

15/11/2019

IBSA Australasia
12-14 Zouch Road
DENHAM COURT N 2222

Attn: Mr Nick Simitzis

Dear Nick

Proposed Film Operations (12-14 Zouch Road Denham Court)

Floe has reviewed the *Traffic and Parking Report* (dated 13 November 2019) in relation to the IBSA's proposed development at 12-14 Zouch Road, Denham Court. Our review has highlighted the suitability of the methodology and assumptions applied to determine the traffic and safety impacts of the development proposal.

A detail response to each section of the report is provided at Attachment A with a copy of the report at Attachment B.

From this review it is concluded:

- The report has suitably referenced appropriate background information and presented a reasonable description of existing traffic conditions.
- The report has adequately determined the car parking demand for each scenario and identified a surplus of car parking supply which will cater for the proposed development including peak filming days.
- A comprehensive car parking demand survey is not required due to the nature of the existing use which houses most of its staffing needs and has allocated parking.
- The car parking layout is satisfactory and meets AS2890.1-2004.
- The development is not expected to have a significant impact to the surrounding road network.
- Concessions have been made by IBSA to further minimise amenity impacts to the residents of Church Road by limiting development associated traffic on this road, though not necessary based on the classification of Church Road and its potential to support larger development traffic if the IBSA land were subdivided.
- Traffic volumes may increase on Zouch Road by:
 - 12 vehicles in the AM and PM peak each day
 - 20 vehicles in the AM associated with cast during filming (8 days per month)
 - 55 vehicles in the AM associated with cast during large filming days (a rare occasion within the scheduled filming days)
- Traffic volumes on Church Road:
 - Are expected to remain in accordance with the existing approved use of the access on a daily basis.
 - Are not expected to be generated by the proposed development at all on a daily basis (non-filming days).
 - Are to be limited in the AM during filming days (8 days per month) by management direction to use Zouch Road.

- May increase on filming days during business hours to support cast leaving the site so as not to interfere with filming operations.
- The conclusions made within the traffic report represent a reasonable consideration of the impacts of the proposed development and no further traffic assessment is considered necessary.

On the basis of this assessment, Floe considers the traffic assessment suitable. The proposed development is not expected to generate a significant impact to the surrounding road network and is supported by Floe. Should you have questions please do not hesitate to contact me on 07 3040 8151.

Yours sincerely



Davin Brown
Director – CpEng, RPEQ #18321
Floe Pty Ltd

Attachment A

Review of Traffic Report

Review of Traffic and Parking Report (DA Submission)

Alterations and Additions to Existing Religious Establishment (Lindsay Thorpe - November 2019)

(Floe Comments November 2019)

Section 1: Introduction	Floe Comments
1.1 Introduction	Noted
Section 2: Existing Site Description	Floe Comments
2.1 Site Location, Existing Use and Surrounding Use	Noted. Subject property zoned as 'Rural Landscape'. While it contains residential/office uses, the adjacent land is also zoned 'Rural Landscape' and accommodates, residential, place of worship, cemetery and fuel station.
Section 3: Existing Traffic Conditions	Floe Comments
3.1 Road Network and Classification	Agree with the classification
3.2 Road Description and Traffic Control	Denham Court Road midblock LOS not mentioned in RMS REF, however can be calculated based on the RMS REF data. Agree with summary. Note, the site access on Zouch Road is median divided providing separate gated ingress and egress. There is sufficient queuing space at the hold point to meet observed traffic flow.
3.3 Current Intersection Performance	The RMS REF reports Denham Court Road/Campbelltown Road intersection at LOS A in the AM and PM peaks, with more than 50% operational capacity available for future growth/development. The principled assessment of Church Road/Denham Court Road is reasonable and would have greater capacity to the modelled intersection of Denham Court Road/Campbelltown Road.
3.4 Existing Intersection Crash History	The reported crashes on Zouch Road/Campbelltown Road intersection indicate a trend of impact with right turning vehicles from Zouch Road, while the number of reported crashes is not significant, this movement is planned to be removed as part of the future intersection works.
3.5 Existing Public Transportation Services	Agree. Upgrading to the pedestrian network along Campbelltown Road is currently underway which will improve the quality of this connectivity.
3.6 Campbelltown Road Upgrade Project	Agree. Sourced from <i>Campbelltown Road Upgrade Review of Environmental Factors</i> - Aecom 2013

Section 4: Proposed Development	Floe Comments
4.1 Description of the Proposal	Noted. The <i>Film Management Plan</i> (IBSA) indicates that filming may include "up to 100 cast". The traffic report highlights that cast of this size would not be a daily occurrence nor the size of cast needed on all filming days, rather this is referred to as "larger filming days". The traffic report indicates that of the upper limit of 100 cast, 75 are expected to commute to the site for filming, indicating that a proportion of the cast (25 people in the above case) will also live on-site and therefore not contribute to the traffic impact associated with filming days. This may indicate that on smaller filming days, nil or very few commuters may be needed as cast will already be on-site.
4.2 Vehicular and Pedestrian Access	Width of access is appropriate. Provision of 6m queue length adequate for the car parking provision and arrival pattern described. Staff controlled traffic management is not deemed necessary subject to appropriate signage.
4.3 On-site Parking Requirements	Based on office space, the development meets the requirements for parking supply. However, given that the filming set is not a Council classification use, additional assessment has been provided.
4.4 Summary of Existing On-site Parking	Existing approved parking noted. Table 4 not necessary.
4.5 Empirical Car Parking Demand	It is understood that parking for residents is allocated and that they largely remain on-site during business hours. While a parking survey has not been presented, the summary information appears sound. Furthermore, aerial photography (Google 2019) of the site indicates during the middle of the day over 100 spaces as vacant. This excludes any spaces that are under cover. The use of a car occupancy rate of 1.38 has been based on site observations and appears reasonable. Extrapolation of data for forecast is sound.
4.6 On-site Parking Layout and Circulation	Parking layout assessment identifies parking and aisle dimensions in accordance with AS2890.1-2004. While height clearances and grades have not been assessed, no overhead obstructions are present within parking area and gradient is compliant. It is understood that the Church Road access will continue to be used for existing purposes as part of the existing development approval, noting that HRV or larger vehicles access Zouch Road as part of general operations. Swept path assessment adequate.

Section 5: External Traffic Impact	Floe Comments
5.1 Development Impact	Use of RMS trip data resulted in similar traffic generation to the first principles assessment. The resultant peak traffic of 4 trips in the PM is conservative, as mentioned in Section 4.1 the daily crew live on-site and would therefore not generate traffic trips to the site. Agree that the existing residential component has a negligible impact in the weekday AM and PM peak periods.
5.2 Regular Filming Days	First principles assessment methodology appears sound. The resultant peak traffic during filming appears to be made up of commuting personnel (30-35 people) and applying the car occupancy (1.38) determined in Section 4.5. This would result in 20-25 vehicles, though not explicitly described in the report, it is reasonable to assume that these would occur over a 2hr period and that the 15 trips mentioned in this section are those within the peak hour of 7am-8am. However the net difference and impact to the surrounding road network is considered negligible. Agree that the residential component has a negligible impact in the weekday AM and PM peak periods.
5.2 Occasional Larger Filming Days	As mentioned above, the traffic generation would be 20-25 vehicles on general filming days. Explanation of how the "55 in and 55 out" vehicle movements were determined has not been discussed, however this can be calculated by applying the car occupancy rate of 1.38 to the maximum commuting cast of 75 needed on "larger filming days". Likewise, determination of the 15 trips in the PM peak hour of 5-6pm has not been explained. However, if you were to apply a linear distribution to the 55 exiting cars over the 7 hours listed (12pm-7pm) this would equate to less than 8 vehicles an hour. As such, it is reasonable to assume a greater number of these would access the road network during the peak, therefore this assumption is considered satisfactory. The decision not to undertake intersection assessment for the "larger filming days" is sound. The infrequent and rare nature of these larger filming requirements would be not too dissimilar to the temporary traffic impact of special events held by many community centres and churches (such as Easter, Christmas and yearly community fairs) held three or four times a year. Notwithstanding, the impact of an additional 55 vehicles outside the road network peak hour is not considered significant, particularly given the infrequent nature. Upgrade to Campbelltown Road may provide additional capacity to the local intersections, however as noted in the RMS REF, this capacity is predicted to be utilised by 2036 with the growth in the surrounding area. Assessment of weekend traffic impact has not been considered, noting that Church Road would be expected to generate larger traffic number on the weekend due to the Anglican Church accessed on this road. As indicated in the Film Management Plan (IBSA) for the for the most part filming is to occur on business days. As such, assessment of weekend impacts in not required.
Section 6: Conclusion	Conclusion Accurate.

Attachment B

Traffic and Parking Report - Alterations and Additions to Existing Religious Establishment
(Lindsay Thorpe - November 2019)

Traffic and Parking Report

Alterations and Additions to Existing Religious Establishment

Prepared for International Bible Students Association

At 12—14 Zouch Road, Denham Court, NSW 2565

Issue 2 – 13th November 2019

Revision History

Details	Date	Author
Issue 1	30/07/19	Lindsay Thorpe*
Issue 2	13/11/19	Lindsay Thorpe*
*see Appendix C for qualifications		

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1 Introduction

1.1 INTRODUCTION

The International Bible Students Association (IBSA) has prepared this traffic impact assessment in support of the Development Application (DA) for the alterations and additions to its current facilities at 12-14 Zouch Road, Denham Court. The proposal seeks development of 2661m² of its current farming land for use as staging facilities to undertake filming for not-for-profit, Bible based, educational films and short videos. The site is located in City of Liverpool Council (Council) Local Government Area, and has been assessed under Council's controls.

The Traffic Impact Assessment (TIA) documented in this report provides an assessment of the traffic, transport and parking implications of the proposal. In preparing this document, IBSA have referenced the following planning documents:

- Liverpool Development Control Plan 2008 (DCP)
- Liverpool Local Environmental Plan 2008 (LEP)
- Roads and Maritime Services (RMS) Guide to Traffic Generating Developments, 2002 (RMS Guide)
- RMS Technical Direction TDT 2013/04a, Guide to Traffic Generating Developments – Updated traffic surveys (RMS Guide Update)
- Australian Standard 2890.1 (2004): Off-street car parking (AS2890.1)
- Australian Standard 2890.2 (2002): Off-street commercial vehicle facilities (AS2890.2)
- Australian Standard 2890.6 (2009): Off-street parking for people with disabilities (AS2890.6)

This TIA also references general access, traffic and parking guidelines, including:

- Roads and Maritime Services, Guide to Traffic Generating Developments (RMS Guide)
- Australian Standard 2890.1: Parking Facilities – Off Street Car Parking (AS 2890.1)
- Australian Standard 2890.2: Parking Facilities – Off Street Commercial Vehicle Facilities (AS 2890.2)
- Roads and Maritime Services Campbelltown Road Upgrade Report of Environmental Factors (RMS REF)

2 Existing Site Description

2.1 SITE LOCATION, EXISTING USE AND SURROUNDING USE

The site (see Figure 1) currently occupies 12-14 Zouch Road, Denham Court, which is legally described as Lot 2 in DP1111318. Under the existing masterplan, the site currently accommodates a total of 14 separate buildings:

- five used as residential buildings
- three used as office/commercial buildings
- remaining buildings used for support services (maintenance, farming etc.)

The site is surrounded by similar land use, farming and residential.



Figure 1 – Subject site

3 Existing Traffic Conditions

3.1 ROAD NETWORK AND CLASSIFICATION

Zouch Road and Church Road are local roads and run north-south; also bordering the property is Campbelltown Road (state road) and at the North East corner Campbelltown Road and Zouch Road intersect.

Denham Court Road is a RMS Regional Road which intersects with Campbelltown Road. Church Road intersects with Denham Court Road, roughly 140m from the intersection of Campbelltown Road / Denham Court Road.

3.2 ROAD DESCRIPTION AND TRAFFIC CONTROL

Zouch Road (see Figure 2 and Figure 3) is a 2-way, 2-lane undivided road (in the vicinity of the site), approximately 8m wide. At present there are no parking restrictions along both sides of the road.

The vehicle access for the subject site is a priority-controlled T-intersection, with Zouch Road.



Figure 2 – Zouch Road facing North (existing site access on left)



Figure 3 – Zouch Road (facing south) on approach to the Campbelltown Road intersection

The Zouch Road / Campbelltown Road intersection is a 4-way, priority-controlled intersection; Campbelltown Road being the major road.

Campbelltown Road is a 2-way, 2-lane undivided road, approximately 7m wide. Currently no parking restrictions are present.

The current traffic flows on Zouch Road in the vicinity of the subject site are 100-200vpd and 10-20 vph and considered to be appropriate for a local access in a mixed residential and farming area. Traffic is free flowing without any major queuing or delay observed in peak hours; hence the road has spare capacity.

The current level of service (LOS) on Zouch Road and Campbelltown Road is summarised in Table 1.

Table 1: Current LOS on Zouch Road and Campbelltown Road		
Existing LOS	AM	PM
Zouch Road	LOS A*	LOS A*
Campbelltown Road	LOS D*	LOS C*
*Based on Table 4.4 of RMS Guide for peak hour volumes < 200vph		
*Sourced from RMS REF		

Church Road (see Figure 4 and Figure 5) is a 6.5m wide (approx.), 2-way, 2-lane, undivided road; that terminates at an existing vehicle access to the subject site. At present there are no parking restrictions along both sides of the road.

The current traffic flows on Church Road in the vicinity of the subject site are 0-100 vpd and 10-20 vph and considered appropriate for a local access with a mixed use of residential, farming and a place of worship. Traffic is free flowing without any major queuing or delays in peak hours; hence under the Local Government Functional Road Classification (IPWEA (NSW)) this road is underutilised and has spare capacity as a typical local access road has a AADT of <1000 vpd.

The existing approved vehicle access on Church Road adjoins the cul-de-sac head (see Figure 5).



Figure 4 – Church Road (facing south) on approach to the intersection with Denham Court Road



Figure 5 – Existing access to subject site from Church Road

Denham Court Road is a 7m wide (approx.), 2-way, 2-lane, undivided road. Currently no parking restrictions are present.

The current LOS on Church Road and Denham Court Road is summarised in Table 2.

Table 2: Current LOS on Church Road and Denham Court Road		
Existing LOS	AM	PM
Denham Court Road	LOS A [*]	LOS A [*]
Church Road	LOS A [*]	LOS A [*]
*Based on Table 4.4 of RMS Guide for peak hour volumes < 200vph		
*Sourced from RMS REF		

3.3 CURRENT INTERSECTION PERFORMANCE

Average Vehicle Delay (Delay) and Level of Service (LOS) provide a measure of the operational performance of an intersection, as indicated in Table 4.2 of the RMS Guide.

Table 3: Current LOS at intersections		
Existing LOS	AM	PM
Denham Court Road / Church Road	LOS A [*]	LOS A [*]
Campbelltown Rd / Denham Court Rd	LOS A [*]	LOS A [*]

Campbelltown Rd / Zouch Rd	LOS A [*]	LOS A [*]
[*] Based on Table 4.4 of RMS Guide for peak hour volumes < 200vph [*] Sourced from RMS REF		

It has been observed by the author who undertook site observations on 07/08/2018 that the current operational performance of the intersection of Zouch Road / Access Road is LOS A, with an Delay of less than 14 seconds per vehicle. As per the recent RMS REF which undertook traffic assessment of Campbelltown Road / Zouch Road, the current LOS at the intersection is LOS A, with Delay being under 14 seconds for all vehicles.

As per the recent RMS REF which undertook traffic assessment of Campbelltown Road / Denham Court Road intersection, the current LOS in both peaks is LOS A, with delay being under 14 seconds for all vehicles. From onsite observations Denham Court Road / Church Road intersection also operates with a LOS A in both peaks.

3.4 EXISTING INTERSECTION CRASH HISTORY

Crash statistics were analysed for all 4 intersections. A copy of the crash data is provided at Appendix B. A summary of the crash data review is provided in Table 3.

Table 3: Summary of Crash Data Review		
Intersection	Number of Crash Incidents	Trend/Contributing Factor
Church Road/ Denham Court Road	0	No trends
Zouch Road/ Campbelltown Road	2	No trends
Site access/ Zouch Road	0	No trends
Denham Court/ Campbelltown Road	3	No trends

Campbelltown Road / Zouch Road intersection has had 2 crashes in the last 5 years; details can be seen from the crash diagram in Figure 6. While there is no observable trend, both incidents occurred with right turning traffic from Zouch Road. It is noted that with the proposed upgrades to this intersection, as part of the Campbelltown Road Upgrade Project, this existing manoeuvre will be reworked.



Figure 6 – Crash Diagram – Campbelltown Road / Zouch Road

Campbelltown Road / Denham Court Road intersection has had 3 crashes in the last 5 years; details can be seen in Figure 7. There is no observable trend in crashes at this intersection and it operates in a manner consistent with a typical roundabout.



Figure 7 – Crash Diagram – Campbelltown Road / Denham Court Road

3.5 EXISTING PUBLIC TRANSPORTATION SERVICES

The subject site has good access to existing public transport services in the form of trains and buses. The site is located approximately 1.8km from Edmondson Park Train Station which is a distance that can be undertaken easily using active transport, whether walking or riding.

Irregular bus services operate along both sides of Campbelltown Road in the vicinity of the subject site. (i.e. bus route 868). This bus service operates to assist with journeys to and from the two rail stations of Edmondson Park and Ingleburn.

The bus connections are proposed to improve under TfNSW Bus Head Start Program, where TfNSW plans to keep pace with the growth in South Western Sydney by improving Public Transport services (incl. buses).

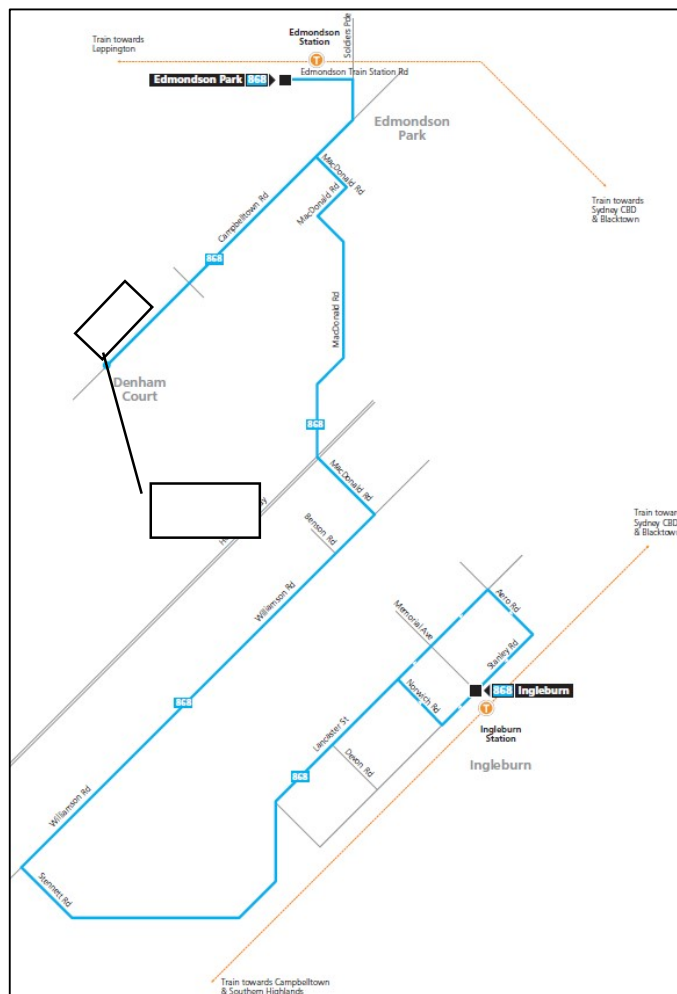


Figure 8 – Map of 868 Bus Route

3.6 CAMPBELLTOWN ROAD UPGRADE PROJECT

The subject site is affected by the proposed Campbelltown Road Upgrade Project. The project aims to improve the traffic flow and facilitate traffic growth in the area by widening Campbelltown Road from 2 to 4 lanes, with the facilities for 6 lanes into the future, as well as signalling key intersections along the road to improve access to redeveloped communities. The impacts of this have been noted on Plans DA-004 30/10/2019. As per the drawings, the proposed road boundary and future project will not be impacted by current or future buildings on our land and hence won't prohibit the construction of the project.

Under the proposal Zouch Road will have all right turns restricted, and through movements along Zouch Road restricted. This will require existing trips coming to our site from Campbelltown Road that currently turn right into Zouch Road to turn into MacDonald Road and travel through the local roads within the Edmondson Park South Precinct to access Zouch Road, and existing trips exiting the subject site wanting to turn right onto Campbelltown Road will need to travel through the local roads of Edmondson Park South Precinct to turn right from MacDonald Road (See Figure 9)

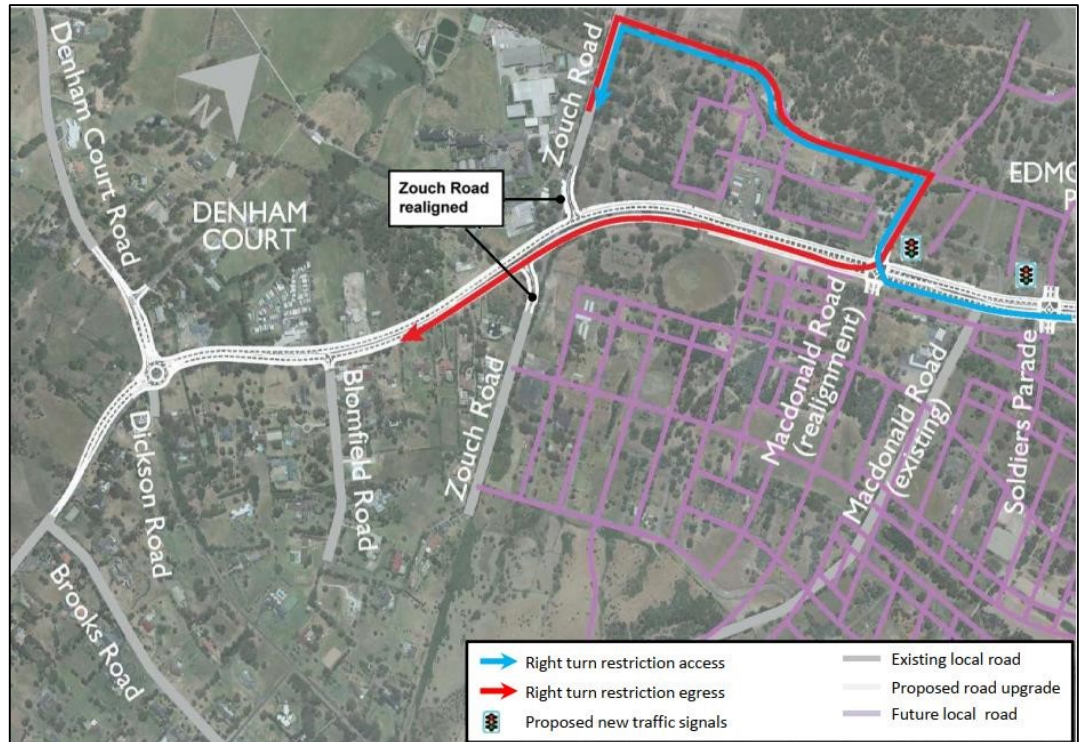


Figure 6-2 Right turn restricted access to Zouch Road (north)

Source: RMS; 2013, modified by AECOM; 2013

Figure 9 – Excerpt from RMS REF showing proposed rerouting of proposed future banned right turns into and out of Zouch Road (North)

Under the proposed, the Denham Court Road / Campbelltown Road existing roundabout will be upgraded from single to dual circulating lanes with proposed left turn slips for north bound and eastbound approaches. Additionally, the Church Road / Denham Court Road intersection is to comprise of 2 through lanes on Denham Court Road and a dedicated right turn lane into Church Road.

4 Proposed Development

4.1 DESCRIPTION OF THE PROPOSAL

The International Bible Students Association is proposing to film a series of Bible-themed educational re-enactments on their existing property.

This requires the construction of 2 sets on the existing playing field and land to the west of the property, construction of a 700m² support building and a 24 space car park (see Figure 10). There will also be alterations to

an existing building on the premises to provide an indoor audio/video studio, as well as supporting the filming activities on the sets.

The new support building will be used for services that assist filming, including offices, bathrooms and changing areas for filming and cast members etc.

The number of cast and crew needed for filming will vary, depending on the portion being filmed. Filming is to occur typically on average 8 business days a month. Generally, the crew will consist of about 35 full-time volunteers that live on site. The cast will vary from one or two in a scene to a typical 30-35 people per day. Most of these will be temporary volunteers that will commute to the site for the day (average 2-3 days per month) from the surrounding Greater Sydney area.

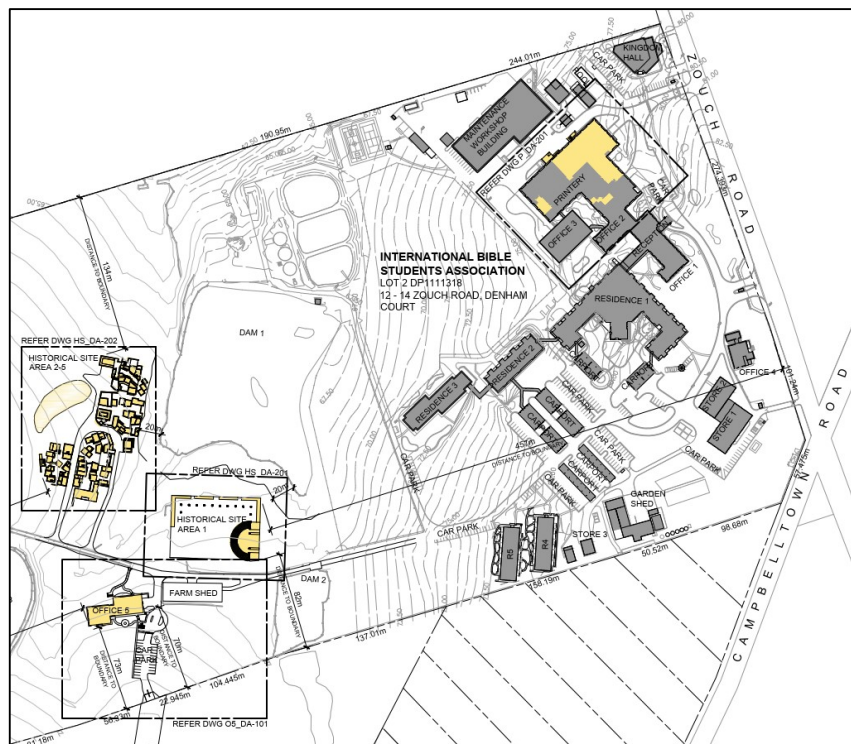


Figure 10 – Map of facility with proposed upgrades

The 24 car parking spaces will be for temporary members of the team that do not live on site. Generally, only 30-35 people will be required to use the car park (90-100% of the car park capacity) on filming days. Typically these vehicles will arrive between 7-8am and leave between 5-6pm.

Filming of larger scenes of up to 75 commuting cast will be required on rare occasions. Additional over flow parking is provided for temporary cast members during peak times. Due to the nature of the work, these members will be arriving typically between 5-6am using the Zouch Rd

entry and leaving gradually between 12-6pm from either access. After 6pm all will use the Zouch Rd entry.

To support this new filming capability, the number of permanent volunteers living at the site will increase from current levels, but will still remain below historical volunteer numbers and the approved capacity of the site. For example, the current staff living on site is 219. If this development is approved this number is projected to rise to 366 permanent members of staff over the next 5 years. However, the existing buildings are currently designed to accommodate up to 464 members, and for time periods in the past, close to this number were accommodated on site. The proposal does not include the building any additional accommodation.

4.2 VEHICULAR AND PEDESTRIAN ACCESS

Vehicular access for the proposed new parking area will be via the existing access to Church Road.

The existing driveway crossing onto Church St will be upgraded to 7.5m wide and will provide 2-way traffic, where two vehicles can pass each other at the same time without causing delays or congestion. There will be an electric gate set 6m from the driveway crossing to provide security for the facility, and allow for all vehicles to store off of the road whilst waiting to access the site.

The internal access road between Church Road and the existing facility which is constructed as part of this development will be min 6.0m wide as per RMS Guide requirements. All vehicular roads will be constructed and located in accordance with the requirements of AS2890.1:2004 and AS2890.2:2002 and the RMS Guide Requirements, where adequate sight distance will be provided.

To manage the traffic within the facility, signposts, and staff will guide and direct traffic to ensure a safe and efficient flow of traffic throughout the property.

4.3 ON SITE PARKING REQUIREMENTS

The Liverpool Development Control Plan (LDCP) 2008 outlines several different land use types and their requirements for off street parking provision.

The LDCP table 13 requires:

- Required car spaces for Office 5: 18
- Proposed car spaces for Office 5: 24
(not including designed temporary overflow parking)

As per LDCP 2% or 1 car spaces will be reserved for disabled access, this has been provided for in the planned new 24 space car parks.

As already noted, a portion of the audio/video staff using the proposed office building live on site and thus already have assigned car parking bays on site. The proposed new parking is for temporary commuting cast members. Provision has been made for temporary overflow parking for peak commuting cast member's car parking. Hence all vehicles will be accommodated wholly within the subject site and will not require on street car parking in Zouch Road or Church Road.

As outlined throughout this submission, there will only be a need to accommodate vehicles for temporary crew members that will need to travel to site by car, hence the proposed permanent and overflow parking provisions are deemed satisfactory for the proposed development.

4.4 SUMMARY OF EXISTING ONSITE PARKING

As part of previous DAs for site, a total of 351 car spaces are approved. *(including reception, commuter parking, kingdom hall, maintenance workshop parking)*

If the site were to be subject to the current LDCP requirements it would have a suggested parking supply as summarised in Table 4.

Table 4: LDCP Car Parking Requirements^x	
Building Class	Number of spaces
Residence	184
Visitors	33
Office	0*
Place of Public Worship	50
Total	267
Surplus	84
*Refer Liverpool Development Control Plan 2008 Part 1, Table 13	
*the staff who work at the offices are accommodated on site and are therefore included in residences space figures	

The proposed off-street parking provided is considered to be adequate for the proposed development and in excess of Council's parking requirements.

4.5 EMPIRICAL CAR PARKING DEMAND

Currently on average 44% of the total car parking is utilised throughout the day (see Table 5). Any additional car parking required due to filming

will be able to be accommodated wholly within the subject site and not require the use of surrounding local roads.

Table 5: Current Car Parking Demand

	Persons	Number of spaces required*
Permanent Onsite Staff	219	136
Commuters per day (typ.)	24	17*
	Total	153
	Surplus	198
*assessed at a rate of 1.38 persons per car based on onsite survey results (undertaken from 6.40am-8.10am on 13 th November 2019 over the course of time when commuters currently arrive at the site for work).		

Proposal includes 24 additional car spaces bringing the total onsite to 375 (excluding overflow car parking area for approximately 22 cars – refer DA drawing O5_DA-101 Office 5 Proposed Site Plan at Appendix D). It is anticipated that approximately 84% of the car parking will be used on the largest filming days (see Table 6).

Table 6: Proposed* Car Parking Demand

	Persons	Number of spaces required*
Permanent Onsite Staff	366	228
Commuters per day (typ.)	39	29*
Maximum additional cast commuters	75	55*
	Total	312
	Surplus	63
*assessed at a rate of 1.38 persons per car based on onsite survey results (conducted on 13 th November 2019)		
*Proposed numbers have been extrapolated based on the ratio of current onsite staff to required car parking spaces.		

4.6 ON-SITE PARKING LAYOUT AND CIRCULATION

The layout of the on-site car parking area and manoeuvring arrangements has been designed to enhance the existing vehicular access, where vehicles can enter and exit the site from and onto Church Road in a forward direction safely, through the provision of adequate internal aisle widths and turning areas.

AS2890.1:2004 Parking facilities Part 1: Off-street car parking requires a minimum car parking space width of 2.4m (for all day staff parking) and 2.5m (for visitors parking) and a minimum length of 5.4m. The proposed off-street car parking spaces have a minimum width of 2.5m and lengths of 5.5m each, which is excess of the requirements and considered acceptable.

The accessible car parking spaces for people with a disability have a minimum width of 2.4m, in addition to an adjacent shared/no parking area (2.5m), which is adequate in accordance with AS2890.6:2009.

Clause 2.4.2 of AS2890.1:2004 requires a minimum aisle width of 5.8m for two-way aisles. The proposed aisles have a minimum width of 5.8m and wider at most aisles throughout the site, which is adequate for vehicles to manoeuvre into and out of the 90° parking spaces and exit the site in a forward direction.

The proposed on-site car parking area has been designed to ensure safe manoeuvring of vehicles within the site and improve safety. It is recommended that pavement directional arrows be provided and be clearly marked to assist motorists with the vehicular circulation within the car parking areas.

All vehicular manoeuvring within the site has been designed and checked using swept path turning in accordance with AS2890.1:2004 and AS2890.2:2002 (see Appendix E).

There is no proposed change to existing arrangements to direct all large vehicles and deliveries to the existing Zouch Road access.

Therefore, the on-site parking layout, vehicle manoeuvring, and circulation arrangements are considered to be adequate, where vehicles can enter and exit the site in a forward direction.

5 External Traffic Impact

5.1 DEVELOPMENT IMPACT

Under the RMS Guide the trip generation for typical office and commercial developments and residential developments are as follows:

- Office and commercial:
 - Daily vehicle trips = 10 per 100m² GFA.
 - Evening peak hour vehicle trips = 2 per 100m² GFA.
- Residential:
 - Evening Peak hour vehicles trips = 0.24 per unit

The additional GFA space for this proposal is 2661m², which under the above guidelines would yield an additional 27 daily trips, and 5 evening peak hour trips. No additional residential space is proposed. However as mentioned earlier in this report, this site is unique as the majority of volunteers both live and work on the same site, and hence the normal trip generation resultant from both residential and commercial space is not applicable to this site. Hence to understand the trip generation of the site, a traffic study of the existing site was undertaken.

A traffic count of the intersection of Zouch Road / Site Access was undertaken from 5:30am-7:00pm on Tuesday 12th June 2019 (see Appendix A). The trips generated over the day are less than the predicted typical trip generation rates for the current commercial GFA and residential space.

Table 7: Summary of Traffic Count Results				
Period	LV/Passenger Car		HV	
	IN	OUT	IN	OUT
Daily				
AM Peak (7am-8am)	19	1	0	0
PM Peak (12:30pm-1:30pm)	12	10	2	0
Totals	87	99	10	6*
*there is a separate heavy vehicle exit just to the north of the main entrance which would account for the discrepancy in heavy vehicle entering and leaving the site				

Zouch Road has a total of approximately 600 vehicles (southbound) and 575 vehicles (northbound) daily. The traffic volume during the AM and PM peak hours are less than 100vph.

From the above, and turning movement data of the vehicles surveyed, the residential trip generation component is minimal to none in the PM peak with none in the AM peak.

Hence all the trips generated are due to the commercial space on the property.

The current GFAs are:

- Total 35,887m²
- Residential Space 16,132m²
- Resultant Space (commercial) 19,755m²

Based on a commercial space of 19,755m², the trip generation for the site per day is 10.02 trips / 100m² which, rounded to 10 trips / 100m², is the same as the RMS guidelines which will be the rate used for this development. Based on the survey data evening peak hour trip generation rate of 1.5 trips / 100m² will be used for this development, which is less than the guidelines.

Table 8: Summary of Additional Traffic Generation

Use	Commercial Space GFA (m ²)	Traffic Gen. Rate (trips/100m ²)		Traffic Gen. (trips/100m ²)	
		Evening Peak Hr	Daily	Evening Peak Hr	Daily
Proposed	2,661	1.5	10	4	27
Existing	19,755	1.5	10	22	202
Total	22,416	1.5	10	26	229

The extra four trips generated from the increase in commercial space will have minimal impact on the external road network including Zouch, Church, Denham Court and Campbelltown Roads, all roads will continue to operate at the LOS mentioned earlier in this report. The extra trips will also have minimal impact on the proposed upgrades to Campbelltown Road, Denham Court Road, Church Road and Zouch Road that will occur in the short term from the RMS Campbelltown Road upgrade project.

A Construction Traffic Management Plan will be created as part of the construction approval. However all vehicles over 12.5m will be required to use the main site access at Zouch Road, and the majority of construction personnel will be housed on site, hence during construction there will be minimal use of the Church Road access point.

Use of Church Road

As discussed in section 4.1, crew are made up on on-site staff, therefore associated with this development the use of Church Road on a daily basis is not required or expected on non-filming days. The use of Church Road for its existing approved use (farming vehicles and occasional light vehicles) will be retained.

5.2 REGULAR FILMING DAYS

Filming days occur on average 8 days a month. As mentioned previously 30-35 people will typically be required to commute to the site for regular filming days. 15 trips will be required most days and these will typically access the site between 7-8am and leave between 5-6pm. To minimise the effects of light spill and noise on our neighbours, arriving commuters will be directed to utilise the Zouch Road access before business hours.

5.3 OCCASIONAL LARGER FILMING DAYS

As was discussed in the proposal section, the planned extras and temporary volunteers required on larger filming days will result, in the upper limit case, of 55 in / 55 out trips utilising Church Road and the access at this location.

55 trips to the subject site will occur at the earliest between 5am-6am. To minimise the effects of light spill and noise on our neighbours, arriving commuters on large filming days will be directed to utilise the Zouch Road access before business hours.

To avoid interruption to filming operations, the 55 exit trips will occur gradually through the Church Road access from 12-6pm, with a maximum of 15 in the peak hour of 5-6pm. This is due to not all extras and support staff being required for all the filming throughout the day and the plan is to stage the scenes to ensure that the extra staff have to be there for the shortest time possible.

As discussed in Section 3 Existing Traffic Conditions, onsite observations indicate that the Denham Court Road / Church Road intersection operates at a current LOS A in both AM and PM peak. Six properties have access via Church Road, 1 being a church and the other 5 residential. This results in <10 trips into and out of Church Road in the peak hours. Hence the intersection has spare capacity to accommodate the proposed development traffic.

It was deemed that undertaking intersection analysis of this intersection was not necessary for the following reasons:

- The current low number of vehicles currently exiting and entering Church Road, and Denham Court Road currently having less than 900 vehicles as per the RMS Guide Table 4.4 has LOS D.
- The low frequency of larger filming days where this would be likely to occur, and the random nature of filming days, makes trying to model the typical scenario difficult.
- It will be a very rare filming day where all 24 car spaces will be utilised and will potentially spill into the overflow car park. It will more than likely vary between 50-100% on filming days.
- Trips entering would be occurring on before the AM peak.

The existing intersections at Denham Court Road / Church Road, Campbelltown Road / Denham Court Road, Campbelltown Road / Zouch Road and Zouch Road / Access Road would still continue to operate at a LOS A in the AM and PM peaks.

In the future (as discussed previously) upgrades to both Denham Court Road / Church Road intersection and Denham Court Road / Campbelltown Road intersection as per the RMS Campbelltown Road

project, will result in the Church Road / Denham Court Road intersection operating at LOS A in both 2026 and 2036 scenarios, and will not be affected by the queue back to the upgraded roundabout as the intersection is 130m from the intersection, as per the RMS REF.

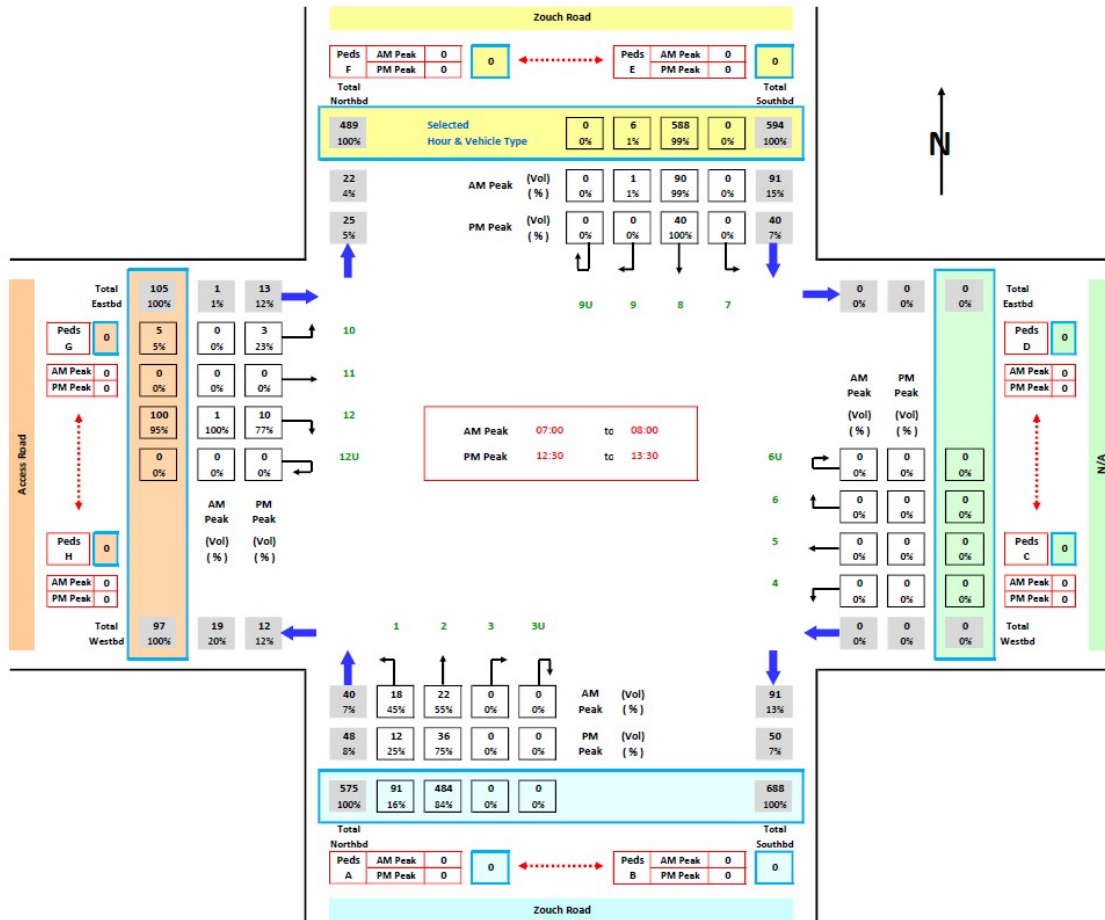
Based on a first principal's assessment, the proposed development is not expected to adversely affect the surrounding road network and no upgrades are required as a result of this development.

6 Conclusion

It can be concluded from the traffic and parking impact assessment that the proposed additional commercial development at 12-14 Zouch Road, Denham Court will have no major impacts on existing traffic or parking conditions.

- The current traffic flows on the surrounding road network are considered to be appropriate for a mixed farming and residential area and operates at acceptable levels of service. The service and safety is expected to improve with the upgrade of Campbelltown Road that is proposed by RMS.
- The estimated traffic generation from the proposed development is considered to be acceptable and will not have any adverse impacts on Zouch Road, Church Road, Denham Court Road or Campbelltown Road, which is located in a mixed farming and residential area. The traffic generated by the proposed commercial development will not alter the current levels of service and additional traffic can be readily accommodated within the existing and proposed new road network.
- The external impact of the traffic generated by proposal is considered to be satisfactory and will remain well within the Environmental capacity of the surrounding streets, with no adverse impacts on the amenity of the area.
- The on-site car parking provision and loading facilities are considered to be adequate for the proposed development and in accordance with Council's parking requirements.
- The on-site vehicular access, car parking layout and circulation is adequate for the proposed development and appropriately designed to allow vehicles to enter and exit the site in a forward direction.
- The subject site has good access to existing public transportation services and active transport options, this will only improve with the approved redevelopment of Edmondson Park and upgrade to Campbelltown Road.
- Church Road access will be limited to a maximum vehicles size of 12.5m and will only be utilised during daytime hours.

7 Appendix A – Traffic Survey Results





Detailed Crash Report

NOTES: Reported crashes within 10m of the intersection of Denham Court Rd & Campbelltown Rd - 1 Jan 14 to 31 Dec 18

Crash No.	Data Source	Date	Day of Week	Time	Distance	ID Feature	Loc Type	Alignment	Weather	Surface	Condition	Speed Limit	No. of Tus	Tu Type/Obj	Age/Sex	Street	Travelling	Speed	Travelling	Manoeuvre	Degree of Crash-Detail	Killed	Seriously Inj.	Moderately Inj.	Minor/Other Inj.	Uncateg'd Inj.	Factors
Sydney Region																											
Campbelltown LGA																											
Denham Court																											
Campbelltown Rd																											
E0869977		115850 S	31/12/2017	Sun	17:40	at DENHAM COURT RD	RDB	CRV	Fine	Dry		70	1	4WD	M19	S in CAMPBELLTOWN RD				Unk Turning right	MC	0	0	1	0	0	S
Fence																											
1171837 S		1004/2018	Tue	13:34	at DENHAM COURT RD	RDB	CRV	Fine	Dry			70	2	SEM	M59	N in CAMPBELLTOWN RD				Unk Other forward	MC	0	0	1	0	0	
E08072874						at DENHAM COURT RD	RUM	39	Other same direction					TRK	F42	N in CAMPBELLTOWN RD				Unk Other forward							
Liverpool LGA																											
Denham Court																											
Campbelltown Rd																											
1016030 P		19/02/2014	Wed	15:40	at DENHAM COURT RD	RDB	CRV	Raining	Wet			70	1	CAR	M30	N in CAMPBELLTOWN RD				40 Proceeding in lane	NC	0	0	0	0	0	S
E54529742							RUM	81	Off left/rt bnd>obj					Signpost													

Report Totals: Crashes: 3 Fatal Crashes(FC): 0 Serious Injury Crashes(SC): 0 Moderate Injury Crashes(MC): 2 Minor/Other Injury Crashes(OC): 0 Uncategorised Injury Crashes(UC): 0 Non-Casualty Crashes(NC): 1 Killed(K): 0 Seriously Injured(S): 0 Moderately Injured(M): 2 Minor/Other Injured(O): 0 Uncategorised Injured(U): 0

Crashid dataset Reported crashes within 10m of the intersection of Denham Court Rd & Campbelltown Rd - 1 Jan 14 to 31 Dec 18
Crash self reporting, including self reported injuries began Oct 2014. Trends from 2014 are expected to vary from previous yrs. More unknowns are expected in self reported data.
Reporting yrs 1996-2004 & 2019 02 onwards contain uncategorised inj crashes.

9 Appendix C – Qualifications

Lindsay Thorpe has a Bachelor of Civil Engineering and has been working in the field of Traffic Engineering and Transport Planning since 2010. Throughout his career he has worked for DPTI (Department of Transport and Infrastructure), Transport Victoria and Roads and Maritime Services.

Lindsay has developed extensive experience and demonstrated ability in the areas of Traffic Engineering, Road Design, Traffic Modelling, Road Safety, Land Use Planning, and Transport Planning. He currently is a qualified Road Safety Auditor, is an expert in technical packages such as SIDRA, AIMSUN, VISSIM, MX, Microstation, AutoCAD, and AutoTurn.

All this experience currently serves him well as a Network Development Manager for Roads and Maritime providing expert technical advice and leadership on small, medium and large projects, for Roads and Maritime, TfNSW and Department of Planning, Infrastructure and Environment. As well as working on and providing advice on Town Centre redevelopments, Masterplan applications and studies, transport planning studies and strategic direction for state agencies.

Key Skills

- Traffic and Transport Planning and Engineering
- Strategic Transport Planning and Modelling
- Road and Car Park Design

10 Appendix D -O5_DA-101 Office 5 Proposed Site Plan Drawing



11 Appendix E – 5.2m Passenger Vehicle Turn Path

