

To: Amanda Seraglio
PO Box 21, Fairfield NSW 1860
Project/File: 15 Hilwa Street and 896 to 898
Woodville Road, Villawood

From: Bayzid Khan
Sydney
Date: 26 June 2023

Reference:301400270

Background

The following memorandum comprise a summary of Stantec's review of the response to Transport Impact Assessment Review for a planning proposal application comprising a mixed-use development at 15 Hilwa Street and 896-898 Woodville Road, Villawood, prepared by Genesis Traffic.

The specific document provided for the review are outlined in Table 1.

Table 1: Reviewed Material

Material	File Name	File Description
Letter	15 Hilwa Street, 896-898 Woodville Road, Villawood, letter prepared by Bernad Lo from Geneiss Traffic dated 19 June 2023	Response to RFI
SIDRA	VILLAWOOD 16062023	SIDRA Models

The previous Transport Impact Assessment Review and Response to RFI's prepared by Stantec and responded too by Genesis Traffic are also contained in Attachment 1 reference.

Review Summary

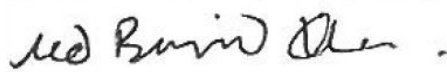
It is understood that the SIDRA models have been calibrated and validated based on Geneiss observations of the operation of the study intersections and Stantec note this is an acceptable approach. Stantec note that all technical comments have generally been addressed by Geneiss. Based on this, the SIDRA model is accepted as a tool to understand the traffic impact of the development to the road network. Notwithstanding and as previously discussed, Transport for NSW may provide additional comments during their review of the model.

However, removal of the Woodville Road/ Howatt Street north approach right turn "bus only" restriction, to enable all public vehicles to use this intersection to right onto Howatt Street, does not appear to provide a material benefit to the operation of the surrounding road network. Notwithstanding, it is understood this would provide significant benefit for vehicular access to the site. As previously discussed, the bus only lane is a Transport for NSW asset and as such, the ultimate approval for these road network modifications sits with Transport for NSW.

Reference: Planning Proposal Woodville Road and Hilwa Street, Villawood

Best regards,

Stantec Australia Pty Ltd

A handwritten signature in black ink, appearing to read "Bayzid Khan", followed by a period.

Bayzid Khan

Principal Transportation Engineer
Phone: +61 2 8448 7195
Bayzid.khan@stantec.com

Reference: Planning Proposal Woodville Road and Hilwa Street, Villawood

Attachment 1 – Previous Reviews Prepared by Stantec

To: Amanda Seraglio
PO Box 21, Fairfield NSW 1860

From: Bayzid Khan
Sydney

Project/File: 15 Hilwa Street and 896 to 898
Woodville Road, Villawood

Date: 1 June 2023

Reference:301400270

The following sections comprise a summary of Stantec's review of the response to Transport Impact Assessment Review for a planning proposal application comprising a mixed-use development at 15 Hilwa Street and 896-898 Woodville Road, Villawood, prepared by Genesis Traffic.

The specific document provided for the review are outlined in Table 1.

Table 1: Reviewed Material

Material	File Name	File Description
Letter	15 Hilwa Street, 896-898 Woodville Road, Villawood, letter prepared by Bernad Lo from Geneiss Traffic dated 3 May 2023	Response to RFI
SIDRA	VILLAWOOD 02052023, including the following scenarios	SIDRA Models

The previous Transport Impact Assessment Review and Response to RFI prepared by Stantec and responded too by Genesis Traffic are also contained in Attachment 2 reference.

Stantec have also included an email from Transport for NSW clearly outlining their expectations for model preparation and calibration/ validation. Reference to this attachment is provided throughout this letter. Please note personal details have been removed from the PDF, including some emails and phone numbers.

As part of the response to submissions process, the proponent has expanded the number of modelling scenarios considered in the assessment. The modelling scenarios are detailed in Table 2.

Table 2: Scenario analysis for modelling traffic impacts

#	Scenario	Description
1	Existing condition	June 2022 traffic surveys
2	Existing condition with modifications	Scenario 1, plus allowance for proposed road network modifications
3	2022 Post development, without modifications	Scenario 1, plus allowance for traffic generated by the indicative development scheme
4	2022 Post development, with modifications	Scenario 3, plus allowance for proposed road network modifications
5	2032 Future base condition	Scenario 1, with 2 per cent per annum traffic growth
6	2032 Post development, with modifications	Scenario 5, plus allowance for traffic generated by the indicative development scheme AND proposed road network modifications

Reference: Planning Proposal Woodville Road and Hilwa Street, Villawood

This document is set out as follows:

- review priority criteria
- review and comments relating to the RFI Response
- summary and recommendations.

1 Review Priority Criteria

Key findings of the review have been allocated a level of priority to assist interpretation. Table 3 shows the criteria adopted in assessing the level of priority.

Table 3: Priority criteria

Priority	Description
Note	For information.
Minor	Comments are not critical to the outcome of the assessment.
Moderate	Comments should be addressed to ensure a robust assessment.
Major	Comments are critical and must be incorporated to assess the impacts of the proposal. If the comment is not addressed by the applicant, adequate justification would be required.

2 RFI Response Review

Table 4 presents a summary of comments on the RFI Response. Please note the item number has remained consistent across both Stantec and Genesis Traffic documents for ease of review. Further, Stantec has included notes in the “RFI Response” column in *italicised text* to provide context to the reader.

Table 4: Summary of review comments – RFI Response

Item	RFI Response	Comment	Priority
1.	No further action		
2.	The assessment has been revised to adopt 3,000m ² GFA (all supermarket) to absorb any discrepancies arising from the remaining review concerns.	Noted	Note
3.	No further action		
4.	Subject to planning advice <i>Car parking rates</i>	Noted	Note
5.	No further action		
6.	No further action		

Reference: Planning Proposal Woodville Road and Hilwa Street, Villawood

Item	RFI Response	Comment	Priority
7.	The specific details of these elements will be incorporated in the updated architectural plans.	Noted	Note
8.	No further action		
9.	<p><i>Comment has been extracted from Genesis previous letter response dated April.</i></p> <p>The assessment will be updated with the TfNSW criteria. However, it is noted that the submitted assessment has applied more conservative assessment bases. For comparison, the analysis adopted the following rates:</p> <p>Residential dwelling 0.88 vtp per dwelling; and Commercial 2 vtp per 100m² GFA</p> <p>Whereas the TfNSW's corresponding rates are:</p> <p>Residential dwelling 0.99 vtp per dwelling;</p> <p>Commercial (bulky goods) 2.7 vtp per 100m² GFA</p>	<p>On review of the Revised Traffic Generation Calculations contained in the May 2023 letter, please note the commercial (bulky goods) rate is applicable to the PM peak only. Transport for NSW TDT 2013/04a does not specify an AM traffic generation rate, as they note "the morning site peak hour during weekdays does not generally coincide with the network peak hour" and further on page 20 "Network AM peak is outside of opening hours".</p> <p>It is recommended the AM rate is discounted appropriately similar to retail uses.</p>	Minor
10.	The assessment has been revised to adopt a higher traffic generation rate of 0.3 vtp per unit to absorb any discrepancies arising from the remaining review concerns.	The reviewer confirms the updated residential traffic generation rate has been applied.	Note
11.	The assessment will be updated to reflect the rates recommended by STANTEC (which are based on the RMS Guidelines) following confirmation of the retail/commercial floor areas.	<p>Note this comment has been extracted from the Previous Genius letter dated April.</p> <p>The reviewer confirms the updated retail (supermarket) traffic generation rates have been applied.</p>	Note
12.	As per Bullet Point 11.	Accepted.	Note
13.	<p><i>Please note the reviewer has included a reduced version of Genesis Traffic's comment in this table.</i></p> <p>We wish to clarify that we did not assume in our former or current assessment that the passing/diverted traffic should only arise from vehicles that currently pass the site via Howatt Street.</p> <p>...</p> <p>Of these, we say 15% is associated with motorists that are already using Woodville Road and/or Binna Burra Street. Therefore, the 'new' additional traffic introduced to the network as a result of the new development is:</p>	<p>The reviewer stated in the March review that a linked trip assumption of 15 per cent could be supported based on Transport for NSW Guide 2002.</p> <p>The focus of the queries around this discount relates purely to the assumptions behind the re-distribution patterns of these linked trips. Best practise is to map the travel path of these diverted trips on the road network, and reflect this in the turning movement diagrams/ models.</p> <p>With this in mind, all of these "linked trips" (i.e. vehicles already on the road network) would naturally use the Howatt Street access to enter/ exit the site. Given these trips are not "new" they would be derived from:</p>	Note

Reference: Planning Proposal Woodville Road and Hilwa Street, Villawood

Item	RFI Response	Comment	Priority
	<p>AM (-15%) = 115 vph (with 15% equals 20 vph) PM (-15%) = 395 vph (with 15% equals 70 vph) Of the 3,652 vehicles that pass through the adjoining Woodville Road/Howatt Street intersection, our assumption says 90 drivers will make the decision to divert from their normal trips to visit the site's retail offering during the peak hour. ... The proportion of diversion will likely exceed 2.5% following the development. Nevertheless, we have omitted this discount factor in the revised assessment. Therefore, the now omitted passing/diversion discount, the inflated supermarket retail GFA, and the inflated traffic generation rates all work to produce a conservative assessment outcome that will in my opinion overcome any other discrepancies that remain debatable.</p>	<ul style="list-style-type: none"> existing vehicles already traveling along Howatt Street. In this case, there is no action required to map the re-distribution of these vehicles. existing vehicles already traveling north/south along arterial road network, who are diverted to travel into the site, then back out onto the arterial road network. In this case, these trips should be considered when developing turning movement diagrams. Where an existing vehicle deviates from their existing route, a -1 value is applied, and where they travel a new route in order to enter/ exit site, a +1 value is applied to that/ those movement(s). <p>If linked trips are simply removed from the total traffic generation, with no consideration for the re-distribution/ diversion patterns of these existing trips through the local road network, than the applicant is effectively suggesting that all linked trips are vehicles that are already traveling along Howatt Street, consistent with dot point one.</p> <p>Re-application of linked trip discount with consideration for the re-distribution patterns of those linked trips throughout the road network is at the discretion of the applicant.</p>	
14.	No further action		
15.	<p>Updated based on Stantec Comments</p> <p><i>Road network modifications and SIDRA modelling scenarios</i></p>	<p>Noted. The reviewer confirms the revised models now include an existing and post development scenario with and without the proposed road network modifications (opening bus lane to general traffic).</p> <p>Notwithstanding, the future growth year scenarios (2032) includes a base scenario, without the development and without the road network modifications, and a post development scenario, with the development and with the road network modifications.</p> <p>It is recommended a 2032 post development scenario is modelled without the road network modifications. Without this scenario, the impact of the project on the existing road network in the future growth year cannot be isolated and further, the impact of the road network modifications cannot be assessed.</p> <p>Please note that Transport for NSW are the ultimate approval body for the proposed road network modifications, as discussed in Section 3 below.</p>	Moderate
16.	No comment provided from Genisis	Stantec recommended that for a robust and conservative assessment of the proposed road	Note

Reference: Planning Proposal Woodville Road and Hilwa Street, Villawood

Item	RFI Response	Comment	Priority
	<i>Redistribution of existing traffic following road modifications</i>	network modifications, existing traffic should be redistributed to turn right at the Woodville Road/ Howatt Street intersection in the relevant scenarios. It appears the applicant has redistributed a minor quantum of existing vehicles to turn right at Howatt Street.	
17.	Updated based on Stantec Comments <i>SIDRA model to include AM peak period</i>	The reviewer confirms the AM peak is now included in the SIDRA modelling assessment.	Note
18.	The provided AIMSUN generated traffic volumes (of the assessed intersections) indicated average growth rates of 0.9% and 1.1% in the AM and PM peaks, respectively. The assessment believes these rates are relatively low. So instead, it applied a more conservative annual growth rate of 2%. Once more, the future assessment will be robust.	Accepted.	Note
19.	All intersections are now modelled as a coordinated network with a cycle length between 140s and 150s, reflecting the surveyed and observed cycle times.	Noted. The reviewer confirms all intersections now modelled in a network. It is recommended the proponent refers to response to comment 29 and 30 for discussion around cycle times. The reviewer notes that all intersections are now set to coordinated, with 0 seconds offset between intersections (phase A being the reference phase at each intersection). At time of preparing the AIMSUN model, Woodville Road/ Howatt Street intersection had an offset of -13 and -5 relative to the Woodville Road/ Villawood Place intersection, with a cycle time of 140 seconds, in the AM and PM peak periods. It is recommended that coordination and offset information is obtained from Transport for NSW to confirm the above and included in the network models accordingly. The reviewer notes that this issue was raised previously. Moreover, given the nature of the proposed road network modifications, this may be queried by Transport for NSW during their review.	Moderate
20.	The traffic survey data are reproduced in Attachment 2 for reference. The survey took place on 23 June 2022 on a typical Thursday.	Accepted	Note
21.	Heavy vehicle proportions are now modelled as per survey data (Attachment 2).	Accepted	Note
22.	Updated as per Stantec's comment. <i>Site LOS method</i>	Accepted	Note

Reference: Planning Proposal Woodville Road and Hilwa Street, Villawood

Item	RFI Response	Comment	Priority
23.	Pedestrian movements that oppose turning phases have now been prioritised in the SIDRA settings	Accepted.	Note
24.	In addition to the priority control associated with Item 23, all left turn movements are subject to the SIDRA 'Start Loss' setting.	<p>Start loss of three seconds (SIDRA default) accounts for the delayed reaction time between a light turning green, and vehicles commencing movement. As such, this is not equivalent to pedestrian protection.</p> <p>If pedestrian protection is present, than vehicles will be subject to both delay from pedestrian protection plus standard start loss of three seconds.</p> <p>As noted in the SIDRA manual and consistent with comments to date, <i>"the Opposing Peds (Signals) parameter (using the St Loss option) in the Gap Acceptance dialog can be used for the program to calculate a variable value of extra start loss as a function of the pedestrian flow rate. A fixed Extra Start Loss value may be added to the Start Loss value in the Signals tab if it is desirable to specify a fixed value to allow for pedestrian interference."</i></p> <p>All models should be assessed for appropriate pedestrian protection and updated accordingly. Please note this is a standard request from Transport for NSW, as detailed in attachment 1.</p>	Moderate
25.	Updated as per Stantec's comment. <i>Intersection Approach Distances</i>	Accepted	Note
26.	Updated as per Stantec's comment. <i>Short lane lengths</i>	Accepted	Note
27.	Updated as per Stantec's comment. <i>Undetected movements</i>	Accepted	Note
28.	Updated as per Stantec's comment. <i>Phase transitions</i>	Accepted	Note
29.	The observed cycle times range between 140s to 150s. The network model cycle length settings are now consistent with these.	<p>These comments are noted.</p> <p>The reviewer highly recommends the proponent follows Transport for NSW modelling requirements as reproduced in Attachment 1. With regards to the base model phasing set up, this includes the following key notes as reproduced below:</p>	Major
30.	We reinspected the road network on 2 May 2023 to observe the peak traffic conditions. The observed queues, operational delays, and signal phasing are generally consistent with the modelled outcome. Contextually, it is helpful to note that SIDRA, unlike AIMSUN, is a static model. While AIMSUN is capable of/may account for variation of signal phasing, timing, pedestrian flows/demands across a 1 or 2-hour period, this is not the case	<ul style="list-style-type: none"> Signal phasing should be recorded simultaneously during the traffic and pedestrian surveys. Phase, phase duration and skipped phases should be recorded. Then calculate the average phase time per cycle. A couple of different approaches can be applied to phasing during the base model setup. The average cycle time from the 	Major

Reference: Planning Proposal Woodville Road and Hilwa Street, Villawood

Item	RFI Response	Comment	Priority
	<p>for SIDRA. This is because it is not the intent of a static model to reflect the dynamic effect due to the complex SCATS system. A SCATssimulation model fits that purpose. Instead, SIDRA relies on typical/representative operating parameters, examining site/intersection operations on a peak hourly average basis.</p> <p>Therefore, it is generally accepted that the representative operational parameters, e.g. dominant peak signal phasing sequence and cycle lengths are a suitable input for SIDRA model assessment.</p>	<p>survey period can be input as a User Given Cycle Time along with the phase frequency (the % times each phase operates). Then the resultant phase splits can be checked against SCATS maximums to check the model is calibrated to site conditions</p> <ul style="list-style-type: none"> • Or, User Given Phase Times can be used for the purpose of calibration. If user specified phase times are used for the base model setup, they should be removed from any future scenarios. • Particular reference should be made to include pedestrian protection times, late starts and maximum phase splits. <p>As such, Transport for NSW position is that the SIDRA calculated cycle time/ phase times for the existing condition model (currently processed by the Applicant using the Optimal Cycle Time) should align with the actual cycle time/ phase times, where the actual cycle time is based on the average cycle time across the hour period on the day of the survey.</p> <p>Further, the resultant phase splits (i.e. percentage green time allocated to each phase) should be consistent with the actual phase times (being the average/ maximum phase time recorded across the hour period on the day of the survey).</p> <p>The reviewer recommends the applicant review the above information and consider whether:</p> <ul style="list-style-type: none"> • the existing condition cycle time output by SIDRA (noting optimal cycle time of 140 to 150 seconds input into model) is consistent with the average cycle time during the survey period • The existing condition phasing sequence and phase times calculated by SIDRA are consistent with the phase times during the survey period. <p>Given the proposed modifications impact a Transport for NSW asset, it is likely Transport for NSW will provide the same queries during their review.</p>	
31.	<p>Dot Point 1 – 2% applied per response to item 18.</p> <p>Dot Point 2 – Heavy vehicle proportion/quantum have been updated in the model.</p> <p>Dot Point 3 – The delays and queue extents are consistent with circumstances observed onsite.</p>	Noted	Note

Reference: Planning Proposal Woodville Road and Hilwa Street, Villawood

Item	RFI Response	Comment	Priority
	Dot Point 4 – The AM peak models are now included in the assessment.		
32.	Updated as per Stantec's comment. <i>Lane Configuration</i>	Accepted	Note
33.	Updated as per Stantec's comment. <i>Reporting of Results for Priority Controlled Intersections</i>	Accepted	Note
34.	Updated as per Stantec's comment. <i>Lane disciplines</i>	Accepted	Note
35.	Updated as per Stantec's comment. <i>Free Queue</i>	SIDRA defines Free Queue as the number of vehicles which can queue away from the lane without interrupting the flow of the other movement which shares the lane. A review of the free queue shows it has been modelled as 14 metres for the through movement, however a require of aerial photography indicates that at 14 metres, the through movement would block access to the left turn slip lane. As such, it is recommended the free queue for the through movement is reduced.	Minor
36.	Updated as per Stantec's comment. Bunching factor deleted from priority intersection.	Accepted	Note
37.	Updated as per Stantec's comment.	Accepted	Note
38.	Response to Item 30 is applicable in this context. The input signal phasing arrangement is representative and is the most frequently run phasing set during the peak hour.	This comment is noted. It is recommended the proponent refers to response to comment 29 and 30 above.	Major
39.	All models now adopt 'Optimum Cycle Time' setting for consistency.	<p>This comment is noted.</p> <p>The reviewer highly recommends the proponent follows Transport for NSW modelling requirements as reproduced in Attachment 1. With regards to cycle times for future conditions models, the following key notes are reproduced below:</p> <ul style="list-style-type: none"> • All configurations for the base model should be left in place for future scenario modelling. • If User Given Phase Times have been entered manually then the model should be changed to Practical Cycle Time , but cannot used for future scenarios. • However, if the site is to be coordinated with other signal sites, then specify a User Given Cycle Time . • Optimal is for optimising a specific parameter for delay, LOS and is not recommended unless you know what you are optimising which could trigger problems to other problems. Not 	Major

Reference: Planning Proposal Woodville Road and Hilwa Street, Villawood

Item	RFI Response	Comment	Priority
		appropriate for developments, maybe for roads. With regards to the above, given the signalised intersections are coordinated it is likely that Transport for NSW would prefer a user given cycle time to be selected. Given the proposed modifications impact a Transport for NSW asset, it is likely Transport for NSW will provide the same queries during their review.	
40.	Updated as per Stantec's comment. <i>Phase Arrangement</i>	Accepted	Note
41.	Updated as per Stantec's comment. <i>Lane Configuration</i>	A review of the short departure lane shows it has been modelled longer than shown through a review of aerial photography and Google Streetview, noting parking is permitted along Kirrang Avenue north-west of Kamira Avenue. It is recommended that the model is reviewed, and lanes updated to reflect existing conditions	Minor
42.	Updated as per Stantec's comment. <i>Signal Phases</i>	Accepted	Note

3 Summary and Recommendations

Road Network Modifications

The transport assessment includes a proposal to remove the Woodville Road/ Howatt Street north approach right turn "bus only" restriction, to enable all public vehicles to use this intersection to right onto Howatt Street. The reviewer notes that the bus only lane is a Transport for NSW asset and as such, the ultimate approval sits with the Transport for NSW. With this in mind, comments provided within this report have been tailored based on the expected comments to be provided by Transport for NSW during their review of the proposed road network modifications.

Further, given the ultimate approval of the proposed road network modifications is not determined by Council and it is unclear what decision Transport for NSW may provide, it is critical that all modelling scenarios consider the traffic impact of the development both with and without the proposed modifications. This has been completed for the 2022 scenarios, however also is required for the 2032 scenario.

The proponent notes *"The 'modified' option contemplates permitting public vehicles to turn right from Villawood Road onto Howatt Street (currently restricted to buses only). The assessment outcome did not reveal quantifiable network-wide benefit under this arrangement. However, on a network-wide circulation basis, the continued prohibition of the right turn movement will result in a poor development/amenity outcome."*

Under the existing Howatt Street traffic restriction (i.e. one-way west only), vehicles that are bound for the retail car park from the north must turn right at the Villawood Road signals, proceed to turn left at Kamira Court, turn left onto Kirrang Avenue, turn left onto Woodville Road, and finally turn left onto

Reference: Planning Proposal Woodville Road and Hilwa Street, Villawood

Howatt Street (see below illustration). The arrangement will result in a circuitous route for supermarket traffic around what is a predominantly low-density residential precinct on some local roads.”.

Road Network Results

The reviewer will comment on the results and suitability or otherwise of the modifications following final resolution of comments provided above.

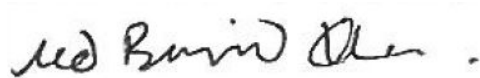
Summary

With regards to the above, the revised modelling provides additional insight into the transport and traffic impacts effects of the proposed development, but further detail is required/ recommended with key items extracted below:

- Additional 2032 scenario, without modifications
- Recommendations to refine cycle time/ phase arrangements based on Transport for NSW preference as described in Attachment 1
- Consideration of whether a 0 second offset between intersections accurately reflects site conditions on the day of the survey.

Best regards,

Stantec Australia Pty Ltd



Bayzid Khan

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Reference: Planning Proposal Woodville Road and Hilwa Street, Villawood

Attachment 1 – Transport for NSW Preferred Modelling Approach

From: [Khan, Bayzid](#)
To: FW: SIDRA methodology
Cc: Tuesday, April 4, 2023 1:11:40 PM
Subject: [image001.png](#)
Date:
Attachments: [image002.png](#)
[image003.png](#)
[image004.png](#)

Hi All,

Just received the following email (as an attachment) from TfNSW for one of the projects I am working on at the moment. It specifies the SIDRA modelling methodology, including cali/vali.

Probably you are aware of these steps already. Thought this could still be useful for some of us.

Not sure if I have copied everyone doing SIDRA modelling in our team. Please pass this to anyone I miss.

Cheers,

Bayzid Khan

Principal Transportation Engineer

Direct:

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Stantec Australia

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Please consider the environment before printing this email.

From: Brett Morrison <Brett.Morrison4@transport.nsw.gov.au>

Sent: Tuesday, March 21, 2023 3:34 PM

To: Sasha Kovacina <sasha.kovacina@transport.nsw.gov.au>

Cc: David Rohloff <David.Rohloff@transport.nsw.gov.au>

Subject: SIDRA methodology

Further to your request regarding model setup/calibration. If appropriate for you to pass on to Craig and Tom.

SIDRA METHODOLOGY

The base model needs to replicate site conditions. For example, the queue lengths or

delays observed on site are compared favorably with the calculated and presented in a tabular format. That the queue lengths are within 10%

In regards model setup and calibration please follow that outlined in the SIDRA User Guide Section 2.6.62-2.6.4. and some additional guidance as follows.

Data Collection

Before undertaking surveys, if possible, it is recommended to check the site(s) for oversaturated conditions. Different approaches to data collection should be applied to under and oversaturated approaches.

SIDRA wants to see demand volumes as input. Therefore, for undersaturated scenarios turning movement counts can be performed at the stop line. For oversaturated conditions the stop line counts should be accompanied by back of queue surveys on the appropriate approaches.

A case study of the impacts of demand vs capacity modelling is available amongst the many publications found on <https://www.sidrasolutions.com/publications>. *Measuring and Assessing Traffic Congestion: A Case Study (2014)* details the findings. The conclusion being that failing to model demand volumes, and the resultant residual queue spillback, significantly underestimated queue lengths.

A minimum survey of 2 hours should be undertaken for the AM and PM peaks separately. Peak times are usually a product of peak commuter travel, however, special consideration should be given to certain locations where special conditions impact peak demand.

Queue Length surveys

Queue length surveys for all approaches are often used for calibration purposes. For ease of comparison, it is recommended to count the number of vehicles in the queue at the start of green to the red per cycle. Then, as part of the calibration, compare the field measurements with the **Queue Length at Start of Green** as reported in the **Queue Analysis** output report as well as setting the Percentile to 50%.

A free spreadsheet template for Back of Queue surveys is available on the SIDRA support website.

<https://support.sidrasolutions.com/support/solutions/articles/1000289573-sidra-back-of-queue-survey-excel-application>

Pedestrian counts are highly recommended to be undertaken during traffic volume counts.

Signal phasing should be recorded simultaneously during the traffic and pedestrian surveys. Phase, phase duration and skipped phases should be recorded. Then calculate the average phase time per cycle. IDM data of phase times for the survey date can be arranged by submitting a request to Scats.traffic.signal.data@rms.nsw.gov.au.

Travel time surveys

Additionally, for a network model, some sample travel times are recorded during the survey period for validation of the post calibration model. The travel time is measured between stop lines of traffic signals. However, it should be closed system where there are no other

signals or side street volumes entering and leaving the section of travel time surveyed. If the comparison is poor confirm on site that the negotiation time ie from the stop line to the departure lane is included in SIDRA.

Model Calibration:

Basic Procedures

There are several input parameters, performance measures, and calibration requirements expected to appear in the SIDRA report. Capacity and performance characteristics (e.g. delay, queue length, stops, etc) of a traffic facility are influenced by both the *intersection geometry* and *driver behaviour*. To a great extent, all input parameters related to intersection geometry and driver behaviour are important for calibrating the SIDRA INTERSECTION traffic model to represent particular intersection and network conditions. As outlined in the SIDRA User Guide Section 2.6 the following key parameters should be considered for specific control types.

Table 2.6.1 - Key Elements of Model Calibration

Site Type	Key parameters used in the capacity model	Recommended key calibration parameter	Input dialog
Signals	Saturation Flow Rate	Area Type Factor	Intersection (per approach)
		Basic Saturation Flow	Lane Geometry dialog - Lane Data tab (per lane)
Roundabouts	Follow-up Headway and Critical Gap	Environment Factor Model Calibration Factor (1)	Roundabouts (per approach)
Two-Way Sign Control	Follow-up Headway and Critical Gap	Base Follow-up Headway and Critical Gap	Gap Acceptance (per movement)

(1) **Environment Factor** when the **SIDRA Standard** roundabout capacity model is used, **Model Calibration Factor (HCM 6)** when the **HCM 6** roundabout capacity model is used, and **Model Calibration Factor (HCM 2010)** when the **HCM 2010** roundabout capacity model is used.

Basic Saturation Flow

For general saturation adjustments across all approaches, **Area Type Factor** can be altered.

This needs to be adjusted for different regions. Appropriate values can be obtained from ARR 123.

For individual adjustments, lane by lane, the **Basic Saturation Flow** values can be changed individually.

Always leave "Apply Saturation Flow Estimation" ticked so that saturation flow estimates can be automatically adjusted in any future scenarios.

Capacity Adjustment

The use of the Calibration Adjustment parameter for calibration is not recommended.

The Calibration Adjustment parameter adjusts the normal program estimate (i.e. it is an end value adjustment). Thereby, this is not a fundamental parameter of the model. Adjustment

of the Basic Saturation Flow Rate is the recommended approach, because the Basic Saturation Flow Rate is a fundamental parameter, which means it is used in various areas of the model as a primary input and is therefore a more robust approach.

Phasing

A couple of different approaches can be applied to phasing during the base model setup. The average cycle time from the survey period can be input as a **User Given Cycle Time** along with the phase frequency (the % times each phase operates). Then the resultant phase splits can be checked against SCATS maximums to check the model is calibrated to site conditions. Or, **User Given Phase Times** can be used for the purpose of calibration, where each phase time can be individually specified along with the phase frequency. Then other data (queue lengths, travel times etc) can be used to validate the accuracy of the model. If user specified phase times are used for the base model setup, they should be removed from any future scenarios. The maximum cycle time should then be substituted.

Particular reference should be made to include pedestrian protection times, late starts and maximum phase splits. These can be obtained at a cost by submitting a request to Scats.traffic.signal.data@rms.nsw.gov.au.

Additional Parameters

Ideally some information on lane preferences, driver behaviour and downstream issues would be known. Otherwise some best judgement modelling applied.

The **Lane Utilisation** parameter can be useful to calibrate for dominant lanes. For an internal approach within a network, the proportion of traffic exiting to alternative exit lanes might need adjustment in **Lane Movements**.

Within networks, the **Blockage Calibration Factor** could be adjusted if further reduction to upstream lane capacity is required.

All changes to default values should be sensible and within a justifiable range. Extreme changes to defaults imply problems with other areas of the model unless data is available to justify those changes. All changes to default values need to be outlined and justified within the TIA.

Oversaturated Conditions

In the case where site conditions are over saturated with excessive queuing. The intersection counts are only what can pass the stop line and therefore a demand volume is required. In this case the base saturation flow is to be adjusted until the DS of 1 is obtained. The flow scale is to be inflated to match the queue lengths.

Future Scenario Modelling:

All configurations for the base model should be left in place for future scenario modelling. If **User Given Phase Times** have been entered manually then the model should be changed to **Practical Cycle Time**, but cannot be used for future scenarios. However, if the site is to be coordinated with other signal sites, then specify a **User Given Cycle Time**.

Optimal is for optimising a specific parameter for delay, LOS and is not recommended

unless you know what you are optimising which could trigger problems to other problems.
Not appropriate for developments, maybe for roads.

Brett Morrison

Senior Land Use Planner
Development Assessment Western
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Transport for NSW

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**Transport
for NSW**



I acknowledge the Aboriginal people of the country on which I work, their traditions, culture and a shared history and identity. I also pay my respects to Elders past and present and recognise the continued connection to country.

Please consider the environment before printing this email.

OFFICIAL: Sensitive – NSW Government

Reference: Planning Proposal Woodville Road and Hilwa Street, Villawood

Attachment 1 – Previous Reviews Prepared by Stantec

To: Amanda Seraglio
PO Box 21, Fairfield NSW 1860

From: Volker Buhl
Sydney

Project/File: 15 Hilwa Street and 896 to 898
Woodville Road, Villawood

Date: 18 April 2023

Reference:301400270

The following sections comprise a summary of Stantec's review of the response to Transport Impact Assessment Review for a planning proposal application comprising a mixed-use development at 15 Hilwa Street and 896-898 Woodville Road, Villawood, prepared by Genesis Traffic.

The specific document provided for the review are outlined in Table 1.

Table 1: Reviewed Material

Material	File Name	File Description
Letter	15 Hilwa Street, 896-898 Woodville Road, Villawood – Supplementary Traffic Engineering Assessment, letter prepared by Bernad Lo from Geneiss Traffic dated 3 April 2023	Response to RFI

The Transport Impact Assessment Review prepared by Stantec and responded too by Genesis Traffic is also contained in Attachment 1 for reference.

This document is set out as follows:

- review priority criteria
- review and comments relating to the RFI Response
- summary and recommendations.

1 Review Priority Criteria

Key findings of the review have been allocated a level of priority to assist interpretation. Table 2 shows the criteria adopted in assessing the level of priority.

Table 2: Priority criteria

Priority	Description
Note	For information.
Minor	Comments are not critical to the outcome of the assessment.
Moderate	Comments should be addressed to ensure a robust assessment.
Major	Comments are critical and must be incorporated to assess the impacts of the proposal. If the comment is not addressed by the applicant, adequate justification would be required.

Reference: Planning Proposal Woodville Road and Hilwa Street, Villawood

2 RFI Response Review

Table 3 presents a summary of comments on the RFI Response.

Table 3: Summary of review comments – RFI Response

Item	RFI Response	Comment	Priority
1.	The proposal assumes 135 dwellings. The unit mixes can be refined at the appropriate stage.	Accepted	Noted
2.	The identified discrepancy being 8m ² is approximately 0.3% in difference in the grand scheme. The Planning Proposal is high-level by virtue of its nature. A detailed assessment will be updated with accurate development yield.	The intention of this query was to reconcile the gross floor area of the specialty retail shops. Based on a review of the plans, the shops appear to occupy a total area greater than eight square metres. As such, this suggests the total retail area may be greater than 2,350 square metres given the plans indicate the supermarket occupies 2,342 square metres. It is recommended that the retail areas are clarified.	Minor
3.	Please refer to Bullet Point 10 in relation to additional residential traffic.	Noted	Note
4.	The ADG specifies the applicable criteria to be the lower between the RMS Guideline and the DCP. As STANTEC rightly pointed out, the RMS Guidelines' published rates are lower, representing the applicable car parking criteria in this context.	The reviewer defers to council to make a final call on car parking rates to be used in this instance. As previously noted, car parking rates adopted for this assessment are based on Apartment Design Guide (ADG) SEPP 65 for residential developments within 800 metres of a railway station in the Sydney Metropolitan Area. ADG SEPP 65 recommends adoption of the following minimum residential car parking rates based on Transport for NSW Guide to Traffic Generating Developments Version 2.2 October 2002 (Transport for NSW Guide 2002): <ul style="list-style-type: none"> One bedroom unit – 0.6 spaces per unit Two bedroom unit – 0.9 spaces per unit Three bedroom unit – 1.4 spaces per unit Residential visitors – 1 space per five units. These minimum parking rates are lower than the residential parking requirements set out in the Fairfield City Wide DCP 2013 for developments within 400 metres of a railway station, as set out below: <ul style="list-style-type: none"> One/ two bedroom unit (less than 110m²) – 1 space per unit Three or more bedroom unit (greater than 110m²) – 1.5 spaces per unit Residential visitors – 1 space per four units. 	Deferred to Council
5.	The quantum of the retail car park will be finalised as the GLFA is determined.	Accepted	Note

Reference: Planning Proposal Woodville Road and Hilwa Street, Villawood

Item	RFI Response	Comment	Priority
6.	Noted in relation to other modes of transport i.e. bicycles, motorcycles, etc.	Noted	Note
7.	The specific details of these elements will be incorporated in the updated architectural plans.	Accepted	Note
8.	Noted.	N/a	Note
9.	<p>The assessment will be updated with the TfNSW criteria. However, it is noted that the submitted assessment has applied more conservative assessment bases. For comparison, the analysis adopted the following rates:</p> <p>Residential dwelling 0.88 vtpd per dwelling; and Commercial 2 vtpd per 100m² GFA</p> <p>Whereas the TfNSW's corresponding rates are: Residential dwelling 0.99 vtpd per dwelling; Commercial (bulky goods) 2.7 vtpd per 100m² GFA</p>	Noted	Note
10.	It is not agreed that the assessment should be based on a generically adopted traffic generation rate (of 0.3 vtpd per unit), particularly as extensive and up-to-date assessments/surveys have been undertaken to reflect the traffic generation characteristics of high-density apartment buildings in proximity to transport facilities.	<p>The reviewer defers to council to make a final call on traffic generation rates to be used in this instance.</p> <p>For reference, the reviewers original comment is excerpted below:</p> <p><i>"Council has specified use of the following residential traffic generation rates for planning proposals in both Villawood¹ and Fairfield²:</i></p> <ul style="list-style-type: none"> <i>0.3 movements / unit in the AM peak hour</i> <i>0.3 movements / unit in the PM peak hour</i> <i>0.3 movements / unit in the Saturday peak hour.</i> <p><i>It is recommended the Council endorsed rates are adopted for the purpose of this assessment."</i></p>	Deferred to Council
11.	The assessment will be updated to reflect the rates recommended by STANTEC (which are based on the RMS Guidelines) following confirmation of the retail/commercial floor areas.	Noted. The reviewer assumes this will occur prior to determination of the Planning Proposal.	Moderate
12.	As per Bullet Point 11.	Noted. The reviewer assumes this will occur prior to determination of the Planning Proposal.	Moderate

¹ 2 Villawood Road, Villawood

² Fairfield Forum, 8-36 Station Street, Fairfield

Reference: Planning Proposal Woodville Road and Hilwa Street, Villawood

Item	RFI Response	Comment	Priority
13.	The submitted assessment assumes that only 15% of the calculated development traffic is associated with passing traffic, not the majority as indicated in the STANTEC review. In this regard, we respectfully ask that STANTEC clarifies its example of 49 vtph.	<p>The origin/ destination of any traffic that is considered to be “passing traffic” needs to be considered in the assessment.</p> <p>The assessment currently assumes all of the “passing traffic” is generated by vehicles already traveling along Howatt Street with their ultimate destination in Villawood.</p> <p>A review of existing traffic as shown in the image below indicates that currently, 93 vehicles travel past the proposed site access including 4 heavy vehicles and 89 light vehicles (the previous Transport Impact Assessment review excluded vehicles traveling from the east and hence assumed 49 light vehicles travelled along Howatt Street).</p> <p>The reviewer notes it is unreasonable to assume a significant proportion of these existing vehicles will be attracted to enter the site during the PM peak period. The reviewer notes that it is more reasonable to assume:</p> <ul style="list-style-type: none"> a proportion of the “passing traffic” are already traveling along Howatt Street the remainder of the “passing traffic” are diverted from their existing journey along Woodville Road to turn onto Howatt Place and into the site access, and then travel back onto Woodville Road to complete their journey. <p>It is therefore recommended the linked trips/ “passing traffic” distribution assumptions are reviewed when updating the assessment in accordance with comment 9 to 12.</p>	Minor
14.	Noted – the inconsistent numbers will be updated.	Noted	Note
15.	The assessment found that opening the right-hand turn from north to Howatt Street to public vehicles will neither	The reviewer confirms a scenario should be run excluding the road network modifications from the post development model, and the road	Major

Reference: Planning Proposal Woodville Road and Hilwa Street, Villawood

Item	RFI Response	Comment	Priority
	deteriorate that turning movement nor the overall intersection operation – a working solution. Nevertheless, if necessary, the assessment can be updated with another scenario that does not contemplate this option.	<p>network modifications should rather be assessed as part of the applicant's proposed mitigation measures.</p> <p>The reviewer also notes that the impact of the proposal to remove the Woodville Road/ Howatt Street north approach right turn "bus only" restriction, to enable all public vehicles to use this intersection to right onto Howatt Street has not been adequately assessed in SIDRA.</p> <p>Consistent with comments in the Transport Impact Assessment Review, the following is recommended:</p> <ul style="list-style-type: none"> For a robust and conservative assessment, existing traffic should be redistributed to turn right at the Woodville Road/ Howatt Street intersection. Any future year horizon models should account for road network changes within Villawood Town Centre, including any resultant background traffic redistribution. As an example, Villawood Town Centre DCP 2020 indicates that Howatt Street is proposed to be extended west to Kamira Court and Kamira Avenue. As such, it is recommended the post-development SIDRA models are updated considering the traffic redistribution of the precinct. 	
16.	Noted – per Bullet Point 15.	See response to comment 15 above.	Major
17.	The assessment is omitted because most retail traffic movements (i.e. some 80% of the overall traffic) are absent in the AM peak. The AM peak traffic models can be included as necessary.	<p>The reviewer confirms that AM peak period traffic models should be prepared.</p> <p>It is noted that application of item 12 will result in greater retail traffic in the AM peak period.</p>	Major
18.	The Council can advise the appropriate growth rates through its AIMSUN mesoscopic model for consistency	The reviewer has provided AIMSUN mesoscopic model outputs to Council for their distribution to the applicant. These outputs include base year and growth year traffic volumes that can be used to understand growth rates.	Major
19.	The SIDRA models will be updated accordingly (and incorporating STANTEC's comments as required) for Council's reassessment.	Noted. The reviewer assumes this will occur prior to determination of the Planning Proposal.	Major

Reference: Planning Proposal Woodville Road and Hilwa Street, Villawood

Summary and Recommendations

With regard to the above, it is noted that the response to RFI provides initial insight into the transport and traffic effects of the proposed development. To fully understand the impacts of the planning proposal, the updated SIDRA models incorporating updates as committed by the proponent in Table 3, and addressing comments provided in Table 4 of the Transport Impact Assessment Review should be provided for review.

Stantec also defer to Council to determine their preferred residential car parking and traffic generation rates as discussed in comment 4 and 10.

Best regards,

Stantec Australia Pty Ltd



Volker Buhl

Principal Transportation Planner / Team Leader - Transportation Planning
Phone: +61 2 8448 1839
volker.buhl@stantec.com

Reference: Planning Proposal Woodville Road and Hilwa Street, Villawood

Attachment 1 - Transport Impact Assessment Review

To: Amanda Seraglio
PO Box 21, Fairfield NSW 1860
Project/File: 15 Hilwa Street and 896 to 898
Woodville Road, Villawood

From: Volker Buhl
Sydney
Date: 13 March 2023

Reference:301400270

The following sections comprise a summary of Stantec's review of the Transport Impact Assessment and supporting SIDRA Intersection models relating to a planning proposal application for a mixed-use development at 15 Hilwa Street and 896-898 Woodville Road, Villawood, prepared by Genesis Traffic.

The specific documents and traffic models provided for the review are outlined in Table 1.

Table 1: Reviewed Material

Material	File Name	File Description
Report	Traffic Impact Assessment 15 Hilwa Street, 896-898 Woodville Road, Villawood, 2 November 2022	Traffic Impact Assessment
SIDRA Model	VILLAWOOD.sip	SIDRA Model

This document is set out as follows:

- overview of the proposal and SIDRA assessment methodology
- review priority criteria
- review and comments relating to the Transport Impact Assessment
- review and comments relating to the SIDRA intersection model outputs
- summary and recommendations.

Reference: Planning Proposal Woodville Road and Hilwa Street, Villawood

1 Overview

The site location and study area, including key intersections modelled in SIDRA intersection, are illustrated in Figure 1.

Figure 1: Study area



Base image source: Nearmap

Key transport aspects of the proposal relevant to this review include:

- the indicative development scheme comprises the following:
 - retail/ commercial gross floor area (GFA) of 2,350 square meters
 - 135 residential units, including:
 - 36 one-bedroom units
 - 78 two-bedroom units
 - 16 three-bedroom units
- the proposal indicatively includes a basement car park for retail customers, residents and residential visitors, as well as an on-site loading dock accommodating vehicles up to and including a 12.5 heavy rigid vehicle (HRV)
- the proposal indicatively includes vehicular access via Hilwa Street to the north for residents and Howatt Street to the west for retail/ commercial and loading

Reference: Planning Proposal Woodville Road and Hilwa Street, Villawood

- The southbound right-turn movement from Woodville Road to Howatt Street is currently restricted to buses only. The application proposes to remove this restriction to permit all vehicles to turn right.

The following modelling scenarios were included as part of the SIDRA intersection assessment:

- existing condition (2022), without development
- post-development, with development and no applied background growth.

The study also references documentation from a mesoscopic (meso) Aimsun model that has been developed by Stantec on behalf of the Council to support various planning activities within the Local Government Area.

2 Review Priority Criteria

Key findings of the review have been allocated a level of priority to assist interpretation. **Error! Reference source not found.** shows the criteria adopted in assessing the level of priority.

Table 2: Priority criteria

Priority	Description
Note	For information.
Minor	Comments are not critical to the outcome of the assessment.
Moderate	Comments should be addressed to ensure a robust assessment.
Major	Comments are critical and must be incorporated to assess the impacts of the proposal. If the comment is not addressed by the applicant, adequate justification would be required.

3 Transport Impact Assessment Review

Table 3 presents a summary of comments on the Transport Impact Assessment Report.

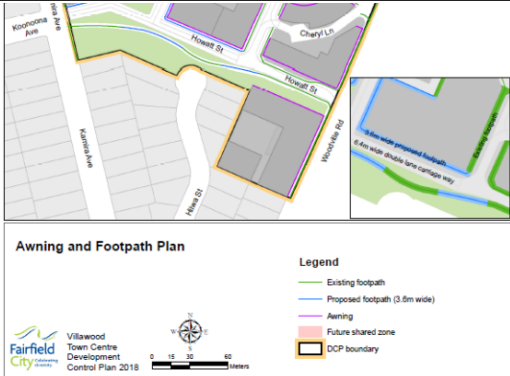
Table 3: Summary of review comments – Traffic Impact Assessment Report

Item	Section	Comment	Priority
1.	Proposed Development	The indicative development schedule provided in Section 3 of the Transport Assessment specifies up to 135 units, however the breakdown of unit types indicates a total of 130 units (36 x 1-bed, 78 x 2-bed, 16 x 3-bed). It is recommended that the total and indicative breakdown of unit types are reviewed for consistency.	Minor
2.	Proposed Development	The indicative development schedule provided in section 3 of the Transport Assessment details 2,350 square metres Gross Floor Area (GFA) for retail land uses. However, the architectural plans provided in Attachment 1 of the Transport Assessment indicates that the indicative supermarket use on ground floor comprises some 2,342	Minor

Reference: Planning Proposal Woodville Road and Hilwa Street, Villawood

Item	Section	Comment	Priority
		<p>square metres, and appears to exclude area from retail tenancies along the arcade, as well as retail area in the basement indicatively allocated as an office for the supermarket.</p> <p>It is recommended that the GFA calculation is revised to include all relevant areas. Alternatively, given parking and traffic generation calculations rely on Gross Leasable Floor Area (GLFA), it is recommended GLFA is reported rather than GFA.</p>	
3.	Vehicular Access	<p>Vehicular access to the basement car park access is proposed via Hilwa Street for residents and Howatt Street for retail and commercial staff/ customers.</p> <p>The reviewer notes that the vehicular access along Howatt Street complies with permissible vehicle access locations, as detailed in Figure 6 of the Villawood Town Centre Development Control Plan (DCP) 2020.</p> <p>Residential vehicular access via Hilwa Street appears logical, noting the site access is expected to generate up to an additional 41 vehicle trips in each peak period (refer to comment Error! Reference source not found. on traffic generation).</p>	Note
4.	Residential Car Parking Rate	<p>Car parking rates adopted for this assessment are based on Apartment Design Guide (ADG) SEPP 65 for residential developments within 800 metres of a railway station in the Sydney Metropolitan Area.</p> <p>ADG SEPP 65 recommends adoption of the following <u>minimum</u> residential car parking rates based on Transport for NSW Guide to Traffic Generating Developments Version 2.2 October 2002 (Transport for NSW Guide 2002):</p> <ul style="list-style-type: none"> • One bedroom unit – 0.6 spaces per unit • Two bedroom unit – 0.9 spaces per unit • Three bedroom unit – 1.4 spaces per unit • Residential visitors – 1 space per five units. <p>These minimum parking rates are lower than the residential parking requirements set out in the Fairfield City Wide DCP 2013 for developments within 400 metres of a railway station, as set out below:</p> <ul style="list-style-type: none"> • One/ two bedroom unit (less than 110m²) – 1 space per unit • Three or more bedroom unit (greater than 110m²)– 1.5 spaces per unit • Residential visitors – 1 space per four units. <p>The reviewer defers to Council on this matter.</p>	Note
5.	Retail Car Parking Rates	<p>It is noted from Section 4 of the Transport Assessment the retail car parking rate adopted for this assessment is 1 space per 40m² GFA. However, Fairfield City Wide DCP 2013 specifies a car parking rate of 1 space per 40 m² GLFA.</p> <p>The retail car parking requirements should be calculated based on GLFA and the Transport Assessment updated accordingly.</p>	Minor
6.	Other Parking Requirements	<p>Any future development application should provide accessible parking, bicycle parking and end of trip facilities, and motorcycle parking in accordance with requirements set out in the relevant DCP.</p>	Note
7.	Footpath/ Shared Path	<p>The reviewer notes there are no details on any proposed footpaths connecting to existing facilities and/ or aligning with requirements set out in Figure 9 of the Villawood Town Centre DCP 2020, extracted below.</p>	Moderate

Reference: Planning Proposal Woodville Road and Hilwa Street, Villawood

Item	Section	Comment	Priority
		 <p>It is recommended that the indicative development scheme is updated to provide details on the proposed active transport connections.</p>	
8.	Off-street parking facilities	Off-street parking facilities proposed as part of any future development application should be designed in accordance with the relevant DCP and Australian Standards.	Note
9.	Existing Traffic Generation	To estimate traffic generation of the existing site, traffic generation rates have been sourced from Transport for NSW Guide 2002. However, reference should be made to Transport for NSW Guide to Traffic Generating Developments Updated Traffic Surveys (Transport for NSW TDT 2013/04a) which provides updated traffic generation rates for residential and commercial land uses.	Minor
10.	Traffic Generation Rates – Residential	<p>Council has specified use of the following residential traffic generation rates for planning proposals in both Villawood¹ and Fairfield²:</p> <ul style="list-style-type: none"> • 0.3 movements / unit in the AM peak hour • 0.3 movements / unit in the PM peak hour • 0.3 movements / unit in the Saturday peak hour. <p>It is recommended the Council endorsed rates are adopted for the purpose of this assessment.</p>	Moderate
11.	Traffic Generation Rates – Supermarket (PM peak hour)	<p>Traffic generation rates have been sourced from Transport for NSW Guide 2002. This includes adoption of a retail traffic generation rate of 12.5 trips per 100 m² GFA in the PM peak hour, based on an average rate for shopping centres on a Friday.</p> <p>Given the retail area indicatively primarily comprises a supermarket use, it is recommended that the following traffic generation rates be adopted based on Transport for NSW Guide 2002:</p> <p><i>Shopping Centre Evening Peak Hour = 155 A(SM) + 46 A(SS) (vehicle trips per 1000m²).</i></p> <p>Where,</p> <ul style="list-style-type: none"> • A(SM): Supermarket GLFA - includes stores such as Franklins and large fruit markets. • A(SS): Specialty shops, secondary retail GLFA - includes specialty shops and take-away stores such as McDonalds. These stores are grouped as they tend to not be primary attractors to the centre. 	Moderate

¹ 2 Villawood Road, Villawood

² Fairfield Forum, 8-36 Station Street, Fairfield

Reference: Planning Proposal Woodville Road and Hilwa Street, Villawood

Item	Section	Comment	Priority
		It is therefore recommended that retail traffic generation rates are updated to apply 15.5 trips per 100 m ² GLFA for supermarket use and 4.6 trips per 100 m ² GLFA for the remaining smaller retail tenancies in the PM peak hour.	
12.	Traffic Generation Rates – Supermarket (AM peak hour)	<p>The Transport Assessment assumes no traffic is generated by the retail uses on site during the AM peak hour. Major supermarket retailers typically operate from 7:00am and hence it is unreasonable to assume no traffic is generated given the proposed indicative use.</p> <p>The reviewer notes a conservative assessment should adopt a trip rate in the AM peak period of around 4.5 trips per 100m² GLFA for supermarket and 2.3 trips per 100m² GLFA for specialty shops, equating to around 30 and 50 per cent of the PM peak respectively.</p> <p>It is recommended the Transport Assessment be updated to ensure a robust and conservative assessment.</p>	Major
13.	Traffic Generation – Retail Uses	<p>The reviewer notes that the retail trip composition, defining whether trips are “primary”, “pass-by” or “diverted”, has been adopted based on outcomes from an <i>Australian Road Research Board (ARRB)</i> study published at a conference in 2012. The Transport Assessment discounts the retail traffic generation by the proportion of pass by trips, equating to 15 per cent of total traffic or 43 trips in the PM peak hour.</p> <p>Transport for NSW Guide 2002 notes up to 25 per cent of trips to / from a retail centre with less than 10,000m² GLFA could be considered as “linked trips” (however also notes discounts of this nature should not apply without adequate substantiation).</p> <p>A linked trip assumption of 15 per cent could therefore be supported based on Transport for NSW Guide 2002.</p> <p>Notwithstanding, it is recommended the Transport Assessment better consider where the trips are linked from. The reviewer notes that based on a review of the SIDRA models, 49 light vehicles currently travel past the proposed site access in the PM peak hour. It is unreasonable to assume majority of these existing vehicles (43 linked trips) will be attracted to enter the proposed development via the Howatt Street access on their way to their existing destination within Villawood. It is more reasonable to assume a proportion of the 43 linked trips are diverted from their existing journey along Woodville Road to turn onto Howatt Place and into the site access, and then travel back onto Woodville Road to complete their journey.</p> <p>It is recommended the linked trip assumptions, including linked trip distribution and how existing vehicles are diverted on the road network, are reviewed and the Transport Assessment and SIDRA models are updated accordingly.</p>	Moderate
14.	Traffic Generation – Net Uplift	<p>There are slight inconsistencies between Table 6-2 and Table 6-4 and Figure 6-2. Further, existing traffic generation from the commercial land use has not been considered in Table 6-4.</p> <p>It is recommended the trip generation and distribution tables/ diagrams are reviewed and updated accordingly.</p>	Minor
15.	Model Scenarios - Mitigation Measures	The indicative development includes the proposal to remove the Woodville Road/ Howatt Street north approach right turn “bus only” restriction, to enable all public vehicles to use this intersection to right onto Howatt Street.	Major

Reference: Planning Proposal Woodville Road and Hilwa Street, Villawood

Item	Section	Comment	Priority
		<p>The reviewer notes that this modification is important for the proponent to gain vehicular access to the commercial/ retail car park directly from the north.</p> <p>Notwithstanding, the proposed modification would result in the following:</p> <ul style="list-style-type: none"> a significant change to access into Villawood generally, with general vehicles likely to redistribute from turning right from Woodville Road at Villawood Place, to turning right at Howatt Street and Kamira Court significant change to the operation of the Woodville Road/ Howatt Street/ Binna Burra Street intersection performance, with flow on effects to the operation of Woodville Road impacts to bus travel times. <p>As the post development scenario includes the proposed road network changes, the impact of the project on the existing road network cannot be isolated and further, the impact of the road network modifications cannot be assessed.</p> <p>It is recommended the road network modifications are excluded from the post development model and should rather be assessed as part of the applicant's proposed mitigation measures.</p> <p>We also defer to Council around the suitability of the proponent considering the removal of the Howatt Street north approach right turn "bus only" restriction, to enable all public vehicles to use this intersection to right onto Howatt Street.</p>	
16.	Traffic Distribution - Mitigation Measures	<p>Further to comment 15, the post development SIDRA model including proposed modifications to the Woodville Road/ Howatt Street intersection, has not considered the impact of these modifications to existing traffic volumes on the road network.</p> <p>For a robust and conservative assessment, existing traffic should be redistributed to turn right at the Woodville Road/ Howatt Street intersection.</p> <p>It is recommended the post-development SIDRA models are updated considering the traffic redistribution of the precinct.</p>	Major
17.	Model Scenarios - AM Peak Period	<p>Further to comment 12, a post development scenario should be assessed for the AM peak period.</p>	Major
18.	Model Scenarios - Future Year Assessment	<p>Based on <i>Austroads Guide to Traffic Management Part 12</i> an appropriate future year horizon should be assessed (i.e., year of opening and plus 10 years). As a minimum, it is recommended this includes a post development scenario at indicative year of opening and a 2031 scenario, consistent with recent traffic modelling completed for Kamira Court Precinct.</p> <p>Traffic growth information (STFM outputs for future design years) could be obtained from TfNSW to determine traffic growth factors per approach/ movement for inclusion in the models</p> <p>Further, any future year horizon models should account for road network changes within Villawood Town Centre, including any resultant background traffic redistribution. As an example, Villawood Town Centre DCP 2020 indicates that Howatt Street is proposed to be extended west to Kamira Court and Kamira Avenue.</p>	Major

Reference: Planning Proposal Woodville Road and Hilwa Street, Villawood

4 SIDRA Intersection Review

Table 2 presents a summary of comments on the SIDRA intersection models.

Table 4: Summary of review comments – Traffic Impact Assessment Report

Item	Section	Comment	Priority
General			
19.	Site Networks	<p>The SIDRA model considers all intersections as isolated. Given each of the sites are within close proximity to one another, it is recommended that sites are modelled as a network to achieve accurate representation of vehicle performance. This also allows the software to pinpoint intersections where average and 95th percentile queuing has the potential to impede and block nearby sites. Further to comment 15, this is critical to assess the impact of the proposed road network modification to Woodville Road/ Howatt Street intersection.</p> <p>It is also expected that when two intersections are in close proximity along a major road and should SCATS signal timing data identify that they have the same cycle length, that they may be coordinated.</p> <p>It is recommended that coordination and offset information is obtained from TfNSW and included in the network models to accurately reflect the midblock queuing between the intersections.</p>	Major
20.	Traffic Surveys	The Transport Assessment notes traffic surveys were commissioned to support the assessment. No information has been provided on when the surveys were undertaken for this traffic assessment. As such, the reviewer cannot check if the survey day/ period was fit for purpose.	Moderate
21.	Heavy vehicle traffic volumes	<p>The models have coded a flat percentage of heavy vehicles for all turning movements, being 2%. Given the model does not include any supporting information (survey data etc.), the source of these inputs cannot be confirmed.</p> <p>It is uncommon for all movements to have the same heavy vehicle percentages, particularly along a road network proximate to an industrial area. Review of traffic counts collected by Stantec to support preparation of the AIMSUN model indicates heavy vehicle percentages significantly higher than 2% for the Villawood Road/ Woodville Road/ Llewellyn intersection (as an example):</p> <ul style="list-style-type: none"> • south approach, between 7% and 33% for each movement in both peak periods, with exception of left turn at 2% in PM • east approach, between 38% and 48% for each movement in AM and 11% to 13% for each movement in PM • north approach, between 7% and 16% for each movement in both peak periods, with exception of right turn at 4% in PM • west approach, between 7% and 19% for each movement in AM and 3% to 4% for each movement in PM, with exception of the through movement at 0% in PM. <p>As such, it is expected that heavy vehicle composition may be higher than 2% at all intersections, and it is recommended that this is reviewed and corrected in all models where applicable.</p>	Moderate
22.	Parameter Setting	The site Level of Service Method is set to Delay (SIDRA).	Minor

Reference: Planning Proposal Woodville Road and Hilwa Street, Villawood

Item	Section	Comment	Priority
		The Level of Service method should be changed to RTA (NSW) and the results in the Transport Assessment should be updated accordingly.	
23.	Priorities - Pedestrian	A review of priorities for signalised intersections show vehicle movements do not include the conflict with the pedestrian movements. Failure to include this can have a major impact on model throughput. All models should be assessed for appropriate pedestrian priorities and updated accordingly.	Moderate
24.	Pedestrian Protection	Further to comment 23, it is common for pedestrian protection to be applied at intersections within NSW, with the late starts for vehicles reducing the capacity for movements. Pedestrian protection likely applies at intersections along Woodville Road. It is recommended that information is sought from TfNSW to understand if applicable. If applicable it is applied using the Gap Acceptance – Opposing Peds (Signals) parameter. It is important that this is included in models as it will reduce the amount of green time provided for the left and right turn movements and represent the likely queue lengths more accurately. All models should be assessed for appropriate pedestrian protection and updated accordingly.	Moderate
25.	Geometry – Intersection Approach Distance	For approach distances at the extremities of the network, i.e. all approaches in an isolated intersection, or Woodville Road north approach should the intersections be combined into a network as recommended in comment 19, it is often recommended that the intersection approach distance remain at the default 500 metres (no matter the presence of an adjacent signalised intersection). This is to allow SIDRA to accurately calculate queuing and prevent SIDRA from applying Probability of Blockage and reducing the capacity of the approaches.	Minor
26.	Geometry – Short Departure Lane Length	A review of short approach and departure lanes across all intersections shows lanes have generally been modelled longer than shown through a review of aerial photography and Google Streetview. This will have an impact on intersection performance. It is suggested these lanes are reviewed and modified, with lane lengths measured to the point where lane width reaches 2.5m.	Minor
27.	Signal Phasing – Undetected Movements	No movements have been defined as 'Undetected' movements. Failure to define undetected movements can mean that movements can push for additional green time (if practical or optimal cycle time selected) and therefore changing queue lengths. This is particularly important for left turn overlap phases. It is recommended that this is reviewed corrected in all models where applicable.	Minor
28.	Signal Phasing – Phase Transitions	No left turn movements have had the 'Phase transitions' applied, where applicable. Phase transitions are required in order for SIDRA to shut down the left turn movement before recommencing as the left turn overlap movement. For example, in the Woodville Road/ Howatt Street model, the left turn on the north approach should stop at the end of 'Phase C' prior to commencing again in 'Phase A'. Failure to include the phase transition overestimates the amount of green time provided for the left turn and reduces the queue lengths. It is recommended that this is reviewed corrected in all models where applicable.	Minor

Reference: Planning Proposal Woodville Road and Hilwa Street, Villawood

Item	Section	Comment	Priority
29.	Cycle Length – Existing Condition	<p>The existing condition models adopted methodology has used User Given Phase time, Optimum Cycle Times and Practical Cycle times.</p> <p>Whilst the results may be consistent with SCATS, this approach is uncommon.</p> <p>Further to comment 19, it is expected that the sites are coordinated and hence should have a consistent cycle time, however the SIDRA calculated cycle times are vastly different, ranging from 90 to 120 seconds in the AM peak and 80 to 140 seconds in the PM peak.</p> <p>No information has been provided to show how the SIDRA calculated cycle time/ phase times (processed using the Optimal Cycle Time, Practical Cycle time and User Given cycle time) align with the actual cycle time/ phase times</p>	Major
30.	Calibration and Validation of Existing Conditions	<p>The report does not include any details as to whether the existing base traffic models has been calibrated based on Site Observations. No information is provided within the report to detail the calibration process adopted.</p> <p>Furthermore, no information has been provided to validate that the model results represent existing conditions. For example, no information is included to show how the SIDRA calculated cycle time/ phase times (processed using the Optimal Cycle Time, Practical Cycle time and User Given cycle time) align with the actual cycle time/ phase times or how onsite queue lengths align with the 95th percentile queues in SIDRA.</p> <p>This may mean that the “existing conditions” results are not representative. Although in some circumstances it may be suitable to provide a “Net Difference” assessment, it should be detailed in the report if this is the case.</p>	Major
31.	Model Results	<p>It is recommended that the analysis is re-evaluated following review and acceptance of some or all of the modelling comments this review, including but not limited too:</p> <ul style="list-style-type: none"> • traffic growth assumptions • heavy vehicle composition • validation of base year results to existing conditions • assessment of post development scenario in the AM peak period. 	Major
Villawood Road and Villawood Place			
32.	Geometry – Lane Configuration	<p>A review of the intersection geometry has shown that there are the following errors:</p> <ul style="list-style-type: none"> • The south departure should have one full length lane • The north departure should have one full length lane • The west departure should have one full length lane • The west approach right turn lane control should be continuous rather than give way. <p>It is recommended that the model is reviewed, and lanes updated to reflect existing conditions.</p>	Moderate
33.	Outputs	<p>SIDRA results provided in the Table 6-6 of the Transport Assessment report on the overall intersection performance. As this is a priority-controlled intersection, results should report on the movement with the worst delay. Based on the current results, this includes either the north or south approach right turn movement.</p>	Minor

Reference: Planning Proposal Woodville Road and Hilwa Street, Villawood

Item	Section	Comment	Priority
Villawood Road, Woodville Road and Llewellyn Avenue			
34.	Geometry – Lane Disciplines	Given the phasing arrangement and heavy volume of right turning traffic acting as a “trap” for through vehicles, it is recommended the lane disciplines on the eastern approach are reviewed as it may be likely that through movements use lane 1 rather than lane 2. Correction of the lane disciplines, assuming this reflects existing conditions, should significantly improve the operation of the eastern approach to the intersection.	Major
35.	Geometry – Free Queue	The SIDRA Model includes a left turn slip lane from the through lane of Woodville Road north approach into Llewellyn Avenue. SIDRA requires information to be provided in this scenario to allow determination of when the queues of left and through movements would interact and potentially block the other movement. It is recommended that the free queue distances should be set up set up for both the left turn and through movements within the Lane Disciplines tab.	Minor
36.	Extra Bunching	Extra bunching of 10% has been applied to the eastern approach to the intersection, with no justification. The extra bunching parameter allows for the effect of upstream signals on unsignalised intersection capacity and is typically determined as a function of the approach distance to upstream signals. Table 5.2.1 of the SIDRA Intersection 9 User Guide indicates that as a rough guide, no extra bunching is applicable when the upstream signalised intersection is located greater than 800 metres from the approach. Notwithstanding, there are no signalised intersections proximate to the eastern approach of the intersection.	Major
37.	Lane Movements	A review of the lane movement definitions flow proportions show west approach through flowing into the east short departure lane. It is recommended that where a single movement is occurring, the flow be moved to a full length lane rather than the short lane.	Minor
38.	Signal Phases	Review of phasing arrangement observed by Stantec to support preparation of the AIMSUN model indicated the north and southern approach filter right turn movements during phase A did not run during peak periods. Right turn movements were observed to run in alternate phases, such as phase B, E, E1 and/ or E2, with different arrangements observed in AM and PM. It is recommended that this is reviewed and corrected where applicable based on conditions on the day of the survey.	Moderate
39.	Cycle Length	SIDRA calculated cycle time increased from 140 to 150 seconds in the post development PM peak period. Given the post development scenario appears to be set in the existing condition year, it is unlikely that such significant changes to signal phasing would occur hence it is recommended that the post development signal phasing is reviewed and updated accordingly and/ or justified. Further, The existing condition models adopted methodology has used Optimum Cycle Times whereas the post development model adopted Practical Cycle times. It is recommended that the methodology is kept consistent between models, otherwise Justification for this change will be required in the report.	Moderate

Reference: Planning Proposal Woodville Road and Hilwa Street, Villawood

Item	Section	Comment	Priority
Woodville Road, Howatt Street and Binna Burra Street			
40.	Signal Phases	Review of TCS plan 1201 and phasing arrangement observed by Stantec to support preparation of the AIMSUN model indicates phase C precedes phase B i.e. the dedicated right turn for northern approach occurs after phase A.	Minor
Woodville Road and Kirrang Avenue			
41.	Geometry – Lane Configuration	A review of the intersection geometry has shown that the west approach should have one full length lane and one short lane. It is recommended that the model is reviewed, and lanes updated to reflect existing conditions.	Minor
42.	Signal Phases	A review of TCS 12 and Google Streetview indicates a left turn on red is permitted from Kirrang Road onto Woodville Road.	Minor

Summary and Recommendations

With regard to the above, it is noted that the Transport Impact Assessment provides initial insight into the transport and traffic effects of the proposed development, but further detail on the following aspects is required to fully understand the impacts:

- Trip generation rates – a refinement of retail generation rates in the PM peak period and consideration of AM peak for conservative assessment.
- Future year assessment– it is recommended to assess an appropriate future year horizon to account for the growth and development impacts.
- SIDRA assessments – it is recommended the SIDRA intersection model is further refined to better reflect existing conditions and inform the impact of the proposal. This includes:
 - information of how the 2% heavy vehicle corresponds to the traffic surveys.
 - information to show how onsite queue lengths align with the 95th percentile queues in SIDRA existing condition model.
 - information to show how the adopted cycle times/ calculated cycle times for the existing models align with the on-site actual cycle/phase time.
 - review of the intersection geometry to reflect existing conditions.
 - any road network changes (i.e. proposal to remove the Woodville Road/ Howatt Street north approach right turn “bus only” restriction, to enable all public vehicles to use this intersection to right onto Howatt Street) should be excluded from the post development model and should rather be assessed as part of the applicant’s proposed mitigation measures.
- Car parking – Stantec defer to Council as to their preferred residential car parking rates for the indicative development scheme

Reference: Planning Proposal Woodville Road and Hilwa Street, Villawood

Best regards,

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