AECOM

Transport Assessment

Mayfield Site Port-Related Activities Concept Plan

Transport Assessment

Mayfield Site Port-Related Activities Concept Plan

Prepared for

Newcastle Port Corporation

Prepared by

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1.0 Introduction

AECOM has been engaged to provide transport input into an Environmental Assessment (EA) of the Concept Plan for the proposed redevelopment of land in Mayfield, Newcastle (proposed concept). The proposed concept is being undertaken by Newcastle Port Corporation (NPC) and it is understood that the proposed concept will facilitate upgraded port-related activities over the next 25 years.

The purpose of the EA is to anticipate environmental impacts that future developments may generate, and suggest mitigation measures, if necessary. This report has been revised to address issues raised during public exhibition.

Concept approval for the proposed concept is sought to ensure a coordinated and environmentally sustainable approach to the proposed concept that will provide a level of certainty and a framework for future development. The purpose of the proposed concept is to assist in the achievement of several state and regional objectives and initiatives formulated to provide a secure major port use in the future.

The transport input into the EA consists of:

- A review of the existing road and rail conditions and the available capacity for the proposed concept;
- An evaluation of potential impacts from predicted future development scenarios (initial [2024] and final [2034]); and
- The development of criteria for future development of the proposed concept and potential mitigation measures to be adopted.

As part of the EA process, the impact of construction traffic would normally be assessed. However, in this case, as the exact nature of the infrastructure to be constructed on site and hence the future construction methods are unknown, this aspect of the EA will be dealt with as part of the future Project applications for the construction and operation of the five land-based precincts, when these are made by the prospective operators of the facilities.

The site is located along the South Arm of the Hunter River, within the Newcastle Local Government Area (LGA), northwest of Newcastle City Centre (see **Figure 1.1**).

Figure 1.1: Proposed Site for Redevelopment

Source: AECOM, 2010

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2.0 Review of Relevant Policy and Legislation

This section provides an overview of the current policies and legislation from State to local level with regards to transport that might influence the Project.

2.1 State Strategic Planning Policies

2.1.1 New South Wales State Plan

Document	NSW State Plan
Date	2010
Purpose	Set clear priorities to guide the NSW Government decision making and resource allocation.
Content	The State Plan sets out the main areas where NSW communities expect improvements, and identifies how those improvements will occur.
Content relating to traffic and relevance to the Project	Transport was identified as the highest priority for NSW communities, given its importance in providing access to jobs, services and facilities. A transport Strategy for the Hunter region has been earmarked. Targets of the Strategy include: • Increase the share of commute trips made by public transport • Improve the quality (smoothness) of urban and rural State roads to national standards • Roll out new buses to cater for increased demand on key Strategic Bus Corridors in Newcastle. A freight strategy for NSW is also in the early stages of development. Key goals of the Strategy include improving freight movements across NSW and providing major upgrades to the capacity of the State's ports.

2.1.2 State Infrastructure Strategy

Document	State Infrastructure Strategy 2008-2018
Date	2008
Purpose	The purpose of the State Infrastructure Strategy (SIS) is to complement planning schemes embedded in the Sydney Metropolitan Strategy and other regional strategies to plan and fund the infrastructure that supports economic growth and the services that the Government delivers.
Content	The SIS identifies the funding requirement needed to finance long-term Government infrastructure goals developed for Sydney and other regions of NSW to support efficient and sustainable growth over the long term. The SIS also outlines capital investment in each of the State's six broad regions, including Sydney, Central Coast, Hunter, Illawarra and the South East, North Coast and Inland NSW.
Content relating to traffic and relevance to the Project	The Hunter region covers an area of 31,000 sqkm, and includes the population centres of Newcastle, Lake Macquarie, Maitland, Raymond Terrace, Cessnock, Forster/Tuncurry, Singleton, Muswellbrook, Scone, Gloucester and Gungog. The region provides approximately 33 percent of the State's exports, with Newcastle operating the world's largest coal export port. The strategy identifies the following major road and ports projects in the Hunter Region: • Nelson Bay Road – replacement of Tourle Street Bridge over Hunter River; • New England Highway – Weakleys Drive Interchange (federal funded); • Pacific Highway – F3 Freeway to Raymond Terrace (not yet approved); • Newcastle Port – Mayfield No 4 Berth.

2.1.3 NSW Ports Growth Plan

Document	NSW Ports Growth Plan
Date	2003
Purpose	The Plan provides a framework within which the Government, industry and the community will work to ensure future growth and development of port capacity in NSW.
Content	NSW is dependent on international trade for economic growth. Port infrastructure requires significant levels of investment and long lead in times. Industry needs to plan for structural adjustments. It is therefore important that Government plans are in place to ensure timely delivery of new capacity.
Content relating to traffic and relevance to the Project	The relevant directions of the Plan are: • The former BHP steelworks site at Newcastle Port will be secured for port use. When Port Botany reaches capacity Newcastle will be the state's next major container facility. • The Minister for Infrastructure, Planning and Natural Resources will examine how to increase the proportion of containers moved by rail to and from the ports to intermodal terminals in both the Sydney metropolitan area and regional NSW.

2.2 Regional Strategic Planning Policies

2.2.1 Lower Hunter Regional Strategy

Document	Lower Hunter Regional Strategy
Date	2006
Purpose	The primary purpose of the Regional Strategy is to ensure that adequate land is available and appropriately located to sustainably accommodate the projected housing and employment needs of the region's population over the next 25 years.
Content	The Strategy identifies how the expected growth in the Region will be managed to provide for both economic development and the protection of environmental assets, cultural values and natural resources.
Content relating to traffic and relevance to the Project	As the pre-eminent planning document for the Lower Hunter Region, the Regional Strategy addresses challenges in housing and population, the economy, and the environment. The Strategy highlights the need for major industry and businesses to identify and secure employment lands to capitalise on key regional infrastructure such as the port and airport. Furthermore, the Strategy ensures that local planning provisions reflect and promote the role of the Port of Newcastle, as the site for a second container port facility for NSW. The Strategy also recognises the extensive road network that runs throughout the Lower Hunter. Strong residential growth in the Maitland corridor has already led to increased congestion on the Maitland Road–New England Highway. It is recognised that without careful planning a number of key congestion points will arise.

2.3 Local Plans and Policies

2.3.1 Draft Newcastle Local Environmental Plan

Document	Draft Newcastle Local Environmental Plan 2011
Date	2011
Purpose	This Plan aims to make local environmental planning provisions for land in Newcastle in accordance with the relevant standard environmental planning instrument under section 33A of the Act.
Content	The topics this Plan covers for planning provision for lands in Newcastle include: • Permitted or prohibited development • Exempt and complying development • Principles development standards • Miscellaneous provisions • Local provisions.
Content relating to traffic and relevance to the Project	This Plan identifies requirements for consent authorities to have regard for the objectives for development in a zone when determining a development application in respect of land within the zone. Zones which encompass port facilities have been identified as needing consent prior to development. They include: • Zone B3 Commercial Core • Zone IN1 General Industrial • Zone IN3 Heavy Industrial. These zone provisions are not relevant to the Mayfield site as the State Government has designated the portside land as a State Significant Site under the Three Port Strategy.

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3.0 Existing Transport Conditions and Capacity

This section provides an overview of the current road and rail network surrounding the site, as well as the existing capacity of the main access points into the site and existing public transport provision. Modelling results which review the current performance of existing road intersections are also presented.

3.1 Road Network

3.1.1 Strategic Road Network

F3 (Sydney – Newcastle Freeway)

The F3 Freeway is a 127km motorway linking Sydney to the Central Coast, Newcastle and Hunter Regions. The freeway alternates between 2 and 3 lanes in each direction for its length. The northern section of the freeway in the vicinity of the site, from north of Wyong to its terminus at John Renshaw Drive, has 2 lanes in each direction. The freeway has a speed limit varying between 80 and 110km/h.

Pacific Highway

The Pacific Highway is a 1,025km major transport route which links Sydney and Brisbane along the east coast of Australia. The section of the Pacific Highway in the vicinity of Mayfield has 2 lanes in each direction and a speed limit that varies between 60km/h and 80km/h. The Hexham Bridge carries the Pacific Highway over the Hunter River and has 2 lanes in the southbound direction and 3 lanes in the northbound direction. Currently, the section of road between the F3 Freeway and the Raymond Terrace bypass (12.2km) is being upgraded from a single carriageway to a dual carriageway to improve safety and relieve traffic congestion.

New England Highway

The New England Highway connects to the Pacific Highway at Hexham and travels west towards Maitland. It is an alternative inland route to the Pacific Highway travelling between Sydney and Brisbane. The majority of the route is single carriageway; however, between Hexham and Maitland, it has 2 lanes in each direction. For most of its length the New England Highway has a 100km/h speed limit.

Cormorant Road

Cormorant Road is located on Kooragang Island, the site of a deep water port for the export of coal, and a major heavy industry area in the Newcastle area. Cormorant Road is a sealed road that predominantly consists of one lane in each direction; the eastern section of the road widening into a dual carriageway in each direction. There is a speed limit of 60km/hr in the westbound direction and 80km/hr in the eastbound direction.

Tourle Street

Tourle Street is the continuation of Cormorant Road over the South Arm of the Hunter River to the southern mainland. Tourle Street provides a direct route between Newcastle, the industrial area and Newcastle Port facilities on Kooragang Island. The new Tourle Street Bridge opened in May 2009, and consists of one lane in each direction, with 2m shoulders. Tourle Street has a speed limit of 60km/hr in both directions.

3.1.2 Local Road Network

The proposed concept is located on an existing industrial area on the South Arm of the Hunter River. The northern portion of the site is connected to the regional road network through Industrial Drive (via Ingall Street or Bull Street); while the southern portion of the site is connected to Industrial Drive via Selwyn Street and George Street (see **Figure 3.1**).

Industrial Drive

Industrial Drive is a major four lane divided, classified road providing connections to the Pacific Highway, site, and to the north bank of the South Arm of the Hunter River. It is used as a major link between Maitland and Newcastle CBD providing access to the Honeysuckle Precinct and is the preferred alternative to the Pacific Highway for southbound traffic. It is a B-Double approved vehicle route signed at 80km/h.

The RTA has advised that Industrial Drive is fully developed and no further upgrades are planned. The existing road reserve for Industrial Drive has no provision for future widening except for a small parcel opposite the Tourle Street junction.

Ingall Street

Ingall Street currently provides access to the north of the site from Industrial Drive, terminating at a security gate. To the south of Industrial Drive, it is an undivided, two lane, two-way collector road connecting Industrial Drive to the Pacific Highway through a predominantly residential area. It is sign posted at 50km/h and 40km/h to the north and south of Industrial Drive respectively. There are slight cracks present on the road surface of Ingall Street making it uneven in places.

Bull Street

Bull Street is a one-way slip road off Industrial Drive for eastbound traffic. It joins Ingall Street at a T-junction and is signed at 50km/h. It has large cracks and an uneven road surface along most of its length.

George Street/Selwyn Street

To the west of Industrial Drive, George Street is a four lane road with two traffic lanes and two parking lanes. It is signed at 50km/h and runs through a residential area in Mayfield East. To the east of Industrial Drive, George Street connects immediately to Selwyn Street, which runs adjacent to the rail line to the south of the site, and provides access to the site. Selwyn Street is initially two lanes in each direction and then narrows to one lane in each direction, east of the rail level crossing.

The section of Selwyn Street giving access to the site has an uneven road surface with cracks forming in places.

Figure 3.1: Intersection Locations

Source: AECOM (adapted from Google Maps), 2010

3.1.3 Traffic Volumes

Daily Traffic Counts

RTA traffic volume data has been obtained to determine the historical traffic growth and current mid-block traffic flows in the surrounding study area. **Table 3.1** shows historical Average Annual Daily Traffic (AADT) volumes at two stations in the vicinity of the site. Both stations are located on Industrial Drive to the west of the site.

Table 3.1: Historical Traffic Volumes and Growth

Station Number	Location	1995	1998	2001	2004	Growth (%)
05.953	Industrial Drive, (NW of Woodstock Street)	29,746	29,549	30,334	30,717	0.36
05.979	Industrial Drive, (West of Werribi Street)	22,952	21,608	21,559	23,339	0.19

Source: RTA Traffic Volume Data

The data shows that between 1995 and 2004, there has been an average yearly growth rate of 0.27% in the surrounding area.

AM and PM Peak Intersection Counts

In 2008, NPC commissioned Mark Waugh Pty Ltd to undertake Traffic Impact Statements (TIS) associated with the Industrial Development at Mayfield. These were undertaken in relation to the following:

- Proposed Bulk Liquid Storage Depot[1] – located in the north west portion of the site; and
- Proposed Industrial Site[2] – located to the south of the site.

As part of these impact statements, traffic count data was collected at the two key intersections providing access to the site from Industrial Drive, namely:

- Industrial Drive / Ingall Street; and
- Industrial Drive / George Street.

Based on these reports, the AM peak and PM peak periods occur between the hours of 7.30am – 8.30am and 4.45pm – 5.45pm respectively. Intersection turning movements for the AM peak and PM peak periods at these locations are illustrated in **Figure 3.2** and **Figure 3.3**. The figures show the number of Light Vehicles (LV) and the percentage of Heavy Goods Vehicles (HGV) on each movement.

[1] *Proposed Bulk Liquid Storage Depot, Mayfield North, NSW*, Mark Waugh Pty Ltd, Sept 2008

[2] *Proposed Interim Port Side Industrial Development, Selwyn Street, Mayfield, NSW*, Mark Waugh Pty Ltd, June 2008

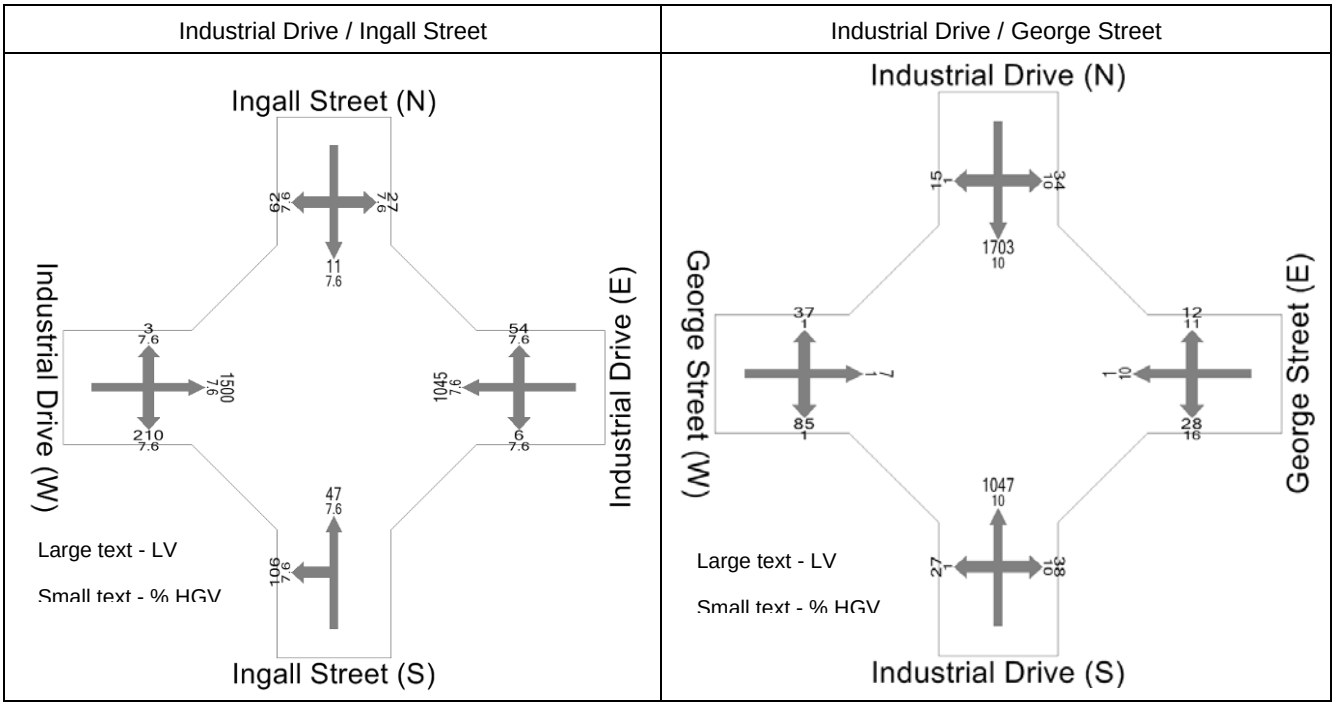

Figure 3.2: 2008 Intersection Movements – AM Peak Period

Source: Mark Waugh Pty Ltd, 2009

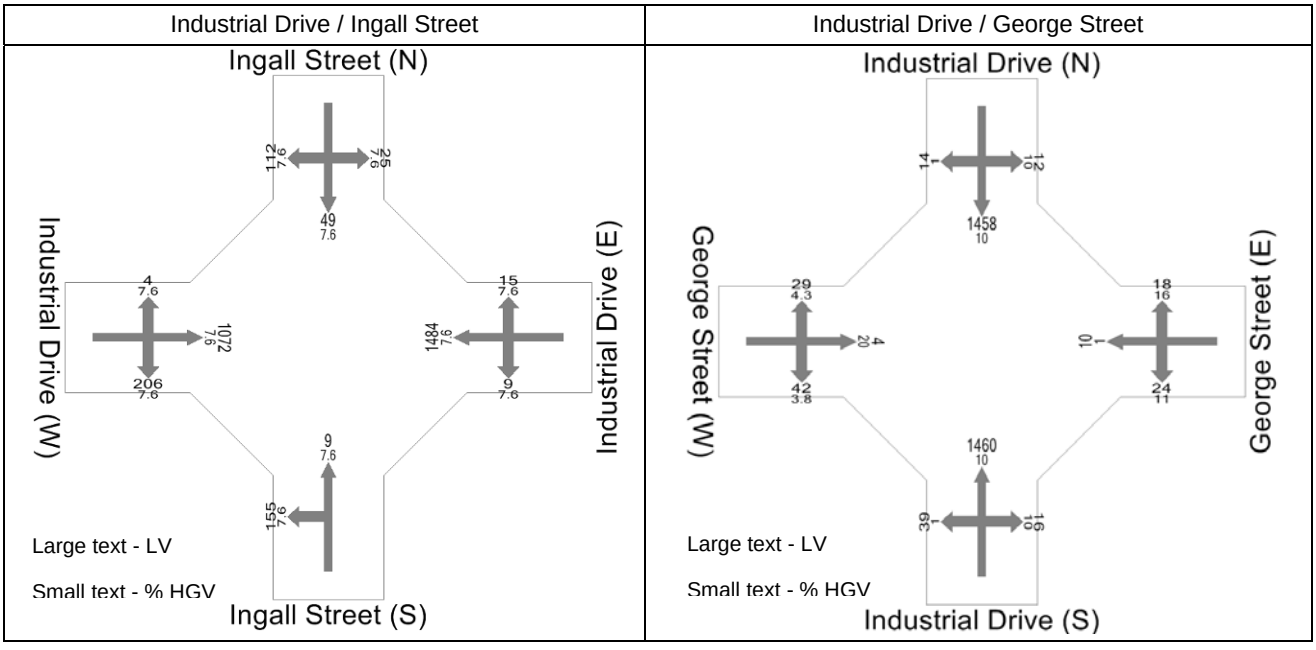

Figure 3.3: 2008 Intersection Movements – PM Peak Period

Source: Mark Waugh Pty Ltd, 2009

3.1.4 Intersection Performance

Intersection performance assessments have been evaluated using SIDRA Intersection 3.2, a computer based modelling package designed for calculating isolated intersection performance.

The main performance indicators for SIDRA Intersection 3.2 include:

- **Degree of Saturation (DoS)** – a measure of the ratio between traffic volumes and capacity of the intersection is used to measure the performance of isolated intersections. As DoS approaches 1.0, both queue length and delays increase rapidly;
- **Average Delay** – duration, in seconds, of the average vehicle waiting at an intersection; and
- **Level of Service (LOS)** – a measure of the overall performance of the intersection (this is explained further in **Table 3.2**).

Table 3.2: Level of Service and Average Delay Performance Criteria for Intersections

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

Source: Guide to Traffic Generating Developments, RTA, 2002

Industrial Drive / George Street

The intersection of Industrial Drive and George Street is a signalised intersection with a pedestrian crossing on the northern leg. All turning movements are permitted. The schematic layout is illustrated in **Figure 3.4**, while **Table 3.3** and **Table 3.4** summarise the intersection performance based on the 2008 traffic flows for the AM and PM peak hours.

Table 3.3: 2008 AM Peak Hour Base Case Intersection Performance (Industrial Drive / George Street)

Location	Demand Flow (veh/h)	Level of Service	Deg of Satn (v/c)	Aver Delay (sec)	95% Back of Queue (m)
Industrial Drive (S Leg)	1,113	B	0.524	16.4	131
George St (E)	42	C	0.052	38.4	11
Industrial Drive (N Leg)	1,753	B	0.830	22.8	273
George St (W)	131	D	0.292	46.5	35
All Vehicles	**3,039**	**B**	**0.830**	**21.7**	**273**

Source: AECOM, 2010

Table 3.4: 2008 PM Peak Hour Base Case Intersection Performance (Industrial Drive / George Street)

Location	Demand Flow (veh/h)	Level of Service	Deg of Satn (v/c)	Aver Delay (sec)	95% Back of Queue (m)
Industrial Drive (S Leg)	1,516	C	0.857	30.3	254
George St (E)	53	C	0.050	32.5	10
Industrial Drive (N Leg)	1,485	B	0.833	27.2	234
George St (W)	75	C	0.115	37.6	16
All Vehicles	**3,129**	**C**	**0.857**	**29.0**	**254**

Source: AECOM, 2010

The intersection of Industrial Drive / George Street is shown to operate within capacity during the AM and PM peak and at LOS B and C in the AM and PM peak hours respectively. The longest 95th percentile queue occurs on Industrial Drive in both peaks. The queue reaches 273m on the northern approach in the AM peak and 254m on the southern approach in the PM peak.

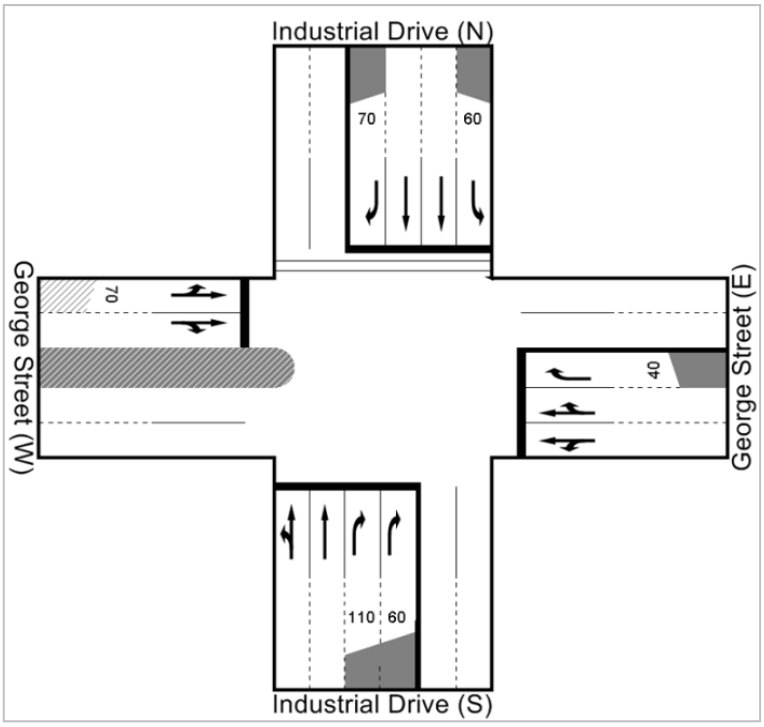

Figure 3.4: Industrial Drive / George Street Schematic Layout

Source: AECOM, 2010

Industrial Drive / Ingall Street

The Industrial Drive / Ingall Street intersection is a signalised intersection with a banned right turn from the south, and a left slip lane from the north. The schematic layout is illustrated in **Figure 3.5**, while **Table 3.5** and **Table 3.6** summarise the intersection performance based on the 2008 traffic flows for the AM and PM peak hours.

Table 3.5: 2008 AM Peak Hour Base Case Intersection Performance (Industrial Drive / Ingall Street)

Location	Demand Flow (veh/h)	Level of Service	Deg of Satn (v/c)	Aver Delay (sec)	95% Back of Queue (m)
Ingall St (S Leg)	153	D	0.541	47.9	46
Industrial Drive (E Leg)	1,106	B	0.575	19.5	129
Ingall St (N Leg)	100	D	0.585	42.5	31
Industrial Drive (W Leg)	1,714	B	0.651	15.9	160
All Vehicles	**3,073**	**B**	**0.651**	**19.6**	**160**

Source: AECOM, 2010

Table 3.6: 2008 PM Peak Hour Base Case Intersection Performance (Industrial Drive / Ingall Street))

Location	Demand Flow (veh/h)	Level of Service	Deg of Satn (v/c)	Aver Delay (sec)	95% Back of Queue (m)
Ingall St (S Leg)	164	D	0.528	45.6	61
Industrial Drive (E Leg)	1,508	B	0.817	24.7	223
Ingall St (N Leg)	186	D	0.818	47.8	54
Industrial Drive (W Leg)	1,283	B	0.811	24.1	134
All Vehicles	**3,141**	**B**	**0.818**	**26.9**	**223**

Source: AECOM, 2010

The results show that the intersection operates satisfactorily at LOS B during both the AM and PM peak. During the AM peak the largest 95th percentile queue occurs on Industrial Drive (western leg) and is indicated in the order of 160m, while during the PM peak, a 95th percentile queue in the order of 223m is indicated on Industrial Drive (eastern leg).

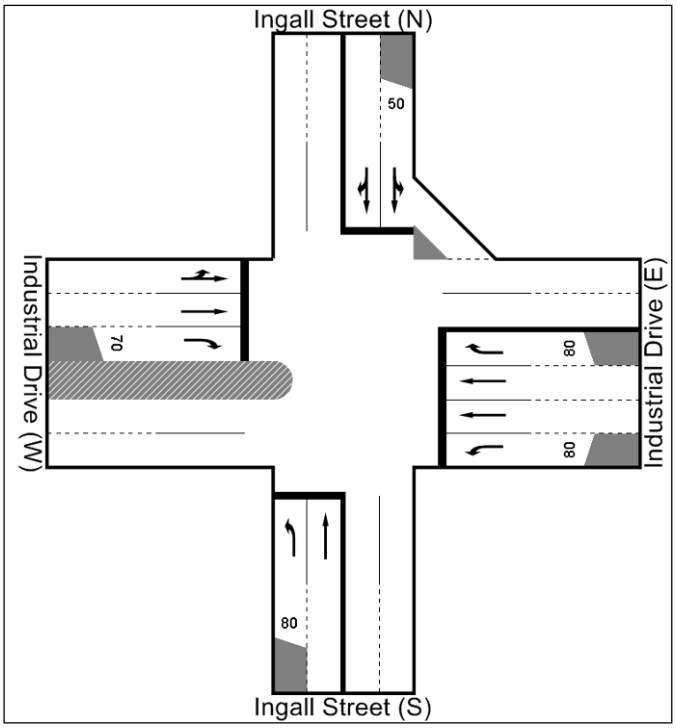

Figure 3.5: Industrial Drive / Ingall Street Schematic Layout

Source: AECOM, 2010

3.2 Existing Public Transport Provision

There are no bus routes that travel along Industrial Drive between the George Street and Ingall Street intersections.

Route 104 (operated by Newcastle Buses) runs between Jesmond and Newcastle via Industrial Drive and George Street. Route 104 operates eight buses during the AM peak (7am to 9am) and six buses during the PM peak (4pm to 6pm).

Route 118 (operated by Newcastle Buses) runs between Stockton and Newcastle via Industrial Drive and Ingall Street. However, route 118 is a Friday & Saturday NightOwl bus service that replaces the Stockton Ferry and only operates early Saturday and Sunday mornings.

These routes are shown on **Figure 3.6**.

The closest railway station is Waratah Station, which is approximately 2km away, as the crow flies, and over 3km by road. The site is considered to be outside of the station catchment.

Figure 3.6: Local Bus Network

Source: Newcastle Buses and Ferries, 2010

3.3 Rail Network

3.3.1 Description and Capacity of Infrastructure

Newcastle Port is currently served by two distinct rail loops – Kooragang Island and Port Waratah.

Kooragang Island is one of the busiest coal handling facilities in the world, connected via Kooragang Island Junction to the Main North Rail Line, and via Sandgate grade separation to the coal lines leading into coal mining districts in the Hunter Valley. For the purposes of this study, Kooragang Island and the Hunter Valley Coal chain will not be considered, except where it impacts on services to Port Waratah.

Port Waratah is a smaller coal handling facility, but also has a grain export facility that can be very heavily utilised in certain periods of the year. Port Waratah is connected to the Main North Rail Line via Islington Junction. There are a number of sidings and facilities connected to Port Waratah, namely:

- Port Waratah Coal handing facility;
- Brambles Sidings;
- Bullock Island Grain facility;
- Pasminco Siding;
- Grain Corp Grain loading facility;
- Morandoo Sidings; and
- OneSteel Sidings.

All of the above are connected to the Main North via Islington Junction, and two roads (Arrival Road and Storage Road 1). The Arrival Road services all but the Morandoo and OneSteel sidings, which are accessed via Storage Road 1 (see **Figure 3.7**).

A typical move for trains entering either facility from Sydney, is to head north on the Down Main, through Broadmeadow, moving across Islington Junction, then cross the Clyde Street Level crossing , before turning into the arrival roads for the port. Trains then cross from the Arrival Road onto Storage Road 1, and then onto Storage Road 2, before entering the Morandoo Sidings.

The Morandoo Arrival Road links to the old BHP Billiton sidings (currently in use by OneSteel) and the link between the Morandoo and OneSteel Sidings are the subjects of this study.

The proposed port site is connected to Port Waratah via the One Steel Arrival Road. This siding, which will be used for any rail freight movements from the new berths, is currently used by OneSteel. The OneSteel site appears to be in use as an intermodal, with evidence of steel coils being transferred from rail wagons to trucks. This siding currently operates as a single siding, with no signalling control or separation for trains within the siding, so all operation is at 15km/h maximum by shunt manoeuvre. OneSteel currently operates up to three trains in and out of their site per day.

There is capacity currently on the Port Waratah and Bullock Island loops to accommodate additional train movements, however, some periods of the day (e.g. morning peak) are quite busy and careful scheduling of train movements to/from the port would be required.

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ROAD AND RAIL NETWORK

Transport Assessment

Mayfield Site Port-Related Activities Concept Plan

Figure 3-7

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