



14 June 2019
Ref 18576

Felicity Roberts
Parramatta Council
P.O. Box 32
PARRAMATTA NSW 2124

Attn: Ms Felicity Roberts
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Dear Felicity,

PLANNING PROPOSAL RZ/18/2016
PROPOSED RESIDENTIAL DEVELOPMENT
23-25 WINDSOR ROAD, NORTHMEAD
PROPOSED VEHICULAR ACCESS ARRANGEMENTS - ADDENDUM ASSESSMENT

Introduction

This addendum traffic assessment has been prepared in response to comments received from Council in relation to *Varga Traffic Planning's* previous assessment dated 12 March 2019. The following information is provided in response to the issues raised by Council in their latest comments.

Proposal

I understand that under the current *LEP* planning controls that apply to the site, including the *R4* zoning and the 16m height limit, the site has the potential to achieve a yield in the order of 270 dwellings, equating to an FSR of approximately 1.5:1.

The Planning Proposal seeks to increase the height controls that currently apply to the site as well as increase the FSR to 1.8:1. The proposed amendments to the *LEP* thereby result in a potential yield of 308 dwellings – i.e. a *nett increase* of 38 dwellings over and above the current controls (down slightly from the previous 310 dwellings in the previous *VTP* assessment).

It is envisaged that off-street parking will be provided in basement car parking areas located underneath the respective buildings, in accordance with the parking rates specified in Council's *Parramatta DCP 2011* for high density residential flat buildings in sub-regional centres. Vehicular access to the site remains proposed via a new entry/exit driveway located at the north-western end of the Windsor Road site frontage.

In this regard, reference is made to comments received from Council’s Urban Design Department, dated 13 November, 2018, under the “Site Access and Circulation” section, which notes:

“Vehicular access should be provided as a 2-way and 24hr access-way. Given the unlikely possibility for vehicular access to the rear of the site through a dedication from the adjacent Northmead Creative and Performing Arts School and proximity of the south-west corner to the highway intersection, it is understood that the only reasonable vehicular access point to the site is on the north-west corner, off Windsor Road. However, the proposal should maintain the potential for future connections to the centre and rear”.

Further to the above, Council’s latest comments also notes the following:

“Council’s officer notes that RMS has already advised the applicant that they raised no objections to the original proposed plan (406 units) prior to the lodgement of the Planning Proposal. Council will therefore carry out formal consultation with the RMS should the PP proceed to Gateway Determination as part of the public exhibition phase where the updated traffic report will be provided accordingly”.

A recent aerial image of the site in relation to the Windsor Road and the James Ruse Drive intersection is reproduced below.



Existing Lane Configuration

Windsor Road directly outside the site comprises two northbound traffic lanes and 5 southbound traffic lanes, comprising the following:

- Lane 1: dedicated left turn slip lane for vehicles turning left onto James Ruse Drive
- Lane 2: dedicated Bus Lane for buses heading south along Windsor Road
- Lane 3: general traffic lane for vehicles heading south along Windsor Road
- Lane 4: general traffic lane for vehicles heading south along Windsor Road
- Lane 5: right turn holding lane for vehicles turning right onto James Ruse Drive

Existing & Future Public Transport

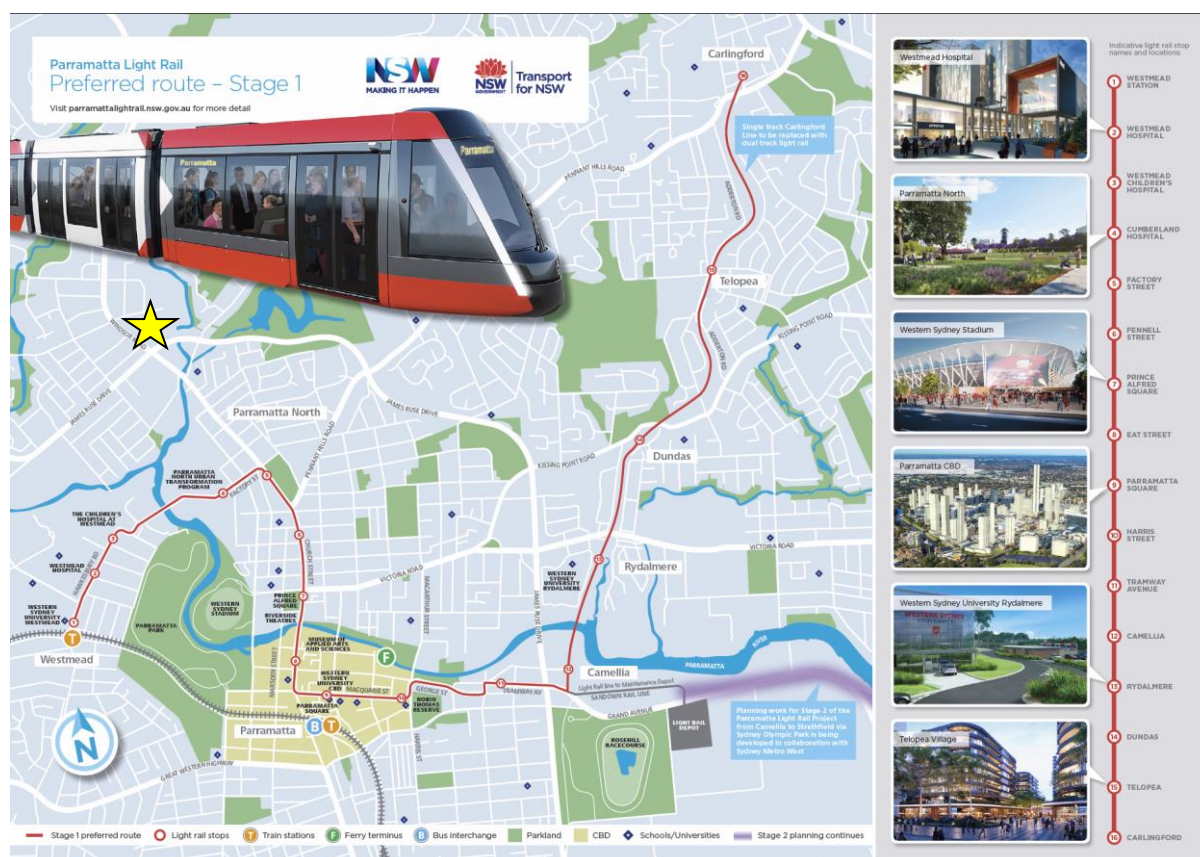
There are currently six bus services that operate along Windsor Road, directly past the site, with the nearest bus stops located approximately 160m walking distance to/from the site including the 601, 603, 604, 606, 609 and 706 services along with the high-frequency intra-regional *Metrobus M60*.

The M60 service operates between Hornsby and Parramatta seven days per week, with weekday services every 15 minutes (every 10 minutes during the morning and afternoon peak) and weekend services every 20 minutes. The abovementioned bus services also connect with train services at numerous suburban railway stations including Parramatta, Blacktown, Hornsby and Pennant Hills.

Furthermore, the new Parramatta Light Rail is one of the NSW Government's latest infrastructure projects being delivered to serve a growing Sydney.

Stage 1 will connect Westmead to Carlingford via the Parramatta CBD and Camellia, with a two-way track spanning 12kms, and is expected to open in 2023. The Stage 1 route will link Parramatta's CBD and Railway Station to the Westmead Health precinct, Parramatta North Urban Transformation Program, the new Western Sydney Stadium, the Camellia Precinct, the new Powerhouse Museum, the private and social housing redevelopment at Telopea, Rosehill Gardens Racecourse and three Western Sydney University campuses. A map of the Stage 1 route is shown below.

Stage 1 of the project will deliver 16 new stations, including "Factory Street" which will be the closest station to the subject site and located approximately 1.2km south of the site – i.e. a 12-16 minute walk. High frequency "turn up and go" services will be provided from early morning to late evening, including every 7.5 minutes throughout the day.



Planning work for Stage 2 of the project, between Camellia and Strathfield via Sydney Olympic Park, is being developed in collaboration with Sydney Metro West, Australia's largest public transport infrastructure project. The Stage 2 route will include 10-12 new stations over a 10km, two-way track.

Existing Traffic Conditions & Gap Analysis

An indication of the existing traffic conditions on the road network in the vicinity of the site is provided by peak period traffic surveys undertaken by *R.O.A.R Data* on behalf of *Terraffic*, the traffic and transport consultant previously engaged on the Planning Proposal.

The traffic surveys were undertaken in Windsor Road, directly outside the subject site, on Tuesday 14th March, 2017. The results of the traffic surveys are attached in full and reveal that:

- southbound traffic flows in Windsor Road past the site during the weekday *morning* network peak period of between 7:00am-8:00am is in the order of 2,750 vehicles per hour (vph)
- southbound traffic flows in Windsor Road past the site during the weekday *afternoon* network peak period of between 5:15pm-6:15pm is *significantly lower* and in the order of 1,450 vph.

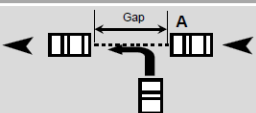
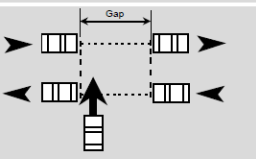
In addition to the peak period traffic counts undertaken in 2017, a video and gap analysis study was undertaken by *Matrix Traffic & Transport Data* on Tuesday 30th and Wednesday 31st October, 2018, between 6:30am-11:30am and again between 2:00pm-7:00pm. The raw data files of the video and gap analysis are provided under separate cover.

With respect to the future residential uses on the subject site, the weekday *morning* peak period is the critical, or *worst-case*, period for this vehicular access analysis as that is the period with the highest volume of southbound traffic on the road network *and* the period with the highest volume of traffic exiting the site – i.e. when residents are leaving home to head to work and therefore entering the road network.

In order to determine the time drivers typically require to enter the road network traffic flow, reference is made to the *Austroads* publication, *Guide to Road Design Part 4A: Unsignalised and Signalised Intersections*, Table 3.4: *Critical Acceptance Gaps and Follow-Up Headways*. An extract of Table 3.4 is reproduced below.

Guide to Road Design Part 4A: Unsignalised and Signalised Intersections

Table 3.5: Critical acceptance gaps and follow-up headways

Movement	Diagram	Description	$t_a^{(1)}$ (sec)	$t_f^{(2)}$ (sec)
Left turn		Not interfering with A Requiring A to slow	14–40 5	2–3 2–3
Crossing		Two lane/one way Three lane/one way Four lane/one way Two lane/two way Four lane/two way Six lane/two way	4 6 8 5 8 8	2 3 4 3 5 5

In essence, *Austroads* research indicates that a driver typically requires a 5 second “critical acceptance” gap to make a left turn into the traffic flow whilst subsequent drivers immediately afterwards require a “follow-up headway” gap of between 2 and 3 seconds to make the same left turn.

For the purposes of this assessment, it has been assumed that a gap of 5-7 seconds would allow 1 car to exit the site into Lane 1, a gap of 8-9 seconds would allow 2 cars to exit, a gap of 10-11 seconds would allow 3 cars to exit, a gap of 12-13 cars would allow 4 cars to exit, and so on.

The previous *VTP* assessment was based on the weekday *morning* peak period of 7:00am-8:00am as that was the peak *hour* determined by the *R.O.A.R Data* survey. Notwithstanding, Council’s latest comments advise that assessment should be based on the weekday *morning* peak period of 8:00am-9:00am “*as this is considered to be the true peak given school drop-offs*”.

By way of comparison, the *R.O.A.R Data* traffic surveys undertaken in Windsor Road, directly outside the subject site on Tuesday 14th March, 2017, revealed that:

- southbound traffic flows in Windsor Road past the site during the weekday *morning* network peak period of between 8:00am-9:00am is in the order of 2,450 vph (compared to 2,750 vph between 7:00am-8:00am)

In any event, the gap analysis raw data has been re-reviewed during the weekday *morning* peak period of 8:00am-9:00am (as requested by Council), and in particular, the number of gaps in southbound traffic flow in Lane 1 (i.e. the kerbside lane). The results of the traffic surveys reveal that:

- on Tuesday 30th October 2018, during the *morning* network peak period there were approximately 48 gaps of 5 seconds *or more* in southbound traffic flow in Lane 1 which would allow approximately 117 potential vehicles to exit the site onto Windsor Road
- during the same Tuesday *morning* period there were 15 gaps (of 5 seconds *or more*) in southbound traffic flow in Lane 2 (i.e. the Bus Lane), with an average gap time of 96 seconds *per gap*
- during the same Tuesday *morning* period there were 56 gaps (of 5 seconds *or more*) in southbound traffic flow in Lane 3, with an average gap time of 24 seconds *per gap*
- on Wednesday 31st October 2018, during the *morning* network peak period there were approximately 66 gaps of 5 seconds *or more* in southbound traffic flow in Lane 1 which would allow approximately 150 potential vehicles to exit the site onto Windsor Road
- during the same Wednesday *morning* period there were 19 consecutive gaps (of 5 seconds *or more*) in southbound traffic flow in Lane 2 (i.e. the Bus Lane), with an average gap time of 126 seconds *per gap*
- during the same Wednesday *morning* period there were 42 gaps (of 5 seconds *or more*) in southbound traffic flow in Lane 3, with an average gap time of 32 seconds *per gap*.

Parking Rates

As the site was previously located within The Hills LGA, prior to the border realignment in 2016, reference is made to *The Hills DCP 2012, Part B, Section 5, Residential Flat Buildings, Section 3.19 – Car Parking* which nominates the following parking rates:

The Hills DCP 2012

1 bedroom unit:	1 space per dwelling
2 bedroom unit:	2 spaces per dwelling
3 bedroom unit:	2 spaces per dwelling
Visitors:	2 spaces per 5 dwellings

The site however is now located within the Parramatta LGA, therefore reference is also made to *Parramatta DCP 2011, Part 3, Development Principles, Table 3.6.2.3 – Minimum Car Parking Rates* which nominates the following parking rates for developments *not* located within 400m walking distance of a transitway bus stop or railway station:

Parramatta DCP 2011

1 bedroom unit:	1 space per dwelling
2 bedroom unit:	1.25 spaces per dwelling
3 bedroom unit:	1.5 spaces per dwelling
Visitors:	0.25 spaces per dwelling

By way of further comparison, reference is also made to the Roads and Maritime's publication *Guide to Traffic Generating Developments, Section 5 – Parking Requirements for Specific Land Uses (October 2002)*.

The RMS *Guidelines* are based on extensive surveys of a wide range of land uses and nominates the following off-street parking rates for high density residential flat buildings:

RMS Guidelines

1 bedroom unit:	0.6 spaces per dwelling
2 bedroom unit:	0.9 spaces per dwelling
3 bedroom unit:	1.4 spaces per dwelling
Visitors:	1 space per 5 dwellings

Since the previous *VTP* assessment, the indicative bedroom mix has been confirmed as follows:

Studio unit:	8 dwellings
1 bedroom unit:	53 dwellings
2 bedroom unit:	195 dwellings
3 bedroom unit:	52 dwellings
TOTAL:	308 dwellings

Application of the various parking rates to the proposed yield of 308 apartments yields the following parking requirements:

	The Hills DCP 2012	Parramatta DCP 2011	RMS Guidelines
Residents	555 spaces	383 spaces	285 spaces
Visitors	123 spaces	77 spaces	62 spaces
TOTAL	678 spaces	460 spaces	347 spaces

It should be noted that the parking rates specified in *The Hills DCP 2012* are considered *extremely high* comparative to other LGAs within greater Sydney, primarily due to the historical lack of rail infrastructure in the area.

By comparison, the parking rates specified in the *Parramatta DCP 2011* are much lower and reflective of high density residential developments in areas with good access to a range of public transport services including bus and rail such as the subject site.

The parking rates specified in the *RMS Guidelines* are lower again and reflective of high density residential developments in areas with excellent access to a range of public transport services including bus and rail.

As noted in the foregoing, there are currently six bus services which operate along Windsor Road past the site, including high-frequency *Metrobus* services. In addition, the new Parramatta light rail is under construction, with the nearest future station to be located approximately 1.2km walking distance south of the site.

As such, it is considered that the parking rates specified in the *Parramatta DCP 2011* are the most appropriate rates to apply to the Planning Proposal.

Projected Traffic Generation

The traffic implications of development proposals primarily concern the effects of the *additional* traffic flows generated as a result of a development and its impact on the operational performance of the adjacent road network.

An indication of the traffic generation potential of the Planning Proposal is provided by reference to the Roads and Maritime Services publication *Guide to Traffic Generating Developments, Section 3 - Landuse Traffic Generation (October 2002)* and the updated traffic generation rates in the *RMS Technical Direction (TDT 2013/04a)* document.

The TDT 2013/04a document specifies that it replaces those sections of the *RMS Guidelines* indicated, and must be followed when RMS is undertaking trip generation and/or parking demand assessments.

The *RMS Guidelines* and the updated TDT 2013/04a are based on extensive surveys of a wide range of land uses and nominate the following “Sydney Average” traffic generation rates which are applicable to the development proposal:

High Density Residential Flat Dwellings (Sydney Average)

AM: 0.19 peak hour vehicle trips *per unit*

PM: 0.15 peak hour vehicle trips *per unit*

Notwithstanding, previous advice received by Council based on the *Journey to Work* data provided by the NSW *Bureau of Statistics* indicates that for a residential development located within the Northmead area, the “Rockdale” traffic generation rates should apply as they both exhibit similar travel mode characteristics.

Appendix B3 of the TDT 2013/04a therefore nominates the following traffic generation rates which apply to the Rockdale area, and in theory, the Northmead area as well:

High Density Residential Flat Dwellings (Rockdale)AM: 0.32 peak hour vehicle trips *per unit*PM: 0.18 peak hour vehicle trips *per unit*

Application of the above traffic generation rates to the potential 308 apartments outlined in the amended Planning Proposal yields a traffic generation potential of between 46 vph and 59 vph using the “Sydney Average” rates and between 55 vph and 99 vph using the “Rockdale” rates.

Sydney Average

AM: 308 units @ 0.19 vtp/unit = 59 vph

PM: 308 units @ 0.15 vtp/unit = 46 vph

Rockdale

AM: 308 units @ 0.32 vtp/unit = 99 vph

PM: 308 units @ 0.18 vtp/unit = 55 vph

By way of comparison, application of the above traffic generation rates to the potential for 270 apartments permissible under the current planning controls yields a traffic generation potential of between 41 vph and 51 vph using the “Sydney Average” rates and between 49 vph and 86 vph using the “Rockdale” rates.

Sydney Average

AM: 270 units @ 0.19 vtp/unit = 51 vph

PM: 270 units @ 0.15 vtp/unit = 41 vph

Rockdale

AM: 270 units @ 0.32 vtp/unit = 86 vph

PM: 270 units @ 0.18 vtp/unit = 49 vph

As noted in the foregoing, with respect to the future residential uses on the subject site, the weekday *morning* peak period is the critical, or *worst case*, period for this vehicular access analysis as that is the period with the highest volume of southbound traffic on the road network *and* the period with the highest volume of traffic exiting the site – i.e. when residents are leaving home to head to work and therefore entering the road network.

If a 20/80 split is applied to the (Rockdale) AM traffic volumes specified above (i.e. 20% entering & 80% exiting), the *nett increase* in vehicles exiting the site during the weekday *morning* network peak period between the Planning Proposal and a development under the current planning controls is just 13 vph, or approximately *1 vehicle every 4.6 minutes*, as detailed in the table below.

	Planning Proposal	Permissible Development	Difference
AM Peak – IN	20 vph IN	17 vph IN	+3 vph IN
AM Peak – OUT	79 vph OUT	69 vph OUT	+10 vph OUT
TOTAL	99 vph	86 vph	+13 vph

The amended gap analysis detailed earlier in this traffic study, which was based on surveys conducted over a *two-day* period, focusing on the weekday *morning* peak period of 8:00am-9:00am (as requested by Council), indicates that during that hour period, there were sufficient gaps in southbound traffic flow in Lane 1 to allow between 117 vehicles and 150 vehicles to exit the site onto Windsor Road. Furthermore, the results also indicate that there is an average gap time of 111 seconds *per gap* into Lane 2 and an average gap time of 28 seconds *per gap* into Lane 3 (averaged between the two survey days).

Notwithstanding, Council’s latest comments noted that the above assessment is based on each lane in isolation, not the through lanes on Windsor Road as a whole.

Council's traffic team *“observed the raw data associated with the video and gap analysis and identified that there were periods of 2 to 3 minutes where there was no gap greater than 5 seconds in these travel lanes at the same time. Average delays for cars exiting the site onto Windsor Road are likely to be higher than 2 minutes”*.

Whilst a re-review of the raw data associated with the video and gap analysis by VTP indicates that Council's above comments are reasonable, and that vehicles exiting the site across into Lane 3 on Windsor Road during the weekday *morning* peak period are likely to experience delays higher than 2 minutes, Council also acknowledges that *“the site is located at the confluence of a major through traffic route (Windsor Road the James Ruse Drive on-ramp) which means that even development of the site within current planning controls are likely to be subject to egress issues during the morning peak”*.

Access Driveway Design

Reference to Table 3.1 & Table 3.2 in AS2890.1:2004 which indicates that for a Class 1A development with between 301 and 600 parking spaces, accessed from an arterial road, a Category 4 driveway is required, that is, entry and exit driveway widths of between 6m-8m each, with a 1m-3m separation distance.

The site frontage is of sufficient width that the above parameters should be able to be accommodated without issue, subject to detailed design at DA stage.

Traffic Implications

Further reference to the *Journey to Work* data indicates that “place of employment” splits for residents living within the Northmead area are detailed in the table below.

Whilst the precise future percentage split for drivers wishing to exit into either Lane 1 or Lane 3 is difficult to accurately quantify, it is expected that during the weekday *morning* peak period, the majority of future residents exiting the site will turn left out of the site into Lane 1 and then left onto the James Ruse Drive on ramp as that will be the easiest option. Drivers wishing to head north, west and potentially south then have the option to either exit James Ruse Drive onto Pennant Hills Road, approximately 1.6km south of the Windsor Road interchange, or undertake a U-turn at the Pennant Hills Road interchange back onto James Ruse Drive. Potential departure routes are also noted in the table below.

Sydney Area	% Split	Potential Departure Route During AM Peak
Blacktown	5%	James Ruse Dr to Parramatta Rd and M4 Motorway
Baulkham Hills	12%	James Ruse Dr to Pennant Hills Rd & U-turn back to Windsor Rd
Carlingford	4%	James Ruse Dr to Pennant Hills Rd
Parramatta	41%	James Ruse Dr to Victoria Rd or Hassall Street
Fairfield	3%	James Ruse Dr to Parramatta Rd or M4 Motorway
Merrylands	4%	James Ruse Dr to Parramatta Rd or M4 Motorway
Auburn	5%	James Ruse Dr to Parramatta Rd or M4 Motorway
Ryde/Hunters Hill	9%	James Ruse Dr to Victoria Rd
Chatswood/Lane Cove	4%	James Ruse Dr to Pennant Hills Rd & M2 Motorway
Sydney Inner City	13%	James Ruse Dr to Victoria Rd or M4 Motorway
TOTAL	100%	

Whilst it is acknowledged that there will inevitably be a percentage of future residents that will seek to exit the site into Lane 3 on Windsor Road, including during the weekday *morning* peak period, the future site access driveway width of between 6m-8m (as required by AS2890.1:2004), will give drivers the option to either keep on the left side of the exit driveway and enter Lane 1 (quicker option) *or* keep on the right side of the exit driveway and enter Lane 3 (longer option). Consideration could also be given to signposting and/or linemarking the exit driveway into two lanes which may assist future residents and assist in minimising exit waiting times.

It should also be noted that once the Parramatta light rail is complete, it would be unsurprising if the travel modes of future residents living within the development would be closer aligned to the “Sydney Average” traffic generation rates which would in turn, reduce the abovementioned exiting volumes even further.

Conclusion

Based on the analysis and discussions presented within this report, the foregoing assessment has found that the *nett difference* in traffic generation potential of a high density residential development on the subject site when comparing the Planning Proposal scheme and a scheme permissible under the current planning controls is just 13 vph when using the “Rockdale” traffic generation rates (comprising 3 vph IN and 10 vph OUT).

Furthermore, there are sufficient gaps in the existing southbound traffic volumes along Windsor Road past the site to adequately allow the anticipated volume of development traffic expected to exit the site during the *worst-case* scenario, that being, the weekday *morning* network peak period.

Whilst the majority of development traffic is expected to exit the site into Lane 1 during the weekday *morning* peak period, as that will be the easier/quicker option, the future design of the site access driveway will be sufficiently wide enough to accommodate *two* exit lanes, thereby giving drivers the option to either keep on the left side of the exit driveway and enter Lane 1 *or* keep on the right side of the exit driveway and enter Lane 3.

It is therefore reasonable to conclude that the amended Planning Proposal will not have any unacceptable implications in terms of road network capacity or access arrangements.

I trust this advice satisfies your requirements. Please do not hesitate to contact me on telephone 9904 3224 should you wish to discuss any aspect of the above.

Yours sincerely



Chris Palmer
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