Orica Southlands Remediation and Redevelopment, Banksmeadow

Transport Assessment Review

July 2011

SAMSA CONSULTING

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1. Introduction

Orica is proposing to redevelop its Southlands site at McPherson Street, Banksmeadow for warehousing and distribution purposes under *Part 3A* of the *Environmental Planning and Assessment Act, 1979*. The project includes:

- Remediation of the site, including the realignment of groundwater infrastructure associated with the Botany Groundwater Cleanup Project.
- Establishment of several warehouses over a number of stages, with a proposed floor area of 79,190 m^2 split up as follows:
  - Stage 1: 47,000 m^2 GFA
  - Stage 2: 16,490 m^2 GFA
  - Stage 3: 15,700 m^2 GFA
- Associated infrastructure including:
  - site access;
  - upgrades to the Hill Street and Exell Street intersections at Botany Road;
  - new road link to Botany Road;
  - flood mitigation works;
  - car parking; and
  - landscape works.

The EA identifies that the proposed development would increase the number of heavy vehicles on Hill Street, Exell Street and Botany Road to access the Southlands site. It is noted that Stage 3 of the proposal would be subject to further approvals, however, for the purposes of the assessing the traffic impacts for the proposal, traffic generated by Stage 3 was included in the traffic assessment.

This report details a review of the traffic and access assessment for the proposed Project and has been prepared by *Samsa Consulting Pty Ltd*, Transport Planning & Traffic Engineering Consultants, for *NSW Department of Planning* (DoP) as part of its project assessment process.

1.1 Objectives & Scope of Work

Orica has indicated that the development for Stage 1 would require upgrades to both Hill Street and Exell Street at their Botany Road intersections. In addition, Orica is proposing a new road from the site to Botany Road via the Discovery Cove Estate, prior to their Stage 2 development. An assessment of the proposed upgrades and the new road is required to establish whether the proposed works are appropriate.

The DoP is currently assessing the application from Orica and requires independent technical advice with respect to the Project's transport assessment. This review has been carried out to provide the independent technical advice including:

1. Review of the Traffic and Transport Assessment, submitted as part of the EA, prepared by URS (August 2009)
2. Review traffic and transport related issues in submissions received during the

public exhibition period.

3. Identify any additional information or clarification required from Orica to complete an assessment of the application.
4. Provide an assessment report to the Department, including consideration of:
   - existing transport conditions and potential impacts of the project;
   - required level of upgrade works to service the project;
   - appropriate contributions from Orica for the upgrade works;
   - a timeframe for completion of the upgrade works; and
   - proposed conditions of approval, if recommended.

In undertaking the review, the following documents were referenced / reviewed:

- NSW Department of Planning *"Orica Southlands Site, Banksmeadow NSW – Southlands Remediation and Development Project and associated roadworks*", June 2006
- NSW Department of Planning *"Orica Southlands Remediation and Redevelopment, Botany Bay Local Government Area – Environmental Assessment Requirements Under Part 3A of the Environmental Planning and Assessment Act 1979*", 12/09/06
- Orica Australia Pty Ltd "*Southlands Remediation and Development Project: Response to Submissions on the Environmental Assessment & Preferred Project Plan (Rev.2)*", November 2010
- Orica Australia Pty Ltd "*Southlands Remediation and Development Project: Preferred Project Plan, Updated and Consolidated Information Package (Rev.6)*", May 2011
- Orica Australia Pty Ltd "*Southlands Remediation and Development Project: Preferred Project Plan, Updated and Consolidated Information Package (Rev.7)*", June 2011
- Traffix "*Southlands Stages 1 and 2 Project Application, Traffic Impact Assessment for an Industrial/Warehouse Development at McPherson Street, Banksmeadow*", October 2007
- Traffix "*Part 3A Application 06-0191: Proposed Remediation and Redevelopment of Orica Southlands Site, Botany Bay*", 30 May 2010
- Traffix "*Preferred Project Application – Part 3A Application 06-0191: Proposed Remediation and Redevelopment of Orica Southlands Site, Botany Bay*", 30 March 2011
- Traffix "*Preferred Project Application – Part 3A Application 06-0191: Proposed Remediation and Redevelopment of Orica Southlands Site, Botany Bay*", 14 April 2011
- Traffix "*Preferred Project Application – Part 3A Application 06-0191: Proposed Remediation and Redevelopment of Orica Southlands Site, Botany Bay*", 6 June 2011
- Traffix "*Preferred Project Application – Part 3A Application 06-0191: Proposed Remediation and Redevelopment of Orica Southlands Site, Botany Bay*", 14 July 2011

- URS "*Southlands Development, Botany, Access Implications Assessment*", 16 October 2006
- URS "*Southlands Remediation and Development Project, Environmental Assessment, Project Application (MP 06_0191)*", August 2009

1.2 Report Structure

The remainder of this report is presented as follows:

Chapter 2 describes the proposed project.

Chapter 3 provides a review of the traffic and access assessment undertaken for the project.

Chapter 4 details the stakeholder and community issues raised in project submissions including description of project amendments and a preferred project plan.

Chapter 5 provides conclusions and recommendations to the assessment review.

2. Project Description

Orica's Southlands site at Banksmeadow is approximately 18.2 ha in size and is bounded by McPherson Street to the south, Port Feeder Road to the west, Sydenham-Botany Goods railway line to the east and the Mobil site and Nant Street tank farm to the north – refer to *Figure 2.1: Project Location* following. The Southlands site is located wholly within the City Of Botany Bay Council area.

Figure 2.1: Project Location

The site is currently vacant except for equipment and infrastructure required by Orica to maintain ongoing groundwater remediation. The site is surrounded by mainly industrial and warehousing activity with some commercial land uses.

The Orica Southlands project involves collaborative remediation and redevelopment of the site to create a new industrial estate. It is proposed that the site would become a major industrial and warehousing estate servicing Port Botany and the wider Sydney Metropolitan Area. The original project application comprises the following key components (a subsequent Preferred Project Plan is described in Chapter 4 of this document).

- Establishment of industrial / warehousing development, with a proposed floor area of 79,190 m^2 split up as follows:
  - Stage 1: 47,000 m^2 GFA (western half of site)
  - Stage 2: 16,490 m^2 GFA (south-eastern portion of site)
  - Stage 3: 15,700 m^2 GFA (north-eastern portion of site and subject of a

future development application)

- Operations on a 24-hours / 7-days a week basis
- Associated infrastructure includes:
  - site access off McPherson Street;
  - upgrades to the Hill Street and Exell Street intersections at Botany Road in Stage 1;
  - new road link to Botany Road in Stage 2 of the development, including internal reconfiguration of Discovery Cove Estate;
  - flood mitigation works;
  - approximately 820 car parking spaces, with allowance for future decked parking area of 300 spaces if required in future; and
  - landscape works.

The proposed site layout and development staging for the original project application is shown in *Figures 2.2 to 2.4* following.

Figure 2.2: Proposed Site Layout (Original Project Application)

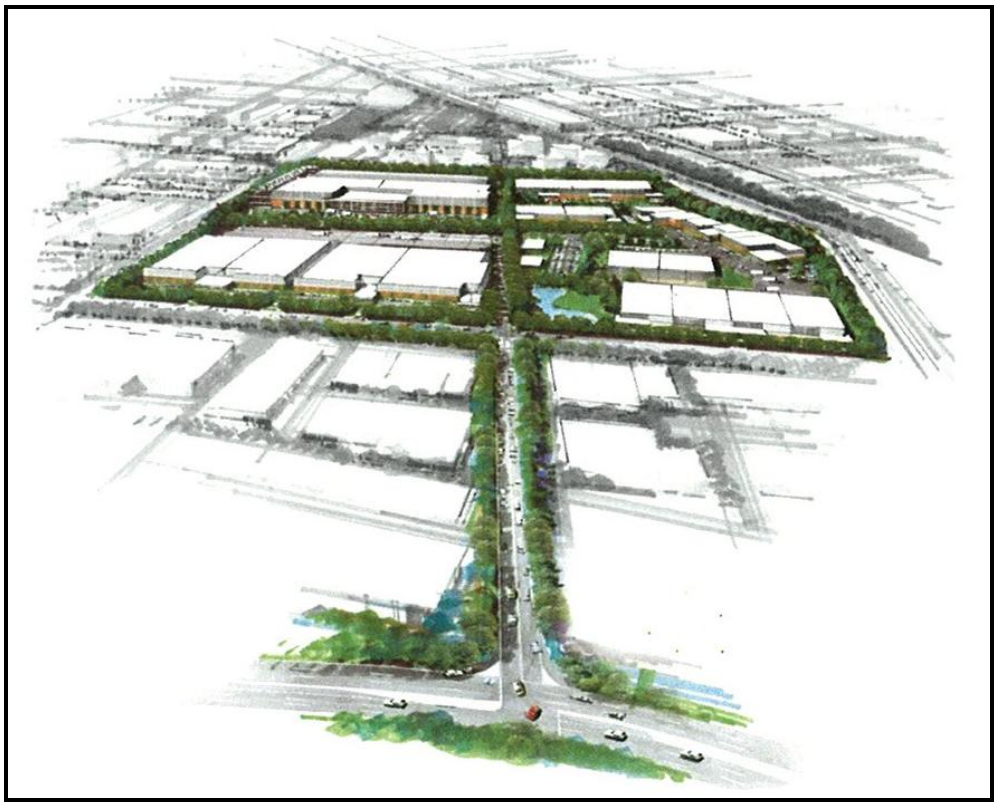

Figure 2.3: Aerial Perspective of Proposed Site Layout and Link Road

Figure 2.4: Proposed Development Staging (Original Project Application)

3. Review of Traffic & Access Assessment

In undertaking a review of the traffic and access assessment for the original proposal / project application, Traffix's "*Southlands Stages 1 and 2 Project Application, Traffic Impact Assessment for an Industrial/Warehouse Development at McPherson Street, Banksmeadow*" (dated October 2007) was used as the main document in addition to the other documents noted in *Section 1.1* previously. Subsequent reviews of the later Preferred Project Plan are included in Chapter 4 of this document.

The EA identifies that the proposed development for the original project application would increase the number of heavy vehicles on Hill Street, Exell Street and Botany Road to access the Southlands site. It is noted that Stage 3 of the proposal would be subject to future approvals, however, for the purposes of the assessing the traffic impacts for the proposal, traffic generated by Stage 3 was included in the traffic assessment.

3.1 Key Assessment Issues

In carrying out the assessment of transport-related impacts for the proposal, the proponent was required to address several key areas related to traffic and access, which were nominated by the DoP's Director General. These key areas included the following:

- Description of the existing traffic and transport environment.
- Details of traffic types and volumes to be generated.
- Details of proposed site access to service the development areas, internal roads and parking.
- Predicted impacts on road safety and capacity of the road network, particularly the surrounding arterial road network and nearby intersections, and consequent need for any road upgrades or improvement works.
- Assessment of any other potential impacts of the project, including any cumulative impacts, taking into consideration any relevant guidelines, policies, plans and statutory provisions.
- Description of the measures that would be implemented to avoid, minimise, mitigate and/or offset the impacts of the proposal.
- Preliminary design details and timing of any roadworks or other transport related infrastructure proposed as part of the development.

3.2 Parking & Site Access

Parking provision for the development is proposed as follows:

- Stage 1: 440 spaces including accessible parking as per Australian Standards plus potentially an additional 300 spaces in a decked arrangement
- Stage 2: 260 spaces proposed
- Stages 1 & 2: 700 spaces proposed plus potentially an additional 300 spaces

The following comments are provided with respect to parking provision:

- There is a deficiency in parking provision based on Council's DCP parking rate

(which would require 600 spaces for Stage 1 and 821 spaces for Stages 1 & 2) but a surplus based on RTA's guideline rate (which would require 148 spaces for Stage 1 and 203 spaces for Stages 1 & 2). Council's argument that their higher DCP parking rate would be more appropriate because the development has the potential to be subdivided in future creating increased tenancy levels that may be higher than those on which RTA guideline parking rates are based appears reasonable. Further justification of parking rates would be useful, eg. comparison with comparable developments with similar public transport and road network links.

- It should be noted that higher parking rates resulting in increased spaces are likely to result in increased traffic generation by increasing the latent traffic demand, ie. more available on-site parking would generally attract more car trips. This is why some public authorities are now capping parking rates or working to 'maximum' rates rather than 'minimum' rates. In capping and reducing parking rates, alternative transport modes need to be readily available (eg. bus services) so that on-street parking is not used at the expense of residents or other users.
- A comment is made in the Traffix report that parking provision could be reviewed at later development stages if necessary. This approach is considered to be imprudent and parking provision should be finalised prior to development because it is often difficult to provide additional parking at later stages and/or retro-fit parking into site areas. Furthermore, parking provision has a direct affect on traffic generation, which affects site access and road network upgrades that may have been provided based on lower parking and hence traffic generation numbers.
- No mention was made of the provision of accessible parking spaces.
- In determining parking space provision, Table 2 (page 14) in the Traffix report has incorrectly used an area of 40,000 m^2 for warehousing land use rather than the 43,000 m^2 used previously in the report.

With respect to site access and internal manoeuvring, the assessment states compliance with *AS 2890.1* and *AS 2890.2* for vehicles up to B-double size including swept path analysis. This is considered to be adequate.

Separation of light and heavy vehicle driveway accesses is not fully provided as mentioned in the Traffix assessment. There are separate driveway accesses for light vehicle parking areas directly off McPherson Street, but internal parking areas would be accessed via the internal access road, which would also be used by heavy vehicles. While this is not ideal, with appropriate traffic controls, signage and linemarking, this should not present a significant concern.

3.3 Traffic Generation

The original proposal / project application assessment initially adopted a traffic generation rate of 15 vehicle trips per developable hectare for warehouse/distribution purposes as had been adopted by RTA in other similar locations including the Western Sydney Employment Hub. This resulted in traffic generation of 230 vehicle trips per hour (vtph) during peak travel periods. An 80:20 peak directional split was assumed, which is considered reasonable.

Subsequently, more detailed traffic generation rates from RTA's "*Guide to Traffic Generating Developments*" were used to obtain traffic generation from the proposed development's floor area, which would be more absolute. These resulted in a traffic

generation range between 345 vehicles per hour (vph) to 790 vph. The 345 vph was incorrectly calculated from the generation rate of 0.5 vtph per 100 m^2 floor area for 79,190 m^2 of floor area – this should have been 396 vph.

In any case, a traffic generation rate of 465 vph was adopted by the assessment, which it is assumed was used because it was approximately double the initial vehicle trips per developable hectare rate. The assessment mentioned that the adopted rate "*represents a worst-case scenario that potentially overstates the expected level of traffic generation*", which is prudent in determining potential impacts. It also mentions that the adopted rate may be further conservative (ie. high) if the adjacent rail infrastructure is used as a transport mode for some end-users. While this is correct, there is no further discussion or assessment of the potential for rail transport.

The percentage of heavy vehicles within the overall forecast traffic generation was not provided in the assessment. The heavy vehicle percentage would be significant for a development such as the one proposed and should be evaluated and used in any modelling scenarios due to the effects that heavy vehicle movements have on intersection and road network operations.

Traffic generation should also take into account the number of parking spaces proposed. Higher parking numbers are likely to result in increased traffic generation by increasing the latent traffic demand, ie. more available on-site parking would attract more car trips, particularly if alternative transport modes such as buses and bicycles are not provided. For the assessment of Stage 1 of the proposed development, the adoption of a traffic generation of 235 vph was used in conjunction with parking for 442 parking spaces. This represents only approximately half the number of trips per hour per parking space, which seems low and would result in an under-utilised parking area for long periods. Similarly, for the combined Stages 1 and 2, the traffic generation of 465 vph was used in conjunction with parking for 700 parking spaces.

Heavy vehicle trips should also include nominated heavy vehicle routes to allow for travel along the major road network and not through local streets, eg. approach via Foreshore Road, Botany Road, Hill Street, McPherson Street and departure via McPherson Street, new link road / Exell Street, Botany Road, Foreshore Road.

In describing future 2016 traffic conditions, the Traffix assessment report mentions major developments in the wider area including Port Botany Expansion, Green Square urban renewal, Sydney Airport Master Plan and Prince Henry Hospital Redevelopment. These are estimated to generate an additional 26,700 vph onto the road network and in this context the proposed Southlands development would only account for less than 2% of this traffic. This is misleading in that the above traffic would be distributed over a wide area of south-eastern Sydney, while the Southlands traffic generation would affect a localised area surrounding the site, which is where its major impacts would occur.

3.4 Road Network and Intersection Analysis

The road network and intersection analysis for the original proposal / project application was undertaken by URS in a separate network modelling and intersection assessment report appended to the Traffix report. URS produced network models in both AM and PM peak periods for the following scenarios:

- Existing 2006 conditions (model calibrated to traffic counts)

- 2016 base traffic flows without traffic generation from the proposed Southlands development using existing local road network conditions
- 2016 traffic flows with Southlands traffic generation and road network Option 1 (McPherson Street roundabout connection via new link road to existing Discovery Cove Estate roundabout on Botany Road)
- 2016 traffic flows with Southlands traffic generation and road network Option 2 (McPherson Street connection via new link road through Discovery Cove Estate to signals on Botany Road east of Foreshore Road – designated as the preferred option in the assessment report)
- 2016 traffic flows with Southlands traffic generation and road network Option 3 (McPherson Street extension east over Goods Railway line to signals on Beauchamp Road)

In addition, a further Option 4 was assessed with intersection analysis only. This option adopted 2016 traffic flows with Southlands traffic generation using the existing local road network but with upgrades to Hill Street (separated lanes for left-turn and right-turn movements from Botany Road) and Exell Street (signals at Botany Road).

The lack of a road network model for Option 4 is not significantly problematic because the local road network is essentially the same and maintains a 'closed' road network off Botany Road via the Hill Street entry and Exell Street exit. However, for consistency, a road network model used for the other options would be useful to determine if any redistribution of traffic occurs due to the introduction of a new set of signals on Botany Road, for example.

Option 4 was assessed to essentially show that the new link road would not be required until Stage 2 of the original proposed Southlands development. However, it should be noted that for this option, it is unlikely that RTA would approve of the proposed upgrade to the Exell Street intersection by introducing a new set of traffic signals on Botany Road. The intersection analysis for 2016 with development traffic using Exell Street sign control indicates poor intersection performance with significant average delay. Therefore, another (non-traffic signal) option would need to be developed to show that the Exell Street exit onto Botany Road is adequate.

Other comments with respect to the original proposal / project application on the road network and intersection analysis modelling include:

- It is understood that the timeframe for the development to be operational is 2011. This would be for Stage 1 but it is not known when Stage 2 and the associated new link road would be constructed. The road network modelling undertaken should assess the road network for a minimum 10-year period including the proposed link road intersection at Botany Road. In this regard, the 2016 models provided in the assessment are too short-term (less than five years after operations start) and should be extended to at least 10 years after Stage 2 and the new link road are proposed to be operational.
- The combined use of *Netanal*, *Scates* and *Intanal* models is considered appropriate to cover strategic network-wide issues, signal coordination issues and localised intersection analysis respectively.
- Intersection analysis results for the existing road network and traffic conditions appear to indicate generally better performance than traffic operations observed on site, eg. level of service (LoS) C and average vehicle delay (AVD) of 38 seconds in

both AM and PM peak periods for the Botany Road / Foreshore Road intersection.

- The URS modelling assessment does not indicate what growth rate was used to determine background traffic volumes required for the 2016 scenario analyses. The background traffic growth alone is shown in the URS modelling assessment in Figures 8 and 9. However, the road network appears to be missing Foreshore Road in these figures.
- Modelling used the 465 vph development traffic generation but adopted a 70:30 peak directional split, ie. 325 vph arriving the morning peak period and 140 vph departing and the opposite during the afternoon/evening peak period. Although this is inconsistent with the Traffix assessment report, it is considered to be a reasonable assumption.
- The 2016 base traffic models (background traffic only without Southlands traffic) for AM and PM peak periods both seem to be missing the Foreshore Road link from their network diagrams. This is likely to be a printing error because volumes east of Foreshore Road are significantly higher than those entering or exiting into Botany Road (west) and Penrhyn Road. Nonetheless, correct network diagrams are required to assess and compare traffic distribution.
- For the preferred Option 2 road network (with new link road onto Botany Road east of Foreshore Road), the model network diagram shown for the PM peak period is the Option 1 model network – refer to *Figure 15* in URS report. The Option 2 model network diagram for the PM peak period is required to assess and compare traffic distribution for that option.
- The 'sign control' results for the Exell Street intersection analysis (*Table 22* in URS report) appear to indicate that the 'side road' (presumed to be Exell Street) has average annual daily traffic (AADT) of 24 vehicles, which would be incorrect.
- The network modelling for future 2016 scenarios does not seem to consider the two proposed intersections on Foreshore Road being constructed for the Port Botany Expansion project. Furthermore, the increases in traffic from Penrhyn Road onto the Botany Road / Foreshore Road intersection appear to be low considering the increase in activities associated with the expansion of Port Botany.
- There does not seem to have been any consideration of operations at the McPherson Street development site access point with no intersection analysis at this location.

3.5 Proposed Road Network Upgrades

In the original proposal / project application, upgrades to the existing road network were proposed as follows:

- Signalisation of Botany Road / Exell Street intersection (during Stage 1)
- Formalisation of Botany Road / Hill Street intersection with separation of left and right-turn in movements (Stage 1)
- Replacement of Discovery Cove Estate roundabout (at a later indefinite date)
- Additional lane (eastern side) for Botany Road southbound approach to the Foreshore Road intersection (at a later indefinite date)
- Signalisation of existing Discovery Cove Estate left-in / left-out access onto Botany

Road in readiness for the new link road connection at a later date (prior to Stage 2)

The following comments with respect to the original proposal / project application are provided with respect to proposed road network upgrades:

- For the proposed Hill Street intersection upgrade, there would be a circuitous route for vehicles wanting to access Greenfield Street from the left-turn off Botany Road southbound because of the restriction to cross-over movements in Hill Street. Vehicles would need to travel via Hill Street, McPherson Street, Exell Street and enter Greenfield Street westbound rather than enter directly eastbound from Hill Street. Moreover, vehicles would need to turnaround in Greenfield Street to exit via Exell Street rather than travel around the block again by exiting via Hill Street, McPherson Street and Exell Street to Botany Road. The assessment has not adequately addressed whether westbound Greenfield Street vehicles would be able to turn-around and exit via Exell Street.
- The deceleration lane for the left-turn into Hill Street from Botany Road would need to be sufficiently long and delineated to allow right-turn movements to safely assume that left-turn movements are not continuing southbound along Botany Road, thus unnecessarily delaying the right-turn movements into Hill Street.
- The proposed four-lane widening of the Botany Road southbound approach to Foreshore Road appears to encroach on adjacent land outside the existing road reserve. There is a risk that a larger road upgrade would be required, which would need to be approved by RTA and affect Foreshore Road / Botany Road / Penrhyn Road intersection operations.
- The Exell Street signalised intersection is located in relative close proximity to the Foreshore Road / Botany Road / Penrhyn Road intersection. Signal operations would need to be coordinated with the major intersection to prevent queuing upstream or downstream of the new intersection. Therefore, operations may not be optimal for traffic exiting Exell Street. This issue has been raised by RTA, which stated that signals would not be approved at this location because their modelling indicated extensive delays and unacceptable queue lengths on Botany Road.

3.6 Alternative Transport

The assessment report mentions the potential for reduced traffic generation due to adjacent rail infrastructure being available as a transport mode. However, there is no further feasibility assessment of rail transport and all transport is proposed by road. Moreover, Council's DCP 33 (Banksmeadow Industrial Precinct) requires developments with frontages onto the Goods Railway line to investigate rail transport options, which the assessment has not provided.

It is considered that alternative transport options including pedestrian and bicycle facilities have not been adequately addressed. This includes:

- Pedestrian access between the development site and existing bus services along Botany Road (Sydney Buses Route 309).
- Cycleways (on-road and off-road) serving the site and connecting to existing on-road cycleway along Foreshore Road, west of Botany Road and any proposed future cycle networks.

- Bicycle parking and 'end-of-journey' facilities at the proposed development site.

The assessment states that bus services would be improved to the area with the provision of the proposed new link road. This however, would need to be confirmed with Sydney Buses or other bus operators and in any case would not occur until Stage 2 of the development when the new link road is proposed to be constructed.

3.7 Construction Phase Issues

A detailed construction traffic management plan (CTMP) has been proposed for Stage 2 works when Stage 1 is operational and Stage 2 construction activities would coincide with Stage 1 operations. However, a CTMP would also be required to be prepared and submitted for approval prior to Stage 1 construction activities proceed. This should include proposed traffic mitigation and road safety measures as well as nominated heavy vehicle routes, eg. approach via Foreshore Road, Botany Road, Hill Street, McPherson Street and departure via McPherson Street, new link road / Exell Street, Botany Road, Foreshore Road.

Construction truck generation for Stage 1 of the project stated a peak of 100 trucks per day. However, only the average daily truck generation of 50 to 60 trucks was considered in the assessment. It is considered that a peak generation would be more appropriate and provide a conservative ('worst case') basis to the assessment.

4. Stakeholder & Community Submissions

4.1 Submissions Received

During the exhibition period for the Project, the DoP received 17 submissions on the project, including:

- 8 submissions from public authorities;
- 3 submissions from special interest groups; and
- 6 submissions from the neighbouring landowners / general public.

Public Authorities

Submissions came from Sydney Regional Development Advisory Committee (SRDAC), NSW Roads and Traffic Authority (RTA), City of Botany Bay Council (CoBB), Randwick City Council (RCC), Australian Rail Track Corporation Ltd (ARTC),Ministry of Transport, Department of Environment and Climate Change (two separate submissions), South Eastern Sydney and Illawarra Health Service – Public Health Unit, and Sydney Water. The following traffic and transport issues were raised:

- RTA / SRDAC
  - The modelling undertaken was not considered appropriate because of the timeframe (too short until 2016 – should model until 2026 for minimum 10-year life for new intersection) and the strategic nature of the modelling (*Netanal* and *Scates* models). A micro-simulation model would be better covering the local area that redistributes traffic flows and evaluates intersection operations.
  - RTA would not approve the proposed link road intersection at Botany Road unless modelling indicates intersection operations and traffic distribution would not have detrimental effects on Botany Road and Foreshore Road.
  - Model should include a 'no right turn' from Botany Road into the new link road.
  - RTA modelling indicates that traffic signals on Botany Road at Exell Street would create extensive delays and unacceptable queue lengths on Botany Road. Therefore, signals would not be approved at this location.
  - Left-turn slip lane and right-turn bay into Hill Street off Botany Road would be at the proposed development's expense.
  - Traffic generation for the development was underestimated at 465 vehicle trips per hour – should be 495 vehicle trips per hour based on RTA's "*Guide to Traffic Generating Developments*".
  - Traffic report mentions the potential for reduced traffic due to alternative rail transport mode. However, there is no further feasibility assessment of rail transport and all transport is proposed by road.
- RTA raised the following additional transport-related concerns at a meeting with DoP on Thursday 1 July 2010 (held at RTA Parramatta offices):
  - Clarification from DoP on the status of landowners consent for the Link Road (to service Stages 2 & 3). Council has said that Orica don't have landowners consent for the proposal.
  - Justification from Orica for a right-hand turn out of Exell Street, when Botany

Road (north) leads to an area with heavy vehicle restrictions.

- Too much for all traffic (ultimate Stages 2 & 3) to go through Exell Street – Stage 1 may be suitable (subject to conditions), but stages 2 & 3 would require a new access road (new Link Road).
- Location where the Link Road intersects with Foreshore Road may be problematic due to distance to next intersection / traffic flow. RTA may have to recommend a restriction such as banning right-hand turn.
- Impact of fly-over proposal from Sydney Ports on Foreshore Road. This would have serious implications for all proposals in the area, particularly the Link Road connection.

- CoBB
  - Botany Road, south-east of Stephen Road, experiences extensive congestion and queuing in the afternoon peak period (3 to 6 pm) due to Foreshore Road intersection signal phasing.
  - The modelling undertaken should be extended until 2026 for realistic life-span of new link road and intersection at Botany Road.
  - Council's DCP 33 (Banksmeadow Industrial Precinct) requires developments with frontages onto the Goods Railway line to investigate rail transport options, which the assessment has not provided.
  - Alternative transport options including pedestrian and bicycle facilities have not been adequately assessed.
  - No reallocation of lost on-site parking at Discovery Cove Estate due to proposed link road modifications through the site.
  - Adequacy of truck manoeuvring paths along the proposed link road and on-site including through Discovery Cove Estate has not been suitably addressed, eg. interaction of semi-trailers with other on-site light vehicle traffic.
  - Truck routes need to be nominated:
    - Approach via Foreshore Road, Botany Road, Hill Street, McPherson Street
    - Departure via McPherson Street, new link road / Exell Street, Botany Road, Foreshore Road
  - Deficiency in parking provision based on Council's DCP rates
    - Stage 1: 440 proposed but 642 required
    - Stage 2: 260 proposed and 228 required
    - Stages 1 & 2: 700 proposed but 870 required
    - Stage 1 should include the additional 300 decked parking spaces proposed for the long-term
  - Council considers their higher DCP parking rate to be appropriate because the warehouse development has the potential to be subdivided in future creating increased tenancy levels that may be higher than those on which RTA guideline parking rates are based. Future subdivision of the site would not be able to readily provide increased parking once the development is complete.

- RCC
  - Would not support a new link road extending east over the rail line along the McPherson Street alignment and connecting to Beauchamp Road at Perry

Street, because the development traffic would have direct impacts on RCC road network.

- Traffic and road safety issues during construction need to be addressed including the preparation of a detailed CTMP and truck routes to use the major road network via Botany Road and Foreshore Road.

- ARTC
  - If an option to extend McPherson Street over the railway line was chosen, ARTC would require appropriate vertical clearance (7.1 m) and formal application to ARTC.
  - Any future rail sidings / connections into the ARTC network would require formal application to ARTC.

- Ministry of Transport
  - Alternative transport modes not addressed adequately in the assessment, eg. pedestrian and cyclist facilities, public transport (buses). Examples include pedestrian network to serve existing bus services on Botany Road (eg. Route 309) and cycleways to connect into existing and proposed networks.
  - There are opportunities for a mode-shift away from private vehicle (car) transport but not addressed adequately in the assessment.
  - Workplace travel plans should be prepared covering issues such as:
    - adequate bicycle storage and 'end-of-journey' cyclist facilities;
    - management of parking including reduction in parking space provision to lower RTA rates to encourage use of public transport and cycling;
    - employee 'car share' schemes; and
    - preparation of Travel Access Guides (TAGs) to inform staff and site visitors of transport options.

Special Interest Groups

Submissions came from Sydney Ports Corporation, Botany Environment Watch and Concerned Citizens Association Rockdale 3rd Ward. The following traffic and transport issues were raised:

- Sydney Ports Corporation
  - New link road may adversely impact on the operations of the key port access intersection of Foreshore Road and Penrhyn Road, including the proposed grade-separated road access at Penrhyn Road as part of the Port Botany Expansion project.
  - Intersections have been analysed in isolation and the assessment does not consider two proposed intersections on Foreshore Road being constructed for the Port Botany Expansion project as well as Botany Road / Beauchamp Road intersection. Coordinated analysis is required of all intersections.
  - Further justification is required of traffic generation and parking rates – would be more representative to use comparable developments rather than RTA rates.
  - Need to distinguish between light and heavy vehicle traffic generation.
  - Modelling analysis needs to be extended to at least 2021 for longer term assessment.

  - Traffic volumes adopted for 2016 scenario analysis appear to be low with limited background traffic growth.
  - The proposed four-lane widening of the Botany Road southbound approach to Foreshore Road would not be readily achievable within the existing road reserve, indicating a larger road upgrade would be required.

- Botany Environment Watch
  - New roads would result in increased traffic, which would impact on nearby residential areas.
  - Compliance with NSW DECC's industrial noise policy would be required during construction and operations.

- Concerned Citizens Association Rockdale 3rd Ward
  - Botany Road is currently congested ("a nightmare") and the site is served by a poor road network.
  - The road network in the surrounding area needs to be assessed as a whole. Traffic signals proposed along Botany Road would be very close together increasing congestion, which is currently significant at the Botany Road / Foreshore Road intersection.

Neighbouring Landowners / General Public

A number of issues were raised by neighbouring landowners and the general public including Gazal Corporation Ltd, ING Industrial Fund, Solvay Interox Pty Ltd, Hynlong Pty Ltd, Lynda Newnam and Jim Towart. The following traffic and transport issues were raised:

- Submission by Johnson Winter & Slattery Lawyers on behalf of Gazal Corporation Ltd (neighbouring property on southern side of McPherson Street). The submission included a 'Review of Traffic Reports' by ML Traffic Engineers. The main issue raised was that the proposed link road should be provided for Stage 1 of the development rather than delayed until Stage 2. Other issues raised with respect to the transport assessment were:
  - Strategic traffic forecasts until 2016 would not satisfy long-term projections;
  - Assumptions were made in the modelling that upgrades to Hill and Exell Streets had been completed;
  - Assessment states that bus services would be improved to the area with the provision of the proposed link road, however this would not be evident until Stage 2 of the development;
  - Background traffic in modelling did not take into account two new major developments, ie. Toll development on southern side of McPherson Street and 12 warehouse units at the corner of McPherson and Exell Streets;
  - Traffic generation and travel demand is too low based on the high car parking provision; and
  - Lack of intersection modelling at the McPherson Street access point.

- Submission by Urbis on behalf of ING Industrial Fund who own several properties in the vicinity of the Orica site. The main issue raised was that the proposed link road should not be delayed until Stage 2 of the development. Moreover, existing traffic congestion problems at Hill Street, Exell Street, the Discovery Cove Estate

roundabout and Botany Road queuing back from Foreshore Road would be exacerbated by the Stage 1 development without the proposed link road.

- Solvay Interox Pty Ltd (neighbouring property on western side of Orica site) noted existing congestion on the local road network of McPherson, Hill and Exell Streets, as well as extensive congestion on Botany Road would be exacerbated during Stage 1 of the proposed development without the provision of the new link road. Furthermore, the proposed road upgrades for Stage 1 would have minimal affect on existing congestion issues.
- Lynda Newnam "*Objection to Orica Southlands Project Application 06/0191: Part 3a Development*". The submission raised the following transport-related issues:
  - Improving existing traffic via upgrades to Hill and Exell Streets would not compensate for the traffic generation from the proposed development.
  - Warehousing development at this site would impact on Port Botany's container transport flows.
  - From a transport and land-use viewpoint, these type of warehouse developments should be located in Sydney's population centre (west of Parramatta) where intermodal terminals are planned.

4.2 Orica Response to Submissions

Orica prepared a response to submissions received as follows: Orica Australia Pty Ltd "*Southlands Remediation and Development Project: Response to Submissions on the Environmental Assessment & Preferred Project Plan, Final Issue to DoP (Rev.2)*", November 2010.

With respect to transport issues, the amended (preferred) project plans include the following modified characteristics:

- Essentially the same number of parking spaces based on a slightly smaller development area (46,500 m^2 against the previous 47,000 m^2) – 437 parking spaces against the previous 440 spaces. No mention was made of accessible parking spaces or bicycle parking facilities.
- Essentially the same traffic generation based on a similar development area – 46,500 m^2 against the previous 47,000 m^2.
- The proposed interim improvements for Stage 1 remain unchanged and include the installation of traffic signals at the intersection of Exell Street with Botany Road and the provision of improved channelisation at the intersection of Hill Street with Botany Road. It is noted that the provision of traffic signal control at the intersection of Exell Street with Botany Road is proposed for the Stage 1 development only, with the intersection's long-term operation to be assessed later as required by the RTA in relation to the Link Road that is proposed in Stage 2.
- Change for direct vehicular access onto Coal Pier Road, which serves Warehouses 5 and 6. Warehouses 1 to 4 inclusive retain direct access onto McPherson Street.

It is considered these minor changes are reasonable and satisfactory.

The responses relating to traffic and transport were largely based on an additional traffic review prepared by Traffix for Orica (dated 30 May 2010 and updated 7 December 2010 based on amended project plans dated 8 November 2010) included as Appendix 2 to Orica's 'Response to Submissions' report. The responses are summarised as follows:

- Parking rates and provision are above RTA's "*Guide to Traffic Generating Developments*" rates but below Council's parking rates. Providing the higher Council parking provision would undermine the State Government policy of pursuing travel by promoting alternate (non-car) travel modes. No latent parking demand is anticipated.
- Shift overlaps for the development would occur outside peak background traffic periods and thus an increased level of parking would not result in a commensurate increase in peak period traffic generation.
- The percentage of heavy vehicles used in the modelling was 20% and this was considered reasonable for the peak background travel periods when the predominant traffic movements are associated with employee arrivals and departures.
- The peak parking demand occurs at shift change-over time which does not coincide with the on-street peak background travel periods. The peak period traffic generation is therefore independent of peak period parking demands and hence, there is no need to penalise the application by the adoption of higher trip rates due to parking provision.
- Concern that the road improvements being required to accommodate this development are largely due to other development in the area, including general traffic growth over a 10 year period. Hence, while future modelling can be undertaken, it should not be assumed that the improvement works that are identified are wholly the responsibility of the applicant.
- The proposed interim improvements (Exell Street signals and Hill Street channelisation) are intended to facilitate only the Stage 1 development and will be temporary. All matters raised by the RTA have been addressed. The need for the Exell Street signals to remain will be further assessed as part of modelling in relation to the Stage 2 development. Note that a subsequent detailed concept was developed for the Exell Street signals (dated 17 May 2010) to the satisfaction of RTA.
- Growth rates and land use development assumptions were agreed with the RTA as part of the modelling process and these vary for individual routes.
- The need to assess alternate travel modes would be dealt with through the preparation of a Transport Access Guide (TAG), which can be conditioned. The benefits of a TAG are however potentially diminished by the provision of any parking above the RTA requirements. The applicant prefers that parking is suppressed slightly (or even more), with alternate travel supported by a TAG.
- Construction issues are acknowledged by the applicant and will need to be the subject of a detailed Construction Traffic Management Plan, which can be conditioned.
- Micro-simulation modelling to be undertaken by the applicant post-Stage 1 would address Sydney Ports and other stakeholder concerns.

- The proposed Link Road needs to be seen in the context where it provides a strategic road solution that benefits all landowners and is not required solely to support the subject application. It does not have a nexus solely with the Stage 1 development and even when provided in Stage 2, there are cost sharing issues that will need to be addressed including offsets to Section 94 contributions.
- Pedestrian and cyclist facilities are proposed around the perimeter of the site and access into the site.
- Site manoeuvring, particularly for longer heavy vehicles (up to B-double size), would be achieved with full compliance to *AS 2890.1* and *AS 2890.2*, in response to a condition of consent.
- Stage 2 works encompass the Discovery Cove development, which forms a necessary element of the delivery of the proposed Link Road in Stage 2.
- The main change made for the purpose of the Preferred Project Plan relates to the proposal to provide direct vehicular access onto Coal Pier Road to serve Warehouses 5 and 6. This achieves a more satisfactory dispersal of trips onto the road network. Warehouses 1 to 4 would retain direct access onto McPherson Street.

This review considers the above responses were reasonable and reliant on RTA agreement of major road operations along Botany Road and Foreshore Road.

4.3 Further Consultations

Additional meetings were held with stakeholders / agencies and Orica / Traffix (Orica's traffic consultants) to discuss traffic and transportation issues subsequent to community submissions and Orica's response to submissions.

A meeting was held with CoBB Council on Friday 18 March 2011 to discuss their views and outstanding issues (following on from their response letter, dated 18 February 2011, to Orica's additional information). The following pertinent traffic and transport issues were raised or reiterated:

- The traffic modelling and traffic flow predictions should be re-assessed based on the opening of the Hale Street extension, which should have reduced traffic flows (particularly heavy vehicle traffic) along the southern end of Botany Road at Foreshore Road. Council stated that the Hale Street Extension report would be made available to Orica to obtain traffic flow counts on Botany Road and that further traffic volumes could be obtained from RTA's TCS data at intersections such as Botany Road / Foreshore Road, Hale Street / Foreshore Road.
- No intersection analysis has been done for Botany Road / Foreshore Road.
- Council considered that the adoption of a 20% heavy vehicle proportion as being too low and not indicative of peak hour traffic generation from the development. Orica's view was that this proportion was reasonable during peak periods when the majority of traffic would be employee movements. This review also considers that a 20% heavy vehicle proportion is reasonable during background traffic peak periods.
- Council reiterated its concerns that the Link Road for Stage 2 has numerous issues that affect its feasibility including land ownership along the proposed road

corridor, flooding issues and RTA agreement to the Link Road intersection onto Botany Road.

A meeting was held with Orica on Tuesday 22 March 2011 to discuss their views and progress in addressing issues raised during submissions. The following pertinent traffic and transport issues were discussed:

- Clarification was to be sought on whether the Hale Street extension had been included as part of the road network modelling undertaken as part of the transport assessment. Subsequent discussion and advice from the proponent revealed that the Hale Street extension had not been included as part of modelling for the transport assessment. The Hale Street extension would have the effect of reducing traffic volumes along Botany Road in the vicinity of Exell and Hill Streets. This would improve operations at these intersections and thus the assessment that has been undertaken by Orica is conservative, ie. higher traffic volumes were used.
- Further detailed design development including road network modelling (micro-simulation analysis) would be required for any post-Stage 1 development.

4.4 Preferred Project Plan

Orica provided a response to the previous issues raised in the form of a "*Preferred Project Plan: Updated and Consolidated Information Package (Rev 6)*", May 2011 and subsequently "*Preferred Project Plan: Updated and Consolidated Information Package (Rev 7)*", June 2011. As part of this Preferred Project Plan, Traffix provided specialist traffic assessment in a letter report dated 14 April 2011 and a subsequent (and similar) letter report dated 6 June 2011 (for the respective Preferred Project Plans).

The Preferred Project Plan (PPP) maintains a three-stage development for the project, the scope of which has not changed since the original submission – see *Figures 4.1* to *4.3* below. The Stage 1 earthworks component extends into part of the Stage 2 area and Stage 3 areas.

The PPP confirmed that no building development is proposed for the Stage 3 area in this Project Application. However, the application does still propose to re-configure and sub-divide the area east of Nant Street to define Stage 2 and Stage 3 areas, including 2 lots in the Stage 3 area in order to add a further easement to facilitate future possible remediation.

Updates to the project originally submitted for application are:

- Revised traffic layouts at the intersections of Botany Road with both Hills and Exell Streets, due to revised traffic arrangements in the vicinity of the site subsequent to the initial submission
- Flood modelling to confirm the Stage 1 area of earthworks will be above nominated flood levels with freeboard
- Source of fill for the Stage 1 earthworks utilises material being treated on another Orica site in the vicinity of Southlands, which has received in principle support from the Site Auditor and Office of Environment and Heritage.

The Statement of Commitments from Orica for the project was confirmed in the latest submission.

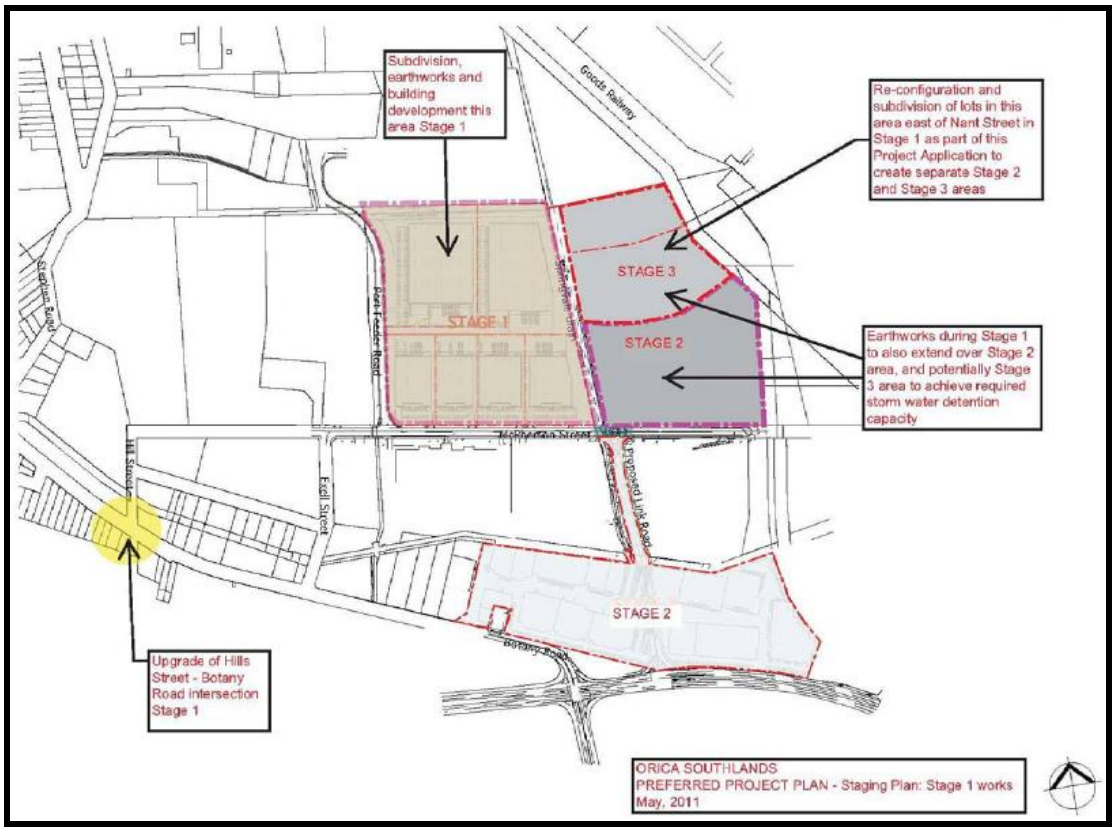

Figure 4.1: Preferred Project Plan – Stage 1

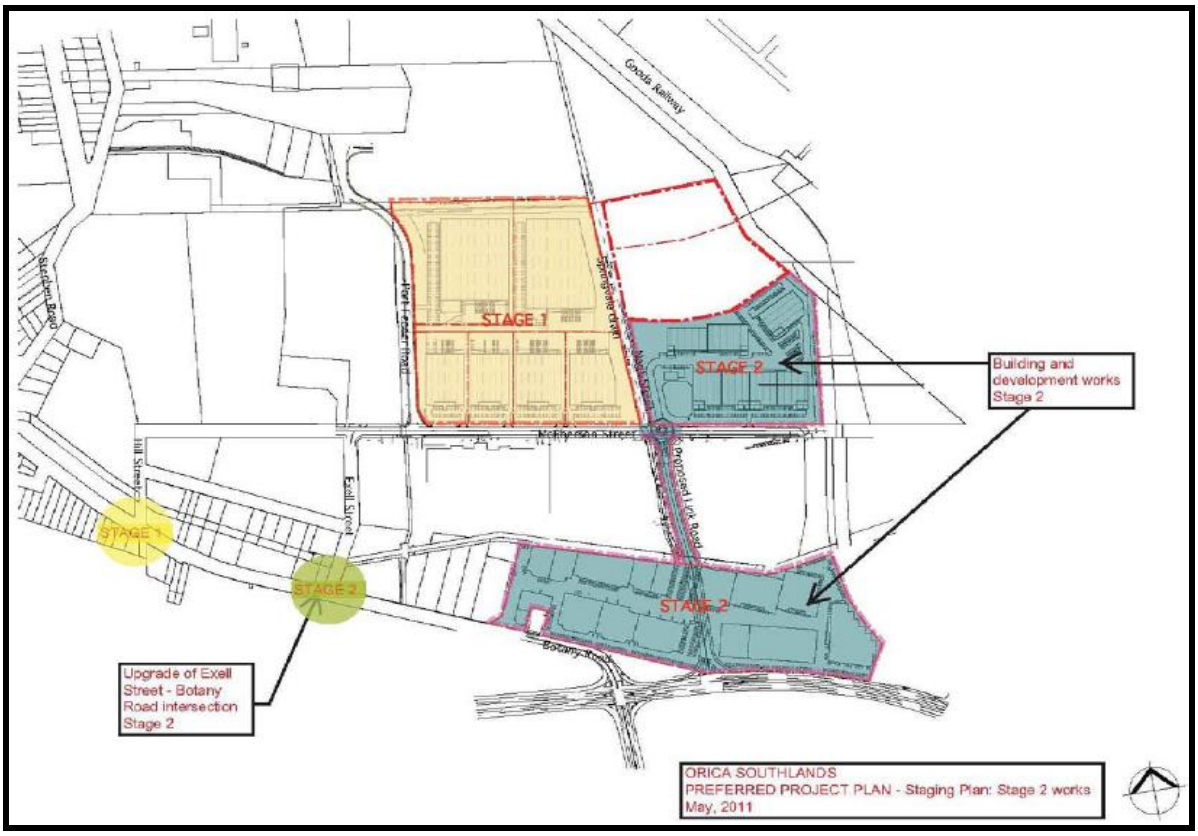

Figure 4.2: Preferred Project Plan – Stage 2

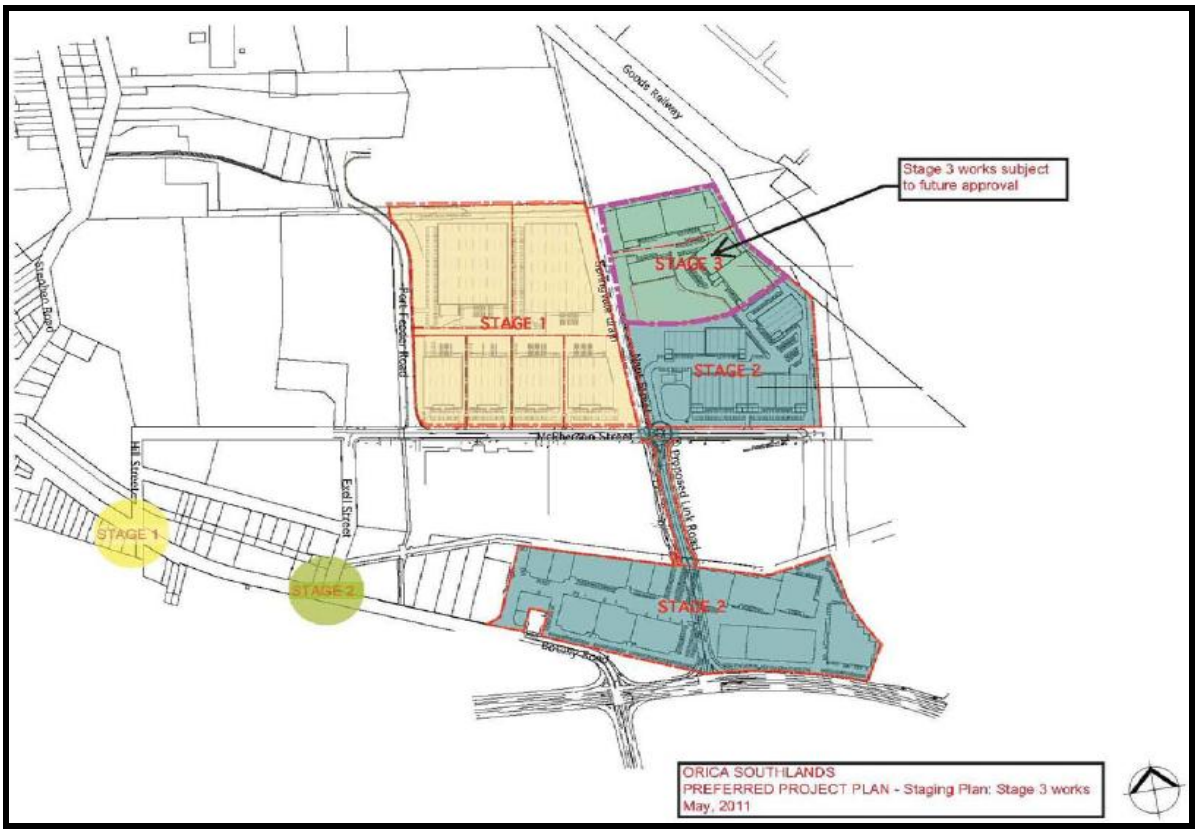

Figure 4.3: Preferred Project Plan – Stage 3

RTA and Council responded to the latest Preferred Project Plan (June 2011) with the following comments. Responses to RTA and Council comments follow in *italics*.

NSW RTA

- The RTA cannot support the proposed layout of the Hill Street intersection, which allows for simultaneous left and right-turn movements off Botany Road – refer to *Figure 4.4* below.

Do not agree that left and right-turn movements into Hill Street cannot occur simultaneously, provided there is adequate separation as they enter Hill Street. The Orica submission shows a separation island which could be extended (at least with linemarking) to reinforce the separation of simultaneous left-turn and right-turn entry movements into Hill Street.

- Concern is raised in regards to the proposed median island on Botany Bay at the Hill Street intersection due to drainage, restrictions for existing driveways and loss of on-street parking. RTA recommends an alternative solution (layout) including extension of right-turn bay by 20 m, provision of a 900 mm wide central median adjacent to and for the full length of the right-turn bay.

It is unclear why the central median on Botany Road has been proposed by Orica. The existing situation without raised medians is considered to be satisfactory. RTA's comments in regards to drainage and restriction of driveway access may be valid, however, these could readily be negated if a painted median is used. Loss of on-street parking is valid, although as mentioned earlier, if existing situation was used rather

than a median, which reduces the overall road width, this would also negate this concern.

Notwithstanding the above, there is agreement with RTA's desired design solution, ie. right-turn bay extension / width and median adjacent to right-turn bay rather than downstream of it.

Orica have mentioned that the Hill Street design they submitted should be seen as an 'in-principle' design (attached to a suitable condition of consent) with detail design at a later stage to satisfy RTA and Council requirements. This 'conditioned' approach may be an alternative course of action.

Orica, via their specialist traffic consultants Traffix, responded to the above RTA comments (correspondence dated 14 July 2011) by stating that they support RTA's recommended improvements / layout.

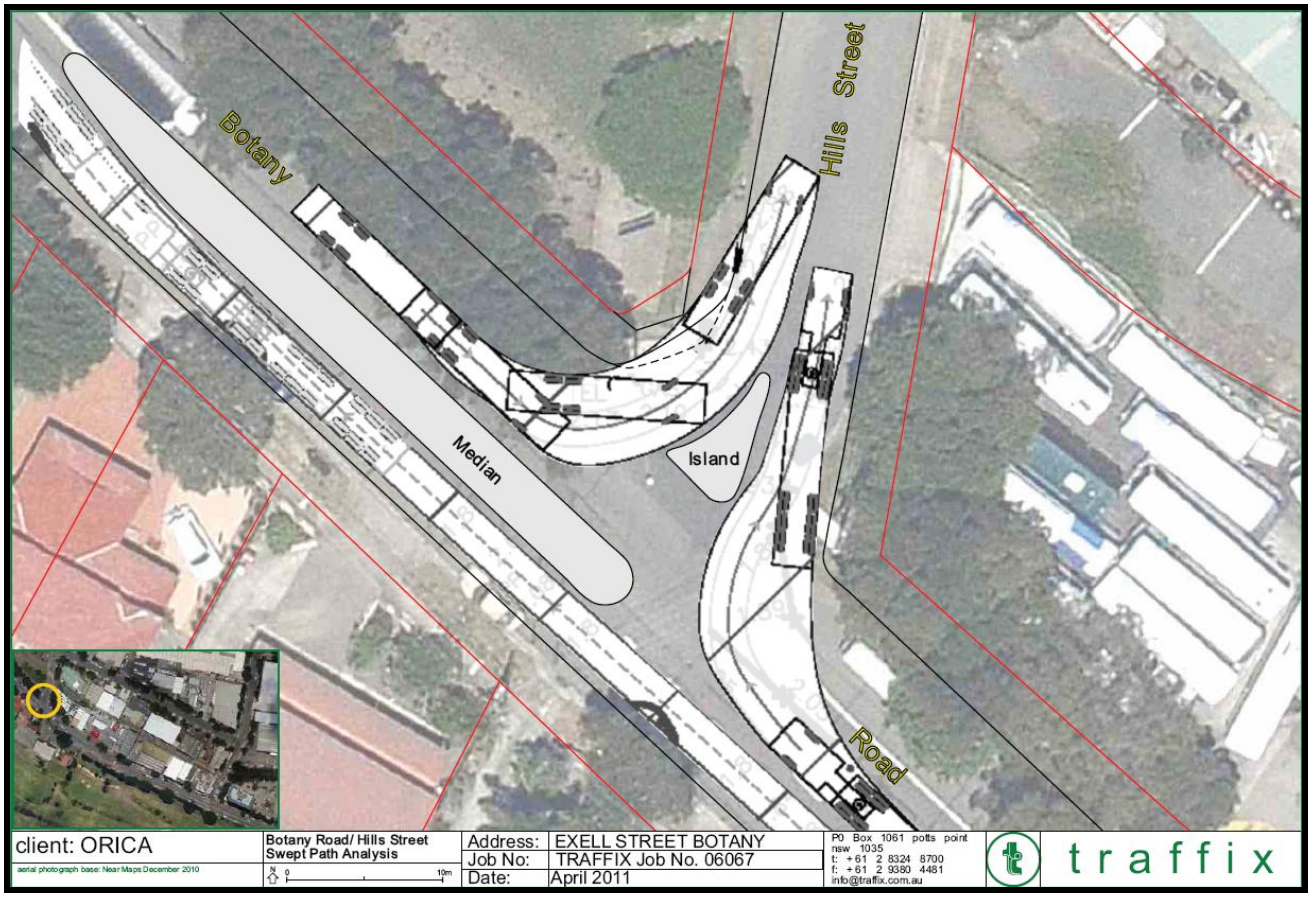

Figure 4.4: Orica's Proposed Hill Street Intersection Layout

- RTA does not support signalised intersection at Botany Road / Exell Street.

RTA's concerns with signals at this intersection are noted. Orica suggest signals would be needed for Stage 2 but by then the new Link Road would be required and the new signals would be obsolete for the Orica development. It is thought that there are considerable difficulties in making the Link Road work and that Stage 2 approval is unlikely in its current form.

- A Construction Traffic Management Plan (CTMP) needs to be submitted prior to works starting.

Agreed – this can be conditioned, as necessary.

City of Botany Bay Council

- No impact assessment (intersection analysis) of the development has been undertaken on the Botany Road / Foreshore Road intersection.

Intersection analysis of the Botany Road / Foreshore Road intersection has been undertaken in Orica's initial Traffic Impact Assessment (October 2007) prepared by Traffix (refer to Appendix A2: URS Traffic Report), which was Appendix L in the overall Environmental Assessment Project Application. This analysis did not take into account any reduction in traffic through this intersection due to the Hale Street extension opening and thus any assessment now would have less impact than what was originally assessed.

Orica, via their specialist traffic consultants Traffix, responded to the above Council comments (correspondence dated 14 July 2011) by stating that analysis had been undertaken of this intersection originally and that no further analysis is required as the original analysis did not take into account any reduction in traffic through this intersection due to the Hale Street extension opening and thus the original analysis was based on a worst case scenario.

- No intersection analysis of the current intersection performance of the Botany Road / Hill Street intersection has been undertaken.

Current performance of the Botany Road / Hill Street intersection has been undertaken in Orica's initial Traffic Impact Assessment (October 2007) prepared by Traffix (refer to Appendix A2: URS Traffic Report), which was Appendix L in the overall Environmental Assessment Project Application. This analysis did not take into account any reduction in traffic along Botany Road due to the Hale Street extension opening and thus any assessment now would have less impact than what was originally assessed.

Orica, via their specialist traffic consultants Traffix, responded to the above Council comments (correspondence dated 14 July 2011) by stating that analysis had been undertaken of this intersection originally and that no further analysis is required as the original analysis did not take into account any reduction in traffic through this intersection due to the Hale Street extension opening and thus the original analysis was based on a worst case scenario.

- The Hill Street upgrade does not facilitate the left-turn movement of 19 m trucks off Botany Road, which may still travel along this route (albeit infrequently) even though there is a heavy vehicle restriction. Council recommends the erection of signage on Botany Road (eastbound) preventing trucks longer than 12.5 m turning left into Hill Street is provided.

Agree with Council's recommendations and comments that signage restricting left-turn truck movements into Hill Street to 12.5 m would be beneficial.

- The proposal to not upgrade the Exell Street / Botany Road intersection does not consider light vehicles (cars) that need to turn right into Botany Road, which currently turn left and then U-turn at the Discovery Cove Estate roundabout, adding to congestion in the area. Council considers that the Exell Street intersection needs to be signalised for Stage 1 of the Southlands development.

Council acknowledges RTA's view that signalisation of the intersection would not be accepted by RTA.

Council's concerns about light vehicles exiting Exell Street onto Botany Road and then U-turning at the Discovery Cove Estate roundabout and how that would justify a right-turn out of Exell Street does not specifically reflect on Orica's site and development but the area's traffic movements generally. It is considered that Southlands' Stage 1 development should not hinge on this upgrade even though it may be required from other developments' requirements, eg. adjacent ten-storey commercial office building. Traffic analysis for the Exell Street intersection provided by Orica seems reasonable in maintaining the current left-out layout and justifies their proposed actions.

- Council considers the future link road would not be economically viable or provide a practical solution to the area's traffic impacts. Orica has not indicated whether the link road has been suitably negotiated with affected landowners. Therefore, the Southlands development cannot be supported and Council cannot enter into any VPA regarding the project due to link road issues being unresolved.

Noted. It is agreed that for Stage 2, the new Link Road is likely to be required. It is thought that there are considerable difficulties in making the Link Road work and that Stage 2 approval is unlikely in its current form.

- The improvements gained along Botany Road due to the opening of the Hale Street extension should not be used to delay upgrades to other parts of the road network (which is implied by Orica with respect to the non-upgrade of Exell Street). The Botany Road / Exell Street intersection should be upgraded as part of Stage 1 of the Southlands development.

If an upgrade to the Exell Street / Botany Road intersection is required due to all development in the area, then perhaps, Orica could contribute to this as it would benefit them. However, it is considered that it should not preclude Stage 1 being approved.

- Upgrades to Botany Road fronting the Botany Bay Hotel would require contributions by Orica as they provide benefits to the Southlands development.

Noted and agreed. However, while Orica would benefit from the proposed road upgrades and as such should contribute to them, the proportion / amount are debatable as all developments in the area would benefit from the works. Again, it is considered that it should not preclude Stage 1 being approved.

5. Conclusions & Recommendations

5.1 Conclusions

5.1.1 Original Project Assessment

The following conclusions are provided in the review of the proposed development's original transport assessment:

- Parking rates and provision are above RTA rates but below Council's parking rates. It is agreed that shift overlaps for the development would occur outside peak background traffic periods and thus an increased level of parking would not result in a commensurate increase in peak period traffic generation. It is acknowledged that latent parking demand is not likely to be an issue resulting in increased parking and hence traffic generation to the site.
- The proposed interim improvements along Botany Road at Exell Street (traffic signals) and Hill Street (turn-lane channelisation) are considered appropriate for the Stage 1 development. Satisfactory levels of service (LoS) have been demonstrated for both improved intersections (LoS A or B[1]) in 2016. Importantly, signalisation of the Exell Street intersection would also improve road safety for light vehicles turning right (north) into Botany Road (heavy vehicles are required to turn left towards Foreshore Road due to a weight restriction along Botany Road to the north). This would be a positive impact for the whole development area not just for the proposed Southlands development.
- It is understood that the Exell Street signalised intersection treatment would be temporary subject to further design development and mitigation measures for subsequent development stages. All matters raised by the RTA are understood to have been addressed for Stage 1 of the development proposal.
- Additional direct vehicular access onto Coal Pier Road is considered advantageous and prudent as well as distributing trips to/from the development site away from a consolidated single access point.
- Site manoeuvring for Stage 1 is considered to be adequate up to B-double vehicle size, but will require full compliance with *AS 2890.1* and *AS 2890.2*.
- Pedestrian and cyclist facilities are proposed around the perimeter of the site and access into the site. These are considered to be adequate.

5.1.2 Preferred Project Plan

The following conclusions are provided in the review of the proposed development's Preferred Project Plan (PPP) submitted in June 2011:

- The proposed improvements at the Botany Road / Hill Street intersection (turn-lane channelisation) are required for the Stage 1 development to proceed. The 'do nothing' course of action for the Botany Road / Exell Street intersection is considered appropriate for the Stage 1 development and has been reasonably justified by the Project's traffic assessment

1 Good with acceptable delays and spare capacity

- For the proposed improvements at the Botany Road / Hill Street intersection, the following recommendations made by RTA and Council are considered to be reasonable:
  - Extension of existing right-turn bay by 20 m.
  - Provision of a 900 mm wide central median adjacent to and for the full length of the right-turn bay.
  - Minimum width of 3.2 m for the right-turn bay.
  - Erection of signage on Botany Road (eastbound) preventing trucks longer than 12.5 m turning left into Hill Street.
- For Stage 2, the new Link Road is likely to be required. It is thought that there are considerable difficulties in making the Link Road work and that Stage 2 approval is unlikely in its current form.

5.2 Recommendations

It is considered that the transport assessment adequately addresses traffic, access, parking and other transport issues for Stage 1 of the development, subject to the following recommended (Draft) Conditions of Consent:

- Hill Street upgrade works to be undertaken prior to Stage 1 operations (this could be a Condition of Consent or within Statement of Commitments). In this regard, the following recommendations made by RTA and Council for an upgraded Hill Street intersection layout are considered to be prudent:
  - Extension of existing right-turn bay by 20 m.
  - Provision of a 900 mm wide central median adjacent to and for the full length of the right-turn bay, to the satisfaction of RTA requirements.
  - Minimum width of 3.2 m for the right-turn bay.
  - Erection of signage on Botany Road (eastbound) preventing trucks longer than 12.5 m turning left into Hill Street.
- A minimum 437 parking spaces is to be provided as proposed by the Preferred Project Plan. This should include the applicable number of accessible parking spaces as required by Australian Standards.
- Site manoeuvring, particularly for longer heavy vehicles (up to B-double size), to achieve full compliance with *AS 2890.1* and *AS 2890.2*.
- Construction transport issues to be addressed by a detailed Construction Traffic Management Plan (CTMP).
- Bicycle parking facilities are to be provided to appropriate standards and guidelines, eg. Austroads.
- Preparation of a Transport Access Guide (TAG) as per Transport NSW guidelines to assess alternate travel modes and reduce reliance on private car transport to the site.

For subsequent development stages (ie. Stages 2 and 3), the provision of a new Link Road (or other mitigation measures that may be proposed) has not adequately demonstrated that transport impacts would be resolved / mitigated. It is thought that there are considerable difficulties in making the Link Road work and that Stage 2 approval is unlikely in its current form.

There is significant additional design development required to demonstrate the suitability of mitigation measures required to deal with transport impacts for future development stages. The design development would particularly need to focus on the following:

- Micro-simulation modelling to be undertaken by the applicant to address RTA, CoBB Council, Sydney Ports and other stakeholder concerns with respect to surrounding road network and intersection operations, particularly for the new Link Road connecting into Botany Road / Foreshore Road, the operation of the Exell Street / Botany Road signals and Discovery Cove Estate roundabout operations.