

B & M LOPREIATO

TRAFFIC REPORT FOR
PROPOSED RETAIL
DEVELOPMENT, SILVERDALE

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1. INTRODUCTION

- 1.1 Colston Budd Hunt and Kafes Pty Ltd has been commissioned to prepare a report examining the traffic implications of a proposed shopping centre on Silverdale Road at Silverdale. The site location is shown in Figure 1.
- 1.2 The site is currently occupied by a retail and commercial centre of 1,630m², plus a service station, a dwelling and market gardens.
- 1.3 Wollondilly Council has prepared its Growth Management Strategy 2010. The structure plan for Silverdale identifies the extension of the business zone area on the site. It is therefore proposed to rezone the southern part of the site to enable the extension of the shopping centre.
- 1.4 The proposed extended shopping centre would provide 9,370m², including 1,305m² of the existing centre which would be retained. The service station would also be retained. The new development would include a supermarket, discount department store, specialty shops, family restaurant and tavern.
- 1.5 This report assesses the implications of the proposed development through the following chapters:
- Chapter 2 - describing the existing conditions; and
 - Chapter 3 - assessing the traffic implications of the proposed development.
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2. EXISTING CONDITIONS

Site Location and Road Network

- 2.1 The site is located on the eastern side of Silverdale Road at Silverdale, as shown in Figure 1. It is currently occupied by a retail and commercial centre of 1,630m², plus a service station, a dwelling and market gardens.
- 2.2 There is a driveway from Silverdale Road at the northern end of the site which provides for entry to the service station. There is an exit driveway further south for the petrol station and shopping centre, and an entry driveway to the shopping centre further south again. Separate access is provided to the dwelling and market gardens near the southern end of the site.
- 2.3 There are residential areas south of the site and an industrial area to the west. To the north and east, land use is predominantly rural/residential.
- 2.4 The road network in the vicinity of the site includes Silverdale Road, Farnsworth Avenue, Warradale Road and Marsh Road. Silverdale Road is an unclassified road which provides the main north-south road link through the area, connecting Wallacia in the north with The Oaks in the south. In the vicinity of the site it provides one traffic lane in each direction, with unsealed shoulders and a 60 kilometre per hour speed limit. There are bus stops on both sides of the road, adjacent to the shopping centre. Silverdale Road provides access to the site, as well as rural and residential properties.

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- 2.5 North of the site, Farnsworth Avenue connects to Silverdale Road at a roundabout. Farnsworth Avenue provides one traffic lane in each direction and connects to Warragamba to the west.
- 2.6 South of the site, Warradale Road connects Silverdale Road in the east with Farnsworth Avenue in the west. It provides access to residential properties and provides for one traffic lane and one parking lane in each direction, clear of intersections. The intersection of Warradale Road with Silverdale Road is an unsignalised t-intersection controlled by stop signs. There are concrete medians on each approach to the intersection to channelize traffic.
- 2.7 South of the site, Marsh Road connects Warradale Road in the north with Silverdale Road in the south. It provides access to residential and rural properties. It provides one traffic lane in each direction with parking permitted. The intersection of Marsh Road with Silverdale Road is an unsignalised t-intersection controlled by stop signs. There are concrete medians on the approaches to the intersection to channelize traffic.

Traffic Conditions

- 2.8 Traffic generated by the proposed development will have its greatest effects during weekday afternoon and Saturday peak periods when it combines with commuter and retail traffic. In order to gauge traffic conditions, traffic counts were undertaken during Thursday afternoon and Saturday lunchtime peak periods at the following intersections:
- ❑ Silverdale Road/Farnsworth Avenue;
 - ❑ Silverdale Road/Warradale Road; and
 - ❑ Silverdale Road/Marsh Road.
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- 2.9 The results of the surveys are shown in Figures 2 and 3, and summarised in Table 2.1.

Table 2.1: Existing two-way (sum of both directions) peak hour traffic flows			
Road	Location	Thursday afternoon peak hour	Saturday midday peak hour
Silverdale Road	North of Farnsworth Avenue	775	540
	East of Farnsworth Avenue	585	380
	North of Warradale Road	605	450
	South of Warradale Road	515	390
	North of Marsh Road	360	285
	South of March Road	385	385
Farnsworth Avenue	South of Silverdale Road	200	180
Warradale Road	West of Silverdale Road	150	120
Marsh Road	North of Silverdale Road	65	130

- 2.10 Table 2.1 shows that Silverdale Road carried some 300 to 800 vehicles per hour two-way during the Thursday afternoon and Saturday peak periods. Farnsworth Avenue, Warradale Road and Marsh Road carried lower flows of some 200 vehicles per hour or less two-way.
- 2.11 The existing centre generated some 270 and 215 vehicles per hour two-way during the surveyed Thursday afternoon and Saturday peak hours respectively.

Intersection Operations

- 2.12 The capacity of the road network is largely determined by the capacity of its intersections to cater for peak period traffic flows. The surveyed intersections shown in Figure 2 have been analysed using the SIDRA computer program. SIDRA analyses intersections controlled by traffic signals, roundabouts and signs.

2.13 SIDRA provides a number of performance measures. The most useful measure provided is average delay per vehicle expressed in seconds per vehicle. Based on average delay per vehicle, SIDRA estimates the following levels of service (LOS):

- For traffic signals, the average delay per vehicle in seconds is calculated as delay/(all vehicles), for roundabouts the average delay per vehicle in seconds is selected for the movement with the highest average delay per vehicle, equivalent to the following LOS:

0 to 14	=	"A"	Good
15 to 28	=	"B"	Good with minimal delays and spare capacity
29 to 42	=	"C"	Satisfactory with spare capacity
43 to 56	=	"D"	Satisfactory but operating near capacity
57 to 70	=	"E"	At capacity and incidents will cause excessive delays. Roundabouts require other control mode
> 70	=	"F"	Unsatisfactory and requires additional capacity

- For give way and stop signs, the average delay per vehicle in seconds is selected from the movement with the highest average delay per vehicle, equivalent to following LOS:

0 to 14	=	"A"	Good
15 to 28	=	"B"	Acceptable delays and spare capacity
29 to 42	=	"C"	Satisfactory but accident study required
43 to 56	=	"D"	Near capacity and accident study required
57 to 70	=	"E"	At capacity and requires other control mode
> 70	=	"F"	Unsatisfactory and requires other control mode

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- 2.14 It should be noted that for roundabouts, give way and stop signs, in some circumstances, simply examining the highest individual average delay can be misleading. The size of the movement with the highest average delay per vehicle should also be taken into account. Thus, for example, an intersection where all movements are operating at a level of service A, except one which is at level of service E, may not necessarily define the intersection level of service as E if that movement is very small. That is, longer delays to a small number of vehicles may not justify upgrading an intersection unless a safety issue was also involved.
- 2.15 The analysis found that the roundabout controlled intersection of Silverdale Road with Farnsworth Avenue is operating with average delays of less than 15 seconds per vehicle during Thursday afternoon and Saturday peak periods. This represents LOS A/B, a good level of service.
- 2.16 The intersections of Silverdale Road with Warradale Road and Marsh Road are operating with average delays for the highest delayed movements of less than 15 seconds per vehicle during peak periods. This represents level of service A/B, a good level of service.

Public Transport

- 2.17 Local bus services are provided by CDCBus/Westbus. As previously discussed there are bus stops on both sides of Silverdale Road adjacent to the site.
- 2.18 Route 795 operates along Silverdale Road and Marsh Road between Warragamba, Silverdale, Wallacia, Mulgoa Road, Jamisontown and Penrith. Nine services are provided in each direction on weekdays, with limited weekend services. Services include a link to Penrith railway station and interchange.
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3. IMPLICATIONS OF PROPOSED DEVELOPMENT

3.1 The proposed extended shopping centre would provide 9,370m², including 1,305m² of the existing centre which would be retained. The service station would also be retained. The new development would include a supermarket, discount department store, specialty shops, family restaurant and tavern. Vehicular access is proposed from Silverdale Road and a new road connecting east from Silverdale Road along the southern part of the site.

3.2 This chapter assesses the traffic implications of the proposed development through the following sections:

- ❑ public transport;
- ❑ parking provision;
- ❑ access, servicing and internal layout;
- ❑ traffic generation and effects; and
- ❑ summary.

Public Transport

3.2 As previously discussed, bus services operate along Silverdale Road, adjacent to the site, and provide links to surrounding areas, including Warragamba, Wallacia, Jamisontown and Penrith. The site is therefore accessible by public transport.

3.3 It is unlikely that a large proportion of customers would use public transport. However, employees could use public transport. The proposed development would therefore increase employment densities close to existing public transport services. The proposal would therefore strengthen the existing demand for these

services. In association with the development a new bus stop and shelter is proposed on the eastern side of Silverdale Road, adjacent to the site.

3.4 The proposed development is therefore consistent with government policy and the planning principles of:

(a) improving accessibility to employment and services by walking, cycling, and public transport;

(b) improving the choice of transport and reducing dependence solely on cars for travel purposes;

(c) moderating growth in the demand for travel and the distances travelled, especially by car; and

(d) supporting the efficient and viable operation of public transport services.

Parking Provision

3.5 Section 2.21 of Volume 4 of the Wollondilly Development Control Plan 2010 indicates that *“the number of on-site car parking spaces required for specific development types are listed in Section 2 to this volume. Where no specific number of car spaces is nominated for a land use, on-site car parking is required at the rates specified in the current Guidelines by the NSW Roads and Traffic Authority or, where not listed in these guidelines will be assessed on the merits of each case and site.”*

3.6 Section 2 of Volume 4 does not contain parking rates for retail and commercial uses. The RTA’s “Guide to Traffic Generating Developments” indicates the following parking requirements for shopping centres when the breakdown of retail floor areas is known:

Peak parking = $24 A(S) + 40 A(F) + 42 A(SM) + 45 A(SS) + 9 A(OM)$
(per 1,000m²), where:

A(S) = slow trade GLFA, includes major department stores such as David Jones and Myer, furniture, electrical and utility goods stores.

A(F) = faster trade GLFA, includes discount department stores such as K-Mart and Target, together with larger specialist stores such as Fosseys.

A(SM) = supermarket GLFA, includes stores such as Franklins and large fruit markets.

A(SS) = specialty shops and secondary retail GLFA, includes specialty shops and take away stores such as McDonalds. These stores are grouped since they tend not be primary attractors to the centre.

A(OM) = offices, medical GLFA.

3.7 Including the existing development being retained, the proposed development provides the following areas:

- o A(SM): 3,500m²;
- o A(F): 1,500m²;
- o A(SS): 3,410m²; and
- o A(OM): 360m².

3.8 On this basis, the proposed retail development would require 364 spaces.

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- 3.9 Part 3.4.2 of Volume 4 of DCP 2010 indicates that food and drink premises should provide one parking space per six seats. Based on 120 seats, the proposed restaurant would require 20 spaces.
- 3.10 For hotels, Section 3.5.3 of Volume 3 of DCP 2010 indicates that parking for hotels should be provided at one space per 5m² of bar/lounge area. With a 350m² tavern proposed, the parking requirement would be 70 spaces.
- 3.11 The total parking requirement would therefore be some 454 spaces. The proposed provision of 455 spaces satisfies this requirement and is considered to be appropriate.
- 3.12 In Stage 1 of the development, the supermarket (3,500m²), specialty retail (2,450m², including 945m² existing retail) and 360m² commercial would be provided. On this basis, 260 spaces would be required in Stage 1. 260 spaces are proposed to be provided in Stage 1 in accordance with these requirements.
- 3.13 Appropriate disabled parking and bicycle parking will be provided in the development in accordance with Council's requirements.

Access, Servicing and Internal Layout

- 3.14 Vehicular access to the development is proposed to be provided from Silverdale Road and a new road to be provided along the southern side of the site.
- 3.15 The two existing northern driveways to the site on Silverdale Road would be retained. The exit only driveway on the southern side of the service station would be modified to cater for entering and exiting vehicles. The two existing southern driveways to the site from Silverdale Road would be removed.
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- 3.16 A new road would be provided along the southern side of the site (to be provided on land from the subject site and the adjacent site to the south). In accordance with Council's Subdivision and Engineering Standards for commercial/collector roads, the new road would have a minimum reserve width of 21 metres, with a 13 metre carriageway. Ultimately, this road will also provide access to residential development on the remainder of the site to the east.
- 3.17 The intersection between the new road and Silverdale Road would include a right turn bay on Silverdale Road. As discussed in the subsequent section on traffic generation and effects, this intersection will operate at a good level of service (LOS A/B) with traffic from the proposed retail development. It will also have appropriate capacity to cater for traffic from future residential development to the east. A concept design of the intersection is shown in plans prepared by the applicant's civil engineer.
- 3.18 Access to the shopping centre will be provided from this new road, as shown in plans prepared by Woodhead. A main entry/exit driveway will be provided for customers, as well as a secondary exit driveway further east. Two driveways will provide access for service vehicles near the eastern end of the site. A roundabout will provide access to and from the supermarket/DDS loading dock areas.
- 3.19 Loading bays for the development will be provided for the supermarket, DDS, and specialty shops, including two areas for specialty shop deliveries on the northern and southern sides of the building. Service vehicle areas will be provided to accommodate 19 metre semi trailers (for the supermarket and DDS) and a mix of small, medium and large rigid trucks for the other uses in accordance with the Australian Standard for Parking Facilities (Part 2: Off-street commercial vehicle facilities), AS 2890.2 – 2002.
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- 3.20 Within the customer parking area, parking spaces will be a minimum of 2.6 metres wide by 5.4 metres long, with 6.6 metre wide circulation aisles. Spaces with adjacent obstructions will be 0.3 metres wider to provide for doors to open. Disabled spaces will be a minimum of 2.4 metres wide, with a 2.4 metre wide adjacent area for loading/unloading wheelchairs. These dimensions are considered appropriate, being in accordance with the Australian Standard for Parking Facilities (Part 1: Off-street car parking and Part 6: Off-street parking for people with disabilities), AS 2890.1:2004 and AS 2890.6:2009.

Traffic Generation and Effects

- 3.21 The RTA's "Guide to Traffic Generating Developments" includes the following Thursday afternoon and Saturday peak hour traffic generation rates for retail development:
- o supermarket: 15.5 and 14.7 vehicles per hour per 100m² two-way on Thursdays and Saturdays respectively;
 - o DDS/mini-majors: 5.1 and 1.3 vehicles per hour per 100m² two-way on Thursdays and Saturdays respectively;
 - o specialty retail: 4.6 and 10.7 vehicles per hour per 100m² two-way on Thursdays and Saturdays respectively; and
 - o office/medical: 2.2 vehicles per hour per 100m² on Thursdays.
- 3.22 The RTA guidelines also indicate generations of 100 to 180 vehicles per hour two-way for drive-in/take-away food outlets. On this basis, and treating the tavern as

specialty retail, the proposed development would generate some 980 and 1,120 vehicles per hour two-way during Thursday afternoon and Saturday peak hours respectively.

- 3.23 As discussed in Chapter 2, the existing shopping centre, including the service station, generated some 270 and 215 vehicles per hour two-way during peak hours. With allowance for 100 vehicles per hour from the service station, the increase in traffic generation would be some 810 and 1,005 vehicles per hour two-way at peak times on Thursdays and Saturdays respectively.
- 3.24 A proportion of the traffic generated by the development will be passing trade, which are customers passing the development regardless of their visit to the development. For shopping centres, the RTA Guidelines indicates a proportion of 25 per cent. For fast food restaurants, the proportion is 35 to 50 per cent.
- 3.25 The increase in traffic generation would therefore be some 550 and 715 vehicles per hour two-way during weekday afternoon and Saturday peak hours respectively.
- 3.26 The additional traffic has been assigned to the road network. Existing traffic flows plus the additional development traffic are shown in Figures 2 and 3, and summarised in Table 3.1. Traffic increases on Silverdale Road would be some 100 to 340 vehicles per hour two-way at peak times. Increases on Warradale Road would be lower at some 100 to 120 vehicles per hour two-way. The new road along the southern side of the site would carry some 545 to 620 vehicles per hour at peak times. The new road would also carry a proportion of traffic between future residential areas to the east and the proposed development.
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Table 3.1: Existing two-way peak hour traffic flows plus development traffic

Road	Location	Thursday afternoon peak hour		Saturday midday peak hour	
		Existing	Plus development	Existing	Plus development
Silverdale Road	North of Farnsworth Avenue	775	+ 100	540	+ 120
	East of Farnsworth Avenue	585	+ 100	380	+ 120
	North of Warradale Road	605	+ 300	450	+ 340
	South of Warradale Road	515	+ 200	390	+ 220
	North of Marsh Road	360	+ 100	285	+ 120
	South of March Road	385	+ 100	385	+ 120
Farnsworth Avenue	South of Silverdale Road	200	-	180	-
Warradale Road	West of Silverdale Road	150	+ 100	120	+ 120
Marsh Road	North of Silverdale Road	65	-	130	-
Proposed access road	East of Silverdale Road	-	+ 545	-	+ 620

- 3.27 The intersections previously analysed in Chapter 2 have been re-analysed with SIDRA for the additional development traffic flows shown in Figures 2 and 3. The analysis found that the roundabout controlled intersection of Silverdale Road with Farnsworth Avenue would operate with average delays of less than 20 seconds per vehicle during Thursday afternoon and Saturday peak periods. This represents LOS B, a good level of service.
- 3.28 The intersections of Silverdale Road with Warradale Road and Marsh Road would operate with average delays for the highest delayed movements of less than 15 seconds per vehicle during peak periods. This represents level of service A/B, a good level of service.
- 3.29 The intersection of Silverdale Road with the new road along the southern side of the site, including the proposed right turn bay, would operate with average delays

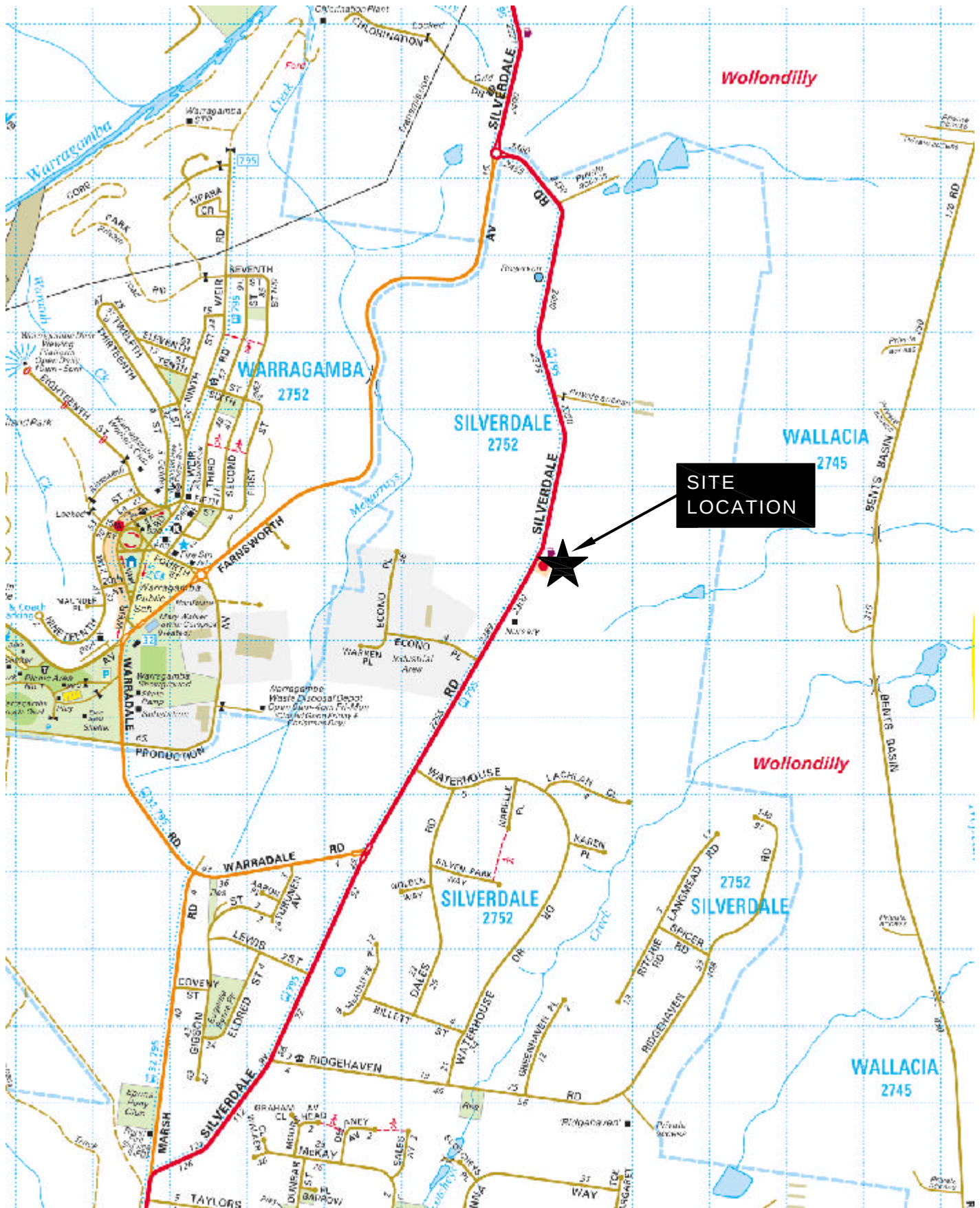
of less than 15 seconds per vehicle during peak periods. This represents level of service A/B, a good level of service.

- 3.30 Therefore, with the proposed works, the road network will be able to cater for the additional traffic from the proposed development.

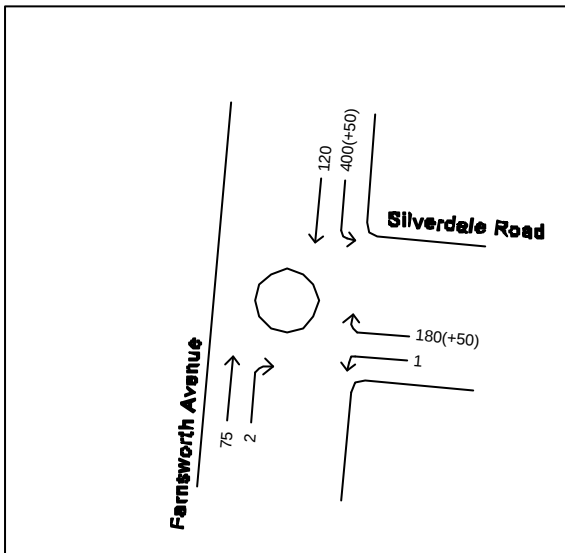
Summary

- 3.31 In summary, the main points relating to the traffic implications of the proposed development are as follows:

- i) the proposed development would increase employment densities close to public transport services;
- ii) the proposed parking provision is considered appropriate;
- iii) access, servicing arrangements and internal layout will be provided in accordance with AS 2890.1:2004 and AS 2890.2 – 2002;
- iv) the following works are proposed:
 - new road along the southern side of the site, connecting to Silverdale Road; and
 - a right turn bay in Silverdale Road for turns into the new road;
- v) with these works, the road network will be able to cater for the additional traffic from the proposed development.

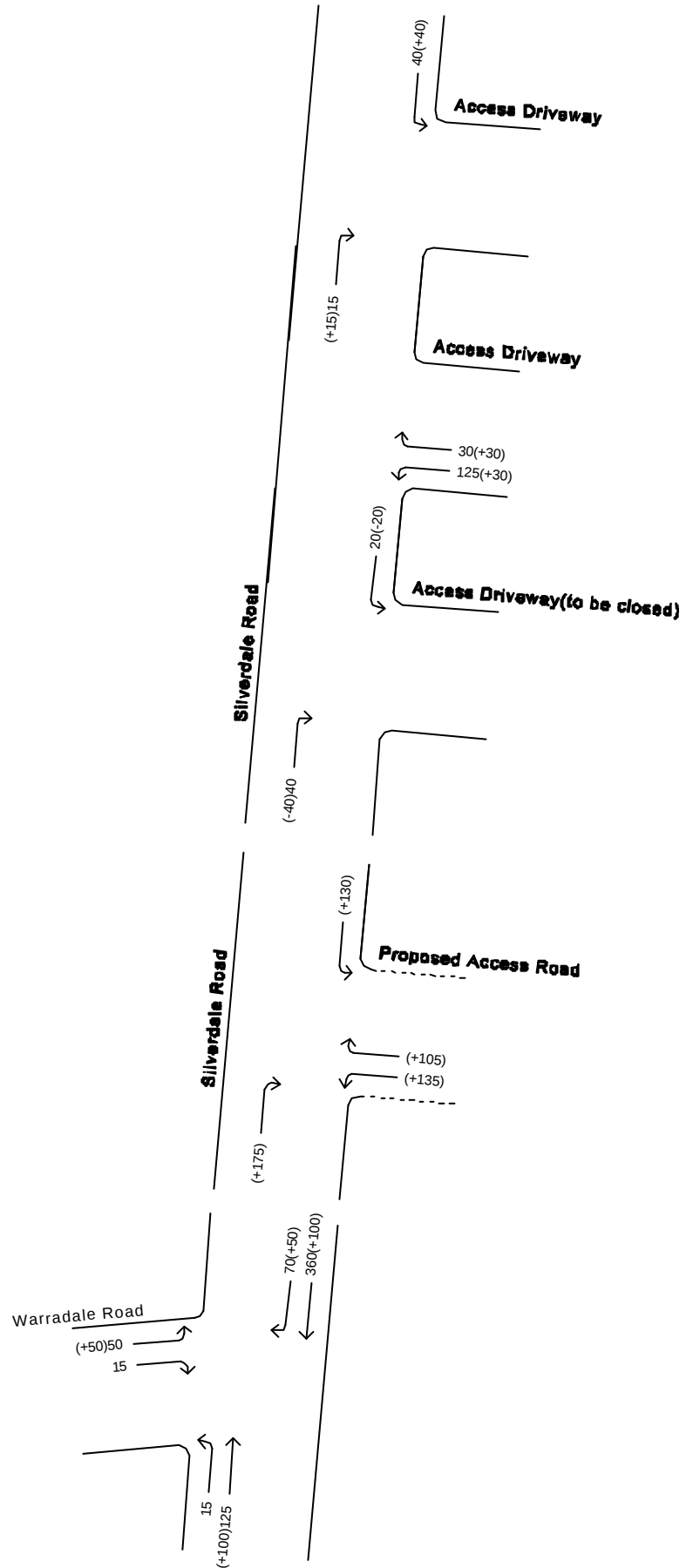
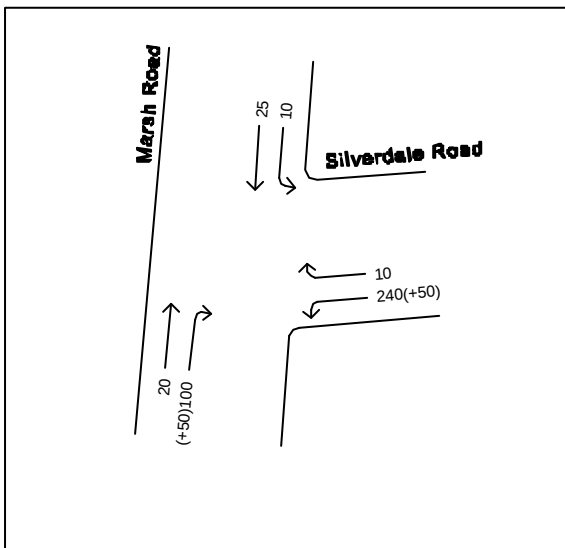


Location Plan

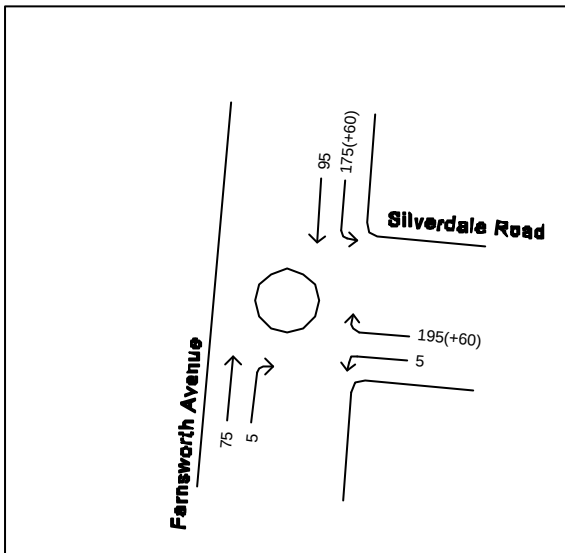


LEGEND

- 100 - Existing Peak Hour Traffic Flows
- (+10) - Additional Development Traffic
- - Roundabout

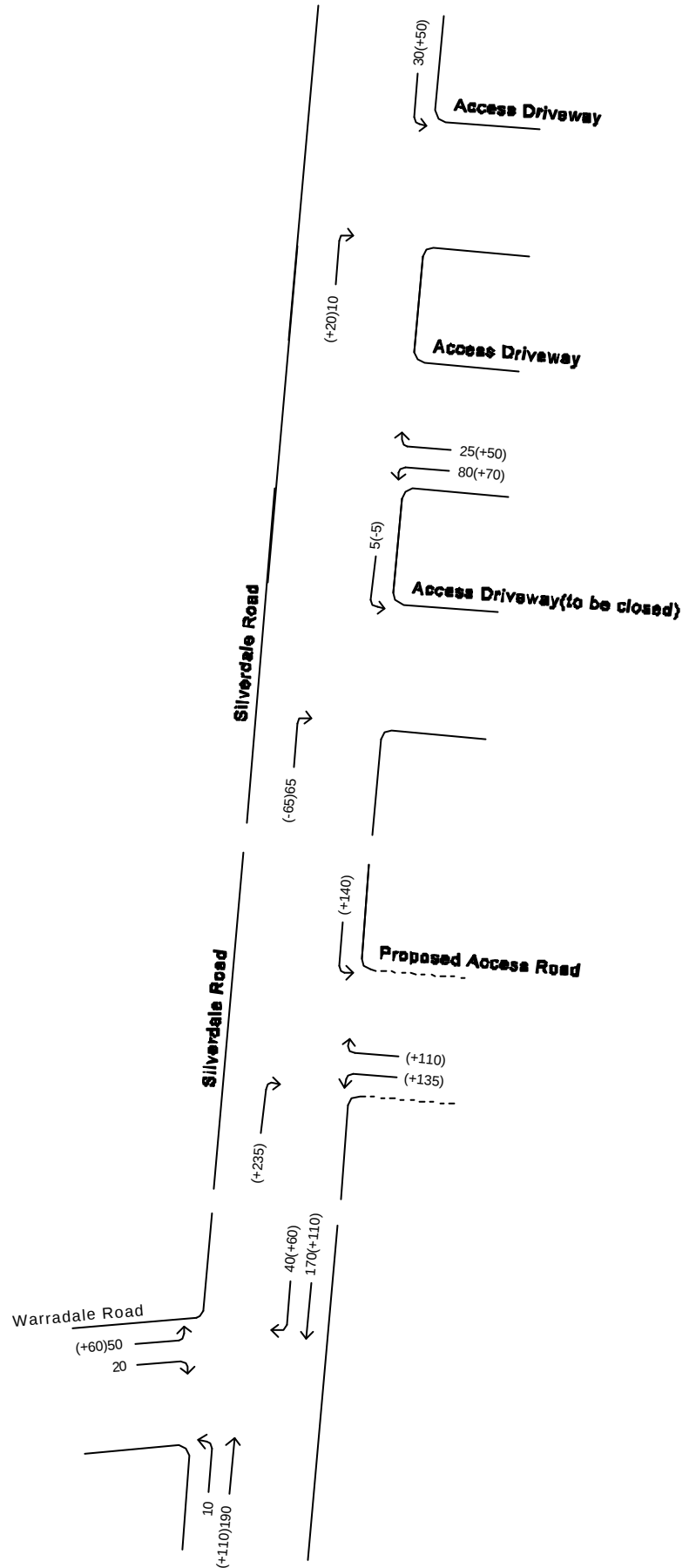
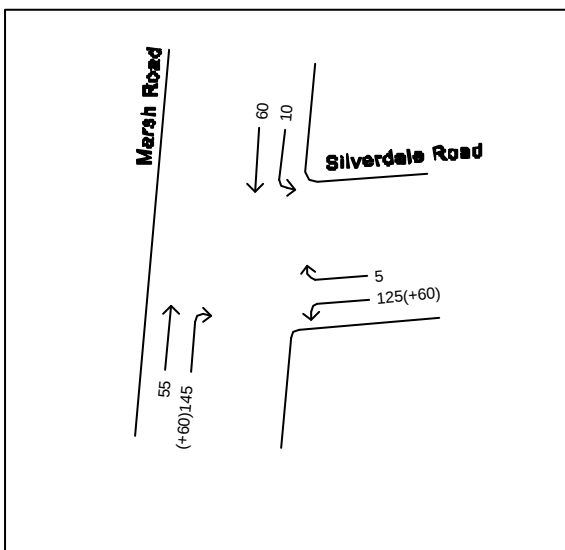


**Existing weekday afternoon peak hour
traffic flows plus development traffic**



LEGEND

- 100 - Existing Peak Hour Traffic Flows
- (+10) - Additional Development Traffic
- - Roundabout



Existing Saturday lunchtime peak hour
traffic flows plus development traffic