

STOCKLAND

TRAFFIC REPORT FOR
PROPOSED WAREHOUSE
DEVELOPMENT,
GOVERNOR MACQUARIE DRIVE,
WARWICK FARM

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I. INTRODUCTION

- I.1 Colston Budd Hunt and Kafes Pty Ltd has been commissioned by Stockland to prepare a report examining the traffic implications of a proposed warehouse development at Warwick Farm. The site (known as Area B – Coopers Paddock) forms part of land formerly owned by the Australian Turf Club (ATC) and is located on the southern side of Governor Macquarie Drive, as shown in Figure I.
- I.2 The site has an area of some 11.5ha and is located between the Sydney Water site to the west and the Georges River to the south-east. Warwick Farm Racecourse and the Inglis site are located to the north, on the northern side of Governor Macquarie Drive.
- I.3 In association with a number of parcels of land, including the Inglis site (proposed horse stabling and ancillary racecourse uses) to the north and Area G (proposed bulky goods/hardware development) to the west, the site has been rezoned for some 80,000m² of warehouse area. A traffic report⁽¹⁾ was prepared which supported the rezoning application.
- I.4 Subsequent to the rezoning application, the Inglis site has been approved for horse stabling and sales yard facilities and Area G has been approved for a Masters home improvement centre.

⁽¹⁾ “Warwick Farm Industrial & Stabling Rezoning Proposal Traffic Impact Assessment.”, prepared by Stapleton Transportation & Planning Pty Ltd, August 2010.

- I.5 The proposed development comprises some 48,560m² of warehouse area and some 3,145m² of office area. Vehicular access to the site will be provided from Governor Macquarie Drive.
- I.6 In association with the rezoning application and the subsequent development approvals for the Inglis site and Area G, a series of road works were identified and agreed with Council and RMS to accommodate development of the sites. The identified road works form part of a Voluntary Planning Agreement (VPA), including the provision of a roundabout on Governor Macquarie Drive to provide access to the Inglis site to the north and a future fourth leg on the southern side of the roundabout, to provide access to the proposed warehouse development. The identified road works have been approved by Liverpool City Council and road design tender documents have been issued for construction.
- I.7 Subsequent to the approved road works, Liverpool City Council indicated that the Australian Turf Club (ATC) has been advised its preferred intersection control for the access driveways to the Inglis site and the proposed warehouse development is a four-way traffic signal controlled intersection, instead of a roundabout.
- I.8 This report assesses the implications of the proposed development through the following chapters:-
- Chapter 2: describes existing conditions; and
 - Chapter 3: assesses the traffic implications of the proposed development.
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2. EXISTING CONDITIONS

Site Location and Road Network

- 2.1 The site forms part of land formerly owned by the Australian Turf Club (ATC) and is located on the southern side of Governor Macquarie Drive, as shown in Figure 1. The site has an area of some 11.5ha and is located between the Sydney Water site to the west and the Georges River to the south-east. Warwick Farm Racecourse and the Inglis site are located to the north, on the northern side of Governor Macquarie Drive.
- 2.2 The site is currently undeveloped and has been used in the past by Warwick Farm Racecourse as a training paddock for horses associated with the racecourse. Access to the site is provided from Governor Macquarie Drive.
- 2.3 Surrounding land uses comprise a mix of residential, commercial and racecourse associated uses. There are residential dwellings located to the east of the Georges River and the west of the site, closer to the Hume Highway. There are commercial uses on the north western side of the Hume Highway and racecourse and associated uses on the northern side of Governor Macquarie Drive.
- 2.4 In the vicinity of the site, Governor Macquarie Drive provides an east-west connection between the Hume Highway and Newbridge Road. It is located adjacent to the northern boundary of the site and provides access to industrial and residential areas. In the vicinity of the site, it provides an undivided road with one traffic lane in each direction, clear of intersections. Governor Macquarie Drive intersects with the Hume Highway to the north-west at a signalised intersection.
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- 2.5 The Hume Highway to the north-west of the site provides three traffic lanes in each direction with a central concrete median. There are right turn bays in the Hume Highway for turning traffic. Clearways operate during weekday peak periods in the direction of peak traffic flow (eastbound in the morning and westbound in the afternoon).
- 2.6 Munday Street is located to the west and provides access to facilities associated with the racecourse, as well as residential properties. Munday Street provides for one traffic lane and one parking lane in each direction, clear of intersections. There are no stopping restrictions on both sides of the road on race days. The intersection of Munday Street with Governor Macquarie Drive is controlled by a 'seagull' type intersection. It includes a right turn bay in Governor Macquarie Drive for turns into Munday Street, and a protected area for right turns from Munday Street into Governor Macquarie Drive. There are two lanes on Munday Street on the approach to Governor Macquarie Drive.

Previous Work

- 2.7 In association with a number of parcels of land, including the Inglis site (proposed horse stabling and ancillary racecourse uses) to the north and Area G (proposed bulky goods/hardware development) to the west, the site has been rezoned for some 80,000m² of warehouse development. A traffic report was prepared by Stapleton Transportation and Planning August 2010, which supported the rezoning application.
- 2.8 Subsequent to the rezoning application, the Inglis site has been approved for horse stabling and sales yard facilities and Area G has been approved for a Masters home improvement centre. In association with the Masters development, upgrades to
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the intersection of Governor Macquarie Drive with Munday Street (traffic signals) and the Hume Highway (additional lanes) are to be constructed.

2.9 Plans, prepared by Lean & Hayward Pty Ltd for the ATC (May 2011) and approved by Liverpool City Council (DA27/2012), in association with the development of the Inglis Site, identify a series of road and intersection works, identified in the Stapleton report, to accommodate development of the sites. These include:-

- ❑ provision of two new roundabouts on Governor Macquarie Drive providing access to the Inglis Site and to Lot 1 located on the northern side of Governor Macquarie Drive;
 - ❑ the two roundabouts will provide two approach lanes and two circulating lanes for Governor Macquarie Drive;
 - ❑ the two roundabouts have been designed to cater for industrial traffic, including b-doubles;
 - ❑ the eastern roundabout will provide for a future four leg on its southern side to provide access to Area B (the site being considered by yourselves);
 - ❑ provision of two through lanes in each direction on Governor Macquarie Drive on the approaches to and between the two roundabouts;
 - ❑ access to the Inglis Site and to Lot 1 at the respective roundabouts will be via a two-way access road with one traffic lane in each direction;
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- ❑ construction of shared bike/pedestrian paths of a minimum width of 2.5 metres located adjacent to Governor Macquarie Drive, between the William Long Bridge and the Hume Highway.

2.10 The identified road works, as shown on Figure 2, form part of a VPA for the site and the road design tender documents have been issued for construction.

Public Transport

2.11 The site is some 1.2 kilometres from Warwick Farm railway station. Warwick Farm is on the Cumberland, South, Inner West and Bankstown Lines. Services through Warwick Farm on these lines operate on a 10 to 15 minute headway in each direction throughout the day and 5 to 10 minute headway in each direction during the morning and afternoon peak periods.

2.12 Other than on race day, bus services do not operate along Governor Macquarie Drive past the site. Local bus services in the area include Route 903 (Veolia Transport) between Liverpool and Chipping Norton, which operated along Epsom Road on the eastern side of the Georges River, and Route 904 (Veolia Transport) between Liverpool and Fairfield, via Lansvale, which operates along the Hume Highway. Route 903 operates a loop service along Epsom Road and Nuwarra Road, to the east of the site. It operates on a 60 minute headway, Monday to Saturday, and 20 to 30 minute headway during the morning and afternoon peak periods.

2.13 Route 904 has stops on the Hume Highway adjacent to the Warwick Farm Racecourse, north-east of Governor Macquarie Drive. It operates on a 60 minute headway in each direction, Monday to Saturday, and 30 minute headway in each

direction during the morning and afternoon peak periods. Services include links to Fairfield, Warwick Farm and Liverpool railway stations.

3. IMPLICATIONS OF PROPOSED DEVELOPMENT

- 3.1 In association with the rezoning application, the site has been rezoned for some 80,000m² of warehouse area. The proposed development comprises some 48,560m² of warehouse area and some 3,145m² of office area. Access to the site will be provided via a combined entry/exit driveway onto Governor Macquarie Drive.
- 3.2 In association with the rezoning application and the approved road works, which form part of a VPA, a roundabout on Governor Macquarie Drive is required to provide access to the Inglis site to the north and a future fourth leg on the southern side of the roundabout, to provide access to the proposed warehouse development. However, Liverpool City Council has indicated that its preferred intersection control is a four-way traffic signal controlled intersection, instead of a roundabout.
- 3.3 This chapter assesses the traffic implications of the proposed development through the following sections:-
- ❑ public transport;
 - ❑ parking provision;
 - ❑ access arrangements;
 - ❑ internal layout and servicing;
 - ❑ traffic effects;
 - ❑ principles of construction traffic management; and
 - ❑ summary.
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Public Transport

- 3.5 As previously discussed, the site is within some 1.2 kilometres of Warwick Farm station. Services through Warwick Farm operate on the Cumberland, South, Inner West and Bankstown Lines. Buses operate in the vicinity of the site with services along the Hume Highway to the west and Epsom Road to the east. These services provide links to the surrounding area, including Liverpool, Fairfield and Lansvale.
- 3.6 It is anticipated that new bus services would be developed to cater for future developments. The proposed development would increase employment densities to support new public transport services in the area.
- 3.7 The road works set down in the VPA include the provision of shared bike/pedestrian paths located adjacent to Governor Macquarie Drive, between the William Long Bridge and the Hume Highway. These paths will improve pedestrian and bicycle facilities through the area.
- 3.8 These public transport measures are consistent with government objectives 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;
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- (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

3.9 Part 1.2 of the Liverpool DCP 2008 has parking rates as follows:-

- one space per 35m² for the office component; plus
- the greater of one space per 75m² of factory/warehouse or one space per two employees.

3.10 By comparison, the RMS “Guide to Traffic Generating Developments” indicates that warehouses should provide one space per 300m². The guidelines do not include a separate rate for the office component of a warehouse. The RMS guidelines note that there can be significant variability in the parking requirements for warehouse developments.

3.11 At this stage, individual tenants and the number of employees is not known. However, experience with other recent warehouse developments in Liverpool, including at the Nexus business park and Aldi warehouse at Prestons, indicates that the likely parking demands will be lower than Council’s DCP parking requirements. In these developments, the following parking was provided:-

- some 172 spaces for 52,930m² (one space per 308m², including office component) for the Aldi warehouse;

- ❑ some 125 spaces for 13,120m² (one space per 105m², including office) for the Atlas Metals warehouse in the Nexus estate; and
- ❑ some 59 spaces for 9,709m² (one space per 165m², including office) for the Natsteel warehouse in the Nexus estate.

3.12 Based on the above, the average parking provision for these developments is one space per 210m². This rate is considered more appropriate than the DCP rate of one space per 75m².

3.13 For the proposed development the parking provision is some 345 spaces, representing a rate of one space per 150m². This parking provision is considered appropriate.

3.14 The proposed development will also provide bicycling parking.

Access Arrangements

3.15 The VPA includes a roundabout to provide access to the Inglis site on the northern side of Governor Macquarie Drive and a fourth leg on the southern side of the roundabout, to provide access to the proposed development. However, Liverpool City Council has indicated that it prefers a four-way traffic signal controlled intersection, instead of a roundabout. The traffic aspects of access to the proposed development by either a roundabout or traffic signals are discussed in the following section.

- 3.16 The design of the intersection should provide for turning movements to/from the site and be designed to cater for the swept paths of service vehicles ranging from large rigid trucks to articulated vehicles, including b-doubles.

Internal Layout and Servicing

- 3.17 An internal private two-way circulation road will provide access to loading facilities and car parking areas located adjacent to the four warehouse buildings within the site. The circulation road has been designed to cater for two-way service vehicle activity with roundabouts located within the southern and western parts of the site to provide for vehicles to turn around and recirculate through the site.
- 3.18 Service vehicle access to/from the site and circulation within the development has been assessed using the Autoturn computer program. We have assessed access and circulation for use by 19 metre articulated vehicles and 26 metre b-doubles. Service vehicle swept paths are provided in Appendix A. Service access will be designed in accordance with Australian Standard for Parking Facilities (Part 2: Off-street commercial vehicle facilities) AS2890.2-2002.
- 3.19 On-site parking will be located adjacent to the four warehouse buildings. Car parking spaces will be a minimum of 2.4 metres wide by 5.4 metres long with adjacent circulation aisles of some 6 metres in width. Spaces with adjacent obstructions will be 0.3 metres wider to provide for door opening. Disabled parking spaces will be 2.4 metres wide with an adjacent 2.4 metre wide shared zone for wheelchair access. Disabled parking spaces will be located in close proximity to the main pedestrian access to development. These dimensions are considered appropriate, being in accordance with the Australian Standards AS2890.1-2004 and AS2890.6-2009.
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Traffic Effects

- 3.20 The previous traffic report submitted with the rezoning application assessed weekday morning and afternoon peak hour traffic generations of some 220 vehicles per hour two-way for warehouse development on the subject site.
- 3.21 The proposed development is some 51,705m², comprising some 48,560m² of warehouse area and some 3,145m² of office area. Based on the RMS guideline rate of 0.5 vehicles per hour per 100m², the proposed warehouse development would have a traffic generation of some 260 vehicles per hour at peak times. This is similar to the traffic generation of 220 vehicles per hour assessed at the rezoning stage.
- 3.22 The proposed development would therefore have similar traffic effects. The road works set out in the VPA will therefore cater for the proposed development. We have also assessed the operation of signalization of the Governor Macquarie Drive access intersection. A concept plan for the signalised intersection is shown on Figure 3.
- 3.23 Updated traffic counts were undertaken on Governor Macquarie Drive adjacent to the site during the morning and afternoon peak periods, on Wednesday 26 November 2014. Future 2025 traffic flows have been estimated by increasing existing traffic flows by 2% per annum compounded for 10 years and combined with the additional development traffic generated by the approved Inglis and Masters developments, plus the traffic from the proposed warehouse development. The 2025 traffic flows plus the development traffic are shown on Figures 4 and 5.
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3.24 The operations of the Governor Macquarie Drive intersection have been assessed using the SIDRA program. SIDRA is designed to analyse signal controlled intersections, roundabouts and priority intersections.

3.25 The program simulates the operation 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):-

- 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

- 3.26 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.
- 3.27 For the 2015 traffic flows the SIDRA analysis found a roundabout at the Governor Macquarie Drive intersection would operate with average delays, for the movement with the highest average delay, of less than 20 seconds per vehicle during the morning and afternoon peak periods. This represents a level of service B, a good level of intersection operation.
- 3.28 The SIDRA analysis found that with signalisation the Governor Macquarie Drive intersection would operate with average delays of less than 25 seconds per vehicle during the morning and afternoon peak periods. This represents a level of service B, which is also a good level of intersection operation.
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- 3.29 Therefore, the Governor Macquarie Drive access intersection will cater for future traffic flows will operate as either a roundabout or signalised intersection.

Principles of Construction Traffic Management

- 3.30 At this stage, the construction methodology, process and staging have not been defined for the proposed development. The appointed builder will be responsible for the preparation of a construction traffic management plan, which will be prepared prior to the commencement of construction.
- 3.31 During the construction of the proposed development, an on-site work zone, materials handling area and construction site facilities will be established within the northern part of the site, adjacent to Governor Macquarie Drive. Construction and containment fencing will be erected around the perimeter of the site compound.
- 3.32 Temporary construction access to the site compound will be provided to/from Governor Macquarie Drive, with trucks entering and exiting the site in a forward direction. In order to minimise construction traffic on surrounding streets, trucks will approach and depart the site to/from the Hume Highway, along designated truck routes.
- 3.33 The loading and unloading of construction material from trucks, associated with the overall construction activity, will be carried out on-site. Construction material will be stored on-site within designated material handling areas.
- 3.34 Openings in the construction fencing and the construction access driveways will be managed and controlled by qualified site personnel. Pedestrian movements
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across the access driveways and the movement of trucks entering and exiting the site compound will be managed and controlled by traffic controllers. Pedestrian warning signs will be erected adjacent to the driveway.

- 3.35 Work associated with the construction activity will be carried out in accordance with the approved hours of construction.
- 3.36 The site contractor will be responsible to instruct and control sub-contractors regarding the hours of work. Any work outside the approved construction hours would be subject to prior approval from Liverpool Council.
- 3.37 The control of hours of operation avoids truck movements during the early morning and evening periods. To facilitate an efficient program, the arrival and departure of trucks associated with the construction works will be regulated and on-site works will be carefully managed and controlled by site personnel. Trucks will be called onto the site when required. Trucks will not be permitted to park on-street in Governor Macquarie Drive or within surrounding local streets.
- 3.38 The overall principles for traffic management during construction will be:-
- provide a convenient and appropriate environment for pedestrians;
 - provide appropriate safety fencing around the perimeter of the site compound, with overhead protection where required;
 - management and control construction vehicle movements to and from the site;
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- ❑ maintain current traffic arrangements along Governor Macquarie Drive in the vicinity of the site;
 - ❑ maintain traffic capacity at intersections and mid-block in the vicinity of the site along Governor Macquarie Drive;
 - ❑ construction vehicles to be accommodated on-site;
 - ❑ ensure that construction vehicles do not stop or park on-street along Governor Macquarie Drive or within adjacent local streets in the vicinity of the site;
 - ❑ restrict construction vehicle routes to/from the site to the main road network through the area;
 - ❑ construction access driveways and pedestrians to be managed and controlled by qualified site personnel;
 - ❑ construction vehicles to enter and exit the site in a forward direction;
 - ❑ construction activity to be carried out in accordance with approved hours of construction;
 - ❑ maintain safety for construction workers and the general public;
 - ❑ manage and control vehicle activity in the vicinity of the site;
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- the preparation of the construction traffic management plan, signage detail, control of pedestrians and control and management of construction activity/vehicles in the vicinity of the site will be the responsibility of the appointed builder.

Summary

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

- i) the site has been rezoned for some 80,000m² of warehouse development;
- ii) the proposed development comprises some 48,560m² of warehouse area and some 3,145m² of office area;
- iii) the proposed parking provision is considered appropriate;
- iv) access, servicing arrangements and internal layout will be provided in accordance with AS2890.1-2004, AS2890.2-2002 and AS2890.6-2009;
- v) the proposed warehouse development would have a traffic generation of some 260 vehicles per hour during the morning and afternoon peak periods;
- vi) this is similar to the traffic generation of 220 vehicles per hour assessed for the rezoning;
- vii) the proposed development would therefore have similar traffic effects;

- viii) the road works set out in the VPA will therefore cater for the proposed development;
- ix) the Governor Macquarie Drive access intersection will be able to cater for future traffic flows as either a roundabout or signalised intersection.

APPENDIX A

SWEPT PATHS
