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19 June 2025

P0788 SA 27 Steam Street Maitland

Brown Commercial Building
2 Elwell Close,
Beresfield NSW 2322

Attn: Caitlin O'Brien

Dear Caitlin,

Proposed Childcare Centre, 27 Steam Street, Maitland, NSW.

Further to your email and following our site visit and review of the documentation provided for the proposed childcare centre at Maitland, NSW, we provide the following traffic impact statement. This assessment has been prepared in accordance with the Austroads Guidelines and the Guide to Transport Impact Assessments which provides the structure for the reporting of key issues to be addressed when determining the impacts of traffic associated with a development. This guide indicates that the use of this format and checklist ensures that the most significant matters are considered by the relevant road authority.

The report has also taken into consideration the planning requirements outlined within the Maitland Development Control Plan 2013.

The subject site is located at 27 Steam Street, Maitland, as shown in Figure 1. It is bounded by Allan Walsh Drive to the south / west and Steam Street to the north. The surrounding land use consists of mostly residential housing and commercial developments with the main northern rail line to the south.

There is currently no formal access provided to the site.

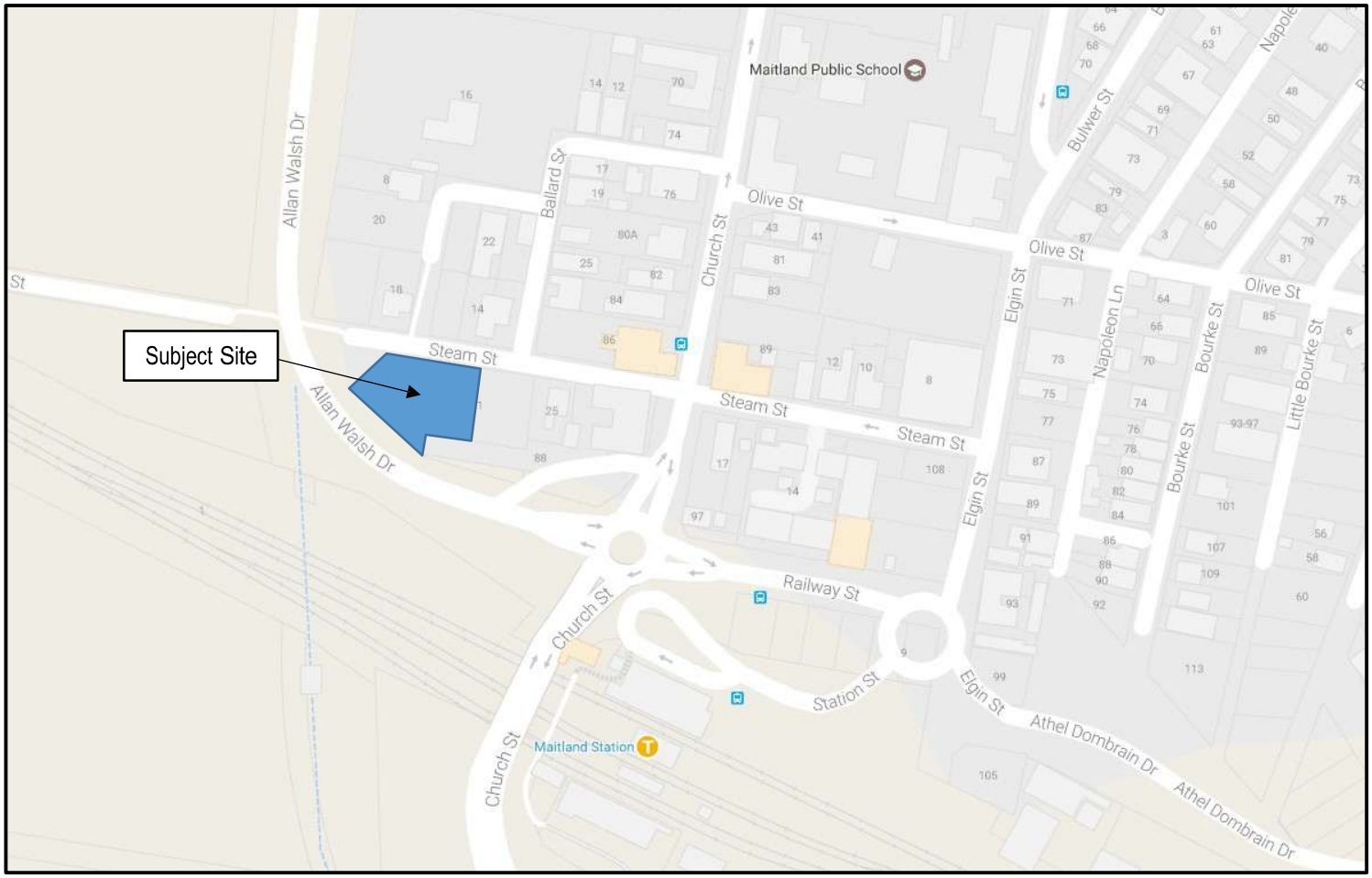
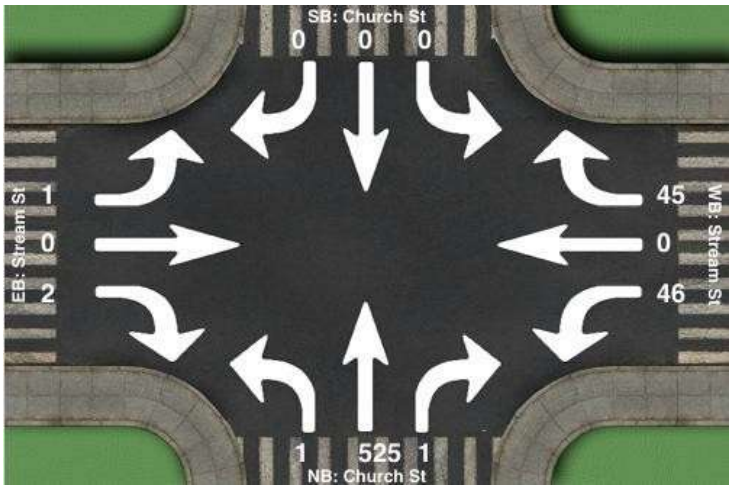


Figure 1 - Project area within the context of the local road network (Source: Google Maps).

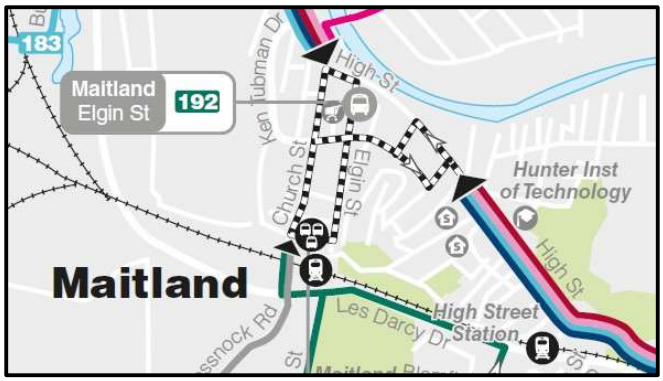
Traffic Impact Assessment:

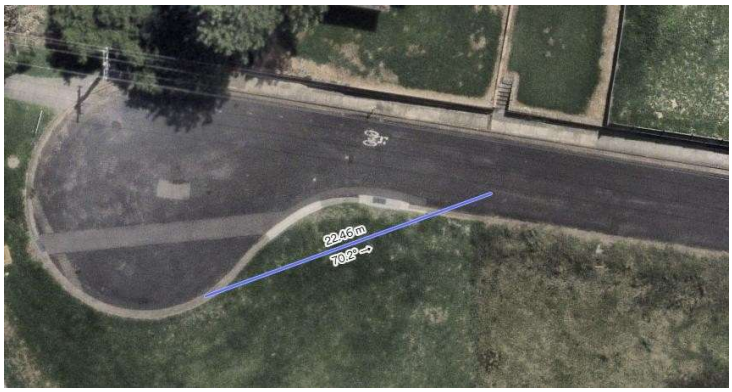
Item	Comment
Existing Situation	
2.1.1 Site Location and Access	The subject site is located at 27 Steam Street, Maitland, as shown in Figure 1. It is bounded by Allan Walsh Drive to the south / west and Steam Street to the north. To the east the adjacent site is vacant with then an existing residential dwelling and the Grand Junction Hotel with Church Street providing connection to the broader road network. There is currently no formal access provided to the site.
2.2.1 Road Hierarchy	The main road through the locality is the **New England Highway** which provides a connection between the Greater Newcastle Area (Hexham) through to the Queensland State Border. It is a classified arterial road which forms part of the state road network (HW9) carrying a high volume of traffic towards Newcastle (east) and through Rutherford to Muswellbrook in the west. Locally it provides two lanes of travel in each direction connecting the various townships within the Maitland LGA. The **Hunter Expressway** provides an east-west road link between the M1 motorway to the east and the Hunter Valley (Branxton) to the west. This road provides a fast connection and bypasses the Maitland area and the various suburbs along the New England Highway. The Hunter Expressway can be accessed via Cessnock Road south of the subject site. **Allan Walsh Drive** is a local collector road which provides a north-south connection between Church Street and Ken Tubman Drive. It provides two lanes of travel allowing for southbound connection between the Maitland Town Centre towards the New England Highway via Church Street. On the western side of Church Street, Allan Walsh Drive connects with Railway Street providing access to Maitland Station and the associated parking and bus interchange in this location. **Church Street** is the major collector road through the locality, providing a north-south connection from the New England Highway (south) through to Maitland Town Centre (via High Street). North of Steam Street, Church Street operates as a one-way road providing a single lane of travel northbound. It has a sealed pavement in the order of 10 meters wide allowing for kerbside parking to both sides of the street. Street lighting is provided along Church Street and there are pedestrian footpaths located to each side. It operates under the posted speed limit of 40 km/hr being a high activity area, with a 40 km/hr school zone in the vicinity of Olive Street. To the south of Steam Street, Church Street operates as a two-way road, forming a roundabout intersection with Railway Street and Allan Walsh Drive. Further south, Church Street connects with the New England Highway and Cessnock Road via a roundabout intersection with a grade separated overpass for eastbound through traffic. The intersection of Church Street and Steam Street is controlled by 'Give Way' signs allowing for all turning movements onto Church Street with Church Street having priority. Both the eastern and northern legs of this intersection allow for one way movements only.

Item	Comment
	To the north of the site, Church Street forms priority controlled T-intersections with Ballard Street and Olive Street. **Steam Street** is a local road, which to the west of Church Street, provides a sealed pavement in the order 6.5 meters wide allowing for a single lane of travel in each direction. It provides a No Through Road terminating with a turning head adjacent to the site. It connects with Ballard Street via a priority control T-intersection with Steam Street having priority. Parking is not permitted along the northern side of Steam Street and is controlled by 'No Stopping' and 'No Parking' signs. A pedestrian footpath is provided to the northern side of the roadway along its length and on the southern side of the roadway to the front of the Grand Junction Hotel and the adjacent residence. Cyclists are accommodated on the street with pavement markings indicating the presence of a cycling route along this road. East of Church Street, Steam Street offers a single lane of travel west bound from Elgin Street with No Entry signs at Church Street. It provides kerbside parking to both sides. It is in the order of 7.5 metres wide. **Ballard Street** is a local road providing a sealed pavement in the order of 6 metres wide. 'No Stopping' and 'No Parking' signs restrict parking to one side of the roadway along most of its length. Pedestrian footpaths are inconsistent and street lighting is provided. It is noted that the end of school zone signage on this road indicate a posted speed of 50km/h westbound which is inconsistent with the provision of the 40km high activity zone. The surrounding roads are local roads under the control of Maitland City Council.
2.2.2 Roadworks	No roadworks planned or ongoing in the locality.
2.2.3 Traffic Management Works	Works undertaken in the past five years on the New England Highway at the roundabout intersection with Church Street included the construction of an eastbound overpass over the roundabout to improve traffic capacity and road safety through this intersection. The intersection of Railway Street / Elgin Street, Elgin Street / Athel Dombrain Drive and Elgin Street / Station Street were also upgraded to replace each of the existing T-intersections with a single roundabout intersection.
2.2.4 Pedestrian and Cycling Facilities	There are pedestrian footpaths provided on most of the local roads surrounding the site with shared paths provided on Steam Street (east of Church Street) and Church Street (to the south of Steam Street). A footpath is provided along the northern side of Steam Street. A pedestrian crossing is provided on Church Street to the north of the site (adjacent to Maitland Public School) and pedestrian refuge islands are provided at the roundabout intersection of Church Street and Railway Street which allow for pedestrian access across Church Street. An on road cycling route is provided along Steam Street indicated by pavement markings and street signage which connect to a cycleway west of this location.

Item	Comment
2.3 Traffic Flows	As part of the project work, Seca Solution collected traffic data at the intersection of Steam Street and Church Street to determine the current operation and traffic volumes along these roads.  *Figure 2 Current Traffic Flows* Traffic surveys were completed during the morning (7:30am to 9:15am) on Wednesday 4th December 2025. This time was based on historic data collected in this location which demonstrated AM flows to be higher than PM flows. This also coincides with the peak demand for childcare centres. The morning peak hour occurred between 8:15am and 9:15am. The historic data demonstrated the afternoon peak hour occurs between 2:45pm and 3:45pm. These are reflective of the primary school along this route as well as access via Church Street to the Maitland town centre. Compared with flows in this location in 2016, northbound flows on Church Street are less being 571 vph. This reflects the mature nature of this part of Maitland.
2.3.1 AADT	AADT data is available for the New England Highway east of the site at counter 05140. 2019 data shows that the two way flows at this point were 32,743 with eastbound flows significantly less than westbound. These flows are less than flows of 2011 (47,292) prior to the opening of the Hunter Expressway and less than flows in 2016.
2.3.2 Daily Traffic Flows	Advice from the TfNSW Guidelines indicate that peak hour flows typically represent around 8-12% of the daily traffic flows. As such the daily flows along Church Street (south of Steam Street) would be in the order of 5,750 vehicles per day, with daily flows to the north of Steam Street only marginally less. Daily flows along Steam Street (east of Church Street) are significantly lower, in the order of 910 vehicles per day whilst on the western leg are minimal being less than 100 vpd.
2.3.3 Daily Traffic Flow Distribution	Traffic flows along Steam Street would be reasonably balanced throughout the day although existing flows from the western end are very low. Traffic flows along Church Street are restricted to one-way movements north of Steam Street as are the flows along the eastern leg of Steam Street.

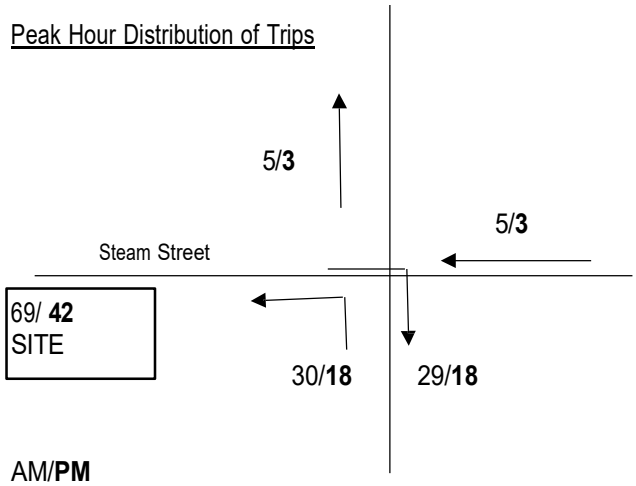
Item	Comment
2.3.4 Vehicle Speeds	No speed surveys were completed as part of the survey work, however observations on site indicate that drivers typically travel at or below the posted speed limit due to interactions with nearby driveways, intersection and parked vehicles along Church Street.
2.3.5 Existing Site Flows	The subject site is currently vacant and does not generate traffic demands.
2.3.6 Heavy Vehicle Flows	Based on survey data heavy vehicles represent approximately 4.5% of the total traffic flows along Church Street. These consisted mostly of local buses and deliveries to the nearby businesses and shopping centre within the Maitland Town Centre.
2.3.7 Current Road Network Operation	Observations on site indicate that the local roads operate very well throughout the day with minimal delays or congestion during the morning and afternoon peak hours.
2.4 Traffic Safety and Accident History	A review of the Interactive Crash Statistics (www.roadsafety.transport.nsw.gov.au) indicates that there have been no accidents recorded within the locality of the site in the five year period 2019-2023. The local roads and intersections are well aligned, providing good visibility for turning vehicles and approaching traffic and ensuring an acceptable level of overall road safety.
2.5 Parking Supply and Demand	
2.5.1 On-street Parking Provision	There is no on-street parking permitted along the north side of Steam Street (west of Church Street to Ballard Street) with the provision of 'No Stopping' and 'No Parking' restrictions. Similarly, there is no on-street parking permitted along the eastern side of Ballard Street. West of Ballard Street there is no parking control nor along the southern side of Steam Street. On-street parking is available on Church Street to the east of the site with typical restrictions associated with driveways and intersections.
2.5.2 Off-street Parking Provision	There is no off-street parking within the immediate vicinity of the site except an informal parking area adjacent to the Grand Junction Hotel with access from Allan Walsh Drive. Off-street parking is provided at Maitland Station 200 metres southeast of the subject site.
2.5.3 Parking Demand and Utilisation	Observations on site indicate there is a low demand for on street parking along Steam Street with those cars typically parked with one wheel on the footpath due to the narrow nature of the road. There is a demand for on-street parking along Church Street associated with the nearby businesses and residences.
2.5.4 Set down or pick up areas	No set down or pick up areas in the locality of the site.
2.6 Public Transport	
2.6.1 Rail Station Locations	Maitland Station is located on the corner of Church Street and Railway Street around 200 metres southeast of the subject site.
2.6.2 Bus Stops and Associated Facilities	A bus stop is located near the corner of Church Street and Steam Street less than 100 metres to the east of the subject site. Only a sign is provided.
2.6.3 Transport Services	Buses operate along Church Street with local services provided by Hunter Valley Buses and Rover Coaches. Church Street forms part of a major bus route through the locality, with multiple services operating along this road every hour including: • Route 164: Cessnock to Maitland • Route 166: Kurri Kurri to Maitland • Route 179: North Rothbury to Stockland Green Hills • Route 180: Singleton Heights to Stockland Green Hills

Item	Comment
	• Route 181: Aberglasslyn to Woodberry • Route 182: Rutherford to Thornton • Route 183: Rutherford to Tenambit • Route 184: Stockland Green Hills Morpeth • Route 185: Maitland to Largs • Route 192: Maitland to South Maitland  *Figure 2 – Buses operating near the subject site (Source: Hunter Valley Buses).* Maitland Station is located on the Hunter Line which provides half hourly services throughout the day between Newcastle and Scone or Dungog. Commuters can change trains at Hamilton to travel south to the Central Coast and Sydney.
2.7 Pedestrians Network	Pedestrian footpaths along the local roads provide good connectivity from the subject site to Maitland Station and to the nearby bus stops along Church Street. These footpaths also provide pedestrian access to Maitland Public School and local shopping (including a Woolworth Supermarket) to the north.
2.8 Other Proposed Developments	No other significant developments are noted in the locality.
The Development	
3.1.1 Nature of Development	The proposed development is for the construction of a childcare centre with the capacity to provide care for up to 107 children with 21 staff. The centre will operate as a long day care centre, providing a wide spread of drop off and pick up times for parents and carers. The plans for the development show provision for 28 parking spaces on site including an accessible space. A concept plan for the proposed childcare centre is included in **Attachment A**.
3.1.2 Access and Circulation Requirements	The Maitland Development Control Plan requires that all vehicles shall be able to enter and exit the site in a forward direction. Both the access driveway and internal site layout shall be designed in accordance with AS2890 and take into consideration Council design requirements. The site shall have a single driveway only.
3.2 Access	The access to the site is proposed via a single driveway allowing two way movements with 90 degree parking provided on each side. The driveway shall be 6 metres wide in accordance with AS2890.1 for a car park with between 25 and 100 spaces accessed off a local road.

Item	Comment
3.2.1 Driveway Location	The proposed driveway will connect with Steam Street on the southern side of the turn head at the terminus of the street.
3.2.2 Sight Distances	Steam Street in this location provides a straight road alignment. The location of the driveway within the turn head can be provided allowing exiting motorists to be able to view a vehicle approaching the end of the street and wait until that vehicle has either entered the site or undertaken a U-turn in the turn head. Sight distance requirements for vehicles exiting a site at an access driveway are specified by AS2890, based upon the speed limit along the frontage road. For the speed limit of 40 km/hr along Steam Street, being within the high activity zone, the standard requires a minimum sight distance of 35 metres at the access driveway with 55 metres being desirable. Motorists would however be travelling at a speed lower than this given the dead end nature of the road.   *Sight visibility to right across corner of site towards Steam Street* As part of the project work, Seca Solution has reviewed the visibility at the location of the proposed access. Sight distances at the driveway would be available across the corner of the site for a distance of 22 metres. This is less than the minimum distance for a frontage speed of 40km/h (35 metres) however given the very slow speed and the fact that

Item	Comment
	motorists exiting the site are familiar with the arrangement this is considered acceptable in these circumstances.
3.2.3 Service Vehicle Access	
3.2.4 Queuing at entrance to site	No vehicles queues expected at the access driveway. Inbound traffic is left in only and due to the low overall traffic flows along Steam Street there are no delays for vehicles exiting the site.
3.2.5 Comparison with existing site access	No formal access is currently provided for the site.
3.2.6 Access to Public Transport	The site has excellent connectivity to public transport. Pedestrian footpaths provide a direct connection to Maitland Station and the nearby bus stops on Church Street, both of which are located within comfortable walking distance of the subject site (less than 200 meters).
3.3 Circulation	
3.3.1 Pattern of circulation	All vehicles will enter/exit the site via Steam Street with the internal carpark layout allowing for two way movements.
3.3.2 Road width	The central aisle provides a width of 7 metres within the site.
3.3.3 Internal Bus Movements	No requirement for buses to access the development.
3.3.4 Service Area Layout	Servicing for the site will be minimal. The majority of materials are brought to the site by staff. Occasional deliveries will otherwise be during the day, outside of peak pick up and drop off times with such deliveries typically in a small van or truck. A loading bay for a SRV has been provided to accommodate both deliveries and waste collection. The main servicing will be associated with waste collection. Waste shall be collected on site outside peak pickup and drop off times enabling the waste truck to enter and exit in a forward direction and manoeuvre on site as required.
3.4 Parking	
3.4.1 Proposed Supply	Parking will be provided at ground level with 28 parking spaces. Of these one shall be an adaptable parking space.
3.4.2 Authority Parking	Maitland DCP specifies a carparking requirement for Centre Based Childcare Facilities: • 1 space per 4 children in attendance or part thereof. This is consistent with the Guide to Transport Impact Assessments (TfNSW).
3.4.3 Parking Layout	The carpark layout and individual parking spaces shall be designed in accordance with AS2890 for a Class 3 parking facility for visitor/drop off parking spaces being 2600mm wide. Staff parking can be provided as all day parking being 2400mm wide.
3.4.4 Parking Demand	Applying the DCP rate the parking requirement would be 26.75 (27) spaces. The project is consistent with the DCP requirement with 28 parking spaces provided on site.
3.4.5 Service Vehicle Parking	No dedicated service vehicle parking required on site. Per 3.3.4 occasional deliveries would typically be in a small van which can park within the site carpark using a visitor parking space outside peak drop off and pick up times.

Item	Comment
3.4.6 Pedestrian and Bicycle Facilities	There are no pedestrian facilities with any external pedestrian demands accommodated per the existing situation with people able to walk on the nature strip behind the kerb. Cycling facilities are on street linking to existing facilities to the west of the site.
Traffic Assessment	
4.1 Traffic Generation	The Guide to Transport Impact Assessments specifies the following network traffic generation rates for a long day care centre: • AM Network peak hour trips - 0.64 trips per child place • PM Network peak hour trips - 0.39 trips per child place • 2.97 trips daily Allowing for the maximum capacity of 107 children attending the childcare centre, the proposal could generate up to: • 69 trips (vph) during the AM network peak period • 42 trips during the PM network peak period. • 318 trips daily (vpd) (159 inbound/159 outbound) The centre is likely to appeal to local residents, those working in the Maitland Town Centre or those either travelling past the site on their daily commute or travelling by train from Maitland Station. A large percentage of the traffic generated by the proposal is therefore expected to be diverted trips being passing traffic associated with parents and carers travelling on the New England Highway or on local street within close proximity to the site. These vehicles would already be travelling in the locality of the site as part of their journey to work etc and would therefore have a negligible impact upon the broader road network.
4.1.1 Daily and Seasonal Factors	Daily demands with no weekend demands. Lesser demands during school holidays and over Christmas.
4.1.2 Pedestrian Movements	Given the low number of residential dwellings within close proximity to the site the majority of families are expected to drive to the site. There maybe some demand for commuters travelling to Maitland town centre by bus or train.
4.2 Traffic Distribution and Assignments	As Steam Street provides a 'No Through' road, and Church Street is one way northbound north of Steam Street, all vehicles will access the site from the east either left in off Church Street or straight through on Steam Street. Outbound vehicles travelling to the north or east within the Maitland Town Centre would turn left onto Church Street after exiting the site. The balance being the majority of vehicles would turn right onto Church Street to access the New England Highway or Cessnock Road (Hunter Expressway).
4.2.1 Origin / destinations assignment	Based on the existing traffic demands in the vicinity of the site, traffic generated by the development is expected to primarily approach from the south (85%) and return in the same direction with the balance approaching from the east along Steam Street.

Item	Comment
	Peak Hour Distribution of Trips  AM/**PM** Allowing for demands on Church Street it is anticipated that a number of these trips will already be travelling past Steam Street approaching employment within the Maitland town centre. The *additional* traffic will therefore be less than that shown above.
4.3 Impact on Road Safety	There have been no accidents recorded on the local roads surrounding the subject site in the 5 years between 2019-2023 indicating that the local road network provides an acceptable level of road safety. The local roads are generally well aligned allowing for good visibility on the approaches to nearby intersections. The proposed development will not significantly increase the traffic demands along these roads (see Section 4.4.1), and all parking demands can be contained within the site. Therefore, it is concluded that the additional vehicles associated with the development will have a minimal impact upon overall road safety.
4.4 Impact of Generated Traffic	Peak hour flows along Steam Street (west of Church Street) are minimal and currently are in the order of 4 vehicles per hour (two way) in the AM. The development of the site will increase these by up to 69 vehicles per hour two way during the morning peak. The development flows are less (42) in the afternoon peak. It can be seen that the existing flows along Steam Street, together with the additional traffic associated with the development during the absolute peak would be less than 75 vehicles per hour, less than 1 every thirty seconds. As a collector road through the area, the capacity of Church Street would be 900 vehicles per hour per direction, corresponding to Level of Service (LoS) D. The current one way traffic flows on Church Street (north of Steam Street) are 571 vehicles per hour during the morning peak and the proposed development will increase this by 5 vehicles per hour to 576 vehicles. This is well within the mid-block capacity of Church Street. South of Steam Street, Church Street functions as a two way road. The AM two flow is 575 vph with a northbound flow in the order of 575, 605 including the development traffic. This represents a LoS D however

Item	Comment
	allowing for a proportion of these trips to already be on Church Street it is anticipated that the impact would be minimal and see no significant change over the current LoS of C being less than 600 vph per direction.
4.4.1 Impact on Daily Traffic Flows	Allowing for a daily increase of 318 vpd the proposed development will have the following impact upon daily traffic flows in the locality of the site: • Increase daily flows along Steam Street (west of Church Street) by 318 vehicles per day to be in the order of 360 vehicles per day two-way. • Increase daily flows along Church Street (south of Steam Street) by 270 vehicles per day to 6020 Being a local street, the desirable maximum for Steam Street is given as 200 vehicles per hour with a maximum of 300 vehicles per hour. It is obvious from the assessment above that Steam Street will operate well within the desirable capacity of the road being less than 100 vehicles per hour in the AM network peak.
4.4.2 Peak Hour Impacts on Intersections	SIDRA modelling previously undertaken by Seca Solution (**Attachment C**) on the intersection of Church Street and Steam Street demonstrated that based on the traffic flows at the time (higher than current), the intersection of Church Street and Steam Street operated well within its capacity, providing minimal delays and congestion during the morning peaks with Level of Service (LoS) A on all approaches. Given current traffic flows surveyed are less, this assessment is considered valid. It is also consistent with the observations on site. The proposed development will increase traffic flows through this intersection by up to 69 vehicles per hour during the morning peak. This corresponds to just more than one vehicle passing through the intersection each minute. This however makes no allowance for existing vehicles diverting into Steam Street to approach the site. This would therefore have an acceptable impact on this intersection. The impact upon the surrounding intersections would be lower as traffic disperses along several potential routes also taking into account the high number of diverted trips from the New England Highway.
4.4.3 Impact of Construction Traffic	During construction works there may be a requirement to establish a works zone to the front of the site on Steam Street to allow for unloading and loading. Details of any works zone will be provided as part of a construction traffic management plan for the site as will any local parking controls along Steam Street. Parking for construction staff will be managed to reduce the impacts on the local road network during construction. During construction, there will be a requirement for construction vehicles to access the site as well as additional traffic movements associated with worker. These movements can be catered for within the local road network.
4.4.4 Other Developments	No other significant developments noted in the locality.
4.5 Public Transport	
4.5.1 Options for improving services	None required.

Item	Comment
4.5.2 Pedestrian Access to Bus Stops	The nearest bus stops are located less than 100 meters away on Church Street and there are pedestrian footpaths connecting these to the subject site.
4.6 Recommended Works	
4.6.1 Improvements to Access and Circulation	The access driveway and carpark shall be designed per AS2890 taking into consideration Council requirements.
4.6.2 Improvements to External Road Network	None required. It is noted that the additional traffic generated by the development is well within the capacity of Steam Street. Although Steam Street is narrow, given the low overall flows the street will continue to operate in a manner similar to the present. The parking for the development is within the guidelines and able to be accommodated within the site with no impact on the external roadway. The existing parking along Steam Street is outside the control of this subject site however the road authority may consider No Stopping signs to provide a clear road width.

Site Photos:

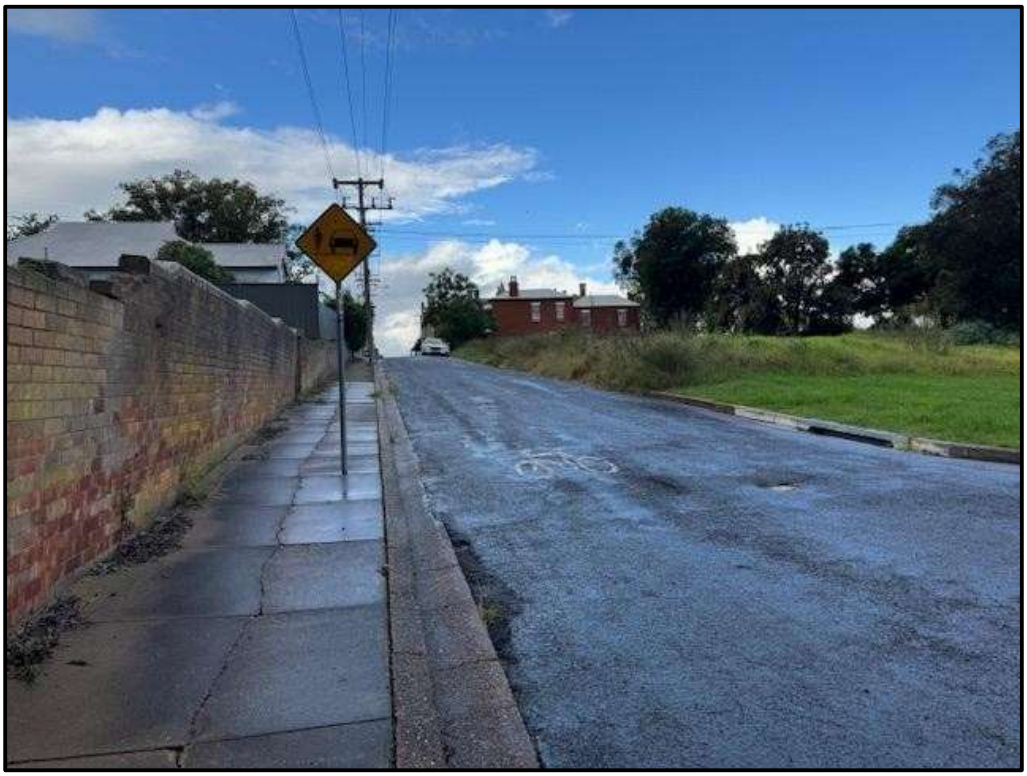


Photo 1 – Visibility looking east along Steam Street showing cross section and on road cycling

Photo 2 – Showing vehicles parked on Steam Street with one wheel on the footpath.

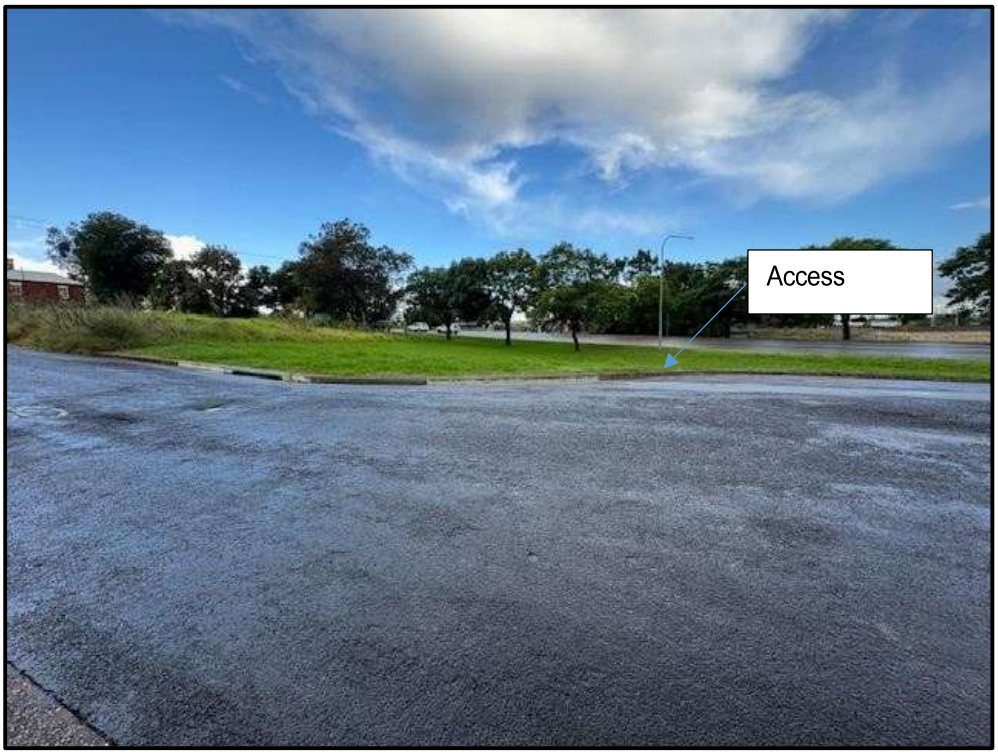


Photo 3 – looking across turn head towards site and proposed access

Conclusion:

From the site work undertaken and the review of the development proposal and associated plans against the requirements of the Guide to Transport Impact Assessments it is considered that the proposed development application should have no objections raised on traffic and access grounds. The additional traffic movements generated by the development will have an acceptable impact on the surrounding road network.

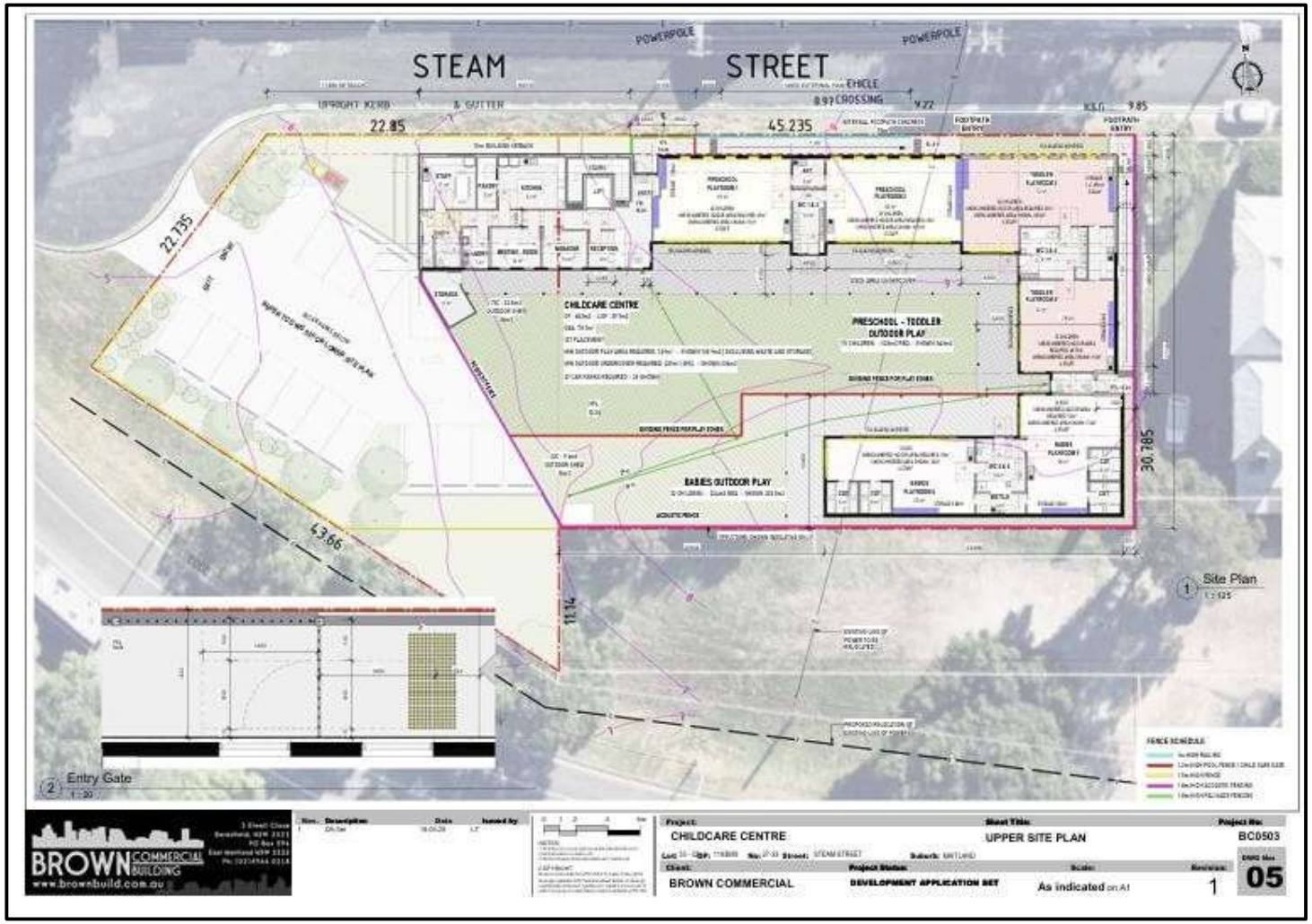
Parking will be provided on site in accordance with the DCP requirements and the site can be serviced allowing for all vehicles to enter and exit the site in a forward direction.

Yours sincerely,

Cathy Thomas
Director

Version	Date	Description	Prepared by	Reviewed and Approved for Issue
Ver01	30/4/25	Draft	C. Thomas	S. Morgan 
Ver02	19/6/25	Final	C.Thomas	S.Morgan 

Attachment A: Site Plan and service zone movements



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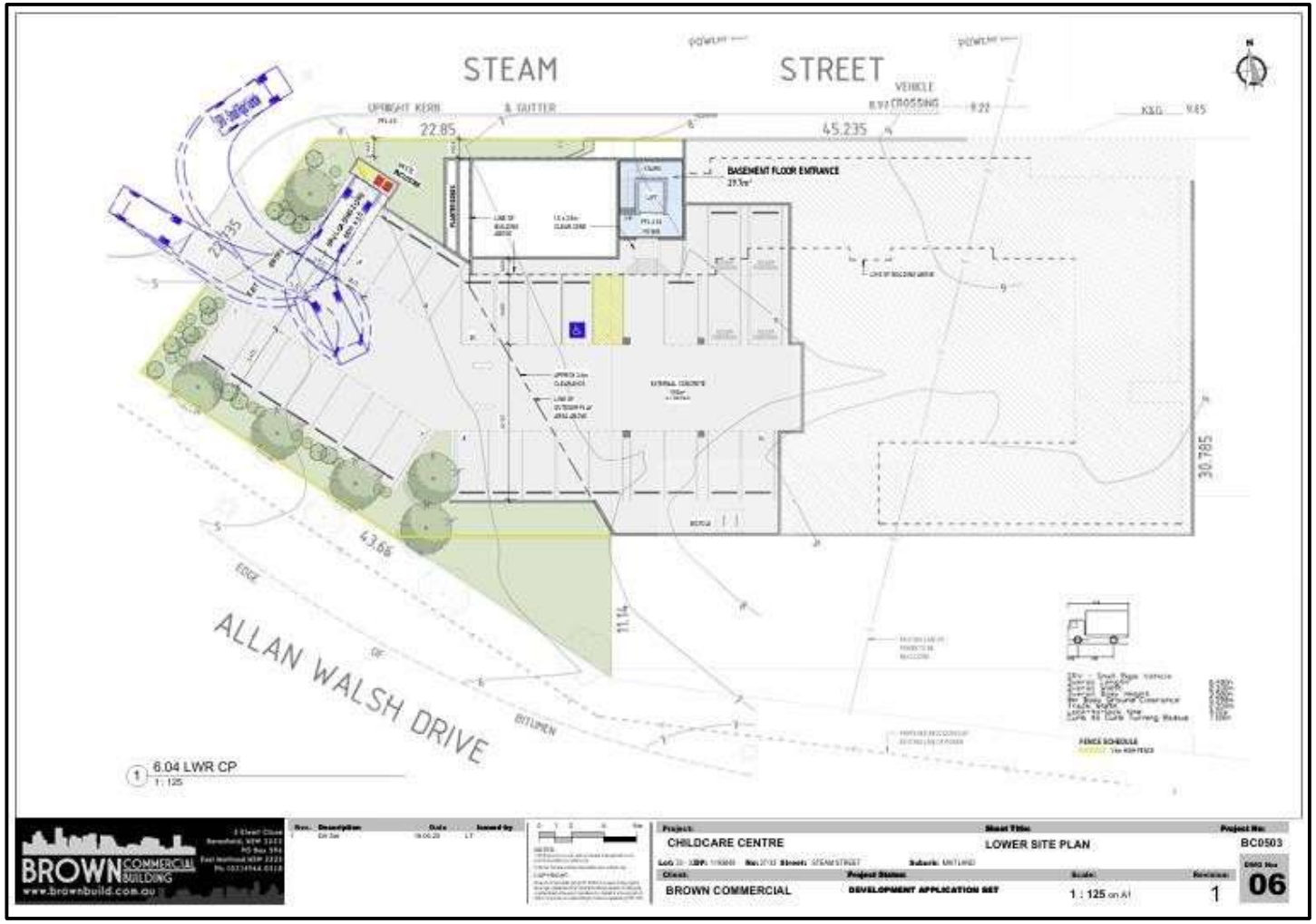
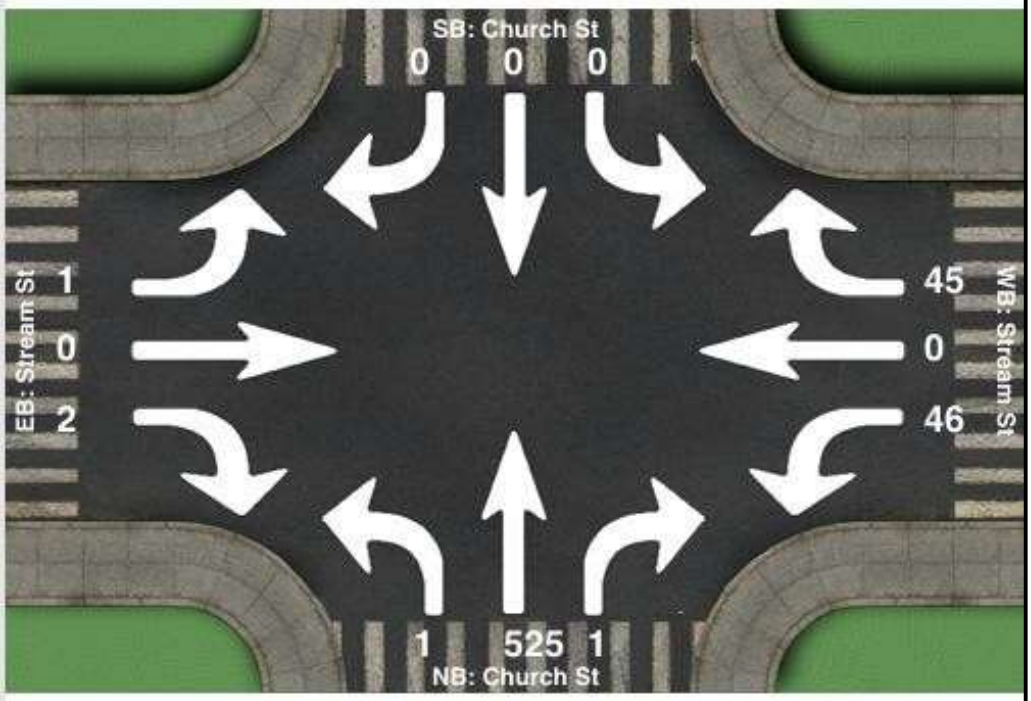


Attachment B: Traffic Data

Intersection Peak Hour

Location: Church St at Stream St, Maitland
GPS Coordinates:
Date: 2024-12-04
Day of week: Wednesday
Weather: Sunny
Analyst: CT



Intersection Peak Hour

08:15 - 09:15

	SouthBound			Westbound			Northbound			Eastbound			Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
Vehicle Total	0	0	0	46	0	45	1	525	1	1	0	2	621
Factor	0.00	0.00	0.00	0.57	0.00	0.54	0.25	0.91	0.25	0.25	0.00	0.50	0.87
Approach Factor	0.00			0.89			0.91			0.38			

Attachment C: Sidra Results

Criteria for interpreting Sidra results:

1-Level of Service (LoS)

LoS	Traffic Signals and Roundabouts	Give Way and Stop Signs
A	Good	Good
B	Good, with acceptable delays and spare capacity	Acceptable delays and spare capacity
C	Satisfactory	Satisfactory, but requires accident study
D	Operating near capacity	Near capacity and requires accident study
E	At capacity, excessive delay: roundabout requires other control method	At capacity, requires other control mode
F	Unsatisfactory, requires other control mode or additional capacity	Unsatisfactory, requires other control mode

2-Average Vehicle Delay (AVD)

The AVD is a measure of operational performance of an intersection relating to its LoS. The average delay should be taken as a guide only for an average intersection. Longer delays may be tolerated at some intersections where delays are expected by motorists (e.g. those in inner city areas or major arterial roads).

LoS	Average Delay / Vehicle (secs)	Traffic Signals and Roundabouts	Give Way and Stop Signs
A	Less than 15	Good operation	Good operation
B	15 to 28	Good with acceptable delays and spare capacity	Acceptable delays and spare capacity
C	28 to 42	Satisfactory	Satisfactory but accident study required
D	42 to 56	Operating near capacity	Near capacity, accident study required
E	56 to 70	At capacity, excessive delays: roundabout requires other control mode	At capacity; requires other control mode
F	Exceeding 70	Unsatisfactory, requires additional capacity	Unsatisfactory, requires other control mode

3-Degree of Saturation (D/S)

The D/S of an intersection is usually taken as the highest ratio of traffic volumes on an approach to an intersection compared with the theoretical capacity, and is a measure of the utilisation of available green time. For intersections controlled by traffic signals, both queues and delays increase rapidly as DS approaches 1.0. An intersection operates satisfactorily when its D/S is kept below 0.75. When D/S exceeds 0.9, queues are expected.

MOVEMENT SUMMARY

Site: 101 [Steam Street / Church Street AM 2017] (higher base flows than 2024)

Steam Street / Church Street
2017 Flows
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Church Street											
1	L2	4	0.0	0.326	4.3	LOS A	0.0	0.0	0.00	0.00	14.3
2	T1	622	3.9	0.326	0.0	LOS A	0.0	0.0	0.00	0.00	59.9
Approach		626	3.8	0.326	0.0	NA	0.0	0.0	0.00	0.00	59.5
East: Steam Street											
4	L2	35	2.9	0.075	5.5	LOS A	0.4	2.7	0.55	0.52	27.5
5	T1	1	0.0	0.075	10.2	LOS A	0.4	2.7	0.55	0.52	32.0
6	R2	31	6.5	0.075	14.4	LOS A	0.4	2.7	0.55	0.52	44.6
Approach		67	4.5	0.075	9.7	LOS A	0.4	2.7	0.55	0.52	38.7
West: Steam Street											
10	L2	3	0.0	0.005	8.1	LOS A	0.0	0.1	0.52	0.64	47.1
12	R2	1	0.0	0.005	9.1	LOS A	0.0	0.1	0.52	0.64	29.0
Approach		4	0.0	0.005	8.4	LOS A	0.0	0.1	0.52	0.64	44.7
All Vehicles		697	3.9	0.326	1.0	NA	0.4	2.7	0.06	0.06	57.4

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

INTERSECTION SUMMARY

Site: 101 [Steam Street / Church Street AM 2017] (higher base flows than 2024)

Steam Street / Church Street
2017 Flows
Giveway / Yield (Two-Way)

Intersection Performance - Hourly Values		
Performance Measure	**Vehicles**	**Persons**
Travel Speed (Average)	57.4 km/h	57.4 km/h
Travel Distance (Total)	382.5 veh-km/h	459.0 pers-km/h
Travel Time (Total)	6.7 veh-h/h	8.0 pers-h/h
Demand Flows (Total)	697 veh/h	836 pers/h
Percent Heavy Vehicles (Demand)	3.9 %	
Degree of Saturation	0.326	
Practical Spare Capacity	200.9 %	
Effective Intersection Capacity	2140 veh/h	
Control Delay (Total)	0.20 veh-h/h	0.24 pers-h/h
Control Delay (Average)	1.0 sec	1.0 sec
Control Delay (Worst Lane)	9.7 sec	
Control Delay (Worst Movement)	14.4 sec	14.4 sec
Geometric Delay (Average)	0.6 sec	
Stop-Line Delay (Average)	0.4 sec	
Idling Time (Average)	0.2 sec	
Intersection Level of Service (LOS)	NA	
95% Back of Queue - Vehicles (Worst Lane)	0.4 veh	
95% Back of Queue - Distance (Worst Lane)	2.7 m	
Queue Storage Ratio (Worst Lane)	0.01	
Total Effective Stops	40 veh/h	48 pers/h
Effective Stop Rate	0.06 per veh	0.06 per pers
Proportion Queued	0.06	0.06
Performance Index	7.5	7.5
Cost (Total)	81.24 $/h	81.24 $/h
Fuel Consumption (Total)	28.6 L/h	
Carbon Dioxide (Total)	68.4 kg/h	
Hydrocarbons (Total)	0.005 kg/h	
Carbon Monoxide (Total)	0.080 kg/h	
NOx (Total)	0.102 kg/h	

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

NA: Intersection LOS for Vehicles is Not Applicable for two-way sign control since the average intersection delay is not a good LOS measure due to zero delays associated with major road movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Intersection Performance - Annual Values		
Performance Measure	**Vehicles**	**Persons**
Demand Flows (Total)	334,560 veh/y	401,472 pers/y
Delay	94 veh-h/y	113 pers-h/y
Effective Stops	19,167 veh/y	23,001 pers/y
Travel Distance	183,617 veh-km/y	220,340 pers-km/y
Travel Time	3,201 veh-h/y	3,841 pers-h/y
Cost	38,996 $/y	38,996 $/y
Fuel Consumption	13,741 L/y	
Carbon Dioxide	32,841 kg/y	
Hydrocarbons	2 kg/y	
Carbon Monoxide	38 kg/y	
NOx	49 kg/y	

MOVEMENT SUMMARY

Site: 101 [Steam Street / Church Street PM 2017]

Steam Street / Churh Street
2017 Flows
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Church Street											
1	L2	6	0.0	0.213	4.3	LOS A	0.0	0.0	0.00	0.01	14.3
2	T1	398	6.0	0.213	0.0	LOS A	0.0	0.0	0.00	0.01	59.8
Approach		404	5.9	0.213	0.1	NA	0.0	0.0	0.00	0.01	59.0
East: Steam Street											
4	L2	74	1.4	0.101	5.5	LOS A	0.5	3.7	0.43	0.48	30.2
5	T1	3	0.0	0.101	8.2	LOS A	0.5	3.7	0.43	0.48	34.9
6	R2	46	4.3	0.101	11.2	LOS A	0.5	3.7	0.43	0.48	46.6
Approach		123	2.4	0.101	7.7	LOS A	0.5	3.7	0.43	0.48	39.8
West: Steam Street											
10	L2	3	0.0	0.007	6.9	LOS A	0.0	0.2	0.43	0.61	48.2
12	R2	3	0.0	0.007	7.7	LOS A	0.0	0.2	0.43	0.61	30.4
Approach		6	0.0	0.007	7.3	LOS A	0.0	0.2	0.43	0.61	42.7
All Vehicles		533	5.1	0.213	1.9	NA	0.5	3.7	0.10	0.12	54.8

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

INTERSECTION SUMMARY

Site: 101 [Steam Street / Church Street PM 2017]

Steam Street / Churh Street
2017 Flows
Giveway / Yield (Two-Way)

Intersection Performance - Hourly Values		
Performance Measure	**Vehicles**	**Persons**
Travel Speed (Average)	54.8 km/h	54.8 km/h
Travel Distance (Total)	272.0 veh-km/h	326.4 pers-km/h
Travel Time (Total)	5.0 veh-h/h	6.0 pers-h/h
Demand Flows (Total)	533 veh/h	640 pers/h
Percent Heavy Vehicles (Demand)	5.1 %	
Degree of Saturation	0.213	
Practical Spare Capacity	359.8 %	
Effective Intersection Capacity	2501 veh/h	
Control Delay (Total)	0.28 veh-h/h	0.34 pers-h/h
Control Delay (Average)	1.9 sec	1.9 sec
Control Delay (Worst Lane)	7.7 sec	
Control Delay (Worst Movement)	11.2 sec	11.2 sec
Geometric Delay (Average)	1.4 sec	
Stop-Line Delay (Average)	0.5 sec	
Idling Time (Average)	0.1 sec	
Intersection Level of Service (LOS)	NA	
95% Back of Queue - Vehicles (Worst Lane)	0.5 veh	
95% Back of Queue - Distance (Worst Lane)	3.7 m	
Queue Storage Ratio (Worst Lane)	0.01	
Total Effective Stops	66 veh/h	80 pers/h
Effective Stop Rate	0.12 per veh	0.12 per pers
Proportion Queued	0.10	0.10
Performance Index	6.2	6.2
Cost (Total)	74.20 $/h	74.20 $/h
Fuel Consumption (Total)	23.2 L/h	
Carbon Dioxide (Total)	55.6 kg/h	
Hydrocarbons (Total)	0.004 kg/h	
Carbon Monoxide (Total)	0.062 kg/h	
NOx (Total)	0.100 kg/h	

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

NA: Intersection LOS for Vehicles is Not Applicable for two-way sign control since the average intersection delay is not a good LOS measure due to zero delays associated with major road movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Intersection Performance - Annual Values		
Performance Measure	**Vehicles**	**Persons**
Demand Flows (Total)	255,840 veh/y	307,008 pers/y
Delay	136 veh-h/y	163 pers-h/y
Effective Stops	31,859 veh/y	38,230 pers/y
Travel Distance	130,547 veh-km/y	156,656 pers-km/y
Travel Time	2,384 veh-h/y	2,861 pers-h/y
Cost	35,618 $/y	35,618 $/y
Fuel Consumption	11,119 L/y	
Carbon Dioxide	26,681 kg/y	
Hydrocarbons	2 kg/y	
Carbon Monoxide	30 kg/y	
NOx	48 kg/y	