

DEXUS PROPERTY GROUP

TRAFFIC REPORT FOR PROPOSED
MODIFICATIONS OF THE PROJECT
APPROVAL FOR DEXUS ESTATE,
PRECINCTS B & C, SOUTHERN
EMPLOYMENT LANDS,
GREYSTANES

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I. INTRODUCTION

- I.1 Colston Budd Hunt & Kafes Pty Ltd has been commissioned by Hansen Yunken Pty Ltd on behalf of Dexu Property Group to assess the traffic aspects of the proposed modifications of the project approval for the Dexu Estate Precincts B and C, located within the Southern Employment Lands at Greystanes (Greystanes SEL). The Greystanes SEL is located within the Greystanes Industrial Estate (identified for development under the framework of SEPP59 Western Sydney Employment). The site location is shown on Figure I.
- I.2 The approved masterplan for the industrial park, located on the 47 hectare portion of the Greystanes SEL, included some 220,865m² warehouse, some 20,900m² office with associated road works, including the provision of three signalised intersections on Reconciliation Road. Construction of the Dexu Estate has commenced on a number of industrial site within the estate.
- I.3 We have previously prepared traffic reports⁽¹⁾⁽²⁾ assessing the traffic aspects of modifications to Precincts A and C of the approved masterplan. The changes included the reconfiguration of industrial lots within Precincts A and C and the deletion of a section of Bellevue Circuit between Basalt Road and Reconciliation Road, located adjacent to Precinct C. The approved masterplan for the Dexu Estate, incorporating the approved changes to Precincts A and C, include the following:-

⁽¹⁾ "Traffic Report for Proposed Modifications of the Project Approval for Dexu Estate, Southern Employment Lands, Greystanes", November 2011, Colston Budd Hunt & Kafes Pty Ltd.

⁽²⁾ "Traffic Report for Proposed Modifications of the Project Approval for Dexu Estate, Precinct A, Southern Employment Lands, Greystanes", February 2012, Colston Budd Hunt & Kafes Pty Ltd

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- Precinct A - some 96,132m² industrial area (comprising some 87,367m² warehouse and some 8,765m² office);
 - Precinct B - some 86,760m² industrial area (comprising some 77,050m² warehouse and some 9,710m² office); and
 - Precinct C - some 57,702m² industrial area (comprising some 52,622m² warehouse and some 5,080m² office).

1.4 This report assesses the traffic aspects of the further modifications to Precincts B and C of the approved masterplan. The proposed changes include the reconfiguration of industrial lots and the extension of the southern access road (Bellevue Circuit South) adjacent to Lots 13 and 14 within Precinct C. The proposed modifications to Precincts B and C result in a net increase in warehouse area of some 9,414m² and an increase in office area of some 990m².

1.5 The regional and local traffic effects of the Greystanes SEL have previously been assessed through a number of studies. These include:-

- Regional Transport Requirements for Boral's Greystanes Estate (Sinclair Knight Merz, 1999);
 - Greystanes Estate Transport Plan (Environmental Resources Management Australia, 2000);
 - Boral Greystanes Estate, Local Traffic Study (Sinclair Knight Merz, 2001);
 - Greystanes Estate, Southern Employment Land Traffic and Transport Assessment, (Sinclair Knight Merz, 2006); and
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- Traffic Review of Proposed DEXUS Estate Masterplan, Southern Employment Lands, Greystanes, (Colston Budd Hunt & Kafes Pty Ltd, 2009).

1.4 The traffic aspects of the proposed modifications of the project approval for the Dexus Estate Precincts B and C are assessed through the following chapter.

2. TRAFFIC ASPECTS

- 2.1. The Greystanes SEL is located on the former Prospect Quarry within the Greystanes Industrial Estate, in Western Sydney, as shown on Figure 1. The Greystanes Estate is approximately 330 hectares and comprises the Northern Employment Lands (Greystanes NEL), Residential Lands (Nelson's Ridge), Southern Employment Lands (Greystanes SEL) and open space. The Greystanes SEL occupies a total area of some 156 hectares.
- 2.2. To the north of the site is the predominantly established Greystanes NEL, comprising warehouse/distribution centres and the Boral office building. Total development within the Northern Employment Lands will comprise some 245,000m².
- 2.3. The approved masterplan for the industrial park, including the approved changes to Precincts A and C, comprises some 217,039m² warehouse, some 23,555m² office with associated road works, including the provision of three signalised intersections on Reconciliation Road. Construction of the Dexu Estate has commenced on a number of industrial site.
- 2.4. The main access to the Greystanes Estate is provided via a north-south spine road through the estate (Reconciliation Road). This road combines with Prospect Highway to connect to the M4 Western Motorway and the Great Western Highway located to the north of the estate. Currently Reconciliation Road terminates at the southern end of the estate. It has been constructed as a divided carriageway with one to two traffic lanes in each direction, clear of intersections. The intersections of Reconciliation Road with Prospect Highway/Reservoir Road and the M4 on/off ramps are controlled by roundabouts.
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- 2.5. Butu Wargun Drive and Foundation Place are existing internal access roads within the estate, servicing warehouse/distribution centres located within the Greystanes NEL. These roads provide undivided roads with one traffic lane and one parking lane in each direction, clear of intersections. Butu Wargun Drive and Foundation Place intersect with Reconciliation Road at roundabout controlled intersections.
- 2.6. In association with the development of the Greystanes SEL, Reconciliation Road will be extended to connect to Widemere Road, located to the south of the estate. It will provide a divided carriageway, with two traffic lanes in each direction and right turn lanes provided to improve safety and intersection capacity. The main intersections within the estate will be signalised. The intersections of Prospect Highway with Great Western Highway, M4 Motorway and Reservoir Road will be upgraded to cater for development traffic.
- 2.7. As part of the redevelopment of the Greystanes SEL, a bus transitway will be provided along Reconciliation Road, connecting Blacktown with the Liverpool to Parramatta Bus Transitway.
- 2.8. The traffic aspects of the proposed modifications to Precincts B and C are assessed through the following sections:-
- proposed modifications;
 - internal road network;
 - access arrangements;
 - parking provision;
 - b-double routes;
 - pedestrian network;
 - cycle network;
 - traffic generation and effects; and
 - summary.
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Proposed Modifications

- 2.9. The proposed modifications within Precincts B and C include the following:-
- reconfiguration of Lot 6 (Blackwoods) within Precinct B;
 - reconfiguration of Lot 13 (Roche) within Precinct C; and
 - extension of the southern access road (Bellevue Circuit South) within Precinct C, to service Lots 13 and 14.
- 2.10. The proposed modifications to Precincts B and C result in a net increase in warehouse area for the overall estate of some 9,414m² and an increase in office area of some 990m².
- 2.11 Access to Precincts B and C will be provided via Reconciliation Road, Bellevue Circuit and Basalt Road. Reconciliation Road provides a north-south traffic route through the estate and currently intersects with Bellevue Circuit and Basalt Road at priority sign controlled intersections. Construction of Reconciliation Road has been completed, however the road is closed at the southern end of the estate. When opened, it will extend to the south to connect into the Wetherill Park Industrial Area via Widemere Road.
- 2.12 The transport assessment for the Greystanes SEL has previously been prepared in association with the approved concept plan and approved masterplan for the Dexus Estate. The reports concluded that the surrounding road network, incorporating the proposed road improvements, would operate at appropriate levels of service.
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Internal Road Network

- 2.13 The internal road network within the Greystanes SEL is shown on Figure 2. The road network incorporates a logical hierarchy of road functions and appropriate design to facilitate vehicle, pedestrian and cycle activity.
- 2.14 In accordance with the approved masterplan, Reconciliation Road will extend to connect to Widemere Road, located to the south of the estate. It will be upgraded to provide a divided carriageway, with two traffic lanes in each direction and right turn lanes provided to improve safety and intersection capacity. When appropriate warrants are met the three main intersections within the estate will be signalised. The intersections of Prospect Highway with Great Western Highway, M4 Motorway and Reservoir Road will be upgraded to cater for development traffic.
- 2.15 As part of the redevelopment of the Greystanes SEL, a bus transitway will be provided along Reconciliation Road connecting Blacktown with the Liverpool to Parramatta Bus Transitway.
- 2.16 The estate access roads within the subject site include Bellevue Circuit and Basalt Road. Bellevue Circuit provides an undivided industrial road, with one traffic lane and one parking lane in each direction, clear of intersections. It circulates through the northern and eastern parts of the estate, providing access to the industrial developments. Bellevue Circuit provides a loop road between Reconciliation Road (southern boundary of Precinct A) and Basalt Road (southern boundary of Precinct B). The intersection of Reconciliation Road and Bellevue Circuit will be controlled by traffic signals. The intersection of Basalt Road and Bellevue Circuit is controlled by a roundabout.
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- 2.17 Basalt Road provides an east-west access road through the estate, between Precincts B and C, linking Bellevue Circuit to Reconciliation Road. It incorporates a divided road with one traffic lane and one parking lane in each direction, clear of intersections.
- 2.18 The internal road network within the estate has been designed to accommodate industrial traffic, including b-doubles. These arrangements are considered appropriate to provide efficient and appropriate access to the industrial development within the estate.

Access Arrangements

- 2.19 The proposed access arrangements for the various industrial developments within the estate will be designed to cater for the swept paths of service vehicles, including articulated vehicles and b-doubles. For the larger warehouse developments, separate access driveways will be provided for staff/visitor parking and industrial traffic.
- 2.20 The final access arrangements and internal layout of loading and car parking areas will be determined at the time of the development applications for the individual sites. Access arrangements and internal circulation for the individual sites within Precinct B and C have not been assessed as part of the report. Access arrangements, internal circulation and layout of loading and car parking areas should be designed in accordance with Australian Standards for Off-street car parking facilities (AS2890.1-2004) and Off-street commercial vehicle facilities (AS2890.2-2002).
- 2.21 Service vehicle access to Lot 6 (Blackwoods) will be provided by a combined entry/exit driveway onto Bellevue Circuit adjacent to the eastern boundary of the
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site and by separate exit only driveway onto Bellevue Circuit some 70 metres east of Reconciliation Road. Access to staff/visitor parking will be provided by a separate (left in/left out) access driveway onto Bellevue Circuit.

- 2.22 Access to Lot 13 (Roche) will be provided via an extension of the southern access road (Bellevue Circuit South) within Precinct C. The extension of the internal estate road, located at the southern end of Precinct C will provide a two-way undivided industrial road with one traffic lane in each direction, clear of intersections. A turnaround area will be provided at the northern end of the dead end section of the road, designed to allow large articulated vehicles and b-doubles to turnaround and recirculate back onto Reconciliation Road. Separate access driveways to staff/visitor parking and to service vehicle areas to Lots 13 and 14 will be provided from the extended internal estate road.
- 2.23 The proposed access driveways should provide appropriate sight lines for entering and exiting traffic and should be designed in accordance with Australian Standards for Off-street car parking facilities (AS2890.1-2004) and Off-street commercial vehicle facilities (AS2890.2-2002).

Parking Provision

- 2.24 Car parking provision within the Greystanes SEL will be determined at the time of the development applications for the individual sites. Car parking will be provided in accordance with the following approved parking rates:-
- Warehouse
 - one space per 300m² GFA;

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- Commercial
 - one space per 40m² GFA; and

 - Café
 - one space per 20m² GFA.

B-Double Routes

- 2.25 Roads within the area approved for use by 25 and 26 metre b-doubles include the M4 Motorway, Great Western Highway, Prospect Highway, Blacktown Road, Reservoir Road, Reconciliation Road, Widemere Road, Davis Road and Hassall Street. The approved routes are shown in Figure 3.
- 2.26 In association with the development of the Greystanes SEL and the extension and upgrade of Reconciliation Road through to Widemere Road, it would be appropriate to classify all roads within the Greystanes NEL and SEL for b-double access. The Roads and Maritime Service's "*Route Assessment Guidelines for Restricted Access Vehicles*" outlines the procedure for having roads classified for b-double use.

Pedestrian Network

- 2.25 In accordance with the approved masterplan, a network of pedestrian footpaths will be provided within the road reserves, and through landscape areas within the Greystanes SEL. The network will be incorporated into controlled pedestrian crossings at the three signalised intersections along Reconciliation Road. Local roads within the site, including the internal estate roads, will have pedestrian footpaths on both sides.
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- 2.26 The pedestrian and cycle networks will be designed to maximise clear and unobstructed sight lines at all crossing points. All path crossings will be at-grade, incorporating pram ramps. Paths will be designed and constructed in accordance with the Australian Standards AS1428.

Cycle Network

- 2.27 Cycleway provision will be made in the Transitway road reserve, which is to be constructed by the Roads and Maritime Services, as part of the Transitway works. This cycleway will link to the cycleway network north and south of the Greystanes Estate and integrate with “*Bikeplan 2010*” as issued by the Roads and Maritime Services.

Traffic Generation and Effects

- 2.28 The traffic generated by the Greystanes SEL, including the proposed modifications to Precincts B and C, will have its greatest effects during the morning and afternoon periods when it combines with commuter traffic. Surveys undertaken by the Roads and Maritime Services found the following two-way peak hour traffic generation rates for industrial/warehouse and commercial developments:-

- Warehouse
 - 0.5 vehicles per hour per 100m² GFA;

- Commercial
 - two vehicles per hour per 100m² GFA.

- 2.29 Based on these rates, the approved masterplan for the Dexus Estate plus the proposed modifications to Precincts B and C, would result in traffic generations of
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some 1500 to 1700 vehicles per hour two-way (in plus out) during the morning and afternoon peak periods. By way of comparison the traffic assessment (Sinclair Knight Merz, 2006) assessed a traffic generation for the overall development of some 4800 vehicles per hour two-way during peak periods, including traffic generations of some 2700 to 2800 vehicles per hour two-way for the approved Dexus Estate masterplan. That report concluded that the surrounding road network incorporating the proposed road improvements would operate at appropriate levels of service.

- 2.30 The proposed development within the Dexus Estate, including the proposed modifications to Precincts B and C, will generate considerably less traffic during peak periods than was previously assessed by SKM. Hence the road network will be able to cater for the proposed modifications.
- 2.31 The traffic generated by the proposed development has been combined with the traffic generated by the overall Greystanes Industrial Estate (NEL and SEL) for 2016. The morning and afternoon peak period traffic flows within the Greystanes SEL are shown on Figures 4 and 5.
- 2.32 The operations of the proposed three signalised intersections on Reconciliation Road, incorporating the road network changes, have been analysed using the SIDRA program. The program simulates the operation of the 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):-
- For traffic signals, the average delay per vehicle in seconds is calculated as $\text{delay}/(\text{all vehicles})$, 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 the 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.

- 2.33 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
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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.

2.34 The SIDRA analysis found that the proposed signalised intersections would operate at levels of service C or better during the morning and afternoon peak periods in 2016. Average delays per vehicle were found to be less than 42 seconds per vehicle during peak periods. This represents a level of service C, a satisfactory level of service.

2.35 In addition to the SIDRA analysis for the signalised intersections on Reconciliation Road, we have also assessed the operation of the access driveway for Lot 6 (Blackwoods) on Bellevue Circuit. Figure 6 shows the forecast 2016 traffic flows at the access driveway during the morning and afternoon peak periods.

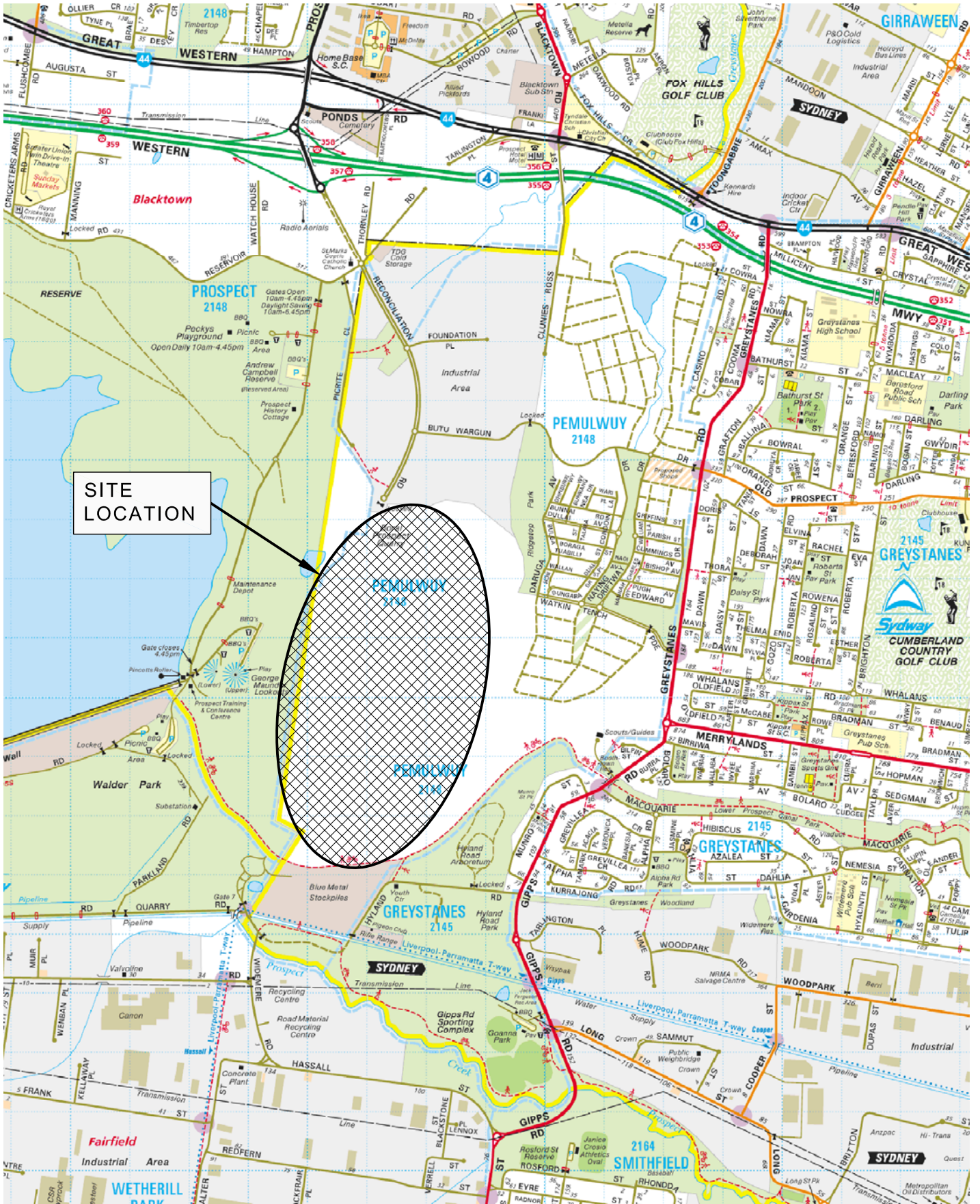
2.36 The SIDRA analysis found that the access driveway will operate with average delays, for the movement with the highest average delay, of less than 10 seconds per vehicle during the morning and afternoon peak periods. This represents a level of service A, a good level of intersection operation.

Summary

2.37 In summary, the main points relating to the traffic aspects of the proposed modifications to the project approval for the Dexus Estate are:-

- i) the site is located within the Greystanes SEL;
- ii) the approved Dexus Estate masterplan, including the approved changes, comprises some 217,039m² warehouse, some 23,555m² office with

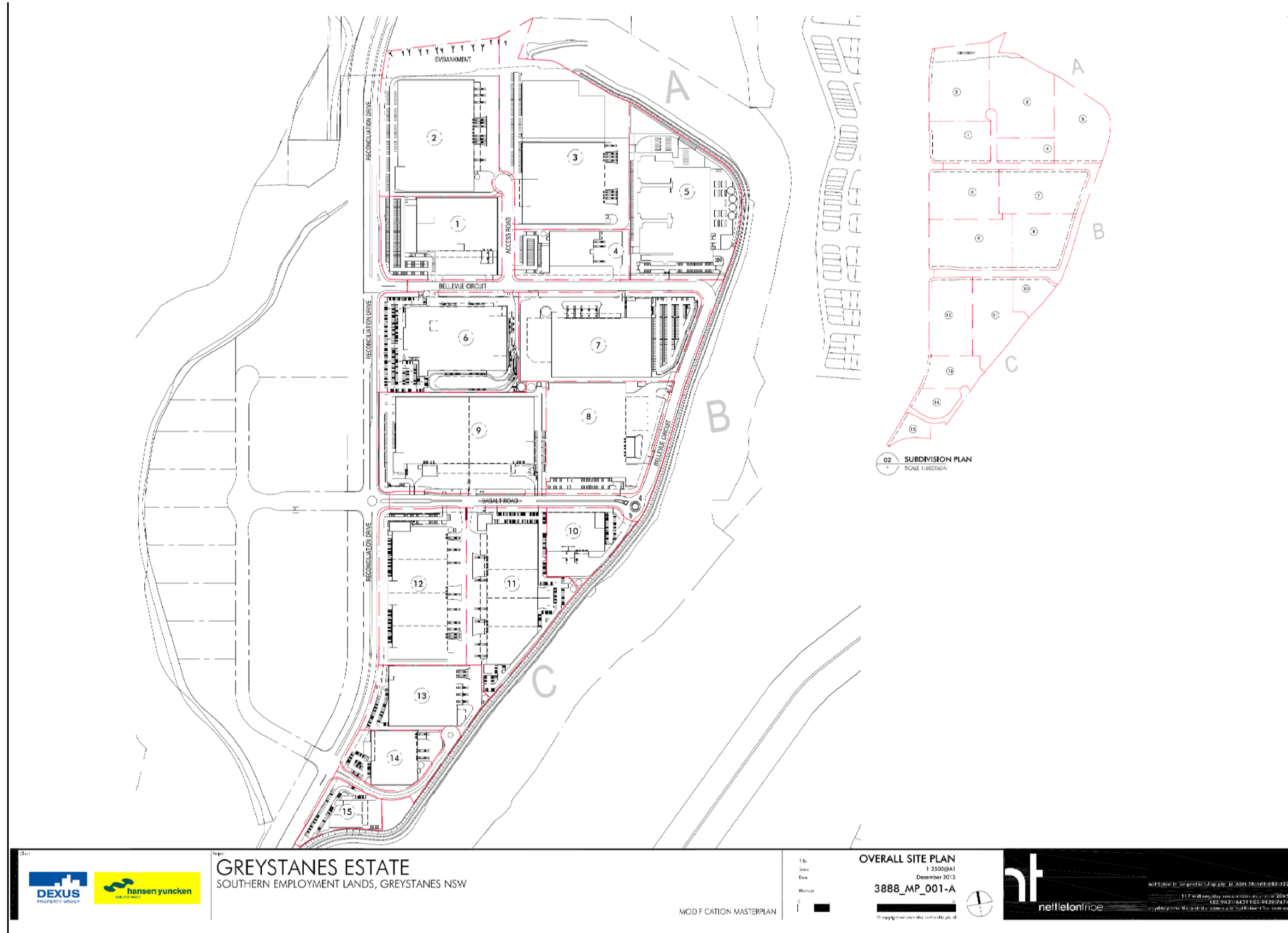
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- associated road works, including the provision of three signalised intersections on Reconciliation Road;
- iii) the proposed modifications to Precincts B and C result in a net increase in warehouse area for the overall estate of some 9,414m² and an increase in office area of some 990m²;
 - iv) the internal road network within the estate, including the extended internal road within Precinct C, will be designed to accommodate industrial traffic, including b-doubles;
 - v) the proposed access, internal circulation and car parking arrangements for the various sites within the estate will be designed in accordance with the Australian Standards AS2890.1-2004 and AS2890.2-2002;
 - vi) the pedestrian and cycle network will be designed in accordance with the Australian Standard AS1428;
 - vii) the regional and local traffic effects of the Greystanes SEL have previously been assessed;
 - viii) the proposed development, including the proposed modifications to Precincts B and C, will generate considerably less traffic during peak periods than was previously assessed;
 - ix) the proposed road network, incorporating the network improvements within the overall Greystanes Industrial Estate, will be able to cater for the proposed development.
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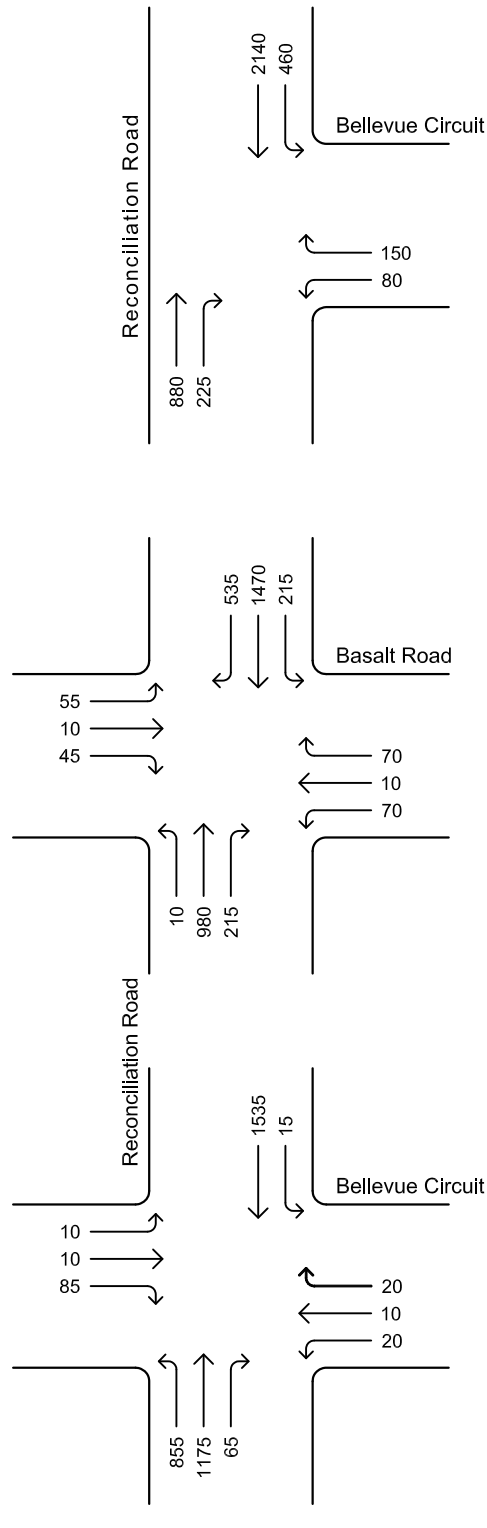
Location Plan

Colston Budd Hunt & Kafes Pty Ltd

Figure 1

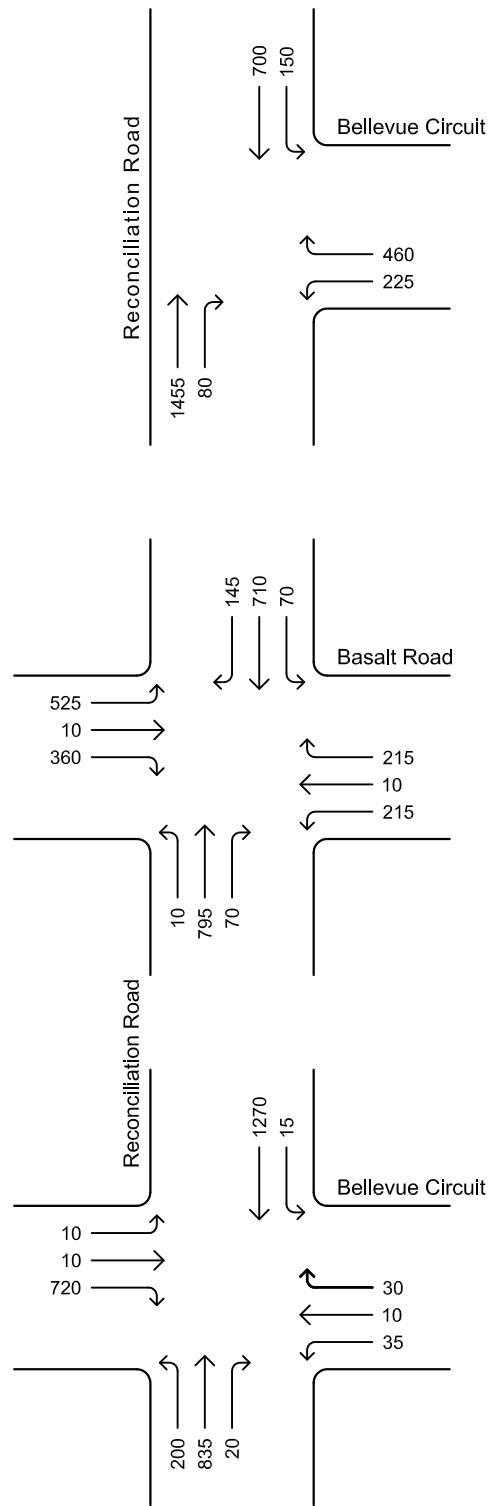


Dexus Estate Greystanes
Internal Road Network



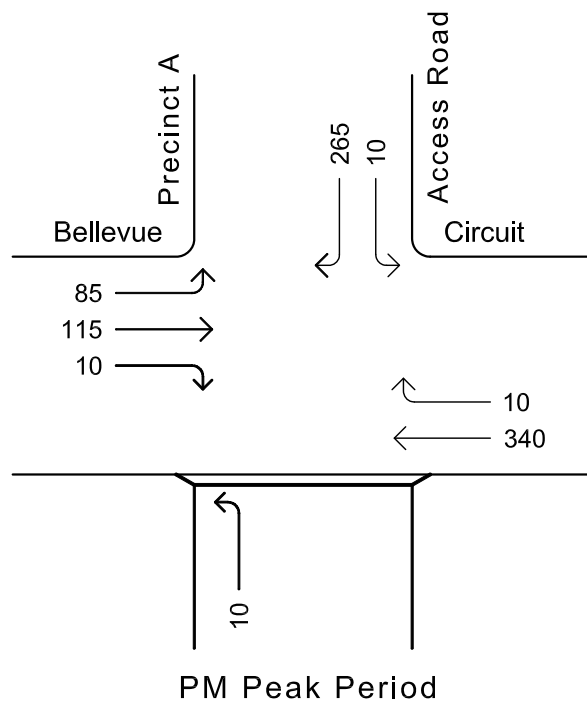
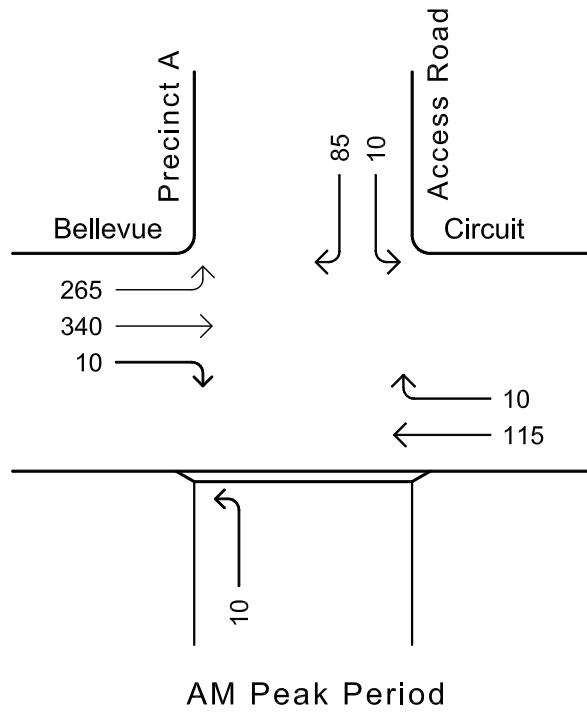
Source -
Based on modified Sinclair Knight
Merz, 2006 forecast traffic flows

**Forecast morning peak hour 2016
traffic flows**



Source -
Based on modified Sinclair Knight
Merz, 2006 forecast traffic flows

**Forecast afternoon peak hour 2016
traffic flows**



Source -
Based on modified Sinclair Knight
Merz, 2006 forecast traffic flows

Forecast peak hour 2016 traffic flows