

# Memorandum

ARUP

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Subject **Life City Wollongong - Review of Traffic and Transport Assessment**

Dear Robert,

Arup has undertaken review of an updated Preferred Project Report for the proposed Life City Wollongong development, prepared by TCG Planning dated 24 October 2013. The revised Preferred Project Report addresses amendments to the project arising from submissions from government agencies and peer review of previous traffic and geotechnical reports prepared for the project. Amendments to the project from the previous proposal are as follows:

- The relocation of the Stage 1 Medical Centre, Day Surgery and Respite Care Centre to a position adjacent to the Warwick Street entrance, where the Stage 7 Residential Care Facility was previously located;
- Removal of part of Stage 4 of the project which comprises the research, library, lecture theatre and auditorium complex;
- Combining of the Stage 4 Ancillary Accommodation with the Stage 5 Medi Serviced Apartments to incorporate the accommodation for staff, patients and visitors in one building, known as the Stage 2 Medi Hostel and Medi Serviced Apartments;
- The Nolan Street access will be constructed in Stage 2 in conjunction with the Medi Hostel and Medi Serviced Apartments and at this time access from Warwick Street will be restricted to ingress/egress only to the Stage 1 (Medical Centre and Day Surgery) and emergency vehicles;
- The relocation of the Stage 7 Residential Care Facility to the position of the previous Stage 4 Accommodation and Research Facility, to therefore allow for siting of Stage 1 (Medical Centre, Day Care Centre, Child Care Centre and Respite Care) adjacent to the Warwick Street access;
- A reduction in the level of excavation required for the project, reduced from the 78,191m<sup>3</sup> of cut which was previously proposed to a net cut of 14,000m<sup>3</sup>.

The revised Preferred Project Report includes a *Traffic and Transport Assessment Report* by GHD consultants at Appendix 1. That report provides traffic engineering impact assessment for the revised proposal, and provides the focus of this review. The GHD report provides discussion of:

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- Existing Conditions – a review of existing road features, adjacent developments, traffic volumes, pedestrian facilities, sight distances and crash data;
- Proposed Development – a review of additional traffic generated from the proposed facility, proposed access/egress arrangements and parking facilities; and,
- Development Impact – assessment of sightline distances and the performance of the existing intersections (queues, delays, level of service, safety).

Arup's previous review of traffic issues for the proposed development is described in the Arup report *Life City Wollongong Review Version 3* dated 10 July 2013. That report raised key traffic-related issues as follows:

- Stage 4 remained ambiguous in terms of its operation and likely trip generation and parking requirements;
- Predicted traffic volumes on Nolan Street for full development exceeded guidelines for the environmental capacity of a collector street;
- Traffic generation calculations for the impacts analysis were assumed to be same for the morning and afternoon peak periods, and the split of generated traffic entering and exiting the site was assumed to be 50%/50% respectively in the peaks for all of the proposed land uses. This is unlikely to be the case for many of the proposed uses;
- The Nolan Street entrance was identified as requiring to be constructed as a roundabout for the full buildout of the development;
- Parking was identified to be provided to a level exceeding Wollongong City Council's DCP requirements, however this assumed that the parking on site would be shared for Stage 4 of the development.

The responses to these issues as identified in the revised Preferred Project Report and the GHD *Traffic and Transport Assessment Report* are addressed in turn below:

## 1. Traffic Generation

Potential traffic generation for each stage of the revised development is computed by GHD at Table 7 of its report. The rates and calculations for trip generation used by GHD are generally consistent with those used for the previous proposal.

Stage 4 of the development had previously proposed to include ancillary accommodation and a research, library, lecture theatre and auditorium complex. In the revised proposal the research, library, lecture theatre and auditorium complex is removed. The ancillary accommodation has been combined with the former Stage 5 Medi Serviced Apartments to incorporate the accommodation for staff, patients and visitors in one building. This will now be developed at Stage 2 as the Medi Hostel and Medi Serviced Apartments.

The previous proposal did not provide specific details of the research, library, lecture theatre and auditorium complex, but did make allowance of 100 peak hour trips to be generated by this facility in the context of 'high public transport usage'. Deletion of this facility from the proposed development removes uncertainty around its potential traffic impacts.

The details of the ancillary accommodation and combined serviced apartments are well defined, and the potential traffic generation for what is now Stage 2 is calculated by GHD on the basis of 12 x two-bedroom apartments, 6 x three bedroom apartments and 24 hostel rooms, generating 26 peak hour trip ends which exceeds the RMS rate of 0.4-0.5 trips/dwelling which is the rate for medium

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density residential development. This is therefore a slightly conservative estimate of potential trip generation, considering that the Stage 2 facilities will only be available for use by staff, patients and visitors, however it is noted that the calculations assume a worst case with no public transport use for access to the development.

The Hi-Tech Holistic Cancer and Medical Hospital is specified as having 320 beds. GHD allows for 275 peak hour trip ends for this facility, based upon assumptions from the preliminary assessment. Arup has checked this against the rates from RMS' traffic generation guidelines, which provide private hospital estimates for peak vehicle trips as  $-22.07 + 1.04 \times \text{beds}$  giving 310 trips, or alternatively evening commuter peak trips as  $-11.96 + 0.69 \times \text{beds}$  giving 208 trips. Given this range and the regression parameters of the RMS formulae, an estimate of 275 trips appears reasonable.

Total trip generation for the revised proposal is calculated as 470 peak hour trip ends at full development. This is reduced from the previous proposal which was estimated to generate 602 peak hour trip ends with inclusion of the research, library, lecture theatre and auditorium complex and 502 peak hour trip ends without this complex.

The reduction from 502 to 470 trip ends without the complex arises primarily from the changed assumption that the Holistic Health Care Course facility will be for on-site use only and no additional traffic generation will result from this use.

On the basis that this is the case, the computations for the potential level of traffic generation for the revised proposal appear reasonable for the purposes of assessing impacts of the development on the surrounding transport network.

## 2. Nolan Street Traffic Volumes

GHD identifies typical nominal traffic volumes expressed in terms of annual average daily traffic (AADT) serviced by various functional classes of road at Table 1 of its report, citing RMS as a source. The table specifies that collector roads have a nominal environmental capacity of 2,000-10,000 vehicles per day. The RTA *Road Design Guide 1991* provides the following 'factors for functional classification of roads':

		Arterial	Sub-Arterial	Collector	Local
Traffic use:	In a residential area	no limit	20,000 veh/d max	5,000 veh/d max	2,000 veh/d max
	In other areas	no limit	20,000 veh/d max	10,000 veh/d max	4,000 veh/d max

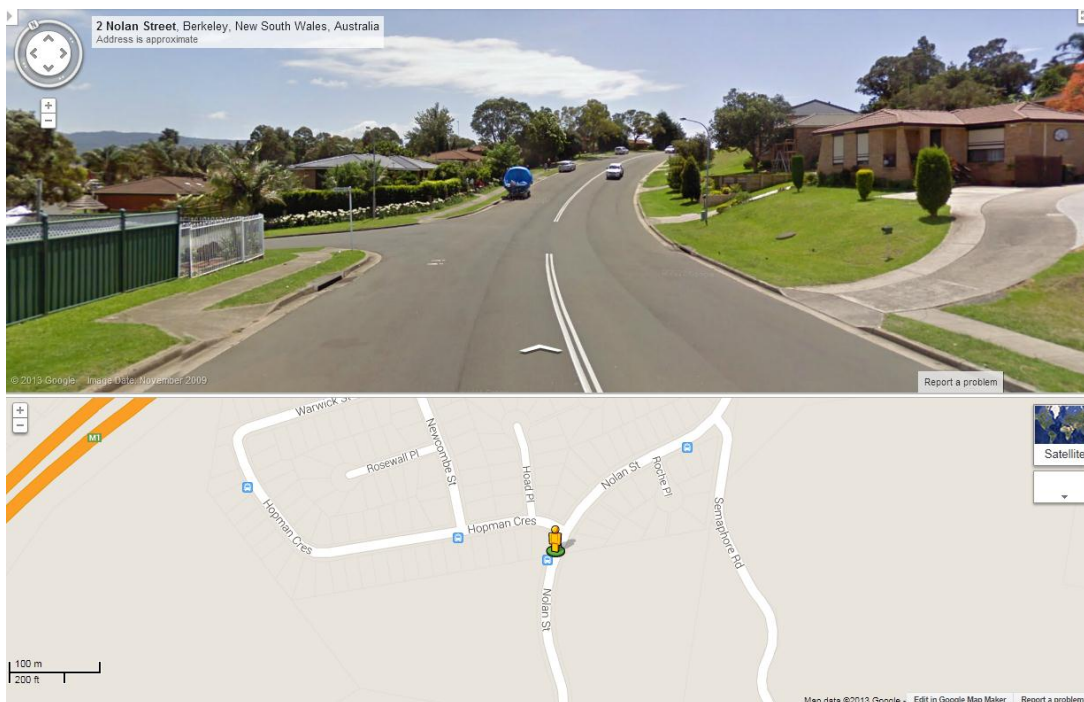
The Road Design Guide indicates that a collector road in a residential area has a desirable maximum environmental capacity of 5,000 vehicles per day and a collector road in a non-residential area has a desirable maximum environmental capacity of 10,000 vehicles per day.

Nolan Street has a wide cross-section with width for a single lane plus a parking lane in each direction, as shown in Figure 1 and Figure 2.

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**Figure 1. Nolan Street view north at Warwick Street (Source: Google Maps 2013)**



**Figure 2. Nolan Street view north at Hopman Crescent (Source: Google Maps 2013)**

While it has residential frontages along its length as can be seen in Figure 2, Nolan Street serves an important collector function including carrying bus services. GHD identifies from surveyed volumes that Nolan Street is currently carrying around 4,000-4,600 vehicles per day.

Based on background traffic growth forecasts sourced by GHD from the Wollongong Shoalhaven Strategic Traffic Model, volumes on Nolan Street will exceed 5,000 vehicles per day in 2031

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irrespective of development of Life City Wollongong. GHD identifies that with development of Life City Wollongong, traffic volumes on Nolan Street will reach around 7,400-7,800 vehicles per day in 2031.

It is recognised that these volumes exceed the current standards for the desirable classification limit for Nolan Street. However, given the wide cross section of Nolan Street and that the volumes remain below 10,000 vehicles per day (the current limit for a collector street in other/non-residential areas), we consider that these future/+18 years volumes with development of Life City Wollongong are reasonable and acceptable for a road of the nature and function of Nolan Street.

### 3. Traffic Generation Directional Assumptions

Arup's review of the previous proposal identified that the split of generated traffic entering and exiting the site had been assumed to be 50/50 for all land uses, and that this was unlikely to be the case for many of the proposed uses and would most likely underestimate critical directional flows in peak periods.

This assumption has been retained in the assessment for the revised proposal.

In reality, it is probable that there will be some degree of directionality of flows into and out of the Life City development, dependent primarily on staff shift times for the medical centre, child care centre, hospital and residential care facility. Visitors and resident self-care seniors may be expected to have more evenly split trip patterns by in and out directions in the peaks.

This assumption impacts the computed traffic volumes used in simulation modelling with SIDRA to determine Levels of Service at key intersections providing access for the development. It does not impact the estimates of total daily traffic volumes on key access roads such as Nolan Street, Warwick Street, Northcliffe Drive.

The intersection simulation results presented by GHD indicate that the performance of critical intersections on Nolan Street and Northcliffe Drive is projected to range from good (LoS B) to satisfactory (LoS C) in AM and PM peak periods in 2031.

Given this, it is unlikely that changes in the assumptions for directional split of traffic to/from the proposed development in peak periods will have sufficient impact to change the outcomes for projected intersection performance. We would accept that on this basis further analysis for alternative directional assumptions is not required.

### 4. Nolan Street Entrance

Assessment for the previous proposal had identified that a roundabout would be required at the Nolan Street entrance to the development to cater for projected traffic volumes accessing the site in 2031.

With the reduced scope of development for the revised proposal, traffic volumes accessing the site in peak periods are projected to be lower, and GHD's assessment indicates that a roundabout is no longer required.

Inspection of the SIDRA simulation model results for the revised proposal shows that in 2031 there are minimal queues (one vehicle or less) indicated for vehicles turning right or left into the site from Nolan Street in peak hours. Queues for vehicles turning out of the development onto Nolan Street are indicated to be no greater than around 23m for 95% of the time. This is well within the storage length of the access road connecting the development to Nolan Street.

These outcomes support that a roundabout is no longer required at the site entrance on Nolan Street.

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## 5. Parking

The previous proposal identified that parking provision would exceed the requirements of Wollongong City Council's DCP, however this was assumed to be shared across the site. Stage 4 in particular was considered to be ambiguous with respect to its operation or actual requirements.

With the deletion of Stage 4 and the relocation of some uses, parking has been rationalised under the revised proposal. A total of 580 spaces are proposed to be provided, exceeding the requirement of 558 spaces from Wollongong City Council's DCP. Parking is proposed to be provided by stage and appropriately associated with the different stages of development.

Bicycle, motorcycle and disabled parking are also provided in accordance with AS2890.6 and Council's DCP.

The parking provision quantities and arrangements are considered appropriate.

## Conclusion

Arup has reviewed traffic and transport issues related to the revised Preferred Project Report for the proposed Life City Wollongong development, prepared by TCG Planning dated 24 October 2013 and the supporting *Traffic and Transport Assessment Report* by GHD consultants.

The revised proposal appropriately addresses concerns arising from the previous development proposal related to:

- traffic generation;
- environmental capacity of local streets;
- assumptions for directional flows of generated traffic in peak hours;
- the site entrance at Nolan Street; and,
- parking.

We consider that the traffic and transport planning arrangements for the revised proposal are sufficient and adequate and that traffic impacts from the proposal can be accommodated by the existing and proposed transport infrastructure to acceptable standards.