

# Report

## Canberra Sand and Gravel–Traffic Impact Assessment



PREPARED FOR RIVERVIEW PROJECTS

#### DOCUMENT CONTROL

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# 1 Introduction

In November 2021, Calibre was engaged by Riverview to undertake a Transport Impact Assessment (TIA) for the proposed Canberra Sand and Gravel (CSG) site on Belconnen Block 1582. The traffic assessment of this site has been requested to help support the submission of the Development Application (DA) for the proposed relocation works of CSG to this site.

The proposed location for the Canberra Sand and Gravel site is located within Belconnen Block 1582, approximately 12 km Northwest of the Canberra CBD and 6KM West of Belconnen Town Centre. The estate is bounded by Stockdill Drive to the west and Pro Hart Avenue to the North, undeveloped land to the east and south. An aerial image of the planned location for the estate can be seen in Figure 1.1 & Figure 5.1. The proposed CSG site will have access via Stockdill Drive, requiring the construction of a standard rural driveway in accordance with *Roads standards policy (2017) (RD-POL-9)* driveway and a private Gravel road.

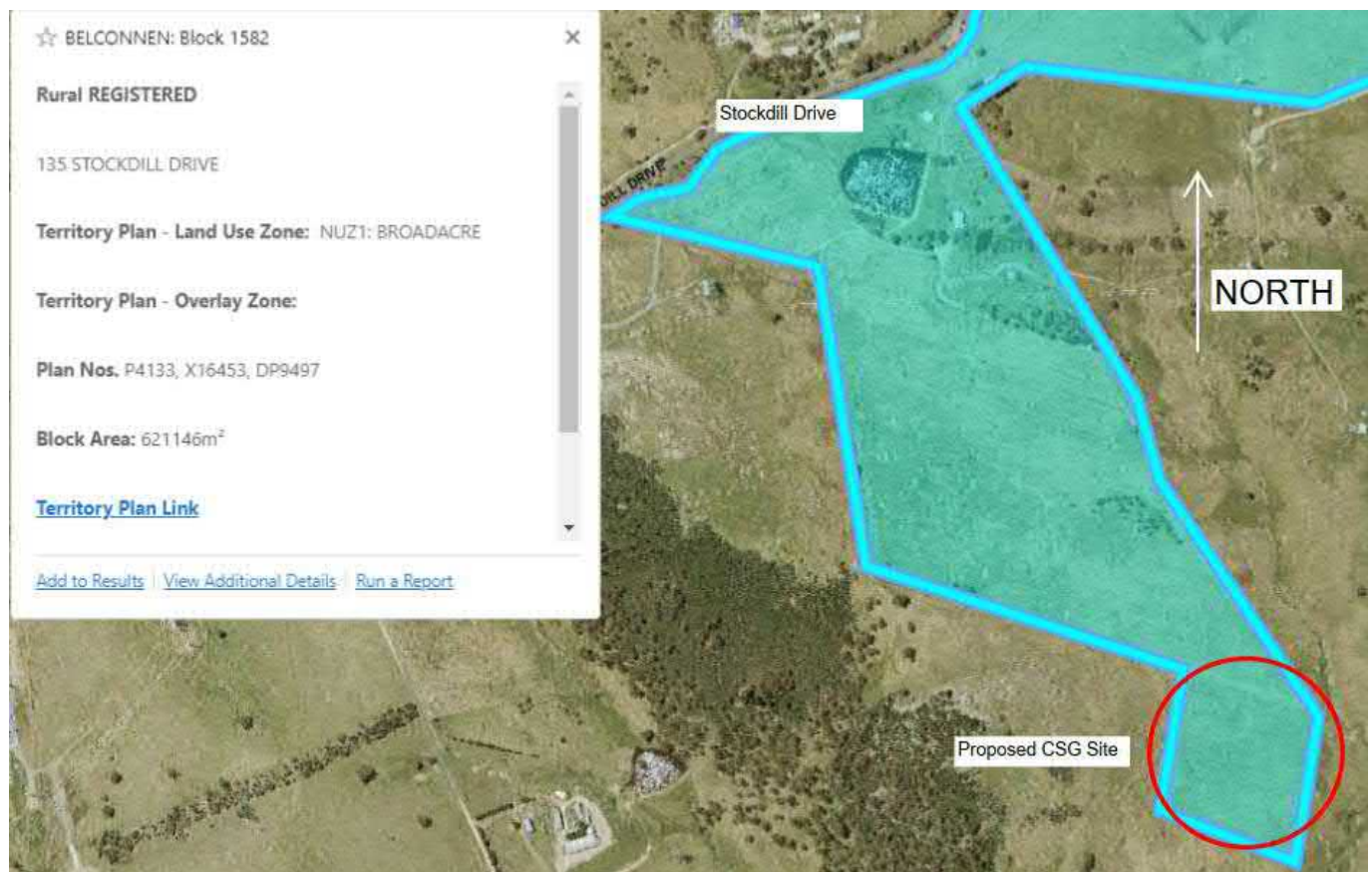


Figure 1.1 Proposed Canberra Sand and Gravel site block

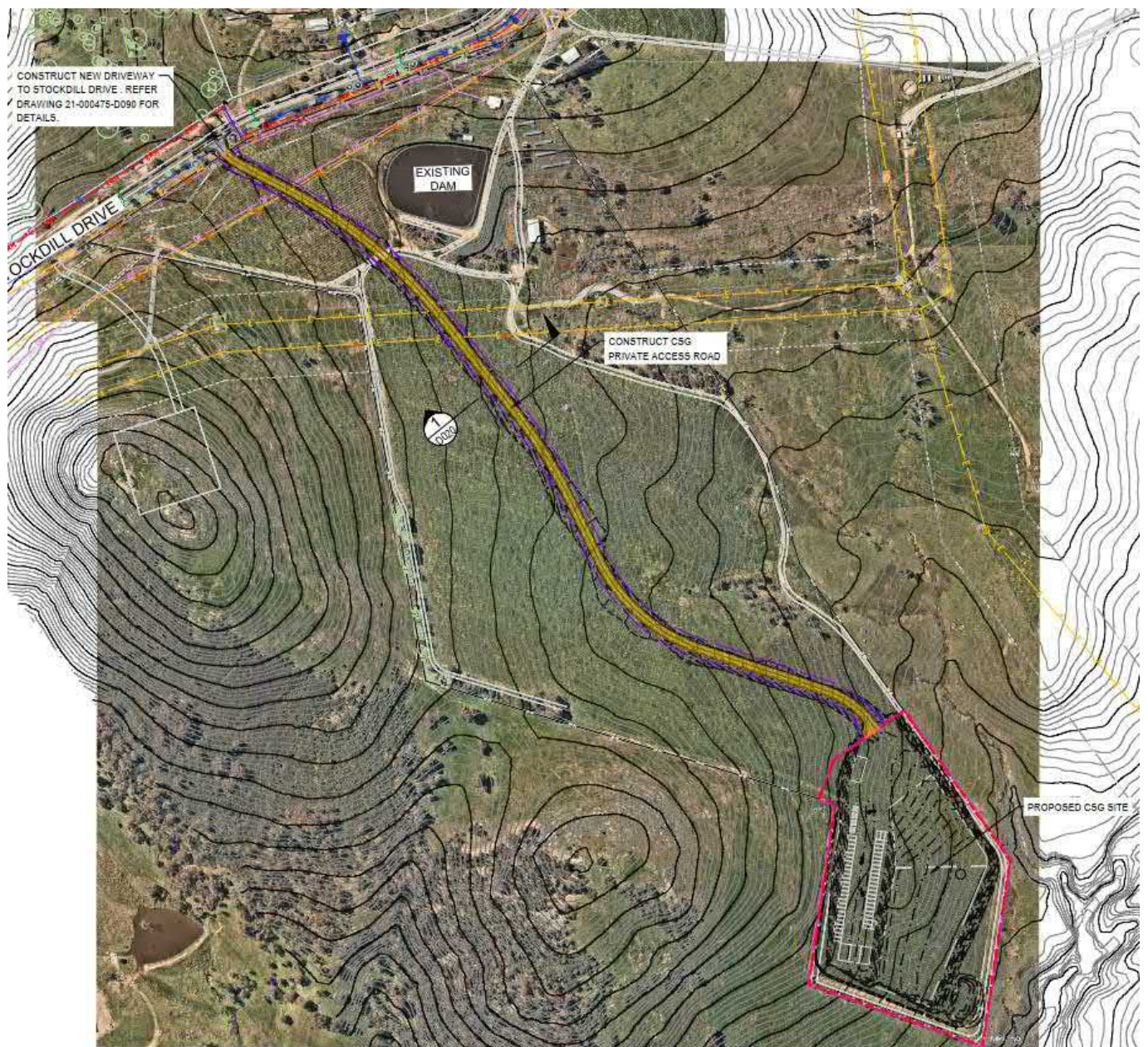


Figure 1.2 Canberra Sand and Gravel Site Plan

## 1.1 Scope of Investigation

This report will provide a detailed analysis of the impact of the proposed Canberra Sand and Gravel relocation project on existing road networks. This will include traffic volume forecasts and performance analysis of key intersections connecting to the project site and the surrounding road network. Traffic values were taken from previous reports produced by Calibre and AECOM for the local Strathnairn and Ginninderry areas. These traffic volumes were used to ensure the road hierarchy for the proposed works was still adequate and to assess the performance of key intersections within and adjacent to the project site. Traffic volume forecasts developed by AECOM have been used to develop the 2041 ultimate traffic scenario and provide traffic values for the modelling of the ultimate scenario.

Key areas for investigation include:

- SIDRA assessment of Pro Hart Avenue and Stockdill Drive intersection to confirm whether its current configuration will be suitable with the traffic from fully occupied Strathnairn and Macnamara EDP1 plus CSG peak traffic (Approximate 5 year timeframe).
- SIDRA assessment of the access road AM and PM peaks using traffic generation numbers from Strathnairn and Macnamara EDP1 and a calculated ultimate scenario including CSG traffic rates.
- Review impacts of CSG volumes on AM and PM traffic volumes, road performance and on road hierarchy.
- Assessment of the site access suitability and supporting commentary
- Traffic assessment of the access road in SIDRA
- Generation of a TIA report to support the DA.

## 2 Existing Conditions

### 2.1 Road Network

There are three roads within close proximity to the proposed CSG site location. These are Stockdill Drive, Pro Hart Avenue and Yoornie Way.

**Stockdill Drive** is currently a rural road that runs North to South between Pro Hart Avenue to the north and the Lower Molonglo Quality Control Centre to the south. Stockdill Drive is a single carriageway 2 lane rural road which is currently 60km/hr from Block 1582 driveway to Pro Hart Avenue and 100-speed limit un-signposted to the south of the site. Stockdill Drive serves as access to the several rural land areas and the Lower Molonglo Water Quality Control Centre. The new connecting road for site access to the CSG site will branch off from Stockdill Drive and head east from the road. Stockdill Drive is identified as a minor collector road in the Strathnairn EDP.

**Pro Hart Avenue** runs from east to west from the edge of the Macnamara development through Strathnairn until it intersects with Drake Brockman Drive in the east which connects to Belconnen and the broader Canberra areas. The cross section of Pro Hart Avenue changes along its length and its carriageway is broken up by multiple islands and crossings including dedicated foot and bike paths to facilitate safer pedestrian and cycle active travel in the Strathnairn Area. Pro Hart Avenue includes multiple roadside parking bays and sidewalks for access to the surrounding residential area. Pro Hart Avenue has a sign posted speed limit of 60km/hr. Pro Hart Avenue will continue further west and is ear marked for duplication as part of proposed upgrades when traffic volumes, performance and safety dictate this to be required.

**Yoornie Way** is a small Local access street that connects directly to Stockdill Drive and indirectly to Pro Hart Avenue through Gullifer Street. Yoornie Way provides residential access to 27 households. Residents can also gain access via Gullifer Street.

## 2.1.1 Key Intersections

### Pro Hart Avenue / Stockdill Drive

The CSG site's new access driveway will be connected to Stockdill Drive and the adjoining Pro Hart Avenue. The Pro Hart Avenue / Stockdill Drive intersection is the key intersection which will see the majority of traffic impact from this new development. The upgrade of Pro Hart Avenue between Lionel Rose St to Spofforth Drive and Drake Brockman Drive are being undertaken by the Ginninderry development as a separate project and these upgrade works will account for the proposed CSG site. As such intersections along these roads are not considered in this TIA. The Pro Hart Avenue / Stockdill Drive Intersection is a give-way controlled T' intersection with dedicated turning lanes from Pro Hart Avenue into Stockdill Drive. There is a Dedicated right turning lane from Stockdill Drive onto Pro Hart Avenue with Pro Hart Avenue having right of way. There is a median strip that runs along this portion of Pro Hart Avenue and a small seagull that can be used to ease the right hand turn onto Pro Hart Avenue from Stockdill Drive. The seagull has storage space of 12m and can hold 2 cars. The dedicated right hand turning lane from Pro Hart Avenue to Stockdill Drive is approximately 85m in length and the dedicated right hand turning lane from Stockdill onto Pro Hart Avenue is approximately 60m in length. The Pro Hart Avenue / Stockdill Drive intersection can be seen in Figure 2.1 below.



Figure 2.1 Pro Hart Avenue / Stockdill Drive Intersection



### Yoornie Way / Stockdill Drive

The Yoornie Way and Stockdill Drive intersection is a Split T Intersection providing access to the residential block to the west of Stockdill Drive and the south of Pro Hart Avenue. The impact on this intersection is expected to be minimal as residents can choose to use Gullifer Street to the west as access to Pro Hart Avenue. The Yoornie Way / Stockdill Drive intersection is a Give way controlled T intersection with Stockdill Drive having priority. Stockdill Drive is the major leg of this intersection with Yoornie Way being the minor leg. There are no dedicated turning lanes or holding points for the Yoornie Way / Stockdill Drive intersection. Yoornie Way can be accessed from either lane of Stockdill Drive. The Yoornie Way / Stockdill Drive intersection can be seen in Figure 2.2 below.



Figure 2.2 Yoornie Way / Stockdill Drive Intersection

## 2.2 Active Travel Network

From review of the current active travel infrastructure within close proximity of the proposed site location, it is noted that there is a dedicated 2.5m path in the western verge of Stockdill Drive. The Macnamara EDP1 Active Travel Plan is included in Figure 2.3 and shows Stockdill Drive is listed as an Existing on road Route and Existing Principal Cycle Training Route. These routes are proposed to be retained and the CSG relocation is expected to have minimal impact on the cycle routes. There is no particular active travel infrastructure associated with these routes as is typical for low volume rural roads.

Pro Hart Avenue is listed as a Principal Cycle Training Routes and a future recreational trail is planned to run adjacent to Pro Hart Avenue.

Along Pro Hart Avenue, there are dedicated cyclist only and shared paths providing access along Pro Hart Avenue and into the surrounding Strathnairn Suburb and connecting to the external active travel network.

The shared paths along Pro hart Avenue crosses the Pro Hart Avenue / Stockdill Drive intersection at an uncontrolled crossing along the Western leg of Pro Hart Avenue, with vehicles having priority. There is a 9m median that pedestrians and cyclists can use to hold at and safely give way to traffic.

The dedicated bike path to the north of the Pro Hart Avenue / Stockdill Drive intersection is continuous and does not impact the intersection. The dedicated Bike Path to the south of the intersection crosses Stockdill Drive at an uncontrolled crossing where vehicles have priority. There is a small 2.5m median that crossing cyclists can use to hold at and give way to traffic.

### 2.3 Macnamara EDP 1 Active Travel Plan

The Ginninderry development has outlined an active travel plan for the Strathnairn, Ginninderry and Macnamara areas which can be seen below in Figure 2.3. The whole drawing has been attached in Appendix E.

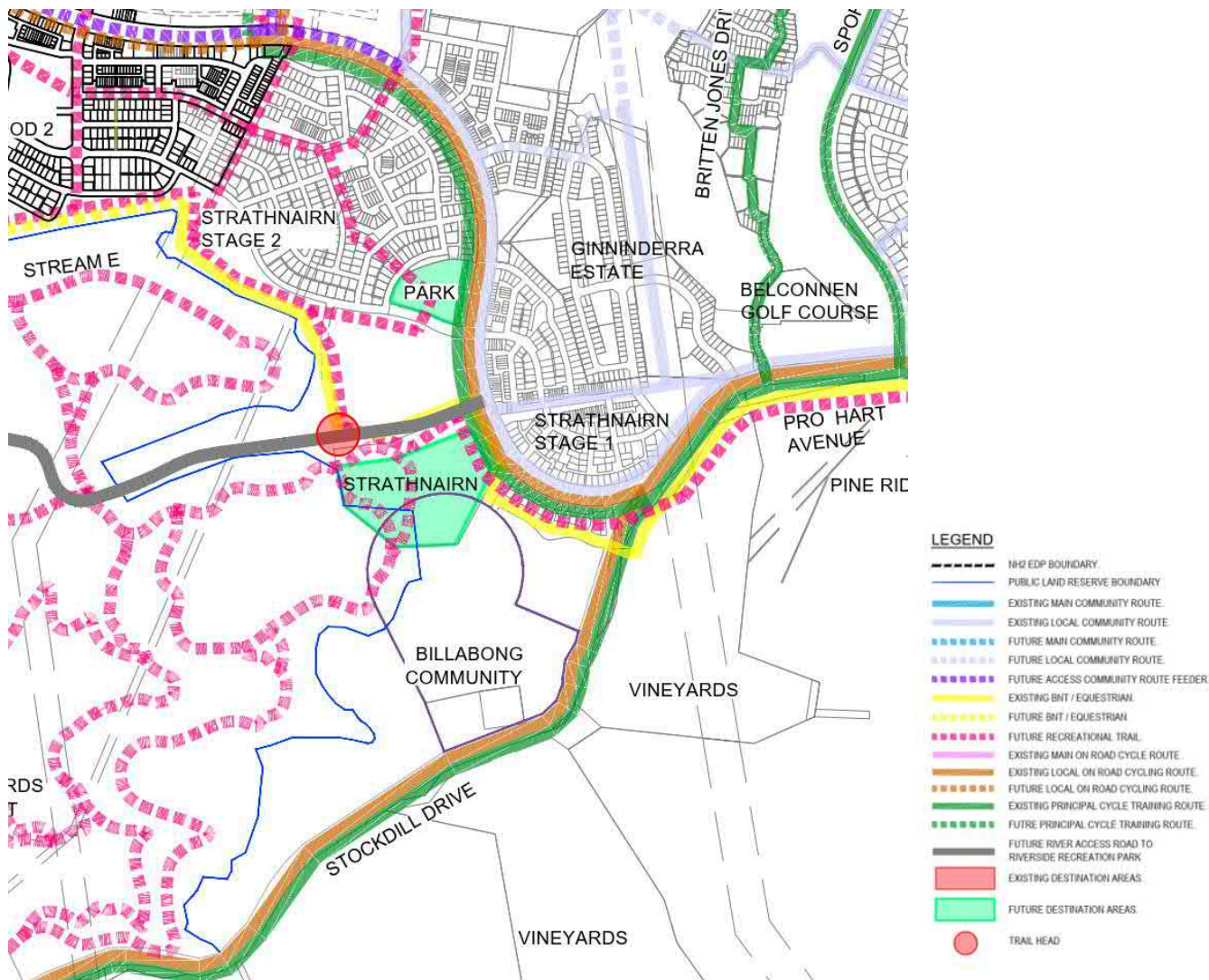


Figure 2.3 Macnamara EDP 1 Active Travel Plan

## 2.4 Public Transport Network

There is one bus route that runs along Pro Hart Avenue which services the local area. The bus route is the 903 Kippax to Strathnairn Loop which runs the length of Pro Hart Avenue. A map of the Bus route is available in Figure 2.4 below.

This bus route does not directly connect to Stockdill Drive, and the two bus stops directly to the east and west of the Stockdill Drive / Pro Hart Avenue intersection is approximately 1km from the proposed site location so are not deemed as acceptable for use. Due to the proposed land use, rural nature of Stockdill Drive, and limited residential dwellings located adjacent to the road, the lack of cyclist or pedestrian infrastructure and public transport is not viewed as a critical shortfall nor considered necessary for the site.

The ultimate bus route will only run along Pro Hart Avenue with no bus routes proposed along Stockdill Drive.

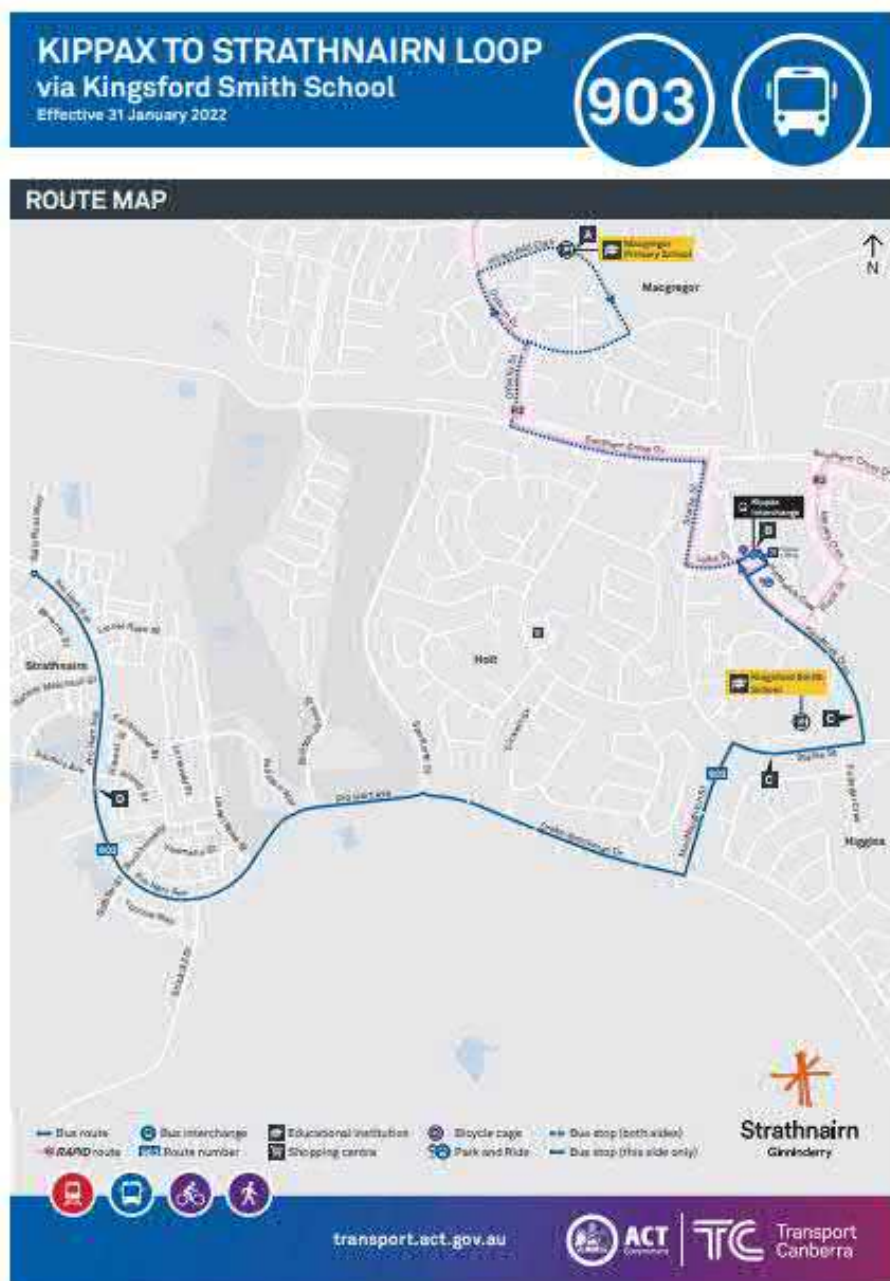


Figure 2.4 Kippax to Strathnairn Loop - 903

### 3 Previous Studies

The following previous studies were reviewed and utilised to guide this analysis:

- West Belconnen Technical Traffic Report published by AECOM in February 2015
- West Belconnen Stage 1 – Traffic Impact Assessment Technical Memorandum published by Calibre in April 2016
- Ginninderry Stage 2 – Traffic Impact Assessment Report published by Calibre in September 2017
- West Belconnen Neighbourhood One EDP Traffic Modelling Report published by AECOM in April 2016

The interim 2031 traffic values were derived from previous studies and included the full development of Strathnairn and Macnamara EDP 1.

The 2041 Traffic Modelling Report produced by AECOM served as the basis for modelling of the ultimate traffic scenario. The upgraded Pro Hart Avenue / Stockdill Drive intersection design was adopted from the AECOM report and the traffic signal phasing was also duplicated.

## 4 Ultimate Pro Hart Avenue Design

The growth of the local Strathnairn suburb and the additional traffic produced by the broader Ginninderry development will dramatically increase the vehicles per day travelling through Strathnairn via Pro Hart Avenue and the surrounding road network.

### Pro Hart Avenue

The West Belconnen Neighbourhood One EDP Traffic Modelling Report published by AECOM in April 2016 proposed that Pro Hart Avenue be a dual carriageway road with the Pro Hart Avenue / Stockdill Drive intersection to be signalised. The Strathnairn Stage 1 EDP included this ultimate design for dual carriageway road and signalised intersection and included the interim construction of a single lane in each direction and unsignalised intersection. The constructed works are single carriageway in each direction and have been designed to suit this ultimate duplication upgrade works in the future when required.

A summary of the ultimate configuration recommended by AECOM to accommodate the ultimate traffic volumes are outlined below.

The ultimate Pro Hart Avenue / Stockdill Drive intersection will be signalised with dedicated turning lanes from Pro Hart Avenue to Stockdill Drive. The Upgraded intersection design can be seen in Figure 4.1 Updated Pro Hart Avenue / Stockdill Drive 2041 Intersection

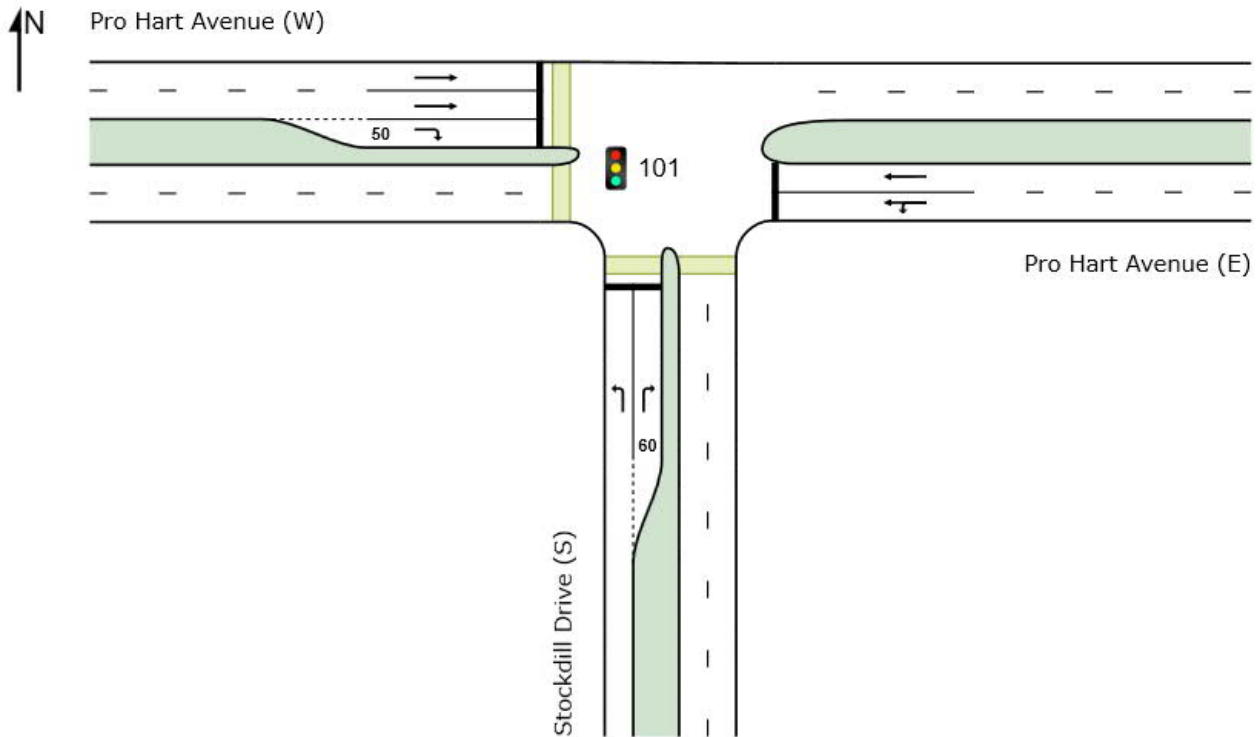


Figure 4.1 Updated Pro Hart Avenue / Stockdill Drive 2041 Intersection

### Stockdill Drive

Stockdill Drive has been upgraded between Yoornie Way to Pro Hart Avenue to be a kerbed urban road. Currently Stockdill Drive is a rural road south of Yoornie Way. The Ginninderry development will extend further south of Yoornie Way past the proposed driveway to the proposed CSG site. It is planned to upgrade Stockdill Drive to an urban collector road as residential development extends south in the future.

## 5 Proposed Development

### 5.1 Development Site Location and Access

The Canberra Sand and Gravel site is located within Belconnen Block 1582, approximately 12 km Northwest of the Canberra CBD and 6KM West of Belconnen Town Centre. The estate is bounded by Stockdill Drive to the west and Pro Hart Avenue to the North, undeveloped land to the east and south. An aerial image of the planned location for the estate can be seen in Figure 5.1.

Vehicular access to the CSG site will be conveyed through a proposed new private gravel road that will branch off from Stockdill Drive to the east.

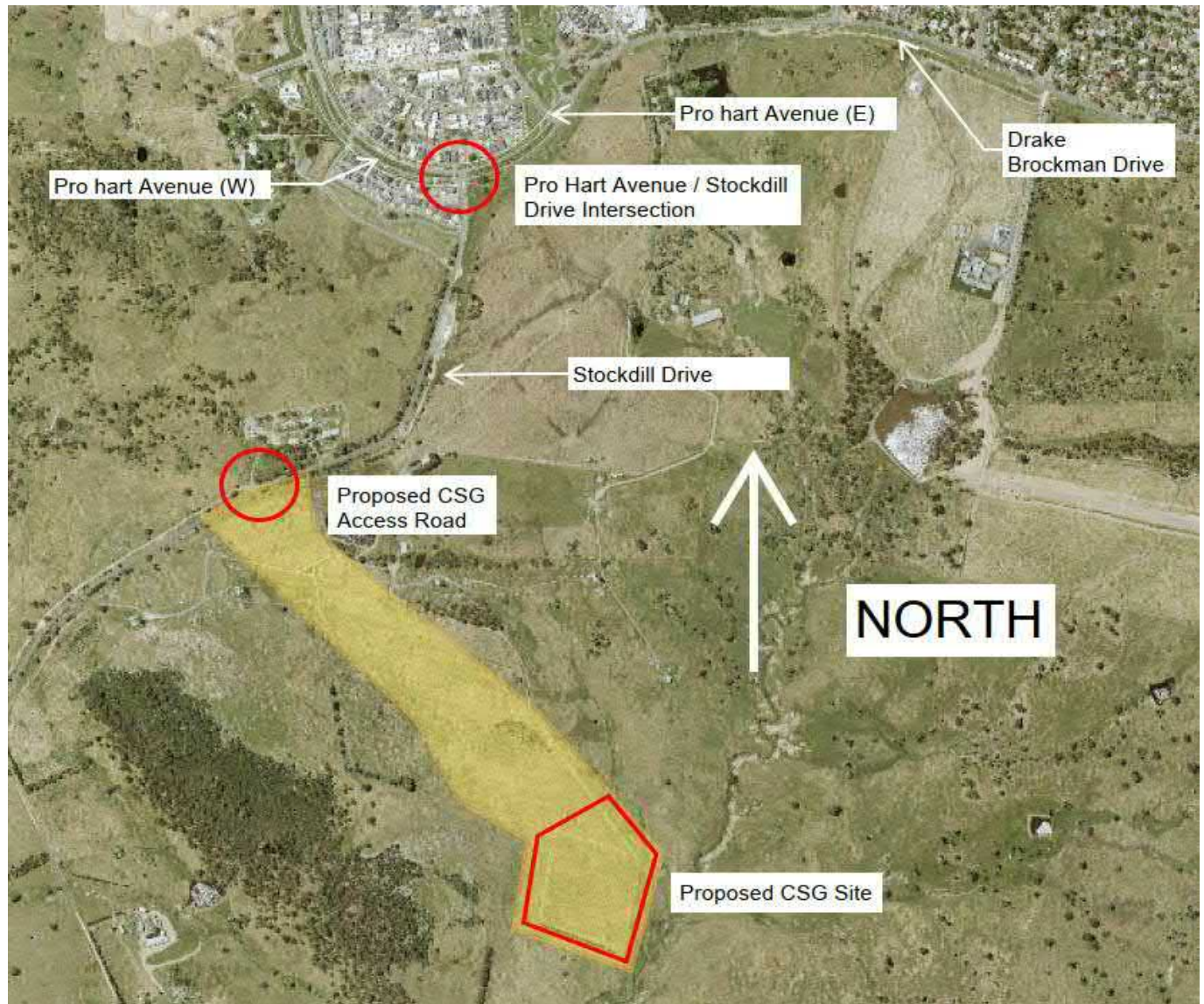


Figure 5.1 Aerial Image of the Proposed CSG Site Location

#### 5.1.1 Development Details

Upon completion, Canberra Sand and Gravel will primarily store and distributing sand, gravel, and other landscaping materials. The site will see deliveries of landscaping supply materials via trucks and trailers along with the pickup and green waste drop off of civilians/civilian cars and trailers purchasing materials.

Based off the provided plans the CSG site will be approximately 35,000 m<sup>2</sup>.

## 5.2 Trip Generation

The Canberra Sand and Gravel site is expected to act as a landscape supplier, storing and selling landscaping materials along with accepting green waste drop offs.

Other similar CSG sites within Canberra have been used as a basis for generation and expectation for traffic movements. Canberra Sand and Gravel have provided a breakdown of the typical number of vehicles they experience at the existing CSG site on Parkwood Road. A copy of their email has been provided in Appendix D.

A breakdown of trips generated:

- Green waste drop off 500 cars per day.
- Green waste drop off 25 trucks per day
- Landscape supplies 200 cars per day minus 20% who also do green waste drop off = 160 cars per day extra
- Landscape supplies 25 trucks per day

Total cars per day = 650 per day

Total trucks per day = 50 per day

Total vehicles per day (in + out) = **1400vpd**

To undertake a comparison and order of magnitude suitability check a trips per GFA has been reviewed. The *RTA Guide to Traffic Generating Developments* (2002) outlines various land uses. While bulk landscape supplies is not provided as a land use, the closest equivalent was seen to be warehouse. As such the CSG site area has been tested with a warehouse GFA as detailed in Table 5.1.

Table 5.1 Traffic generation Rates for Warehouses

Development Type	Unit	Daily Rate	Peak Period Rate
Warehouse	/100m <sup>2</sup> GFA	4	0.5

Using the Traffic generation based on GFA, the total predicted trips generated by the CSG Development was calculated. The volumes for warehouse can be seen in Table 5.2.

Table 5.2 CSG Site Trip Generation – comparison test based on guidelines.

Type	GFA (m <sup>2</sup> )	Daily		Peak Hour	
		Generation Rate	Trips	Generation Rate	Trips
Warehouse	35000	4 trips / 100m <sup>2</sup> GFA / day	1397	0.5 trips / 100m <sup>2</sup> GFA / hour	175
<b>Total</b>		-	<b>1397</b>	-	<b>175</b>

This gross floor area value has been checked against other Canberra Sand and Gravel sites to compare the traffic generation rates.

The daily traffic volume determined from information provided by CSG (1400vpd) is essentially the same as that predicted using the RTA guidelines (1397vpd) which provides confidence in considering the CSG volumes provided for trip generation and traffic modelling purposes.

## 5.3 Traffic values for SIDRA Modelling

The traffic values to be modelled in SIDRA 9.0 are sourced from multiple previous Calibre and AECOM reports concerning the Strathnairn and Ginninderry area over the last 7 years. These reports are listed in Section 3 Previous Studies.

The calculated Canberra Sand and Gravel traffic values are added to each of the base values when modelling networks in SIDRA. The values for modelling are provided in Appendix C.

The hours of operation for the CSG site are expected to be similar to other sites around Canberra which typically close between 4:30 – 5:00PM. As such, the site is not expected to generate significant volumes in the PM commuter peak (considered to be between 5-6pm from previous reports). To determine the traffic impact of the Canberra Sand and Gravel site on the surrounding road network in the PM peak a conservative rate of 20% of the calculated peak hr traffic has been applied. This reduction has been deemed reasonable as it reflects the lowered volume of traffic generated by CSG due to their closing hours as employees and shipments may still be traveling to and from the site after common business hours have ceased. The AM peak will be impacted by CSG traffic generation and as such no scaling has been applied to the values attributed to the AM Peak.

## 5.4 Traffic Distribution

The distribution of trips from the CSG site to the external road network has been based on expected catchment areas and checked against journey-to-work (JTW) data from the 2016 Australian Census. Based on the other CSG sites, the relocated site is expected to cater for most of Belconnen, as well as Molonglo.

Based on expected projection to the broader road network, the following directions were adopted to represent the external trip distribution:

- East (Via Pro Hart Avenue) – 95% of trips
- West (Via Pro Hart Avenue) – 5% of Trips

The trip distribution values chosen were picked conservatively to reflect the greater right turn volumes of trips out of the Ginninderry/Strathnairn suburbs into the wider Belconnen area (critical movement). The upgraded 2041 Pro Hart Avenue / Stockdill Drive intersection is signalised and as such provides greater leeway and room for growth in the network. As the split between East and West changes over time the traffic signal phasing can be changed to account for it. Riverview will continue to review the operation and safety of the road networks based on actual volumes as the development progresses.

## 5.5 Proposed CSG Access Road

### CSG Access Road

The proposed CSG Access road location is situated on Stockdill Drive which is a 2-lane rural road. The addition of the access will involve the construction of a new standard rural driveway. The driveway will mesh with the existing road pavement and provide access for cars and trucks. The proposed Stockdill Drive / CSG Access Road intersection location can be seen in figure 5.2.



Figure 5.2 Stockdill Drive / CSG Access Road Location



## 5.6 CSG Site Parking

Parking requirements for various land uses are outlined within the *Territory Plan - Parking and Vehicular Access Code*. Section 3.5.5 outlines Bulk landscaping suppliers parking requirements as “subject to individual assessment”. As such, there is no code specified rates.

It is noted that parking will be required on site at the Canberra Sand and Gravel site to accommodate both employee parking and customer parking. CSG will manage this parking within the footprint of their proposed facility as currently occurs on all CSG sites across Canberra including the current Belconnen CSG site.

It is recommended that employee parking at the CSG site should be implemented at a conservative 1:1 ratio for the expected number of peak shift employees. This value should be determined by CSG based on their expected workforce and other active CSG sites.

# 6 Traffic Impact Assessment

## 6.1 Network Traffic Volumes

To ensure the adequate performance of the external road network connecting to the CSG site, intersection performance analysis has been undertaken for the Pro Hart Avenue / Stockdill Drive intersection and the Stockdill Drive / CSG Access Road. Analysis has been completed for 2031 and 2041 design years to assess both the interim performance and the predicted ultimate performance when the CSG development and surrounding areas are fully constructed.

The volumes for the interim 2031 assessment were taken from previous TIA's developed by Calibre and considered the full buildout of Strathnairn and Macnamara EDP 1. Traffic values for the ultimate 2041 development have been taken from the AECOM April 2016 traffic report and considered the completion of the Ginninderry development.

The volumes entering and exiting the CSG site are determined using GFA values for the proposed CSG site tested against empirical data from other CSG sites.

The SIDRA software represents intersection performance through the following four key parameters:

- Degree of Saturation (DOS) – The ratio of traffic demand to capacity,
- Delay – The average delay in seconds,
- Level of Service (LOS) – Conversion of the average delay into a letter grade, and
- Queue length – The length of the 95<sup>th</sup> percentile queue in metres.

### 6.1.1 Performance Criteria

The *RMS Traffic Modelling Guidelines* identify the maximum practical DOS for various intersection controls as presented in Table 6.1.

Table 6.1 Maximum Practical DOS by Intersection Control

Intersection Control	Maximum Practical DOS
Traffic Signals	0.90
Roundabouts (incl. Metered)	0.85
Priority-Controlled	0.80

Intersections operating in excess of their maximum practical capacity typically experience unstable traffic flow whereby small disruptions result in excessive congestion and flow breakdown.

The *RMS Traffic Modelling Guidelines* also identify LOS criteria for intersections as shown in Table 6.2 below.

Table 6.2 LOS Criteria for the Intersections (RTA NSW Method)

LOS	Average delay per vehicle	Description
A	≤ 14s	Good operation
B	15s – 28s	Acceptable delays and spare capacity
C	29s – 42s	Satisfactory
D	43s – 56s	Near capacity
E	57s – 70s	At capacity, priority-control not suitable
F	> 71s	Unsatisfactory with excessive queueing

The *TCCS Traffic Impact Assessment Guidelines*, similarly, identifies intersections operating at LOS D or better as acceptable. 95<sup>th</sup> percentile queue lengths have been assessed to ensure that queues in short lanes do not extend back to impact traffic in adjacent lanes and that queues in full-length lanes do not extend back to impact upstream intersections.

### 6.1.2 Summary of Tested Scenarios.

To develop an appropriate understanding of the traffic volumes and the impact of the Canberra Sand and Gravel relocation on the broader traffic network it was deemed appropriate for the Traffic Impact Assessment to be modelled on the 2031 Interim values and the 2041 Ultimate values. The 2031 volumes represent the build out of Macnamara EDP1 and Strathnairn.

The expected growth of the Ginninderry development and the surrounding areas of Strathnairn will lead to higher traffic volumes throughout the Strathnairn area, and particularly Pro Hart Avenue which is a key road for the Canberra Sand and Gravel site.

The following locations and scenarios were tested as part of this assessment.

- Stockdill Drive / Pro Hart Avenue Interim (2031) Base Conditions without CSG
- Stockdill Drive / Pro Hart Avenue Interim (2031) With CSG Development Scenario
- Stockdill Drive / Pro Hart Avenue Ultimate (2041) without CSG
- Stockdill Drive / Pro Hart Avenue Ultimate (2041) With CSG Development Scenario
- Stockdill Drive / CSG Access Road 2031
- Stockdill Drive / CSG Access Road 2041

## 6.2 Road hierarchy

A summary of the road hierarchy for the keys roads is outlined below.

Traffic Volumes	Base 2031	Developed CSG 2031	AECOM Base 2041	Developed CSG 2041
Pro Hart Avenue (West)	9600	9615	22245	22260
Pro Hart Avenue (East)	9960	10990	23915	24945
Stockdill Drive	505	1555	2260	3305

Table 6.3 Traffic Values for determining Road Hierarchy

### 6.2.1 Road Classifications

Road Classification	Daily Traffic Volume Range	Base 2031 Values	Base 2031 + CSG Values	Ultimate 2041 Values	Ultimate 2041 + CSG Values
<b>Arterial Road</b>	>6,000 vpd	Pro Hart Avenue	Pro Hart Avenue	Pro Hart Avenue	Pro Hart Avenue
<b>Major Collector</b>	3,001-6000 vpd				Stockdill Drive
<b>Minor Collector</b>	1,001-3,000 vpd		Stockdill Drive	Stockdill Drive	
<b>Access B</b>	301-1,000 vpd	Stockdill Drive			
<b>Access A</b>	0-300 vpd				

Table 6.4 Road Hierarchy changes between stages

The tables above outline the daily traffic volumes expected along Pro Hart Avenue and Stockdill Drive, these values are used along with the road function and road connectivity to determine the road hierarchy for Pro hart Avenue and Stockdill Drive in their Base, Base + CSG, Ultimate and Ultimate + CSG states.

At the time of writing (2022) Pro Hart Avenue is listed on *Active Travel Infrastructure Practitioners Tool* as a Major Collector and Stockdill Drive is a major collector from the intersection with Pro Hart Avenue changing to rural road after Yoornie Way. It is expected with natural growth of the Ginninderry area that Pro Hart Avenue will become an arterial road (>6,000 vpd).

Stockdill Drive's road hierarchy is expected to change to Access road B by 2031 with natural growth. With the addition of the CSG site Stockdill Drive is expected to change to a minor collector road. The ultimate 2041 numbers without the CSG development are expected to push Stockdill Drive to a minor collector. The ultimate 2041 + CSG values will push Stockdill Drive to a major collector with an expected 3590 vpd traveling along Stockdill Drive. The paved section of Stockdill Drive was constructed as a major collector road. The traffic from CSG occurs over an entire day with a more balanced distribution rather than sharp peaks with the busiest periods occurring on weekends. Tuck movements also typically occur outside of the network peak and as such the site is expected to have little impact on operations during peak times. Given the dispersion of traffic across the day, if Stockdill Drive was constructed as a Minor Collector, south of Yoornie Way, this would not be expected to pose any risk to safety or amenity of the road users.

The classification of the roads is taken from the *Estate development code 2013 – table 1A Street Hierarchy for Estates in Residential Zones and CZ5*.

### 6.3 Stockdill Drive / Pro Hart Avenue Interim (2031) Conditions

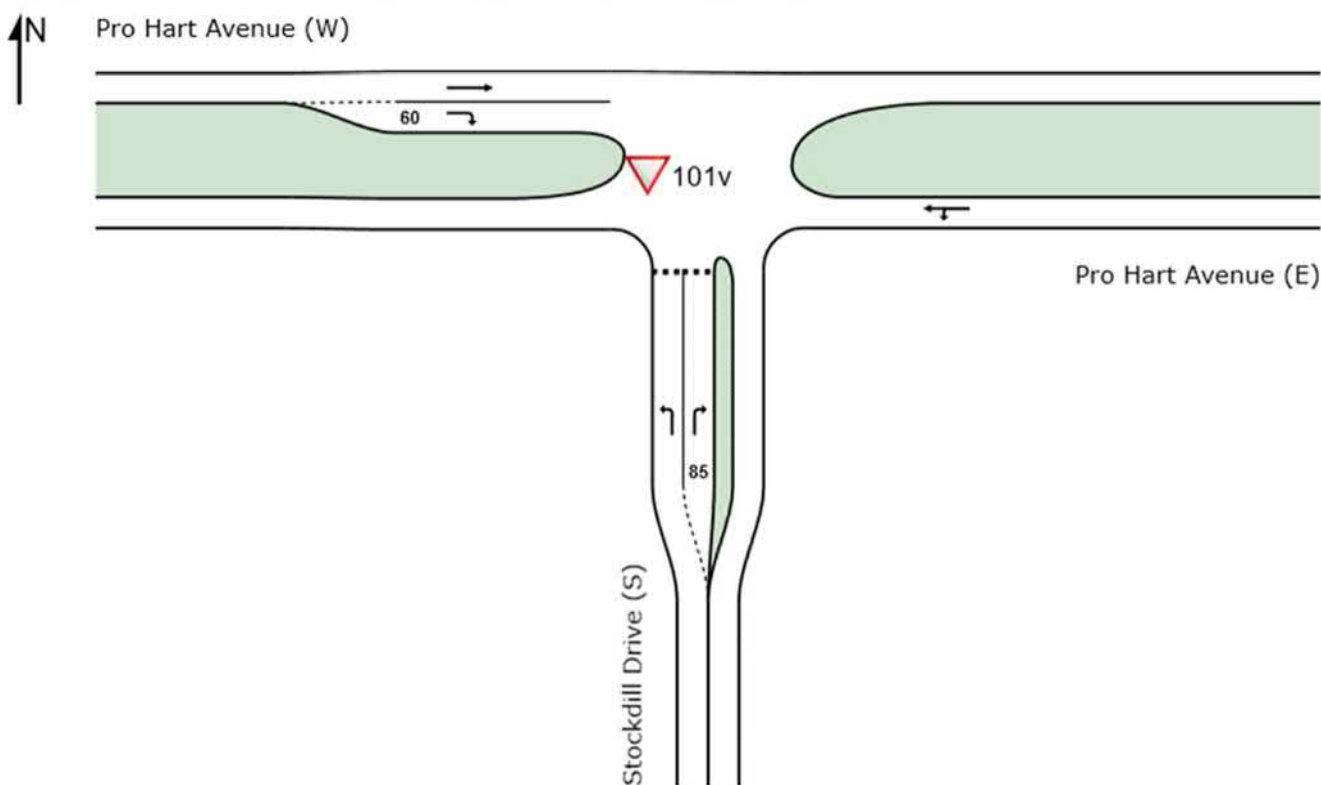
This model is for the existing single lane carriageway Pro Hart Avenue with existing unsignalised T intersection configuration with Stockdill Drive using 2031 traffic volumes.

#### SITE LAYOUT

▽ Site: 101v [Base Interim AM Pro Hart Avenue / Stockdill Drive (Site Folder: Base Stockdill/Prohart 2031)]

New Site  
 Site Category: (None)  
 Give-Way (Two-Way)

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



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Figure 6.1 Intersection Layout – Pro Hart Avenue / Stockdill Drive

Both Table 6.5 and Table 6.6 summarise the key intersection performance parameters for the Pro Hart Avenue / Stockdill Drive intersection in both commuter peak hours on a typical weekday. For further information, the full SIDRA outputs have been provided in Appendix B.

Table 6.5 2031 BASE Intersection Performance Summary – Pro Hart Avenue / Stockdill Drive

Movement	AM Peak Hour				PM Peak Hour			
	DOS	Delay	LOS	Queue	DOS	Delay	LOS	Queue
<b>East Approach: Pro Hart Avenue</b>								
Through	0.091	0s	A	0m	0.466	0s	A	0m
Left	0.091	6s	A	0m	0.466	6s	A	0m
<b>South Approach: Stockdill Drive</b>								
Left	0.003	6s	A	0m	0.010	11s	A	0m
Right	0.158	21s	B	4m	0.042	20s	B	1m
<b>West Approach: Pro Hart Avenue</b>								
Right	0.001	6s	A	0m	0.010	0s	A	0m
Through	0.445	0s	A	0m	0.086	11s	A	1m
<b>Total</b>	<b>0.445</b>	<b>1s</b>	<b>A</b>	<b>4m</b>	<b>0.466</b>	<b>1s</b>	<b>A</b>	<b>1m</b>

Table 6.6 2031 CSG Intersection Performance Summary – Pro Hart Avenue / Stockdill Drive

Movement	AM Peak Hour				PM Peak Hour			
	DOS	Delay	LOS	Queue	DOS	Delay	LOS	Queue
<b>East Approach: Pro Hart Avenue</b>								
Through	0.173	0s	A	0m	0.470	0s	A	0m
Left	0.173	6s	A	0m	0.470	6s	A	0m
<b>South Approach: Stockdill Drive</b>								
Left	0.005	6s	A	0m	0.004	11s	A	0m
Right	0.353	27s	B	9m	0.166	22s	B	4m
<b>West Approach: Pro Hart Avenue</b>								
Right	0.004	0s	A	0m	0.008	11s	A	0m
Through	0.445	6s	A	0m	0.086	0s	A	0m
<b>Total</b>	<b>0.445</b>	<b>2.4s</b>	<b>A</b>	<b>9m</b>	<b>0.470</b>	<b>1.1 s</b>	<b>A</b>	<b>4m</b>

It can be seen that the existing give way controlled intersection of Pro Hart Avenue and Stockdill Drive operate within the acceptable parameters for both capacity and delay during AM and PM peak periods without and with the CSG site and both Strathnairn and Macnamara EDP1 completed. During the AM peak, the maximum DOS seen across the Base and the Calculates + Base modes was 0.445 from the West Approach of Pro Hart Avenue through lane. This rose in the PM peak, with a value of 0.692 recorded in the right hand turn from Stockdill Drive onto Pro Hart Avenue. Maximum delays AT the intersection were similar for Base and Calculated + Base during both AM and PM peaks, with delays between 10 and 30 seconds (LOS B). Queueing at the intersection for both Base and Calculated + base was seen to be minimal during both peak periods along all legs.

### 6.4 Stockdill Drive / Pro Hart Avenue Ultimate report (2041)

This model is for when the Ginninderry development is fully completed with the ultimate dual carriageway Pro Hart Avenue, and signalised T intersection with Stockdill Drive proposed by AECOM.

#### SITE LAYOUT

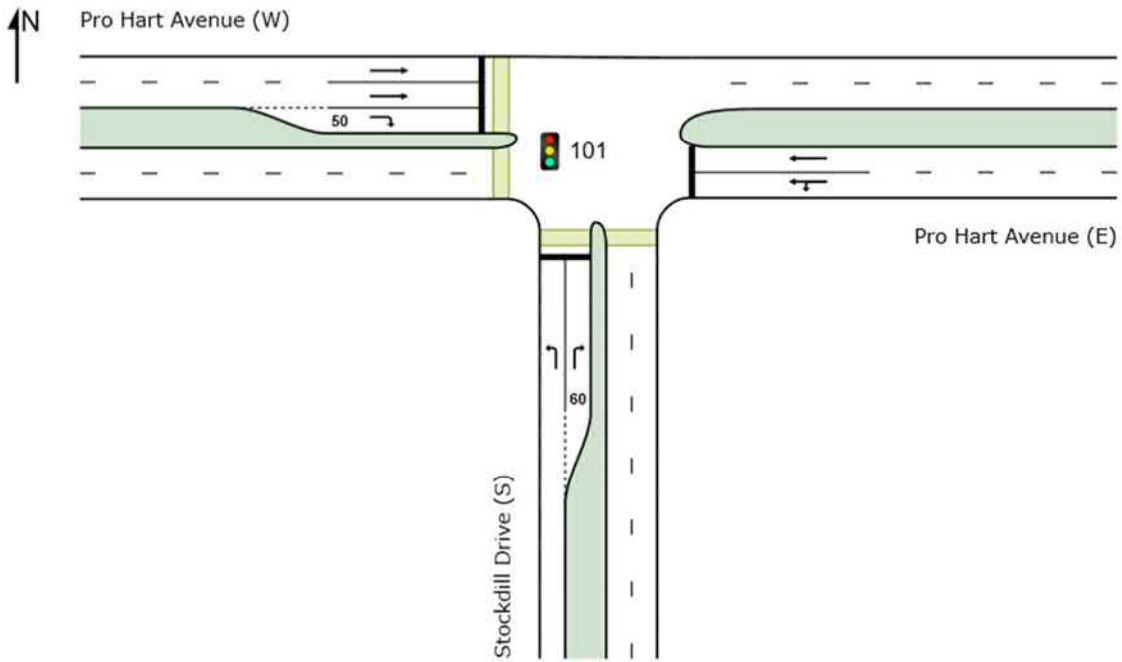
Site: 101 [CSG Calculated Ultimate AM ProHartAve/StockdillDrive (Site Folder: CSG Stockdill/Prohart 2041 Signalised)]

New Site

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated

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Figure 6.2 Intersection Layout – Pro Hart Avenue / Stockdill Drive Ultimate

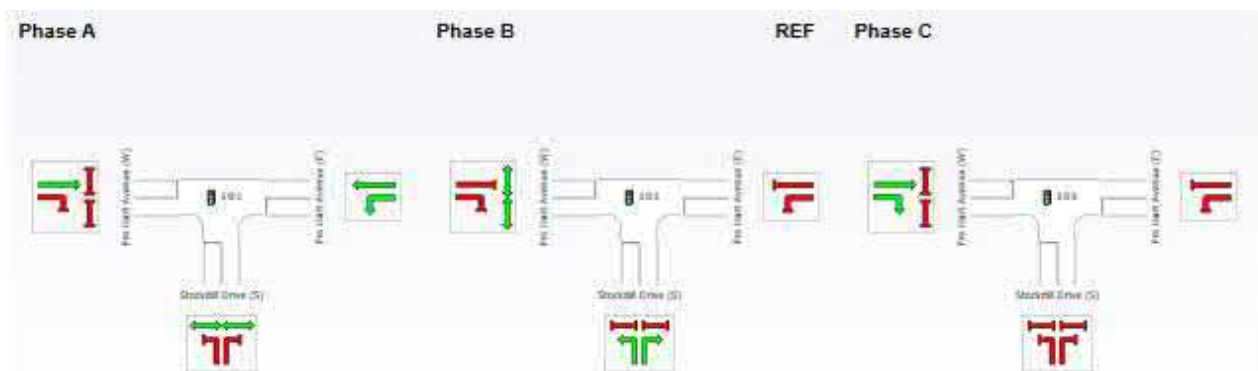


Figure 6.3 Signalised Intersection – Pro Hart Avenue / Stockdill Drive Intersection Phasing

Both Table 6.7 and Table 6.8 summarise the key intersection performance parameters for the Pro Hart Avenue / Stockdill Drive intersection in both commuter peak hours on a typical weekday for the base and with development scenarios. For further information, the full SIDRA outputs have been provided in Appendix B.

Table 6.7 2041 BASE Intersection Performance Summary – Pro Hart Avenue / Stockdill Drive

Movement	AM Peak Hour				PM Peak Hour			
	DOS	Delay	LOS	Queue	DOS	Delay	LOS	Queue
<b>East Approach: Pro Hart Avenue</b>								
Through	0.496	13s	A	49m	0.752	12s	A	186m
Left	0.496	19s	B	49m	0.752	17s	B	186m
<b>South Approach: Stockdill Drive</b>								
Left	0.052	28s	B	2m	0.066	45s	D	3m
Right	0.614	30s	C	25m	0.729	50s	D	40m
<b>West Approach: Pro Hart Avenue</b>								
Right	0.043	28s	B	2m	0.225	48s	D	9m
Through	0.652	6s	A	87m	0.197	2.9s	A	23m
<b>Total</b>	<b>0.652</b>	<b>9.4 s</b>	<b>A</b>	<b>87m</b>	<b>0.752</b>	<b>12.7s</b>	<b>A</b>	<b>186m</b>

Table 6.8 2041 CSG Intersection Performance Summary – Pro Hart Avenue / Stockdill Drive

Movement	AM Peak Hour				PM Peak Hour			
	DOS	Delay	LOS	Queue	DOS	Delay	LOS	Queue
<b>East Approach: Pro Hart Avenue</b>								
Through	0.506	13s	A	66m	0.757	13s	A	199m
Left	0.506	18s	B	65m	0.757	19s	B	200m
<b>South Approach: Stockdill Drive</b>								
Left	0.049	30s	C	3m	0.061	45s	D	4m
Right	0.616	33s	C	36m	0.750	52s	D	51m
<b>West Approach: Pro Hart Avenue</b>								
Right	0.051	33s	C	2m	0.238	51s	D	9m
Through	0.644	7s	A	101m	0.200	3s	A	26m
<b>Total</b>	<b>0.644</b>	<b>11s</b>	<b>A</b>	<b>101m</b>	<b>0.757</b>	<b>13.9s</b>	<b>A</b>	<b>200m</b>

It can be seen that the upgraded Pro Hart Avenue / Stockdill Drive Signalised intersection operates within the acceptable parameters for both capacity and delay during AM and PM peak periods with and without CSG development. During the AM peak, the maximum DOS seen across the Base and the Calculated + Base modes was 0.652 from the West Approach of Pro Hart Avenue through lane. This rose in the PM peak, with a value of 0.811 recorded in the Eastern approach of Pro Hart Avenue. Maximum delays at the intersection were similar for Base and Calculated + Base during both AM and PM peaks, with delays between 30 and 60 seconds (LOS C). Queueing at the intersection for both Base and Calculated + base was seen to be acceptable during both peak periods along all legs with maximum queueing of 261m. Given this, no impact to the greater road network is expected to occur from it.



## 6.5 Stockdill Drive / CSG Access Road 2031

### SITE LAYOUT

▽ Site: 101 [CSG Calculated Interim AM CSG Site Access Road (Site Folder: CSG Stockdill/Prohart 2031)]

New Site  
 Site Category: (None)  
 Give-Way (Two-Way)

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



Figure 6.4 Intersection Layout – Stockdill Drive / CSG Access Road 2031

Both Table 6.9 and Table 6.10 summarise the key intersection performance parameters for the Stockdill Drive / CSG Access Road intersection in both commuter peak hours on a typical weekday for the Interim and ultimate scenario. For further information, the full SIDRA outputs have been provided in Appendix B

As there is no Stockdill Drive / CSG Access Road present in the base conditions only the Base + CSG Calculated scenarios have been modelled.

Table 6.9 2031 CSG Intersection Performance Summary – Stockdill Drive / CSG Access Road

Movement	AM Peak Hour				PM Peak Hour			
	DOS	Delay	LOS	Queue	DOS	Delay	LOS	Queue
<b>South Approach: Stockdill Drive</b>								
Through	0.044	0s	A	1m	0.009	0s	A	1m
Right	0.044	6s	A	1m	0.009	6s	A	1m
<b>East Approach: CSG Access Road</b>								
Left	0.008	6s	A	1m	0.028	6s	A	1m
Right	0.008	6s	A	1m	0.028	6s	A	1m
<b>North Approach: Stockdill Road</b>								
Left	0.087	6s	A	0m	0.026	6s	A	0m
Through	0.087	0s	A	0m	0.026	0s	A	0m
<b>Total</b>	<b>0.087</b>	<b>5s</b>	<b>A</b>	<b>1m</b>	<b>0.028</b>	<b>1s</b>	<b>A</b>	<b>1m</b>

Table 6.10 2041 CSG Intersection Performance Summary – Stockdill Drive / CSG Access Road

Movement	AM Peak Hour				PM Peak Hour			
	DOS	Delay	LOS	Queue	DOS	Delay	LOS	Queue
<b>South Approach: Stockdill Drive</b>								
Through	0.076	0s	A	1m	0.077	0s	A	1m
Right	0.076	6s	A	1m	0.077	6s	A	1m
<b>East Approach: CSG Access Road</b>								
Left	0.041	6s	A	1m	0.034	6s	A	1m
Right	0.041	6s	A	1m	0.034	6s	A	1m
<b>North Approach: Stockdill Road</b>								
Left	0.107	6s	A	0m	0.079	6s	A	0m
Through	0.107	0s	A	0m	0.079	0s	A	0m
<b>Total</b>	<b>0.107</b>	<b>3s</b>	<b>A</b>	<b>1m</b>	<b>0.079</b>	<b>1s</b>	<b>A</b>	<b>1m</b>

It can be seen that the proposed CSG Access Road and Stockdill Drive operates within the acceptable parameters for both capacity and delay during AM and PM peak periods. All the values across the board are very low and each leg of the intersection passes with a LOS A. Given this, the access locations and treatment is considered appropriate.

## 7 Conclusion

In November 2021, Calibre was engaged by Riverview to undertake a Transport Impact Assessment (TIA) for the proposed relocation of Canberra Sand and Gravel (CSG) from the Belconnen Landfill site to Belconnen Block 1582. The traffic assessment of this site was requested to help support the submission of the Development Application (DA) for the proposed relocation works. This report has assessed the Pro Hart Avenue / Stockdill Drive intersection as well as the proposed site access point, the Stockdill Drive / CSG Access Road intersection.

The proposed location for the Canberra Sand and Gravel site is located within Belconnen Block 1582, approximately 12 km Northwest of the Canberra CBD and 6KM West of Belconnen Town Centre. The estate is bounded by Stockdill Drive and Pro Hart Avenue. The proposed CSG site will have access via Stockdill Drive, requiring the construction of a typical rural driveway and a Gravel road. This will be a give way controlled intersection. Upon completion of the CSG site the added traffic will impact the Pro Hart Avenue / Stockdill Drive Intersection and the Stockdill Drive / CSG Access Road intersection.

The existing active travel network within the area provides access to the Ginninderry area, with a separate cyclist and walking path on either side of Pro Hart Avenue. One bus route, 903, runs along Pro Hart Avenue connecting the Kippax interchange to the Strathnairn loop. The CSG development will have minimal impact on the active travel network.

Parking for a bulk landscape suppliers is subject to individual assessment. CSG staff, plant and public parking is expected to be accommodated on site as per existing CSG Belconnen site and other CSG sites.

The Road Hierarchy for Pro Hart Avenue and Stockdill Drive is expected to change. Pro Hart Avenue will Change from a major collector to an arterial road in the base 2031 scenario and will stay an arterial road for the future development scenarios. Stockdill Drive will change from a rural road to an access road b in the 2031 base scenario and is expected to become a major collector in the ultimate 2041 + CSG scenario. Stockdill Drive was updated recently to function as a collector road and as such the increase in volumes along the road is considered to be acceptable.

Traffic impact assessment for the Pro Hart Avenue / Stockdill Drive and Stockdill Drive / CSG Access Road have been undertaken to assess the performance of the road network. All assessment has been completed for both the AM and PM commuter peak hours for a typical weekday. An Interim 2031 and an Ultimate 2041 model have been created to capture the expected traffic values for the current traffic system and the expected system at the completion of the Ginninderry development estimated for 2041.

The SIDRA modelling for both 2031 Interim (existing layout) and 2041 Ultimate (duplicated Pro Hart Avenue layout) scenarios showed both intersections operated within acceptable parameters with the CSG development and there is little adverse impact expected on the surrounding road network as a result of the proposed Canberra Sand and Gravel relocation. Given this, the intersections of Pro Hart Avenue / Stockdill Drive and Stockdill Drive / CSG Access Road are expected to perform adequately with their current and future layouts.

The current unsignalised configuration of the Pro Hart Ave / Stockdill Drive intersection is suitable for the fully occupied Strathnairn and Macnamara EDP1 developments together with the expected traffic from the proposed CSG site on Stockdill Drive. Relocation to the proposed CSG site does not require offsite road upgrade works to be undertaken in the short term.

## CANBERRA SAND AND GRAVEL–TRAFFIC IMPACT ASSESSMENT

# Appendix A CSG Drawing Set

## CANBERRA SAND AND GRAVEL-TRAFFIC IMPACT ASSESSMENT

# Appendix B SIDRA Analysis

RIVERVIEW PROJECTS

## CANBERRA SAND AND GRAVEL-TRAFFIC IMPACT ASSESSMENT

# Appendix C Traffic Generation Values

RIVERVIEW PROJECTS

## CANBERRA SAND AND GRAVEL-TRAFFIC IMPACT ASSESSMENT

# Appendix D CSG Traffic Numbers Advice

RIVERVIEW PROJECTS

CANBERRA SAND AND GRAVEL-TRAFFIC IMPACT ASSESSMENT

Appendix E Macnamara EDP1 Active Travel

RIVERVIEW PROJECTS





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