

PLANS AND DOCUMENTS
referred to in the ULDA
APPROVAL dated 31/1 /2018

Appendix F
Traffic Report
prepared by TTM

10th May 2012

Our Ref: 11BRT0065

ULDA
C/- RPS Group
743 Ann Street
Fortitude Valley QLD 4006

Attention: Julian Kemp,

Re: Teviot Village, Greenbank – Proposed Residential Development

Letter of Advice (Traffic Engineering Report)

1. Background

TTM has been engaged by RPS Group to review the impacts from a traffic engineering perspective of the revisions made to the proposed development layout for Teviot Village. The revised plan includes a reduction in lot yield from the original plan submitted as part of the development application as well as minor amendments to the road layout.

The original traffic report submitted as part of the DA was based on a 1516 dwelling yield. The revised layout comprises 1326 dwellings. The reduction in 190 dwellings is not expected to have a significant impact on the analysis undertaken as part of the original development application as the road layout has remained relatively unchanged.

The only amendment to the road network includes a new 18m wide collector road leading to Pub Lane, east of the 21.5m wide major collector connecting to Pub Lane. The new road will be restricted to left-in / left-out movements and is expected to ease pressure off the intersection of Pub Lane and the 21.5m wide collector as well as the nearby roundabout.

The new road will provide a shorter route between the higher density lots in the north-east portion of the site and Pub Lane. The location of the new 18m wide road and its intersection with Pub Lane has been depicted in Figure 1.

TTM has undertaken a review of the revised development layout and the suitability of the new intersection on Pub Lane.

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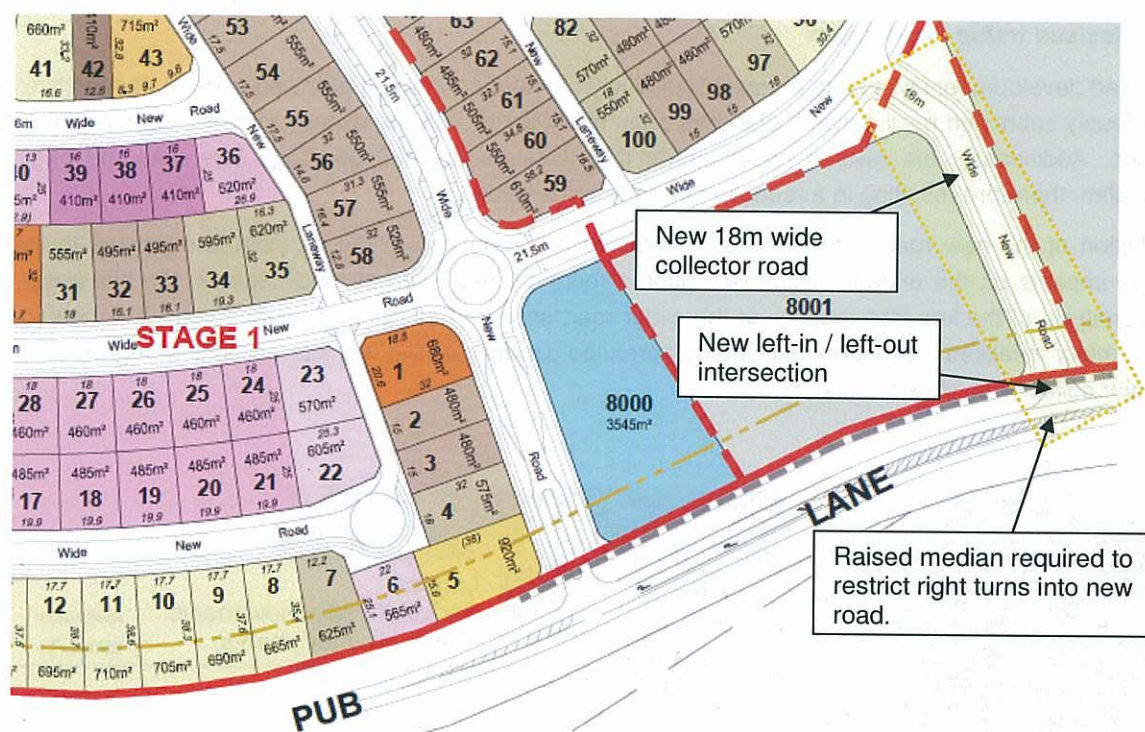


Figure 1: Proposed new road east of major collector

2. New Intersection on Pub Lane

TTM have carried out a sight distance assessment to determine the suitability of the proposed new intersection with Pub Lane. The results of this assessment indicate that the intersection is compliant with Austroads Part 4A. In accordance with Austroads Guidelines, the new intersection is subject to the following sight distance requirements based on a posted speed limit of 80kph:

- Approach sight distance: 114m
- Safe intersection sight distance: 181m

As the new intersection will be restricted to left-in / left-out movements only, the critical sight distances must be achieved between the new intersection and the western approach of Pub Lane.

The results of TTM's on-site sight distance assessment indicate a sight distance of 199m achieved in the crucial westerly direction. On this basis the proposed location of the new intersection is considered suitable.

To restrict the turn movements to left-in / left-out only, the taper on Pub Lane shown in Figure 1 will need to be raised concrete to prevent traffic from performing illegal right turns onto the new 18m wide road. All works can be accommodated within the existing road reserve.

3. Revised traffic distribution

The revised development layout has remained relatively unchanged from a traffic engineering perspective as the previously submitted road network plan has been maintained, with the exception of the new road link to Pub Lane. Additionally, the revised development layout comprises 190 dwellings less than the original concept plan, therefore resulting in a reduction in traffic generation.

The addition of the new road onto Pub Lane, along with a reduction in the lot yield is expected to have negligible impacts on the overall traffic distribution throughout the external road network. On this basis, a revised analysis of the key intersections in the wider road network has not been undertaken. The new road will have minor localised diversions resulting in increased capacity at two key intersections along the 21.5m wide major collector as shown in Figure 2.



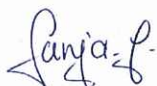
Figure 2: Localised changes in traffic movements

4. Conclusion

TTM has reviewed the revised development layout for the Teviot Village proposed development application. The latest layout amendments which include a new road connection to Pub Lane and a minor decrease in dwelling yield are considered negligible from a traffic engineering perspective and do not warrant a revised traffic impact assessment to be undertaken. TTM has identified localised traffic diversions expected to occur as a result of the addition of a new road and intersection onto Pub Lane. The new left-in / left-out intersection on Pub Lane is expected to result in increased capacity at two key intersections along the 21.5m wide collector road by providing a new route to Pub Lane for the north-east corner of the development site. The new intersection achieves adequate sight distances along the critical western approach along Pub Lane.

If you require additional information relating to the traffic engineering issues discussed in this letter, please do not hesitate to contact TTM on 3327 9500.

Yours faithfully,

A handwritten signature in blue ink, appearing to read 'Sanja Nikolic', is written over a faint, illegible stamp.

Sanja Nikolic

Lead Consultant

Appendix A

PROPOSED DEVELOPMENT LAYOUT



Note: All dimensions and areas are approximate only, and are subject to survey and Council approval. Dimensions have been rounded to the nearest 0.1 metres. The boundaries shown on this plan should not be used for firm detailed engineers design. The boundaries shown on this plan should not be used for firm detailed engineers design. The boundaries shown on this plan should not be used for firm detailed engineers design.

DRAFT ONLY

TEVIOT NORTH - DRAFT CONCEPT PLAN
TEVIOT DOWNS ESTATE PTY LTD

Legend

- Site Boundary
- Stage Boundary
- Indicative Footpath (Outside Site)
- Retained Remnant Endangered
- 10m Vegetation Buffer
- 15m Creek Corridor Buffer
- 15m GSDRA Road Noise Contour
- 15m 700BA Rail Noise Contour
- Roads
 - Temporary Turnaround Area
- Open Space
 - Active Open Space
 - Pedestrian Linkage / Landscape Treatment
 - Linear Open Space
 - Existing Easement
 - Park / Community Use
- Allotment
 - 25m Residential
 - Courtyard Allotment
 - Premium Courtyard Allotment
 - Tradition Allotment
 - 32m Residential
 - Via Allotment
 - Courtyard Allotment
 - Premium Courtyard Allotment
 - Tradition Allotment
 - Premium Tradition Allotment
 - Lifestyle Residential
 - Lifestyle Allotment
 - Premium Lifestyle Allotment
 - Multiple Residential
 - Duplex Allotment
 - Super Allotments
 - Balance Super Allotment
 - Salica Office Allotment

Attachment B
Addendum and Amendments to Traffic Report
Prepared by TTM

PLANS AND DOCUMENTS
referred to in the ULDA
APPROVAL dated 31/1/2023

5th July 2012

Our Ref: 11BRT0065

Your Ref: DEV201/284

ULDA
C/- RPS Group
743 Ann Street
Fortitude Valley QLD 4006

Attention: Julian Kemp,

Re: Teviot Village, Greenbank – Proposed Residential Development

Response to Information Request from ULDA (Addendum and amendment to TTM Traffic Engineering Report dated January 2011, ref 27185)

Background

TTM has been engaged by RPS Group to respond to the traffic engineering issues raised in an information request issued by the ULDA on 13th June 2012 relating to the proposed Teviot Village development application. This response forms an addendum to the original traffic engineering report prepared by TTM, dated January 2011. The following traffic engineering issues have been raised by the ULDA and addressed in this response:

Engineering

3. Provide an amended traffic report which addresses the following:

a) The adopted traffic generation rate of 0.6vph per dwelling is low for outer suburbs and more acceptable in the inner city. An acceptable rate per dwelling would be 8vph or higher. Justify the adoption of a traffic generation rate of 0.6vph per dwelling.

Response

The adopted traffic generation rate of 0.6vph was derived from survey results which captured the existing Teviot Downs Estate catchment, south of Pub Lane. As shown in Figure 1, the existing Teviot Downs Estate is a closed catchment therefore all development generated traffic utilise the following three surveyed intersections:

- Pub Lane / Equestrian Drive
- Pub Lane / Dungaree Road
- Pub Lane / New Beith Rd

Based on the number of lots developed at the time when the data was collected (approximately 850 dwellings), a traffic generation rate of 0.55vph per dwelling was derived. Figure 1 depicts the extent of the existing Teviot Downs Estate catchment to the south of Pub Lane captured in the surveys, while Figure 2 shows the survey results at the key intersections which provide access into this catchment.

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Figure 1: Existing Teviot Estate closed catchment (surveyed 2009)

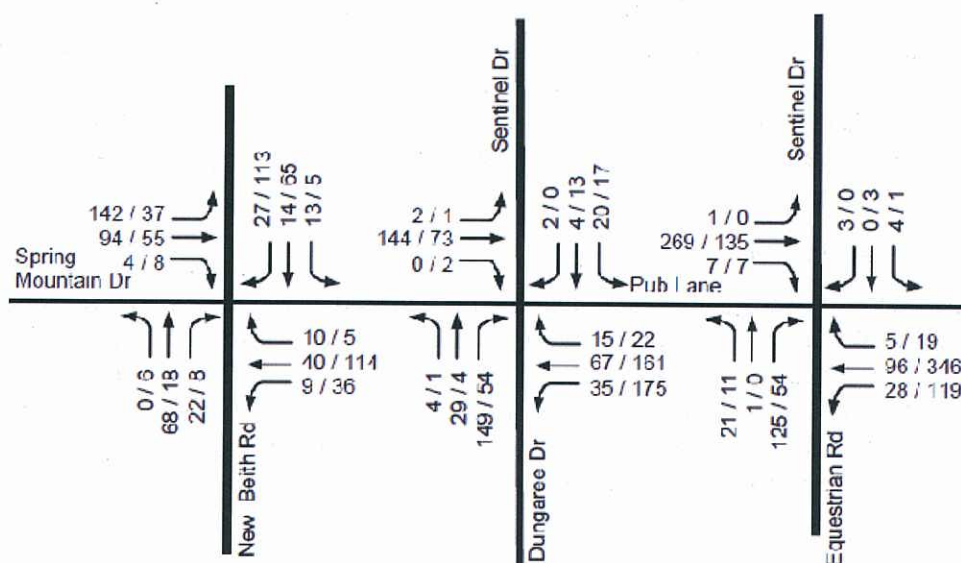


Figure 2: Surveyed traffic distribution at key intersections (August 2009)

The traffic generated by the existing Teviot Downs Estate represents 100% of the traffic along the Dungaree Drive and Equestrian Road approaches. At the New Beith Road / Pub Lane roundabout only 20% of the surveyed volumes on the New Beith Road south approach have been attributed to the subject catchment, namely residents living in the north-western corner of the catchment travelling north along New Beith Road.

These figures result in a traffic generation rate of 0.55vph per dwelling, which has been rounded up to 0.6vph for all future analysis scenarios. A traffic generation rate of 0.6vph per dwelling is considered

appropriate given the nature and location of the proposed development site. Based on the semi-rural nature of the area, TTM's data suggests patterns of combined trips occurring. Given the distance to some services and facilities, residents tend to economise by combining trips. This trend is expected to continue at the Teviot Village Estate to the north of Pub Lane regardless of the increased density which does not have an impact on these behavioural patterns.

b) The current proposal shows no connection to the Sentinel Drive / Pub Lane / Equestrian Drive intersection and the submitted traffic report dated January 2011 includes this intersection when distributing traffic across the intersections with external roads. The Pub Lane / main access intersection is likely to be impacted by higher levels by 2025 which may require the provision of traffic signals and/or two exit lanes. Review and submit an amended traffic report to the current proposal.

Response

The following analysis replaces section 6.4 of TTM's traffic engineering report dated January 2011 (ref27185).

TTM's original traffic report dated January 2011 shows 25% of development generated traffic utilising the Sentinel Drive / Pub Lane / Equestrian Drive intersection. The removal of this connection will result in those 25% of vehicle trips heading towards Teviot Road to shift onto the New Road running parallel with Sentinel Drive to the east.

The original analysis of the Pub Lane / New Road intersection was based on a higher yield. While the revised development layout no longer includes the connection to Pub Lane via the subject roundabout, the overall number of dwellings has decreased by almost 200 dwellings. Also, an additional road link to Pub Lane has been included, east of the proposed New Road. Although the new road link will be limited to left-in / left-out movements, it is expected to alleviate some traffic from the Pub Lane / New Road all movements intersection. However, in response to ULDA's information request, TTM have revised their analysis of the Pub Lane / New Road intersection.

Pub Lane / New Road – New Intersection

Based on the revised traffic distribution resulting from changes to road connections to Pub Lane, namely the removal of the connection via the Sentinel Drive roundabout and the inclusion of a new left-in / left-out intersection to the east of the Pub Lane / New Road intersection, this intersection is expected to have the following traffic distribution. The following distribution is based on an assumption that up to 30% of development generated traffic from the north-east corner of the site, which comprises future high density lots, will utilise the new left-in / left-out intersection when heading east towards Teviot Road.



Figure 3: Traffic distribution at Pub Lane / New Road intersection based on revised road network

TTM's Sidra modelling is based on the intersection layout shown in Figure 4. The detailed design of the new access intersection will conform to the current Austroads guidelines for a posted speed limit of 80kph. The right turn lane has 20m of storage capacity with an additional 70m for deceleration (including taper).

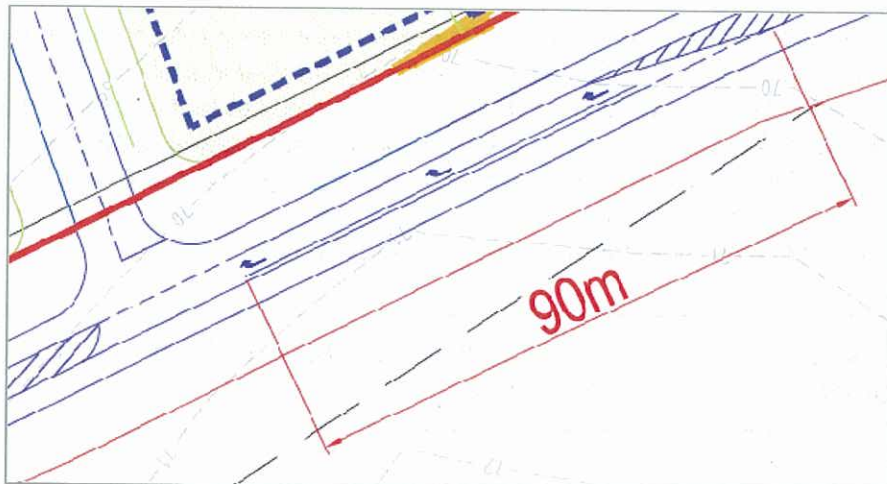


Figure 4: Teviot Road / New Road - New Intersection Layout

Table 1 gives a summary of the SIDRA outputs for the various traffic scenarios modelled.

Table 1: Teviot Rd / New Rd Intersection - Summary of Sidra Outputs

Case	Degree of Saturation	Maximum Delay (seconds)	Lowest level of Service	Maximum Queue Length on approach (m)		
				Pub Lane (West)	Pub Lane (East)	New Road (North)
AM Project Case - 2025	46.6%	13.8 (New Rd – L/R)	B	0	4.5 (Right turn)	20.4 (Left / Right)
AM Project Case - 2035	52.4%	15.3 (New Rd – L/R)	C	0	5.0 (Right turn)	23.7 (Left / Right)
PM Project Case - 2025	54.3%	12.6 (Pub Ln – Right)	B	0	22.9 (Right turn)	3.7 (Left / Right)
PM Project Case - 2035	52.7%	11.6 (Pub Ln – Right)	B	0	17.0 (Right turn)	3.5 (Left / Right)

Conclusion

It is evident from results summarised in Table 1 that the proposed intersection can facilitate the forecasted traffic volumes at development completion 2025 and future year 2035. TTM's Sidra analysis has confirmed that the intersection will perform adequately under priority control, with no further upgrades warranted. As such, it is considered that the priority controlled layout illustrated in Figure 4 should be maintained as it will allow the intersection to facilitate the projected traffic volumes at development completion 2025 and future year 2035.

c) Provide evidence that the adopted growth rate of 5% for the 20 year planning horizon is sustainable.

Response

The 5%pa growth rate applied to traffic volumes along Teviot Road was based on previous advice from Council as well as historical growth data between 2006 and 2009 and is not considered sustainable for the planning design horizon as outlined in the original traffic report. This was confirmed through modelling data supplied to TTM by Logan City Council in June 2012. Using the model output data supplied by Council, the traffic growth rates along Teviot Road were found to be 2% without the subject development site and 3.5%pa with the inclusion of the subject development application. On this basis, TTM have revised their analysis using the more appropriate growth rate of 2% for all traffic volumes along Teviot Road.

d) Review the external intersections as listed in Section 6 of the Traffic Report dated January 2011 to determine if an upgrade is required as a result of this development.

Response

The following analysis replaces section 6.2 of TTM's traffic engineering report dated January 2011 (ref27185).

In response to ULDA's request, TTM have revised their analysis to reflect the revised background traffic growth rate of 2% along Teviot Road. TTM have identified two relevant intersections affected by the growth rates along Teviot Road, namely the intersection of Teviot Rd / Pub Lane as well as Teviot Rd / Stoney Camp Rd. The remaining intersections listed in section 6 of TTM's traffic report were not subjected to the higher growth rate along Teviot Road and have therefore not been revised.

With respect to the Teviot Road / Stoney Camp Road intersection, the analysis presented in TTM's original traffic engineering report showed this intersection exceeding its maximum operating capacity in 2009 and therefore triggering signals. TTM suspects this situation has worsened since the 2009 counts with the need for a signalised intersection in this location being critical. As this is an existing situation, the upgrades associated with this intersection should be undertaken by Council using funding collected through infrastructure charges. Following consultation with Logan City Council and gaining access to their modelling data, TTM can confirm that traffic generated by the subject development site has been included in the model. Therefore any future upgrade requirements identified by Council along this road network take into consideration the subject site.

On this basis, TTM have only revised their analysis of the following key intersection which is expected to carry 80% of the traffic generated by the proposed development:

- Pub Lane / Teviot Road Signalised Intersection

Pub Lane / Teviot Road Intersection

The base case analysis is based on the existing intersection configuration depicted in Figure 5.

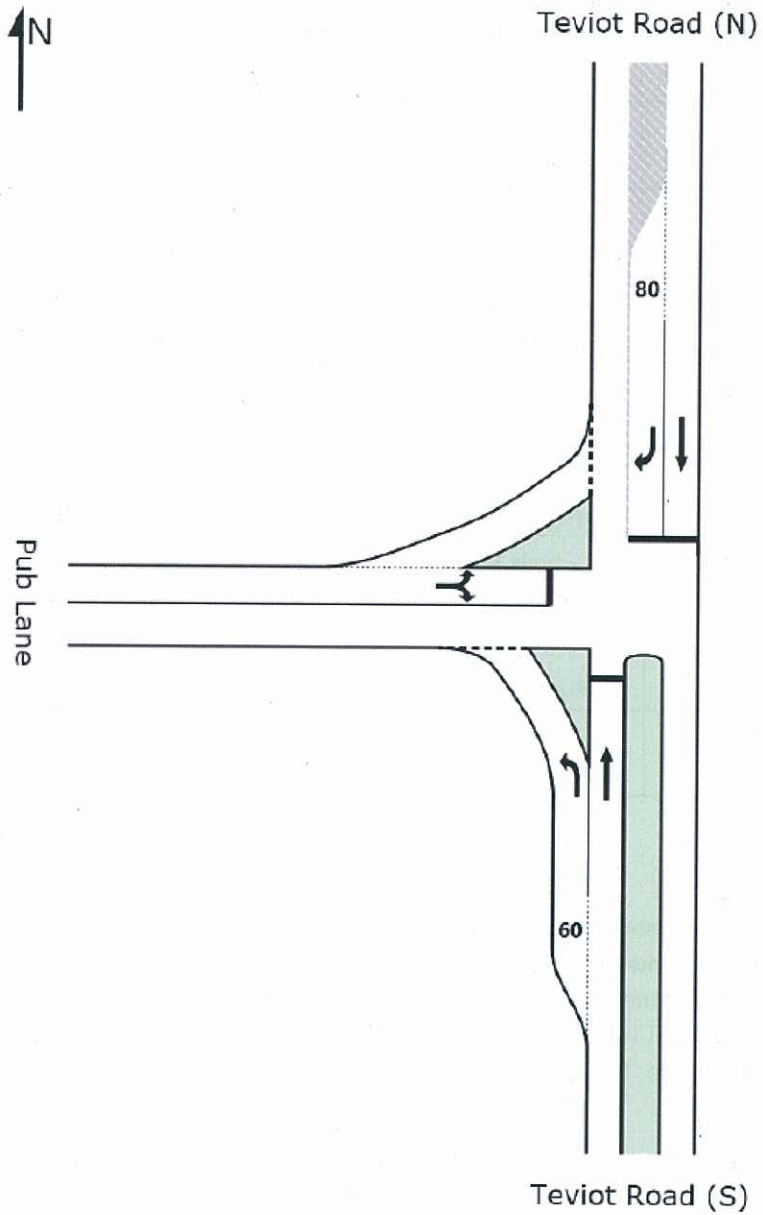


Figure 5: Existing Pub Lane / Teviot Road intersection configuration 2012

Table 2 gives a summary of the SIDRA outputs for the various traffic scenarios modelled.

Table 2: Teviot Road / Pub Lane Intersection - Summary of Sidra Outputs

Case	Degree of Saturation	Maximum Delay (seconds)	Lowest Level of Service	Maximum Queue Length (m)		
				Teviot Rd (South)	Teviot Rd (North)	Pub Ln (West)
AM Base Case - 2009	49.7%	16.5 Teviot Rd (N) – Right	B	63.2 Through	16.8 Through	35.8 L+R
AM Base Case - 2025	87.7%	42.0 Pub Lane - Left	D	147.5 Through	32.0 Through	158.5 L+R
AM Project Case - 2025	100.3%	107.6 Teviot Rd (S) – Thru	F	378.8 Through	108.2 Right	740.2 L+R
AM Upgraded Project Case - 2035	75.9%	32.6 Pub Lane – Right	C	90.3 Through	22.1 Right	38.8 Right
PM Base Case - 2009	52.7%	18.4 Teviot Rd (N) – Right	B	37.0 Through	59.7 Through	30.1 L+R
PM Base Case - 2025	89.1%	34.5 Pub Lane - Left	C	45.9 Through	86.6 Through	68.4 L+R
PM Project Case - 2025	100.00%	62.8 Pub Lane – L+R	E	121.3 Through	252.9 Through	214.4 L+R
PM Upgraded Project Case – 2025	87.3%	50.0 Pub Lane – Right	D	85.2 Through	194.1 Right	100.0 Right

Conclusion

The results of TTM's Sidra analysis show the signalised intersection of Pub Lane / Teviot Road operating within acceptable performance parameters through until 2025, although approaching capacity in the PM peak. The addition of development generated traffic will have a significant impact on the performance of this intersection in 2025. On this basis, TTM have identified works to be undertaken by 2025 to mitigate the impacts of this development. Figure 6 depicts the intersection configuration required to cater for the development traffic demands in 2025.

The year 2025 has been adopted as the development completion date, with the ten year design horizon being 2035. TTM's preliminary Sidra analysis shows the upgraded intersection configuration will no longer cater for the 2035 development traffic demands. However, the modelling data supplied by Logan City Council shows a decrease in future traffic volumes along Teviot Road. Council have advised that several new road connections within this network are expected to significantly decrease the traffic demands along Teviot Road. However, with respect to the timing associated with these road works, Council's written correspondence states that for the purpose of this analysis, the assumption should be made that no upgrades will be planned before 2021.

Based on this advice, TTM suggest the development impacts at this intersection should be mitigated to cater for 2025 traffic demands. With uncertainty surrounding the road network post 2025 and the timing of road works identified by Council, TTM believe that any future road upgrade requirements will be captured in Council's modelling and therefore contributed for through infrastructure charges.

Figure 6 depicts the Pub Lane / Teviot Road intersection configuration required to cater for the 2025 development traffic demands. The key changes include:

- Lengthen right turn lane on Teviot Road (north) approach from 80m to 120m
- Construct continuous slip lane and 100m long downstream merge lane for left turns from Pub Lane

The identified intersection upgrades can be accommodated within the existing road reserve and are consistent with the ultimate configuration. Furthermore, the works are considered creditable towards infrastructure charges already being paid by the developer.

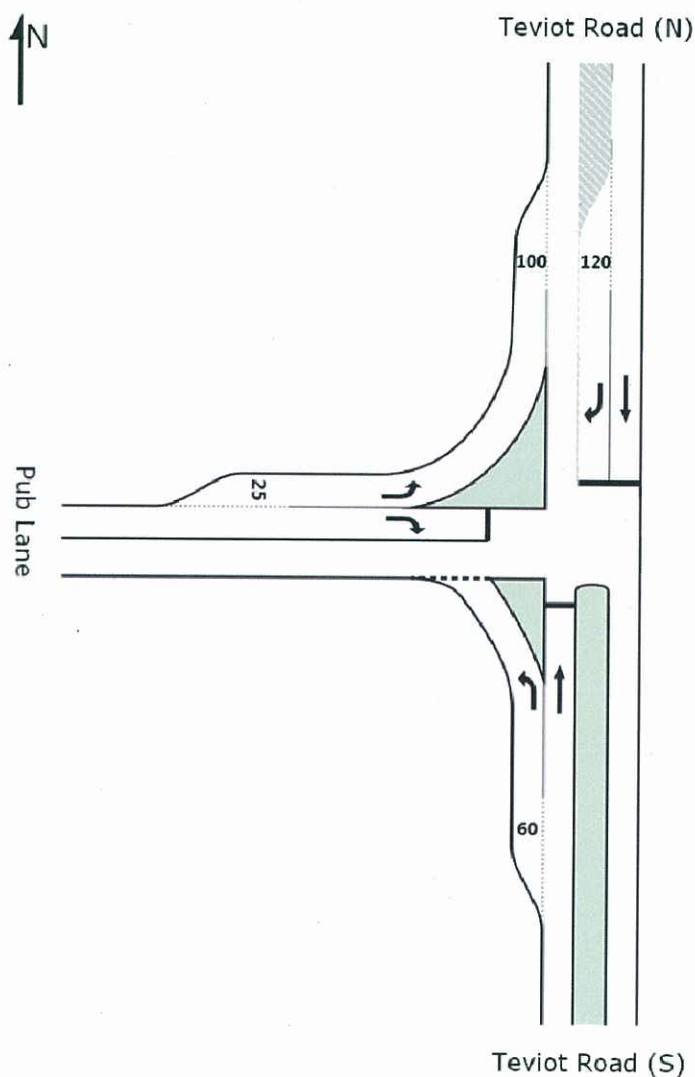
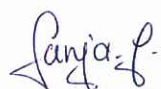


Figure 6: Pub Lane / Teviot Road intersection configuration 2025

If you require additional information relating to the traffic engineering issues discussed in this letter, please do not hesitate to contact TTM on 3327 9500.

Yours faithfully,

A handwritten signature in black ink, appearing to read 'Sanja Nikolic'. The signature is written in a cursive, flowing style.

Sanja Nikolic

Lead Consultant

Appendix A

PROPOSED DEVELOPMENT LAYOUT

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