

HILFOR PROJECT PTY LTD

TRANSPORT REPORT FOR
PROPOSED MIXED USE
REZONING, 32-34 & 38-46
SILVERWATER ROAD & I-13
GREY STREET, SILVERWATER

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I. INTRODUCTION

- I.1 Colston Budd Hunt and Kafes Pty Ltd has been commissioned by Hilfor Project Pty Ltd to prepare a report assessing the transport implications of a proposed mixed use development at 32-34 and 38-46 Silverwater Road and 1-13 Grey Street at Silverwater. The site location is shown on Figure I.
- I.2 The site is occupied by a commercial building previously used by a dry cleaner, a café and 13 residential dwellings. It is proposed to rezone the site to B4 mixed use. A potential scale of development includes some 3,550m² retail, 350m² commercial plus 220 residential apartments.
- I.3 This report assesses the transport implications of the potential scale of development through the following chapters:
- Chapter 2 - describing the existing conditions; and
 - Chapter 3 - assessing the transport implications of the proposed development.

2. EXISTING CONDITIONS

Site Location and Road Network

- 2.1 The site is located at 32-34 and 38-46 Silverwater Road and 1-13 Grey Street at Silverwater, as shown on Figure 1. It occupies the entire block bounded by Silverwater Road, Carnarvon Street, Bligh Street and Grey Street. The site is occupied by a commercial building previously used by a dry cleaner, a café and 13 residential dwellings. Vehicular access to the site is provided from all of the streets noted above.
- 2.2 Surrounding land use includes industrial and commercial development along Silverwater Road, and north of the site. There is residential development to the south and east. The M4 Motorway is south of the site. To the west are residential properties, industrial properties, open space and a church.
- 2.3 Silverwater Road is a major road which forms part of a north-south route connecting Hornsby, Pennant Hills and Carlingford in the north with Auburn, Bankstown and the southern suburbs of Sydney in the south. In the vicinity of the site it provides a six lane divided carriageway with three traffic lanes in each direction and a 70 kilometre per hour speed limit. Clearways operate in both directions during weekday peak periods. Major intersections are signalised with additional lanes for turning traffic.
- 2.4 Carnarvon Street intersects Silverwater Road at a signalised intersection, adjacent to the site, with all turns permitted. It provides for one traffic lane and one parking lane in each direction, clear of intersections. Carnarvon Street provides access to industrial development. There are bus stops west of the site.
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- 2.5 Bligh Street connects to Silverwater Road, south of the site, at an unsignalised t-intersection. Turns at the intersection are restricted to left in/left out by the median in Silverwater Road. Bligh Street provides access to industrial and residential development. It provides for one traffic lane and one parking lane in each direction, clear of intersections.
- 2.6 Grey Street connects Carnarvon Street with Bligh Street. Both intersections are unsignalised t-intersections, with all turns permitted. Grey Street provides access to industrial properties and the subject site. It provides for one traffic lane and one parking lane in each direction, clear of intersections, and has a three tonne load limit.

Traffic Flows

- 2.7 Traffic generated by the proposed development will have its greatest effects during weekday morning and afternoon peak periods when it combines with commuter traffic on the surrounding road network. In order to gauge traffic conditions, counts were undertaken during weekday morning and afternoon peak periods at the following intersections:
- o Silverwater Road/Carnarvon Street;
 - o Silverwater Road/Bligh Street;
 - o Grey Street/Carnarvon Street; and
 - o Grey Street//Bligh Street.
- 2.8 The results of the surveys are shown in Figures 2 and 3, and summarised in Table 2.1.
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Table 2.1: Existing two-way (sum of both directions) peak hour traffic flows			
Road	Location	AM peak hour	PM peak hour
Silverwater Road	North of Carnarvon Street	3,835	3,220
	North of Bligh Street	4,400	3,840
	South of Bligh Street	4,470	3,865
Carnarvon Street	East of Silverwater Road	530	555
	West of Silverwater Road	525	615
	West of Grey Street	545	595
Bligh Street	West of Silverwater Road	80	45
	West of Grey Street	65	50
Grey Street	South of Carnarvon Street	40	20
	North of Bligh Street	65	15

- 2.9 Table 2.1 shows that Silverwater Road carried some 3,200 to 4,500 vehicles per hour two-way during the weekday morning and afternoon peak hours. Carnarvon Street carried lower flows of some 500 to 600 vehicles per hour two-way. Flows on Bligh Street and Grey Street were less than 100 vehicles per hour two-way.

Intersection Operations

- 2.10 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 Figures 2 and 3 have been analysed using the SIDRA program.
- 2.11 SIDRA simulates the operations of intersections to provide 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):

- ρ 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

- ρ 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

- 2.12 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.

- 2.13 The SIDRA analysis found that the signalised intersection of Silverwater Road with Carnarvon Street is operating with average delays of less than 50 seconds per vehicle during peak periods. This represents levels of service D, a satisfactory level of service for a busy intersection during peak periods.
- 2.14 At the intersection of Silverwater Road with Bligh Street, observations indicate that traffic turns from Bligh Street when gaps are created in the traffic stream by the upstream traffic signals on Silverwater Road.
- 2.15 The intersections of Grey Street with Carnarvon Street and Bligh Street are operating with average delays for the highest delayed movements of less than 15 seconds per vehicle during peak periods. This represents levels of service A/B, a good level of service.

Public Transport

- 2.16 The closest railway station to the site is Auburn, which is some 20 minutes walking distance. Auburn is on the Western (Emu Plains/Richmond to North Sydney via the City) and South (Macarthur to City via Granville) Lines.
- 2.17 Services through Auburn are every 30 minutes in each direction on the Western Lines and every 15 to 30 minutes in each direction on the South Line. During weekday peak periods, services are every 10 to 15 minutes in each direction.
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- 2.18 Local bus services are provided by Sydney Buses. As previously discussed, there are bus stops on Carnarvon Street, west of the site.
- 2.19 Route 544 connects Auburn, Silverwater, Ermington, Eastwood, Deniston East, Macquarie University and Macquarie Centre. Services are every 60 minutes in each direction, Monday to Saturday, and every 15 to 30 minutes during weekday peak periods. Services include a link to Auburn railway station.
- 2.20 Route 540 operates along Carnarvon Street and Vore Street and connects Auburn and Newington. It provides a weekday peak period service.
- 2.21 There is a north-south cycle route west of site which connects Auburn with Sydney Olympic Park. This route connects to the wider cycle network within the LGA.
- 2.22 The draft Metropolitan Strategy for Sydney identifies the need for a future viable and frequent public transport service along the Parramatta Road corridor, in which the site is located.
- 2.23 The site is therefore accessible by existing public transport services, and close to future planned services along Parramatta Road.
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3. IMPLICATIONS OF PROPOSED DEVELOPMENT

3.1 It is proposed to rezone the site to B4 mixed use. A potential scale of development includes some 3,550m² retail, 350m² commercial plus 220 residential apartments. Vehicular access is proposed from Grey Street.

3.2 Parking will be provided in accordance with appropriate Council and RMS controls at the time that a development application is made. This chapter assesses the transport implications of the proposed development through the following sections:

- policy context;
- public transport, walking and cycling;
- travel access guide;
- access, servicing and internal layout;
- traffic generation and effects; and
- summary.

Policy Context

o Metropolitan Transport Plan

3.3 The Metropolitan Transport Plan – Connecting the City of Cities has four key policy objectives:

- o commuting to work easily and quickly;
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- o transport and services accessible to all members of the community;
- o an efficient, integrated and customer focused public transport system; and
- o revitalized neighbourhoods with improved transport hubs.

3.4 It includes a target of 28 per cent of trips to work in the Sydney Metropolitan Region to be undertaken by public transport by 2016, compared to some 22 per cent in 2006.

3.5 To help achieve these objectives, it identifies, in conjunction with the metropolitan strategy, key areas of future housing and employment growth in Sydney to 2020 and 2036. Additionally, it outlines a 10 year funding program to 2020 for the following transport projects:

- o rail line extensions for more platforms at CBD stations;
- o rail lines to north west and south west Sydney;
- o light rail in the CBD and further extension to the Inner West;
- o more air conditioned train carriages;
- o 1,000 additional buses;
- o completion of the 43 strategic bus corridors across Sydney;
- o completion of the highest priority missing links in the Sydney Strategic Cycleway Network.

o NSW 2021

3.6 NSW 2021: A Plan to Make NSW Number One sets targets to increase the proportion of commuter trips made by public transport for various areas within Sydney by 2016, including:

- o 80 per cent in the Sydney CBD;
- o 50 per cent in the Parramatta CBD;
- o 20 per cent in the Liverpool CBD; and
- o 25 per cent in the Penrith CBD.

3.7 It also has targets to:

- o improve road safety and reduce fatalities to 4.3 per 100,000 population by 2016;
- o double the mode share of bicycle trips made in the metropolitan area by 2016; and
- o increase the proportion of the population living within 30 minutes by public transport of a city or major centre in the metropolitan area.

3.8 The following sections discuss how the proposed development satisfies these objectives and the measures proposed to achieve them.

Public Transport, Walking and Cycling

3.9 As previously discussed, the site is accessible by bus services which connect to surrounding areas including Auburn, Silverwater, Ermington, Newington, Eastwood, Deniston East, Macquarie University and Macquarie Centre. Services include a link to Auburn railway station. There are bicycle routes close to the site which connects to surrounding areas and the wider network within Auburn. The planned future provision of public transport along Parramatta Road will further improve the site's accessibility.

- 3.10 Existing public transport services will provide for people to access the development by public transport, walking and cycling, for residents, and for employees in the retail component. To support accessibility by bicycles, appropriate bicycle parking, in accordance with Council requirements, should be provided. Provision will be included for a bus stop on Silverwater Road, adjacent to the site.
- 3.11 The development will therefore satisfy the objectives of the Metropolitan Transport Plan and NSW 2021 as follows:
- ❑ enabling commuters to readily access trains and buses close to the site (Metropolitan Transport Plan objective);
 - ❑ providing an appropriate level of on-site parking, with reference to appropriate Council and RMS requirements, to encourage public transport use and increase the proportion of trips by public transport (Metropolitan Transport Plan objective);
 - ❑ providing residential development close to employment centres in Silverwater and Sydney Olympic Park, to reduce the need for travel; and
 - ❑ improving pedestrian connectivity in the area by providing a through site pedestrian link between Grey Street and Silverwater Road.

Travel Access Guide

- 3.12 To encourage travel modes other than private vehicle, a travel demand management approach should be adopted, through a travel access guide to meet
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the specific needs of future residents, employees and visitors. The specific requirements and needs of these groups should be incorporated in the travel access guide to support the objectives of encouraging the use of public transport.

3.13 The principles of the travel access guide, which should be developed as part of a future development application in consultation with Council, RMS, public transport providers and other stakeholders, would include the following:

- 0 encourage the use of public transport, including rail and bus services close to the site;
- 0 identify existing bus routes which stop near the site, including the location of bus stops and pedestrian crossings at signalised intersections;
- 0 work with public transport providers to improve services;
- 0 encourage public transport by residents and employees through the provision of information, maps and timetables in the travel access guide;
- 0 raise awareness of health benefits of walking and cycling (including maps showing walking and cycling routes);
- 0 encourage cycling by providing safe and secure bicycle parking, including the provision of lockers and rails;
- 0 provide appropriate on-site parking provision, consistent with appropriate Council/RMS controls and the objective of reducing traffic generation.

- 3.14 The travel access guide should be developed in accordance with the principles identified by Transport for NSW and RMS, and distributed with marketing material for the site. The travel access guide would assist in delivering sustainable transport objectives by considering the means available for reducing dependence solely on cars for travel purposes, encouraging the use of public transport and supporting the efficient and viable operation of public transport services.

Access, Servicing and Internal Layout

- 3.15 Vehicular access to the proposed development would be provided from Grey Street. Driveways will provide for two-way traffic, with all movements permitted, and should be provided with widths and grades in accordance with the Australian Standard for Parking Facilities (Part 1: Off-street car parking), AS 2890.1:2004. The driveways will include maximum grades of 1:20 for six metres inside the property line for appropriate visibility between pedestrians and exiting vehicles.
- 3.16 A shared zone will be provided, running east-west through the site, for cars and pedestrians. It will provide vehicular access to buildings within the development, from Grey Street. It will not provide a vehicular connection to Silverwater Road. Pedestrians will be able to walk through the site between Grey Street and Silverwater Road.
- 3.17 At the development application stage, the parking space dimensions, aisle widths, column locations and height clearances should be provided in accordance with AS 2890.1:2004.
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- 3.18 Appropriate provision for service vehicles should be included within the development. Service vehicles will include garbage collection and deliveries to the retail and commercial components. The design should provide for service vehicles to enter and exit the site in a forward direction, with service vehicle areas to be provided in accordance with AS 2890.2 – 2002. The size of trucks will depend on final retail tenancies, but will likely include rigid trucks and semi trailers.

Traffic Generation and Effects

- 3.19 Traffic generated by the proposed development will have its greatest effects during weekday morning and afternoon peak periods when it combines with commuter traffic. The RMS “Guide to Traffic Generating Developments” indicates that high density residential apartments in town centre locations close to public transport generate 0.29 vehicles per hour per dwelling, two-way, during peak hours. Medium density developments generate some 0.4 to 0.65 vehicles per hour two-way.
- 3.20 Based on the above, the proposed development would be likely to have a traffic generation of some 0.3 to 0.4 vehicles per hour per dwelling two-way at peak times. Therefore, traffic generation of the residential component would be some 65 to 90 vehicles per hour two-way at peak times.
- 3.21 The RMS guidelines suggest a traffic generation of some two vehicles per hour per 100m² for commercial development at peak times. Therefore, the commercial component would generate some five to 10 vehicles per hour two-way at peak times.
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- 3.22 The RMS “Guide to Traffic Generating Developments” indicates that small retail developments generate some 12.3 vehicles per hour per 100m² two-way during weekday afternoon peak hours. During the weekday morning peak hour, the generation is significantly lower as trading is low and many shops are not open. For the morning peak hour, we have assessed a generation of 20 per cent of the afternoon peak hour.
- 3.23 The retail component would therefore have a traffic generation of some 90 and 440 vehicles per hour two-way during morning and afternoon peak hours respectively. Total traffic generation would therefore be some 160 to 190 and 510 to 540 vehicles per hour two-way during morning and afternoon peak hours respectively.
- 3.24 The RMS guidelines indicate that some 25 per cent of retail traffic is passing trade (customers who would have driven past the site regardless of their visit to the site). Our assessment is based on 25 per cent of retail traffic being passing trade.
- 3.25 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 summarized in Table 3.1. Traffic increases on Silverwater Road, Carnarvon Street, Bligh Street and Grey Street would be some 20 to 125 vehicles per hour two-way during morning peak hours and some 50 to 375 vehicles per hour two-way during afternoon peak hours.
- 3.26 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.
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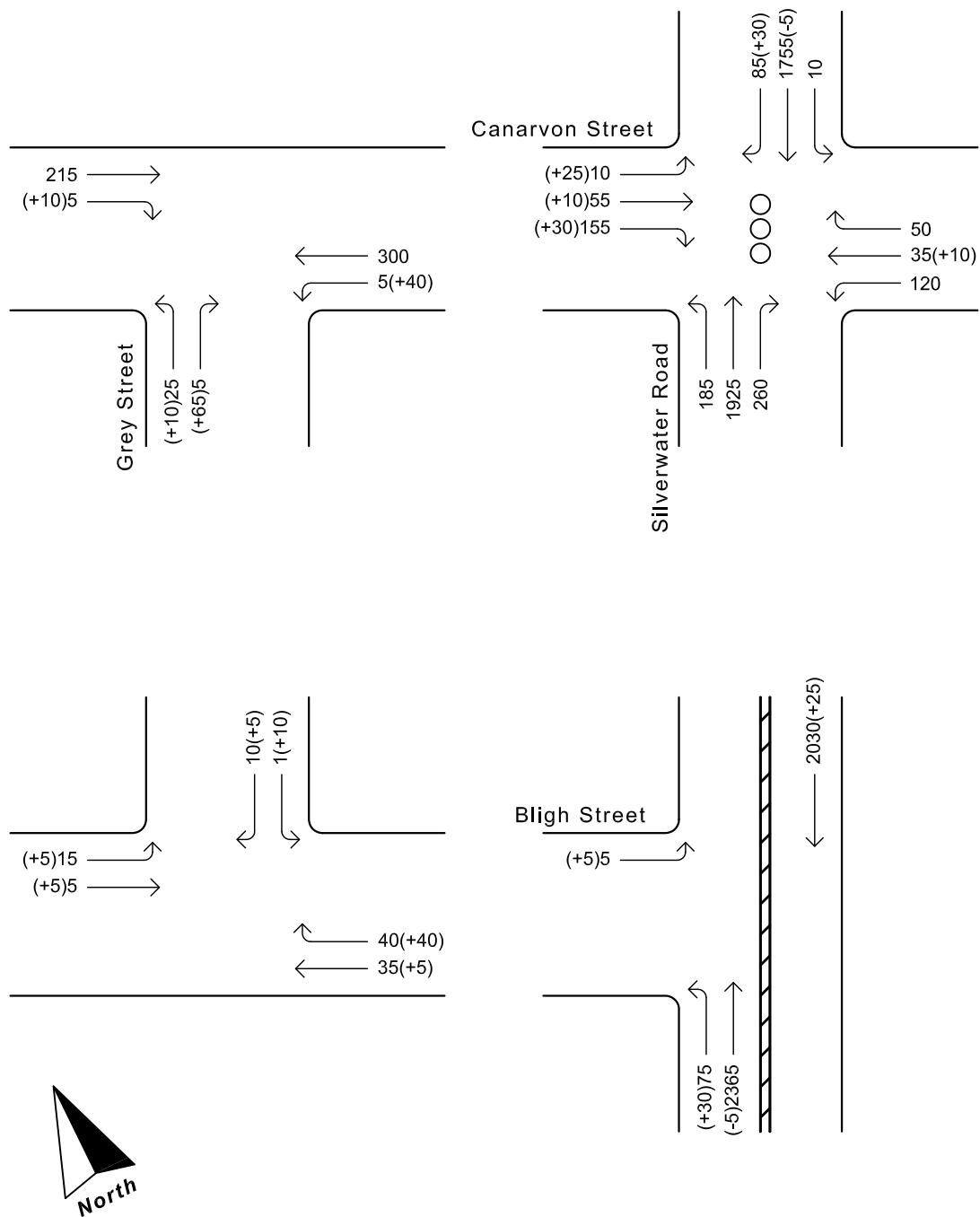
Table 3.1: Existing two-way peak hour traffic flows plus development traffic					
Road	Location	AM peak hour		PM peak hour	
		Existing	Plus development	Existing	Plus development
Silverwater Road	North of Carnarvon Street	3,835	+ 50	3,220	+ 130
	North of Bligh Street	4,400	+ 25	3,840	+ 65
	South of Bligh Street	4,470	+ 50	3,865	+ 130
Carnarvon Street	East of Silverwater Road	530	+ 20	555	+ 50
	West of Silverwater Road	525	+ 105	615	+ 315
	West of Grey Street	545	+ 20	595	+ 60
Bligh Street	West of Silverwater Road	80	+ 35	45	+ 135
	West of Grey Street	65	+ 20	50	+ 60
Grey Street	South of Carnarvon Street	40	+ 125	20	+ 375
	North of Bligh Street	65	+ 60	15	+ 130

- 3.27 The analysis found that the intersection of Silverwater Road with Carnarvon Street would operate with average delays of less than 50 seconds per vehicle during peak periods. This represents levels of service D, a satisfactory level of service for a busy intersection during peak periods.
- 3.28 The modest additional traffic turning from Bligh Street into Silverwater Road would not have significant implications on its operation. Traffic will continue to turn from Bligh Street when gaps are created in the traffic stream by the upstream traffic signals on Silverwater Road.
- 3.29 The intersections of Grey Street with Carnarvon Street and Bligh Street will continue to operate with average delays for the highest delayed movements of less than 15 seconds per vehicle during peak periods. This represents levels of service A/B, a good level of service.

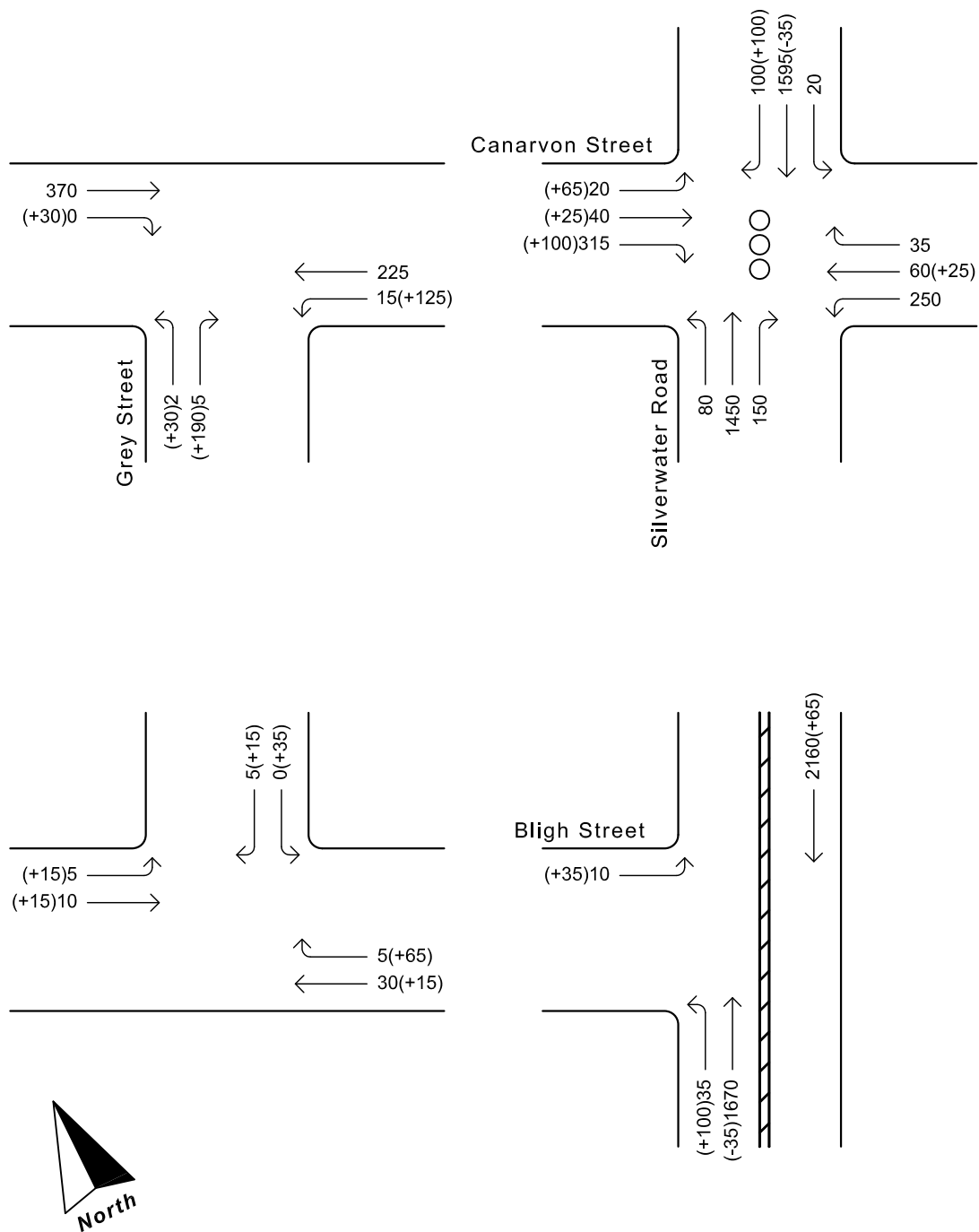
- 3.30 Therefore, the road network will be able to cater for the additional traffic from the proposed development.

Summary

- 3.31 In summary, the main points relating to the transport implications of the proposed mixed use residential development are as follows:
- i) the proposed development will be accessible by public transport;
 - ii) access, servicing and internal layout are considered appropriate; and
 - iii) the road network will be able to cater for the additional traffic from the proposed development.



Existing weekday morning peak hour traffic flows plus development traffic



Existing weekday afternoon peak hour traffic flows plus development traffic