

PTG/04606

Transport Impact Statement Chandala Battery Energy Storage System

31 July 2026 | Revision D

Prepared for Accenture Australia Pty Ltd

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REPORT DETAILS

Unique Document Identification

Document Title	Transport Impact Statement – Chandala Battery Energy Storage System
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Revision Details

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A	18/6/2026	For Issue	NA	RJC
B	25/6/2026	Minor Update	NA	RJC
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D	31/7/2026	Minor Updates	NA	RJC

1 INTRODUCTION

1.1 Background

PTG Consulting Pty Ltd (PTG) has been commissioned by **Accenture Australia Pty Ltd** ('the Client') to prepare a Traffic Impact Statement (TIS) for the Battery Energy Storage System (BESS) proposed to be located at the Chandala Processing Plant, 722 Old Gingin Road, Muchea ('the Site') within the Shire of Chittering. The Chandala BESS facility is proposed to include a total of four (4) modules.

This report has been prepared in accordance with the *Western Australian Planning Commission (WAPC) Transport Assessment Guidelines for Developments: Volume 4 – Individual Developments (2016)* and the Transport Impact Statement (TIS) Checklist is included at **Appendix A**.

Specifically, this report aims to assess the operations of the proposed development internally and its connections to the adjacent road network, with a focus on traffic volumes, access and accessibility.

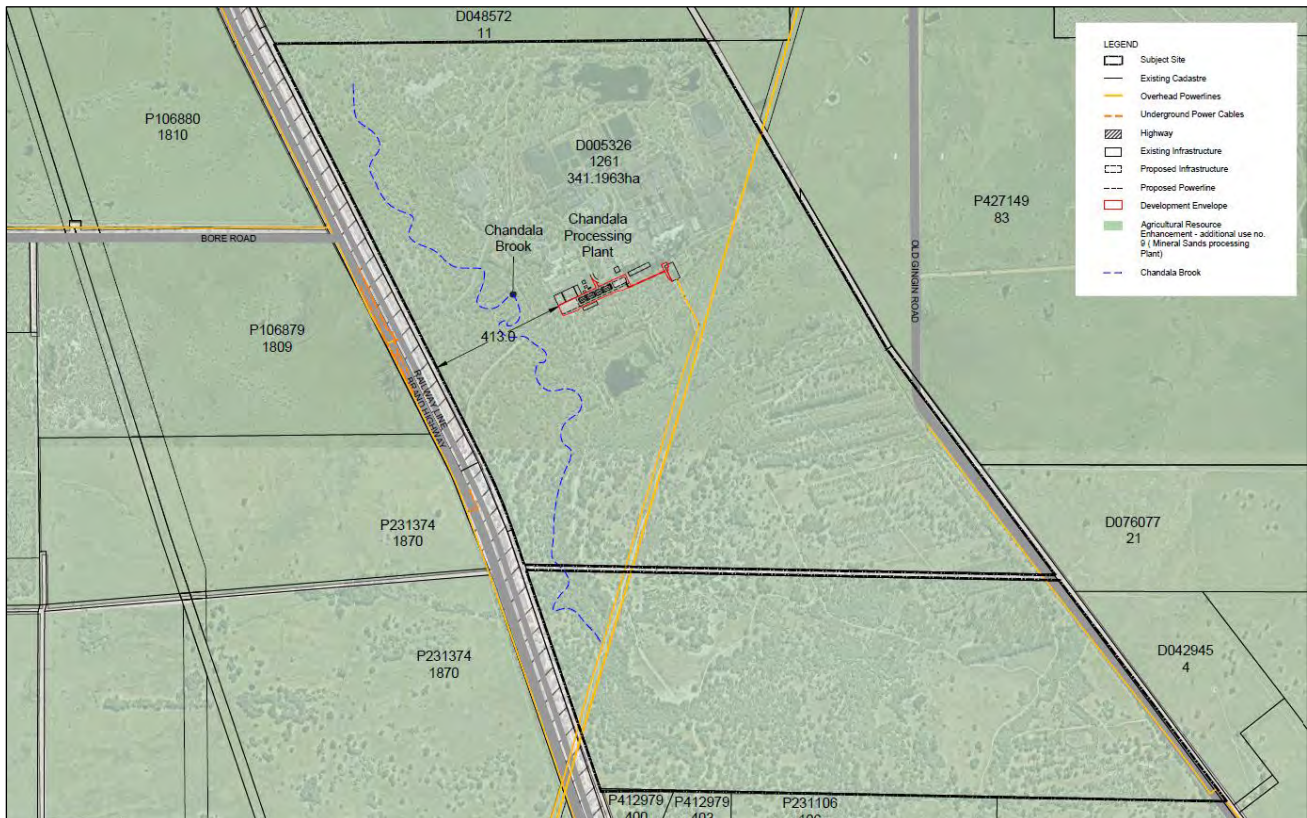
This report also outlines the requirements and opportunities associated with traffic and transport within the development, referencing relevant Council and WAPC policies and guidelines as well as best practice planning within Western Australia.

2 PROPOSED DEVELOPMENT

2.1 Site Location

The proposed Site of the Chandala BESS facility is within the Chandala Processing Plant, 722 Old Gingin Road, Muchea in the Shire of Chittering as shown in **Figure 1**. The Chandala Processing Plant is bounded by Brand Highway to the west and farmland to the east. A larger version of the site plan is included in **Appendix B**.

Figure 1 Proposed Chandala BESS Location



Source: SLR Consulting

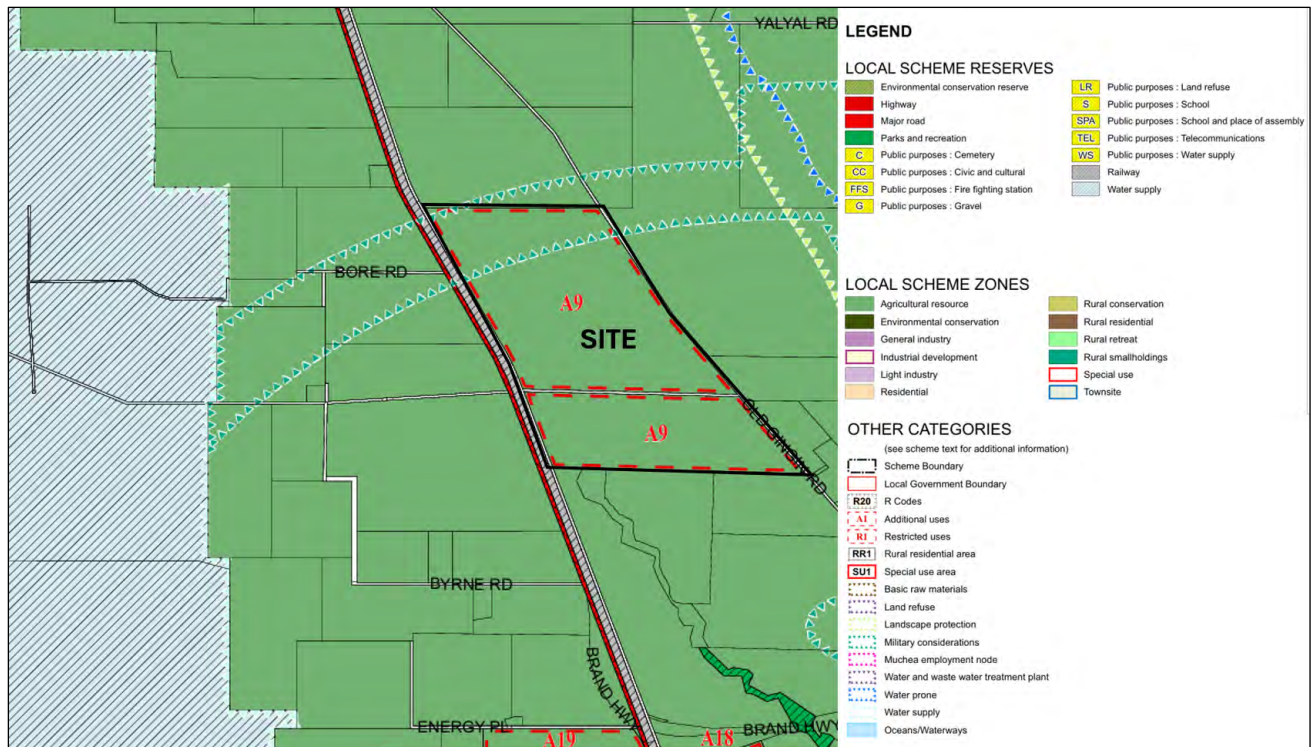
2.2 Existing Land Uses

The proposed Chandala BESS facility will be located in the old railway lines area in the south of the Site.

2.3 Context with Surrounds

Pursuant to the *Shire of Chittering Local Planning Scheme No. 6*, the lot where the Chandala BESS facility will be located is zoned 'Agricultural Resource' with additional uses as shown in **Figure 2**. The Site is surrounded by other agricultural resource uses as well.

Figure 2 Context with Surroundings



Source: *Shire of Chittering Local Planning Scheme No. 6*

2.4 Proposed Land Uses

The old railway lines area within the Chandala Processing Plant lot will be used as the location of the battery energy storage system (BESS). One (1) BESS location has been identified that will house four (4) modules. Figure 3 shows the provisional location of the BESS, substation and the power line route.

Figure 3 Proposed Land Uses



Source: SLR Consulting

3 VEHICULAR ACCESS AND PARKING

3.1 Access Arrangements

The proposed Chandala BESS facility can be accessed from the intersection of Brand Highway and the Site's access road as illustrated in Figure 4.

Figure 4 Access Arrangements



3.2 Public, Private, Disabled Parking Set Down/Pick Up

The statutory car parking requirements are outlined in the *Shire of Chittering Local Planning Policy No. 13 – Car Parking Requirements* and does not include a car parking requirement associated with a BESS facility. The scheme indicates:

“Where an application is made for planning consent and the purpose for which the land or building is to be used is not specified in Table 1, the Local Government shall determine the number of car parking bays to be provided, based on the number of employees and likely visitors to the site.”

It is anticipated that 2-4 staff members would conduct scheduled maintenance once a month, and as such will produce an additional maximum traffic of two (2) light vehicles and one (1) truck during monthly visits. The existing car parking area within the Chandala Processing Plant will be utilised by the maintenance staff and is expected to accommodate the additional traffic.

4 SERVICE VEHICLES (NON-RESIDENTIAL)

4.1 Swept Path Analysis

A swept path analysis was undertaken for a 19m semi-trailer for the Chandala BESS facility. The 19m semi's will only access the site if there is any major maintenance with the BESS site which is likely to happen once a year. **Figure 5** illustrates the possible path of the service vehicle and no issues were observed regarding ingress, egress and circulation within the Site. It is anticipated that the existing trees will be removed once the BESS facility is operational to accommodate the vehicle's manoeuvre within the Site. A larger version of the swept path is included in **Appendix C**.

Figure 5 Swept Path – 19m semi-trailer



4.2 On/Off-Site Loading Facilities

On/off-site loading facilities will be located adjacent the BESS facility.

5 HOURS OF OPERATION

The Chandala BESS facility will operate 24 hours a day, seven (7) days a week.

6 TRAFFIC VOLUMES

6.1 Development Traffic Volumes

The anticipated traffic generation of the Chandala BESS facility has been determined based on information provided by the Client. During the operational stage, the maximum traffic generated by the facility is two (2) light vehicles and one (1) truck, associated with maintenance visits conducted by staff once a month. It is noted that BESS facilities are typically monitored remotely in real time and do not require on-site personnel at all times.

Table 1 shows the total number of vehicular trips the BESS facility will generate once a month.

Table 1 Trip Generation

Land Use	Source	Trips Generated Once a Month	
		IN	OUT
Battery Energy Storage System (BESS) facility	Client information	3 vehicle trips	3 vehicle trips
Total		6 vehicle trips	

The traffic generated during the construction phase and its impacts are excluded from the scope of this report and will be addressed in a separate report as necessary. Construction and Operational Traffic Management Plans will be prepared in consultation with Tronox Operations prior to the commencement of site operations.

6.2 Types of Vehicles

Based on the proposed land use, the main types of vehicles expected to access the facility will be private cars and trucks to conduct monthly maintenance. A 19m semi-trailer is anticipated to be used to deliver battery replacements from time to time.

7 TRAFFIC MANAGEMENT ON FRONTAGE STREETS

7.1 Existing Road Network and Traffic Management

The road network within Western Australia is defined by Main Roads WA Road Hierarchy which describes the function, characteristic and management of each type of road. A description of each road type as per Main Roads WA Road Hierarchy criteria is summarised in **Table 2** below.

Table 2 Road Hierarchy Description

Road Type	Description
Primary Distributors	Provide for major regional and inter-regional traffic movement and carry large volumes of generally fast-moving traffic. Some are strategic freight routes, and all are State Roads. They are managed by Main Roads Western Australia (MRWA).
District Distributor A	Carry traffic between industrial, commercial and residential areas and generally connect to Primary Distributors. These are likely to be truck routes and provide only limited access to adjoining property. They are managed by local government.
District Distributor B	Perform a similar function to type A District Distributors but with reduced capacity due to flow restrictions from access to and roadside parking alongside adjoining property. These are often older roads with a traffic demand in excess of that originally intended. District Distributor A and B roads run between land-use cells and generally not through them, forming a grid which would ideally space them around 1.5 kilometres apart. They are managed by local government.
Regional Distributor	Roads that are not Primary Distributors, but which link significant destinations and are designed for efficient movement of people and goods within and beyond regional areas. They are managed by local government.
Local Distributor (Urban)	Roads that carry traffic within a cell and link District Distributors or Regional Distributors at the boundary, to access roads. The route of Local Distributors should discourage through traffic so that the cell formed by the grid of District Distributors only carries traffic belonging to or serving the area. These roads should accommodate buses but discourage trucks. Urban Local Distributor roads are managed by local government.
Local Distributor (Rural)	Connect to other Rural Distributors and to Rural Access Roads. Not Regional Distributors, but which are designed for efficient movement of people and goods within regional areas. Rural Local Distributor roads are managed by local government.
Access Roads	Provide access to abutting properties with amenity, safety and aesthetic aspects having priority over the vehicle movement function. These roads are bicycle and pedestrian friendly. They are managed by local government.

Figure 6 shows the road hierarchy network and Table 3 provides a summary of the road characteristics of the surrounding road network.

Figure 6 Road Hierarchy



Source: Main Roads WA Road Information Mapping System

Table 3 Surrounding Network Road Hierarchy

Road Name	Road Hierarchy	Jurisdiction	No. of Lanes	No. of Footpaths	Road Pavement Approximate Width (m)	Speed Limit (km/hr)
Brand Highway	Primary Distributor	MRWA	2-3	-	8.2-11.8	110

Source: Main Roads WA Road Information Mapping System & MetroMap

7.2 Traffic Flows on Surrounding Roads

Existing traffic volume data were obtained from Main Roads WA's Traffic Map at the location surrounding the Site shown in **Figure 7**. The daily traffic volumes are summarised in **Table 4**.

Figure 7 Traffic Data Location

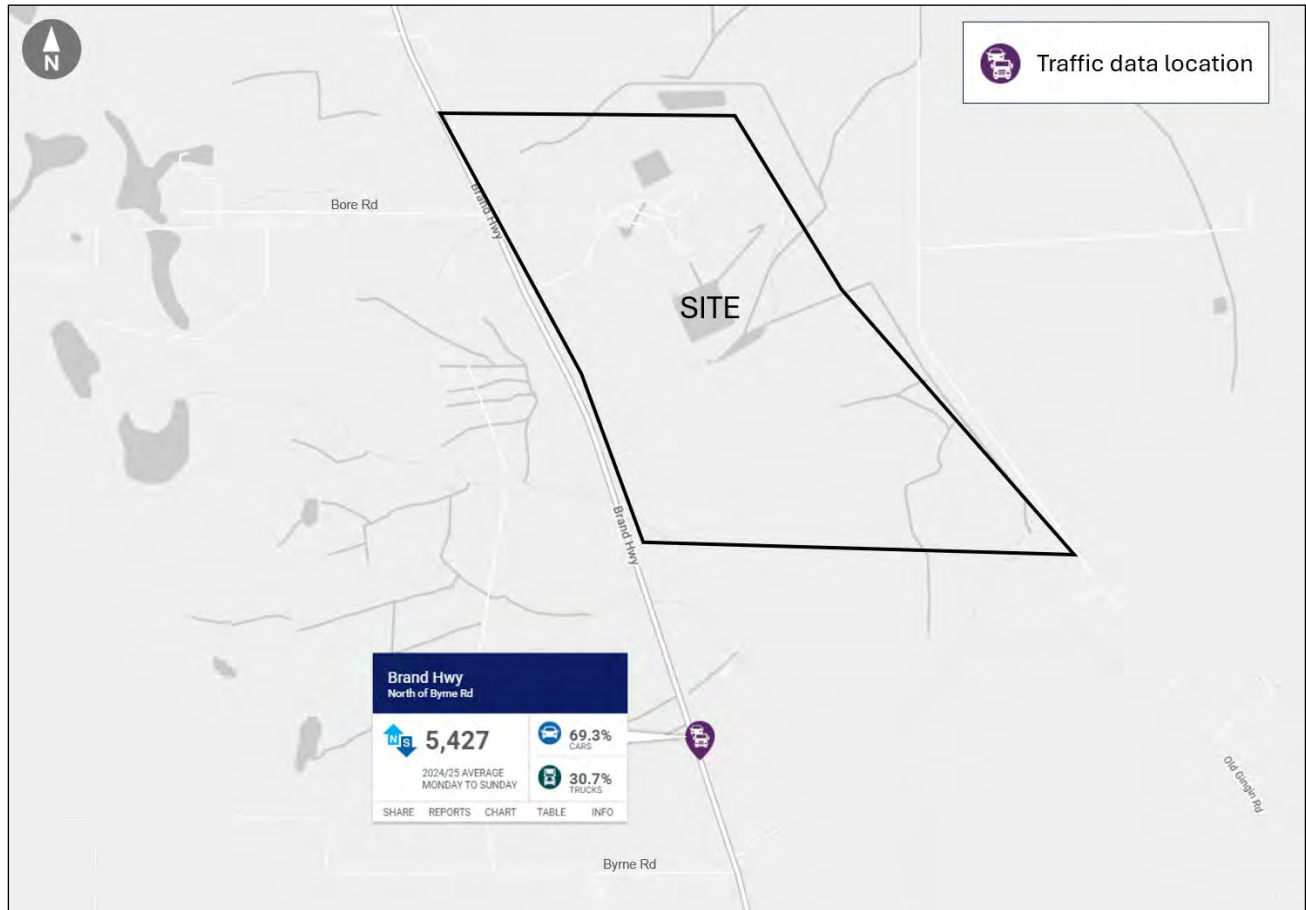


Table 4 Existing Traffic Volumes

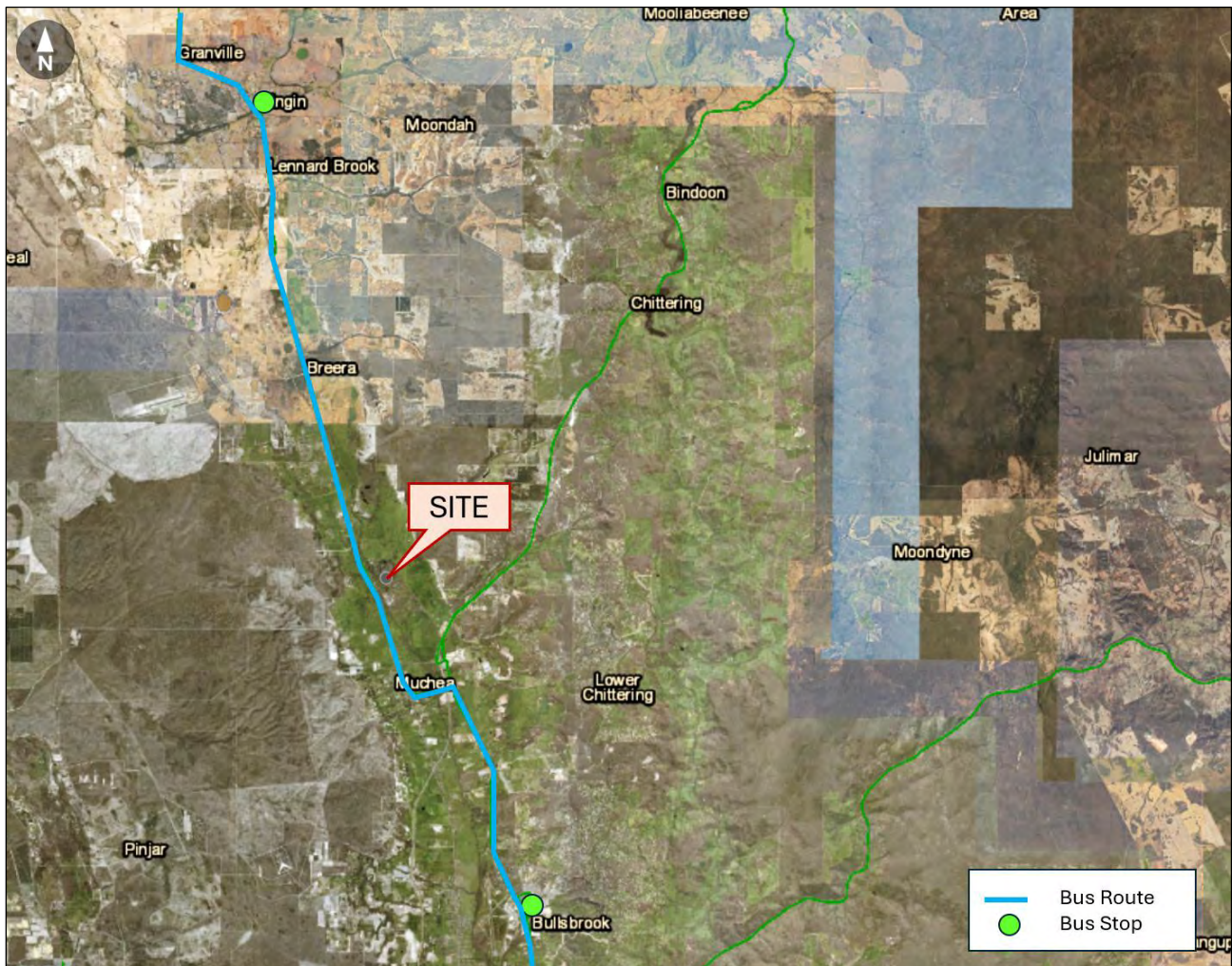
Road Name	Source	Date	AM Peak (vph)	PM Peak (vph)	Average Daily (vpd) (HV%)
Brand Highway (North of Byrne Road)	MRWA	2024/2025	390	427	5,427 (30.7%)

8 PUBLIC TRANSPORT ACCESS

8.1 Existing Public Transport Services

Figure 8 presents the route of the N1 coach line from East Perth to Kalbarri and Geraldton via Eneabba operated by TransWA which passes by the Site. Figure 9 details the N1 coach line timetable as posted on the TransWA website.

Figure 8 Existing Bus Route



Source: Locate V5

Figure 9 N1 Timetable

Perth to Kalbarri via Eneabba			Perth to Geraldton via Eneabba		
From Perth			879	GPE1	GPE2
			Mon Wed Fri	Tue Thur Sat	Mon to Sat
			AM	AM	
East Perth Terminal		Dep	8:30	8:30	
Midland Station (Stand No. 10)		Dep	8:55	8:55	
Bullsbrook (bus stop)		Dep	9:17	9:17	
Gingin (Shire Office)		Dep	9:46	9:46	
Cataby (Liberty Roadhouse)		Arr	10:43	10:43	
		Dep	11:15	11:15	
Badgingarra (information bay)		Dep	11:46	11:46	
			PM	PM	
Jurien Bay turnoff/Brand Highway (38km)*		Dep	12:00	12:00	
Warradarge (Roadhouse)		Dep	12:14	12:14	
Eneabba (Roadhouse)		Dep	12:37	12:37	
Port Denison (Point Leander Drive)		Dep	1:34	1:34	
Dongara (Visitor Centre)		Dep	1:39	1:39	
Greenough (town site)		Dep	2:09	2:09	
Cape Burney turnoff (1km)*		Dep	2:19	2:19	
Geraldton (Railway Station)		Arr	2:30	2:30	
		Dep	2:40		
Northampton (Lions bus shelter)		Dep	3:22		
Kalbarri (Motor Hotel)		Arr	4:55		
From Kalbarri/Geraldton					
Kalbarri (Motor Hotel)		Dep			
Northampton (Lions bus shelter)		Dep			
Geraldton (Railway Station)		Arr			AM
		Dep			8:30
Cape Burney turnoff (1km)*		Dep			8:40
Greenough (town site)		Dep			8:50
Dongara (Visitor Centre)		Dep			9:20
Port Denison (Point Leander Drive)		Dep			9:25
Eneabba (Roadhouse)		Dep			10:22
Warradarge (Roadhouse)		Arr			10:45
		Dep			11:15
Jurien Bay turnoff/Brand Highway (38km)*		Dep			11:29
Badgingarra (information bay)		Dep			11:45
					PM
Cataby (Liberty Roadhouse)		Dep			12:15
Gingin (Shire Office)		Dep			1:11
Bullsbrook (bus stop)		Dep			1:40
Midland Station (Stand No. 10)		Dep			2:02
East Perth Terminal		Arr			2:30

Source: TransWA

8.2 Nearest Bus Stops/Train Stations

No bus stops are found near the Site. However, the Site is located between the stops of the N1 coach line operated by TransWA as shown in **Figure 8**. The Gingin stop is situated 21.6km north of the Site and the Bullsbrook stop is located 16.5km south of the Site. However, it is very unlikely that maintenance staff will utilise public transport.

8.3 Pedestrian/Cycle Links to Bus Stops/Train Stations

No bus stops are observed near the Site, and no footpaths were identified along Brand Highway.

9 PEDESTRIAN AND CYCLE ACCESS/FACILITIES

9.1 Existing Pedestrian/Cycle Networks within the Development

No pedestrian/cycle Networks are present within the Chandala Processing Plant.

9.2 Proposed Pedestrian/Cycle Facilities within the Development

There are no proposed pedestrian and cycle facilities within the development.

9.3 Existing Pedestrian/Cycle Facilities on Surrounding Roads

No pedestrian footpaths and cycle facilities are provided along Brand Highway.

9.4 Proposals to Improve Pedestrian/Cycle Access

There are no known proposals to improve pedestrian/cycle access in the vicinity of the Site in the short to medium-term.

10 SITE SPECIFIC ISSUES

There are no Site-specific issues identified within this assessment.

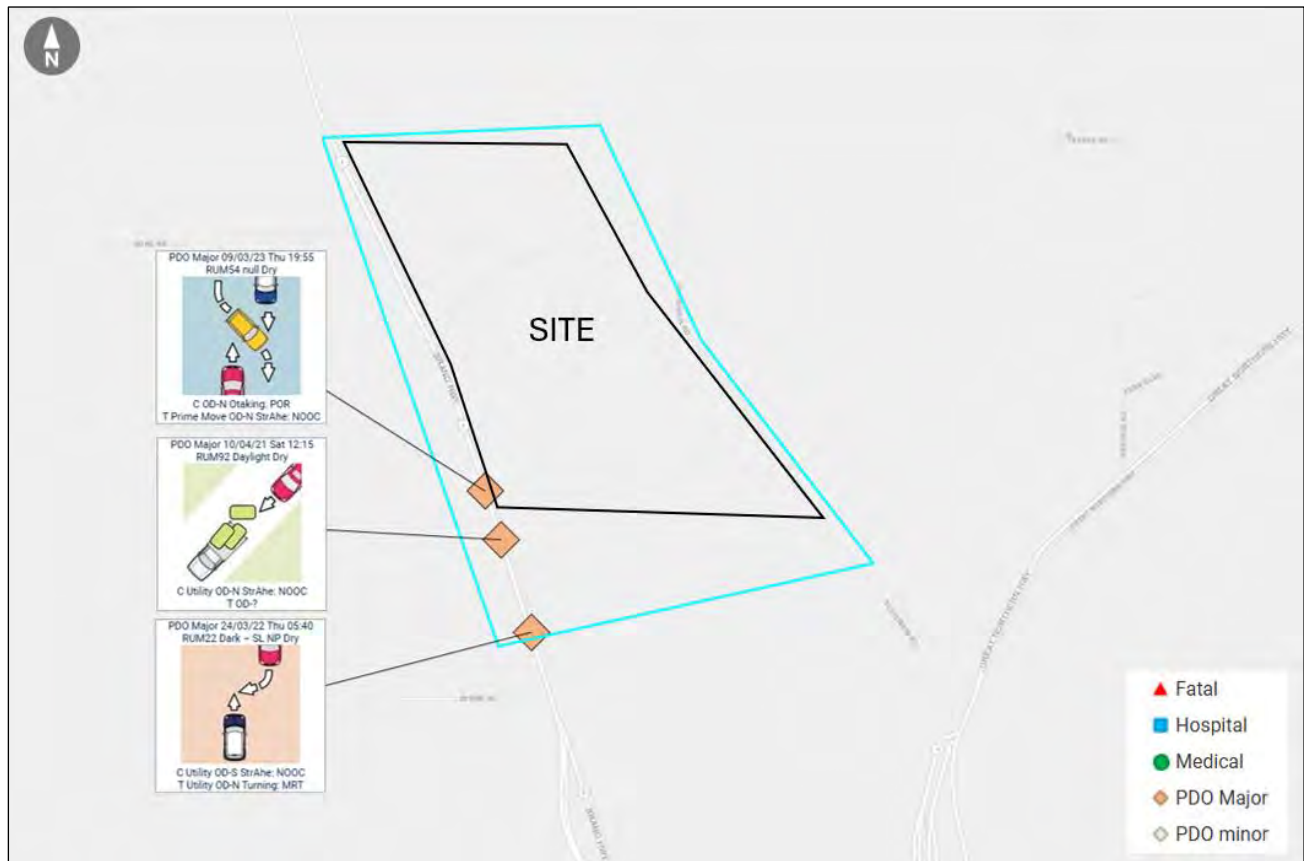
11 SAFETY ISSUES

11.1 Crash Assessment

A crash assessment for the surrounding road network of the Site has been completed using Main Roads WA Reporting Centre. The assessment covers all the recorded crashes for the 5-year period between 1 January 2021 to 31 December 2025.

The crash locations and severity of these crashes are illustrated in **Figure 10**. A summary of all crashes that occurred within the vicinity of the Site is provided in **Table 5**.

Figure 10 Crash Locations



Source: Main Roads WA Reporting Centre

Table 5 Total Crashes

Crash Nature	Fatal	Hospital	Medical	PDO Major	PDO Minor	Total Crashes
Right Turn Thru	-	-	-	1	-	1
Sideswipe Same Direction	-	-	-	1	-	1
Unspecified	-	-	-	1	-	1
Total	-	-	-	3	-	3

Crash data is summarised as follows:

- » A total of three (3) crashes were recorded along Brand Highway, with no fatal crashes recorded.
- » The recorded crashes had different causes, but all resulted in major property damage.
- » All crashes occurred at the midblock and none at the intersection.

Overall, given the low expected traffic generation, it is unlikely that the proposed development will have a significant impact on road safety in the area.

11.2 Stopping Sight Distance

According to *Austrroads Guide to Road Design Part 4: Intersections and Crossings (AGRD Part 4)*, the sight distance requirements for railway level crossings depend on the type of crossing control. As the subject crossing is actively controlled by flashing lights, the sight distance requirements in AGRD Part 4 do not apply.

For actively controlled crossings, the key requirement is that drivers have adequate sight distance to see the signals. Therefore, the approach sight distance requirements in *Austrroads Guide to Road Design Part 4A: Unsignalised and Signalised Intersections (AGRD Part 4A)* should be achieved.

The approach sight distance (ASD) for trucks to stop safely at a railway level crossing with active control (i.e. flashing lights) is determined in accordance with the provisions of AGRD Part 4A which says: “Approach sight distances for trucks are numerically the same as the stopping sight distance (SSD) values for trucks provided in *Austrroads Guide to Road Design Part 3: Geometric Design (AGRD Part 3)*.”

Figure 11, from AGRD Part 3, shows the corresponding SSD based on the truck’s operating speed and driver reaction time. Considering that the truck will slow down at the slip lane along Brand Highway with an adopted operating speed of 60 km/h and using a reaction time of 2.5 seconds, the SSD is 91 metres. It is noted that the internal road has a posted speed limit of 40 km/h. Therefore, the stopping sight distance assessment is conservative.

As shown in **Figure 12**, the required stopping sight distance of 91m is accommodated within the slip lanes along Brand Highway and at the access road to the Site. This means that drivers are provided with sufficient visibility to detect the railway level crossing, perceive any warning devices and stop safely before reaching the tracks. Warning signage are also posted along Brand Highway to inform drivers of the upcoming railway crossing.

Figure 13 and **Figure 14** present the Street View images from the driver's position at the 91m stopping sight distance. **Figure 13** shows that the flashing light signals are clearly visible within the required sight triangle, confirming that the available sight distance is adequate. **Figure 14** shows that although some trees are located within the sight triangle, gaps in between the trees allow the flashing light signals to remain visible to the driver from this location.

Figure 11 Truck Stopping Sight Distances

Operating speed (km/h)	Single unit trucks, semi-trailers and B-doubles Based on $d = 0.29^{(1)}$							
	$R_T = 1.5 \text{ s}^{(2)}$				$R_T = 2.0 \text{ s}$		$R_T = 2.5 \text{ s}$	
40	38				44		49	
50	55				62		69	
60	74				82		91	
70	96				105		115	
80	120				131		142	
90	147				160		172	
100	–				191		205	
110	–				225		241	
Corrections due to grade ^{(3) (4)}	–8%	–6%	–4%	–2%	2%	4%	6%	8%
40	8	6	3	2	–1	–3	–4	–5
50	13	9	5	3	–2	–4	–6	–7
60	19	13	8	4	–3	–6	–8	–11
70	25	17	11	5	–4	–8	–11	–14
80	33	23	14	6	–6	–11	–15	–19
90	42	29	18	8	–7	–13	–19	–24
100	52	35	22	10	–9	–16	–23	–29
110	63	43	26	12	–11	–20	–28	–36

- 1 On any horizontal curve with a side friction factor greater than the desirable maximum value for trucks, the stopping sight distance values given should be based on a coefficient of deceleration that is reduced by 0.05.
- 2 Reaction times of 1.5 s cannot be used in Western Australia. A 1.5 s reaction time is only to be used in constrained situations where drivers will be alert. Typical situations are given in Table 5.2. The general minimum reaction time is 2.0 s.
- 3 If the roadway is on a grade, designers shall adjust stopping sight distance values by applying these grade corrections derived with $d = 0.29$. Downhill grades are shown as negative, with uphill listed as positive. The grade adopted is determined using the average grade over the braking length.
- 4 Corrected stopping sight distances should be rounded conservatively to the nearest 5 m.

Note: Combinations of design speed and reaction times not shown in this table are generally not used.

Source: Austroads Guide to Road Design Part 3: Geometric Design

Figure 12 Stopping Sight Distances and Warning Signage at Brand Highway and Railway Crossing



Figure 13 Driver's View of the Flashing Lights at 91m Stopping Sight Distance (at the north approach of Brand Highway)



Source: Metromap

Figure 14 Driver's View of the Flashing Lights at 91m Stopping Sight Distance (at the south approach of Brand Highway)



Source: Metromap

11.3 Remedial Measures

No remedial measures are proposed as no safety issues were identified.

12 SUMMARY AND CONCLUSIONS

This report has been prepared in accordance with the Western Australian Planning Commission (WAPC) Transport Assessment Guidelines for Developments: Volume 4 – Individual Developments (2016); the checklist is included in **Appendix A**.

The following conclusions can be drawn from this TIS:

- » The Site is proposed to be located at the Chandala Processing Plant, 722 Old Gingin Road, Muchea within the Shire of Chittering.
- » The proposed Chandala BESS facility will store a total of four (4) modules.
- » The anticipated traffic generation during the operational phase of the BESS facility is three (3) inbound vehicle trips and three (3) outbound vehicle trips, occurring only once a month for scheduled maintenance visits by staff. The traffic generated during the construction phase and its impacts are excluded from the scope of this report and will be addressed in a separate report as necessary.
- » Construction and Operational Traffic Management Plans will be prepared in consultation with Tronox Operations prior to the commencement of site operations.
- » The *Shire of Chittering Local Planning Policy No. 13* does not include a car parking requirement associated with a BESS facility. Based on the anticipated traffic generation of two (2) light vehicles and one (1) truck during the BESS operations, the existing car parking area within the Chandala Processing Plant is considered sufficient to accommodate the additional traffic.
- » TransWA's N1 coach line passes by the Site. However, no bus stops are found near the Site. The Gingin stop is situated 21.6km north of the Site and the Bullsbrook stop is located 16.5km south of the Site. However, it is very unlikely that maintenance staff will utilise public transport.
- » A swept path analysis was conducted using a 19m semi-trailer. It was demonstrated that the service vehicle will have no issues regarding ingress, egress and circulation of the service vehicle within the Site.
- » A total of three (3) crashes were recorded within the vicinity of the Site over the past five years, with all crashes resulting in major property damage.

Overall, it is not expected that the proposed development will have an adverse impact on road safety or traffic operations in the surrounding area.

Appendix A

WAPC CHECKLIST

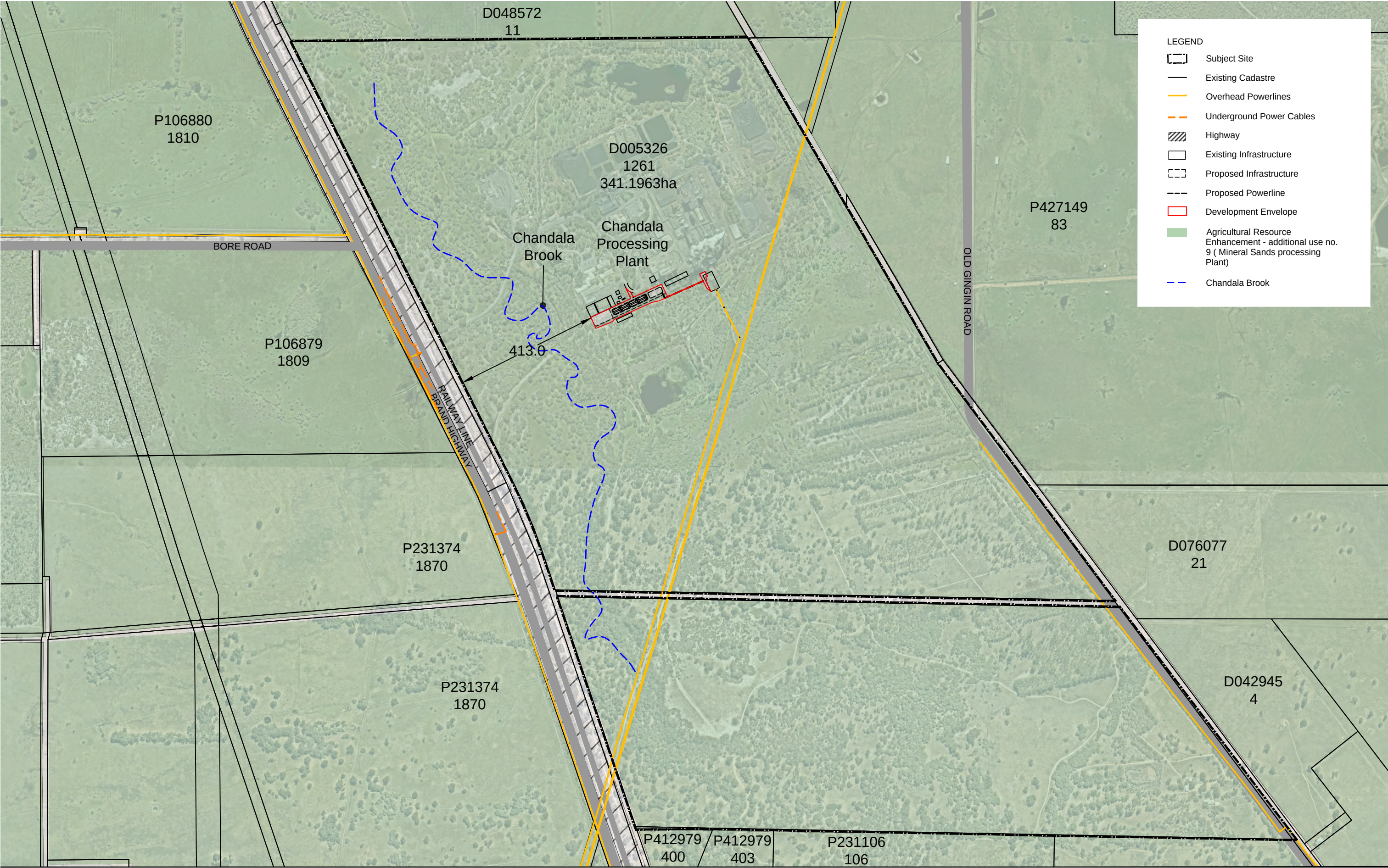


Item	Status	Comments/Proposal
Proposed Development	Section 2	
existing land uses	Section 2	
proposed land uses	Section 2	
context with surrounds	Section 2	
Vehicular access and parking	Section 3	
access arrangements	Section 3	
public, private, disabled parking set down/pick up	Section 3	
Service vehicles (non-residential)	Section 4	
access arrangements	Section 4	
on/off-site loading facilities	Section 4	
Hours of Operation (non-residential only)	Section 5	
Traffic Volumes	Section 6	
daily or peak traffic volumes	Section 6	
type of vehicles (e.g. cars, trucks)	Section 6	
Traffic management on frontage streets	Section 7	
Public transport access	Section 8	
nearest bus/train routes	Section 8	
nearest bus stops/train stations	Section 8	
pedestrian/cycle links to bus stops/train station	Section 8	
Pedestrian and Cycle access/facilities	Section 9	
existing pedestrian and cycle facilities within the development (if any)	Section 9	
proposed pedestrian and cycle facilities within the development	Section 9	
existing pedestrian and cycle facilities on surrounding roads	Section 9	
proposals to improve pedestrian and cycle access	Section 9	
Site specific issues	Section 10	
Safety issues	Section 11	
identify issues	Section 11	
remedial measures	Section 11	
Summary	Section 12	

Appendix B

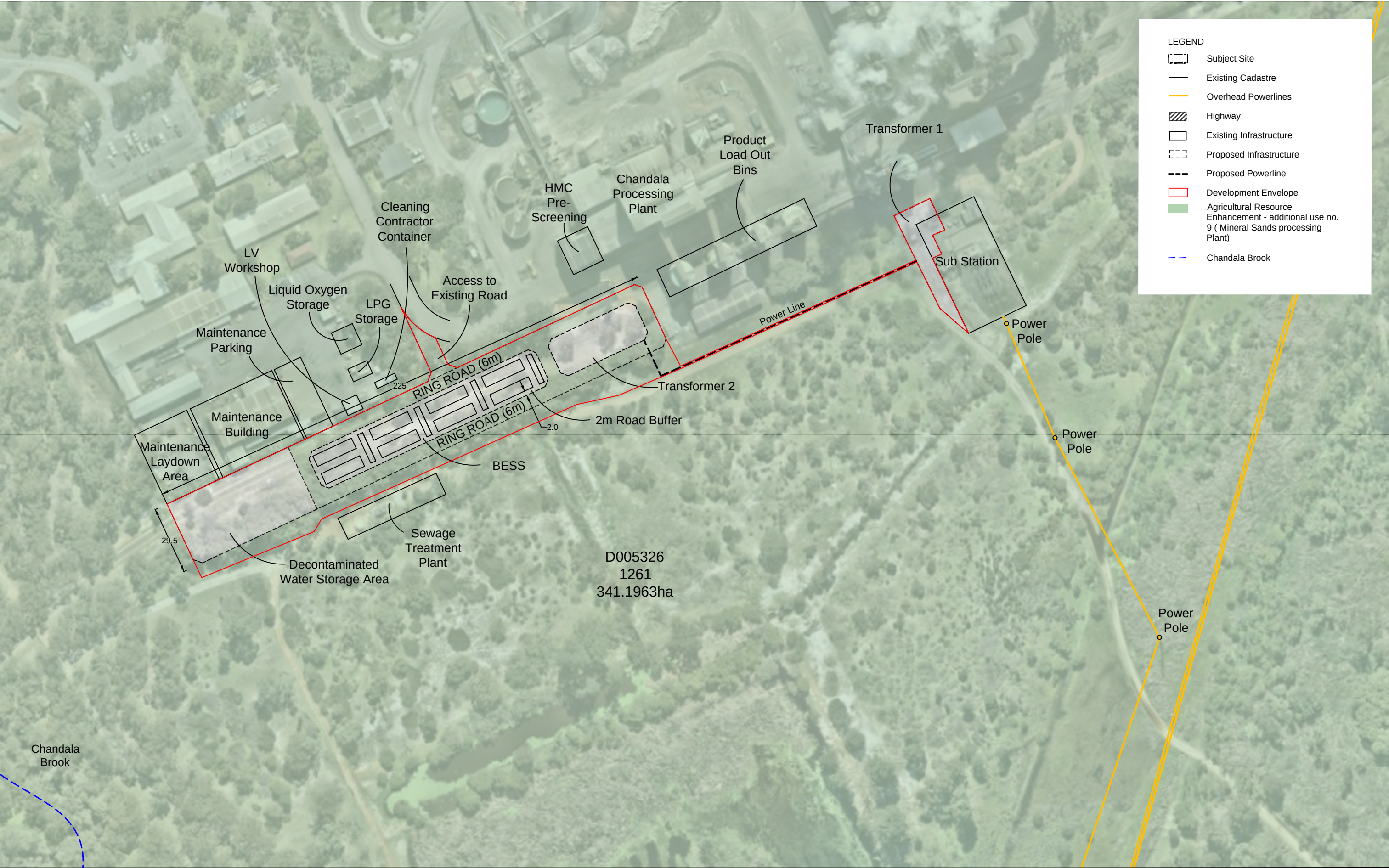
SITE PLAN





Site 4 - Local Context
Lot 1261 (No. 722) Old Gingin Road, Muchea





Site 4 - Site Context

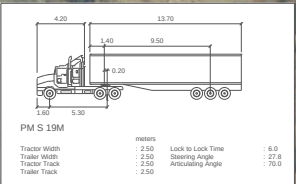
Lot 1261 (No. 722) Old Gingin Road, Muchea

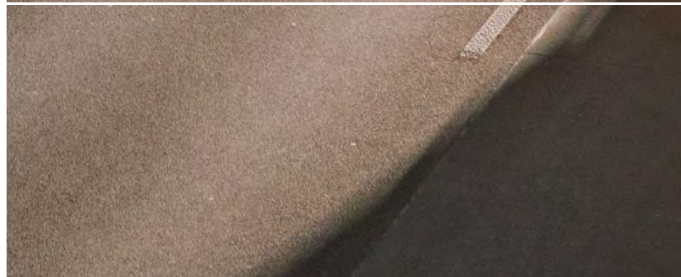


Appendix C

SWEPT PATH







ptg
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