

8. CONCLUSIONS

The proposed structure plan for Macquarie Park as illustrated in the draft Macquarie Park Corridor DCP has been assessed using the (Quadstone) Paramics traffic micro-simulation package to determine:

- whether the internal, local road network is sufficient to meet expected year 2031 traffic demands; and
- what connections to the major road network and what major road network improvements should be provided in and around Macquarie Park by 2031.

A base year (2007) Paramics model has been created and validated to a level suitable for development of the 2031 traffic demands and networks and also for the further development of a base year model to be used for the testing of the impacts of individual developments or short term network improvements in the area.

This model was then run with the currently approved LEP (LEP137) in 2031 using the existing road network. This modelling demonstrated excessive congestion near the boundaries of the model with insufficient network capacity to accept the expected traffic demands. Essentially this would mean that the LEP137 development could not be realised unless additional transport capacity was provided into the area.

The 2031 modelling has assumed a public transport share of 40% of trips to, from and within the study area. This has been deemed as being an achievable target due to:

- the impending opening of the Epping to Chatswood Rail Line;
- the commitment of bus lanes on Lane Cove Road;
- expected additional bus services in the study area; and
- the requirement of workplace travel plans for all developments in the area, similar to what Optus have recently provided.

Based on the 40% public transport share, it is expected that the traffic generation of much of the existing developed areas of Macquarie Park will remain at year 2007 levels up until 2031, with the key exceptions being:

- Macquarie University;
- Macquarie Park Shopping Centre; and
- the eastern section of Macquarie Park between Lane Cove Road, Epping Road and the M2.

As Macquarie Park continues to develop with commercial buildings, the morning peak will evolve as a far more congested period than the afternoon peak.

Furthermore, most of the traffic growth inferred from the strategic transport model for the area (and input into the Paramics model), shows the largest growth will be on the M2 and on Lane Cove Road north and south of the study area. Based on this, the largest traffic movements in the study area in 2031 are expected to be in the north/north-west near Macquarie University as well as in the east near the M2/Pittwater Road/Delhi Road area. In particular, the M2 is expected to play an increasingly important role in getting traffic through the study area, as well as to/from Macquarie Park, particularly given capacity limitations on other roads such as Epping Road and Lane Cove Road.

Key findings from the modelling of the 2031 road network requirements for Macquarie Park under LEP2008 are:

- the internal (local) road network within Macquarie Park comprises a dense grid of roads and intersections which provides well in excess of the capacity required for local traffic movements;

- access to Macquarie Park is generally best provided by getting Macquarie Park traffic off the major network at multiple points on Epping Road (generally via new left in/out accesses) as well as out of Macquarie Park via more controlled movements onto Lane Cove Road via new signalised intersections. Without these multiple access opportunities, fewer key intersections significantly exceed their capacity thereby affecting other parts of the major road network well beyond Macquarie Park; and
- the most significant road network improvements needed are along/around the M2 with a significantly upgraded interchange at Herring Road, some improvements at the Lane Cove Road interchange and a much wider cross-section between these interchanges (i.e. ten lanes).

With the network improvements identified in this report, the study area road network operates in 2031 without any significant congestion which blocks other major intersections. The only exception is the approach capacity from Lane Cove Road in the north in the morning peak which queues extensively (as it does in 2007).

Even a tunnel running under Lane Cove Road from north of the M2 to south of Epping Road does not alleviate this queue as most of the queued traffic is associated with the M2 and Macquarie Park, rather than being movements which pass through the area from north to south. This congestion is more related to broader network issues and the spacing of alternative north-south corridors to carry traffic to east-west motorways in this region.

The assessment of a number of supplementary options requested to be investigated by the RTA resulted in the following additional conclusions being drawn:

- limiting the number of left in/left out connections from Macquarie Park onto Epping Road has a negligible effect on travel times and congestion on the network;
- removing the proposed traffic signals at Road 1/Lane Cove Road and Road 2/Lane Cove Road intersections and replacing them with left turns in only has a noticeable effect on travel times. Whilst making these changes does not cause the model network to “gridlock” removing the ability for movements across Lane Cove Road puts extra pressure on Epping Road and Lane Cove Road in the morning peak and on the Waterloo Road and Talavera Road intersections with Lane Cove Road in the afternoon peak and reduces pedestrian and traffic accessibility across Lane Cove Road. Also, there is a strong weaving manoeuvre associated with right turns from Epping Road into Lane Cove Road and then left into Road 2, introducing potential safety issues. This manoeuvre is significantly reduced if through movements across Lane Cove Road from one side of Road 2 to the other are allowed;
- the proposed signalised intersection of Road 1 with Lane Cove Road only requires a single lane right turn out of Road 1 to cater for a relatively localised catchment. Importantly, the key benefit of this intersection is the free left turn providing an alternative location away from Waterloo Road and Talavera Road intersections where this can be made;
- the proposed new signals at Lane Cove Road/Road 1 and Lane Cove Road/Road 2 can be configured to accommodate single-stage pedestrian crossings across Lane Cove Road without significantly affecting travel times or congestion, due to the capacity relief provided by new ramps to/from the M2. However, there are expected to be significant pedestrian volumes at the Waterloo Road intersection with Lane Cove Road associated with pedestrians entering and leaving the new rail station. This may introduce pedestrian capacity issues and therefore warrant some form of pedestrian grade separation across Lane Cove Road which would in turn provide an improvement to traffic operational capacity on Lane Cove Road;
- traffic using the proposed Herring Road eastbound on ramp is relatively insensitive to tolls whereas a small toll on the westbound off ramp diverts the majority of this traffic down Talavera Road;

- providing an M2 off ramp to the western end of Waterloo Road, instead of the double left turn off ramp onto Lane Cove Road southbound is an effective alternative which also allows the north to west loop-ramp to be maintained at the Lane Cove Road/M2 interchange. Also, the existing north to west on ramp loop from Lane Cove Road to the M2 is a more effective configuration than a right turn overpass;
- not providing a north to east on ramp from Lane Cove Road to the M2 has a negligible effect on traffic performance of the network; and
- if the Lane Cove Tunnel remains two lanes each way there is not expected to be any significant effects back into Macquarie Park based on the “pinch point” for the M2 being expected to be further to the west.

9. RECOMMENDATIONS - PROPOSED TRAFFIC NETWORK FOR MACQUARIE PARK

9.1 LOCAL INTERNAL ROADS AND INTERSECTIONS

Table 9.1 identifies the road width requirements by road within the Macquarie Park Corridor. Construction costs have not been provided for “local” works as it envisaged that these would be undertaken as part of development in the area.

Table 9.1: Road Width Requirements, Local Roads

Road	Recommended Traffic Lanes	Auxiliary Lanes ¹
Talavera Road (Herring Road to Lane Cove Road)	Four lanes plus intersection widening	Yes
Talavera Road (Christie Road to Herring Road)	Six lanes	No
Waterloo Road	Four lanes generally, plus widening at Lane Cove Road and Herring Road intersections	Yes
Herring Road	Four lanes (existing configuration), plus localised widening at Waterloo and Talavera Road intersections	No
Road 2 (Lane Cove Road to Road 9)	Four lanes (two lanes on approach to Lane Cove Road and two lanes on approach to Road 9 transitioning back to one lane)	No
Road 38	Four lanes plus intersection widening	No
Lyon Park Road (Epping Road to Byfield Street)	Four lanes	No
All other roads in Macquarie Park	Two lanes	Yes

¹ Whilst on-street parking may be discouraged on some streets, auxiliary lanes may be provided for bicycle lanes, bus stops, informal deceleration lanes to accesses, peak period clearways etc.

Table 9.2 provides the changes to the local road connections and intersections shown in the publicly advertised street network for LEP2008.

Table 9.2: Changes to LEP2008 Local Road Connections and Intersections

Connection/Intersection	Recommendation
Road 3/Lane Cove Road	Remove connections to Lane Cove Road (i.e. cul-de-sacs Road 3)
Road 8 (south), Road 16 and the unnamed road east of Wicks Road	Remove connections to Epping Road (i.e. cul-de-sac these roads)
Road 9/Epping Road and Road 11/Epping Road	To be left in/left out movements only
Road 1/Lane Cove Road and Road 2/Lane Cove Road	New traffic signals
Waterloo Road/Herring Road	Double right turn from Waterloo Road into Herring Road
Herring Road/Talavera Road	As per changes shown in Table 5.2
All other intersections	As per intersection controls shown in Table 5.2

9.2 MAJOR ROADS AND INTERSECTIONS

Table 9.3 summarises the major road network improvements surrounding Macquarie Park required to provide sufficient capacity in the study area in 2031, assuming a 40% public transport mode split. These recommendations have been made considering road capacity, accessibility, road function and safety considerations. Indicative construction cost ranges have been provided as well.

Table 9.3: Major Road Recommendations

Major Network Element	Requirements	Construction Cost Range ¹
M2 (west of Herring Road)	Six lanes (eight lanes if possible) mid-block	n.a. ²
M2 (Herring Road to Lane Cove Road)	Ten lane cross-section for entire section	\$80M-\$120M
M2 (Lane Cove Road to Delhi Road)	Eight lane cross-section (five lanes westbound, three lanes eastbound) reducing to seven lanes (four westbound, three eastbound) south of the new Lane Cove Road off ramp from the M2 westbound	\$50M-\$70M
M2 east of Delhi Road	Six lanes (eight lanes if possible) mid-block	n.a. ²
Lane Cove Road (north of M2)	Six lanes mid-block plus intersection widening	\$50M+ ²
Lane Cove Road (M2 to Epping Road)	Eight lanes mid-block generally (nine lanes north of Talavera and ten lane cross-section south of Road 1, including bus lanes)	\$30M - \$50M
Lane Cove Road south of Epping Road	Generally, seven lane section (four northbound and three southbound) to Kent Road, and six lanes mid-block south of Kent Road	\$10M - \$20M
Epping Road	Existing through lanes generally sufficient west of Lane Cove Road (intersection improvements and Herring Road overpass costed separately in Table 9.4).	\$0
Delhi Road	Seveb lane section primarily due to intersection right turn pocket needs (M2 to Plassey Road)	\$40M - \$60M

¹Indicative costs only, not based on design plans or quantities

²Dependant on how far beyond the model boundary the works are extended

Table 9.4 provides the recommended major intersection and interchange upgrades with indicative construction costs also provided.

Table 9.4: Major Intersection/Interchange Upgrade Recommendations

Major Intersection	Upgrade Recommendation	Construction Cost Range ¹
M2/Herring Road Interchange	New two-lane east facing on and off ramps and a two lane overpass from Herring Road across Talavera Road to the ramps for the M2	\$30M-\$50M
New M2 westbound off ramp	A new westbound off ramp from the M2 to the western end of Waterloo Road (with grade separation across the Delhi Road on ramp)	\$10M-\$20M
Epping Road/Delhi Road	A new grade separated right turn from Epping Road into Delhi Road and onto the westbound on-ramp of the M2	\$5M-\$10M
Epping Road/Herring Road	Epping Road overpass over Herring Road and change lane markings at existing signalised intersection	\$5M-\$10M
Pittwater Road/Epping Road	Signalised double left turn from Pittwater Road into Epping Road	\$1M-\$2M
Wicks Road/Epping Road	Double right turn pockets from the northern and western approaches and lengthen the four "stand-up" lanes on the southern approach	\$1M-\$2M
Lyon Park Road/Epping Road	As per configuration in Table 5.2	\$5M-\$10M
Epping Road/Balaclava Road	Double right turn from the eastern approach and extension of the four "stand-up" lanes on the southern approach	\$1M-\$2M
Road 1/Lane Cove Road	New signalised three-leg intersection	\$1M-\$2M
Road 2/Lane Cove Road	New signalised four-leg intersection	\$2M-\$3M

¹Indicative costs only, not based on design plans or quantities