Better Transport Futures

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Ms Paula Poon,
Director, Panel Secretariat
NSW Department of Planning and Infrastructure

Traffic Planning and Engineering Peer Review
DA/10/1049 – Proposed Mosque, 158A and 164 Croudace Road, Elermore Vale NSW

Further to your instructions we have now completed our review of the traffic planning and engineering aspects of the development application for the above project. This review has taken into consideration the requisite guidelines and standards for traffic engineering practice and design.

The purpose of this Peer Review is to:

1. Provide an independent review of the methods applied to assess the traffic impacts associated with the subject site
2. Make comment on the adequacy (or otherwise) of the assessment techniques and the relevance to the range of traffic, environmental capacity and amenity issues as they relate to the proposed traffic operations of the development and its impacts on the surrounding street system.

Significant issues of consideration are as follows:

1. Car Occupancy
2. Traffic Generation Rates
3. Parking Demand
4. Background Traffic Flows
5. Access operation and Junction controls
6. Special Events
7. Safety

Comments on these issues are provided below.

1. Car Occupancy and Traffic Generation Rate

a. The applied car occupancy rate leads to the predicted traffic generation rate and car parking demand for the subject site. It has been derived from a single spot survey of existing operations at the Newcastle Mosque at 6 Metcalf Street Wallsend. This was undertaken because there is no specific traffic generation rate for the subject use contained within the recognised traffic guidelines (RTA or Council).
b. RTA guide allows for this type of assessment by encouraging surveys of similar land use activity in the absence of published rates of traffic generation.
c. The adopted traffic generation rate is derived from a car occupancy rate of 3, within a range observed of 1 to 5 on a single day at the existing Mosque. This also leads to calculation of a traffic generation rate of 400/3 = 133 trips for the Friday afternoon prayer session.
d. If this rate was 1.5 as is contested, then the traffic generation rate would double.
e. If this rate was 1.5 as is contested, then the parking demand would also double.
f. It is not considered reasonable here to apply the traditional place of worship rates, (and this has not been done in the applicants traffic assessment) as this development activity is not that of the type of place of worship covered by the RTA guide; i.e. the timing and nature of the Friday prayer session requires patrons to travel from a range of other activities, with a need to in many cases return to their previous place of activity e.g. work.

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This places a different level of importance on the ability to travel quickly (particularly if utilising a short break and returning to work/ lectures etc.) and hence, in my opinion, will lead to a different traffic generation profile to a weekend place of worship activity.

2. Parking Demands

a. As stated above if the car occupancy rate is halved to the contested 1.5 then the parking requirement for the site would increase to 400/1.5 = 267, which would exceed the on site provision by ~ 100 spaces.

3. Access & Junction controls

a. Analysis of the access should, in my opinion, consider the interactions of ñprivate drivewaysò given their proximity and potential volume of conflicting traffic movements.
b. The shopping centre exit will be impacted by the proposed site access, as will the adjacent residential housing access.
c. By considering these additional movements, the predicted performance of all movements (existing and proposed) will be more realistic.
d. It is reasonable to expect such movements should be considered in junction analysis as these movements will have a direct influence on gap acceptance and hence delays at the access for the subject site.
e. The ability to control access movements by restriction needs to be considered in a practical sense, not just a convenience to eliminate a problem movement; e.g. the banning of the right turns from the subject site means these movements will be performed at the nearest convenient point of U turn. This is most likely to use residential streets in the vicinity of the Wallsend South Public School e.g. Grandview Road and may lead to other safety concerns which have not been addressed by the applicant.
f. I do not accept the assertion that traffic signals (or other higher order control) should not be considered in a situation such as this, because it will introduce unacceptable delays to the through traffic on Croudace Road. If such a premise were followed, then traffic signals would not exist, e.g. at the McCaffery Drive / Lookout Road intersection, nor anywhere for that matter. It is a balance between network efficiency and safety that is required, and hence traffic signals or other forms of higher order control are considered to maintain safety of movement for all users as conflicts increase.
g. I accept the premise that the junction of Garsdale Avenue with Croudace Road operates poorly at peak times at present, and that this is not an issue to be addressed by the subject development alone. However it will worsen this impact albeit with a minor level of increase in peak flows, and to not address it will lead to further deterioration of traffic conditions.

4. Background Traffic Flows

a. It has been correctly explained that the appropriate times for assessing the Friday afternoon prayer session for arrivals and departures are before 1pm and after 2pm.
b. The distribution of flows is also subject to variations, and it is common practice to assess these for a range; for example as well as the assumed 50/50, assess 60/40, 40/60, and even 70/30. This is particularly so where there is little evidence to support the assumptions.
c. Where there is available data on origins (e.g. by postcode of origin) of patrons (which is usually readily available) this can be used to provide a greater level of confidence in this assumption.
d. It is also a standard practice of the road authorities to consider 10 year projections of background traffic, to simulate the effects of wider traffic growth on the road network. This is not merely about development in the immediate vicinity of the subject site, but rather the cumulative impact of development across the region.
e. Another consideration at this point is the phenomenon of peak spreading. As the peak flows on Croudace Road are approaching the nominal capacity of a traffic lane (900vplph) and as demand continues, the timeframe of the peak spreads. There are 2 distinct PM peaks on Croudace Road, at 3pm (School related) and at 5pm (Commuter) peak.

f. Other factors that should also be considered in assessing the level of background growth are the extent, if any, of network development:
   i. In this instance the completion of the Hunter Expressway is going to significantly alter the traffic flow profile on the Newcastle Link Road / Newcastle Road corridor (the RTA is currently studying this corridor with the view of increasing its capacity)
   ii. Growth in flows on this corridor is likely to maintain the attractiveness of the Croudace Road / McCaffery Drive sub arterial connection. This is in spite of capacity improvements proposed by the RTA. The growth in flows will be considerable, and Croudace Road will continue to present as an attractive alternative for some trips into the future
   iii. It is possible to forecast the change in traffic flows without the development on a route such as Croudace Road from the RTAôs regional traffic model, as a guide to the extent of background traffic growth that might be expected. However in this instance the use of 2%-3% p.a. for 10 years is in line with accepted practice

5. <u>Assessment of Access operation</u>

a. Sensitivity testing of key assumptions where there is no supporting data or published facts, is routinely requested by the road authorities, and is applied to test the robustness of traffic planning decisions. In this instance the following parameters could be adjusted:
   i. Car occupancy rate
   ii. Peak hour flow factors
   iii. Background traffic flows
   iv. Traffic distribution assumptions
b. To demonstrate how this might affect the considerations here I have performed an independent SIDRA analysis of the site access with the following parameters:

   1. Car occupancy varied to 1.5, 2, 2.5 and 3 people per vehicle
   2. Distribution of 60 East / 40 West (Affects approach, not departure)
   3. Background traffic growth of 20% (2%p.a for 10 yrs) and 30% (3%p.a for 10 yrs)
   4. Base traffic flows reflecting 12.30pm arrivals, 2.30pm departures
   5. Allowance for shopping centre movements (as quoted in assessment material)
   6. Arrival and departure timeframes of 30 mins (with other flows adjusted to match)

c. The junction analysed is a simple priority controlled T junction, allowing all movements except the right turn out of the site as is the latest proposed access arrangement. RTA gap acceptance parameters have been applied.
d. The significance of the assumption on car occupancy is demonstrated by this analysis, with the left turn from the site failing once the occupancy drops below 2 people. Whilst the queuing is essentially contained on site, it brings into question the interaction of this access and the subsequent external movements, which vary between 4 and 9 vehicles per minute, half of which, if the assumptions on distribution are correct, will need to perform a U turn somewhere. These U turn movements and their impacts on other local junctions have not been tested. Confirmation of these and control at specific locations would improve traffic safety.
e. My conclusion from reviewing the intersection modeling / analysis as completed for the applicant, and the assessment conducted on behalf of Council, is that there is sufficient doubt in the voracity of the assumptions (particularly the car occupancy assumption), and hence the subsequent analysis relied on as part of the submission, to place doubt as to whether the access operation as proposed and predicted can operate without some level of deterioration of the general road environment.
f. It is also possible that some patrons may choose to not use on site parking because of possible delays and queuing on departure, especially if there is a need to meet a time deadline for another activity.

6. **Special Events**

a. It has been noted that the subject site plans several special events each year, and that these events can generate significant traffic and parking demands. The anticipated attendance at these events is up to 450 people, and at a time slot of 7:30am to 9:00am.
b. Whilst the day varies for these events, it is not unreasonable to expect analysis of a planned event which could generate significant traffic and parking demand, which at the nominated timeslot could coincide with AM peak traffic flows on the adjacent network, and also during school zone operations (given there is a zone that could be affected by site traffic movements).
c. It is not usual to design to cater for peak events of this nature however it is usual to plan to accommodate the anticipated demands in an orderly and controlled manner.
d. In the absence of any supporting information for these special events, it is recommended conditions of consent exclude this use, and that a separate application be prepared to cover these activities, should this be required.

7. SAFETY

a. I can confirm that site access facilities are able to meet the basic design requirements.
b. However to rely on any level of essentially uncontrolled U-turn movements, particularly with the multiple driveways and multiple movements (i.e. they are not simply standard residential blocks) is not moral traffic engineering practice, in my opinion.
c. I agree with Council officer comments that the only way to prevent illegal manoeuvres at the site entrance would be to place a central median in Croudace Road. This however conflicts with other access and is not possible. There is therefore a risk associated with enforcement of this turn prohibition.
d. The level of flows from the shopping centre access, and from the subject site are akin to those at minor intersections within a residential estate. For such movements Councilôs and other industry guidelines would not recommend offset ñjunctionsò with conflicting flows, such as would occur here.
e. Left turn exit only appears to be the only option, with subsequent U turns performed to head in the desired direction.
f. It should be noted that it would be possible to control the subsequent Uï turn movements created by this exit turn prohibition, within the local road network (for example by providing approach medians in Grandview Road at Croudace Road where this manoeuvre may be undesirable).
g. The extent of traffic performing this U-turn manoeuvre could be as high as 130 vehicles in a 30 minute period (depending on the car occupancy figure adopted.) Whether this exceeds environmental capacity thresholds as stipulated by the road authorities has not been tested.

CONCLUSION

From a review of the traffic investigations performed to support the subject development and the assessment of the same, I can conclude:

1. That the basic approach adopted is consistent with accepted traffic planning and engineering techniques required by the road authorities.

2. However, given the nature of the subject development, which falls outside the normal parameters covered by the RTA Guidelines to Traffic Generating Developments (RTA 2002), there is some doubt about the voracity of assumptions that have significant influence on the predicted levels of traffic generation and parking demand for the site.

3. The most critical assumption in the traffic assessment is that of an average car occupancy of 3 people. This flows on to affect rates for both peak traffic generation and peak parking demand. Given the importance of this assumption, it is reasonable to expect a greater level of validation of this parameter, given the possible impacts of it being a lower figure and the risk of this then impacting negatively on traffic operations, and also resulting in the on site parking allocation being inadequate for the siteôs demands.

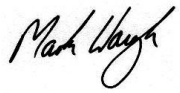
4. There are numerous examples of this type of land use activity in our cities that could be used to confirm (or deny) the car occupancy figure assumed here. This would allow the proposalôs traffic and parking arrangements to be assessed with a greater level of confidence and statistical validity (as is the case for the more common land uses contained within the RTA guide).

5. The extent of impact of special events has not been tested as part of the D/A submission and, given the time frames noted coincide with AM peak on street activity, it is concluded these events should be subject to a separate assessment and approval.

6. Croudace Road is a busy sub arterial road, and will, in my opinion, get busier over time. It is also appropriate to consider a level of growth in background traffic levels as part of the assessment.

7. The proposal ultimately relies on a level of U turns elsewhere to offset the inability to control all movements at its single entrance. There is no specific control of these turns which may impact on local residential streets, and the extent of this impact has not been considered in any detail. However it is considered feasible to address these concerns within technical guidelines.

The overall conclusion in relation to the traffic assessment of the subject site is that there is some risk that predicted traffic and parking demands have been underestimated which could lead to greater impacts on the surrounding street system than is envisaged from the traffic investigations conducted in support of and assessment of the subject development.



Mark Waugh
Director

Attachments A BTF Checklists of Assessment Issues ï RTA Guide to Traffic Generating Developments

Attachment A - BTF Checklists of Assessment Issues - RTA Guide to Traffic Generating Developments

Item	Issue	Comment
2. EXISTING SITUATION		
2.11 Site Location and Access	YES	Location of driveway conflicts with public housing driveway and shopping centre access opposite.
2.2.1 Road Hierarchy	NO	Croudace Road / McCaffery Drive sub arterial road, carries ~ 18600 vpd.
2.2.2 Road works	NO	None noted in vicinity of site
2.2.3 Traffic Management Works	NO	None noted.
2.2.4 Pedestrian and Cycling Facilities	NO	Pedestrian path on both sides of Croudace Road. No specific cycling facilities.
2.2.5 Public Transport	NO	Bus stops adjacent to site on Croudace Road. (< 400 metres).
2.3 Traffic Flows	YES	Traffic Count completed, but unclear if shopping centre and other interacting movements included
2.3.1 Daily Traffic Flows	YES	High daily traffic on Croudace Road ~ 18600vpd. NO Count performed on Garsdale Avenue. No count on Grandview Road.
2.3.2 Daily Traffic Flow Distribution	YES	Assumptions on Flow distribution are unsubstantiated.
2.3.3 Vehicle Speeds	NO	NO speed survey completed. Post speed limit is 60 km/h. General traffic observations to be travelling at or below posted speed limit (60 km/h). Note speed camera south-east on McCaffery Drive
2.3.4 Existing Site Flows	NO	One residential dwelling only ï minimal flows
2.3.5 Heavy Vehicle Flows	NO	One residential dwelling only ï minimal flows. Garbage collection vehicles on street in Croudace Road only.
2.3.6 Current Road Network Operation	YES	Dominated by Elermore Vale shopping centre. Fair - intersection of Croudace Road / Garsdale Avenue simply T junction priority operates poorly now.
2.4 Traffic Safety and Accident History	NO	NO information provided. Council review shows some low level accident history
2.5 Parking Supply and Demand	YES	Low on-street parking noted adjacent to site, potential to conflict with bus stops, shopping centre access etc if on site supply inadequate.
2.5.1 On-street Parking Provision	NO	Parking allowed on Croudace Road. BUT multiple access points and bus stops limit available space.
2.5.2 Off-Street Parking Provision	NO	Majority of adjacent residential property have driveway and garage space.
2.5.3 Parking Demand and Utilisation	NO	Low levels of vehicles parked adjacent to site. Kerb side parking on Croudace Road not fully utilized.
2.5.4 Set down or pick up areas	NO	Bus stops on Croudace Road.
2.6 Public Transport		
2.6.1 Rail Station Locations	NO	Not relevant. Closest railway station (Broadmeadow) located considerable distance east of site.
2.6.2 Bus Stops and Associated Facilities	NO	Bus stops adjacent to site on Croudace Road.
2.6.3 Pedestrians	YES	Pedestrian path along both sides of Croudace Road. Interactions with shopping centre pedestrian access likely to occur.
2.7 Other Proposed Developments	NO	No other developments noted in vicinity of site. Mature residential area, with Elermore Vale shopping centre opposite.
3. PROPOSED DEVELOPMENT		
3.1 The Development	-	Relocation of Newcastle Mosque from 6 Metcalf Street Wallsend
3.1.1 Nature of Development	-	Place of Worship
3.1.2 Access and Circulation Requirements	YES	Access on Croudace Road conflicts with adjacent property access. Right turn out of site proposed to be banned.

3.2 Access	NO	All vehicles will be able to enter and exit the site in a forward direction.
3.2.1 Driveway Location	YES	Single driveway located on Croudace Road. Conflicts with shopping centre exit, and public housing access opposite.
3.2.2 Sight Distances	NO	Satisfactory.
3.2.3 Service Vehicle Access	NO	Refuse collection & occasional delivery vehicles assumed can park within on site car park if required.
3.2.4 Queuing at entrance to site	YES	Possibly queuing for existing vehicles. Some minor queuing on Croudace Road but right turn lane adequate.
3.2.5 Comparison with existing site access	NO	Requires commercial off street parking access driveway to AS/NZS 2890 standard.
3.2.6 Access to Public Transport	NO	Buses on Croudace Road, with stops adjacent to site access.
3.3 Circulation		
3.3.1 Pattern of circulation	NO	All vehicles can enter and exit the site in a forward direction
3.3.2 Road width	NO	Not assessed in detail assumed can comply with requirements of Australian standard AS/NZS2890.1 2004
3.3.3 Internal Bus Movements	NO	NOT required
3.3.4 Service Area Layout	NO	Within car park
3.4 Parking		
3.4.1 Proposed Supply		162 car spaces
3.4.2 Authority Parking Requirements	YES	1 per 3 seats = 133 (But subject to car occupancy assumptions)
3.4.3 Parking Layout	NO	Assumed to meet AS/NZS 2890 requirements.
3.4.4 Parking Demand	YES	400 people. Dependent on assumed car occupancy rate. Occ= 3. Demand = 133. Supply = 162 ï Balanced Occ= 2. Demand = 200. Supply = 162 ï Shortfall 38 spaces Occ= 1.5 Demand =267. Supply = 162 ï Shortfall 107 spaces Parking Demand very dependent on assumptions relating to Car Occupancy
3.4.5 Service Vehicle Parking	NO	Assumed within proposed car park on site.
3.4.6 Pedestrian and Bicycle Facilities	NO	Assumed within proposed car park on site.
4. Impact of Proposed Development		
4.1 Traffic Generation	YES	Assumed as 1 trip per 400/3 people, assuming an average car occupancy rate of 3 people. This figure is substantiated only by ñobservationsò at the existing Newcastle Mosque on Metcalf Street Wallsend. The impacts (parking and traffic) are highly dependant on this assumption. Sensitivity testing (of both parking supply/demand) and traffic generation is warranted. If Car occupancy reduced to 2, then Peak traffic = 200 vehicles If Car occupancy reduced to 1.5, then Peak traffic = 267 vehicles This is double the assumed level of traffic.
4.1.1 Daily and Seasonal Factors	YES	Standard RTA growth assumptions for background traffic are 2%-3% per annum. This should be applied to the background flow levels.
4.1.2 Pedestrian Movements	NO	Some pedestrian demand, but not monitored or assessed. Some access to shopping centre opposite expected.
4.2 Traffic Distribution and Assignments	YES	East to McCaffery Drive, west on Croudace Street, North west via Garsdale Avenue to Wallsend.
4.2.1 Origin / destinations assignment	NO	Simple 2 way assignment

4.3 Impact on Road Safety	YES	Driveway conflicts may cause confusion amongst drivers, for both the subject site, public housing site, and shopping centre. Street lights provided along Croudace Road. U turns are likely at uncontrolled locations.
4.4 Impact of Generated Traffic	YES	Peak traffic impacts of concern, especially if sensitivities are considered.
4.4.1 Impact on daily Traffic Flows	NO	Low overall impact.
4.4.2 Peak Hour Impacts on Intersections	YES	Initially wrong period of traffic movements considered. Exit flows would be 2-2.30pm, or even 2pm ï 3pm. This is after the flow period considered. Predicted exit queues very dependent on car occupancy assumptions.
4.4.3 Impact of Construction Traffic	NO	Controllable. Not a significant issue.
4.4.4 Other Developments	NO	None noted
4.5 Public Transport	NO	Existing bus services considered adequate, but unlikely to attract significant patronage because they do not serve the site demands directly.
4.5.1 Options for improving services	NO	Low impact
4.5.2 Pedestrian Access to Bus Stops	NO	Pedestrian path along both sides of Croudace Road.
4.6 RECOMMENDED WORKS		
4.6.1 Improvements to Access and Circulation	-	None required. Ensure sight visibility splays are available from the driveway for exiting traffic.
4.6.2 Improvements to External Road Network	-	None required
4.6.3 Improvements to Pedestrian Facilities	NO	Need pedestrian footpath along site frontage on White Street. Plan proposes footpath. Ensure gradients comply with Standards
4.6.4 Effect of Recommended Works on Adjacent Developments	-	Nil
4.6.5 Effect of Recommended Works on Public Transport Services	-	Nil
4.6.6 Provision of LATM Measures	-	None required
4.6.7 Funding	-	Developer funded upgrade to site access and on street traffic controls.