



Technical Note

Project: Cardup Siding Road, Cardup

Subject: Transport Assessment to Planning Amendment

Client:	SmartStream Technologies c/o Wormall Civil	Version:	B - Draft
Project No:	06705	Author:	Tanya Moran
Date:	7 November 2022	Approved:	Tanya Moran

I Background

1.1.1 Smartstream Technology is seeking approval from the Shire of Serpentine Jarrahdale (SoSJ) to increase their operational capacity at their site located within Wormall Civil's yard at 17 Cardup Siding Road, Cardup.

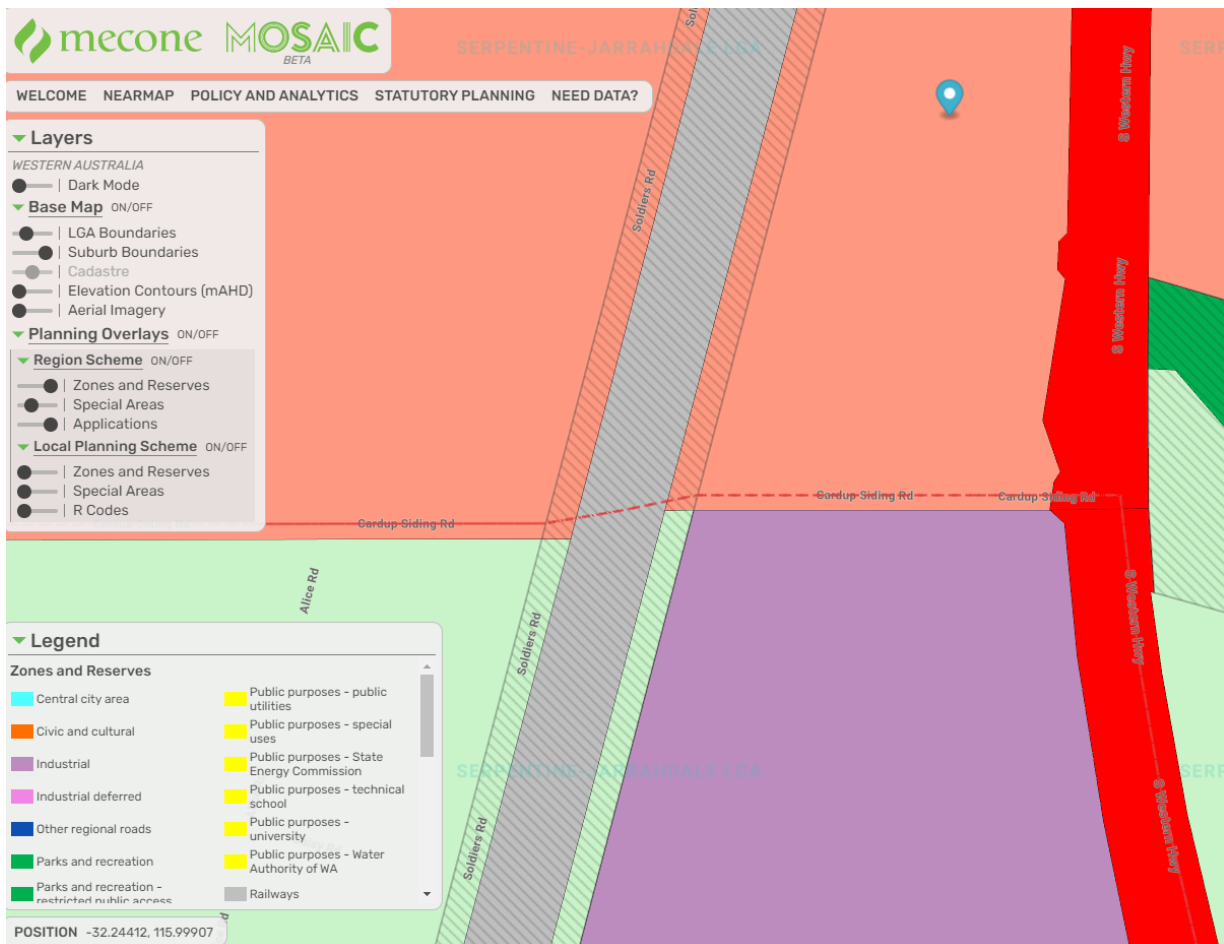
1.1.2 Accordingly, the Shire of Serpentine Jarrahdale (SoSJ) has indicated this increase in throughput would result in an amendment to the existing planning approval. As such, SoSJ seek traffic information, amongst other studies such as noise and air emissions, to be...*"undertaken by a suitably qualified transport consultant which models vehicle movements based on the amendment to the production and the traffic impact (if any) on the road network"*.

2 Planning Condition #17

2.1.1 It is understood that there is a maximum of two (2) commercial vehicles a day currently permitted to access the site per columns 1 and 2 below:

Columns a1 and 2 Shire of Serpentine Jarrahdale comments	
17	<p>A maximum of 2 commercial vehicles a day are permitted to access the site for loading and unloading purposes.</p> <p>Additional information is required with regards to the number and types of vehicles being generated as a result of unrestricting the throughput . A TIS would be required to demonstrate that any additional vehicles generated by this will not impact upon the road network.</p>

- 2.1.2 The site is zoned 'industrial' under the region scheme so the current approval over this ~4.5Ha site for only two commercial vehicles, equating to four truck movements per day, appears to be extremely low and disproportionate to the size of land and gross flow areas for this land use.



(source: Mosaic Beta Tool, Mecone)

3 Existing operations

- 3.1.1 The site is fully occupied by Smartstream Technologies and Wormall Civil.
- 3.1.2 The existing operations at the site are 7am to 5.30pm Monday to Friday and 7am to 1pm Saturdays.
- 3.1.3 Data provided by Smartstream Technologies show existing vehicle movements to/from the site. These all access the site using Cardup Siding Road and are as follows:

- 4 truck movements per working day on average (weekday) 7am to 5.30pm; 4 truck movements on Saturdays, 7am to 1pm.
- 8 container trucks per month ie. 2 per week.
- 16 staff vehicle movements per day (8 staff total).
- Total existing **maximum** number of **vehicles** per typical **weekday** = **21 vehicles**¹.

3.1.4 Type of commercial vehicles used for pickups and deliveries are as follows:

- 5% of collections – Load capacity of 20t (container trucks) – 19.0m long equivalent.
- 25% of collections – Load capacity of 4-12t
- 70% of collections – Load capacity of up to 4t (this includes vans and utes) – B99 equivalent.

3.1.5 Majority of delivery vehicles travel to/from South Western Highway intersection.



(source: Nearmap)

4 Proposed operations

4.1.1 The site will continue to be fully occupied by Smartstream Technologies and Wormall Civil.

¹ Assuming one of the monthly container truck movements also accesses on that day.

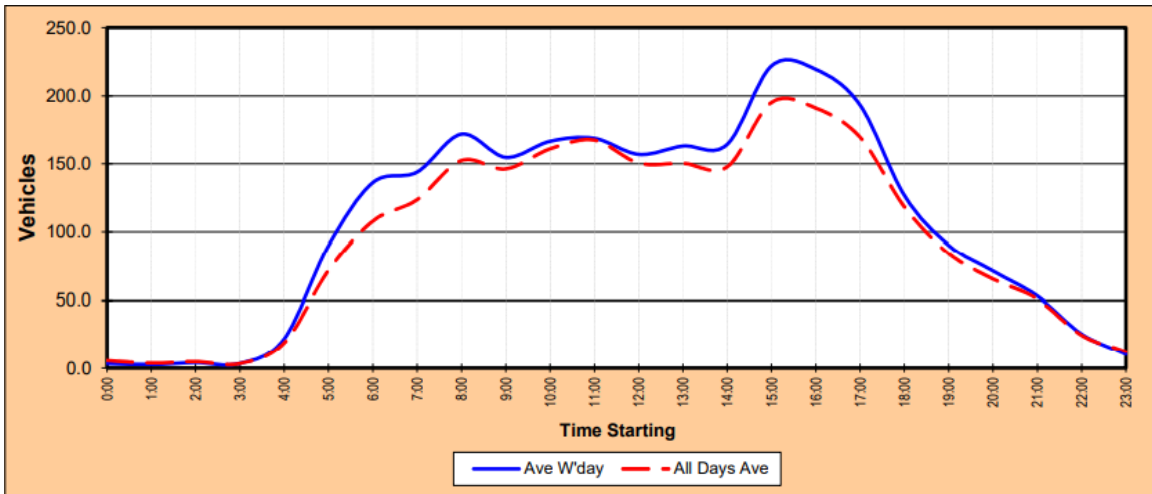


- 4.1.2 The future operations at the site are to be 24 hours 5 days a week and no change on Saturdays.
- 4.1.3 Proposed commercial vehicle movements to/from the site, all using Cardup Siding Road, are as follows:
- 10 truck movements per working day on average (weekday), 24 hour operations; 4 truck movements on Saturdays, 7am to 1pm.
 - 16 container trucks per month ie. 4 per week.
 - 32 staff vehicle movements per day, shift work² (16 staff total).
 - Total **proposed** number of **vehicles per weekday = 42 vehicles**.
- 4.1.4 Type of trucks will not change. The largest vehicle will remain the same at 19.0m long semi-trailer.
- 4.1.5 Refuse collection and Emergency vehicle access routes will not change from existing.
- 4.1.6 Based on the above, the increase in vehicles to/from Cardup Siding Road and South Western Highway as a result of the proposal will be 21 vehicles per day for a total of 42 vehicles per day. In the AM Peak this would be a **maximum of 12 movements per hour** (10 staff in and 1 truck in and out) in/out of the site. In the PM peak, a **maximum of 21 movements per hour** (10 staff out, 6 staff in and 5 truck movements added) as a worst case scenario.

5 Existing Network

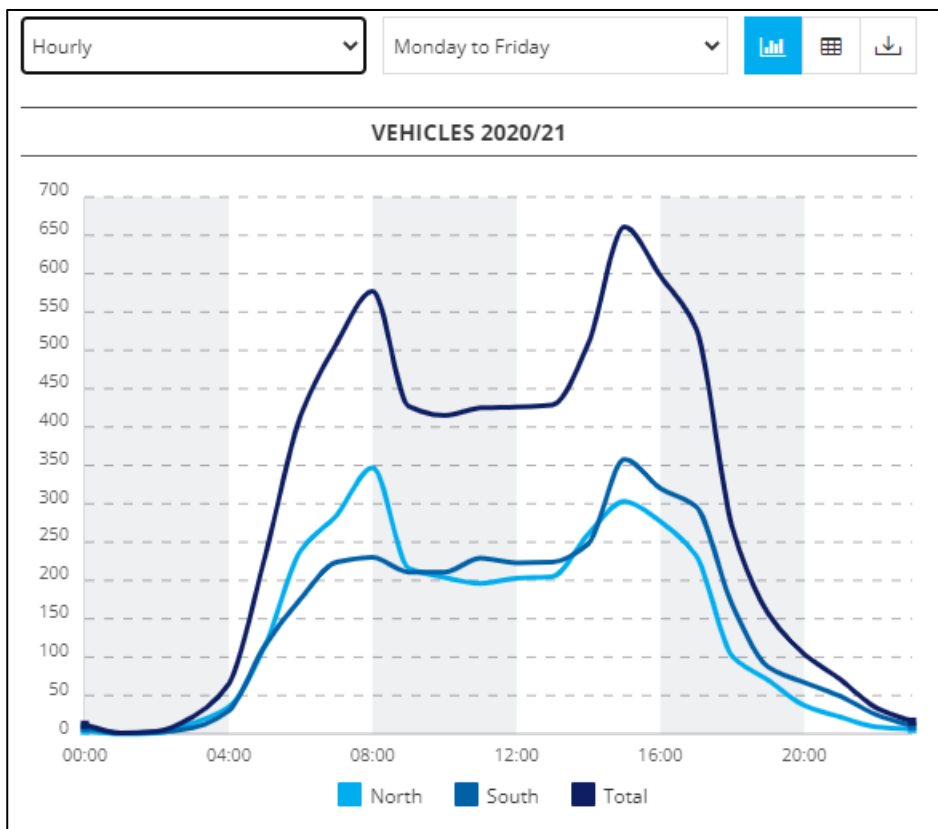
- 5.1.1 Cardup Siding Road is classified as an Access Road according to Main Roads WA Metropolitan Functional Road Hierarchy with a posted speed of 60km/h. The road is a single carriageway with one lane for each direction. The road pavement width is approximately 7.1m.
- 5.1.2 South Western Highway is classified as a Primary Distributor according to MRWA Metropolitan Functional Road Hierarchy with a posted speed of 110km/h. The road is a single carriageway with one lane for each direction. The road pavement width is approximately 11.3m.
- 5.1.3 Existing weekday traffic volumes were obtained from SoSJ and Main Roads WA.
- Cardup Siding Road, SoSJ December 2020 counts – 2,563 vehicles per day (vpd) two-way.

² AM Peak: 10 staff starting at 8am; 6 staff starting at 4pm for 24hr operations.



(Source: Austraffic)

- South Western Highway, south of Kiln Road, MRWA 2020-2021 counts – 6,901 vpd two-way.



(source: MRWA)



5.1.4 Due to the locality of the site within a rural area, there is currently no pedestrian/cycle path facilities apart from provision of sealed shoulders of approximately 1.5m wide on both sides of South Western Highway.

5.1.5 There is currently bus services provision available in the area, including the following:

- Route 251 Armadale Station-Byford via South Western Highway
- Route 252 Armadale Station-Mundijong via Byford
- Route 253 Armadale Station-Jarrahdale via Byford & Mundijong
- Route 254 Armadale Station-Byford via Kardan Boulevard.

The above bus services terminate at Armadale Station to a train service (Armadale Line).

6 Future Network

6.1.1 The *Cardup Business Park Local Structure Plan (March 2019)* notes extensive transport assessment has been completed by Main Roads WA for the region which shows the proposed Tonkin Highway extension along the Hopkinson Road alignment. This planning is to cater for growth that is anticipated for residential and commercial development south of Byford.

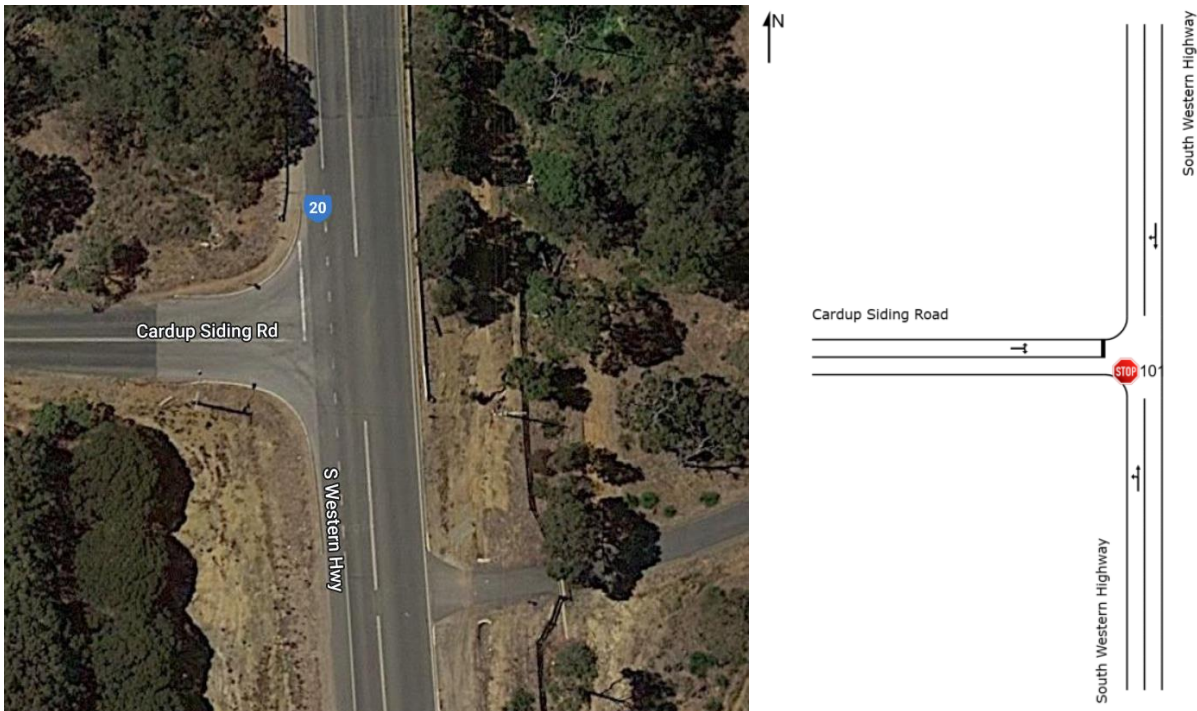
6.1.2 The LSP reports note Main Roads WA ROM forecast traffic model for year 2031 for the area does not currently indicate a new east-west through connection between South Western Highway and Tonkin Highway extension. Notwithstanding, the LSP notes Cardup Siding Road does not currently provide a feasible alignment to the future Tonkin Highway and would require acquisition of rural pastureland to establish a functional alignment. Significant upgrade, including grade separation would be necessary at the existing railway crossing.

6.1.3 It has also been highlighted by Wormal Civil, that Cardup Siding Road has also been planned to become a cul-de-sac to the west of the Wormal Civil/Smartstream Technology site, prior to the railway crossing with Soldiers Road, with the railway crossing also planned to be removed. Orton Road to the north of Cardup Siding Road is proposed to be the main east west connector. This, if proceeding, would assist the Wormal Civil site as almost all background traffic would disappear, and traffic operations would improve given all Wormal Civil site traffic currently enter / exit Cardup Siding Road via the South Western Highway intersection.

7 Traffic Assessment

7.1.1 An assessment of current traffic operations has been undertaken.

- 7.1.2 Currently, there is some 2,570 vpd two-way on Cardup Siding Road and 6,900 vpd two-way on South Western Highway, with corresponding peaks of 222 vehicles per hour (vph) (3pm-4pm) and 661 vph (3pm – 4pm) respectively.



(source: Google)

- 7.1.3 A SIDRA Intersection analysis, a computer-based modelling package which calculates intersection performance, has been undertaken to understand the current operation of the key South Western Highway / Cardup Siding Road intersection under current demands and how this changes with the proposed doubling of Wormall Civil site operations.
- 7.1.4 North and south traffic distributions have been obtained from the approved LSP and applied to the recent road volumes collected by SoSJ and Main Roads WA. PM peak has been modelled in SIDRA as it represents the highest peak demands (worst-case scenario).
- 7.1.5 The results of the SIDRA analysis for 'existing' scenario shows that currently the South Western Highway / Cardup Siding Road intersection is operating at acceptable levels (refer Attachment A). All average delays for each movement are 13 seconds or less, which meets the WAPC Guideline thresholds. The degree of saturation of the intersection is 0.197 (19.7%) and level of service LoS is A or B.



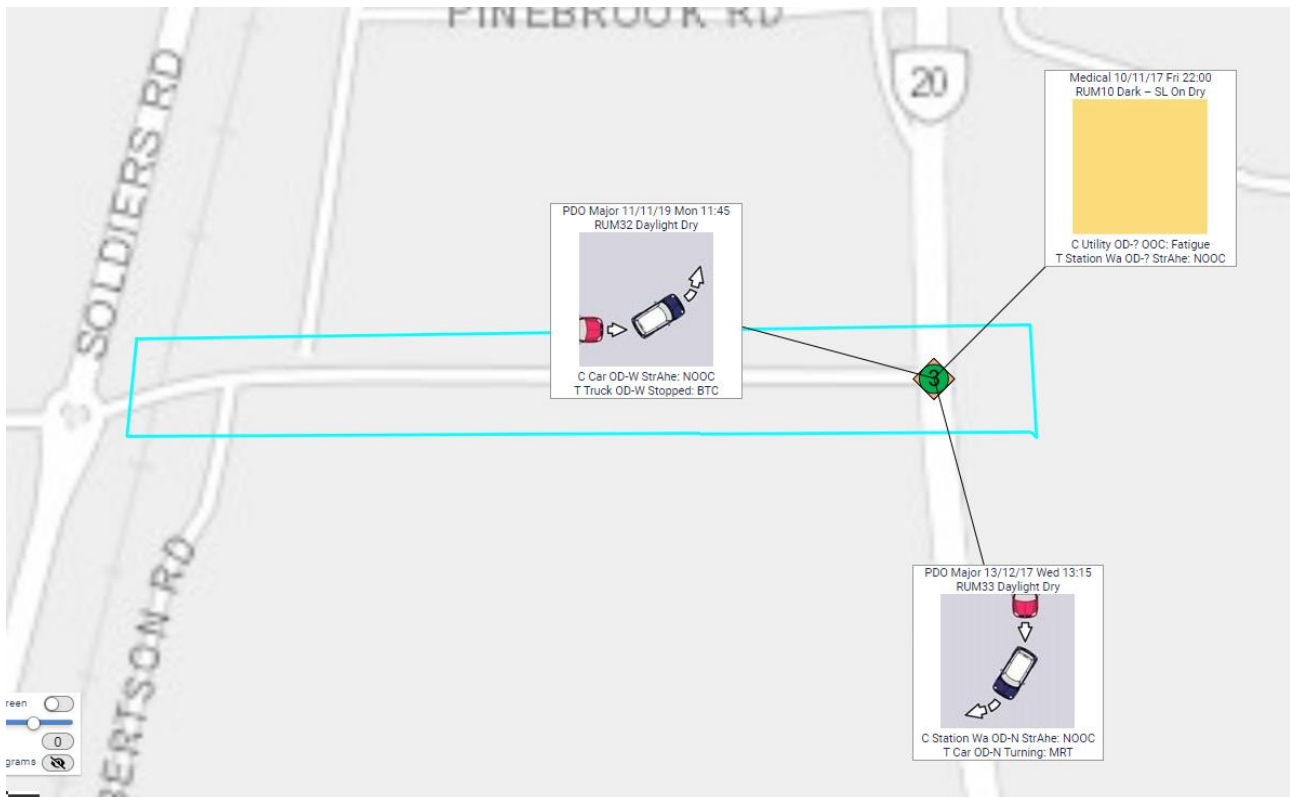
- 7.1.6 To understand how the increase in Wormall Civils' production will impact the network, the 21 additional vehicles in the PM peak has been added to the intersection.
- 7.1.7 The results of the SIDRA analysis for 'increased production' scenario shows that the South Western Highway / Cardup Siding Road intersection will continue to operate at acceptable levels (refer Attachment A). All average driver delay for each movement remain at or below 13 seconds which meets the WAPC Guideline thresholds. The degree of saturation of the intersection is 0.203 (20.3%) and level of service (LoS) remain at LoS is A or B.
- 7.1.8 On this basis, the impacts to the road network are negligible.
- 7.1.9 Further, the intersection of the Site Access / Cardup Siding Road has been reviewed. Table 2.4 from the *Austrroads publication, Guide to Traffic Management Part 6 – Intersections, Interchanges and Crossings* provides advice as to intersection and crossover performance in peak flow conditions about possible further analysis. This is summarised below. If the calculated expected traffic flows for this intersection exceed those shown in the table, further intersection traffic assessment is typically required.

Major Road Type	Major Road Flow (two-way, vph)	Minor Road Flow (two-way, vph)
Two-lane	400	250
	500	200
	650	100
Four-lane	1,000	100
	1,500	50
	2,000	25

- 7.1.10 Traffic flows of 222 vehicles per hour on Cardup Siding Road fall below the Major Road flow of 400 vehicles for two lanes and the Minor Road Site Access flow is below 250 vehicles. This indicates there is no requirement to undertake a detailed intersection assessment as the intersection will operate at good levels of service.

8 Crash Statistics

- 8.1.1 A review of crash information for the last 5 years of available data has been retrieved from Main Roads WA's Integrated Road Information System (IRIS). In the five year period between January 2017 and December 2021 there were three (3) recorded crashes.



8.1.2 Of the three crashes, one was a Right-angle crash which resulted in a medical and occurred in dark conditions but with streets lights on. The remaining two were Rear-End crashes which were Property Damage Only (PDO) Major.

9 Summary

9.1.1 The Shire of Serpentine Jarrahdale sought traffic information and analysis to be undertaken which models vehicle movements based on the proposed increase to production and the traffic impact (if any) on the road network.

9.1.2 This analysis has determined that with the proposed 24-hour operations, the increase in vehicle movements would be 21 vehicles per hour (worst-case).

9.1.3 Under the assessed flows, both Site Access / Cardup Siding Road intersection and South Western Highway / Cardup Siding Road intersection are expected to operate at acceptable levels with the expected increase in production.

Appendix A WAPC Checklist – Transport Impact Statement

Item	Provided	Comments/Proposals
Proposed Development		
Existing Land Uses	Y	
Proposed Land Use	Y	
Context with Surrounds	Y	
Vehicular Access and Parking		
Access Arrangements	Y	
Public, Private, Disabled Parking Set Down/Pick Up	Y	All Private. No Set Down/Pick Up
Service Vehicle (Non-Residential)		
Access Arrangements	Y	
On/Off-Site Loading Facilities	Y	All on-site.
Service Vehicles (Residential)		
Rubbish Collection and Emergency Vehicle Access	Y	
Hours of Operation (Non-Residential Only)	Y	
Traffic Volumes		
Daily or Peak Hour Traffic Volumes	Y	
Type of Vehicles (E.G. Cars, Trucks)	Y	
Traffic Management on Frontage Streets	Y	
Public Transport Access		
Nearest Bus/Train Routes	Y	
Nearest Bus Stops/Train Stations	Y	
Pedestrian/Cycle Links to Bus Stops/Train Station	Y	
Pedestrian Access/Facilities		
Existing Pedestrian Facilities Within the Development (If Any)	N/A	
Proposed Pedestrian Facilities Within Development	N/A	
Existing Pedestrian Facilities on Surrounding Roads	Y	
Proposals to Improve Pedestrian Access	N/A	
Cycle Access/Facilities		
Existing Cycle Facilities Within the Development (If Any)	N/A	
Proposed Cycle Facilities Within Development	N/A	
Existing Cycle Facilities on Surrounding Roads	Y	
Proposals to Improve Cycle Access	N/A	
Site Specific Issues	Y	
Safety Issues		
Identify Issues	Y	



Remedial Measures	Y	
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