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Dear Paul

Oxford Tavern and Dwyer's developments: Response to stakeholder letters

I refer to the RTA's letter dated 1 February 2008 and the Wollongong City Council's letter dated 29 January 2008 regarding concerns with the concept plan and major project application for the above two sites. In response to the issues raised in these letters, PB has prepared the following information.

1. Traffic generation rates

In forecasting the numbers of vehicles generated by each of the proposed developments, PB referenced the RTA's *Guide to Traffic Generating Developments* (2002). This Guide contained the following formula for calculating the number of vehicle trips generate by a shopping centre for a nominated Thursday night peak period. This formula is re-stated below:

$V(P) = 20A(S) + 51A(F) + 155A(SM) + 46A(SS) + 22A(OM)$

Where,

- V(P): the number of vehicle trips generated per 1000m² (includes entering and exiting traffic).
- A(S): Slow trade gross leasable floor area (GLFA), this includes major department stores.
- A(F): Faster trade GLFA including discount department stores such as K-Mart and Target.
- A(SM): Supermarket GLFA including stores such as Franklins and large fruit markets.
- A(SS): Specialty shops, secondary retail GLFA including specialty shops and take-away stores such as McDonalds.
- A(OM): Office, medical GLFA including medical centres and general business offices.

The hotel, cinema and conference components were not included in the traffic generation calculations for the following reasons:

- The cinemas are not a stand-alone entity. That is, they are part of a mixed development including the faster trade and slow trade components, supermarket and food court associated with the shopping centre. Most cinema patrons would be generated by "linked trips" and would also access these other facilities. As such, the above formula (trip generation model) would have already accounted for them.
- It is unlikely that there would be significant volumes of traffic generated by these facilities during the modelled AM and PM peak periods. In particular, the hotel and conference facilities would be unlikely to have a peak traffic generation period that would coincide with the modelled AM and PM peaks. For example, most hotels have a nominated check-out time of 10am.
- The conference facilities would be used more sporadically. That is, they are more likely to generate traffic on less frequent occasions.

It should be noted that the RTA Guide also lacked advice regarding typical traffic generation rates for cinemas and conference facilities as stand-alone entities.

2. Traffic modelling results

As requested in the RTA's letter, copies of all the SIDRA files for the intersection performance assessments will be made available to the RTA.

As stated in the report, Wollongong City Council's Paramics model was only used to obtain the base traffic volumes at each of the study intersections. These base volumes were a result of the underlying trip tables referencing an origin and destination travel zone based on the Transport Data Centre's *Journey to Work* data. The travel zone origin and destination information was also applied to the trips generated by the proposed Dwyer and Oxford developments in order to assign these to specific turning movements at each of the study intersections. The Paramics model itself was not used as an assessment tool, but rather as a source of information for the SIDRA intersection assessments.

It is further noted that the Paramics model (supplied to PB by Wollongong City Council) was not stable and could not run to completion because the model kept freezing before it completed the run. PB noted that the traffic entering a number of roundabouts in the Wollongong road network, lead to the model "freezing". Although PB relayed these concerns to Wollongong City Council on a number of occasions, the issue remained unresolved at the completion of the project. As such, PB assessed the traffic impacts of the proposed development via SIDRA assessments of a number of key intersections in the surrounding road network.

3. Vehicular access points

3.1 Town Hall Place

The RTA's letter also expressed concerns with the right-turn movements into and out of Town Hall Place. As there are no right-turn restrictions into or out of Town Hall Place (east) at present, PB naturally assumed that these access provisions (or lack of prohibitions) would remain following the development.

PB further notes that from a gap acceptance viewpoint, a right-turn movement from a minor road (ie. Town Hall Place) aiming to enter a two-lane two way road (ie. Burelli Street[1]) requires an entering sight distance equivalent to five seconds of travel time at the nominated design speed (RTA, 2000). For traffic approaching Town Hall Place from the east, a reasonable design speed of 40km/h has been adopted as this traffic would have travelled through the signalised intersection of Corrimal Street/ Burelli Street. For traffic approaching Town Hall Place from the west, a design speed of 50km/h has been adopted due to the 50km/h speed limit of Burelli Street. As such, the gap entering sight distances required from the hold line of Town Hall Place towards traffic approaching from the east and west are 55m and 69m respectively. Due to the straight horizontal and vertical alignment of Burelli Street, these sight distance requirements would be met in most situations.

RTA (2000) also states that the gap acceptance sight distance for right-turning traffic from the major road (ie. Burelli Street) into a side road (ie. Town Hall Place) is four seconds. The straight alignment of Burelli Street would provide little impedance to this required sight line in this regard. In these respects, PB believes that there are adequate safety provisions (with regard to visibility and sight distances) for road users to make right turns into and out of Town Hall Place.

PB's report (2007) stated that the left-turn movements into Town Hall Place would be required from lane 2 of Burelli Street. PB re-iterates that all movements into Town Hall Place must in fact be undertaken from lane 2, as lane 1 is a parking lane with a kerb blister inhibiting through traffic movements. As such, an 8.8m service vehicle would be able to access and egress Town Hall place with both left and right-turn movements.

3.2 Porte Cochere

The indented section of the Porte Cochere would be approximately 31m long and 6m wide. The RTA's Road Design Guide – Section 1 (RTA, 1991) states that the design length of a passenger car is 5m and the design width is 1.9m with a full door opening requiring additional width of 0.82m. As such, a vehicle parked up to 0.5m from the kerb line of the Porte Cochere would require a maximum width of 3.2m, leaving an acceptable residual width of at least 2.8m as passing clearance for other traffic in the Porte Cochere.

[1] Note: Although Burelli Street has four marked lanes. The tow side lanes are used for parking and/or bus layover areas. Therefore, these are not considered to be operational lanes and for a gap acceptance analysis, it is considered that this is a two-lane-two-way road.

Standards Australia (1993) state that the minimum length of a parallel parking bay should be 6m. The parking bays at the start and end of the rank can be reduced to 5.4m. Based on these minimum dimensions, the Porte Cochere should be able to provide a maximum of five parking spaces. PB has assumed a conservative “kiss and ride” transaction time of two minutes for each parked car for the unloading/loading of passengers and luggage. This equates to a maximum throughput of 150 “kiss and ride” transactions per hour. PB believes that this capacity would be well in excess of any demand entry volumes for the Porte Cochere.

Furthermore, if the Porte Cochere is required to operate at this maximum throughput capacity, then 150 vehicles per hour would need to be absorbed into the Burelli Street traffic stream at the departure end of the Porte Cochere in order to avoid queuing in and upstream of the Porte Cochere. The traffic modelling work completed by PB showed that in the 2026 PM peak, there are likely to be 293 vehicles/hour entering Burelli Street from the Corrimal Street intersection. It should be acknowledged that if 150 of these vehicles are required to enter the Porte Cochere (which is a gross over-estimate of the realistic entering volumes), therefore only 143 vehicles per hour would remain in the eastbound lane of Burelli Street at the departure end of the Porte Cochere. However, to ensure a conservative analysis, PB has assumed that the traffic volumes at this point would be the total of 293 vehicles per hour.

Austroads (2008) describe a *practical absorption capacity* as the capacity of a major stream of traffic (ie. Burelli Sreet) to absorb a minor stream of traffic (ie. the Porte Cochere entering traffic) based on (i) the available residual capacity of Burelli Street and (ii) the gap acceptance requirements of the Porte Cochere traffic required to enter the Burelli Street. The graph in Figure 1 allows for the derivation of the practical absorption capacity of a major traffic stream for different gap acceptance requirements.

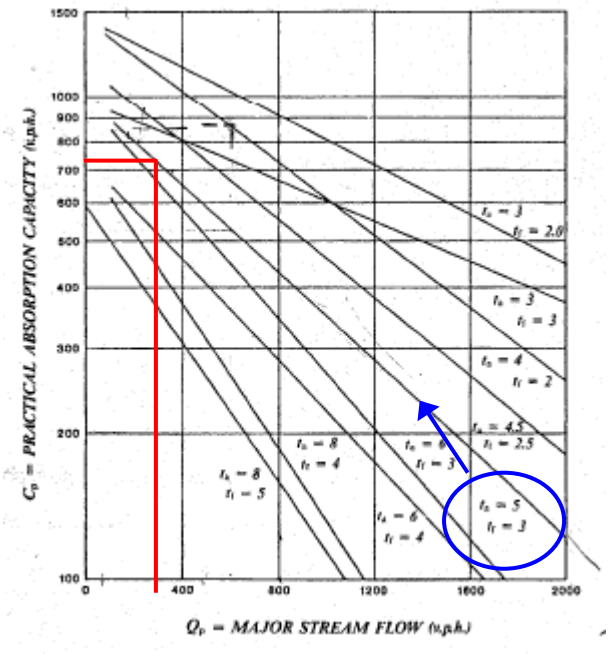

Figure 1 Practical absorption capacity at unsignalised intersections.

The t_a and t_f values correspond to the *gap acceptance* and *follow up headways* for each type of entering movement. A conservative 5 second gap acceptance (t_a) and 3 second follow up headway (t_f) were adopted for the traffic that would egress from the Porte Cochere to enter (be "absorbed into") the Burelli Street traffic. This graph indicates that for the highest case Burelli Street flow of 293 vehicles per hour, there would be a practical absorption capacity of more than 700 vehicles per hour. That is, with the available residual capacity of Burelli Street, and accounting for the gap acceptance requirements of the Port Cochere egressing traffic, more than 700 vehicles could enter from the Porte Cochere into the eastbound traffic lane of Burelli Street. As this absorption capacity greatly exceeds the "kiss and ride" transaction capacity of 150 vehicles per hour, it would be very unlikely that there would be any queuing, or queue spillback from the Porte Cochere. As such, the risk of traffic queuing back into the Burelli Street/ Corrimal Street intersection as a result of the Porte Cochere would be minimal.

The Porte Cochere will only allow light vehicle access and signposting would be installed to this effect. In this regard, all turning paths for the entry and exiting movements by a 5.2m passenger vehicle have been checked and found to be adequate. As an indication, Figure 2 below shows the entering turning path of a 5.2m passenger vehicle at a design speed of 5km/h. The turning template used is an Austroads approved version.

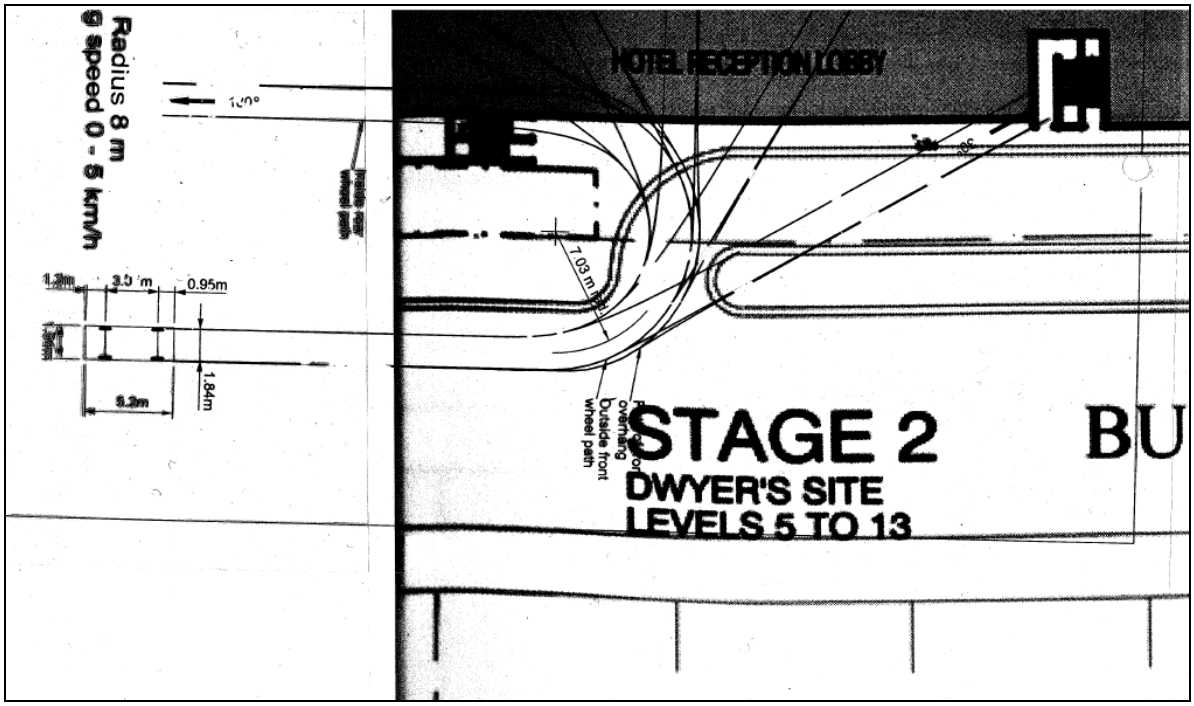

Figure 2 Turning path assessment for a 5.2m passenger vehicle entering the Porte Cochere

The letter from Wollongong City Council stated that “Porte Cochere should be either removed from the proposal or amended to comply with the WCC DCP, section 3.5”. Section 3.5 of the Wollongong City Council DCP (Department of Planning, 2006) describes Porte Cocheres as being undesirable with regard to disrupting pedestrian movements. However, it is noted that since the main pedestrian entrances to the Dwyers complex will be located at the Corrimal Street end, it is unlikely that this location of Burelli Street would carry a high volume of pedestrians. Furthermore, the Porte Cochere would provide a greater level of safety for hotel patrons as they would be laterally separated from the through traffic on Burelli Street traffic. This is one of the merits of the proposed Porte Cochere.

4. Pedestrians

4.1 Porte Cochere

The RTA’s letter expressed concerns about the width of the footpath between the Porte Cochere and the hotel lobby. Austroads (1995, p.19) states that the absolute minimum widths required for footpaths is 0.9m. The design has met this minimum width requirement.

4.2 Widths of driveway accesses at the Dwyer site

Wollongong City Council’s DCP (Section 3.5) states that accesses should be 5.4m for a double lane driveway to minimise the crossing distance for pedestrians. PB believes that this is insufficient to provide a safe passing clearance between two vehicles in adjacent lanes. As stated above, the design width of a passenger vehicle is 1.9m with an additional (approximate) 0.2m either side of the vehicle for the rear-vision mirrors. The combined width of 2.3m per passenger vehicle would mean that two passenger vehicles travelling side by side would have 0.8m of residual width for (i) clearance to any obstructions adjacent to the driveway and (ii) clearance between the two vehicles. This would not provide safe provisions for passing traffic.

The proposal to provide three-lane accesses to the Dwyer Complex would require wider access points than that stipulated in the Wollongong City Council DCP. However, this proposal has merit in that it would provide for two exit lanes. This would have the following operational and safety benefits:

- Left-turning and right-turning traffic would be separated and would have exclusive lanes. This would reduce the rear-end crash conflict, particularly for left-turning traffic as this traffic would have less impedances when entering the Burelli Street traffic.
- There would be less queuing on the ramps.
- The ramp portal would be more “open” and would improve visibility and sight distances to pedestrians and other traffic units.
- The improved visibility and “open” appearance would reduce personal security risks with regard to assault.

In these respects, the design of the proposed is regarded as being appropriate. However, to further improve pedestrian safety, pedestrian warning signs would be placed along the ramp in approach to the pedestrian crossing point. The crossing point would also be marked with an approved surface treatment (ie. either pavement marking or stencilling) to further highlight the presence of pedestrians.

5. Servicing arrangements

5.1 Town Hall Place

A response to the RTA's concerns regarding the access into and out of Town Hall Place has been provided in Section 3.1 above. The RTA also stated that Town Hall Place should be designed to accommodate for the turning requirements of a 12.5m heavy vehicle. PB notes that the design options for allowing this would be constrained by existing infrastructure including:

- The corner of the Wollongong Arts Centre (See Figure 3) which has support columns which appear to be too close to the road. This structure severely constrains any opportunities to redesign the kerb radius to allow for left-turn entry by a 12.5m vehicle.
- A kerb blister in the lane 1 (see Figure 3) of the eastbound direction in Burelli Street also reduces the track-able area available for trucks.

Figure 3 The support structures for the Wollongong Arts Centre and the kerb blister

Whilst it would be ideal to provide full access for a 12.5m truck with no reversing movements, it is not practical to do so due to the above constraints.

PB also notes the following issues regarding existing generated truck movements to Town Hall Place which should be considered in light of the Oxford Tavern proposal:

- Town Hall Place currently provides access to the Platinum apartments. These apartments would generate the occasional truck movements due to removalists and deliveries.
- The Wollongong Arts Centre has a loading dock accessible from Town Hall Place which can accommodate a rigid truck. This currently requires the truck to reverse into the dock to allow for loading/unloading into the property.
- Town Hall Place is used for delivery access to a number of commercial, retail and restaurant properties along Crown Street. PB's site inspection noted that most of these properties have industrial garbage/waste containers which would require specialised waste removal trucks (with front-lift facilities) to access Town Hall Place. Figure 4 shows containers supplied by Thiess Services, SITA and Cleanaway. SITA Environmental Solutions (no date) states that the SITA Front Lift Collection System uses trucks up to 11m in length, 2.5m wide and up to 4.2m in height (with an overall height clearance requirement of 8.5m during the container lifting process). These vehicles also carry a maximum payload of 11 tonnes and have a turning circle of 25m. Presumably, these trucks would enter via the western side of Town Hall Place.

Figure 4 Industrial waste bins in Town Hall Place.

With the current truck access requirements generate by Platinum, the Arts Centre loading dock and the commercial properties backing onto Town Hall Place, there would be existing truck access practices that would require (i) reversing movements, (ii) entry via Town Hall Place west and through the higher pedestrian usage area. Any truck access requirements of the Oxford Tavern development should also be considered in light of these current practices.

5.2 Dwyers loading dock

As requested, PB has completed a turning path assessment for all turning movements required by a 19m semi-trailer to access and egress from the proposed loading facility at the Dwyers site. This includes turning movements at the Corrimal Street/ Crown Street and Corrimal Street/ Burelli Street intersections. These have been shown in Figures 5, 6 and 7. The design tracking speed in all cases was 5 km/h.

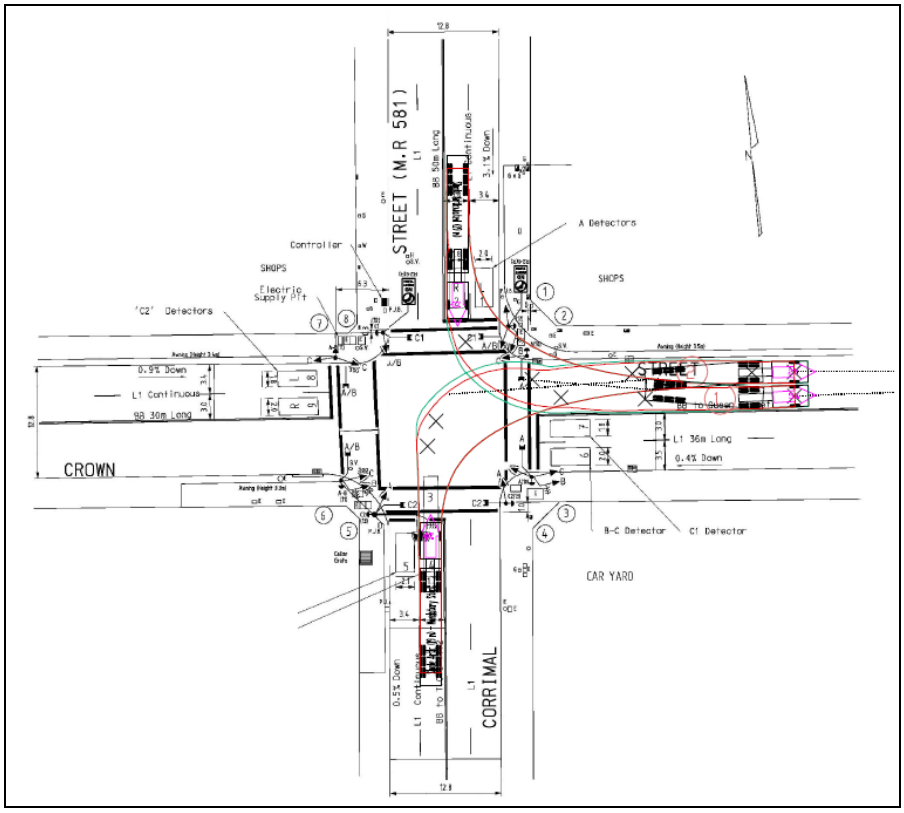

Figure 5 Turning path assessment for the Corrimal Street/ Crown Street intersection.

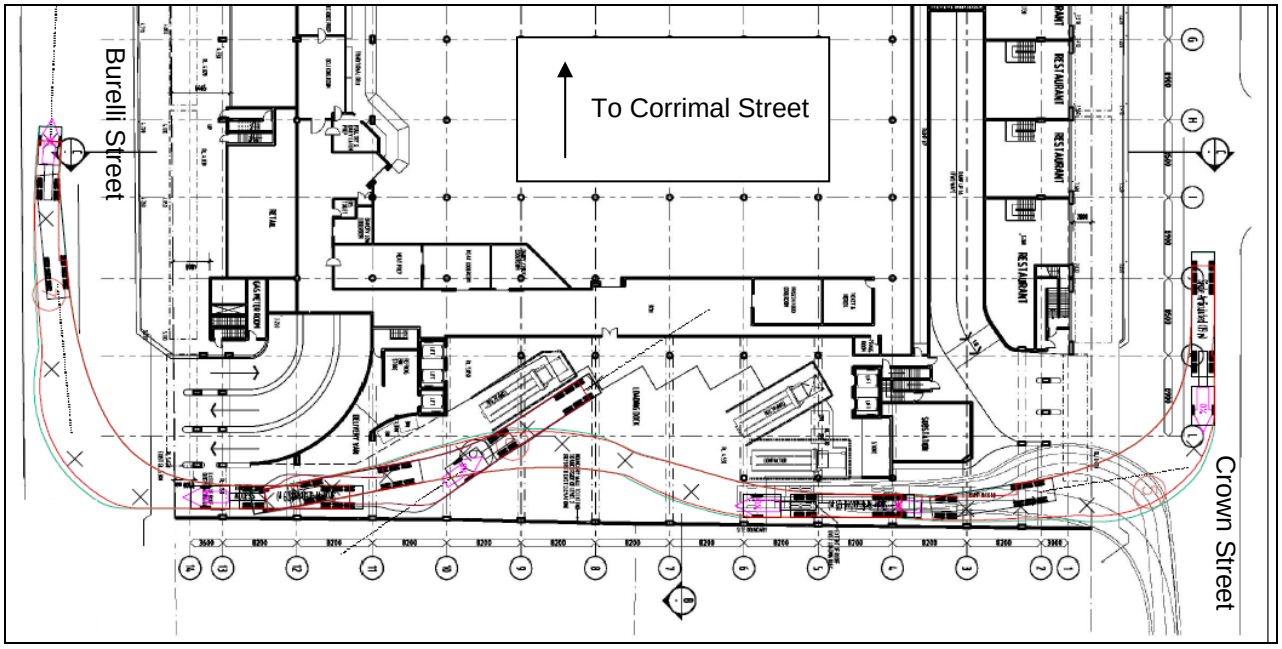

Figure 6 **Turning path assessment for the loading dock entry and egress movements.**

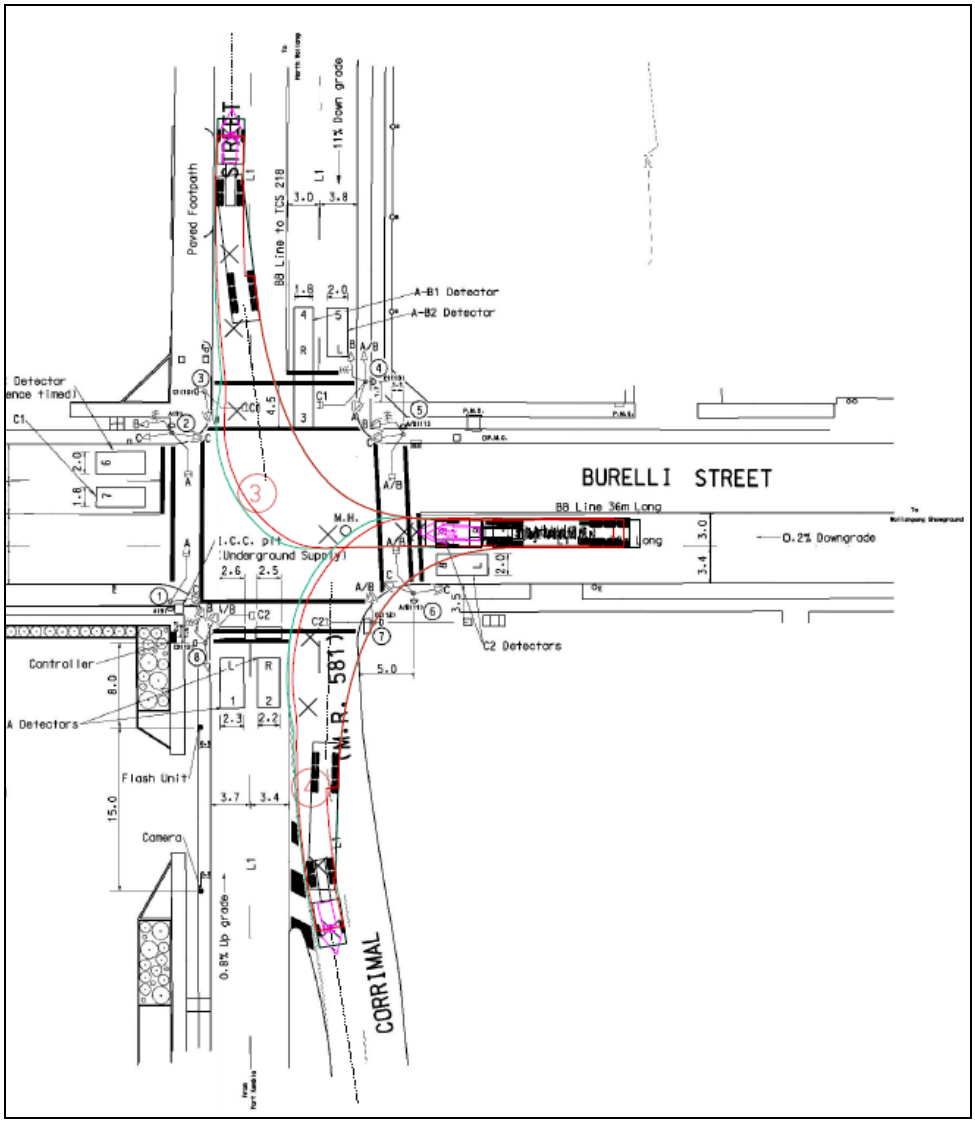

Figure 7 Turning path assessment for the Corrimal Street/ Burelli Street intersection.

The turning path assessment demonstrated that all turning movements into and out of the loading dock area by 19m semi-trailers would be achievable without encroachment over the centrelines of Crown and Burelli Streets and without encroachment over property lines.

The right-turn movement from Corrimal Street to Crown Street, and from Burelli Street to Corrimal Street would also be possible from the right-turn lane. These movements would not result in any illegal encroachment across centrelines or lane lines, and could be achieved without impact to side structures. It is noted that the Australian Road Rules were recently clarified in this regard.

The turning path assessment indicated that the left-turn movements from Corrimal Street to Crown Street, and from Burelli Street to Corrimal Street would not be possible without encroachment over the kerb line. As the kerb area would accommodate traffic signal structures and pedestrians waiting to cross the road, this is not considered acceptable. As such, PB recommends that the following management measures be considered:

- realignment of the kerb lines with minor widening of the intersection
- banning of left-turn movements by trucks and the development of a traffic management plan (TMP) to detail the required access and egress conditions for heavy vehicles accessing the Dwyer site.

6. References

Austroads (2008) Guide to Traffic Engineering Practice: Part 2: Traffic Theory. Austroads. Sydney

Austroads (1995) Guide to Traffic Engineering Practice: Part 13: Pedestrians. Austroads. Sydney

Department of Planning (2006) Wollongong City Council Development Control Plan.

PB (2007) Dwyers and Oxford Tavern proposed re-developments at Dwyers and Oxford Tavern sites – Traffic and parking assessment report: Stage 2 – Concept Report.

RTA (2002) Guide to traffic generating developments. RTA

RTA (2000) Road Design Guide – Section 4: Intersections at Grade. RTA

RTA (1991) Road Design Guide – Section 1: Basic Design Criteria. RTA

Standards Australia (1993) AS2890.5 Parking Facilities: Part 5 – On-street parking. Standards Australia

SITA Environmental Solutions (no date) *Front lift collection system* (brochure)

PB has provided the above information to support the Project Application and Concept Application reports and in response to the concerns raised by the RTA and Wollongong City Council. If there are any further queries regarding the content of this letter, please do not hesitate to contact me on (02) 9272 5694.

Yours sincerely

Damien Chee

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Parsons Brinckerhoff Australia Pty Limited