15 December 2017

PLANNING DEVELOPMENT PROPERTY

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Secretary
Department of Planning and Environment
GPO Box 39
SYDNEY NSW 2001

Dear Madam,

RE: REQUEST FOR SECRETARY'S ENVIRONMENTAL ASSESSMENT REQUIREMENTS FOR THE PROPOSED ESTABLISHMENT OF A RESOURCE RECOVERY FACILITY AND LANDSCAPE SUPPLIES OPERATION AT BADGERYS CREEK WHICH IS CONSIDERED TO BE STATE SIGNIFICANT DEVELOPMENT

1 Introduction

1.1 Purpose

KDC has been commissioned to prepare an environmental impact statement (EIS) and associated development application (DA) documentation for the proposed establishment of a resource recovery facility and a landscape supplies operation on a site located at 80 Martin Road, Badgerys Creek NSW 2555 (the site).

The proposed resource recovery facility and landscape supplies operation is considered to be classified as designated development and State Significant Development (SSD) so therefore are subject to the Secretary's Environmental Assessment Requirements (SEARs). The proposed resource recovery facility is also classified as regional development under Schedule 4A Section 8 of the Environmental Planning and Assessment Act, 1979 (EP&A Act). However, the proposed development exceeds the threshold that applies to regional development and is considered to be SSD.

1.2 Background

The Badgerys Creek site operated as a home occupation until it was purchased by its current owner, Calabro Real Estate Pty Ltd.

Since this time, the site has been used for the intermittent and temporary storage of heavy vehicles associated with a freight and transport company also operated by the owner. Otherwise, the site has not been utilised.

KDC was engaged by the owner to explore the viability and suitability of a resource recovery facility and a landscape supplies operation on the site. Having regard to the proposed Badgerys Creek Airport and the Sydney Regional Growth Centres SEPP the proposed development would appear to be an appropriate use for the site.

On 27th April 2017, Badgerys Creek Resource Recovery and Landscaping Facility Pty Ltd was formed to oversee the proposed operation.

KDC is not aware of any previous development consent being granted for the site by Liverpool Council or any other consent authority.

1.3 Consultation

Various government authorities have been consulted prior to this application for SEARs. The following outlines these consultation processes:

Department of Environment and Heritage (OEH)

The NSW OEH was contacted with a request for a meeting or formal comment on the development. Marnie Stewart, Senior Project Officer, responded to the request on 28th June 2017, by declining the opportunity for a meeting or providing formal comment on the proposal stating "*OEH's preference is to wait until a formal SEARs consultation request is made by the Department of Planning and Environment*."

NSW Environmental Protection Authority (EPA)

The NSW EPA was contacted with a request for a meeting to discuss or provide comment on the proposed development. KDC was contacted on 13th July 2017 and was advised that the EPA preferred to wait for a formal consultation request from the DoP. However, the EPA did confirm that they were generally supportive of the proposal, however noted their preference for all operations and stockpiles to be covered.

Liverpool City Council

Liverpool City Council (Council) has been contacted with a request for either formal comment or a meeting to discuss the proposed development. A letter detailing Council's concerns and recommendations was received on the 27th of July 2017 from the Director of City Economy and Growth Lina Kakish, see Appendix A for letter.

A number of considerations were raised concerning the Badgerys Creek Airport development including the Obstacle Limitation Surface surrounding the airport, the flight hazard caused by attracted birds, and the impact of ground lighting on pilots during take-off and landing.

Council identified the following areas of assessment which should be considered:

- Flood Impact Assessment;
- Groundwater Contamination and Management;
- Ecological Impact Assessment;
- Economic and Social Impact Assessment;
- Waste Management Plan;
- Traffic Impact Assessment;
- Soil Impact, Contamination, and Management;
- Visual Amenity Assessment;
- Bushfire Risk Assessment;
- SEPP33 Hazard Assessment;
- Acoustic Report;
- Air Quality Assessment;
- On-site Sewage Management; and
- Environmental Management Plan.

2 Project Description

2.1 Site Description and Locality

The site is legally described as Lot 2 DP530595 and is located at 80 Martin Road, Badgerys Creek NSW 2555 (see Figure 1).

The site is located within a RU1 Primary Production zone under the Liverpool Local Environmental Plan 2008 (LEP 2008). However, under the State Environmental Planning Policy (Sydney Region Growth Centres) 2006 the site is identified as "Future Industrial".

To the north and south along Martin Road are large rural residential properties. East of the site, the South Creek adjoins the property boundary. Directly across Martin Road is an agricultural land use. Similar activities exist on Martin Road with a concrete recycler to the north of the site and a resource recovery land use to the south of the site.

Figure 1 - Locality Plan

The site has two levels with a slope downward to the adjoining South Creek (see Figures 2 and 3).

Figure 2 - View towards South Creek

Figure 3 - View from the eastern portion of the slope onsite

The site is predominantly cleared land with some scattered trees, shrubs and grass (see Figures 4 and 5). There is an unsealed road which provides access to the rear of the site. A single storey dwelling is situated close to the northern boundary of the site with access to Martin Road via the unsealed driveway. Two dams are located on the site, one in the centre and the other on the north-eastern portion of the site.

Figure 4 -Vegetation on site

Figure 5 - Vegetation adjoining Martin Road

The site has a frontage to Martin Road. A single vehicle access road runs along the southern boundary at the frontage of the site from which vehicles enter and exit. Figure 6 shows this access road entering Martin Road. Figures 7 and 8 show sections of Martin Road in close proximity to the site. It is proposed to expand the existing single direction internal road to become a two-way road as part of the proposed development.

Figure 6 - View of the existing site access

Figure 7 - View northbound along Martin Road

Figure 8 - View southbound along Martin Road

2.2 Project Description

The proposed development involves the following:

- Demolition/removal of foreign material from site;
- Construction of facility, weighbridge, hardstand area, stormwater system, stockpile bunds and onsite road infrastructure;
- Installation of plant; and
- Associated car parking and landscaping works.

The proposed development is illustrated diagrammatically in a concept plan in Appendix C.

Foreign materials will be stockpiled separately for classification and disposal off site. Existing waste on the site mainly consists of various vehicles and plant which will be removed from the site. Any material found to be unsuitable for onsite recycling will be removed and disposed of in accordance with NSW Environment Protection Authority (EPA) requirements. Disposal of waste materials will only be undertaken at appropriately licenced facilities.

Operations will involve the separation, grinding, crushing and general processing of received materials, whether virgin material or recyclable waste. The operation will accept and process up to 500,000 tonnes per year with no more than 100,000 tonnes stored on site at any given time.

2.3 Waste

The range of materials to be processed on the site will include, but not be limited to:

- Drilling mud (Treated and Untreated)
- Non-Destructive Digging waste
- Virgin Excavated Natural Material
- Excavated Natural Material
- Sands
- Construction and demolition waste
- General Solid Waste (Non-putrescible)
- Restricted Solid Waste (Non-Putrescible)
- AMCOR Botany Mill Solids
- Wood waste
- Boiler fly ash Spent Filter Sand Medium
- Ferrous Metal
- Non-ferrous Metal
- Plastics
- Paper
- Paper pulp

The operation will also seek approval for any waste materials listed as Resource Recovery Exemptions issued by the NSW Environment Authority (EPA).

Incoming waste will arrive from within the Sydney metropolitan area from various operations. The aim of the resource recovery operation is to support large scale infrastructure projects by supplying quality recycled materials for use while also accepting their waste for resource recovery.

While the site may accept a diverse range of materials the majority of resource recovery works will focus on landscaping materials such as sand, soil, and green waste along with construction materials concrete and brick.

The site incorporates two stockpiling areas for incoming waste and processed materials, which consist of the top area labelled 9 on the plan at Appendix and the bottom area labelled 10 on the plan. The top area will consist of newly produced material, product to support the landscape supplies operation and recovered resources inappropriate to be stored within the flood prone area. The lower area will accommodate the storage of appropriate inert material whether processed or not.

To ensure the movement of product from the site preventing unwanted stockpiling the operation has engaged a waste management and environmental consultant Langford Environmental to oversee business development into the waste and resource recovery sector. The site will also utilise new technology such as tipd.com.au to connect waste operators and material purchasers with the operation.

2.4 Operational Processes

The proposed development involves two land uses which will be integrally linked to each other.

2.4.1 Landscape Material Supplies Facility

The proposed landscape material supplies facility will provide plants and landscape materials to large scale projects, commercial operations, and to private individuals. The operation will utilise the proposed resource recovery facility to produce high quality landscaping materials from waste products. Thus, providing a sustainable alternative to disposal of waste to landfill.

Through a combination of the site's shape, topography, and its flood potential the rear of the site will be used to grow plants for sale. As demonstrated on the concept plan at Appendix C, seedlings and saplings will be grown in the north-eastern portion of the site adjoining South Creek. More mature plants will be stored along the east and south east portion of the site adjoining South Creek. The aim is to minimise flood impacts and risk associated with development on flood prone land. When the plants are deemed ready for sale, they will be moved to the nursery.

The types of plants to be grown and sold on the site will be determined by market demand, however it is intended to propagate native species.

Recovered resources from the resource recovery facility will include a range of products such as sands, soils, and wood chips. Small packages of materials will be sold to private individual via the nursery with bulk sales being pre-organised with pickup at the truck bays.

2.4.2 Resource Recovery Facility

The resource recovery facility will accept a wide range of non-putrescible materials. The resource recovery facility will support the landscape material supplies operation by producing high quality recovered material for sale however it will not solely provide material to the landscape material supplies operation, rather it will provide material to a wide range of industries and clients.

All processing of materials will occur within the processing area located above the maximum probable flood level. The processing area indicated on the concept plan will be fully enclosed allowing for the effective management of operational impacts associated with resource recovery facilities. Internal layouts, stationary and mobile plant, and further operational requirements will be detailed in the development application.

Waste such as concrete, and road base will be crushed by mobile plant. Once crushed, material will be screened into their respective sizes and moved into the material bays. Screened recovered material is either moved to a stockpile bay for immediate sale or, if an inert material, stockpiled in the eastern stockpile area.

Wood waste and other waste types will be processed to produce various products which may include wood chips, animal bedding, playground softfall, or bioenergy. These waste types will be put through a shredding process which involves a pre-shredder to break large pieces into small pieces followed by processing by a shredder breaking timber down into finer soft material. Screening will be applied to separate the processed material into various grades.

2.5 Sub-consultants

A number of sub-consultants have been engaged as part of the project based on the foreseen environmental constraints of the site.

Delfs Lascelles Consulting Surveyors will undertake an initial survey of the site with the site plan and architectural plans to be undertaken by Lindsay Dynan Consulting Engineers.

In addition to the site plan, Lindsay Dynan will also prepare the site Stormwater Management Plan including a Soil and Water Management Plan and undertake a Flood Impact Study for the proposed development.

Due to the nature of the proposal an Air and Odour Assessment was deemed necessary and as such Todoroski Air Sciences are engaged to prepare the technical document. This will involve the creation of a dispersion model based on the parameters of the site and the potential emissions from the site.

A Noise Impact Assessment is to be undertaken by Muller Acoustic Consulting which will quantify and suggest appropriate management options for noise produced by the proposed development.

An investigation and subsequent report detailing the ecology of the site will be conducted by Ecological Australia and will include the identification of vegetation communities, identification of fauna habitat and foraging resource, hollow-bearing trees present on the site, and will note any opportunistic sightings of fauna on the site.

Having prepared the accompanying Preliminary Traffic Assessment (see appendix B), Intersect Traffic will prepare a formal Traffic Impact Assessment which will estimate traffic generation of the proposed operation, estimate load on key intersections, provide recommendations regarding any upgrade works, review the site access along with on-site parking and vehicle circulation, perform a SIDRA assessment of existing traffic conditions, and provide recommendations to mitigate any impacts.

The abovementioned sub-consultants were selected based on their credentials with experience with large scale developments, their capability to respond to requirements outlined by SEARs, their dedication to providing high quality assessments and reports, and ability to provide solutions which are amenable to all parties involved.

Any further technical documents and studies required to be performed as a result of the SEARs will be undertaken to accompany the development application.

3 Planning Framework

The following discussion provides an initial review of the proposed development against relevant planning requirements. No Commonwealth environmental legislation is triggered by the proposed development. Therefore, this assessment identifies State and local planning requirements.

The legislation and planning instruments to be taken into consideration includes:

- *Environmental Planning and Assessment Act, 1979;*
- *Environmental Planning and Assessment Regulation 2000;*
- *State Environmental Planning Policy (State and Regional Development) 2011;*
- *State Environmental Planning Policy (Infrastructure) 2007;*
- *State Environmental Planning Policy (Infrastructure) 2016 Amendment (Review) Draft;*
- *State Environmental Planning Policy (Sydney Region Growth Centres) 2006;*
- *Liverpool Local Environmental Plan 2008;*
- *Liverpool Development Control Plan 2008; and*
- *Rural Fires Act 1997.*

3.1 Environmental Planning and Assessment Act, 1979

The *Environmental Planning and Assessment Act, 1979 (EP&A Act),* specifies under Section 77A, the following:

> *Designated development is development that is declared to be designated development by an environmental planning instrument or the regulations.*

The discussion in section 3.2 details how the proposal is considered to be a form of designated development.

The proposal is also classified as regional development under Schedule 4A Section 8 of the Environmental Planning and Assessment Act, 1979 (EP& A Act). However, as it exceeds the threshold for regional development it is considered to be SSD.

8 Particular designated development

Development for the purposes of:

(a) extractive industries, which meet the requirements for designated development under clause 19 of Schedule 3 to the Environmental Planning and Assessment Regulation 2000, or

(b) marinas or other related land and water shoreline facilities, which meet the requirements for designated development under clause 23 of Schedule 3 to the Environmental Planning and Assessment Regulation 2000, or

(c) *waste management facilities or works, which meet the requirements for designated development under clause 32 of Schedule 3 to the Environmental Planning and Assessment Regulation 2000*.

3.2 Environmental Planning and Assessment Regulation 2000

Part 1 of Schedule 3 of the *Environmental Planning and Assessment Regulation 2000 (Regulation),* lists a number of developments declared to be designated development for the purpose of Section 77A of the EP&A Act.

There are several definitions which adequately describe the proposed works, namely *crushing, grinding or separating works* and *waste management facilities or works*. These are described below:

16 Crushing, grinding or separating works

(1) Crushing, grinding or separating works, being works that process materials (such as sand, gravel, rock or minerals) or materials for recycling or reuse (such as slag, road base, concrete, bricks, tiles, bituminous material, metal or timber) by crushing, grinding or separating into different sizes:

(a) that have an intended processing capacity of more than 150 tonnes per day or 30,000 tonnes per year, or

(b) that are located:

(i) within 40 metres of a natural waterbody or wetland, or

(ii) within 250 metres of a residential zone or dwelling not associated with the development.

(2) This clause does not apply to development specifically referred to elsewhere in this Schedule.

Comment

It is intended to accept greater than 30,000 tonnes per year of recyclable waste. Once the waste has arrived a separation process as part of the resource recovery works will be initiated. Separated waste material will then be processed which may involve either crushing or grinding to produce recycled product for the landscape supplies operation.

32 Waste management facilities or works

(1) Waste management facilities or works that store, treat, purify or dispose of waste or sort, process, recycle, recover, use or reuse material from waste and:

(a) that dispose (by landfilling, incinerating, storing, placing or other means) of solid or liquid waste:

(i) that includes any substance classified in the Australian Dangerous Goods Code or medical, cytotoxic or quarantine waste, or

(ii) that comprises more than 100,000 tonnes of "clean fill" (such as soil, sand, gravel, bricks or other excavated or hard material) in a manner that, in the opinion of the consent authority, is likely to cause significant impacts on drainage or flooding, or

(iii) that comprises more than 1,000 tonnes per year of sludge or effluent, or

(iv) that comprises more than 200 tonnes per year of other waste material, or

(b) that sort, consolidate or temporarily store waste at transfer stations or materials recycling facilities for transfer to another site for final disposal, permanent storage, reprocessing, recycling, use or reuse and:

(i) that handle substances classified in the Australian Dangerous Goods Code or medical, cytotoxic or quarantine waste, or

(ii) that have an intended handling capacity of more than 10,000 tonnes per year of waste containing food or livestock, agricultural or food processing industries waste or similar substances, or

(iii) that have an intended handling capacity of more than 30,000 tonnes per year of waste such as glass, plastic, paper, wood, metal, rubber or building demolition material, or

(c) that purify, recover, reprocess or process more than 5,000 tonnes per year of solid or liquid organic materials, or

(d) that are located:

(i) in or within 100 metres of a natural waterbody, wetland, coastal dune field or environmentally sensitive area, or

(ii) in an area of high watertable, highly permeable soils, acid sulphate, sodic or saline soils, or

(iii) within a drinking water catchment, or

(iv) within a catchment of an estuary where the entrance to the sea is intermittently open, or

(v) on a floodplain, or

(vi) within 500 metres of a residential zone or 250 metres of a dwelling not associated with the development and, in the opinion of the consent authority, having regard to topography and local meteorological conditions, are likely to significantly affect the amenity of the neighbourhood by reason of noise, visual impacts, air pollution (including odour, smoke, fumes or dust), vermin or traffic.

(2) This clause does not apply to:

(a) development comprising or involving any use of sludge or effluent if:

(i) the dominant purpose is not waste disposal, and

(ii) the development is carried out in a location other than one listed in subclause (1) (d), above, or

(b) development comprising or involving waste management facilities or works specifically referred to elsewhere in this Schedule, or

(c) *development for which State Environmental Planning Policy No 52—Farm Dams and Other Works in Land and Water Management Plan Areas requires consent.*

Comment:

Due to the site's location adjoining South Creek, Clause 32(1)(b)(i) and Clause 32(1)(b)(v) are triggered. A large portion of the proposed operation will be situated within a floodplain as defined by the Liverpool Local Environmental Plan 2008. In addition, the site is within 250 metres of a dwelling not associated with the development triggering Clause 32(1)(b)(vi).

As a designated development, the development application for the proposed development is to be accompanied by an EIS that addresses all the environmental issues pertinent to the development proposal. A

discussion of the potential environmental impacts anticipated in relation to the proposed works is included in *Section 4*.

3.3 Integrated Development

Integrated development is defined under Section 91 of the *EP&A Act*. It includes development proposals that require development consent and one or more specific approvals under the following Acts:

- *Fisheries Management Act, 1994;*
- *Heritage Act, 1977;*
- *Mine Subsidence Compensation Act, 1961;*
- *National Parks and Wildlife Act, 1974;*
- *Protection of the Environment Operations Act, 1997;*
- *Roads Act, 1993;*
- *Rural Fires Act, 1997; and*
- *Water Management Act, 2000.*

Where one of these approvals or permits is required the development application must be submitted to the relevant approval body, for the purposes of obtaining the General Terms of Approval (GTA) from that approval body which may include any conditions to be imposed on any development consent issued by the consent authority. Whether any of these approvals are triggered is discussed in the following pages.

3.3.1 Protection of the Environment Operations Act, 1997

The POEO Act provides an integrated system of licensing for polluting industries. Schedule 1 of the POEO Act identifies types of development that require an environment protection license.

The following are included in Schedule 1 and are applicable to the proposed development:

- **34 Resource recovery - recovery of general waste**
- **41 Waste processing (non-thermal treatment) - non-thermal treatment of general waste**
- **42 Waste storage**

Comment:

The applicant is required under sections 48 of the POEO 1997 Act to obtain an environment protection licence for the operations. Due to this requirement, the proposed development is defined as integrated under the EP&A Act 1979 Section 91(1).

3.4 State Environmental Planning Policies

A number of State Environmental Planning Policies (SEPPs) may be triggered by the proposed development. Relevant SEPPs have been considered in the following sub-sections.

3.4.1 State Environmental Planning Policy (State and Regional Development) 2011

Waste and Resource Management Facilities are included in the State and Regional Development SEPP 2011 under Schedule 1 Part 23.

23 Waste and resource management facilities

(1) Development for the purpose of regional putrescible landfills or an extension to a regional putrescible landfill that:

(a) has a capacity to receive more than 75,000 tonnes per year of putrescible waste, or

(b) has a capacity to receive more than 650,000 tonnes of putrescible waste over the life of the site, or

(c) is located in an environmentally sensitive area of State significance.

(2) Development for the purpose of waste or resource transfer stations in metropolitan areas of the Sydney region that handle more than 100,000 tonnes per year of waste.

(3) Development for the purpose of resource recovery or recycling facilities that handle more than 100,000 tonnes per year of waste.

(4) Development for the purpose of waste incineration that handles more than 1,000 tonnes per year of waste.

(5) Development for the purpose of hazardous waste facilities that transfer, store or dispose of solid or liquid waste classified in the Australian Dangerous Goods Code or medical, cytotoxic or quarantine waste that handles more than 1,000 tonnes per year of waste.

(6) Development for the purpose of any other liquid waste depot that treats, stores or disposes of industrial liquid waste and:

(a) handles more than 10,000 tonnes per year of liquid food or grease trap waste, or

(b) handles more than 1,000 tonnes per year of other aqueous or non-aqueous liquid industrial waste.

Comment:

Given the intended handling rate of 500,000 tonnes per annum the proposed resource recovery facility is covered by Schedule 1 Part 23 (3). As such the development is deemed to be SSD under the State and Regional Development SEPP 2011.

3.4.2 State Environmental Planning Policy (Infrastructure) 2007

Waste and Resource Management Facilities are included in the Infrastructure SEPP 2007 under Part 3 Division 23. Clause 121 of the SEPP establishes locations in which Waste and Resource Management Facilities such as Resource Recovery Facilities are permissible with consent under this SEPP.

121 Development permitted with consent

(1) Development for the purpose of waste or resource management facilities, other than development referred to in subclause (2), may be carried out by any person with consent on land in a prescribed zone.

(2) Development for the purposes of a waste or resource transfer station may be carried out by any person with consent on:

(a) land in a prescribed zone, or

(b) land in any of the following land use zones or equivalent land use zones:

(i) B5 Business Development,

(ii) B6 Enterprise Corridor,

(iii) IN2 Light Industrial,

(iv) IN4 Working Waterfront, or

(c) land on which development for any of the following purposes is permitted with consent under any environmental planning instrument:

(i) industry,

(ii) business premises or retail premises,

(iii) freight transport facilities.

(3) Development for the purpose of the recycling of construction and demolition material, or the disposal of virgin excavated natural material (as defined by the Protection of the Environment Operations Act 1997) or clean fill, may be carried out by any person with consent on land on which development for the purpose of industries, extractive industries or mining may be carried out with consent under any environmental planning instrument.

A prescribed zone is defined under *Clause 120 Definitions* of the Infrastructure SEPP as the following:

prescribed zone *means any of the following land use zones or a land use zone that is equivalent to any of those zones:*

(a) RU1 Primary Production,
(b) RU2 Rural Landscape,
(c) IN1 General Industrial,
(d) IN3 Heavy Industrial,
(e) SP1 Special Activities,
(f) SP2 Infrastructure.

As resource recovery facilities are permissible with consent in prescribed zones under Clause 121(1) and the site is located within an RU1 Primary Production zone which is defined as a prescribed zone the proposed resource recovery facility is permissible under the Infrastructure SEPP.

Schedule 3 – Traffic generating development to be referred to RMS

Under Schedule 3 of the Infrastructure SEPP 2007 any applications for landfill operation, recycling facilities, and waste transfer stations must be referred to the NSW Roads and Maritime Services (RMS) no matter what size or capacity. As such, this development will be required to be referred to the RMS.

3.4.3 State Environmental Planning Policy (Infrastructure) 2016 Amendment (Review) Draft

The Department of Planning and Environment (the Department) have released proposed amendments to the Infrastructure SEPP and therefore these proposed changes have been considered.

The following proposed changes to the Infrastructure SEPP are relevant to the proposed development:

Part 3 Division 23 Clause 120 - Definitions

Clause 120 Definitions *(Aligns terminology with the Standard Instrument.)*

Omit the definitions of resource recovery facility, waste disposal facility, waste or resource management facility and waste or resource transfer station from clause 120.

Insert in alphabetical order:

resource recovery facility, waste disposal facility, waste or resource management facility and waste or resource transfer station *have the same meanings as in the Standard Instrument.*

The definition of a waste or resource management facility and resource recovery facility under the Standard Instrument—Principal Local Environmental Plan is as follows:

waste or resource management facility *means any of the following:*

(a) a resource recovery facility,
(b) a waste disposal facility,
(c) a waste or resource transfer station,
(d) a building or place that is a combination of any of the things referred to in paragraphs (a)–(c).

waste or resource transfer station means a building or place used for the collection and transfer of waste material or resources, including the receipt, sorting, compacting, temporary storage and distribution of waste or resources and the loading or unloading of waste or resources onto or from road or rail transport.

resource recovery facility *means a building or place used for the recovery of resources from waste, including works or activities such as separating and sorting, processing or treating the waste, composting, temporary storage, transfer or sale of recovered resources, energy generation from gases and water treatment, but not including re-manufacture or disposal of the material by landfill or incineration.*

Comment:

The changes proposed will not have any substantive impact on the proposed development if they are adopted.

Schedule 3 Traffic generating development to be referred to RMS

Schedule 3

Omit the Schedule. Insert instead:

Figure 9 - Extract from State Environmental Planning Policy (Infrastructure) 2016 Amendment (Review) Draft

Column 1 Purpose of development	Column 2 Size or capacity—site with access to classified road or to road that connects to classified road (if access within 90m of connection, measured along alignment of connecting road)	Column 3 Size or capacity—site with access to any other road
Airports or heliports	Any size or capacity	Any size or capacity
Car parks (whether or not ancillary to other development)	50 or more motor vehicles	200 or more motor vehicles
Child care centres	50 or more children	50 or more children
Commercial premises (other than restaurants or cafes)	2,500m^2 in gross floor area	10,000m^2 in gross floor area
Drive-in take away food outlets	Any size or capacity	200 or more motor vehicles
Educational establishments	50 or more students	50 or more students
Freight transport facilities	Any size or capacity	Any size or capacity
Hospitals	100 or more beds	200 or more beds
Industry	5,000m^2 in gross floor area	20,000m^2 in gross floor area
Liquid fuel depots	8,000m^2 in gross floor area	8,000m^2 in gross floor area
Residential flat buildings	75 or more dwellings	300 or more dwellings
Restaurants or cafes	300m^2 in gross floor area	200 or more motor vehicles
Service stations (including service stations that have retail outlets)	Any size or capacity	200 or more motor vehicles
Shops	1,000m^2 in gross floor area	2,000m^2 in gross floor area
Subdivision of land	50 or more allotments	200 or more allotments where the subdivision includes the opening of a public road
Transport depots	8,000m^2 in gross floor area	8,000m^2 in gross floor area
Warehouse or distribution centres	8,000m^2 in gross floor area	8,000m^2 in gross floor area
Waste or resource management facilities	Any size or capacity	Any size or capacity
Any other purpose	Any size or capacity	

Comment:

The existing rate for waste or resource management facilities is *any size or capacity*. Therefore, no change in the rate for this development type is proposed.

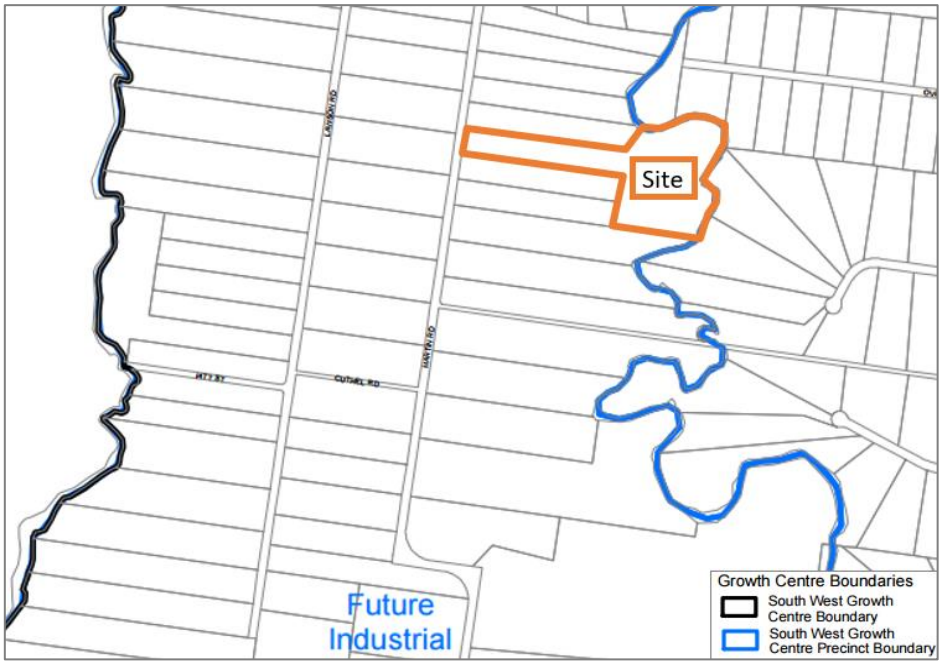
3.4.4 State Environmental Planning Policy (Sydney Region Growth Centres 2006)

The State Environmental Planning Policy (Sydney Region Growth Centres 2006) or Sydney Region Growth Centres SEPP aims to co-ordinate the release of land for residential, employment and other urban development in the North West Growth Centre, the South West Growth Centre and the Wilton Priority Growth Area.

The site is mapped within the defined South West Growth Centre and therefore the Sydney Region Growth Centres SEPP applies. The site has not yet been rezoned nor is it part of a growth centre precinct plan, however it is expected that the Liverpool Growth Centre Precinct Plan will be applicable once the land is rezoned.

As per the land zoning map (LNZ_006) (see Figure 10) from the Sydney Region Growth Centres SEPP the site is identified as "Future Industrial". The applicable industrial zoning under the Liverpool Growth Centre Precinct Plan is IN2 Light Industrial.

Figure 10 - Sydney Region Growth Centres SEPP - South West Growth Centre (LNZ_006)



Zone IN2 Light Industrial

1 Objectives of zone

- *To provide a wide range of light industrial, warehouse and related land uses.*
- *To encourage employment opportunities and to support the viability of centres.*
- *To minimise any adverse effect of industry on other land uses.*
- *To enable other land uses that provide facilities or services to meet the day to day needs of workers in the area.*

2 Permitted without consent

Nil

3 Permitted with consent

Agricultural produce industries; Building identification signs; Business identification signs; Depots; Food and drink premises; Heliports; Hotel or motel accommodation; ***Landscaping material supplies****; Light industries; Neighbourhood shops; Roads;* ***Any other development not specified in item 2 or 4***

4 Prohibited

Agriculture; Air transport facilities; Amusement centres; Boat sheds; Bulky goods premises; Business premises; Caravan parks; Cemeteries; Charter and tourism boating facilities; Correctional centres; Crematoria; Educational establishments; Entertainment facilities; Environmental facilities; Exhibition homes; Exhibition villages; Extractive industries; Farm buildings; Forestry; Freight transport facilities; Function centres; Health services facilities; Home-based child care; Home businesses; Home occupations; Home occupations (sex services); Industries; Marinas; Moorings; Office premises; Public administration buildings; Recreation facilities (major); Research stations; Residential accommodation; Restricted premises; Retail premises; Rural industries; Signage; Tourist and visitor accommodation; Water recreation structures

Assuming that the site will eventually be zoned IN2 Light Industrial due to current provisions under Appendix 8 the proposed land uses of a landscaping material supplies and resource recovery facility are permissible with consent.

It is likely that the Badgerys Creek area will be absorbed into the Western Sydney Priority Growth Area. This area is currently under investigation by the Department.

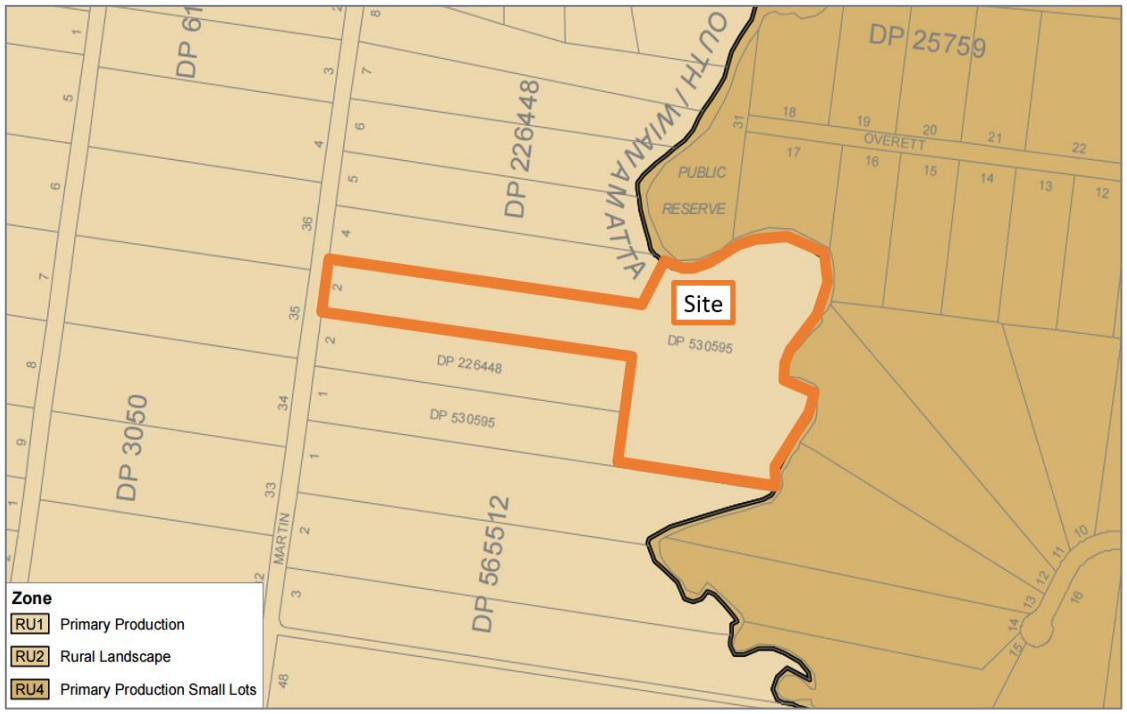
Comment

The proposed development involves a change in use of the site from residential to landscaping material supplies and resource recovery facility. This change is consistent with the expected industrial zoning likely to apply to the site in future.

3.5 Liverpool Local Environmental Plan 2008

Under LEP 2008 the site is zoned as RU1 Primary Production and is subject to the land uses permissible within this zone. See Figure 11 for LEP 2008 land zoning map extract.

Figure 11 - Liverpool Local Environmental Plan 2008 (LZN_005)



Zone RU1 - Primary Production

1 Objectives of zone

- *To encourage sustainable primary industry production by maintaining and enhancing the natural resource base.*
- *To encourage diversity in primary industry enterprises and systems appropriate for the area.*
- *To minimise the fragmentation and alienation of resource lands.*
- *To minimise conflict between land uses within this zone and land uses within adjoining zones.*
- *To ensure that development does not unreasonably increase the demand for public services or public facilities.*
- *To ensure that development does not hinder the development or operation of an airport on Commonwealth land in Badgery's Creek.*
- *To preserve bushland, wildlife corridors and natural habitat.*

2 Permitted without consent

Environmental protection works; Extensive agriculture; Home-based child care; Home occupations

3 Permitted with consent

Agriculture; Airstrips; Animal boarding or training establishments; Bed and breakfast accommodation; Building identification signs; Business identification signs; Cemeteries; Community facilities; Crematoria; Dual occupancies; Dwelling houses; Environmental facilities; Extractive industries; Farm buildings; Farm stay accommodation; Flood mitigation works; Forestry; Hazardous storage establishments; Health consulting rooms; Helipads; Heliports; Home businesses; Home industries; ***Landscaping material supplies****; Offensive storage establishments; Open cut mining; Plant nurseries; Recreation areas; Recreation facilities (outdoor); Roads; Roadside stalls; Rural industries; Rural supplies; Rural workers' dwellings; Secondary dwellings; Veterinary hospitals; Water recreation structures*

4 Prohibited

Any development not specified in item 2 or 3

Landscaping material supplies are permissible within the zone. The resource recovery facility land use is not currently permissible within this zone.

It is likely that this area will eventually be rezoned to an industrial zoning under the State Environmental Planning Policy (Sydney Region Growth Centres 2006) which will allow a resource recovery facility with consent. In addition, the resource recovery facility is permissible in the RU1 Primary Production zoning under the Infrastructure SEPP.

The proposed development is considered to be consistent with the objectives of this zone as it seeks to minimise conflict between land uses within the zone and provides diversity in terms of employment in the area. Due to its location, the site is within proximity to the proposed Badgerys Creek Airport however it is seen as a complimentary development in this area that will not hinder the airport's development or operation.

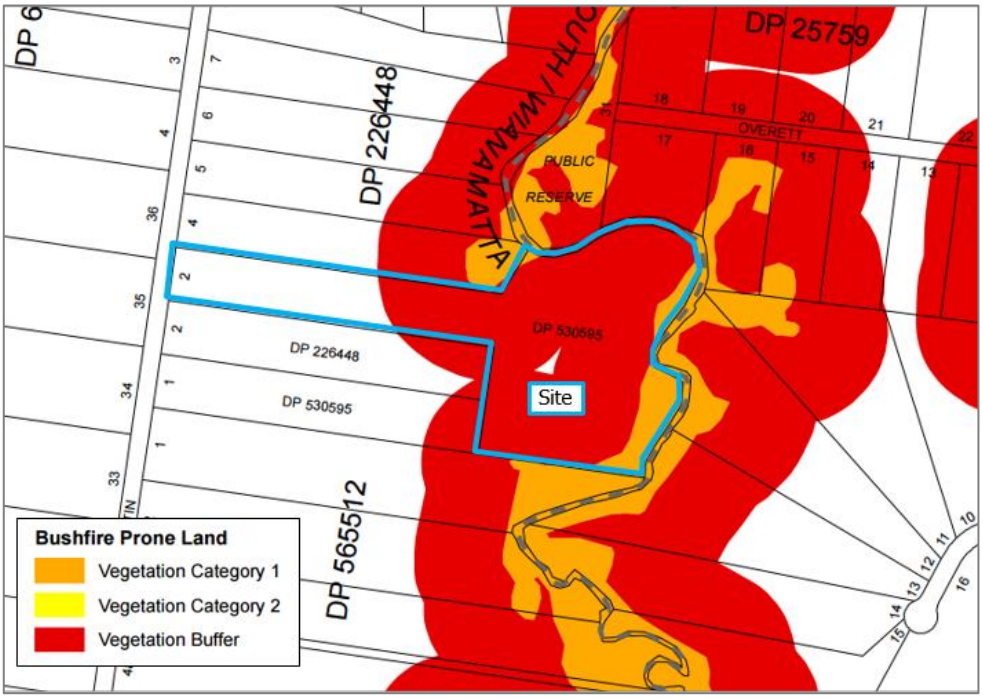
3.6 Liverpool Development Control Plan 2008

Under Part 5 - Development in Rural and Environmental Zones: The proposed use of rural land is covered by section 9.12 of the Development Control Plan 2008 (DCP 2008). The development controls prescribed under the DCP 2008 have been considered in the design of the development with no compliance issues expected to arise.

3.7 Rural Fires Act 1997

Large portions of the site are located within Bushfire Prone Land as mapped under the Council's Bushfire Prone Land map (see Figure 12). As the site is located within Bushfire Prone Land the proposed development will assessed against Section 79BA of the *Environmental Planning and Assessment Act 1979*.

Figure 12 - Liverpool City Councils Bushfire Prone Land Extract (Sheet 8)



It is important to note that the operation does not propose the use of fire or heat for the purpose of waste management or resource recovery nor will any flammable material be stored within the bushfire prone areas whether classed as Vegetation Buffer or Vegetation Category 1.

All roads and buildings will be constructed to comply with the *Planning for Bushfire Protection 2006*, the Building Code of Australia (BCA) and AS 3959.

4 Potential Environmental Issues

4.1 General

Potential environmental issues are likely to include:

- surface water quality impacts;
- flood impacts;
- noise impacts;
- traffic impacts;
- air and odour quality impacts; and
- ecological impacts.

4.2 Potential Water Quality Impacts

There are several potential surface and groundwater issues associated with the proposed development, including:

- runoff from stockpiles may contain contaminants which could have potential impacts on the adjacent natural waterbody;
- stockpiles may potentially contaminate groundwater; and
- erosion and sediment control issues.

It is acknowledged that run off from stockpiles could contain contaminants which could affect the water quality of the natural waterbody South Creek. Such impacts could include changes in pH, sediment, bank erosion, and ecosystem degradation.

A preliminary Erosion and Sediment Control Plan will be prepared. This Plan will establish the minimum requirements for containment and management of sediment, potential contaminants and spills which must be included in the contractor's detailed erosion and sediment control plan. The Erosion and Sediment Control Plan will be based on the Landcom publication "Soils and Construction, Managing Urban Stormwater, 2004".

4.3 Potential flooding impacts

The majority of the site is within the flood plain identified within LEP 2008 and therefore flooding must be a consideration for the proposed development. Due to the type of development and the large cleared area on the site surface flows into South Creek have the potential to contribute to flooding events.

A Stormwater Management Plan will be implemented which addresses stormwater runoff from buildings, hardstand and bunded areas. Water flows from the operational area will be managed to reduce impacts on the adjoining natural waterbody and groundwater.

4.4 Potential Noise Impacts

There are several noise receptors that may be affected by noise generated from proposed operations. Directly to the north, north-west, and south along Martin Road are residences. The proposed development will generate noise due to the increased number of vehicles frequenting the site. Noise generated by on site operations through the processing and separation of waste and crushing and grinding of material will contribute to the background noise levels experienced in the locality.

It must be noted that the site is may be subject to airport noise given its proximity to the proposed Western Sydney Airport.

4.5 Potential Traffic Impacts

A preliminary traffic assessment has been undertaken by Intersect Traffic and is provided at appendix B. The preliminary traffic assessment investigated potential impacts on the surrounding road network including:

- increase in the number of vehicles on Martin Road and Elizabeth Drive;
- congestion at the Martin Road/ Elizabeth Drive intersection;
- appropriate site access designs; and
- assessment of upgrade works required to facilitate the project.

The preliminary traffic assessment estimates that an additional 41 vehicle trips per hour (vtph) will be generated at AM and PM peak hour periods by the proposed development and found that the existing local road network was sufficient to cater to this increase in traffic. In addition, Martin Road was found to be in good condition and is currently approved by RMS to accept 25/26m B-Double heavy vehicles. SIDRA Modelling found the Martin Road/ Elizabeth Drive intersection to be currently at or exceeding capacity during AM and PM peak hours and requires upgrading to accommodate existing traffic loads.

The preliminary traffic assessment concluded that subject to the intersection being upgraded within 10 years the local road network has sufficient space capacity to cater for the development.

4.6 Potential Air and Odour Impacts

Several issues regarding air quality and odour may arise from the operation of the proposed development, these include:

- Fine particulates blown off stockpiles or disturbed by vehicle movements could impact adjoining residences and the water quality of South Creek;
- Fine particulates generated by the processing of waste and material through the crushing, grinding and separation works impacting adjoining residences and reducing water quality of South Creek;
- Waste material brought to the site reducing the odour amenity of the area;
- Waste processing activities producing odours; and
- Reduction in odour amenity due to exhaust from vehicles, generators, and/ or mobile plant.

Due to the nature of the proposed operation dust could be a concern. Dust generated from activities on site could have impacts upon South Creek by introducing more sediment to the system.

Odour is likely to be a minor concern as the proposed range of waste materials to be handled on site will be limited to non-putrescible types of waste. Exhaust fumes produced by vehicles and site plant will be limited by either design or by operational procedures, therefore any impact from exhaust fumes is expected to be minimal.

Appropriate processes and odour management will be implemented to reduce any odour impacts which may occur.

4.7 Ecological Assessment

As previously discussed South Creek, adjoins to the eastern boundary of the site. This creek is part of the Hawkesbury-Nepean catchment. South Creek and its riparian zone are identified as being environmentally significant within the Liverpool LEP 2008. It is therefore important to assess any potential ecological impacts that may arise.

No previous ecological assessment of the site has been carried out. A desktop review did not identify any endangered native species records within the site or in the immediate locality.

The land covered by the Sydney Region Growth Centres SEPP has biodiversity certification under the Threatened Species Conservation Act 1995.

5 Archaeological and Heritage Impacts

The site has been previously cleared so not a great deal of native vegetation and top soil remains. Heritage relics in the area are not likely to exist given that the site has undergone a high level of disturbance. As a result, these investigations are intended to be limited to a desktop identification of Aboriginal sites in the locality.

The site is not listed as a heritage item, nor is it mapped within a heritage conservation area. There are no listed heritage items within the locality.

6 Conclusion

Secretary's Environmental Assessment Requirements for the preparation of an EIS for the proposed landscape supplies and resource recovery facility which is considered to be SSD are formally sought.

6.1 Contacts for KDC

KDC will be responsible for the co-ordination and management of the EIS project team. Contact details for KDC are listed in the following table.

Company Name	**KDC Pty Ltd**
Primary Contact	*Patrick Quinlan*
Address	*2B, 125 Bull Street,* *Newcastle West NSW 2302*
Telephone	(02) 4940 0442 0429 020 128
Email	pquinlan@kobydc.com.au

Yours sincerely,

Patrick Quinlan
Senior Planner

Steve O'Connor
Partner

Appendix A – Liverpool City Council Consultation Letter

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LIVERPOOL CITY COUNCIL

Ref No: 189034.2017
Contact: David Smith: 9821 9293

27 July 2017

Mr Patrick Quinlan
Senior Planner
KDC Pty Ltd
pquinlan@kobydc.com.au

Dear Mr Quinlan

RE: CONSULTATION – BADGERYS CREEK STATE SIGNIFICANT DEVELOPMENT – 80 MARTIN ROAD (LOT 2 DP530595)

Thank you for the opportunity to provide comments in relation to the above state significant development. Upon review of the information provided, the following recommendations have been offered by Council's Strategic Planning and Environment and Health teams:

Strategic Planning recommendations:

- The development site is located less than a kilometre from the boundary of the proposed Western Sydney Airport at Badgerys Creek. The Commonwealth Department of Infrastructure and Regional Development, will be a major stakeholder of this development. Therefore, it will be prudent to consult the development proposal with the Commonwealth agency.

- As per the publications of the Department of Infrastructure and Regional Development, the proposed airport would have a northeast-southwest runway alignment. This will locate the subject site in close proximity of the future flight path.

- Protecting immediate airspace will be important in maintaining a safe operating environment and to provide for future growth. Under the Airports Act 1996, activities such as constructing buildings that intrude into the airspace are identified as controlled activities and cannot be carried out without approval under the Airspace Protection Regulations. The proposed development should check the Obstacle Limitation Surface (OLS) proposed around the airport.

- Due to the nature of recycling materials and the finished product of the proposed industry, it has the potential to attract certain wildlife particularly giving rise to bird hazards in the vicinity of the airport site. This potential issue needs to be considered in the design of the storage and stockpile of the recycling materials.

- Civil Aviation and Safety Authority (CASA) has the authority to determine the potential impact of surrounding ground lighting on pilots during take-off and landing operations and to control ground lights where they have the potential to cause confusion or distraction from glare to pilots within a 6 km radius of an airport. The subject site is located within less than a kilometre from the airport site and may have implications in this aspect.

- Since the proposed development will utilise Martin Road for the transport of goods to and from the recycling facility, there will be high impact on this road particularly the surface of the road. A funding mechanism suitable for future upgrading of the road should be discussed with the applicant.

- As the proponent, you have indicated that several studies will be undertaken for the proposed development. It is further identified that following areas of assessment should be considered in addition which might be critical for the development proposed:

    - Detail flood impact assessment;
    - Groundwater contamination and management;
    - Ecological impact assessment;
    - Economic and social impact assessment – especially potential benefits to the local community;
    - Waste management and disposal;
    - Transport and traffic impact assessment;
    - Soil impact, contamination, and management;
    - Visual amenity assessment;
    - Bushfire risks assessment; and
    - Hazards in accordance with SEPP 33.

- The proposed development is a conventional waste recovery facility and Department of Planning and Environment (DPE) has dealt with such proposals before as State Significant Developments. Therefore, Council can review the information during the public exhibition of the EIS and provide further comments.

Environment and Health recommendations:

Based on the above the activities associated with the proposed SSD requires an Environmental Protection Licence by NSW EPA, and therefore, are classified as Integrated Development. The scheduled activity is likely to include **Waste Storage** and **Resource Recovery Facility** under Schedule 1 of *Protection of the Environment Operations Act 1997.*

The following information is required to support the proposed SSD.

- The proposed modification is considered as Integrated Development pursuant to Section 91 of Environmental Planning and Assessment Act 1979 and as a result shall be referred to NSW Environmental Protection Authority for comment;

- A Detailed Site Investigation prepared by a suitably qualified and experienced contaminated land consultant, which identifies the level and extent of any contamination at 80 Martin Road, Badgerys Creek. This includes providing information to define the nature, extent and degree of contamination; to assess potential risk posed by contaminants to health and the environment; the assessment shall take into consideration the dams and any water courses.

- The report shall be prepared in accordance with the Environmental Protection Authority (EPA) Contaminated Sites Series and shall provide an assessment of the suitability of the above premises for the intended/continued land use.

- An acoustic report shall be prepared by a suitably qualified and experienced acoustic consultant in accordance with the Environment Protection Authority's Industrial Noise Policy, Interim Construction Noise Guideline (DECC 2009), and the NSW Road Noise Policy 2011. The acoustic report shall give consideration to all noise and vibration impacts arising from the construction and operation of the proposed 'concrete batching plant' and where necessary specify recommendations/noise control measures to achieve compliance with the project-specific noise levels.

    - The assessment shall encompass all activities taking place within the boundary of the premises and extend to offsite impacts including road noise. Peak noise level events associated with the construction and operation of the facility should also be assessed for sleep disturbance. In accordance with the EPA's Industrial Noise Policy it would be necessary to determine the project specific noise levels for intrusiveness and amenity relevant to the site or area.

    - Sound levels shall be adjusted in accordance with EPA guidelines for tonality, frequency weighting, impulsive characteristics, fluctuations and temporal content. The acoustic report shall be made available to Council for review.

- Engage the services of a suitably qualified and experienced air quality consultant to undertake an air quality assessment of the proposal in accordance with the Department of Environment and Conservation (now known as the NSW Environment Protection Authority) 'Approved Methods for the Modelling and Assessment of Air Pollutants in NSW (January 2017). The assessment shall identify all sources of air pollution and potential emissions.

- An application for approval to install an On-site Sewerage Management system pursuant to Section 68 of the Local Government Act 1993 is to be submitted to Council for consideration and approval. The application is to be accompanied by a waste water report prepared by a suitably qualified and experienced wastewater/environmental consultant and shall comply with the following guidelines:

    - Local Government (General) Regulation 2005.

    - 'Draft' Liverpool City Council Development Control Plan 2008 – On site Sewage Disposal (dated October 2016).

    - AS/NZS 1547:2012 On-site Domestic Wastewater Management; and

    - Environment and Health Protection Guidelines – On-site Sewage Management for Single Households

- Engage the services of a suitably qualified and experienced environmental consultant and prepare an Environmental Management Plan (EMP) for approval. The EMP shall provide a comprehensive and complete action and implementation plan to ensure that the anthropological and natural environment is not unacceptable impacted upon by the proposed modification. The EMP shall include but not be necessarily limited to the following measures:

    - To control noise emissions from the site;
    - To suppress odours and dust emissions;

- Of traffic routes to minimize residential noise intrusions;
- To soil and sediment control;
- To identify hazardous and industrial waste and the procedures for removal and disposal including asbestos; and
- Of Community Consultation.

Should you wish to discuss any of the recommendations outlined, please contact A/Manager Development Assessment, David Smith on 9821 9593.

Yours sincerely

Lina Kakish
A/Director City Economy and Growth

Appendix B - Preliminary Traffic Report

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PRELIMINARY TRAFFIC ASSESSMENT

RESOURCE RECOVERY FACILITY

MARTIN ROAD, BADGERYS CREEK

PREPARED FOR: KDC PTY LTD

NOVEMBER 2017

REF: 17/163

PRELIMINARY TRAFFIC ASSESSMENT

RESOURCE RECOVERY FACILITY
MARTIN ROAD, BADGERYS CREEK
KDC PTY LTD

Intersect Traffic Pty Ltd (ABN: 43 112 606 952)

Address:
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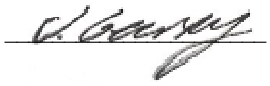
East Maitland NSW 2323

Contact:
(Ph) 02 4933 6200
(Mob) 0423 324 188
Email: jeff@intersecttraffic.com.au

QUALITY ASSURANCE

This document has been prepared, checked and released in accordance with the Quality Control Standards established by Intersect Traffic Pty Ltd.

Issue	Date	Description	By
A	24/11/17	Draft	JG
B		Edit	JG
C		Final Proof	JG
D		Approved	JG

This document has been authorised by 

Date: - November 2017

CONTENTS

ATTACHMENTS

PHOTOGRAPHS

FIGURES

TABLES

1. INTRODUCTION

Intersect Traffic Pty Ltd has been engaged by KDC Pty Ltd to undertake a preliminary traffic assessment for the development of a resource recovery facility off Martin Road, Badgerys Creek. It is understood KDC are looking at several sites on Martins Road for this facility and it was noted on inspection that Australian Native Landscapes (ANL) already operates a similar facility in the area and the Martins Road is adjacent to the Badgerys Creek Waste Disposal and Recycling Centre.

This preliminary traffic assessment is required to inform the feasibility stage of the development and guide the project team in matters pertaining to the traffic impact and access issues associated with the development.

Specifically the report looks to establish;

- What road upgrades would be required to facilitate the facility;
- What are the current capacity thresholds for the local and state road network; and
- What Traffic Impacts may need to be further investigated prior to lodgement of a development application.

This assessment has been undertaken with reference to the *RTA's Guide to Traffic Generating Developments (2002),* Austroads *Guide to Road Design – Part 4A Unsignalised and signalised intersections (2010)*, latest Australian Standards *AS2890.1 & 2 – Parking Facilities – Part 1 – Off street car parking and Part 2 – Commercial vehicle facilities* and Liverpool City Council requirements.

2. DEVELOPMENT PROPOSAL

2.1 Site Location

Martin Road is a no through road that runs for 2 kms generally north south from Elizabeth Drive at Badgerys Creek approximately 7 km west of the M7 Westlink Expressway. The Badgerys Creek Waste Disposal and Recycling Centre is located approximately 800 metres north of the Elizabeth Drive / Martin Road intersection. ***Figure 1*** below shows an aerial view of the Elizabeth Drive / Martin Road intersection while ***Photographs 1*** also shows this intersection.

The surrounding area is mainly rural and Martin Road and Elizabeth Drive have both been constructed as rural standard roads with sealed shoulders and table drains / grass verges. Martin Road however does provide access to a number of light industrial land uses such as resource recovery facilities with a large facility run by ANL being located at the end of Martin Road. Photograph 2 below shows the current land uses within the vicinity of Martin Road.

Figure 1 – Elizabeth Drive / Martin Road intersection

Photograph 1 – Elizabeth Drive / Martin Road intersection from Elizabeth Drive.

Photograph 2 – Land Use – Martin Road.

2.2 Development Proposal

The proposed development concept involves the following;

- Waste Management Facility / resource Recovery Facility with a capacity to cater for 500,000 tonnes per annum of waste and also potentially provide for 100,000 tonnes of waste on the site at any time.

No development concept plans were available at the time of composing this report.

2.3 Existing Road Network

2.3.1 Elizabeth Drive

Elizabeth Drive under a functional road hierarchy is a local collector road that connects the Cecil Park, Kemps Creek, Badgerys Creek and Luddenham areas to the arterial and sub-arterial road networks at the M7 Westlink and The Northern Road respectively. It collects traffic from the local access roads in the area and distributes it to the sub-arterial and arterial road networks at each end. As such it would be under the care and control of Liverpool City Council and a 60 km/h speed zone exists through the area. At the time of inspection it was found to be in good conditions as evidenced in ***Photograph 3*** below. Elizabeth Drive was found to provide a single lane of travel for each direction.

Photograph 3 – Elizabeth Drive near Martin Road

2.3.2 Martin Road

Martin Road in the vicinity of the site is a sealed rural local road (no through road) providing a single travel lane in each direction with sealed shoulders and longitudinal table drains along both sides of the road. The carriageway width was found to be approximately 10 metres wide with only minimal 1 metre unsealed shoulders. A 50 km/hr speed zoning would apply to the road. The road would also be under the care and control of Liverpool City Council and at the time of inspection was found to be in fair to good condition as evidenced in ***Photograph 4*** below.

Photograph 4 – Martin Road near Elizabeth Drive.

2.4 Traffic Generation

Traffic generation data for this assessment report has been determined from the operational details provided by KDC Pty Ltd and assumptions made in relation to operating hours of the facility and truck sizes. The key data used for the traffic generation calculations are;

- Waste delivery is 500,000 tonnes per annum;
- Waste removal based on 100,000 tonnes of storage on site i.e. 400,000 tonnes per annum.
- Each vehicle load (delivery and removal) represents an inbound and outbound trip that will occur in the same hour.
- Operating Hours 10 hours per day – weekdays and 5 hours on Saturdays.
- Facility is open 50 weeks of the year (Closed Christmas, New Year & Easter)
- Waste delivery provided in a number of different sized trucks with an average haulage load of 20 tonnes.
- Waste removal undertaken using semi-trailers and B-Doubles with an average haulage load of 24 tonnes operated by contractors.
- Staff numbers assumed to be 15 staff including drivers.

Therefore the traffic generation calculations are;

1. Waste delivery – 500000 tonnes per annum / 50 weeks per annum / 65 hours per week / 20 tonnes per vehicle x 2 trips per vehicle = approximately 16 vehicle trips per hour.
2. Waste removal – 400,000 tonnes per annum / 50 weeks per annum / 65 hours per week / 24 tonnes per vehicle x 2 trips per vehicle = approximately 10 vehicle trips per hour.
3. Staff trips – Peak Hour considered to be arrival at work (AM) all inbound trips – 15 vtph and departure from work (PM) all outbound trips – 15 vtph.

Therefore Peak Hour and daily Trips can be calculated as follows;

Weekday Daily Vehicle Trips = 16 x 10 + 10 x 10 + 15 x 2 = 290 say **300 vtpd** with visitors.

AM Peak hour = 13 inbound trips + 13 outbound trips + 15 inbound = 41 vtph (28 inbound and 13 outbound).

PM Peak hour = 13 inbound trips + 13 outbound trips + 15 outbound trips = 41 vtph (13 inbound and 28 outbound).

2.5 Trip Distribution

In distributing the traffic from the development the following assumptions are made. The major origin/destination will be to the east towards the M7 Westlink. Therefore at Elizabeth Drive a 70 % east 30% west trip distribution for origins and destinations is assumed. Noting the inbound and outbound movements in the AM and PM peak are as discussed in Section 2.4 the following trip distribution results.

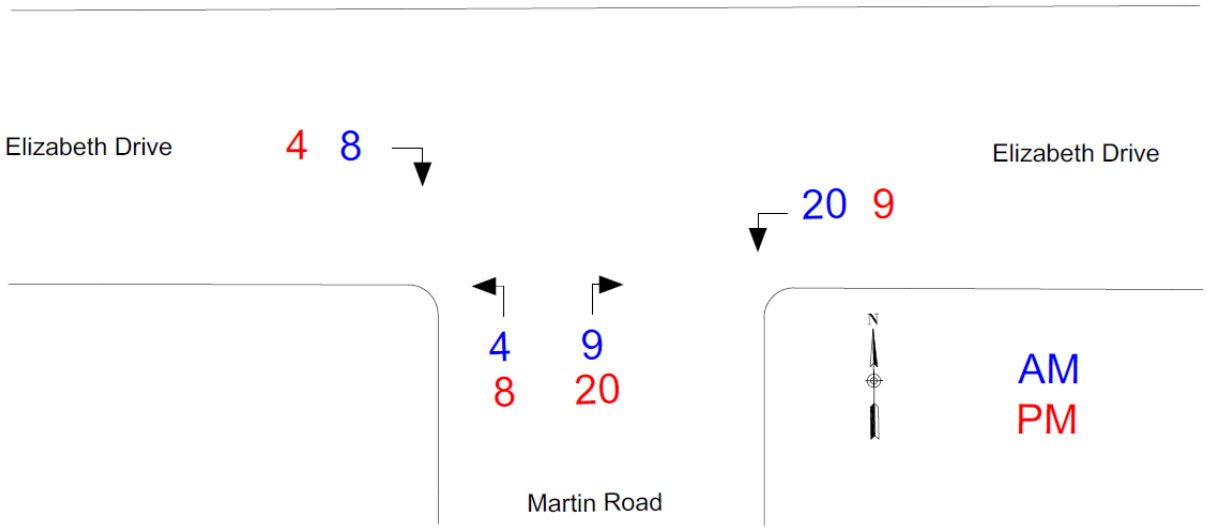


Figure 2 – Development Traffic Trip Distribution

2.6 Traffic Impacts and Considerations

2.6.1 Road Network Capacity

Table 4.4 of the RMS publication "*RTA's Guide to Traffic Generating Developments"* provides some guidance on likely levels of service being experienced on two lane two way urban roads though the capacity of urban roads is generally determined by intersection capacity. This table is reproduced below.

Table 4.4
Urban road peak hour flows per direction

Level of Service	One Lane (veh/hr)	Two Lanes (veh/hr)
A	200	900
B	380	1400
C	600	1800
D	900	2200
E	1400	2800

Source:- RTA's Guide to Traffic Generating Developments 2002

In determining the capacity of Martin Road and Elizabeth Drive from this table the following has been considered;

- Both are two way two lane urban roads i.e. one lane per direction;
- A LoS C is considered the acceptable level of service for these roads given their function within a functional road hierarchy.

On this basis the likely mid-block two-way road capacity for both roads is 1,800 vtph (i.e. 2 x 900 vtph) noting a LoS C exists until the LoS D threshold is reached therefore the LoS D threshold is the lane capacity for a LoS C.

Road Data on behalf of Intersect Traffic undertook traffic counts at the Elizabeth Drive / Martin Road intersection and the Elizabeth Drive / Mamre Road roundabout on Wednesday 1st November 2017 (see ***Attachment A***) and determined the following peak hour volumes on the road network;

- Martin Road – 45 vtph in the AM peak hour and 64 vtph in the PM peak;
- Elizabeth Drive – 1,299 vtph in the AM peak and 1,333 vtph in the PM peak.

The additional traffic from the proposed development would increase these traffic volumes (see ***Figure 2***) as follows;

- Martin Road – 41 vtph in both the AM and PM peak hours;
- Elizabeth Drive – 29 vtph in both the AM peak and PM peak hours.

Adopting a background traffic growth of 2 % per annum on the road network and adding the development traffic would result in future 2027 traffic volumes of;

- Martin Road – 95 vtph in the AM peak hour and 118 vtph in the PM peak;
- Elizabeth Drive – 1,590 vtph in the AM peak and 1,630 vtph in the PM peak.

Therefore as these values are below the mid-block two-way road capacity for the road network of 1,800 vtph it is reasonable to conclude that the existing road network has sufficient two-way mid-block capacity to cater for the proposed development.

2.6.2 Intersection Capacity

To determine the impact of the development on intersection capacity both the Elizabeth Drive / Martin Road give way controlled T-intersection and the Elizabeth Drive / Mamre Road roundabout have been modelled for the AM and PM peak traffic periods using the Sidra Intersection modelling program. This software package predicts likely delays, queue lengths and thus levels of service that will occur at intersections. Assessment is then based on the level of service requirements of the RMS shown below:

Table 4.2
Level of service criteria for intersections

Level of Service	Average Delay per Vehicle (secs/veh)	Traffic Signals, Roundabout	Give Way & Stop Signs
A	< 14	Good operation	Good operation
B	15 to 28	Good with acceptable delays & spare capacity	Acceptable delays & spare capacity
C	29 to 42	Satisfactory	Satisfactory, but accident study required
D	43 to 56	Operating near capacity	Near capacity & accident study required
E	57 to 70	At capacity; at signals, incidents will cause excessive delays Roundabouts require other control mode	At capacity, requires other control mode

Source: - RTA's Guide to Traffic Generating Developments (2002).

Assumptions made in this modelling are:

- The intersection layout will remain as per current conditions.
- Traffic volumes used in the modelling are as collected by Roar Data on Wednesday 1st November 2017.
- Traffic generated by the development is distributed as per ***Figure 2.***
- Future 2027 traffic growth predicted using a 2.0 % per annum background traffic growth rate.

The results of the modelling are summarised in ***Tables 1 & 2*** below for 'all vehicles' and in the case of the priority controlled Elizabeth Drive / Martin Road intersection the worst movement based on LoS (i.e. average delay). The Sidra Movement Summary Tables are provided in ***Attachment B.***

Table 1 – Elizabeth Drive / Martin Road intersection - Sidra Modelling Results Summary

Model	Deg. Satn (v/c)	Average Delay (s)	Worst Level of Service	95 % back of queue length (cars)
2017 AM + development	0.42	1.9	F	1.4
2017 PM + development	1.156	24.4	F	18.1
2027 AM + development	1.025	10	F	6.8
2027 PM + development	3.197	211.2	F	82.1
2027AM + dev roundabout	0.456	3.9	A	3.9
2027PM + dev + roundabout	0.614	4.5	A	6.3

Table 2 – Elizabeth Drive / Mamre Road roundabout - Sidra Modelling Results Summary

Model	Deg. Satn (v/c)	Average Delay (s)	Worst Level of Service	95 % back of queue length (cars)
2017 AM + development	0.626	7.9	A	5.6
2017 PM + development	0.687	8.1	A	6.0
2027 AM + development	0.817	11.7	B	12.1
2027 PM + development	0.874	11	B	12.7

This modelling shows that currently the Elizabeth Drive / Martin Road give way controlled intersection operates with lengthy delays for vehicles turning out of Martin Road during peak periods. While currently the delays and queue lengths are still satisfactory and would not generally require upgrading of the intersection with a further ten years background traffic growth the delays and queue lengths would reach unacceptable levels and the accident risk at the intersection will increase significantly. Therefore with only background traffic growth it is likely this intersection would need to be upgraded to signal or roundabout control. Therefore the intersection is currently operating at or above capacity.

Whilst this development would accelerate the decrease in intersection performance overall its impact is minimal as traffic generated from the site is not considered major. However based on this modelling Council is likely to require upgrading of the intersection prior to further development along Martin Road. It is noted modelling of the intersection as a single lane roundabout indicated satisfactory performance through to and past 2027.

It is my opinion, that as the intersection will fail with background traffic growth it would be unreasonable and unfair for the Council to expect the development fully fund this work. The work would benefit all traffic users on the road network therefore the development should only be expected to pay a fair and reasonable contribution to the upgrade. As development traffic represents only about 1.5 % of existing traffic the fair and reasonable contribution should only be 1.5 % of the road work cost. As I could not find any reference to this intersection in the current Liverpool City Council S94 Developer Contributions Plan such a contribution would need to be via a Voluntary Planning Agreement.

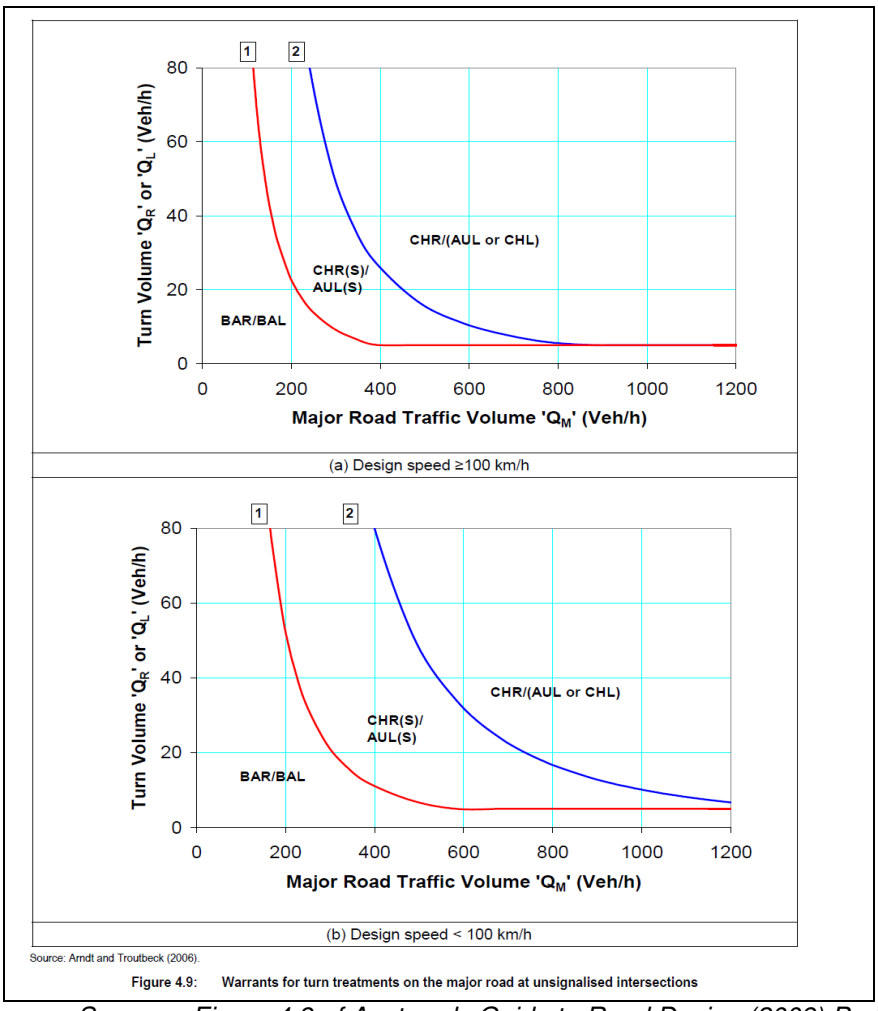
The Elizabeth Drive / Mamre Road intersection continued to operate satisfactorily post development through to and beyond 2027.

2.6.3 Site Access / Road Upgrading

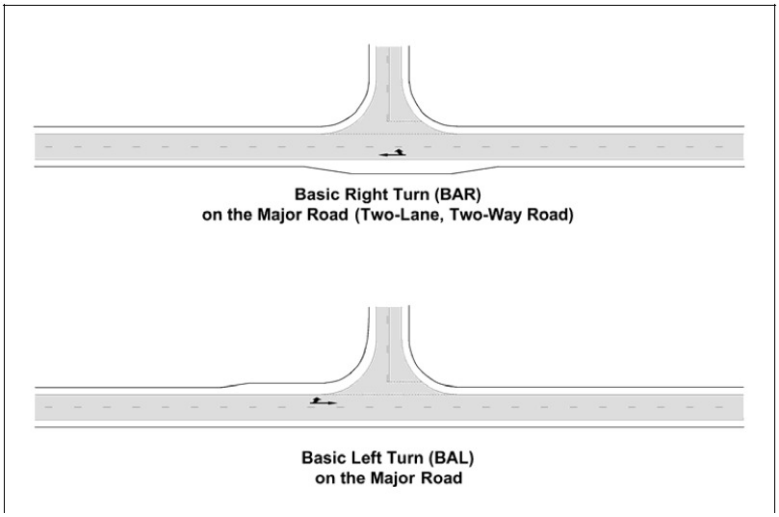
Post development the site access will probably service in excess of < 25 car spaces. Under Table 3.1 of Australian Standard *AS2890.1-2004 Parking facilities – Part 1 - Off-street car parking* a car park with between 0 to 25 car parking spaces accessed via a local road providing long term employee parking (Class 1) is required to have a Category 1 access facility. A Category 1 access facility is combined entry / exit access 3 m to 5.5 metres wide. However for the type of vehicle using the site the access width will be determined by the swept path analysis for entry and exit to and from the site by B-Double vehicles. It is noted from the RMS restricted vehicle access maps that Martin Road is already approved for 25/B26 metre B-Double heavy vehicles therefore it would appear unreasonable for Council to require any upgrading of Martin Road.

Warrants for turning lanes at rural intersections are contained within Figure 4.9 of Austroads *Guide to Road Design (2010) Part 4A – Signalised and Unsignalised intersections* which is reproduced below. For the site access using diagram (b) above for speeds < 100 km/h and with a major road total flow of approximately 45 vtph as well as a right turn or left turn with a maximum volume of in the order of 20 vtph identifies that a BAR / BAL intersection is considered satisfactory for the site access i.e. no dedicated right or left turn deceleration / storage lanes are required at the access (see figure below).

Sight Distance at the access cannot be assessed at this stage and further review is required at DA stage.



Source :- Figure 4.9 of Austroads Guide to Road Design (2009) Part 4A



Source :- Austroads Guide to Road Design (2009) Part 4A

2.6.4 On-site parking and driveway

Not applicable for this stage of the assessment process though it is likely the on-site parking requirements will be 1 space per employee plus a couple of visitor car spaces.

2.6.5 Alternate Transport Modes

Not required at this stage of the development planning though it was noted that it appears a public transport service runs along Elizabeth Drive with bus stops at the Martin Road intersection. To be investigated further at DA stage should the proposal proceed to that stage.

3. CONCLUSIONS

This preliminary traffic assessment for a proposed Resource Recovery Facility in Martin Road, Badgerys Creek has concluded;

- The proposed development is likely to generate in the order of an additional 41 vtph during the AM and PM peak hour traffic periods.
- There is sufficient two-way mid-block capacity within the local road network to cater for the additional traffic generated by this development.
- SIDRA modelling has shown that the Elizabeth Drive / Martin Road give way controlled T-intersection operates at or above capacity during the current AM and PM peak periods. Whilst this development would accelerate the decrease in intersection performance overall its impact is minimal as traffic generated from the site is not considered major. However based on this modelling Council is likely to require upgrading of the intersection prior to further development along Martin Road.
- SIDRA modelling indicates that conversion of the existing Elizabeth Drive / Martin Road give way controlled T-intersection to a roundabout would result in satisfactory intersection performance through to and beyond 2027 post development.
- As the Elizabeth Drive / Martin Road intersection is currently operating at or above capacity and intersection performance will deteriorate quickly with just background traffic growth it would be unreasonable for Liverpool Council to require the upgrading of the Elizabeth Drive / Martin Road intersection be fully funded by the subject development.
- A fair and reasonable contribution to the Elizabeth Drive / Martin Road intersection is considered to be 1.5 % of the cost as the development traffic only represents 1.5 % of all traffic through the intersection.
- As the Elizabeth Drive / Martin Road intersection upgrade does not appear to be contained within Liverpool Council's current S94 Developer Contributions Plan contribution could only be by way of a Voluntary planning Agreement.
- SIDRA modelling of the existing Elizabeth Drive / Mamre Road showed this intersection continues to operate satisfactorily post development through to and beyond 2027.
- The site access width will be determined by the swept path analysis for entry and exit to and from the site by B-Double vehicles. This would need to be reviewed at DA stage.
- It is noted from the RMS restricted vehicle access maps that Martin Road is already approved for 25/B26 metre B-Double heavy vehicles therefore it would appear unreasonable for Council to require any upgrading of Martin Road.
- A turn lane warrant assessment has determined that any site access could be constructed as a basic right turn and basic left turn (BAR / BAL) access and no dedicated right or left turn deceleration lanes are required on Martin Road.
- Site access sight distance, on-site car parking and alternative transport modes have not been considered in this assessment and will need to be further assessed at DA lodgement stage.
- Overall it is concluded that subject to the Elizabeth Drive / Martin Road intersection being upgraded to a roundabout or traffic signals or a financial plan being in place to ensure upgrading within 10 years the local road network has sufficient spare capacity to cater for the development and Liverpool City Council could support the development.

JR Garry BE (Civil), Masters of Traffic
Director
Intersect Traffic Pty Ltd

ATTACHMENT A
TRAFFIC COUNT DATA

R.O.A.R. DATA

Reliable, Original & Authentic Results

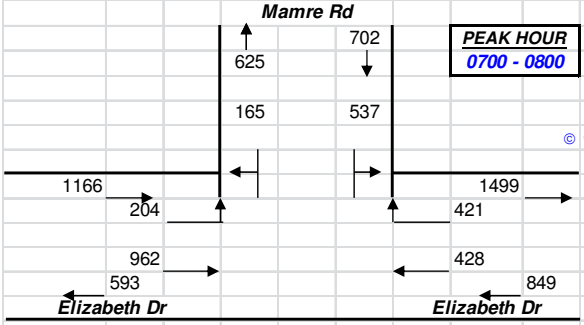
Ph.88196847, Mob.0418-239019

Client	: InTersect Traffic
Job No/Name	: 6617 BADGERYS CREEK Elizabeth Dr
Day/Date	: Wednesday 1st November 2017

All Vehicles

	WEST *Elizabeth*		NORTH *Mamre Rd*		EAST *Elizabeth*		
Time Per	L	T	R	L	T	R	TOTAL
0700 - 0715	45	232	44	94	138	111	**664**
0715 - 0730	52	243	41	150	98	95	**679**
0730 - 0745	59	212	45	146	77	96	**635**
0745 - 0800	48	275	35	147	115	119	**739**
0800 - 0815	71	203	32	107	89	96	**598**
0815 - 0830	59	194	39	77	112	95	**576**
0830 - 0845	43	167	48	84	123	86	**551**
0845 - 0900	41	158	59	88	124	77	**547**
Period End	**418**	**1684**	**343**	**893**	**876**	**775**	**4989**

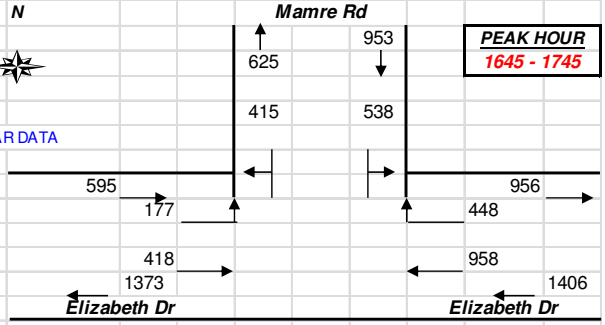
	WEST *Elizabeth*		NORTH *Mamre Rd*		EAST *Elizabeth*		
Peak Per	L	T	R	L	T	R	TOTAL
0700 - 0800	204	962	165	537	428	421	**2717**
0715 - 0815	230	933	153	550	379	406	**2651**
0730 - 0830	237	884	151	477	393	406	**2548**
0745 - 0845	221	839	154	415	439	396	**2464**
0800 - 0900	214	722	178	356	448	354	**2272**
PEAK HR	**204**	**962**	**165**	**537**	**428**	**421**	**2717**



All Vehicles

	WEST *Elizabeth*		NORTH *Mamre Rd*		EAST *Elizabeth*		
Time Per	L	T	R	L	T	R	TOTAL
1600 - 1615	53	113	85	86	275	111	**723**
1615 - 1630	41	108	104	122	239	118	**732**
1630 - 1645	39	104	86	89	238	122	**678**
1645 - 1700	29	122	120	133	266	98	**768**
1700 - 1715	52	104	86	127	257	117	**743**
1715 - 1730	55	110	117	154	217	109	**762**
1730 - 1745	41	82	92	124	218	124	**681**
1745 - 1800	45	88	113	107	203	153	**709**
Period End	**355**	**831**	**803**	**942**	**1913**	**952**	**5796**

	WEST *Elizabeth*		NORTH *Mamre Rd*		EAST *Elizabeth*		
Peak Per	L	T	R	L	T	R	TOTAL
1600 - 1700	162	447	395	430	1018	449	**2901**
1615 - 1715	161	438	396	471	1000	455	**2921**
1630 - 1730	175	440	409	503	978	446	**2951**
1645 - 1745	177	418	415	538	958	448	**2954**
1700 - 1800	193	384	408	512	895	503	**2895**
PEAK HOUR	**177**	**418**	**415**	**538**	**958**	**448**	**2954**



Reliable, Original & Authentic Results

Ph.88196847, Mob.0418-239019

Job No/Name : 6617 BADGERYS CREEK Elizabeth Dr

Day/Date : Wednesday 1st November 2017

TOTAL VOLUMES FOR COUNT

PM

R.O.A.R. DATA

Reliable, Original & Authentic Results

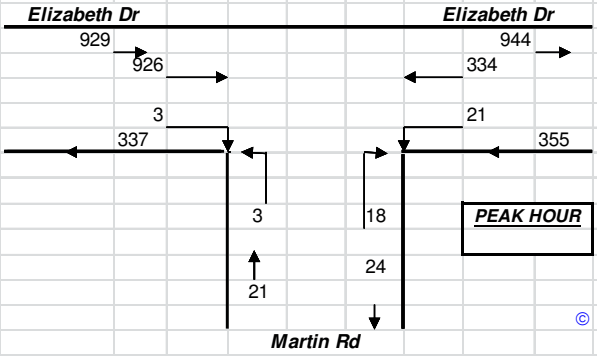
Ph.88196847, Mob.0418-239019

Client	: InTersect Traffic
Job No/Name	: 6617 BADGERYS CREEK Elizabeth Dr
Day/Date	: Wednesday 1st November 2017

All Vehicles

	WEST		SOUTH		EAST		
	Elizabeth		*Martin Rd*		*Elizabeth*		
Time Per	**T**	**R**	**L**	**R**	**L**	**T**	**TOTAL**
0700 - 0715	205	0	1	4	4	83	**297**
0715 - 0730	236	1	0	3	5	67	**312**
0730 - 0745	253	0	0	2	7	102	**364**
0745 - 0800	232	2	2	9	5	82	**332**
0800 - 0815	204	1	3	7	0	97	**312**
0815 - 0830	169	3	3	5	3	90	**273**
0830 - 0845	155	1	2	2	3	89	**252**
0845 - 0900	148	1	3	6	1	120	**279**
Period End	**1602**	**9**	**14**	**38**	**28**	**730**	**2421**

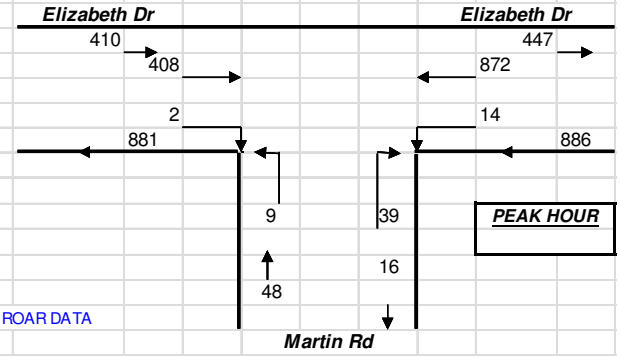
	WEST		SOUTH		EAST		
	Elizabeth		*Martin Rd*		*Elizabeth*		
Peak Per	**T**	**R**	**L**	**R**	**L**	**T**	**TOTAL**
0700 - 0800	926	3	3	18	21	334	**1305**
0715 - 0815	925	4	5	21	17	348	**1320**
0730 - 0830	858	6	8	23	15	371	**1281**
0745 - 0845	760	7	10	23	11	358	**1169**
0800 - 0900	676	6	11	20	7	396	**1116**
PEAK HR	**926**	**3**	**3**	**18**	**21**	**334**	**1305**



All Vehicles

	WEST		SOUTH		EAST		
	Elizabeth		*Martin Rd*		*Elizabeth*		
Time Per	**T**	**R**	**L**	**R**	**L**	**T**	**TOTAL**
1600 - 1615	92	3	1	4	7	178	**285**
1615 - 1630	91	1	2	4	2	201	**301**
1630 - 1645	93	1	2	6	4	214	**320**
1645 - 1700	118	0	0	7	3	204	**332**
1700 - 1715	101	1	6	21	6	231	**366**
1715 - 1730	96	0	1	5	1	223	**326**
1730 - 1745	85	2	0	6	0	174	**267**
1745 - 1800	99	3	3	1	1	169	**276**
Period End	**775**	**11**	**15**	**54**	**24**	**1594**	**2473**

	WEST		SOUTH		EAST		
	Elizabeth		*Martin Rd*		*Elizabeth*		
Peak Per	**T**	**R**	**L**	**R**	**L**	**T**	**TOTAL**
1600 - 1700	394	5	5	21	16	797	**1238**
1615 - 1715	403	3	10	38	15	850	**1319**
1630 - 1730	408	2	9	39	14	872	**1344**
1645 - 1745	400	3	7	39	10	832	**1291**
1700 - 1800	381	6	10	33	8	797	**1235**
PEAK HR	**408**	**2**	**9**	**39**	**14**	**872**	**1344**



Reliable, Original & Authentic Results

Ph.88196847, Mob.0418-239019

Job No/Name	: 6617 BADGERYS CREEK Elizabeth Dr
Day/Date	: Wednesday 1st November 2017

AM

TOTAL VOLUMES FOR COUNT

PM

ATTACHMENT B
SIDRA MOVEMENT SUMMARY TABLE

MOVEMENT SUMMARY

Site: 101 [2017 AM + development]

Elizabeth Drive / Martin Road, Badgerys Creek
Give Way T
Giveway / Yield (Two-Way)

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Martin Road											
1	L2	7	15.0	0.420	20.9	LOS B	1.4	10.7	0.92	1.01	28.9
3	R2	27	15.0	0.420	74.3	LOS F	1.4	10.7	0.92	1.01	28.8
Approach		34	15.0	0.420	63.3	LOS E	1.4	10.7	0.92	1.01	28.8
East: Elizabeth Drive											
4	L2	41	10.0	0.024	5.7	LOS A	0.0	0.0	0.00	0.57	53.2
5	T1	334	10.0	0.182	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		375	10.0	0.182	0.6	NA	0.0	0.0	0.00	0.06	59.1
West: Elizabeth Road											
11	T1	926	10.0	0.377	0.0	LOS A	0.0	0.0	0.00	0.00	59.9
12	R2	11	10.0	0.012	7.5	LOS A	0.0	0.3	0.44	0.61	51.6
Approach		937	10.0	0.377	0.1	NA	0.0	0.3	0.01	0.01	59.8
All Vehicles		1346	10.1	0.420	1.9	NA	1.4	10.7	0.03	0.05	58.0

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [2017 PM + development]

Elizabeth Drive / Martin Road, Badgerys Creek
Give Way T
Giveway / Yield (Two-Way)

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Martin Road											
1	L2	17	15.0	1.156	400.1	LOS F	18.1	143.1	1.00	2.40	7.1
3	R2	59	15.0	1.156	452.5	LOS F	18.1	143.1	1.00	2.40	7.1
Approach		76	15.0	1.156	440.8	LOS F	18.1	143.1	1.00	2.40	7.1
East: Elizabeth Drive											
4	L2	23	10.0	0.013	5.7	LOS A	0.0	0.0	0.00	0.57	53.2
5	T1	872	10.0	0.476	0.1	LOS A	0.0	0.0	0.00	0.00	59.8
Approach		895	10.0	0.476	0.2	NA	0.0	0.0	0.00	0.01	59.7
West: Elizabeth Road											
11	T1	408	10.0	0.166	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
12	R2	6	10.0	0.017	14.3	LOS A	0.1	0.4	0.74	0.85	47.1
Approach		414	10.0	0.166	0.2	NA	0.1	0.4	0.01	0.01	59.7
All Vehicles		1385	10.3	1.156	24.4	NA	18.1	143.1	0.06	0.14	42.4

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [2027 AM + development]

Elizabeth Drive / Martin Road, Badgerys Creek
Give Way T
Giveway / Yield (Two-Way)

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Martin Road											
1	L2	8	15.0	1.025	311.8	LOS F	6.8	53.8	1.00	1.57	7.8
3	R2	31	15.0	1.025	425.0	LOS F	6.8	53.8	1.00	1.57	7.8
Approach		39	15.0	1.025	401.8	LOS F	6.8	53.8	1.00	1.57	7.8
East: Elizabeth Drive											
4	L2	45	10.0	0.026	5.7	LOS A	0.0	0.0	0.00	0.57	53.2
5	T1	401	10.0	0.219	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		446	10.0	0.219	0.6	NA	0.0	0.0	0.00	0.06	59.2
West: Elizabeth Road											
11	T1	1111	10.0	0.453	0.1	LOS A	0.0	0.0	0.00	0.00	59.9
12	R2	12	10.0	0.015	8.0	LOS A	0.1	0.4	0.48	0.64	51.2
Approach		1123	10.0	0.453	0.1	NA	0.1	0.4	0.01	0.01	59.8
All Vehicles		1608	10.1	1.025	10.0	NA	6.8	53.8	0.03	0.06	51.3

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [2027 PM + development]

Elizabeth Drive / Martin Road, Badgerys Creek
Give Way T
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Martin Road											
1	L2	19	15.0	3.197	4022.8	LOS F	82.1	648.4	1.00	3.49	0.9
3	R2	67	15.0	3.197	4067.0	LOS F	82.1	648.4	1.00	3.49	0.9
Approach		86	15.0	3.197	4057.2	LOS F	82.1	648.4	1.00	3.49	0.9
East: Elizabeth Drive											
4	L2	26	10.0	0.015	5.7	LOS A	0.0	0.0	0.00	0.57	53.2
5	T1	1046	10.0	0.571	0.1	LOS A	0.0	0.0	0.00	0.00	59.8
Approach		1072	10.0	0.571	0.3	NA	0.0	0.0	0.00	0.01	59.6
West: Elizabeth Road											
11	T1	490	10.0	0.200	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
12	R2	6	10.0	0.026	20.1	LOS B	0.1	0.6	0.84	0.93	43.7
Approach		496	10.0	0.200	0.3	NA	0.1	0.6	0.01	0.01	59.7
All Vehicles		1654	10.3	3.197	211.2	NA	82.1	648.4	0.06	0.19	13.1

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101v [2027 AM + development - Conversion]

Elizabeth Drive / Martin Road, Badgerys Creek
Give Way T
Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Martin Road											
1	L2	8	15.0	0.046	5.9	LOS A	0.2	1.7	0.50	0.65	51.3
3	R2	31	15.0	0.046	11.7	LOS A	0.2	1.7	0.50	0.65	52.9
Approach		39	15.0	0.046	10.5	LOS A	0.2	1.7	0.50	0.65	52.5
East: Elizabeth Drive											
4	L2	45	10.0	0.044	3.7	LOS A	0.2	1.5	0.08	0.41	56.0
5	T1	401	10.0	0.245	3.6	LOS A	1.4	10.6	0.08	0.34	57.9
Approach		446	10.0	0.245	3.6	LOS A	1.4	10.6	0.08	0.34	57.7
West: Elizabeth Road											
11	T1	1111	10.0	0.456	3.8	LOS A	3.9	29.3	0.19	0.34	57.3
12	R2	12	10.0	0.010	9.5	LOS A	0.0	0.4	0.14	0.59	53.5
Approach		1123	10.0	0.456	3.8	LOS A	3.9	29.3	0.19	0.34	57.3
All Vehicles		1608	10.1	0.456	3.9	LOS A	3.9	29.3	0.16	0.35	57.3

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101v [2027 PM + development - Conversion]

Elizabeth Drive / Martin Road, Badgerys Creek
Give Way T
Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Martin Road											
1	L2	19	15.0	0.188	14.9	LOS B	1.1	8.8	0.84	0.91	45.8
3	R2	67	15.0	0.188	20.7	LOS B	1.1	8.8	0.84	0.91	47.1
Approach		86	15.0	0.188	19.4	LOS B	1.1	8.8	0.84	0.91	46.8
East: Elizabeth Drive											
4	L2	26	10.0	0.025	3.7	LOS A	0.1	0.9	0.06	0.42	56.1
5	T1	1046	10.0	0.614	3.6	LOS A	6.3	48.0	0.09	0.33	57.9
Approach		1072	10.0	0.614	3.6	LOS A	6.3	48.0	0.09	0.33	57.8
West: Elizabeth Road											
11	T1	490	10.0	0.214	3.9	LOS A	1.5	11.3	0.25	0.36	56.9
12	R2	6	10.0	0.005	9.6	LOS A	0.0	0.2	0.24	0.56	53.1
Approach		496	10.0	0.214	3.9	LOS A	1.5	11.3	0.25	0.36	56.9
All Vehicles		1654	10.3	0.614	4.5	LOS A	6.3	48.0	0.18	0.37	56.8

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [2017AM + dev]

Elizabeth Drive / Mamre Road
Roundabout
Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
East: Elizabeth Drive											
5	T1	448	10.0	0.350	4.6	LOS A	2.0	15.4	0.38	0.44	55.6
6	R2	421	10.0	0.359	9.8	LOS A	2.1	15.7	0.40	0.65	52.0
Approach		869	10.0	0.359	7.1	LOS A	2.1	15.7	0.39	0.54	53.7
North: Mamre Road											
7	L2	537	10.0	0.537	7.1	LOS A	3.9	29.3	0.81	0.90	52.8
9	R2	165	10.0	0.096	11.3	LOS A	0.5	3.8	0.67	0.80	51.2
Approach		702	10.0	0.537	8.1	LOS A	3.9	29.3	0.77	0.87	52.4
West: Elizabeth Drive											
10	L2	204	10.0	0.626	8.3	LOS A	5.6	42.6	0.75	0.82	51.9
11	T1	971	10.0	0.626	8.4	LOS A	5.6	42.6	0.75	0.83	53.6
Approach		1175	10.0	0.626	8.4	LOS A	5.6	42.6	0.75	0.83	53.3
All Vehicles		2746	10.0	0.626	7.9	LOS A	5.6	42.6	0.64	0.75	53.2

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [2017PM + dev]

Elizabeth Drive / Mamre Road
Roundabout
Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
East: Elizabeth Drive											
5	T1	967	10.0	0.687	7.5	LOS A	6.0	45.6	0.72	0.81	53.3
6	R2	448	10.0	0.687	13.2	LOS A	5.9	44.9	0.74	0.91	51.3
Approach		1415	10.0	0.687	9.3	LOS A	6.0	45.6	0.73	0.84	52.7
North: Mamre Road											
7	L2	538	10.0	0.413	5.2	LOS A	2.4	18.6	0.57	0.61	53.7
9	R2	415	10.0	0.178	10.3	LOS A	0.9	6.7	0.49	0.71	51.8
Approach		953	10.0	0.413	7.4	LOS A	2.4	18.6	0.53	0.65	52.8
West: Elizabeth Drive											
10	L2	177	10.0	0.353	6.4	LOS A	2.2	16.7	0.65	0.68	52.8
11	T1	438	10.0	0.353	6.4	LOS A	2.2	16.7	0.66	0.65	54.2
Approach		615	10.0	0.353	6.4	LOS A	2.2	16.7	0.66	0.66	53.8
All Vehicles		2983	10.0	0.687	8.1	LOS A	6.0	45.6	0.65	0.74	53.0

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [2027AM + dev]

Elizabeth Drive / Mamre Road
Roundabout
Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
East: Elizabeth Drive											
5	T1	534	10.0	0.430	4.8	LOS A	2.7	20.8	0.46	0.46	55.2
6	R2	505	10.0	0.445	10.1	LOS A	2.8	21.5	0.48	0.67	51.7
Approach		1039	10.0	0.445	7.4	LOS A	2.8	21.5	0.47	0.57	53.4
North: Mamre Road											
7	L2	644	10.0	0.786	12.1	LOS A	8.1	61.4	0.98	1.16	49.6
9	R2	198	10.0	0.143	12.2	LOS A	0.8	6.4	0.78	0.87	50.9
Approach		842	10.0	0.786	12.1	LOS A	8.1	61.4	0.94	1.09	49.9
West: Elizabeth Drive											
10	L2	245	10.0	0.817	14.3	LOS A	12.1	91.6	0.96	1.15	48.0
11	T1	1163	10.0	0.817	14.7	LOS B	12.1	91.6	0.96	1.17	49.2
Approach		1408	10.0	0.817	14.6	LOS B	12.1	91.6	0.96	1.16	49.0
All Vehicles		3289	10.0	0.817	11.7	LOS A	12.1	91.6	0.80	0.96	50.6

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [2027PM + dev]

Elizabeth Drive / Mamre Road
Roundabout
Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
East: Elizabeth Drive											
5	T1	1159	10.0	0.874	12.5	LOS A	12.7	96.6	0.93	1.17	50.4
6	R2	538	10.0	0.874	18.8	LOS B	12.4	94.0	0.94	1.23	47.8
Approach		1697	10.0	0.874	14.5	LOS B	12.7	96.6	0.94	1.19	49.5
North: Mamre Road											
7	L2	646	10.0	0.526	5.8	LOS A	3.7	28.3	0.68	0.71	53.3
9	R2	498	10.0	0.228	10.6	LOS A	1.2	9.2	0.56	0.75	51.6
Approach		1144	10.0	0.526	7.9	LOS A	3.7	28.3	0.63	0.72	52.5
West: Elizabeth Drive											
10	L2	212	10.0	0.480	7.7	LOS A	3.7	27.8	0.80	0.82	52.0
11	T1	522	10.0	0.480	7.9	LOS A	3.7	27.8	0.80	0.82	53.5
Approach		734	10.0	0.480	7.8	LOS A	3.7	27.8	0.80	0.82	53.1
All Vehicles		3575	10.0	0.874	11.0	LOS A	12.7	96.6	0.81	0.97	51.2

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Appendix C - Proposed Site Plan