



TransGrid Regional Sites Upgrade
and Development
Tamworth Depot
Transport Impact Assessment

transportation planning, design and delivery

TransGrid Regional Sites Upgrade and Development

Tamworth Depot

Transport Impact Assessment

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Table of Contents

1. Introduction	1
1.1 Background	1
1.2 Purpose of this Report	1
1.3 References	1
2. Existing Conditions	2
2.1 Road Network	3
2.2 Traffic Volumes	5
2.3 Intersection Operation	6
2.4 Public Transport	7
2.5 Site Layout	8
2.6 Car Parking	9
3. Development Proposal	10
3.1 Land Uses	10
3.2 Car Parking	11
3.3 Pedestrian Facilities	11
4. Car Parking	12
4.1 Car Parking Requirements	12
4.2 Adequacy of Parking Supply	12
4.3 Car Parking Layout Review	12
4.4 Vehicle Swept Paths	12
4.5 Roads and Maritime Services	13
5. Traffic Impact Assessment	14
5.1 Traffic Generation	14
5.2 Traffic Impact	14
6. Conclusion	15

Appendices

- A: Survey Results
- B: SIDRA INTERSECTION Results
- C: Design Advice and Swept Paths
- D: RMS Response

Figures

Figure 2.1:	Subject Site and Its Environs	2
Figure 2.2:	Goonoo Goonoo Road (looking north adjacent to the site)	3
Figure 2.3:	Goonoo Goonoo Road (looking south adjacent to the site)	3
Figure 2.4:	Greg Norman Drive (looking west from the site)	4
Figure 2.5:	The Ringers Road (looking west)	4
Figure 2.6:	South Tamworth Rural Lands Master Plan Study Area	5
Figure 2.7:	AM Peak Hour Traffic Volumes	6
Figure 2.8:	PM Peak Hour Traffic Volumes	6
Figure 2.9:	Site Layout and Substation	8
Figure 2.10:	Central Access Driveway (looking east)	9
Figure 2.11:	Southern Access Driveway (looking east)	9
Figure 3.1:	Proposed Site Layout	10

Tables

Table 2.1:	SIDRA INTERSECTION Level of Service Criteria	7
Table 2.2:	Existing Operating Conditions	7
Table 2.3:	Public Transport Provision	7
Table 3.1:	Development Schedule	10
Table 4.1:	DCP Car Parking Requirements	12
Table 5.1:	Traffic Generation Estimates	14

1. Introduction

1.1 Background

The Tamworth regional depot has undergone a Masterplanning process and requires on-site alterations to include an amalgamation of the administration buildings and operational workshops into two new buildings to be located in the southern section of the site. The Tamworth depot is located at 470-506 Goonoo Goonoo Road in the southern suburbs of Tamworth.

GTA Consultants was commissioned by peckvonhartel in January 2012 to provide input into the Master Plan and undertake a transport impact assessment for the proposal.

1.2 Purpose of this Report

This report sets out an assessment of the anticipated transport implications of the proposed development, including consideration of the following:

- i existing traffic and parking conditions surrounding the site
- ii suitability of the proposed parking in terms of supply (quantum) and layout
- iii service vehicle requirements
- iv pedestrian and bicycle requirements
- v the traffic generating characteristics of the proposed alterations
- vi suitability of the proposed access arrangements for the site
- vii the transport impact of the development proposal on the surrounding road network.

1.3 References

In preparing this report, reference has been made to the following:

- an inspection of the site and its surrounds carried out on Thursday 15 March and Friday 16 March 2012
- Tamworth Regional Council Development Control Plan (DCP) 2010
- Australian Standard, Parking Facilities, Part 1: Off-Street Car Parking AS 2890.1:2004
- Australian Standard, Parking Facilities, Part 2: Off-Street Commercial Vehicle Facilities AS 2890.2:2002
- Australian Standard, Parking Facilities, Part 6: Off-Street Parking for People with Disabilities AS 2890.6:2009
- traffic and car parking surveys undertaken by GTA Consultants as referenced in the context of this report
- plans for the proposed development prepared by pvh, Drawing Number SC-000-001, 010, 050-052, 101, Revision C dated 17/07/12
- other documents and data as referenced in this report.

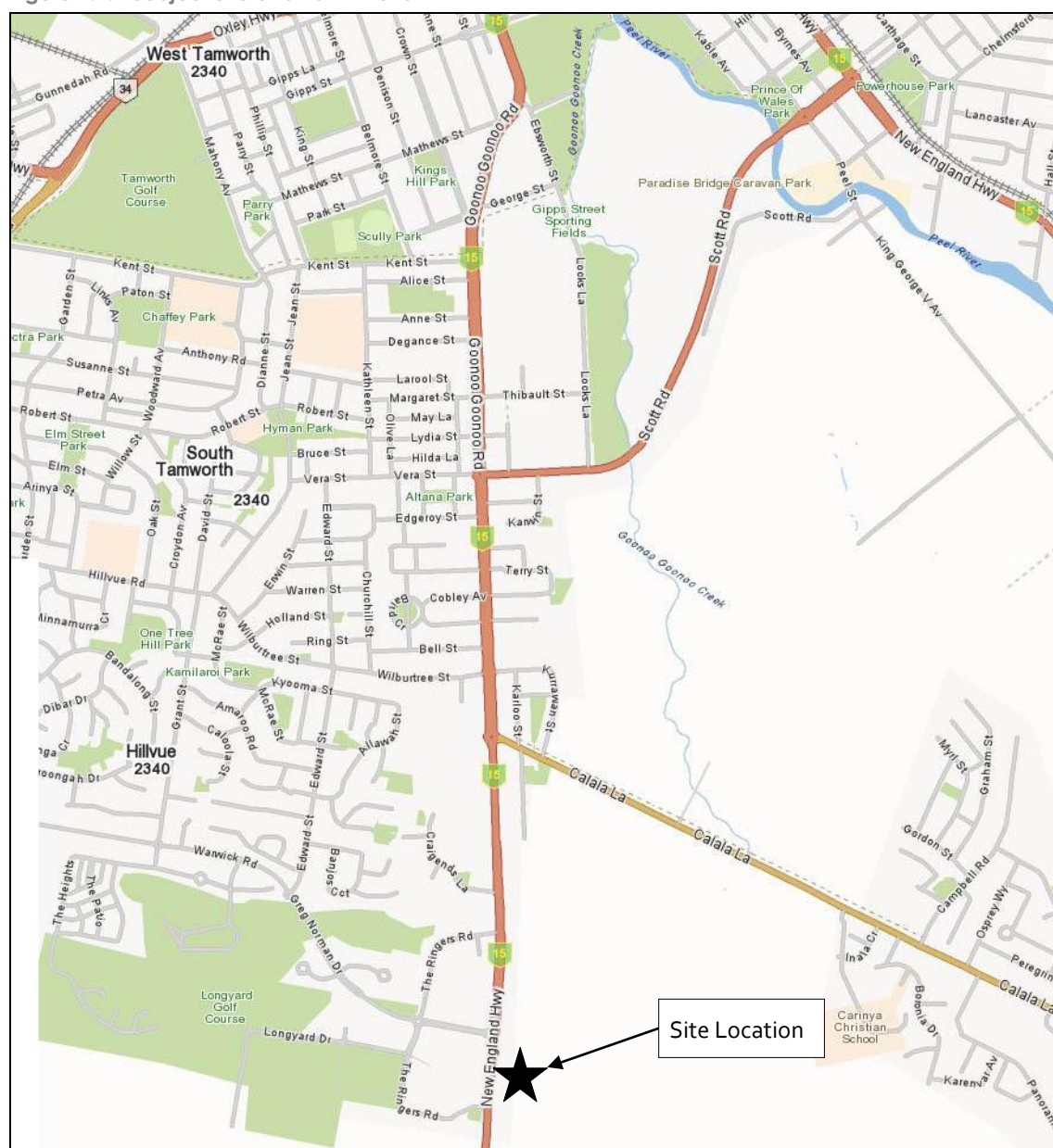
2. Existing Conditions

The subject site is the Tamworth TransGrid depot located at 470-506 Goonoo Goonoo Road, Tamworth, approximately 5 kilometres south of Tamworth City Centre. The site of approximately 28,000m² has a frontage of 400 metres to Goonoo Goonoo Road and currently has a land use classification as RU4 – Rural Small Holdings.

The surrounding properties predominantly include rural, residential and commercial uses.

The location of the subject site and its surrounding environs is shown in Figure 2.1.

Figure 2.1: Subject Site and Its Environs



2.1 Road Network

2.1.1 Adjoining Roads

Goonoo Goonoo Road

Goonoo Goonoo Road forms part of the New England Highway and is classified as a State Road. It is a two-way road aligned in a north-south direction adjacent to western boundary of the site and configured with a 4-lane, 15 metre wide carriageway.

Informal kerbside parking is permitted off the carriageway and the area in the vicinity of the site is currently used for intermittent truck parking and vehicles using the park facilities on the western side of Goonoo Road.

Goonoo Goonoo Road is shown in Figure 2.2 and Figure 2.3 and carries approximately 7, 500 vehicles per day¹.

Figure 2.2: Goonoo Goonoo Road
(looking north adjacent to the site)



Figure 2.3: Goonoo Goonoo Road
(looking south adjacent to the site)



Greg Norman Drive

Greg Norman Drive functions as a collector/ local road and in the vicinity of the site is aligned in an east-west direction. It is a two-way road configured with a 2-lane, 10 metre wide carriageway, set within a 20 metre wide road reserve (approx). Greg Norman Drive provides access to a mix of commercial/ (Tamworth Regional Entertainment Centre, Longyard Golf Course) and residential development west of the site.

Greg Norman Drive is shown in Figure 2.4.

The Ringers Road

The Ringers Road functions as a collector/ local road and in the vicinity of the site is aligned in an east-west direction, turning to travel north-south further west to link with Greg Norman Drive. It is a two-way road configured with a 2-lane, 15 metre wide carriageway, set within a 25 metre wide road reserve (approx). The Ringers Road provides access to commercial/ residential development west of the site, in particular the Australian Equine and Livestock Events Centre (AELEC).

¹ Based on the peak hour traffic counts undertaken by GTA in March 2012 and assuming a peak-to-daily ratio of 8% for arterial roads and 10% for local roads.

The Ringers Road is shown in Figure 2.5.

**Figure 2.4: Greg Norman Drive
(looking west from the site)**



**Figure 2.5: The Ringers Road
(looking west)**



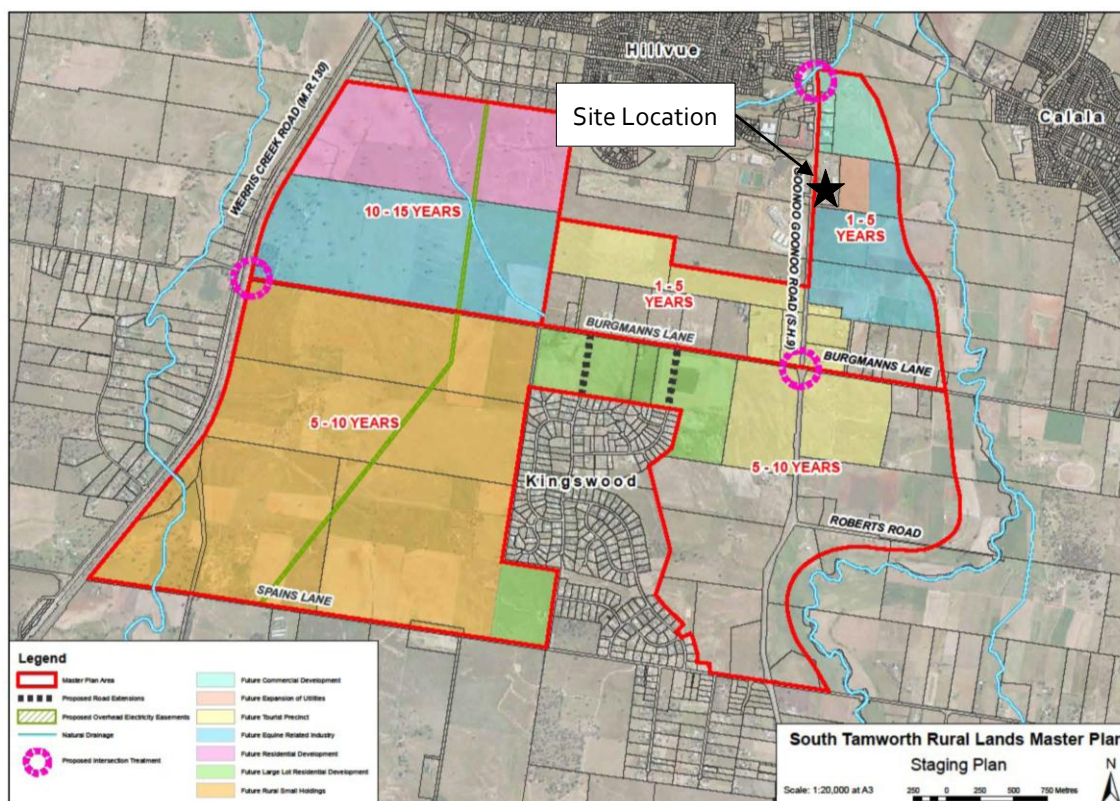
2.1.2 Draft South Tamworth Rural Lands Master Plan

The Tamworth Regional Development Strategy was prepared by Tamworth Regional Council in 2008 to provide for the future direction and management of the land uses within the Tamworth region (TRC, 2012). The Strategy identified the South Tamworth lands as having potential commercial, tourist, equine related and residential development.

The development would be undertaken in stages over a period of 15 years. This includes the first stage which would contain commercial development together with tourism and equine related activity development. Stage 2 would include large lot residential, tourist related, primary production small holding and other rural land development with Stage 2 containing residential development and equine related activity.

The South Tamworth Rural Lands study area is shown in Figure 2.6 while also illustrating the location of the Tamworth TransGrid depot within the study area.

Figure 2.6: South Tamworth Rural Lands Master Plan Study Area



2.1.3 Surrounding Intersections

The following intersections currently exist in the vicinity of the site:

- Goonoo Goonoo Road/ Greg Norman Drive (unsignalised)
- Goonoo Goonoo Road/ The Ringers Road (roundabout).

2.2 Traffic Volumes

GTA Consultants undertook traffic movement counts at the roundabout controlled intersection of Goonoo Goonoo Road/ The Ringers Road on Thursday 15 March and Friday 16 March 2012 during the following peak periods:

- 7:15am and 9:00am
- 4:00pm and 5:45pm.

The AM and PM peak hour traffic volumes are summarised in Figure 2.7 and Figure 2.8, with full results contained in Appendix A.

Figure 2.7: AM Peak Hour Traffic Volumes

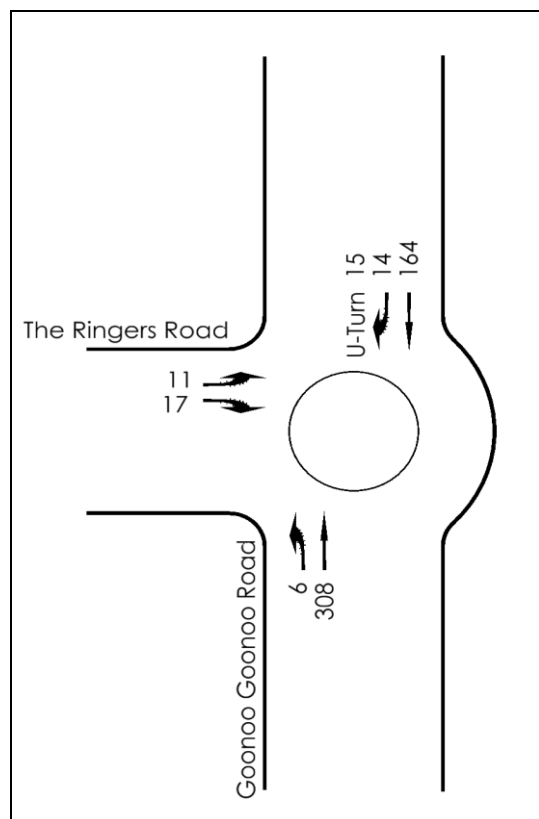
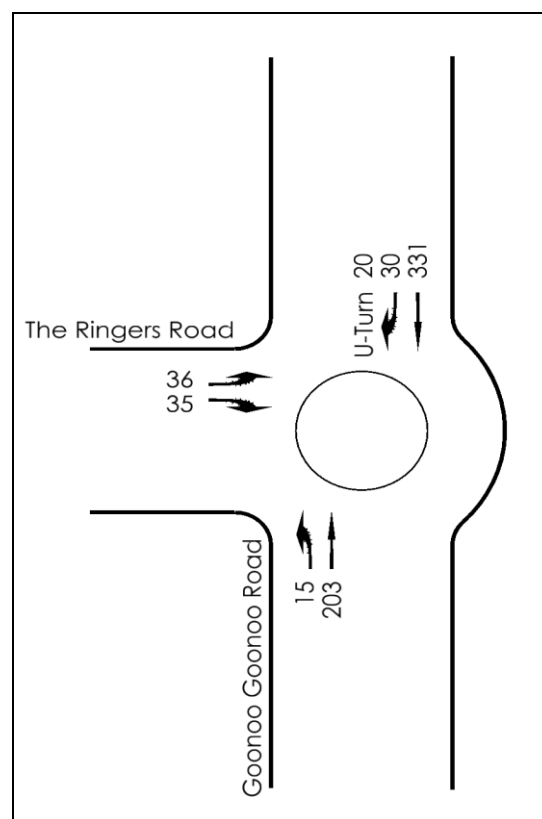


Figure 2.8: PM Peak Hour Traffic Volumes



2.3 Intersection Operation

The operation of the key intersections within the study area have been assessed using SIDRA INTERSECTION², a computer based modelling package which calculates intersection performance.

The commonly used measure of intersection performance, as defined by the RMS, is vehicle delay. SIDRA INTERSECTION determines the average delay that vehicles encounter and provides a measure of the level of service.

Table 2.1 shows the criteria that SIDRA INTERSECTION adopts in assessing the level of service.

² Program used under license from Akcelik & Associates Pty Ltd.

Table 2.1: SIDRA INTERSECTION Level of Service Criteria

Level of Service (LOS)	Average Delay per vehicle (secs/veh)	Traffic Signals, Roundabout	Give Way & Stop Sign
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	Near capacity	Near capacity, accident study required
E	57 to 70	At capacity, at signals incidents will cause excessive delays	At capacity, requires other control mode
F	Greater than 70	Extra capacity required	Extreme delay, major treatment required

Table 2.2 presents a summary of the existing operation of the intersection, with full results presented in Appendix B of this report.

Table 2.2: Existing Operating Conditions

Intersection	Peak	Leg	Degree of Saturation (DOS)	Average Delay (sec)	95th Percentile Queue (m)	Level of Service (LOS)
Goonoo Goonoo Road/ The Ringers Road	AM	South	0.12	7	4	A
		North	0.10	8	3	A
		West	0.02	6	0	A
	PM	South	0.09	8	3	A
		North	0.21	8	7	A
		West	0.03	6	1	A

On the basis of the above assessment, the intersection of Goonoo Goonoo Road/ The Ringers Road currently operates satisfactorily with minimal queues and delays on all approaches.

It is also noted that the site generates approximately 15-20 vehicle movements (two-way) during each respective peak hour with site access provided via Goonoo Goonoo Road (left-in/ left-out) only.

2.4 Public Transport

A review of the public transport available in the vicinity of the site is summarised in Table 2.3.

Table 2.3: Public Transport Provision

Service	Route #	Route Description	Location of Stop	Distance to Nearest Stop	Frequency On/Off peak
Bus	435	East Tamworth CBD to South Tamworth	The Ringers Road (north)	700m	30 minutes peak / hourly off peak

2.5 Site Layout

The TransGrid Tamworth site provides three access driveways from Goonoo Goonoo Road along the western boundary of the site with a security controlled gates at each location set well back (minimum 40m) from the adjacent roadway. The main substation is located north of the administration/ workshop area and each access driveway travelling in an east-west direction providing access as follows:

- northern driveway provides two-way access to the substation
- central driveway provides access to the workshop, rear staff parking and truck storage sheds; linking via an internal circulation road with the on-site uses to the south
- southern driveway provides access to the workshop and rear parking and internal links as above.

On-site parking is provided within an at-grade car park fronting Goonoo Goonoo Road for administration uses and visitors, while workshop staff parking/ truck storage is located internal to the site, within the security controlled area.

The site layout and adjacent substation are illustrated in Figure 2.9 with on-site photos shown in Figure 2.10 and Figure 2.11.

Figure 2.9: Site Layout and Substation



Source: pvh Architects and Google Earth

**Figure 2.10: Central Access Driveway
(looking east)**



**Figure 2.11: Southern Access Driveway
(looking east)**



2.6 Car Parking

GTA Consultants compiled an inventory of on-site car parking at the time of the site inspection. The total formalised car parking supply is approximately 54 spaces, with these spaces shared between TransGrid staff, visitors and accessible spaces. The on-site parking facilities are generally open during normal business hours (7:00am-5:00pm), however staff are provided security access outside of these times.

The administration building car park fronting Goonoo Goonoo Road is largely unused on a typical weekday with the rear workshop car park accommodating TransGrid staff parking.

It is understood that TransGrid has a fleet of vehicles for use by staff, with many of these stored on-site overnight. Other vehicles may be regularly located off-site at project-specific locations. The combined total of these vehicles is approximately 130 vehicles, varying in size from cars up to 19m semi-trailers.

3. Development Proposal

3.1 Land Uses

The Master Plan proposal includes the construction of a purpose-built facility to amalgamate all on-site uses into two new buildings, to be located in the southern section of the site. This will enable efficient use of the site to accommodate administration uses, office space and other ancillary uses together with workshop, storage facilities and chemical store. The proposal is intended to accommodate a total of approximately 64 staff and represents a minor change on existing staff numbers.

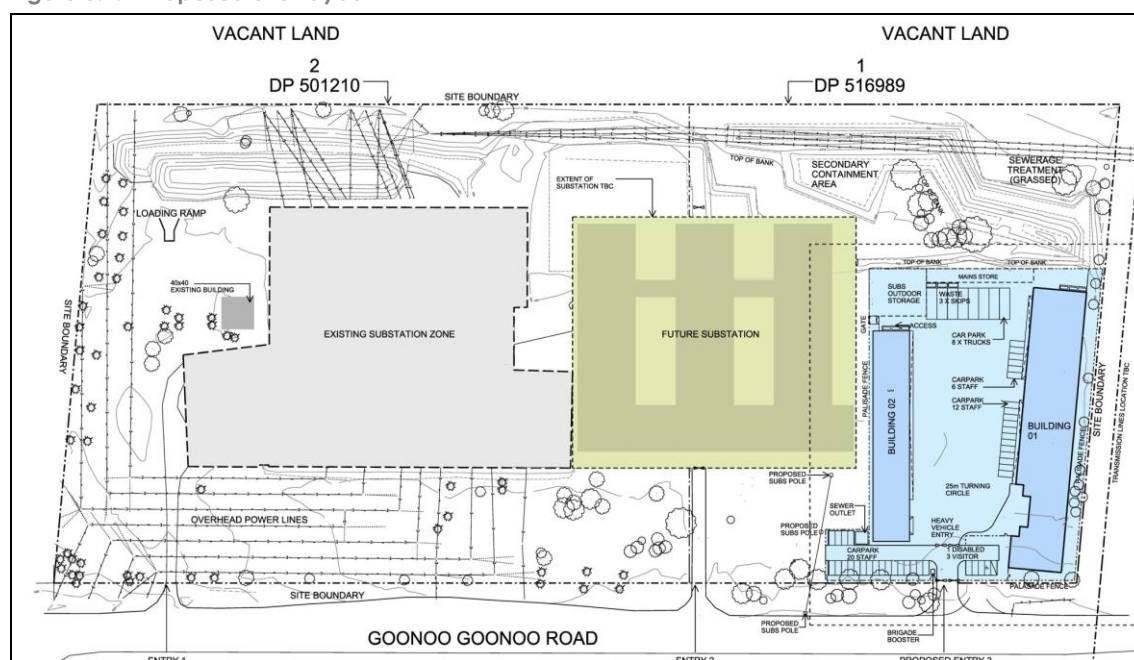
It is also understood that all existing on-site buildings will be demolished with the area occupied by the current depot buildings to be occupied by a new substation after demolition, noting that works associated with the future relocation of the substation do not form part of this proposal. The existing driveway access arrangements will remain unchanged, with the exception of the southern driveway (driveway 3) relocation to the north by approximately 13m.

A breakdown of the proposed TransGrid Tamworth on-site uses is shown in Table 3.1 with the proposed site layout shown in Figure 3.1.

Table 3.1: Development Schedule

Building	Use	Size
Building 01	Administration, Office, Workshops	2,099m ²
Building 02	Oil Processing, Battery Storage, Chemical Store (incl. wash bay)	1,125m ²
Total		3,224m²

Figure 3.1: Proposed Site Layout



3.2 Car Parking

The proposed development will provide a total of 26 car parking spaces for use by all staff and visitors, with an additional 18 'back of house' workshop staff car parking spaces. The breakdown of car parking spaces, including truck parking areas includes the following:

- 40 staff car spaces (incl. 18 in back of house)
- 1 accessible car space
- 3 visitor car spaces
- 8 truck spaces (external to buildings)³

3.3 Pedestrian Facilities

Pedestrian facilities within the site will link all on-site parking with the main structures, particularly the car park adjacent to the western boundary of the site. Internal corridors will also link the uses within Building 01.

³ Does not include truck storage capacity within building 1 or building 2

4. Car Parking

4.1 Car Parking Requirements

The car parking requirements for different development types are set out in Tamworth Regional Development Control Plan 2010. A review of the car parking rates and the floor area schedule results in a DCP parking requirement for the proposed development as summarised in Table 4.1 below.

Table 4.1: DCP Car Parking Requirements

Description	Use	Size	DCP Parking Rate	DCP Parking Requirement
Administration Building, Workshop, Storage	Industrial	3,224m ²	1 space / 75m ² GFA	44 spaces

Based on the above, the proposed Master Plan is required to provide 44 car parking spaces.

4.2 Adequacy of Parking Supply

The Master Plan proposes a total of 44 on-site car parking spaces (incl. 18 'back of house') for use by staff and visitors alike and therefore complies with Tamworth Regional Council's DCP car parking requirements.

4.3 Car Parking Layout Review

The car park layout and on-site circulation has been reviewed against the requirements of the Tamworth Regional Council's DCP 2010 and the Australian Standard for Off Street Car Parking (AS2890.1:2004, AS2890.2:2002 and AS2890.6:2009). This assessment included a review of the following:

- bay and aisle width
- adjacent structures
- turnaround facilities
- circulation roads and aisles
- site access driveway
- internal sightlines and pedestrian safety
- parking for persons with disabilities.

This review indicates that the proposed site access driveway, internal site layout and car parking layout is expected to operate satisfactorily, subject to the adoption of recommendations discussed below and shown graphically at Appendix C.

4.4 Vehicle Swept Paths

GTA Consultants has completed several swept path assessments in order to inform the design and extent of the proposed on-site works. Swept paths of 19m articulated vehicles together with 85th and 99th percentile cars illustrate the design requirements for the site access driveway, internal circulation roads and car park layout for both cars and heavy vehicles.

It is noted that the car park along the western boundary of the site should also include a turnaround bay and the accessible car space include a centrally located bollard within the adjacent shared space to allow for appropriate access.

The vehicle swept paths are included in this report as Appendix C.

4.5 Roads and Maritime Services

Consultation with the Roads and Maritime Services (RMS) has also formed part of the proposal and specifically relates to the site access arrangements via Goonoo Goonoo Road. A number of responses have been received with the latest email response included in this report as Appendix D.

Given that the proposal includes minimal change to the overall site access arrangements, the RMS response includes no major objections to the proposed access arrangements, including the relocation of the southern driveway (driveway 3) north by 10-15m. Site access arrangements are to remain open at each location for left-in/ left-out movements.

5. Traffic Impact Assessment

5.1 Traffic Generation

5.1.1 Design Rates

Traffic generation estimates for the proposed development have been sourced from the *Guide to Traffic Generating Developments* (RMS, 2002).

Estimates of peak hour and daily traffic volumes resulting from the proposal are set out in Table 5.1.

Table 5.1: Traffic Generation Estimates

Land Use Type	Area (GFA)	Traffic Generation Rate	Total Vehicle Trips/Peak Hour	Total Vehicle Trips/Day
Industry - Factories	3,224m ²	1 veh trips/100m ² (peak hour) 5 veh trips/100m ² (daily)	33	162

Table 5.1 indicates that the site could potentially generate up to 33 vehicle movements in a peak hour, with 162 vehicle movements over the entire day.

5.2 Traffic Impact

Given that Goonoo Goonoo Road has been designed to accommodate an increase in traffic volumes as detailed in the Draft South Tamworth Rural Lands Master Plan, the traffic generated by the proposed development is similar to that generated by the existing on-site uses and could not be expected to compromise the safety or function of the surrounding road network.

6. Conclusion

Based on the analysis and discussions presented within this report, the following conclusions are made:

- i The proposed Master Plan includes demolishing the on-site buildings and constructing a purpose built facility to amalgamate all on-site uses into two new buildings. This includes new administration uses, office space, workshop and storage facilities; with a total building area of approximately 3,224m².
- ii The Master Plan generates a Tamworth Regional Council DCP parking requirement of 43 spaces.
- iii The proposed supply of 44 car spaces (incl. 26 spaces for staff and visitors) is satisfactory and in accordance with the DCP requirement.
- iv The proposed access driveways will remain largely unchanged. The southern driveway (driveway 3) is to be relocated north by 10m-15m. The driveway has been designed to accommodate vehicles up to 19m articulated vehicles.
- v The proposed parking layout is consistent with the dimensional requirements as set out in the DCP and Australian Standard for Off Street Car Parking (AS2890.1:2004 and AS2890.6:2009).
- vi The proposed heavy vehicle parking layout, site access driveway and internal circulation is consistent with the dimensional requirements as set out in the DCP and Australian Standard for Off Street Commercial Vehicle parking (AS2890.2:2002).
- vii The proposed on-site uses are expected to generate up to 33 and 162 vehicle movements in any peak hour and daily respectively, representing a similar volume as under existing conditions.
- viii Consultation with the RMS has resulted in a response to the proposed access arrangements via Goonoo Goonoo Road raising no objections.
- ix The Draft South Tamworth Rural Lands Master Plan aims to expand future commercial, tourist, equine related and residential development within the local area surrounding the site.
- x There is adequate capacity in the surrounding road network to cater for the traffic generated by the proposal.

Appendix A

Survey Results

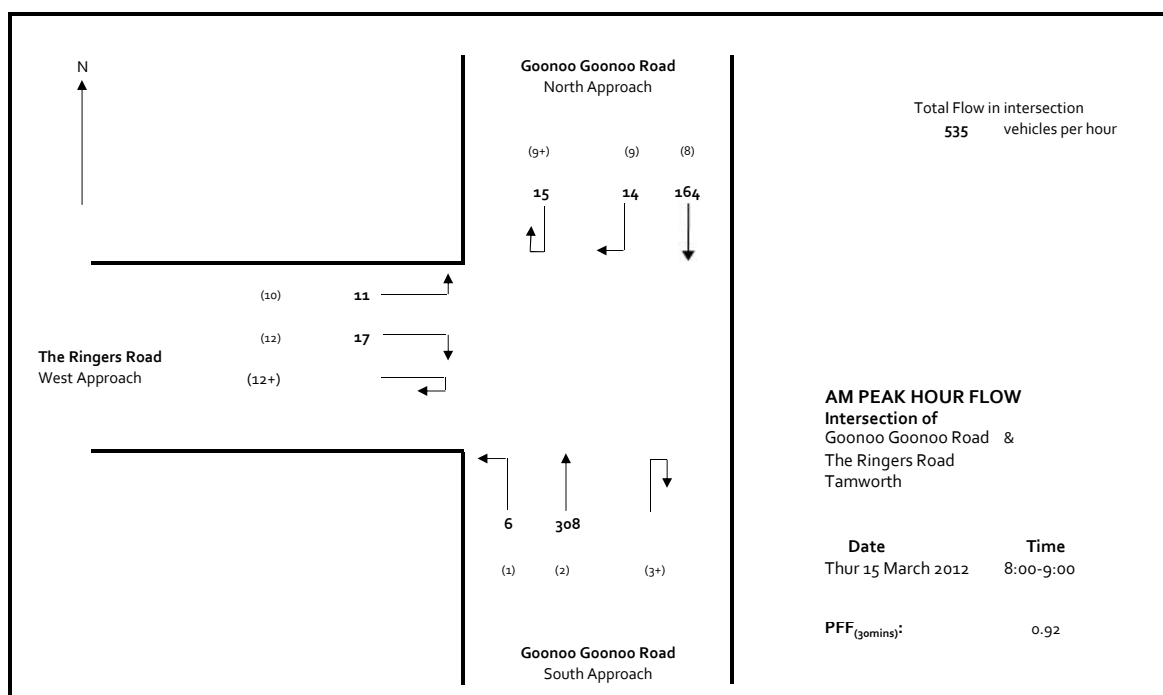
TURNING MOVEMENT SURVEY

Intersection of Goonoo Goonoo Road & The Ringers Road, Tamworth

Date: Thur 15 March 2012

15 minute Data										
Time	Movement									Total
	Goonoo Goonoo Road South Approach			Goonoo Goonoo Road North Approach			The Ringers Road West Approach			
	Left	Through	U Turn	Through	Right	U Turn	Left	Right	U Turn	
	1	2	3+	8	9	9+	10	12	12+	
6:00-6:15										
6:15-6:30										
6:30-6:45										
6:45-7:00										
7:00-7:15	0	0		0	0	0	0	0		
7:15-7:30	1	36		31	3	4	2	2		79
7:30-7:45	3	44		28	5	3	3	7		93
7:45-8:00	1	60		32	3	3	0	4		103
8:00-8:15	2	80		27	2	3	2	3		119
8:15-8:30	1	73		44	3	5	3	5		134
8:30-8:45	1	90		44	8	5	3	6		157
8:45-9:00	2	65		49	1	2	3	3		125
9:00-9:15										
9:15-9:30										
9:30-9:45										
9:45-10:00										
Total	11	448	0	255	25	25	16	30	0	810

Hourly flows										
Time	Movement									Total
	Goonoo Goonoo Road South Approach			Goonoo Goonoo Road North Approach			The Ringers Road West Approach			
	Left 1	Through 2	U Turn 3+	Through 8	Right 9	U Turn 9+	Left 10	Right 12	U Turn 12+	
6:00-7:00										
6:15-7:15										
6:30-7:30										
6:45-7:45										
7:00-8:00	5	140		91	11	10	5	13		275
7:15-8:15	7	220		118	13	13	7	16		394
7:30-8:30	7	257		131	13	14	8	19		449
7:45-8:45	5	303		147	16	16	8	18		513
8:00-9:00	6	308		164	14	15	11	17		535
8:15-9:15										
8:30-9:30										
8:45-9:45										
9:00-10:00										
Peak Hour	6	308		164	14	15	11	17		535



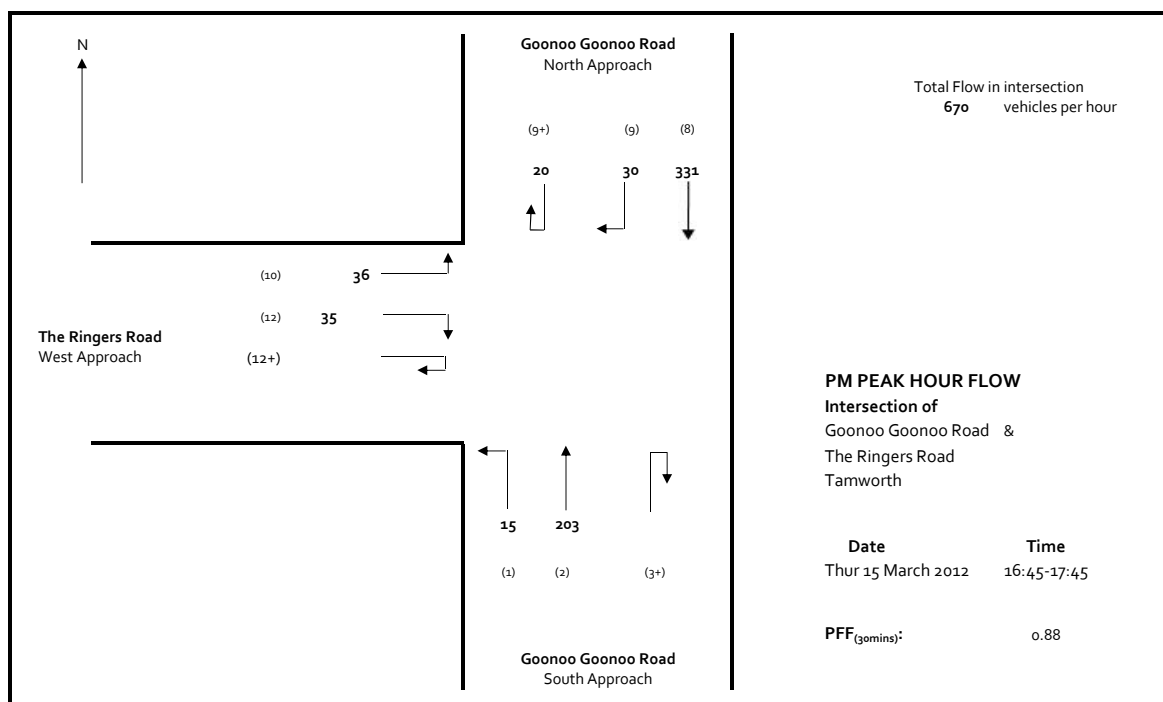
TURNING MOVEMENT SURVEY

Intersection of Goonoo Goonoo Road & The Ringers Road, Tamworth

Date: Thur 15 March 2012

15 minute Data										
Time	Movement									Total
	Goonoo Goonoo Road South Approach			Goonoo Goonoo Road North Approach			The Ringers Road West Approach			
	Left	Through	U Turn	Through	Right	U Turn	Left	Right	U Turn	
	1	2	3+	8	9	9+	10	12	12+	
15:00-15:15										
15:15-15:30										
15:30-15:45	0	0		0	0	0	0	0		
15:45-16:00	3	49		66	2	8	7	7		142
16:00-16:15	3	47		57	2	7	2	4		122
16:15-16:30	2	47		62	7	4	6	7		135
16:30-16:45	3	56		51	6	5	5	8		134
16:45-17:00	4	53		59	7	5	6	8		142
17:00-17:15	4	50		67	8	4	6	7		146
17:15-17:30	5	34		79	11	3	12	14		158
17:30-17:45	2	66		126	4	8	12	6		224
17:45-18:00	1	33		54	7	3	4	4		106
18:00-18:15										
18:15-18:30										
18:30-18:45										
18:45-19:00										
Total	27	435	0	621	54	47	60	65	0	1309

Hourly flows										
Time	Movement									Total
	Goonoo Goonoo Road South Approach			Goonoo Goonoo Road North Approach			The Ringers Road West Approach			
	Left 1	Through 2	U Turn 3+	Through 8	Right 9	U Turn 9+	Left 10	Right 12	U Turn 12+	
15:00-16:00										
15:15-16:15										
15:30-16:30	8	143		185	11	19	15	18		399
15:45-16:45	11	199		236	17	24	20	26		533
16:00-17:00	12	203		229	22	21	19	27		533
16:15-17:15	13	206		239	28	18	23	30		557
16:30-17:30	16	193		256	32	17	29	37		580
16:45-17:45	15	203		331	30	20	36	35		670
17:00-18:00	12	183		326	30	18	34	31		634
17:15-18:15										
17:30-18:30										
17:45-18:45										
18:00-19:00										
Peak Hour	15	203		331	30	20	36	35		670



Appendix B

SIDRA INTERSECTION Results

Appendix B

MOVEMENT SUMMARY

Site: Weekday AM

Goonoo Goonoo Road/ The Ringers Road
Existing Conditions
AM Peak Hour (8:00-9:00)
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	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Goonoo Goonoo Road											
1	L	6	0.0	0.124	8.3	LOS A	0.4	3.1	0.11	0.64	51.5
2	T	324	0.0	0.124	7.4	LOS A	0.5	3.6	0.10	0.53	52.6
3	R	1	0.0	0.124	14.9	LOS B	0.5	3.6	0.10	0.92	47.0
Approach		332	0.0	0.124	7.4	LOS A	0.5	3.6	0.10	0.54	52.5
North: Goonoo Goonoo Road											
8	T	173	0.0	0.103	7.4	LOS A	0.5	3.2	0.09	0.53	52.7
9	R	31	0.0	0.103	13.7	LOS A	0.5	3.2	0.08	0.87	47.6
Approach		203	0.0	0.103	8.3	LOS A	0.5	3.2	0.09	0.58	51.8
West: The Ringers Road											
10	L	12	0.0	0.012	4.4	LOS A	0.0	0.3	0.36	0.47	36.4
12	R	19	0.0	0.016	7.4	LOS A	0.1	0.4	0.34	0.60	34.7
Approach		31	0.0	0.016	6.3	LOS A	0.1	0.4	0.35	0.55	35.3
All Vehicles		565	0.0	0.124	7.7	LOS A	0.5	3.6	0.11	0.55	51.1

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.

Processed: Tuesday, 24 April 2012 10:16:05 AM

SIDRA INTERSECTION 5.1.12.2089

Project: P:\12S1100-1199\12S1135100 - TransGrid Site Upgrade - West Sydney and Tamworth\Modelling

\120423sid-12S1135100 GoonooGoonoo-Ringers Road.sip

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MOVEMENT SUMMARY

Site: Weekday PM

Goonoo Goonoo Road/ The Ringers Road
Existing Conditions
PM Peak Hour (16:45-17:45)
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	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Goonoo Goonoo Road											
1	L	16	0.0	0.090	8.4	LOS A	0.3	2.2	0.14	0.63	51.4
2	T	214	0.0	0.090	7.5	LOS A	0.4	2.6	0.14	0.53	52.3
3	R	1	0.0	0.090	14.9	LOS B	0.4	2.6	0.14	0.90	47.0
Approach		231	0.0	0.090	7.6	LOS A	0.4	2.6	0.14	0.54	52.2
North: Goonoo Goonoo Road											
8	T	348	0.0	0.207	7.4	LOS A	1.0	7.0	0.14	0.52	52.3
9	R	53	0.0	0.207	13.5	LOS A	1.0	7.0	0.13	0.84	47.7
Approach		401	0.0	0.207	8.2	LOS A	1.0	7.0	0.14	0.57	51.7
West: The Ringers Road											
10	L	38	0.0	0.031	3.9	LOS A	0.1	0.8	0.30	0.45	36.6
12	R	38	0.0	0.032	7.2	LOS A	0.1	0.8	0.30	0.59	34.8
Approach		76	0.0	0.032	5.5	LOS A	0.1	0.8	0.30	0.52	35.6
All Vehicles		707	0.0	0.207	7.7	LOS A	1.0	7.0	0.16	0.55	49.8

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.

Processed: Tuesday, 24 April 2012 10:19:47 AM

SIDRA INTERSECTION 5.1.12.2089

Project: P:\12S1100-1199\12S1135100 - TransGrid Site Upgrade - West Sydney and Tamworth\Modelling

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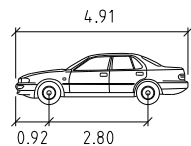
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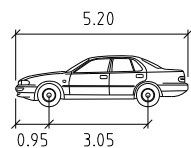
SIDRA
INTERSECTION

Appendix C

Design Advice and Swept Paths



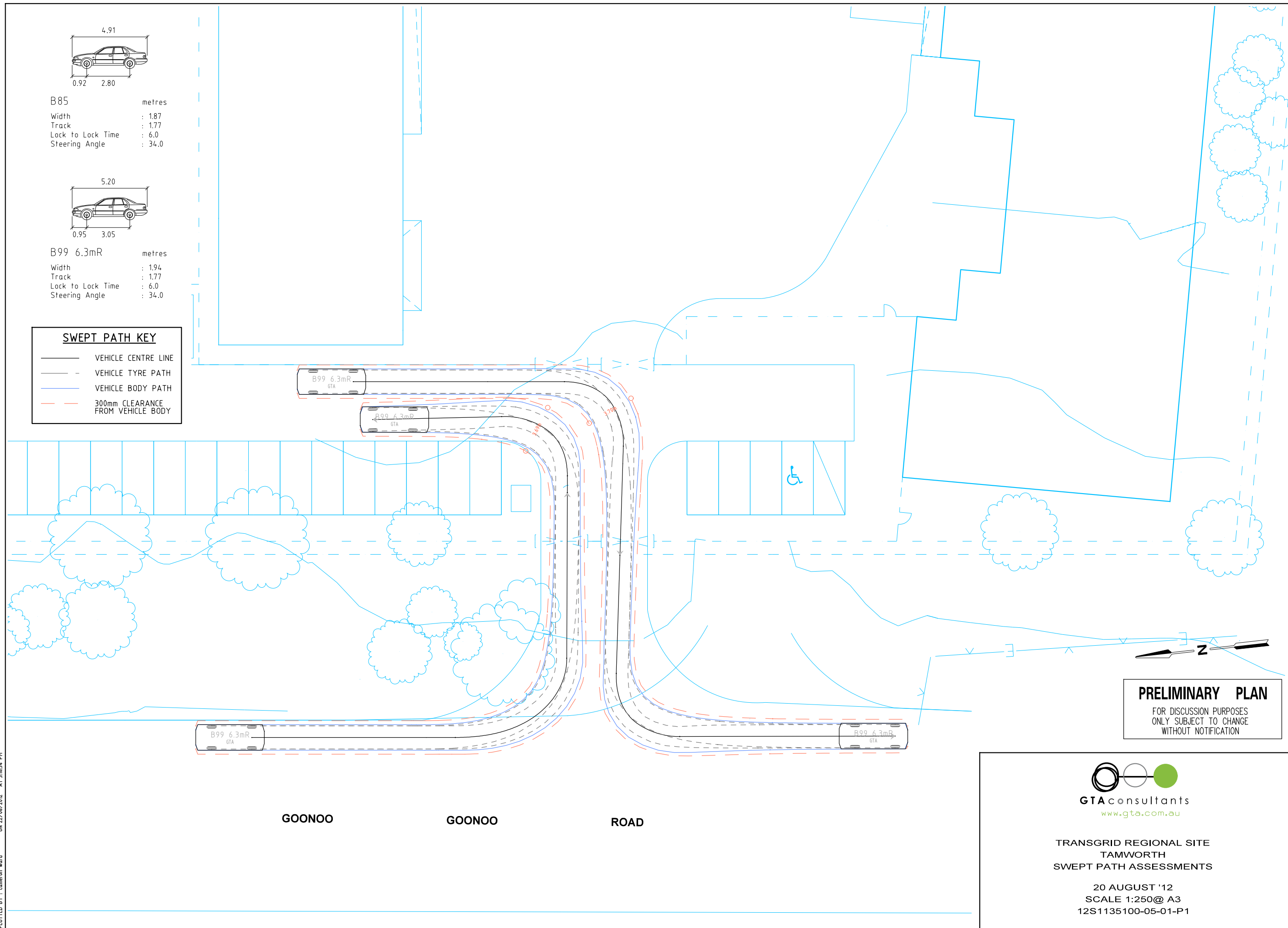
B85 metres
Width : 1.87
Track : 1.77
Lock to Lock Time : 6.0
Steering Angle : 34.0



B99 6.3mR metres
Width : 1.94
Track : 1.77
Lock to Lock Time : 6.0
Steering Angle : 34.0

SWEPT PATH KEY

- VEHICLE CENTRE LINE
- - VEHICLE TYRE PATH
- VEHICLE BODY PATH
- - 300mm CLEARANCE FROM VEHICLE BODY



PRELIMINARY PLAN

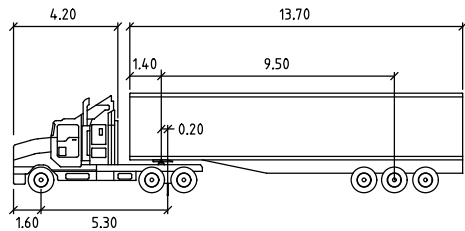
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TRANSGRID REGIONAL SITE
TAMWORTH
SWEPT PATH ASSESSMENTS

20 AUGUST '12
SCALE 1:250@ A3
12S1135100-05-01-P1

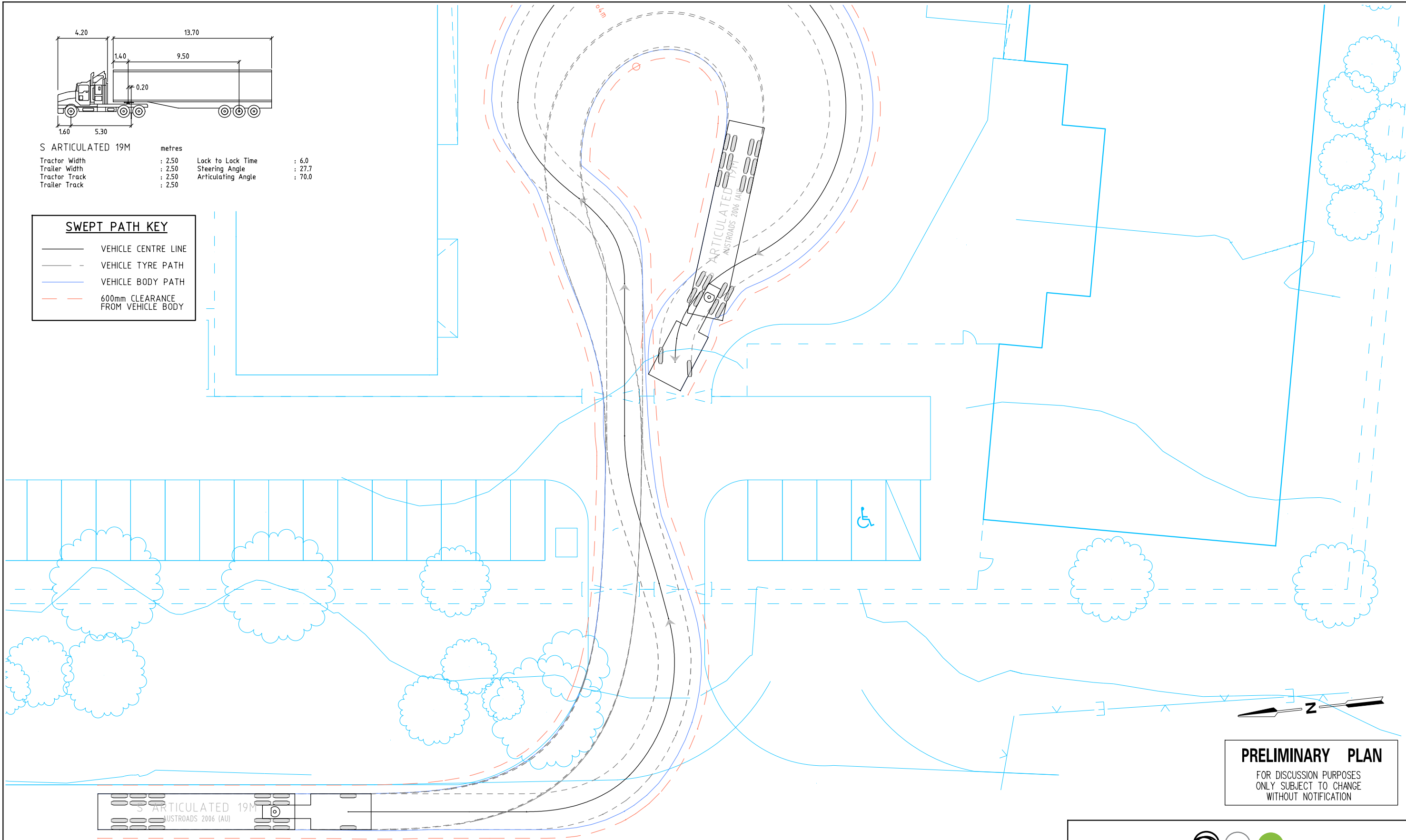


S ARTICULATED 19M

Tractor Width	: 2.50	Lock to Lock Time	: 6.0
Trailer Width	: 2.50	Steering Angle	: 27.7
Tractor Track	: 2.50	Articulating Angle	: 70.0
Trailer Track	: 2.50		

SWEPT PATH KEY

- VEHICLE CENTRE LINE
- - VEHICLE TYRE PATH
- VEHICLE BODY PATH
- - 600mm CLEARANCE FROM VEHICLE BODY



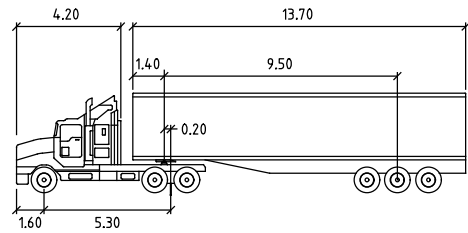
PRELIMINARY PLAN
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TRANSGRID REGIONAL SITE
TAMWORTH
SWEPT PATH ASSESSMENTS

20 AUGUST '12
SCALE 1:250@ A3
12S1135100-05-02-P1

GOONOO GOONOO ROAD

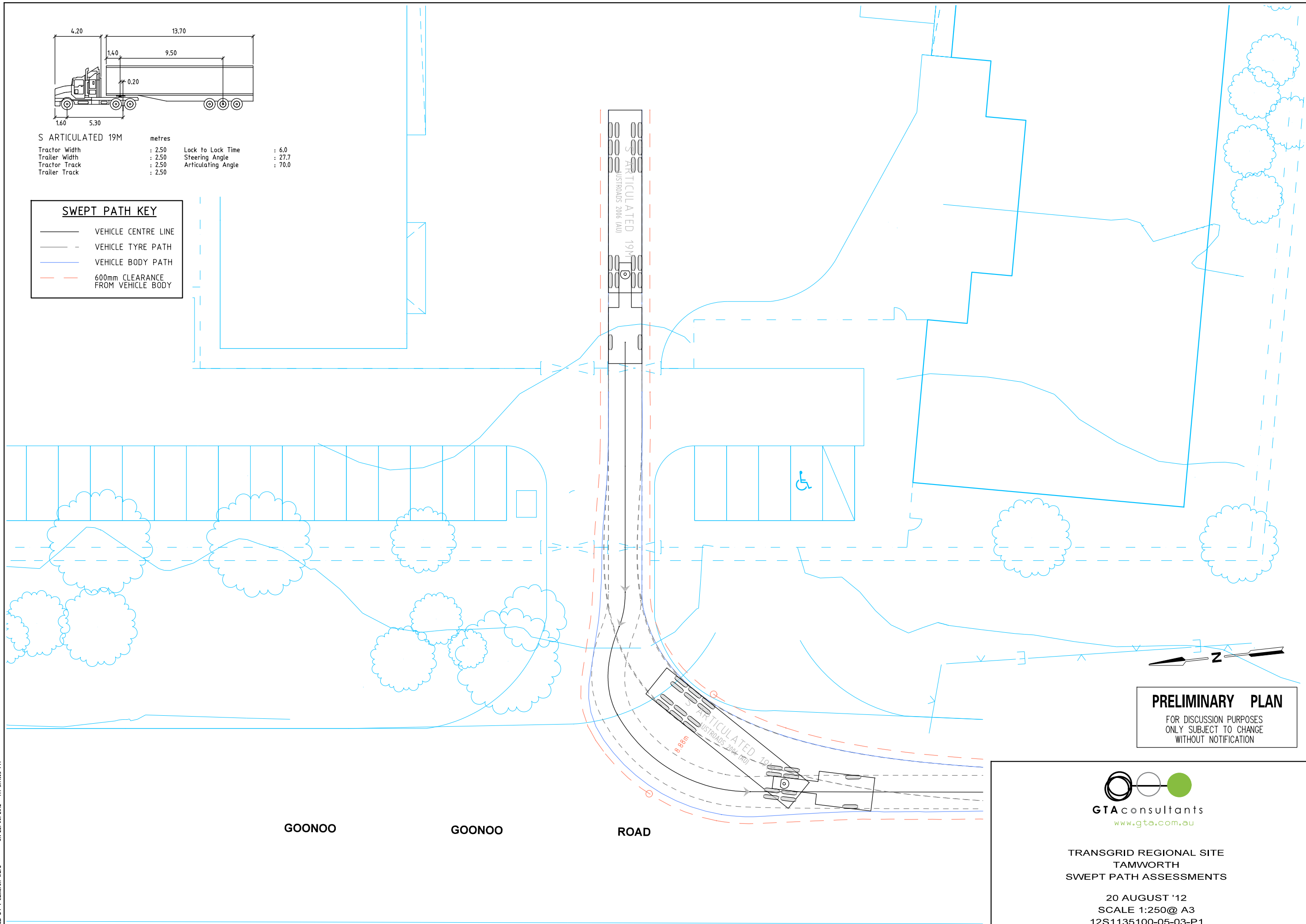


S ARTICULATED 19M

	metres		
Tractor Width	: 2.50	Lock to Lock Time	: 6.0
Trailer Width	: 2.50	Steering Angle	: 27.7
Tractor Track	: 2.50	Articulating Angle	: 70.0
Trailer Track	: 2.50		

SWEPT PATH KEY

- VEHICLE CENTRE LINE
- - VEHICLE TYRE PATH
- VEHICLE BODY PATH
- - 600mm CLEARANCE FROM VEHICLE BODY

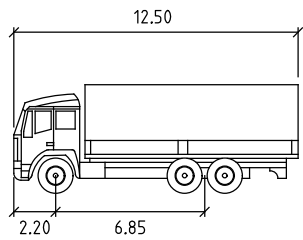


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TRANSGRID REGIONAL SITE
TAMWORTH
SWEPT PATH ASSESSMENTS

20 AUGUST '12
SCALE 1:250@ A3
12S1135100-05-03-P1



SU TRUCK metres
Width : 12.50
Track : 2.50
Lock to Lock Time : 6.0
Steering Angle : 36.6

SWEPT PATH KEY

- VEHICLE CENTRE LINE
- - VEHICLE TYRE PATH
- VEHICLE BODY PATH
- - 600mm CLEARANCE FROM VEHICLE BODY

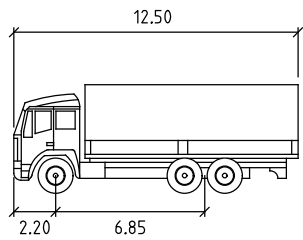


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TRANSGRID REGIONAL SITE
TAMWORTH
SWEPT PATH ASSESSMENTS

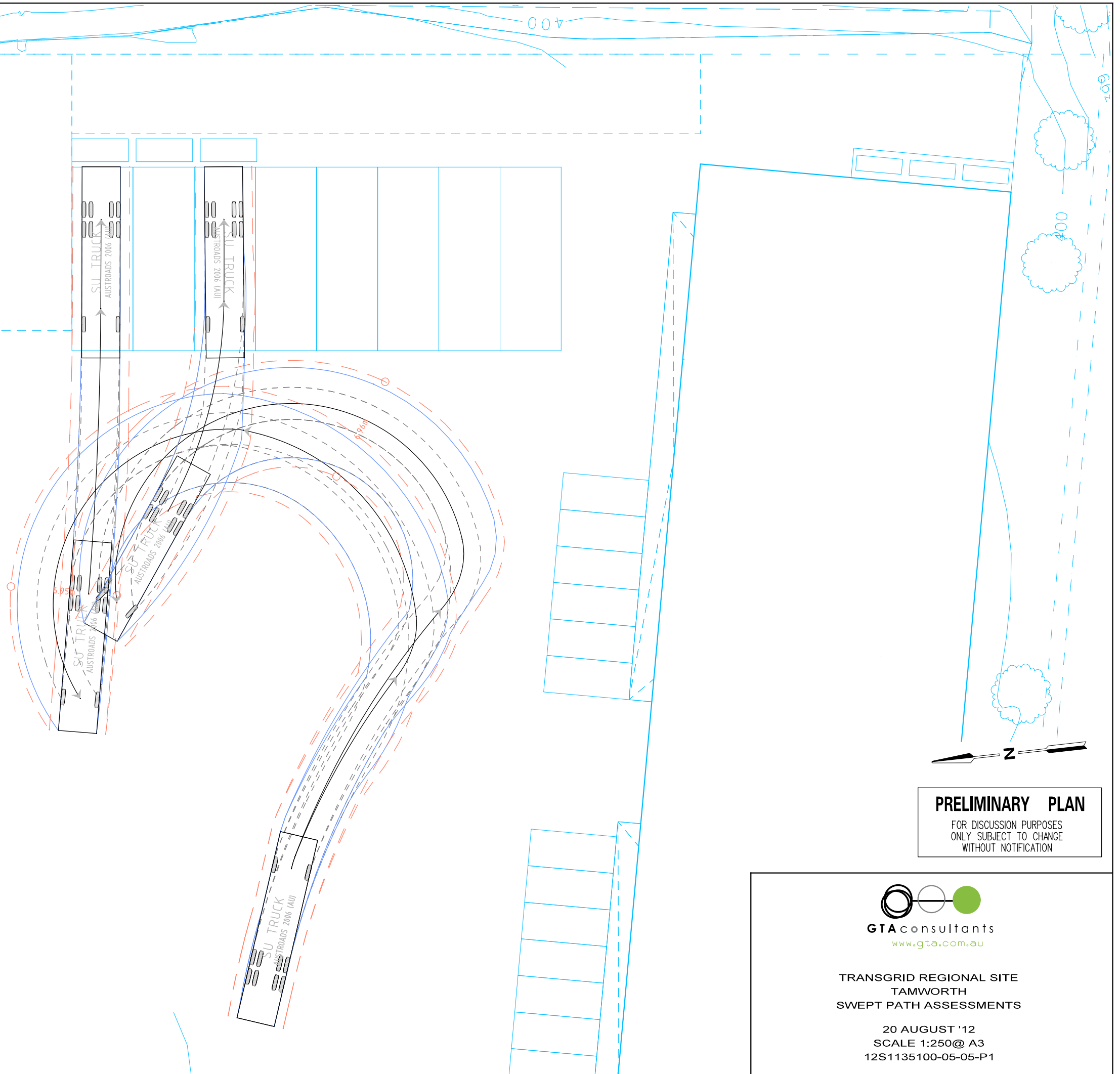
20 AUGUST '12
SCALE 1:250@ A3
12S1135100-05-04-P1



SU TRUCK metres
Width : 2.50
Track : 2.50
Lock to Lock Time : 6.0
Steering Angle : 36.6

SWEPT PATH KEY

- VEHICLE CENTRE LINE
- - VEHICLE TYRE PATH
- VEHICLE BODY PATH
- - 600mm CLEARANCE FROM VEHICLE BODY

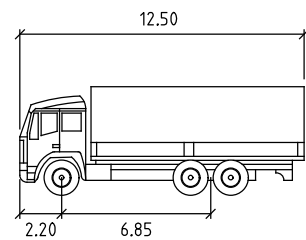


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TRANSGRID REGIONAL SITE
TAMWORTH
SWEPT PATH ASSESSMENTS

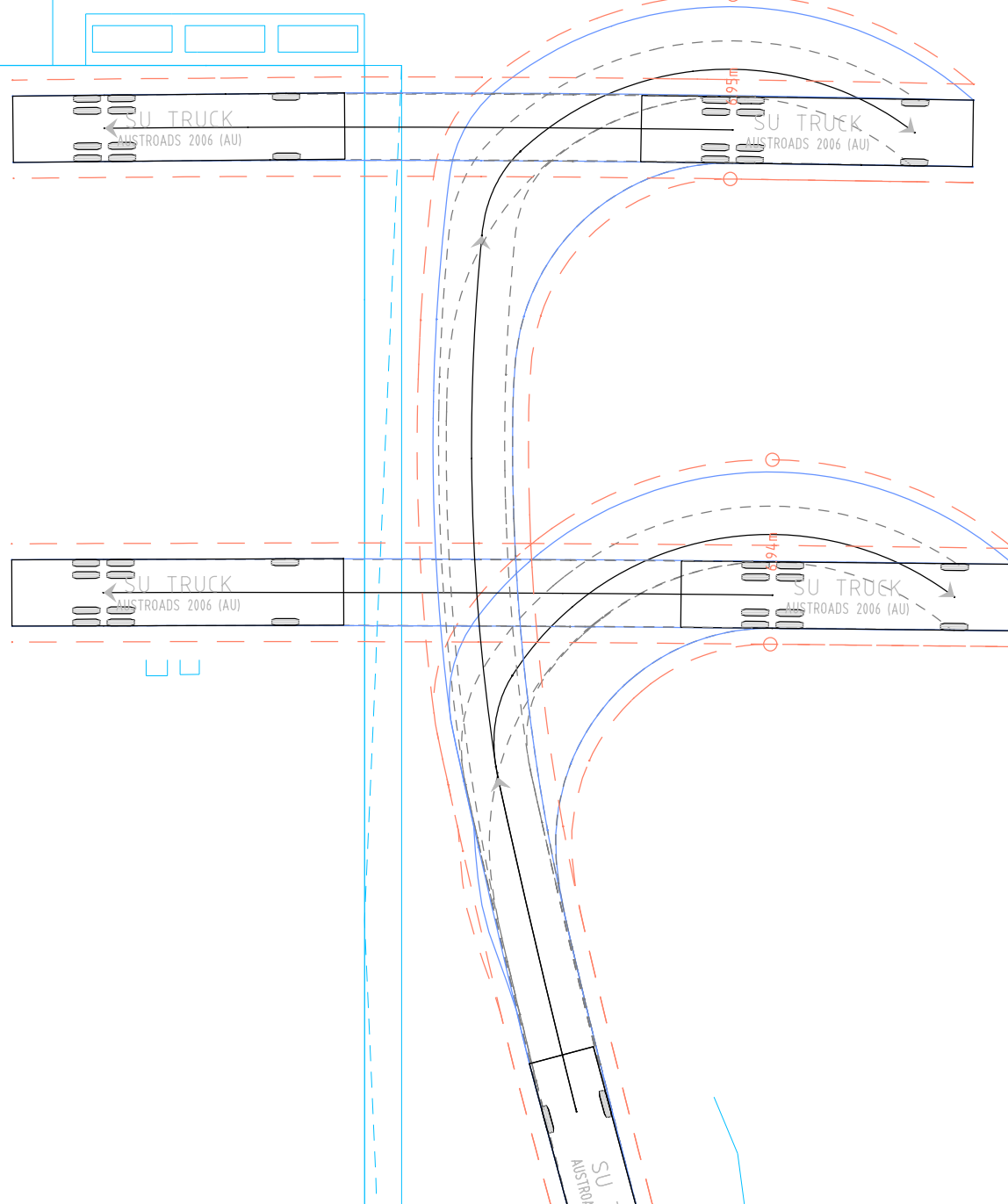
20 AUGUST '12
SCALE 1:250@ A3
12S1135100-05-05-P1



SU TRUCK metres
Width : 12.50
Track : 2.50
Lock to Lock Time : 6.0
Steering Angle : 36.6

SWEPT PATH KEY

- VEHICLE CENTRE LINE
- - VEHICLE TYRE PATH
- VEHICLE BODY PATH
- - 600mm CLEARANCE FROM VEHICLE BODY



PRELIMINARY PLAN

FOR DISCUSSION PURPOSES
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TRANSGRID REGIONAL SITE
TAMWORTH
SWEPT PATH ASSESSMENTS

20 AUGUST '12
SCALE 1:250@ A3
12S1135100-05-06-P1

Appendix D

RMS Response

Rhys Hazell

From: ADAMS Matthew G [Matt.ADAMS@rms.nsw.gov.au] on behalf of Development Northern [development.northern@rms.nsw.gov.au]
Sent: Monday, 13 August 2012 12:06 PM
To: Rhys Hazell
Subject: FW: TransGrid Tamworth

Importance: High

GTAMailSaveLastSavedAsP:\12S1100-1199\12S1135100 - TransGrid Site Upgrade - West Sydney and Tamworth\2 External\Correspondence\120813-FW__TransGrid_Tamworth.msg
GTAMailSaveLastSavedOr13 Aug 2012, 12:26 PM

Rhys,

Further to our brief discussion regarding access from TransGrid's Tamworth Site to the New England Highway (HW9).

RMS has no objection to the retention of the existing southern access for the purpose of Left-in / left-out access only. (See aerial below)

Any proposed upgrade of the site should consider the design of this access point and ensure that it can accommodate the swept path of the largest design vehicle requiring access.

As previously advised, where possible the number of access points from the site onto the New England Highway should be rationalised. Any proposed redevelopment should consider an internal road design servicing one key access point. Additionally, it would be beneficial for the design to allow scope for a future connection from the Southern boundary to the Nearby Ringers Road - New England Highway roundabout.

Please let me know if you have any further questions.

Regards,

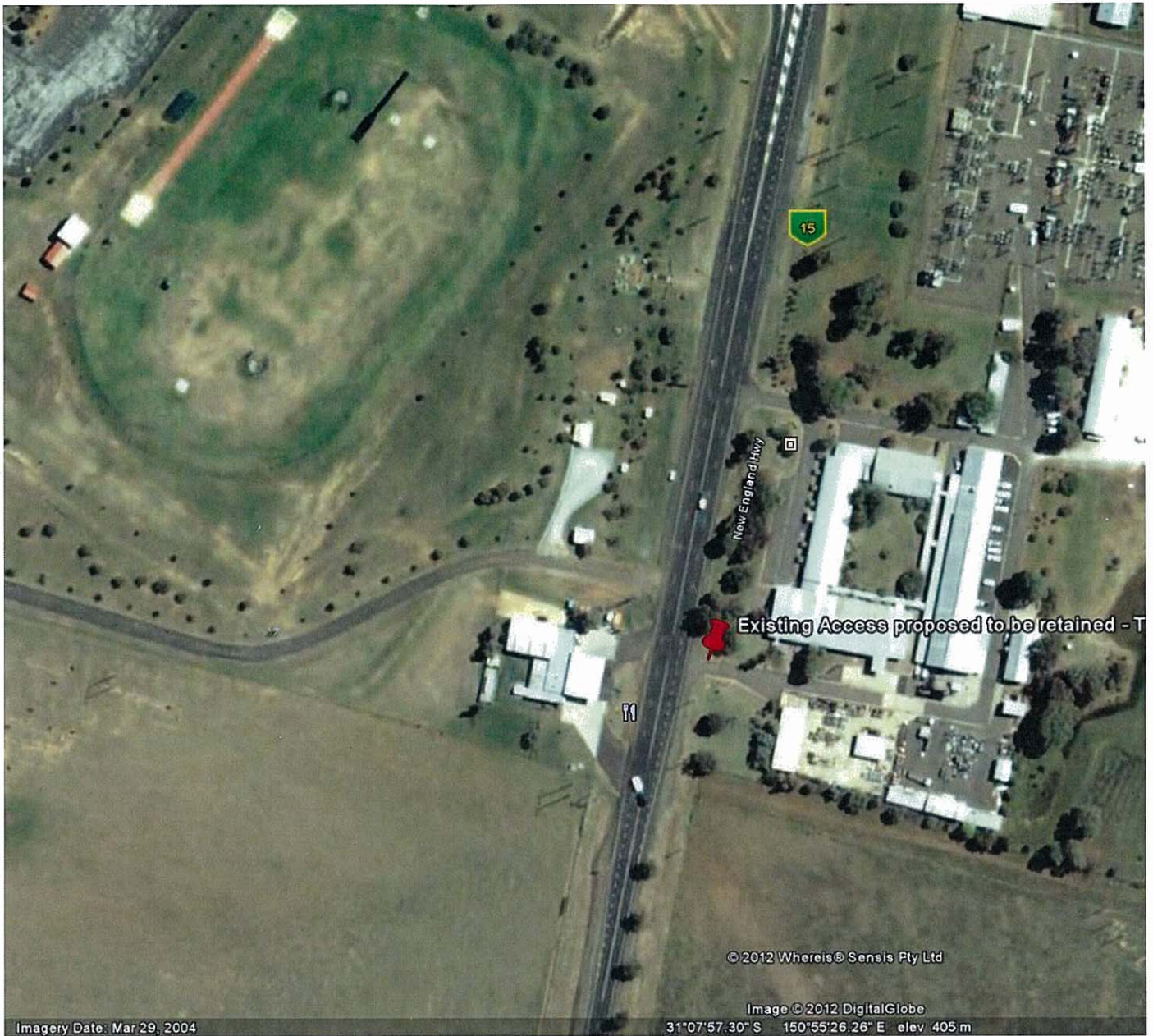
Matt Adams

Development Assessment Officer
RCS Northern RSTM & D | Northern Region
Roads and Maritime Services
T 02 6640 1344 F 02 6640 1304

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