huntingwood West Employment Lands Development Design Controls*, dated September 2006, by Architectus Sydney Pty Ltd
- *Huntingwood West Transport Management and Accessibility Plan* (TMAP), dated 15 September 2006, prepared by Maunsell AECOM
- *Bungarribee Industrial Estate Traffic Impact Assessment* (TIA), dated September 2010, prepared by GHD

The Design Controls and TMAP provide the guidelines for the overall precinct, with the proposed internal road geometry confirmed by the TIA report.

2. Location and Site

The overall site forms part of the Western Sydney Employment Hub. More specifically, the greater Bungarribee Industrial Estate lies to the south of the Great Western Highway and is bounded by Brabham Drive to the east, the M4 Motorway to the south and Eastern Creek to the west. It was historically used for agricultural purposes until the recent rezoning of the site for industrial purposes.

The proposed development forms the western edge of the overall Bungarribee lands and includes Lot 1 and part of the previous superlot 4, as referred to within the GHD report. The site has a total area of 180,000m^2 and is bounded by William Dean Street to the north, Huntingwood Drive and adjoining industrial estates to the east, and the Park Edge Road to the west.

A Location Plan is presented in **Figure 1**, with a Site Plan presented in **Figure 2**. Reference should also be made to the Photographic Record presented in **Appendix A**, which provides an appreciation of the general character of roads and other key attributes in proximity to the site.

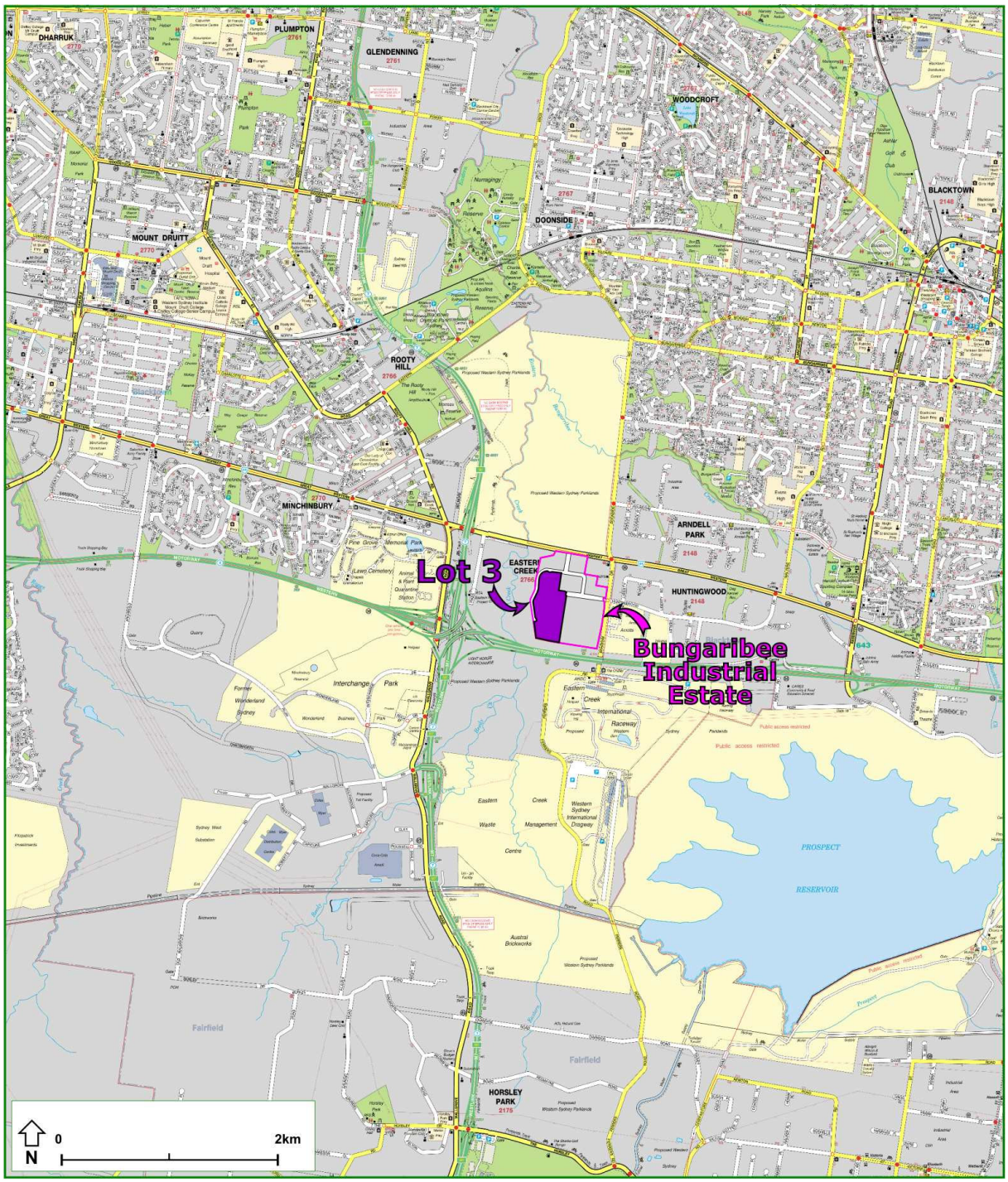


Figure 1: Location Plan

Figure 2: Site Plan

3. Existing Traffic Conditions

3.1 Road Network

The road hierarchy in the vicinity of the site is shown in **Figure 3** with the following roads of particular interest:

- M4 Motorway: forms the primary east-west arterial link between the Sydney CBD and the Western Suburbs. Access to the M4 is available from Wallgrove Road to the south of its intersection with the Great Western Highway.

- Great Western Highway: a Classified Road (MR 5) that runs in an east-west direction to the north of the site. It carries in the order of 30,500vpd in the vicinity of the site. The Great Western Highway forms a signalised intersection with Brabham Drive to the northeast of the site. A signalised intersection between the Bungarribee Industrial Estate and the Parklands redevelopment to the north is also proposed. An 80km/hr speed zoning applies to the Great Western Highway.

- Brabham Drive: a Regional Road (RR 7153) that runs in a north –south direction between the Great Western Highway and Ferrers Road. It carries approximately 18,000vpd, subject to a 60km/hr speed zoning.

- Huntingwood Drive: a local road that runs in an east-west direction to the south of the site. It forms a roundabout controlled intersection with Brabham Drive, at the eastern end of the Bungarribee Industrial Estate. Access to Lots 2A & 2B is proposed via Huntingwood Drive. The eastern approach of Huntingwood Drive is subject to a 60km/hr speed zoning, however a reduced speed of only 50km/hr is permitted within the Bungarribee Industrial Estate.

It can be seen from Figure 3 that the site is conveniently located with respect to the arterial and local road systems serving the region. It is therefore able to effectively distribute traffic onto the wider road network, minimising traffic impacts.

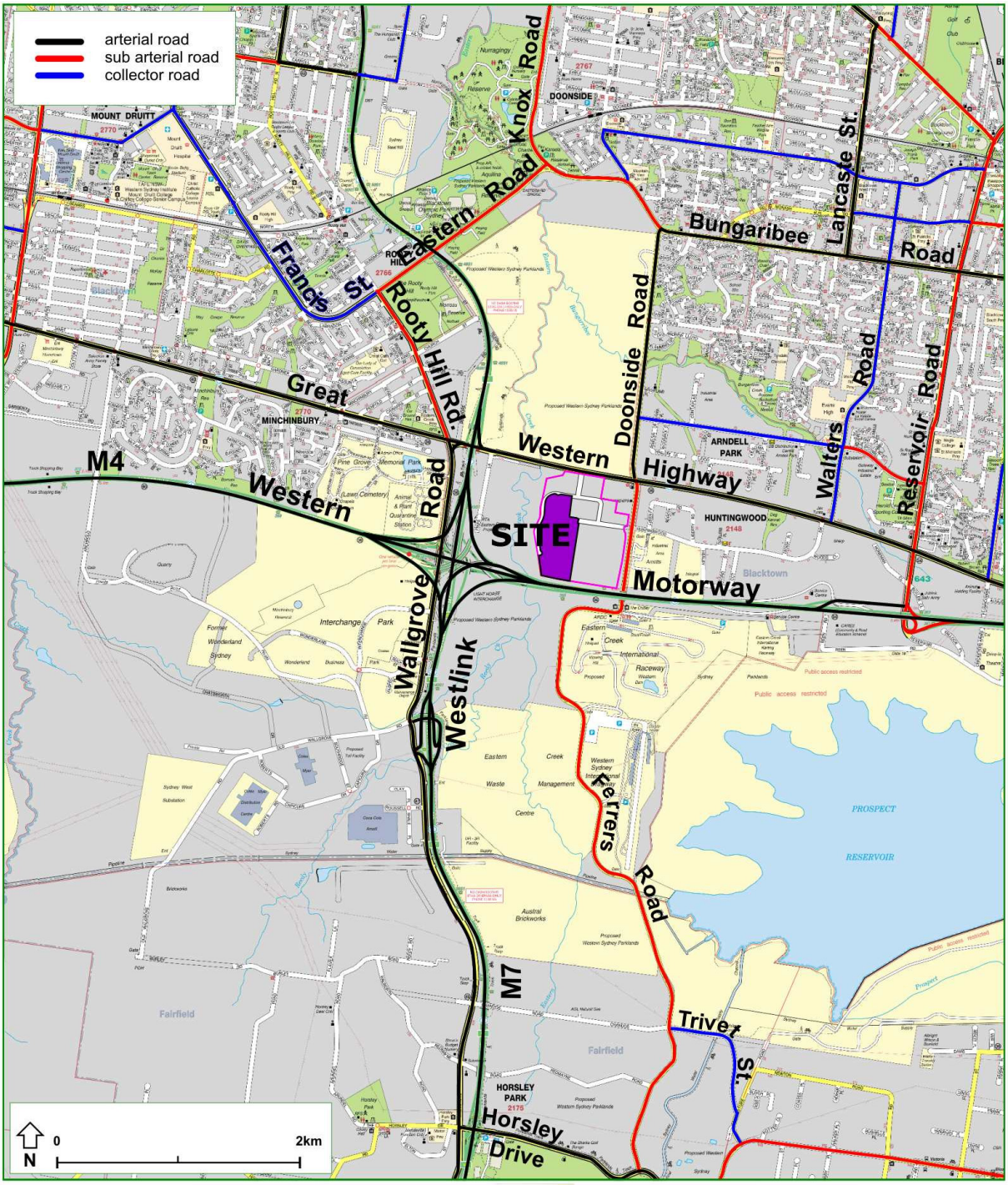


Figure 3: Road Hierarchy

3.2 Public Transport

The existing bus services that operate in the locality are shown in **Figure 4**. This includes Busways Route 724 (during peak hours only) that runs along Brabham Drive and Huntingwood Drive to the east of the site which provides limited bus access for future staff. However, alternative bus routes and increased frequencies may occur in the future as staff levels increase in the locality as a result of development within the Bungarribee Industrial Estate and other planned development. Indeed, the TMAP identifies potential for the redirection of the 724 service within the overall Estate in the future as demand increase. This will be subject to further consideration by the bus companies as development occurs.

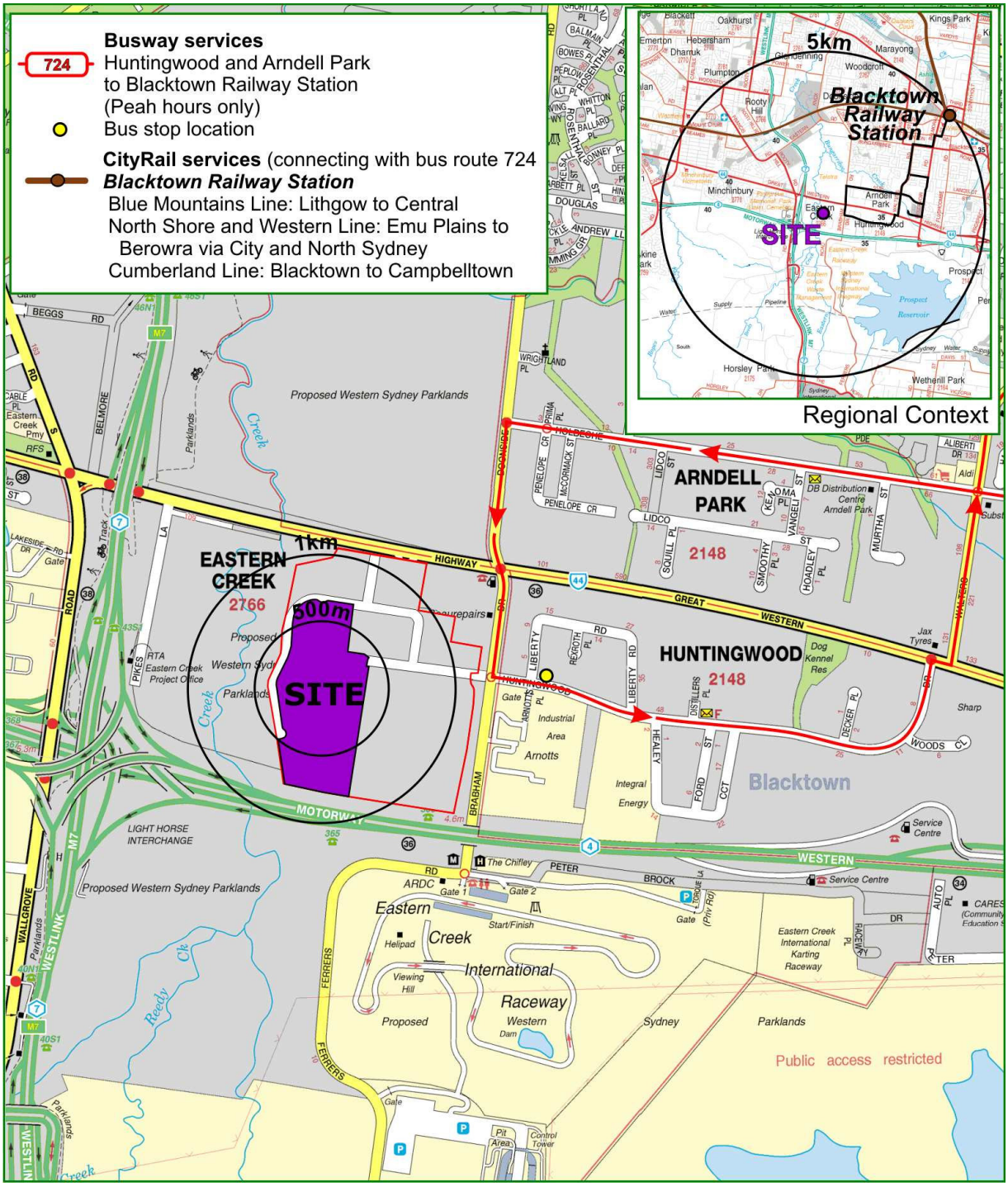


Figure 4: Public Transport Services

3.3 Existing Site Generation

The existing site that is the subject of this application is currently vacant and therefore generates minimal, if any, traffic volumes.

3.4 Existing Intersection Performances

For the purposes of the assessment base case traffic results from the GHD Traffic Impact Assessment Report and subsequent modelling undertaken for the design of the future intersection of GWH with the Huntingwood Access Road have been adopted. These results reflect the ultimate scenario assuming full development of the Bungarribee Estate.

The traffic modelling undertaken by GHD was undertaken using the SIDRA computer program to determine their performance characteristics under existing traffic conditions. The SIDRA model produces a range of outputs, the most useful of which are the Degree of Saturation (DOS) and Average Vehicle Delay per vehicle (AVD). The AVD is in turn related to a level of service (LOS) criteria. These performance measures can be interpreted using the following explanations:

DOS - the DOS is a measure of the operational performance of individual intersections. As both queue length and delay increase rapidly as DOS approaches 1, it is usual to attempt to keep DOS to less than 0.9. When DOS exceeds 0.9 residual queues can be anticipated, as occurs at many major intersections throughout the metropolitan area during peak periods. In this regard, a practical limit at 1.1 can be assumed. For intersections controlled by roundabout or give way/stop control, satisfactory intersection operation is generally indicated by a DOS of 0.8 or less.

AVD - the AVD for individual intersections provides a measure of the operational performance of an intersection. In general, levels of acceptability of AVD for individual intersections depend on the time of day (motorists generally accept higher delays during peak commuter periods) and the road system being modelled (motorists are more likely to accept longer delays on side streets than on the main road system).

LOS - this is a comparative measure which provides an indication of the operating performance of an intersection as shown below:

Level of Service	Average Delay per Vehicle (secs/veh)	Traffic Signals, Roundabout	Give Way and Stop Signs
A	less than 14	Good operation	Good operation
B	15 to 28	Good with acceptable delays and spare capacity	Acceptable delays and spare capacity
C	29 to 42	Satisfactory	Satisfactory but accident study required
D	43 to 56	Operating near capacity	Near capacity and accident study required
E	57 to 70	At capacity; at signals incidents will cause excessive delays. Roundabouts require other control mode	At capacity and requires other control mode
F	More than 70	Unsatisfactory and requires additional capacity.	Unsatisfactory and requires other control mode or major treatment.

A summary of the modelled results are provided below and are summarised below for the ultimate scenario in 2016 for the estate:

Table 1: Peak Hour Intersection Performance: Existing

Intersection Description	Control Type	Period	Degree of Saturation	Intersection Delay	Level of Service
GWH / Huntingwood Access Rd	Signals	AM	0.96	26.3	B
		PM	0.99	31.6	C
GWH / Brabham Dr	Signals	AM	0.997	74.8	F
		PM	1.005	77.4	F
Brabham Dr / Huntingwood Dr	Roundabout	AM	0.71	10.8	A
		PM	0.72	9.3	A
GWH / Huntingwood Dr	Signals	AM	0.72	9.9	A
		PM	0.80	26.9	B

It can be seen from Table 1 that the with the exception of the Great Western Highway with Brabham Drive the intersections above operate satisfactorily during both peak periods and with moderate delays. The intersection of the Huntingwood Access Road with the GWH is not constructed at this stage, however approval has been granted by the RMS. A copy of the approved intersection layout is included in **Appendix B**.

The signalised intersection of the Great Western Highway with Brabham Drive and Doonside Road currently fails under existing conditions with a LoS F during both peak periods. This is consistent with previous traffic modelling undertaken of this intersection and development within the Bungarribee Precinct is required to make contributions to the Roads & Maritime Services to facilitate future road widening of the Great Western Highway between Minchinbury and Huntingwood.

Nevertheless, it is stressed that the most relevant use of this analysis is to compare the relative change in the performance parameters as a result of the proposed development. This is discussed further in Section 6.

4. Description of Proposed Development

A detailed description of the proposed development is provided in the Statement of Environmental Effects prepared by Urbis. In summary, the development for which approval is now sought includes:

- Construction of a 47,000m^2 freight forwarding and distribution facility for the future operation of Toll IPEC.
- Construction of a 2 story office facility with a floor area of 3,380m^2
- Construction of a 1,200m^2 truck workshop and associated wash bays.
- Construction of 4 separate driveway crossings accessing 154 truck parking spaces and 700 staff and visitor spaces.
- Provision of 14 disabled parking spaces.
- Construction of 4 separate access locations including 2 truck accesses and 2 staff/visitor accesses.

The parking and traffic impacts arising from the development are discussed in Sections 5 and 6, respectively. Reference should be made to the plans submitted separately to Council which are presented at reduced scale in **Appendix C**.

5. Parking Requirements

5.1 Council Controls

The Blacktown Development Control Plan 2006 nominally requires car parking to be provided at the following rates, as demonstrated by Table 2, below.

Table 2: Council Parking Rates and Provision

Type	Area (m^2)	Council Parking Rates	Spaces Required
Warehouse (first 7,500m^2)	7,500	1 / 75m^2 GFA	100
Warehouse (remainder)	39,500	1 / 200m^2 GFA	197
Office*	4,480	1 / 40m^2 GFA	112
Workshop	1,200	1 / 40m^2 GFA	30
		Totals	439

Note - * Office includes Gatehouse's, customer pick up and staff/visitor entry

It can be seen that the Council's DCP would require the allocation of 439 spaces for the development. This compares to the Huntingwood West Employment Lands Development Design Controls, prepared by Architectus for the overall Bungarribee Industrial Estate, which requires parking in accordance with Table 3, below.

Table 3: Concept Plan Design Controls Parking Requirements

Type	Area (m^2)	Council Parking Rates	Spaces Required
Warehouse (remainder)	47,000	1 / 200m^2 GFA	235
Office*	4,480	1 / 40m^2 GFA	112
Workshop	1,200	1 / 40m^2 GFA	30
		Totals	377

It is evident that the development would require between 377 and 439 spaces based on application of the Bungarribee Precinct Controls and Council's DCP. However the development, which will operate as a freight transport, warehouse and distribution facility for Toll IPEC, is considered not to be correctly represented by either Council's DCP or the Huntingwood West Employment Lands Development Design Controls which provides rates for warehousing, factories and office land uses only.

In this regard, the Toll IPEC facility is a specific use which combines activities normally associated with warehouses but in the context of a high rate of container delivery and parcel distribution. Accordingly parking for the development has been provided in accordance with the likely future operational requirements. This method of assessment is consistent with the objectives of the Huntingwood West Employment Lands Development Design Controls and in particular Section 4.6.5 which requires states that

a) adequate provision be made on each development site in relation to parking, and

b) The approval authority may consider a variation to the parking rate for developments if the applicant can justify the variation with a traffic study on the basis of the type of use, type of employment and number of employees.

In this regard, information provided by the client (Toll IPEC) indicates that the development will employee a total of 550 full time staff comprising 400 warehouse/delivery drivers and 150 full time office personnel as well as part time staff. Based on this known operational requirement it is proposed that a total of 700 parking spaces be provided. The provision of this level of parking is considered necessary by Toll for the following reasons:

- The parking supply will ensure that the operational requirements are accommodated on-site at all times with no reliance on on-street parking at any time including during critical periods such as shift change over where parking for up to 500 employees may be required (including office staff, warehouse staff, part time staff and truck drivers).

- In addition to employee parking, the facility also needs to make separate provision for visitor parking requirements. An allowance for 40 visitor's spaces has been made to accommodate this demand, which relates to the fact that the site performs a head office function and accommodates numerous occasional functions such as training. While these are not daily activities (and therefore do not reflect on traffic conditions at the 'design' level) they nevertheless need to be accommodated.

- The development will operate on a 24hour basis. Accordingly, during evening shifts employees are unlikely to be able to rely on public transport due to the relatively isolated location of the development with respect to the major public transport network.

- The provision of 700 spaces will ensure that sufficient parking is available to allow for employee growth (from 500 spaces initially) without impacting on-street parking availability or relying on parking within the adjacent lands (including the Western Sydney Parklands). This is particularly relevant considering the long term occupation of the development by the future tenant anticipated at in excess of 15 years, and

- The provision will ensure that the parking demands of part time warehouse staff and delivery drivers is also met during periods of high operational demand (for example Christmas).

The quantum of parking proposed is therefore of a level which provides sufficient on-site parking to accommodate the known operational requirements of the development as well as providing sufficient allowances to accommodate future employee growth. This flexibility to meet the ongoing needs of Toll is considered to be a sound planning approach.

The provision is also consistent with the objectives of the Bungarribee Precinct Pan controls which are particularly relevant considering that the nature of the development as a freight transport and distribution facility is not specifically considered under the plan.

5.2 Disabled Parking

The Disability (Access to Premises – Buildings) 2010 requires accessible car parking spaces be provided at a rate of 1 space per 100 car parking spaces or part thereof for Class 5 & 7 buildings. As such, the proposed development is nominally required to provide 7 accessible parking spaces for the proposed development.

In response the development proposes the provision of 14 spaces which meets this requirement.

5.3 Bicycle Facilities

The approved Huntingwood West Employment Lands Development Design Controls require a dedicated area to be provided for bicycle parking within the car park. The NSW Planning Guidelines

for Walking and Cycling suggests the following bicycle parking provision rates for commercial and industrial developments:

- 3-5% of staff for long term use, plus
- 5-10% of staff for short term visitor use.

With approximately 550 employees it is therefore recommended that approximately 44 spaces be provided. This represents the minimum suggested provision of the NSW Planning Guidelines for Walking and Cycling which is considered reasonable due to the isolated nature of the development with respect to major residential areas.

6. Traffic Impacts

6.1 Trip Generation

6.1.1 Bungarribee Estate Traffic Volumes

The Traffic Impact Assessment report undertaken by GHD for the Bungarribee Industrial Estate, adopts an overall precinct generation of 813 veh/hr during the AM and PM peak periods. This generation was established through the application of the Roads and Maritime Services (RMS) rate of 15 trips per developable hectare adopted for the assessment of the Huntingwood Industrial Estate and other major industrial subdivisions within the locality including the SEPP 59 Lands located to the south west of the site.

Application of this rate to the current proposal which includes a total site area of 18 Ha results in a generation of 270 veh/hr during peak periods. This generation is implicit in the assessment of the precinct including the analysis that was adopted for the design of the approved new intersection of the Great Western Highway with the Huntingwood Access Road/Parklands Access Road.

6.1.2 RMS Guide Traffic Volumes

The Roads and Maritime Services *Guide to Traffic Generating Developments* recommends a traffic generation rate of 0.5 peak hour vehicle trips per 100m^2 GFA for warehouse developments and 2.0 peak hour vehicle trips per 100m^2 of GFA for office components.

Application of these rates to the subject development, with a total warehouse floor area of 47,000m^2 and office component of 4,480m^2 results in a total of 325 vehicles per hour during the morning and afternoon peak periods.

6.1.3 Operational Traffic Assessment

An assessment of the future site traffic generation has also been undertaken based on the expected operational characteristics of the development including both staff and heavy vehicle movements. Based on the information provided by Toll IPEC it is estimated that the development will generate a total of 370 vehicles per hour, based on the following assumptions:

- Staff

Warehouse staff will generally be deployed over three 8 hour shifts including

- 4.00am to 12.00noon (135 staff)
- 9.00am to 5.00pm (135 staff)
- 2.00pm to 10.00pm (135 staff)

It is anticipated that staff will be equally distributed across all shifts which equates to approximately 135 vehicle movements per hour during the critical on street peak periods (8.00-9.00am and 5.00-6.00pm).

Office staff will be contracted on standard 9.00-5.00pm shifts and will generally arrive and depart between 7.00-9.00am and 5.00-7.00pm respectively. The development will employee a total of 150 full time office personnel which results in approximately 75 vehicle movements per hour during peak periods.

- Heavy Vehicles

The development which will operate as a freight transport and distribution facility is expected to generate a relatively high number of heavy vehicle movements per day compared to other industrial facilities such as factories or 'standard' warehousing. Vehicle movements for distribution facilities are dependent on customer demands and store locations and as such are difficult to predict. However for the purpose of assessment the following daily movements (in and out of the site) have been assumed based on information provided by Toll:

- 310 linehaul vehicles movements (maximum 30veh/hr)
- 800 pickup and delivery vehicle movements (maximum 80veh/hr)
- 300 articulated vehicle movements (maximum 30veh/hr)
- 180 Heavy Rigid Vehicle (MRV) movements (maximum 18veh/hr)

The above results in approximately 1,600 heavy vehicle movements per day. The facility will operate 24 hours per day, with up to 10% of these trips occurring in the morning and afternoon peak periods. Accordingly a generation of 160 veh/hr during peak periods has been adopted.

- Total Generation

The total generation of the development during the critical AM (7.00-9.00am) and PM (5.00-7.00pm) peak periods is summarised below:

- Office Staff: 75 veh/hr
- Warehouse Staff: 135 veh/hr
- Heavy Vehicles: 160 veh/hr

This results in an overall generate of 370 veh/hr during peak periods which assumes no public transport or ride sharing by employees and therefore represents a worst case assessment. The distribution of traffic to the site is expected as follows:

- AM Peak (7.00-9.00): 290 in and 80 out
- PM Peak (7.00-9.00): 80 in and 290 out

6.1.4 Summary

The future generation of the site is likely to be between 325veh/hr (RMS rate) and 370veh/hr (assumed operational rates) during the critical AM and PM peak periods. For the purpose of assessment the rate of 370 veh/hr has been adopted which represents a worst case assumption with no reliance on public transport or alternative transport modes.

6.2 Traffic Impacts

The Bungarribee Industrial Estate adopted a rate of 15 trips per hectare for the overall precinct which results in a precinct generation of 813 veh/hr and an implicit site generation of 270 veh/hr (18Ha x 15 trips per Ha). The proposed development is expected to generate in the order of 370 veh/hr as established above which is 100veh/hr over and above that considered under the initial assessment undertaken by GHD for this site.

The rate of 15 trips per hectare adopted for the assessment of the overall precinct is however an average rate and therefore some variation across development sites are expected. Surveys of the

completed Metcash facility were undertaken for the purpose of comparison with the adopted rate used for the assessment of the precinct. The surveys recorded the following peak hour generation rates:

- AM (7.15am-8.15am): 253 veh/hr (200 in and 53 out)
- PM (3.30pm-4.30pm): 171 veh/hr (50 in and 121 out)

With a total site area of 18.79 Ha the recorded generation equates to the following generation rates per hectare of:

- AM: 13.4 trips per Ha
- PM: 9.1 trips per Ha

The generation per hectare of Metcash demonstrates a considerable variation in the assumed and actual generation for sites within the estate. The cumulative generation of the Metcash and Toll facilities is provided in **Table 4** below and compares the precinct plan generation and surveyed/assumed future generation of the site as a result of this application:

Table 4: Traffic Generation Comparison: Precinct Plan vs Surveyed/Estimated

Site	Precinct Plan Generation veh/hr (am/pm)	Surveyed/Estimated Generation veh/hr (am/pm)	Difference veh/hr (am / pm)
Metcash (18.8 Ha)	282 / 282	253 / 171	-29 / -111
Toll IPEC (18.0 Ha)	270 / 270	370 /370	+100 / +100
Total (36.8 Ha)	552 / 552	623 / 541	+71 / -11

It is evident that even under the worst case assessment (assuming no public transport) that the combined generation of the Toll and Metcash facility (623 veh/hr and 541 veh/hr in the AM and PM peaks respectively) will only result in an additional 71 vehicles per hour in the AM (57 in and 14 out), with 11 vehicles per hour less in the PM peak than that adopted in the GHD assessment.

The impacts of the additional trips has been assessed as a net increase over and above that adopted in the GHD traffic Impact Assessment for the 2016 road network during the critical AM peak period. The assessment adopts the same distribution of traffic as documented in the GHD Traffic Impact

assessment and results in the following critical future intersection performances under the 2016 scenarios.

Table 5: Peak Hour Intersection Performance: AM Peak

Intersection Description	Scenario	Degree of Saturation	Intersection Delay	Level of Service
GWH / Huntingwood Access Rd	Precinct Plan Generation	0.96	26.3	B
	Revised Generation	0.97	27.1	B
Brabham Dr / Huntingwood Dr	Precinct Plan Generation	0.156	17.2	B
	Revised Generation	0.402	17.9	B

Table 5 demonstrates that the Level of Service and delays as a result of the additional 71 veh/hr over and above that assumed for the estate will have a negligible impact on the operation of critical intersections in the locality even under a worst case assessment. A summary of the results is provided in **Appendix D**. It is noted that no changes to other intersections in the locality were recorded and all other intersections in the locality will continue to operate as documented in Section 3 above.

In the event that the subject development operated with traffic generation rates in accordance with those of the Metcash facility or as predicted under the RMS guidelines, this would result in improved operation of critical intersections from that assessed by GHD or as assessed in Table 5 above.

Accordingly the traffic impacts resulting from the proposed development are considered supportable and will result in no change in the operation of critical intersections from that previously approved.

It is noted that this traffic report has been prepared based on known traffic and parcel volumes at the date of submission. The facility has been designed to accommodate traffic and parcel growth over the next 20+ years which will be accommodated within the current facility and conveyor design with a modest expansion to the warehouse. The inherent further capacity available within the facility could result in incremental traffic volumes to those forecasted in this report, dependent on the mode and or size of line haul and delivery fleets adopted at this time.

6.3 Non Car Travel Modes

As documented in the GHD Traffic Impact Assessment a Work Place Travel Plan (WPTP) will be produced with an aim of achieving 10% reduction in car trips to/from the Bungarribee Estate once fully constructed. This reduction is to be achieved through the integration of the site with the proposed footpath and cycle networks as well as the provision of new bus stops and the deviation of bus service to within the estate.

This application includes the provision of bicycle parking facilities as well as change room facilities to encourage the use of alternative travel modes. It is envisaged that the provision of the WPTP will be made a condition of consent and that the WPTP will include information such as:

- Local bus network maps and timetables.
- Rail network maps and timetables.
- Cycle route maps.
- Taxi contact numbers.

By providing this information to employees and ensuring that they are aware of the public transport options and frequencies available to them as well as the location of relevant services, a reduction in car oriented trips to/from the site would be expected.

7. Access Internal Design Aspects

7.1 Car and Visitor Access

The development proposes the provision of 2 access driveways to the visitor and staff car park via the existing Park Edge Road. Under AS2890.1 the development would be considered a Class1A facility which, with 700 spaces and two driveways, would require a Category 3 access being a separate 6.0 metre entry and 4.0-6.0 metre exit.

In response the development proposes compliance with a Category 2 access being a 7.0m wide combined entry exit driveway which represents a minor variation to the requirements under AS2890.1.

This is however considered supportable in the circumstances having regard for the character of the Park Edge Road which predominantly accommodates traffic associated with the development, with only minor background traffic volumes associated with the parklands. As such, strict compliance with AS2890.1 would result in a considerable overdesign of the site accesses. Indeed it is also noted that AS2890.1 accepts that the requirements set out in Table 3.1 do not necessarily apply to all development types and that consideration of critical factors such as the frontage road type and access movements into and out of the access driveway should be taken into account.

A swept path analysis is provided in **Appendix E** which demonstrates satisfactory entry and exit movements to the site and accordingly compliance with the intent of the standard. As such the proposed access arrangements are considered supportable on traffic planning grounds.

The Park Edge Road which is constructed with a 6.5m wide carriageway can accommodate up to 3,000 vehicle movements per day under AMCORD guidelines. As documented in Section 6.1 above the traffic generation associated with staff and visitors is expected to be less than 1,000 vehicle movements per day and as such the Park Edge Road is considered suitable to accommodate the future traffic volumes associated with the site.

7.2 Service Vehicle Access

The application proposes two service vehicle accesses to the site. A single entry only access is located on the eastern site boundary and this will accommodate all Pick-up and Delivery Vehicles

(PUD's) which includes rigid vehicles up to and including 8.8 metre MRV's. The access is designed with a 9.0m wide entry and allows for approximately 180 metres of internal queuing space on-site to ensure that all queuing occurs on-site.

A second heavy vehicle access is provided on the northern site boundary to William Dean Street and will accommodate all entry movements by articulated vehicles (including B-Doubles) and all heavy vehicle exit movements associated with the development. The entry is constructed with an approximate width of 14m and accommodates two entry lanes with sufficient internal queuing capacity to accommodate up to 4 B-Double vehicles on-site. The exit driveway is constructed with a width of approximately 17 metres and includes 3 exit lanes.

The accesses provisions therefore exceed (are superior to) the minimum requirements of AS2890.2 and are supportable. A swept path analysis has been undertaken in accordance with AS2890.2 and is provided in **Appendix E** which demonstrates compliance with the relevant standards.

7.3 Internal Design

The internal design complies with the requirements of AS 2890.1 (2004) and AS 2890.2, with the following characteristics considered noteworthy:

7.3.1 Car Park Design

- All staff and visitor parking spaces exceed (are superior to) the requirements for a Class 1A user under AS2890.1. In this regard the design includes the provision of a minimum space length of 5.4m a minimum width of 2.5m and a minimum aisle width of 6.2m.
- All spaces located adjacent to obstructions of greater than 150mm in height are provided with an additional width of 300mm.
- Dead-end aisles are provided with the required 1.0m aisle extension in accordance with Figure 2.3 of AS2890.1.
- All disabled parking spaces are designed in accordance with AS2890.6. Spaces are provided with a clear width of 2.4m and located adjacent to a minimum shared area of 2.4m.
- Appropriate visual splays are to be provided in accordance with the requirements of Figure 3.3 of AS2890.1 at all accesses.

- A swept path analysis of all critical movements has been undertaken to confirm geometry and compliance with the relevant standards. The swept path assessment is included in **Appendix E**.

7.3.2 Internal Circulation and Access

- The internal hardstand area has been designed to allow for one-way clockwise circulation only. Appropriate signposting and line marking will be provided and will clearly outline appropriate circulation paths and internal intersection priorities.

- All drivers accessing the development will be required to adhere to a site management plan which will outline the operational requirements of all vehicles accessing the site. This will ensure that a high level of safety is met at all times.

- A swept path analysis has been undertaken for all critical manoeuvres through the site in accordance with relevant standards for the largest design vehicle being a 26.0m B-Double.

7.3.3 Service Area Design

- The internal design of the service area has been undertaken in accordance with the requirements of AS28090.2 for the maximum length vehicle accessing each dock. A swept path analysis has been undertaken to confirm compliance.

- A minimum clear head height of 4.5m is provided within all areas traversed by service vehicles.

- All ramps have been tested in accordance with Section 3.3.3 of AS2890.2 and are considered satisfactory.

- A minimum bay width of 3.5m is provided for all service bays.

- A swept path analysis has been undertaken as permissible under AS2890.2 and confirms the internal design. The swept path assessment is included in **Appendix E**.

In summary the internal configuration of the car park and loading areas have been designed in accordance with the both AS2890.1 and AS2890.2. It is however envisaged that a condition of consent would be imposed requiring compliance with these standards and as such any minor amendments considered necessary (if any) can be dealt with prior to the release of a Construction Certificate.

7.4 Bungarribee Road Network

No changes are proposed to road hierarchy or layout as part of this application which will remain consistent with the Infrastructure Approval 08_0225.

8. Construction Impacts

8.1 Introduction

A Construction Management Plan (CMP) has been prepared by Hansen Yuncken and outlines the draft methodology to be used for the management of the construction processes. It is envisaged that a detailed Construction Traffic Management Plan will be prepared in response to a Condition of Consent and that this plan will be prepared to the satisfaction of Council and the RMS.

For the purpose of this application a summary of the key issues is provided below.

8.2 Truck Routes

It is envisaged that all ingress and egress to the site will be via the intersection of GWH and Brabham Drive. This however assumes that the construction of the new intersection of GWH with the Huntingwood Access Drive is not completed. Should this intersection be completed prior to the commencement or during the construction of the proposed development, then access would also be achieved via this new intersection.

A detailed description of the truck routes to be adopted will be provided as part of the final CTMP.

8.3 Site Access

Access to the site is proposed via two main access locations subject to approval of Council:

- Main access to the site will be via William Dean Street on the northern site boundary. The access will service as the main vehicle access to the site for the purpose of materials handling.
- Secondary access will be provided via Huntingwood Drive and is to be utilised for staff and for materials handling prior to the completion of the main site access to William Dean Street.

8.4 Traffic Impacts - Site Preparation & Construction

The development would require the importation of approximately 11,000m^3 of fill for the purpose of site preparation and benching. The fill will be delivered to the site by 10m^3 truck and dog combination over a 40 day period with approximately 4 trucks per hour (4 in and 4 out) which over an 8 hour day results in a total of approximately 32 trucks per day.

This will have a negligible impact on the operation of the critical intersections of Huntingwood Drive and Brabham Drive with the Great Western Highway which will continue to operate as currently occurs during peak periods.

During the main construction activities it is expected that the site would generate between 100-200 truck movements per day with an additional 100-200 movements associated with staff arrivals and departures. A more detailed estimate will be included in the CTMP submitted to Council once the construction methodology is better known. However it is noted that the proposed use will generate approximately 1,600 vehicle movements per day once operational (as discussed in Section 6) which is significantly greater than that associated with the likely construction activities.

Accordingly the traffic generation associated with the proposed construction activities is manageable and will have no adverse impact on the operation of critical intersections in the locality. Notwithstanding this it is reiterated that a detailed CTMP will be submitted to the satisfaction of Council and the RMS as a condition of consent.

8.5 Employee Parking

Due to the considerable size of the site, it is expected that sufficient on-site parking will be provided for all employee parking throughout the construction process. Accordingly no reliance on on-street parking is anticipated at any time during the construction of the development

9. DGR Compliance Table

The report seeks to respond to the respond to the specific Director General Requirements Issued by the department. The specific DGR's addressed in this report are summarised below:

	Key Issue	Addressed In
Transport, Access and Parking	Demonstration that the internal road layout is consistent with the internal road hierarchy proposed in the application for the Bungarribee Industrial estate Stage 1 – Infrastructure Project (08_0225)	Section 7
	An assessment of the impacts of this traffic on the safety capacity and efficiency of the surrounding road network, including modelling of key intersections which should include but not be limited to • Brabham Drive/Great Western Highway, • Huntingwood Drive /Great Western Highway • Huntingwood Drive / Brabham Drive	Section 3 and Section 6
	Detailed plans of any proposed road upgrades	Section 6 & Appendix B
	Access including detailed consideration of various access options & justification for the proposed location of the main access points	Section 7
	Details of the availability of non car travel modes, and	Section 6
	Parking	Section 5
Plans & Documents	Preliminary Construction Management Plan inclusive of a Preliminary Construction Traffic Management Plan conference	Section 8
Consultation	Roads and Maritime Services	Meeting Held with RMS on 28/11/2012

10. Conclusions

In summary:

- The proposed parking provision is consistent with the objectives of the Bungarribee Precinct Pan controls.
- The quantum of parking proposed is of a level which provides sufficient on-site parking to accommodate the known operational requirements of the development as well as providing sufficient allowances to accommodate future employee growth. This flexibility to meet the ongoing needs of Toll IPEC is considered to be a sound planning approach.
- Under the worst case assessment undertaken above (assuming no public transport) it is evident that the combined generation of the Toll and Metcash facilities (623 veh/hr and 541 veh/hr in the AM and PM peaks respectively) will result in an additional 71 vehicles per hour in the AM (57 in and 14 out), and 11 vehicles per hour less in the PM peak than that adopted for the two sites in the GHD assessment for the Bungarribee Precinct. Table 5 above demonstrates that the Level of Service and delays as a result of the additional 71 veh/hr over and above that assumed for the estate will have a negligible impact on the operation of critical intersections in the locality even under a worst case assessment and accordingly this increase is considered acceptable.
- The proposed means of site access is considered supportable and will ensure that no heavy vehicle queuing occurs on-street. A swept path analysis of both the heavy vehicle and staff/visitor car park accesses has been undertaken and demonstrates compliance with the relevant standards.
- The internal configuration of the car park and loading areas have been designed in accordance with the both AS2890.1 and AS2890.2. It is however envisaged that a condition of consent would be imposed requiring compliance with these standards and as such any minor amendments considered necessary (if any) can be dealt with prior to the release of a Construction Certificate.
- A detailed Construction Traffic Management Plan will be provided prior to the issue of a Consturction Certificate after the receipt of all relevant information. The CTMP will be prepared to the satisfaction of the RMS and Council.

It is therefore concluded that the proposed development is supportable on traffic planning grounds and will operate satisfactorily.

Appendix A

Photographic Record

View looking northwest at the site from Huntingwood Drive.

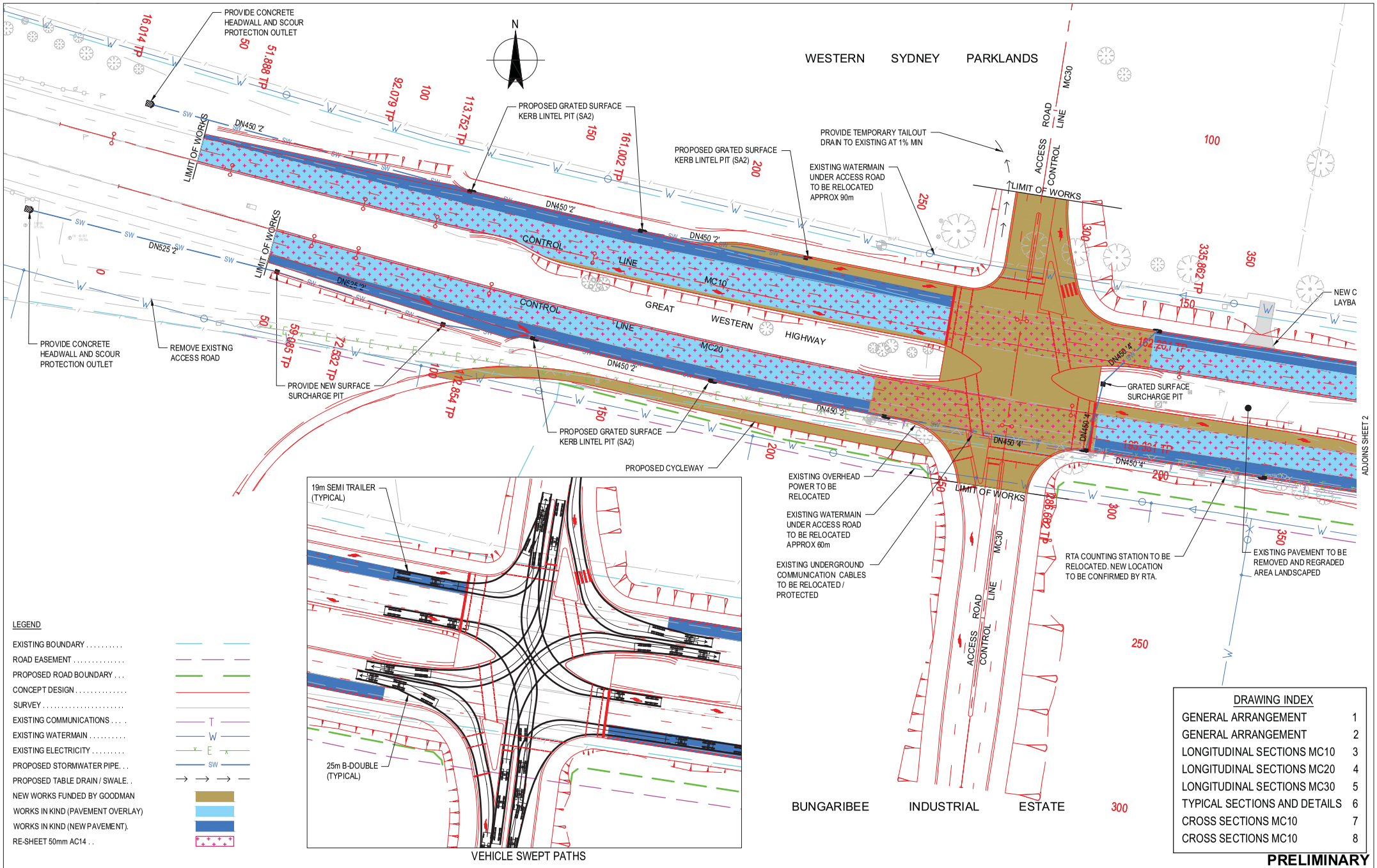
View looking east along Huntingwood Drive on approach to its intersection with Brabham Drive.

View looking south along Brabham Drive on approach to Huntingwood Drive.

View looking north along Brabham Drive on approach to its intersection with the Great Western Highway.

Appendix B

Future Intersection Layout – Huntingwood Access Rd & GWH



LEGEND

- EXISTING BOUNDARY . . . . . .
- ROAD EASEMENT . . . . . .
- PROPOSED ROAD BOUNDARY . . .
- CONCEPT DESIGN . . . . . .
- SURVEY . . . . . .
- EXISTING COMMUNICATIONS . . . . T
- EXISTING WATERMAIN . . . . . W
- EXISTING ELECTRICITY . . . . . E
- PROPOSED STORMWATER PIPE. . . SW
- PROPOSED TABLE DRAIN / SWALE. .
- NEW WORKS FUNDED BY GOODMAN
- WORKS IN KIND (PAVEMENT OVERLAY)
- WORKS IN KIND (NEW PAVEMENT).
- RE-SHEET 50mm AC14 . .

DRAWING INDEX

PRELIMINARY

No	Revision	Note: * indicates signatures on original issue of drawing or last revision of drawing	Drawn	Job Manager	Project Director	Date
C	ADDRESSED RMS COMMENTS ON WORKS IN KIND LEGEND		DAC	FC		16.12.11
B	ADDRESSED RMS COMMENTS		CG	FC		02.12.11
A	CONCEPT DESIGN - FOR RTA APPROVAL		CG	FC		11.10.11

0 10 20 30m
SCALE 1:1000 AT ORIGINAL SIZE

Goodman

GHD CLIENTS | PEOPLE | PERFORMANCE
Level 6, 20 Smith Street Parramatta NSW 2150 Australia
PO Box 788 Parramatta NSW 2124
T 61 2 8898 8800 F 61 2 8898 8810
E sydmail@ghd.com.au W www.ghd.com.au

Drawn	C.GRAZIANI	Designer	C.GRAZIANI
Drafting Check	F.CARROZZA	Design Check	F.CARROZZA
Approved (Project Director)			
Date			
Scale	AS SHOWN	This Drawing must not be used for Construction unless signed as Approved	

Client GOODMAN
Project BUNGARIBEE ESTATE - HUNTINGWOOD WEST
Title GREAT WESTERN HIGHWAY WORKS
GENERAL ARRANGEMENT PLAN

Original Size A3 Drawing No: 21-18115-SK154 Rev: C

Plot Date: 16 December 2011 - 11:26 AM Plotted By: David A Coleman/Sydney/GHD/AU Cad File No: G:\21\18115\CADD\Drawings\21-18115-SK154-161.dwg

Appendix C

Reduced Plans

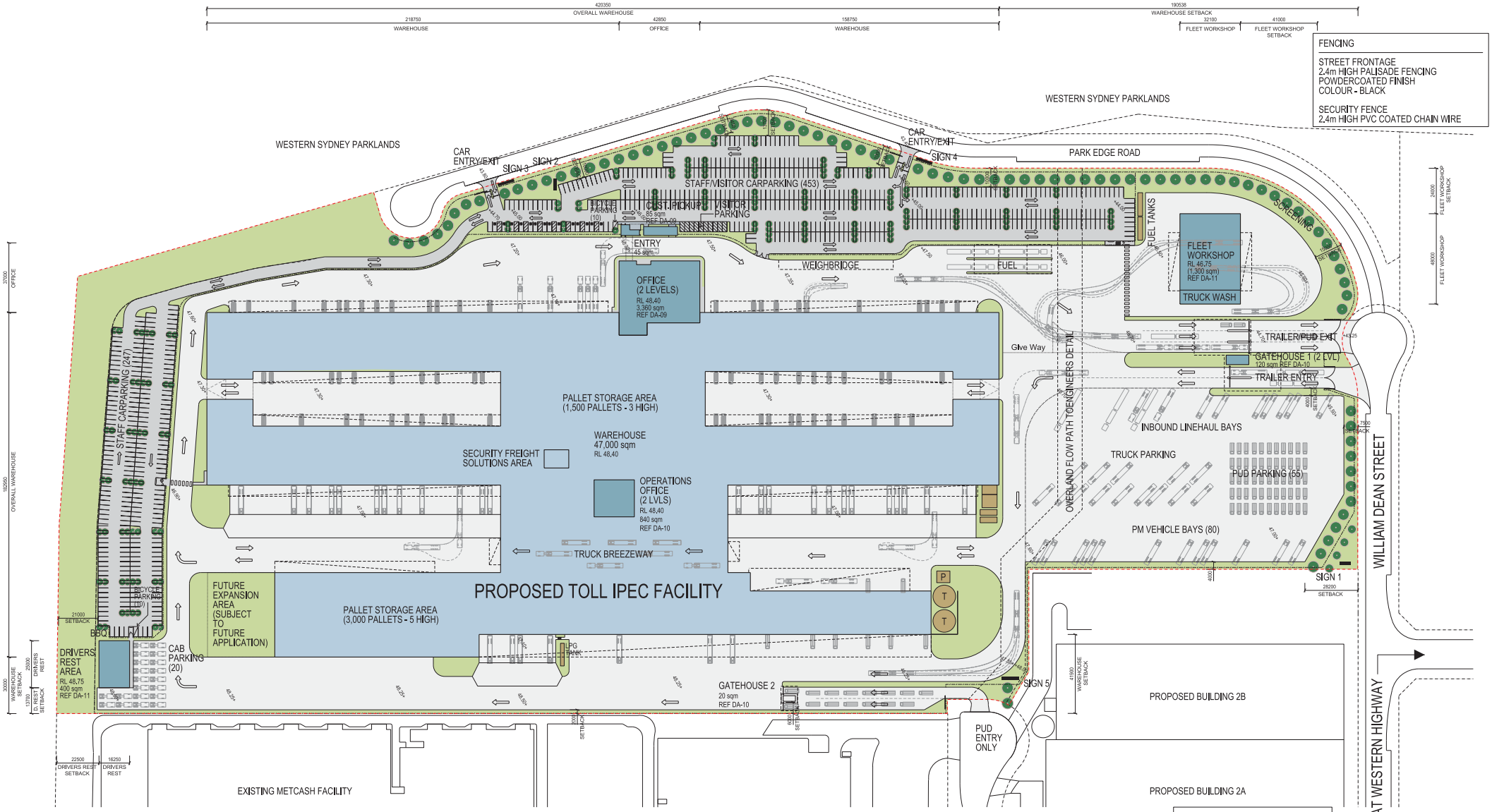
SIGNAGE SCHEDULE

SIGN 1 - 6000H x 2000W PYLON SIGN
SIGN 2 - 6000H x 2000W PYLON SIGN
SIGN 3 - 2000H x 3000W SITE ID SIGN
SIGN 4 - 2000H x 3000W SITE ID SIGN
SIGN 5 - 2000H x 3000W SITE ID SIGN

FENCING

STREET FRONTAGE
2.4m HIGH PALISADE FENCING
POWDERCOATED FINISH
COLOUR - BLACK

SECURITY FENCE
2.4m HIGH PVC COATED CHAIN WIRE



NOTE

FOR LANDSCAPE DESIGN REFER TO LANDSCAPE ARCHITECT DRAWINGS

ISSUE	REV.	DESCRIPTION	DATE
H	1	CARPARKING REVISED	19.11.12
		Carparking spaces added	
G		GENERAL AMENDMENTS	16.11.12
F		REVISION CLOUDS ADDED	15.11.12
	7	Visitor parking added	
	6	BBQ added	
	5	Loading dock repositioned	
	4	gatehouse repositioned	
	3	Tank screen added	
	2	Landscaped depth revised	
	1	Office moved 12m south	
E		CLIENT REVIEW	13.11.12
D		PRE DA MEETING	06.11.12
C		PRELIMINARY	02.11.12

ISSUE	REV.	DESCRIPTION	DATE
J		ISSUE FOR DA APPROVAL	22.11.12

SBA ARCHITECTS
Commercial Industrial Residential Retail Interior Design
Suite 702, 83 Mount Street, North Sydney NSW 2060
T 02 9929 9988 F 02 9929 8999
E info@sbaarch.com.au W www.sbaarch.com.au

CLIENT: Goodman

PROJECT: Toll IPEC Freight Transport Warehouse and Distribution Facility
BUNGARRIBEE INDUSTRIAL ESTATE

TITLE: SITE PLAN

DATE	15.10.1012
SCALE	1:1000 @ A1
DRAWN	SBA
CHECKED	
APPROVED	

PROJECT No. 12197

DWG No. DA - 03

ISSUE J

Appendix D-1

Sidra Intersection Analysis - Existing

MOVEMENT SUMMARY

Site: GWH / Brabham Dr_AM_EX

Great Western Highway / Brabham Drive
Period: AM
Scenario: Existing
Signals - Fixed Time Cycle Time = 140 seconds (Practical Cycle Time)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Brabham Dr (south)											
1	L	108	22.3	0.459	56.7	LOS E	11.8	92.2	0.89	0.84	23.3
2	T	312	3.0	0.459	47.9	LOS D	12.4	92.2	0.90	0.75	22.4
3	R	129	8.9	0.944	100.8	LOS F	10.7	80.6	1.00	1.06	15.4
Approach		549	8.2	0.944	62.1	LOS E	12.4	92.2	0.92	0.84	20.3
East: GWH (east)											
4	L	117	5.4	0.159	34.9	LOS C	5.0	36.4	0.65	0.75	46.7
5	T	364	1.4	0.308	46.9	LOS D	7.9	55.9	0.86	0.70	41.0
6	R	107	1.0	0.249	52.4	LOS D	5.6	39.7	0.81	0.78	39.4
Approach		588	2.1	0.308	45.6	LOS D	7.9	55.9	0.81	0.72	41.7
North: Doonside Rd (north)											
7	L	223	2.4	0.993	112.1	LOS F	45.1	320.9	1.00	1.17	17.4
8	T	718	1.8	0.993	102.9	LOS F	45.1	320.9	1.00	1.20	16.2
9	R	218	15.0	0.826	87.9	LOS F	8.1	64.1	1.00	0.91	20.8
Approach		1159	4.4	0.993	101.9	LOS F	45.1	320.9	1.00	1.14	17.2
West: GWH (west)											
10	L	429	4.4	0.416	14.1	LOS A	7.6	55.5	0.34	0.75	62.1
11	T	1257	1.9	0.997	92.2	LOS F	42.9	305.2	1.00	1.12	28.5
12	R	479	4.4	0.980	68.5	LOS E	33.7	244.8	1.00	0.90	33.6
Approach		2165	3.0	0.997	71.5	LOS F	42.9	305.2	0.87	1.00	33.1
All Vehicles		4462	3.9	0.997	74.8	LOS F	45.1	320.9	0.90	0.98	28.2

Level of Service (LOS) Method: Delay (RTA NSW).
Vehicle movement LOS values are based on average delay per movement
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model used.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Average Back of Queue Distance m	Prop. Queued	Effective Stop Rate per ped
P7	Across W approach	11	63.2	LOS F	0.0	0.0	0.95	0.95
All Pedestrians		11	63.2	LOS F			0.95	0.95

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: GWH / Brabham Dr_PM_EX

Great Western Highway / Brabham Drive
Period: PM
Scenario: Existing
Signals - Fixed Time Cycle Time = 140 seconds (Practical Cycle Time)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Brabham Dr (south)											
1	L	462	2.3	0.984	102.7	LOS F	52.5	373.8	1.00	1.10	14.9
2	T	580	0.7	0.984	95.9	LOS F	52.5	373.8	1.00	1.21	14.2
3	R	83	6.3	0.449	67.0	LOS E	5.1	37.9	0.93	0.77	20.6
Approach		1125	1.8	0.984	96.6	LOS F	52.5	373.8	1.00	1.13	14.9
East: GWH (east)											
4	L	58	1.8	0.048	12.7	LOS A	0.8	5.4	0.25	0.69	62.8
5	T	1227	1.0	1.005	95.3	LOS F	45.9	324.2	0.99	1.11	27.9
6	R	342	1.2	1.000[3]	93.7	LOS F	27.7	195.8	1.00	0.96	28.3
Approach		1626	1.1	1.005	92.0	LOS F	45.9	324.2	0.96	1.07	28.6
North: Doonside Rd (north)											
7	L	194	3.3	0.769	62.6	LOS E	24.4	175.0	0.98	0.89	26.4
8	T	544	2.4	0.769	54.7	LOS D	24.4	175.0	0.99	0.88	24.5
9	R	402	4.6	1.000[3]	73.1	LOS F	15.7	114.2	1.00	0.82	23.5
Approach		1140	3.6	1.000	62.5	LOS E	24.4	175.0	0.99	0.86	24.4
West: GWH (west)											
10	L	271	8.9	0.361	32.2	LOS C	10.5	79.0	0.64	0.83	49.0
11	T	493	2.6	0.383	47.2	LOS D	10.1	72.5	0.88	0.72	40.9
12	R	86	24.4	0.294	64.0	LOS E	5.1	43.5	0.90	0.78	35.1
Approach		849	6.8	0.383	44.1	LOS D	10.5	79.0	0.80	0.76	42.4
All Vehicles		4741	2.9	1.005	77.4	LOS F	52.5	373.8	0.95	0.98	26.3

Level of Service (LOS) Method: Delay (RTA NSW).
Vehicle movement LOS values are based on average delay per movement
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model used.

3 x = 1.00 due to short lane. Refer to the Lane Summary report for information about excess flow and related conditions.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Average Back of Queue Distance m	Prop. Queued	Effective Stop Rate per ped
P7	Across W approach	11	62.2	LOS F	0.0	0.0	0.94	0.94
All Pedestrians		11	62.2	LOS F			0.94	0.94

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

GWH/ Huntingwood Access Drive
Period: AM Peak
Signals - Fixed Time Cycle Time = 140 seconds (User-Given Cycle Time)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Huntingwood Access Road											
1	L	48	10.0	0.080	12.6	LOS A	0.7	5.5	0.26	0.68	48.1
2	T	5	10.0	0.012	44.9	LOS D	0.3	2.0	0.80	0.54	25.9
3	R	34	10.0	0.130	56.2	LOS D	1.9	14.1	0.83	0.73	26.1
Approach		87	10.0	0.130	31.5	LOS C	1.9	14.1	0.52	0.69	34.9
East: Great Western Highway East											
4	L	193	10.0	0.533	32.6	LOS C	12.2	93.1	0.71	0.87	37.4
5	T	964	10.0	0.640	25.6	LOS B	18.7	141.9	0.71	0.63	41.2
6	R	5	10.0	0.067	82.8	LOS F	0.3	2.6	0.98	0.65	19.9
Approach		1162	10.0	0.640	27.0	LOS B	18.7	141.9	0.71	0.67	40.4
North: Parklands Access Road											
7	L	5	10.0	0.032	25.9	LOS B	0.2	1.3	0.52	0.68	38.2
8	T	5	10.0	0.012	44.9	LOS D	0.3	2.0	0.80	0.54	25.9
9	R	5	10.0	0.034	54.5	LOS D	0.3	2.0	0.80	0.66	26.6
Approach		15	10.0	0.034	41.8	LOS C	0.3	2.0	0.71	0.62	29.5
West: Great Western Highway West											
10	L	5	10.0	0.005	10.4	LOS A	0.0	0.1	0.09	0.66	56.9
11	T	3103	10.0	0.975	23.5	LOS B	70.9	538.8	0.65	0.72	43.2
12	R	270	10.0	0.654	53.6	LOS D	15.2	115.7	0.88	0.83	27.0
Approach		3378	10.0	0.975	25.9	LOS B	70.9	538.8	0.67	0.73	41.4
All Vehicles		4642	10.0	0.975	26.3	LOS B	70.9	538.8	0.68	0.71	41.0

Level of Service (LOS) Method: Delay (RTA NSW).
Vehicle movement LOS values are based on average delay per movement
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model used.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Average Back of Queue Distance m	Prop. Queued	Effective Stop Rate per ped
P1	Across S approach	20	36.4	LOS D	0.1	0.1	0.72	0.72
P3	Across E approach	20	64.1	LOS F	0.1	0.1	0.96	0.96
P5	Across N approach	20	15.1	LOS B	0.0	0.0	0.46	0.46
P7	Across W approach	20	64.1	LOS F	0.1	0.1	0.96	0.96
All Pedestrians		80	44.9	LOS E			0.78	0.78

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

GWH/Huntingwood Access Drive
Period: PM Peak

Signals - Fixed Time Cycle Time = 120 seconds (User-Given Cycle Time)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Huntingwood Access Road											
1	L	270	10.0	0.632	39.5	LOS C	10.5	79.6	0.79	0.90	31.6
2	T	1	10.0	0.002	34.6	LOS C	0.0	0.3	0.76	0.46	29.6
3	R	193	10.0	0.630	51.0	LOS D	9.8	74.8	0.91	0.82	27.6
Approach		464	10.0	0.632	44.2	LOS D	10.5	79.6	0.84	0.87	29.8
East: Great Western Highway East											
4	L	34	10.0	0.831	16.6	LOS B	18.5	140.6	0.40	1.28	52.5
5	T	2797	10.0	0.998	40.9	LOS C	85.6	650.8	0.83	1.01	32.8
6	R	12	10.0	0.137	72.4	LOS F	0.7	5.4	0.98	0.68	22.0
Approach		2843	10.0	0.998	40.7	LOS C	85.6	650.8	0.82	1.01	32.9
North: Parklands Access Road											
7	L	49	10.0	0.237	10.6	LOS A	0.3	2.4	0.22	0.67	50.1
8	T	1	10.0	0.002	34.6	LOS C	0.0	0.3	0.76	0.46	29.6
9	R	69	10.0	0.400	46.8	LOS D	3.2	24.1	0.82	0.75	29.0
Approach		119	10.0	0.400	31.8	LOS C	3.2	24.1	0.57	0.72	35.1
West: Great Western Highway West											
10	L	17	10.0	0.019	10.4	LOS A	0.0	0.4	0.10	0.67	56.8
11	T	1195	10.0	0.421	3.6	LOS A	3.8	28.9	0.16	0.14	70.1
12	R	48	10.0	0.548	75.0	LOS F	3.0	22.6	1.00	0.75	21.4
Approach		1260	10.0	0.548	6.4	LOS A	3.8	28.9	0.19	0.17	64.9
All Vehicles		4686	10.0	0.998	31.6	LOS C	85.6	650.8	0.65	0.77	37.5

Level of Service (LOS) Method: Delay (RTA NSW).
Vehicle movement LOS values are based on average delay per movement
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model used.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Average Back of Queue Distance m	Prop. Queued	Effective Stop Rate per ped
P1	Across S approach	20	17.6	LOS B	0.0	0.0	0.54	0.54
P3	Across E approach	20	54.2	LOS E	0.1	0.1	0.95	0.95
P5	Across N approach	20	17.6	LOS B	0.0	0.0	0.54	0.54
P7	Across W approach	20	54.2	LOS E	0.1	0.1	0.95	0.95
All Pedestrians		80	35.9	LOS D			0.75	0.75

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: Huntingwood Drive / GWH
EX AM

Great Western Hwy-Huntingwood Dr
Period: AM Peak
Scenario: Existing

Signals - Fixed Time Cycle Time = 70 seconds (Optimum Cycle Time - Minimum Delay)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Huntingwood Dr (S)											
1	L	12	10.0	0.021	10.9	LOS A	0.1	0.5	0.27	0.66	49.9
3	R	212	10.0	0.712	47.8	LOS D	4.0	30.1	1.00	0.86	28.4
Approach		223	10.0	0.712	45.9	LOS D	4.0	30.1	0.96	0.85	29.1
East: GWH (E)											
4	L	657	10.0	0.379	11.7	X	X	X	X	0.69	58.8
5	T	627	10.0	0.300	8.3	LOS A	5.5	42.0	0.55	0.47	59.2
Approach		1284	10.0	0.379	10.0	LOS A	5.5	42.0	0.27	0.58	59.0
West: GWH (W)											
11	T	1982	10.0	0.729	5.4	LOS A	18.9	143.8	0.61	0.56	62.3
12	R	21	10.0	0.142	44.6	LOS D	0.7	5.4	0.96	0.71	30.2
Approach		2003	10.0	0.729	5.8	LOS A	18.9	143.8	0.61	0.57	61.7
All Vehicles		3511	10.0	0.729	9.9	LOS A	18.9	143.8	0.51	0.59	56.8

X: Not applicable for Continuous movement.

Level of Service (LOS) Method: Delay (RTA NSW).
Vehicle movement LOS values are based on average delay per movement
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model used.

MOVEMENT SUMMARY

Site: Huntingwood Drive / GWH
EX PM

Great Western Hwy-Huntingwood Dr
Period: PM Peak
Scenario: Existing

Signals - Fixed Time Cycle Time = 120 seconds (Optimum Cycle Time - Minimum Delay)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Huntingwood Dr (S)											
1	L	62	10.0	0.314	21.2	LOS B	1.6	12.4	0.51	0.72	41.2
3	R	694	10.0	0.800	59.7	LOS E	20.4	155.1	1.00	0.91	25.0
Approach		756	10.0	0.800	56.5	LOS E	20.4	155.1	0.96	0.89	25.8
East: GWH (E)											
4	L	192	10.0	0.111	11.6	X	X	X	X	0.69	58.9
5	T	1613	10.0	0.801	23.1	LOS B	37.5	285.1	0.87	0.80	42.7
Approach		1804	10.0	0.801	21.9	LOS B	37.5	285.1	0.78	0.79	44.0
West: GWH (W)											
11	T	805	10.0	0.338	9.9	LOS A	10.4	78.8	0.48	0.43	57.5
12	R	5	10.0	0.061	72.0	LOS F	0.3	2.3	0.98	0.65	21.9
Approach		811	10.0	0.338	10.3	LOS A	10.4	78.8	0.49	0.43	56.9
All Vehicles		3371	10.0	0.801	26.9	LOS B	37.5	285.1	0.75	0.73	40.0

X: Not applicable for Continuous movement.

Level of Service (LOS) Method: Delay (RTA NSW).
Vehicle movement LOS values are based on average delay per movement
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model used.

MOVEMENT SUMMARY

Site: Brabham / Huntingwood EX AM

Brabham Drive / Huntingwood Drive
Period: AM Peak
Scenario: Existing
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Brabham Dr (south)											
1	L	31	33.3	0.359	7.7	LOS A	2.6	19.2	0.63	0.66	50.4
2	T	420	3.7	0.359	6.4	LOS A	2.6	19.2	0.63	0.58	50.6
3	R	374	4.6	0.361	13.8	LOS A	2.5	18.1	0.65	0.76	46.4
Approach		824	5.2	0.361	9.8	LOS A	2.6	19.2	0.64	0.67	48.5
East: Huntingwood Dr (east)											
4	L	124	5.5	0.488	11.6	LOS A	3.2	24.3	0.83	0.96	45.2
5	T	21	21.2	0.488	9.9	LOS A	3.2	24.3	0.83	0.93	44.8
6	R	143	15.6	0.488	17.7	LOS B	3.2	24.3	0.83	1.02	42.2
Approach		288	11.7	0.488	14.5	LOS B	3.2	24.3	0.83	0.98	43.5
North: Brabham Dr (north)											
7	L	647	2.9	0.711	9.8	LOS A	8.4	60.1	0.72	0.77	45.2
8	T	761	1.7	0.711	9.2	LOS A	8.4	60.1	0.74	0.78	44.6
9	R	235	9.6	0.711	15.4	LOS B	7.9	57.4	0.75	0.94	40.0
Approach		1643	3.3	0.711	10.3	LOS A	8.4	60.1	0.73	0.80	44.1
West: Huntingwood Dr (west)											
10	L	41	50.0	0.136	11.7	LOS A	0.5	5.3	0.67	0.81	35.4
11	T	5	50.0	0.136	10.3	LOS A	0.5	5.3	0.67	0.76	36.0
12	R	5	80.0	0.136	18.2	LOS B	0.5	5.3	0.67	0.93	32.8
Approach		52	53.1	0.136	12.2	LOS A	0.5	5.3	0.67	0.81	35.2
All Vehicles		2807	5.7	0.711	10.6	LOS A	8.4	60.1	0.72	0.78	45.5

Level of Service (LOS) Method: Delay (RTA NSW).
Vehicle movement LOS values are based on average delay per movement
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model used.

MOVEMENT SUMMARY

Site: Brabham / Huntingwood EX PM

Brabham Drive / Huntingwood Drive
Period: PM Peak
Scenario: Existing
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Brabham Dr (south)											
1	L	3	66.7	0.381	8.7	LOS A	3.0	21.2	0.72	0.67	50.1
2	T	691	0.6	0.381	6.8	LOS A	3.0	21.2	0.72	0.63	49.9
3	R	114	3.7	0.381	14.2	LOS A	2.8	19.6	0.73	0.85	47.5
Approach		807	1.3	0.381	7.9	LOS A	3.0	21.2	0.73	0.66	49.6
East: Huntingwood Dr (east)											
4	L	281	3.4	0.725	9.9	LOS A	7.3	52.3	0.76	0.85	46.6
5	T	11	30.0	0.725	8.4	LOS A	7.3	52.3	0.76	0.86	45.8
6	R	456	2.3	0.725	15.8	LOS B	7.3	52.3	0.76	0.93	43.2
Approach		747	3.1	0.725	13.5	LOS A	7.3	52.3	0.76	0.90	44.4
North: Brabham Dr (north)											
7	L	108	17.5	0.190	6.9	LOS A	1.0	7.7	0.29	0.54	48.1
8	T	401	1.3	0.190	5.0	LOS A	1.0	7.7	0.30	0.43	49.3
9	R	11	60.0	0.190	11.7	LOS A	1.0	7.3	0.31	0.87	44.0
Approach		520	5.9	0.190	5.5	LOS A	1.0	7.7	0.30	0.46	48.9
West: Huntingwood Dr (west)											
10	L	60	10.5	0.176	10.1	LOS A	0.9	6.6	0.76	0.86	36.2
11	T	23	4.5	0.176	8.9	LOS A	0.9	6.6	0.76	0.83	36.7
12	R	9	11.1	0.176	16.0	LOS B	0.9	6.6	0.76	0.97	33.5
Approach		93	9.1	0.176	10.4	LOS A	0.9	6.6	0.76	0.87	36.0
All Vehicles		2167	3.4	0.725	9.3	LOS A	7.3	52.3	0.64	0.70	47.2

Level of Service (LOS) Method: Delay (RTA NSW).
Vehicle movement LOS values are based on average delay per movement
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model used.

Appendix D-2

Sidra Intersection Analysis - Future

MOVEMENT SUMMARY

GWH/Huntingwood Access Drive
Period: AM Peak
Scenario: Existing+Toll Development

Signals - Fixed Time Cycle Time = 140 seconds (User-Given Cycle Time)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Huntingwood Access Road											
1	L	53	10.0	0.086	13.1	LOS A	0.9	6.6	0.28	0.69	47.6
2	T	5	10.0	0.012	44.9	LOS D	0.3	2.0	0.80	0.54	25.9
3	R	37	10.0	0.141	56.3	LOS D	2.0	15.4	0.83	0.74	26.0
Approach		95	10.0	0.141	31.6	LOS C	2.0	15.4	0.52	0.70	34.9
East: Great Western Highway East											
4	L	208	10.0	0.570	34.8	LOS C	13.5	102.4	0.76	0.88	36.0
5	T	964	10.0	0.684	28.7	LOS C	20.4	155.3	0.77	0.68	39.0
6	R	5	10.0	0.067	82.8	LOS F	0.3	2.6	0.98	0.65	19.9
Approach		1177	10.0	0.684	30.0	LOS C	20.4	155.3	0.77	0.71	38.4
North: Parklands Access Road											
7	L	5	10.0	0.032	25.9	LOS B	0.2	1.3	0.52	0.68	38.2
8	T	5	10.0	0.012	44.9	LOS D	0.3	2.0	0.80	0.54	25.9
9	R	5	10.0	0.034	54.5	LOS D	0.3	2.0	0.80	0.66	26.6
Approach		15	10.0	0.034	41.8	LOS C	0.3	2.0	0.71	0.62	29.5
West: Great Western Highway West											
10	L	5	10.0	0.005	10.4	LOS A	0.0	0.1	0.09	0.66	56.9
11	T	3103	10.0	0.975	23.5	LOS B	70.9	538.8	0.65	0.72	43.2
12	R	292	10.0	0.690	51.5	LOS D	16.2	122.9	0.87	0.83	27.7
Approach		3400	10.0	0.975	25.9	LOS B	70.9	538.8	0.67	0.73	41.4
All Vehicles		4687	10.0	0.975	27.1	LOS B	70.9	538.8	0.69	0.72	40.4

Level of Service (LOS) Method: Delay (RTA NSW).
Vehicle movement LOS values are based on average delay per movement
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model used.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Average Back of Queue Distance m	Prop. Queued	Effective Stop Rate per ped
P1	Across S approach	20	38.6	LOS D	0.1	0.1	0.74	0.74
P3	Across E approach	20	64.1	LOS F	0.1	0.1	0.96	0.96
P5	Across N approach	20	15.1	LOS B	0.0	0.0	0.46	0.46
P7	Across W approach	20	64.1	LOS F	0.1	0.1	0.96	0.96
All Pedestrians		80	45.5	LOS E			0.78	0.78

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: Brabham / Huntingwood EX AM + Toll Dev

Brabham Drive / Huntingwood Drive
Period: AM Peak
Scenario: Existing+ Toll Development
Roundabout

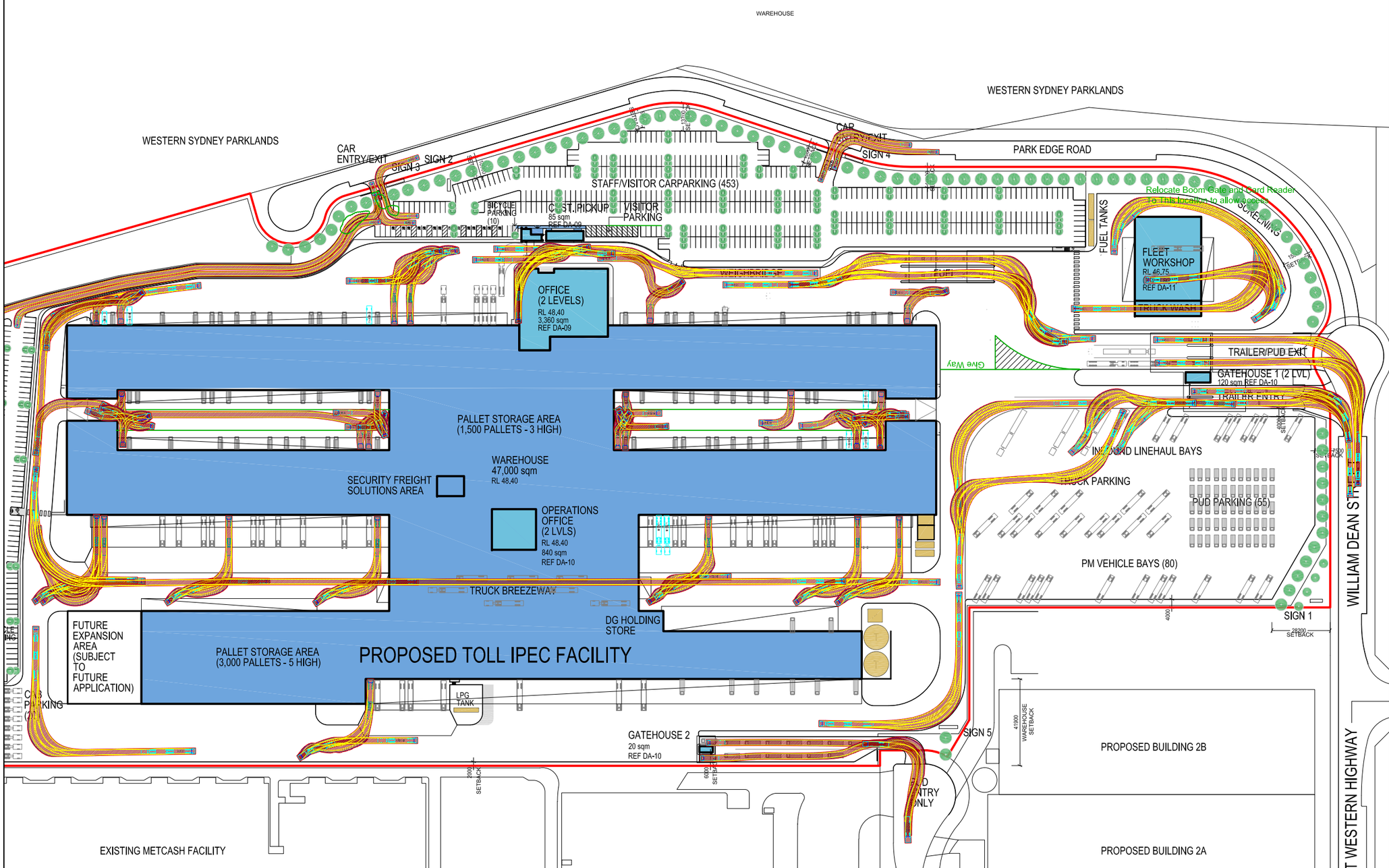
Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Brabham Dr (south)											
1	L	36	33.3	0.370	7.9	LOS A	2.7	20.1	0.66	0.67	50.3
2	T	420	3.7	0.370	6.6	LOS A	2.7	20.1	0.66	0.60	50.5
3	R	374	4.6	0.370	14.0	LOS A	2.6	18.7	0.67	0.77	46.3
Approach		829	5.4	0.370	10.0	LOS A	2.7	20.1	0.66	0.68	48.4
East: Huntingwood Dr (east)											
4	L	124	5.5	0.509	12.0	LOS A	3.4	25.8	0.84	0.97	44.8
5	T	26	21.2	0.509	10.3	LOS A	3.4	25.8	0.84	0.95	44.4
6	R	143	15.6	0.509	18.1	LOS B	3.4	25.8	0.84	1.03	41.9
Approach		294	11.8	0.509	14.9	LOS B	3.4	25.8	0.84	1.00	43.2
North: Brabham Dr (north)											
7	L	647	2.9	0.724	10.0	LOS A	8.9	63.3	0.73	0.79	45.1
8	T	761	1.7	0.724	9.6	LOS A	8.9	63.3	0.75	0.79	44.3
9	R	251	9.6	0.724	15.8	LOS B	8.3	60.4	0.77	0.95	39.7
Approach		1659	3.4	0.724	10.7	LOS A	8.9	63.3	0.75	0.82	43.8
West: Huntingwood Dr (west)											
10	L	43	50.0	0.157	11.9	LOS A	0.6	6.2	0.68	0.81	35.1
11	T	5	50.0	0.157	10.5	LOS A	0.6	6.2	0.68	0.77	35.7
12	R	9	80.0	0.157	18.4	LOS B	0.6	6.2	0.68	0.93	32.6
Approach		58	54.9	0.157	12.8	LOS A	0.6	6.2	0.68	0.83	34.7
All Vehicles		2840	5.9	0.724	11.0	LOS A	8.9	63.3	0.73	0.79	45.3

Level of Service (LOS) Method: Delay (RTA NSW).
Vehicle movement LOS values are based on average delay per movement
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model used.

Appendix E

Swept Path Analysis



notes

This drawing is prepared for information purposes only. It is not to be used for construction.

no.	revision note	by.	date
R1	REVISION_NOTES	INIT	DATE

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Bungarribee Industrial Estate

Toll IPEC Freight Transport Facility

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Swept Paths

drawn:	checked:	date:
INITIALS	INITIALS	28-11-2012

12.368	-	TX.01	-
project no.	drawing phase.	drawing no.	rev

Appendix F

Director General's Requirements

NSW GOVERNMENT | Planning & Infrastructure

Contact: Peter McManus
Phone: 02 9228 6316
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Email: peter.mcmanus@planning.nsw.gov.au

Our ref: SSD 12_5705
File: 12/19185-1

Mr Will Dwyer
Goodman Ltd
Level 17, 60 Castlereagh Street
SYDNEY NSW 2000

3 December 2012

Dear Mr Dwyer

DGRs for TOLL IPEC Freight Transport Warehouse and Distribution Facility, Bungarribee Industrial Estate, Eastern Creek (SSD 12_5705)

Please find attached a copy of the Director General's environmental assessment requirements (DGRs) for the preparation of an Environmental Impact Statement (EIS) for the TOLL IPEC Freight Transport Warehouse and Distribution Facility (SSD 12_5705). These requirements have been prepared in consultation with relevant government agencies based on the information you have provided to date. I have also attached a copy of the government authorities' comments for your information. Please note that the Director-General may alter these requirements at any time.

If you do not lodge a DA and EIS for the development within 2 years, you must consult further with the Director General in relation to the preparation of the EIS.

Prior to exhibiting the EIS that you submit for the development, the department will review the document in consultation with the relevant agencies to determine if it addresses the requirements in Schedule 2 of the *Environmental Planning and Assessment Regulation 2000*.

I would appreciate it if you would contact the department at least two weeks before you propose to submit your EIS. This will enable the department to:

- confirm the applicable fee (see Division 1AA, Part 15 of the *Environmental Planning and Assessment Regulation 2000*); and
- determine the number of copies (hard-copy and CD-ROM) of the EIS that will be required for reviewing purposes.

If your development is likely to have a significant impact on matters of National Environmental Significance, it will require an approval under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). This approval would be in addition to any approvals required under NSW legislation and it is your responsibility to contact the Department of Sustainability, Environment, Water, Population and Communities to determine if an approval under the EPBC Act is required (http://www.environment.gov.au or 6274 1111).

Your contact officer, Peter McManus, can be contacted on 02 9228 6316 or at peter.mcmanus@planning.nsw.gov.au. Please mark all correspondence regarding the proposal to the attention of the contact officer.

Yours sincerely

Heather Warton
Director
Metropolitan and Regional Projects North
as delegate for the Director General

Director General's Environmental Assessment Requirements

Section 78A(8A) of the *Environmental Planning and Assessment Act 1979*

Application Number	SSD 12_5705
Proposal Name	TOLL IPEC Freight Transport Warehouse and Distribution Facility
Location	Bungarribee Industrial Estate, Eastern Creek (Lots 30 & 31 and part Lot 33 in DP 1161771)
Applicant	Goodman Group
Date of Issue	3 December 2012

General Requirements	The Environmental Impact Statement (EIS) must address the *Environmental Planning and Assessment Act 1979* and meet the minimum form and content requirements in clauses 6 and 7 of Schedule 2 the *Environmental Planning and Assessment Regulation 2000*.
	
	Notwithstanding the key issues specified below, the EIS must include an environmental risk assessment to identify the potential environmental impacts associated with the development, including:
	• an executive summary
	• a detailed description of the development, including:
	  • existing and approved operations/facilities, including any statutory approvals that apply to these operations/facilities
	  • the development to be carried out onsite, including plans of all proposed building works
	  • the likely staging of the project.
	• a risk assessment of the potential environmental impacts of the development, identifying key issues for further assessment
	• a detailed assessment of the key issues specified below, and any other significant issues identified in the risk assessment, which includes:
	  • a description of the existing environment, using sufficient baseline data
	  • an assessment of the potential impacts of the development, including any cumulative impacts, taking into consideration any relevant guidelines, policies, plans and statutory provisions
	  • a description of the measures to avoid, minimise and if necessary, offset the predicted impacts, including detailed contingency plans for managing any significant risks to the environment.
	• a suitable assessment of the other issues specified below, outlining the measures that would be implemented to minimise the potential impacts of the development
	• detailed justification for the proposal and suitability of the site to be developed
	• a conclusion justifying the development on economic, social and environmental grounds taking into consideration whether the development is consistent with the object of the *Environmental Planning and Assessment Act 1979*

Key issues	The EIS must address the following specific matters: **1. Statutory and Strategic Context** – including: Address the statutory provisions applying to the development contained in all relevant environmental planning instruments, including:

- Protection of the Environment Operations Act 1997
- State Environmental Planning Policy (Major Development) 2005
- State Environmental Planning Policy No.55 – Remediation of Land
- State Environmental Planning Policy No.33 – Hazardous and Offensive Development
- State Environmental Planning Policy No.64 – Advertising and Signage
- State Environmental Planning Policy (Infrastructure) 2007
- Blacktown Local Environmental Plan 1988
- address the relevant planning provisions, goals and strategic planning objectives in the following with:
    - NSW 2021, Metropolitan Plan for Sydney 2036 and draft subregional strategy
    - any relevant development control plans (DCP);

2. Infrastructure

- Demonstrate that suitable arrangements are in place to provide the necessary local and regional infrastructure for the project.
- Demonstrate that suitable arrangements are in place in accordance with Project Approval for Bungarribee Industrial Estate Stage 1: Infrastructure Project (MP08_0225), in particular conditions 13 and 14.

3. Transport, Access and Parking

- Demonstrate that the internal road layout is consistent with the internal road hierarchy proposed in the application for the Bungarribee Industrial Estate Stage 1: Infrastructure Project (MP08_0225).
- Predictions of the traffic volumes likely to be generated during construction and operation of the proposed development.
- An assessment of the impacts of this traffic on the safety, capacity and efficiency of the surrounding road network, including modelling of key intersections, which should include but not be limited to:
    - Brabham Drive/Great Western Highway
    - Great Western Highway/New Estate Road
    - Huntingwood Drive/Brabham Drive
- Detailed plans of any proposed road upgrades.
- Access, including detailed consideration of various access options and justification for the proposed location of the main access points.
- Details of the availability of non-car travel modes and measures to encourage greater use of these travel modes.
- Details of car parking.

4. Noise and Vibration

- Identify and provide a quantitative assessment of the main noise generating sources and activities at all stages of construction, and any noise sources during operation, including traffic noise. Outline measures to minimise and mitigate the potential noise impacts on surrounding occupiers of land.

→ *Relevant Policies and Guidelines:*

- *NSW Industrial Noise Policy (EPA)*
- *Interim Construction Noise Guideline (DECC)*

5. Drainage, Sediment, Erosion and Dust controls

- Detail measures and procedures to minimise and manage the generation and off-site transmission of sediment, dust and fine particles.
- Address the development's stormwater and drainage infrastructure requirements in accordance with previously approved stormwater management strategies and controls.

→ *Relevant Policies and Guidelines:*

- *Managing Urban Stormwater – Soils & Construction Volume 1 2004*

	(Landcom)
	• *Approved Methods for the Modelling and Assessment of Air Pollutants in NSW (EPA)*
	• *Blacktown City Council's Engineering Guide for Development (Current Version).*
	• *Blacktown City Council's DCP Part R – Water Sensitive Urban Design & Integrated Water Cycle Management.*
	
	6. Flooding
	An assessment of any flood risk on site in consideration of any relevant provisions of the NSW Floodplain Development Manual (2005) including the potential effects of an increase in rainfall intensity.
	
	7. Design and Visual
	• A detailed description (including photomontages and building elevations) of the measures to be implemented to:
	  • demonstrate consistency with any relevant development control plan for the area
	  • determine building design and proposed mechanisms to ensure design excellence, heights, set-backs, floor space ratios
	  • manage the bulk and scale of the buildings
	  • minimise the visual impact of the project
	• A detailed landscaping, lighting and signage strategy for the project.
	
	8. Ecologically Sustainable Development (ESD)
	• Detail how ESD principles (as defined in clause 7(4) of Schedule 2 of the Environmental Planning and Assessment Regulation 2000 will be incorporated in the design, construction and ongoing operation phases of the development.
	• Include a description of the measures that would be implemented to minimise consumption of resources, water and energy, including an Integrated Water Management Plan which details any proposed alternative water supplies, proposed end uses of potable and non-potable water, and water sensitive urban design.
	
	9. Servicing and Waste
	Identify, quantify and classify the likely waste streams to be generated during construction and operation and describe the measures to be implemented to manage, reuse, recycle and safely dispose of this waste. Identify appropriate servicing arrangements (including but not limited to, waste management, loading zones, mechanical plant) for the site.
	
	10. Hazards
	A description of the proposed storage, use and management of any hazardous materials and measures to be implemented to manage hazards and risks associated with the storage.

Plans and Documents	The EIS must include all relevant plans, architectural drawings, diagrams and relevant documentation required under Schedule 1 of the *Environmental Planning and Assessment Regulation 2000*. Provide these as part of the EIS rather than as separate documents. In addition, the EIS must include the following: • Architectural drawings; • Site Survey Plan, showing existing levels, location and height of existing and adjacent structures/buildings and boundaries; • Site Analysis Plan; • Stormwater Concept Plan, including easements and associated overland

	flow paths; • View Analysis/Photomontages; • Landscape Plan and landscape design statement; • Preliminary Construction Management Plan, inclusive of a Preliminary Construction Traffic Management Plan; • Geotechnical; • Fire Safety Strategy and BCA statement; • Accessibility Report; and • Sample board and schedule of materials and finishes.
Consultation	During the preparation of the EIS, you must consult with the relevant local, State or Commonwealth Government authorities, service providers, community groups and affected landowners. In particular you must consult with: • Blacktown City Council; • Roads and Maritime Services • Sydney Water • Integral Energy • Western Sydney Parklands Trust • Local Heritage Group/s, if relevant. The EIS must describe the consultation process and the issues raised, and identify where the design of the development has been amended in response to these issues. Where amendments have not been made to address an issue, a short explanation should be provided
Further consultation after 2 years	If you do not lodge a development application and EIS for the development within 2 years of the issue date of these DGRs, you must consult further with the Director General in relation to the preparation of the EIS.
References	The assessment of the key issues listed above must take into account relevant guidelines, policies, and plans as identified. While not exhaustive, the following attachment contains a list of some of the guidelines, policies, and plans that may be relevant to the environmental assessment of this proposal.