Issue History

File Name	Prepared	Reviewed	Issued by	Date	Issued to
P4803.001T 2 Darcy Road Westmead EIS Peer Review	M.Hassan	SP.Power	SP.Power	02/11/2020	Prity.Cleary@planning.nsw.gov.au
P4803.002T 2 Darcy Road Westmead EIS Peer Review	M.Hassan	SP.Power	SP.Power	01/12/2020	Prity.Cleary@planning.nsw.gov.au
P4803.003T 2 Darcy Road Westmead EIS Peer Review	J.Hu, M.Hassan	SP.Power	SP.Power	05/02/2021	Prity.Cleary@planning.nsw.gov.au
P4803.004T 2 Darcy Road Westmead EIS Peer Review	M.Hassan	SP.Power	M.Hassan	31/03/2021	Prity.Cleary@planning.nsw.gov.au

2 Darcy Road Westmead

EIS Peer Review

1. Introduction

1.1 Background

A State Significant Development application (SSD-10352) for the redevelopment of 2 Darcy Road in the City of Parramatta LGA is currently being assessed by the Department of Planning, Industry and Environment (the Department). The SSD proposal covers only the first stage of the redevelopment. Future stages of the development will be subject to separate planning approvals. The SSD application seeks approval for:

- A primary school with capacity for approximately 1,680 students, to provide expanded facilities for the existing Mother Teresa Primary School on the site and to replace the existing Sacred Heart Primary School at Ralph Street
- A new parish church
- A catholic early learning centre (CELC) (fit-out within an existing building)
- New landscaping

The proposed works comprise of:

- Removal of existing demountable structures, with minimal demolition
- Removal of 24 trees
- Construction over a period of 16 months, targeted completion date of January 2023
  - Construction of a six-storey primary school building within the western portion of the site (52 weeks)
  - Alterations and additions to the ground floor of block B of Mother Teresa Primary School for the CELC (14 weeks)
  - Construction of a new parish church on the north-western corner of the site (40 weeks)

- Landscaping around the church, primary school building and CELC
- Provision of bicycle parking within the site
- Provision of new accessible pedestrian entry from Darcy Road

1.2 Review Scope

Bitzios Consulting (Bitzios) was engaged by the Department to undertake an independent peer review of the following documents and background information:

- the Secretary's Environmental Assessment Requirements (SEARS) relating to transport and access.
- the Applicant's EIS and TIA reports.
- relevant supplementary material/reports.
- review submissions by Council and other relevant public authorities (such as Transport for NSW).
- review Applicant's Response to Submissions (RtS).

Provide advice relating to the following:

- whether the EIS and RtS adequately assesses the traffic impacts on the locality due to the existing school and proposed development including the increase in student numbers.
- the broader impacts / implications of Parramatta Light Rail / Sydney Metro West projects (and any other relevant projects) on the proposal based on the documents submitted by the Applicant
- the existing / future pedestrian environment and the impacts of the additional development on pedestrian safety.
- any additional pedestrian safety measures.
- the impacts of the existing uses surrounding the site and the proposed multi-story car park on site (under a separate Development Application to Council) on the proposal.
- appropriateness of the methodology of the SIDRA model assessment.
- assess the underlying assumptions used to model the traffic impacts and whether they are reasonable and appropriate, including the demand for queuing spaces within the drop-off / pick- up lanes and outside of the site.
- assess the conclusions and recommendations provided in the Traffic and Transport assessment report and whether they are sound and acceptable.
- specifying any additional information required from the Applicant or any other recommendations if issues are not adequately addressed.

2. Review

2.1 SEARs

SEARs relating to Transport and Accessibility are discussed broadly in the Traffic and Accessibility Impact Assessment (TAIA), provided in the Appendix G in the EIS report. Other documents and responses to submissions were also reviewed to assess the SEARs provisions. The proponent submitted response to these comments on 23 December 2020. The review comments and comments on the responses are summarised below:

Item	SEARs	Bitzios Comments	Priority	Comments on the Ethos Urban responses	Required Action
1	Accurate details of the current daily and peak hour vehicle, existing and future public transport networks and pedestrian and cycle movement provided on the road network adjacent to the proposed development.	Current daily number of vehicles is not presented. The traffic survey was limited to the school peak hours only. The survey covers only 4 hours discrete data (7:30 to 9.00am and 2.30 to 5.00pm) and failed to show the hourly traffic flow and determination of peak traffic hours. Information on existing and future public transport network is provided adequately. No pedestrian and cyclist count for present and estimated future year are provided.	**High**	The table and discussion provided is sufficient to determine the peak hours. However, please provide the total daily traffic volume. Incorporating the pedestrian volume in the base models are appreciated. However, a map showing the pedestrian and cyclist volume can clarify the issue.	Provide total daily volume and a map showing pedestrian and cyclist volume.
2	Details of estimated total daily and peak hour trips generated by the proposal, including vehicle, public transport, pedestrian and bicycle trips.	Adequate information is not provided. Particularly, breakdown of the vehicular trips for different hours including school peak hours and regular peak hours should be provided. This is particularly important for the OOSH facilities where a significant number of trips are expected to coincide with the regular PM peak hour.	**High**	Adequately addressed.	No
3	The adequacy of existing public transport or any future public transport infrastructure within the vicinity of the site, pedestrian and bicycle networks and associated infrastructure to meet the likely future demand of the proposed development.	Sufficient discussion was not found regarding the adequacy of the existing or future public transport, pedestrian and bicycle network to meet the likely future demand.	**Medium**	N/A	
4	Measures to integrate the development with the existing/future public transport network.	Adequately addressed.	**N/A**	N/A	

Item	SEARs	Bitzios Comments	Priority	Comments on the Ethos Urban responses	Required Action
5	The impact of trips generated by the development on nearby intersections, with consideration of the cumulative impacts from other approved developments in the vicinity, and the need/associated funding for, and details of, upgrades or road improvement works, if required (traffic modelling is to be undertaken using SIDRA network modelling for current and future years). The key intersections to be modelled / examined should include: Darcy Road / Mons Road / Institute Road	The traffic impacts were assessed using SIDRA network modelling as indicated in SEARs. However, the following deficiencies are noted: ▪ SIDRA modelling has major flaws (details are discussed in Section 2.3) ▪ Future traffic growth scenarios were not discussed sufficiently (details are discussed in item 30) ▪ The study has identified unacceptable level of service for some intersections. However, no mitigation measure is being discussed and not enough information is provided regarding need for improvements or funding.	**High**	The proponent mentioned that the Sidra Modelling was updated to reflect the comments of Bitzios. However, we cannot not verify that as the updated models were not supplied. The comment on future traffic growth was addressed adequately. The version of STFM model used to get the future traffic growth considered PLR1 and PLR2. The proponent did not discuss any mitigation measures as they mentioned that the Westmead 2036 Draft Place Strategy did not show any upgrades of the subject intersections.	Not resolved
6	The identification of infrastructure required to ameliorate any impacts on traffic efficiency and road safety impacts associated with the proposed development, including details on improvements required to affected intersections, additional school bus routes along bus capable roads (i.e. minimum 3.5m wide travel lanes), additional bus stops or bus bays.	No details of the required improvements are provided in the TAIA report.	**High**	The proponent did not discuss any mitigation measures as they mentioned that the Westmead 2036 Draft Place Strategy did not show any upgrades of the subject intersections.	Not resolved
7	Details of travel demand management measures to minimise the impact on general traffic and bus operations, including details of a location-specific sustainable travel plan (Green Travel Plan) and the provision of facilities to increase the non-car mode share for travel to and from the site.	Adequately addressed.	**N/A**	N/A	

Item	SEARs	Bitzios Comments	Priority	Comments on the Ethos Urban responses	Required Action
8	The proposed access arrangements, including car and bus pick-up/drop-off facilities, and measures to mitigate any associated traffic impacts and impacts on public transport, pedestrian and bicycle networks, including pedestrian crossings and refuges and speed control devices and zones.	The proposed multi-deck carpark's entry and exit locations currently has low demands. However, this is expected to change. This change will affect the pedestrian activity and requires more information on the pedestrian activity and the mitigation measures.	**High**	Adequately addressed	No
9	Proposed number of on-site car parking spaces for teaching staff and visitors and corresponding compliance with existing parking codes and justification for the level of car parking provided on-site.	Adequately addressed.	**N/A**	N/A	
10	An assessment of the cumulative on-street parking impacts of cars and bus pickup/ drop-off, staff parking and any other parking demands associated with the development.	Adequately addressed.	**N/A**	N/A	
11	An assessment of road and pedestrian safety adjacent to the proposed development and the details of required road safety measures and personal safety in line with CPTED.	A list of general safety measures is presented for the development. However, no specific assessment is provided to determine which safety measure is needed for any particular location.	**Medium**	N/A	
12	Emergency vehicle access, service vehicle access, delivery and loading arrangements and estimated service vehicle movements (including vehicle type and the likely arrival and departure times).	Adequately addressed.	**N/A**	N/A	

13	The preparation of a preliminary Construction Traffic and Pedestrian Management Plan to demonstrate the proposed management of the impact in relation to construction traffic addressing the following: ▪ Assessment of cumulative impacts associated with other construction activities, including but not limited to the impacts of the Parramatta Light Rail Construction. ▪ An assessment of road safety at key intersection and locations subject to heavy vehicle construction traffic movements and high pedestrian activity. ▪ Details of construction program detailing the anticipated construction duration and highlighting significant and milestone stages and events during the construction process. ▪ Details of anticipated peak hour and daily construction vehicle movements to and from the site. ▪ Details of on-site car parking and access arrangements of construction vehicles, construction workers to and from the site, emergency vehicles and service vehicle. ▪ Details of temporary cycling and pedestrian access during construction. ▪ Demonstrate how pedestrian and cycle rider movements along footways and cycleways are maintained at all times during construction activities. Should the development require closure to either facility, detail the adequate safety and diversion measures out in place to limit time delay and detour distances.	This item has not been adequately addressed. This item has not been adequately addressed. This item has been addressed adequately. This item has been addressed adequately. This item has been addressed adequately. This item has been addressed adequately. This item has not been adequately addressed.	**High**	Addressed adequately	No

Item	SEARs	Bitzios Comments	Priority	Comments on the Ethos Urban responses	Required Action
	▪ Details of any crane locations and road closures, and ▪ Details of any potential impact to the bus network and bus services.	This point is discussed. However, no particular location for any cranes has been mentioned. This item has been addressed adequately.			
14	Identify the potential impacts of existing and future rail infrastructure near to the site (Main Western Line and future Parramatta Light Rail) and any possible impacts of the construction and operation of the proposal on this infrastructure associated mitigation measures	This item has been addressed adequately.	**N/A**	N/A	

2.2 TAIA (Appendix G)

Source Document: Westmead Catholic Community Education Campus Transport & Accessibility Impact Assessment and Green Travel Plan

Item	Section/Page	Bitzios Comments	Priority	Comments on the Ethos Urban responses	Required Action
15	1.3/3	Table 1.1 point 2 and 5, typo. Wrote as “section 0”	Note	N/A	
16	2.6	No mention of the pedestrian and cyclist volumes. During a site visit, large platoons of pedestrians, most being Westmead school students, were observed during the AM peak on Railway Parade and Hawkesbury Road. The footpath was blocked, and long queue of pedestrians waiting to cross Hawkesbury Road was noted. This issue was not discussed in this section or in any part of the report. This should be evaluated in the report.	**Low**	N/A	
17	4.1/14	Here, the report describes two scenarios. However, in page 41, 5 scenarios are mentioned.	Note	N/A	
18	5.1.1/20	Mode Share: We appreciate the use of the questionnaire survey to understand the mode share of journeys to and from the school. However, some key information regarding the survey has not been mentioned in the document. These include: the sample size of the survey, which primary school/s were surveyed, the methodology of the survey. Absence of this information restricts the reviewer to comment on the survey findings.	**High**	Adequately discussed	No

Item	Section/Page	Bitzios Comments	Priority	Comments on the Ethos Urban responses	Required Action
19	5.1.2/22	It is not clear how the car occupancy rate has been calculated. Were the journey to school surveys (Appendix C) used to determine the occupancy rate? Absence of detailed information about the survey methodology will restrict the reviewer to comment on the survey findings. We note that in Appendix C there was no distinction between primary and high school students or whether the students are in the same campus or from different school. Therefore, it is not clear how the occupancy rate for two different school groups were calculated. Again, from Appendix C, it is seen that occupancy at AM peak and PM peak can be different. However, this differentiation is not considered in the trip generation.	**High**	Some explanation is given. However, there was no distinction between primary and high school students or whether the students are in the same campus or from different school. Therefore, the occupancy rate calculation has flaws and needed to be adjusted as discussed in item 26. It may be acceptable if the occupancy rate / directional splits are calibrated or adjusted to reflect the existing trips and then apply the calibrated rate to get the future trip generation.	Not resolved

Item	Section/Page	Bitzios Comments	Priority	Comments on the Ethos Urban responses	Required Action
20	5.2/ 25	Trip generation rate for CELC can be obtained from RMS Guide to Traffic Generating Developments (2002) and details of the survey can be found in RMS published Land Use Traffic Generation Data and Analysis 21 Child Care Centres. As there are existing guidelines, we strongly recommend using these guidelines.	**High**	Proponent did not include the CELC trips arguing that the centre peak will be before or after the modelled peak hour (which is 8-9am and 3-4pm). We defer with them in this issue. We refer to “2015 RMS Trip Generation Surveys Child Care Centres” summary table (**Attachment B**). We think it will be appropriate to use the rates (highlighted in Attachment B) indicating “Centre vehicle trips per licensed place during adjacent road's peak hour” instead of “Centres Peak hour trips per licensed place”. This will give us the trip generation for the network peak which needed to be used for the modelling purpose. It is noted that the rate for Centre vehicle trips per licensed place during adjacent road's peak hour in AM is 0.51 and PM is 0.29. This means in 2033, 92 AM trips and 52 PM trips will be generated in the modelled peak hour for CELC, which is currently ignored. This rate can also be adopted for the OOSH facilities as this document considers centres that have the OOSH facility.	Not resolved

Item	Section/Page	Bitzios Comments	Priority	Comments on the Ethos Urban responses	Required Action
21	5.2.1/ 26	It is noted that the CELC will operate between 6AM and 6PM and therefore the AM peak hour will fall between 5:30 AM and 6:30 AM and PM peak hour will fall between 5:30 PM and 6:30 PM, which is outside the school peak hour. It is not a realistic assumption that all the CELC students will arrive/leave at these times. However, for a conservative and acceptable approach, we recommend using RMS guideline for CELC trip generation. Again, if in PM peak CELC trips are between 5:30 PM and 6:30 PM it will coincide with the regular PM peak and therefore this should be assessed by including the regular PM peak traffic scenario in any modelling.	**High**	The determination of PM peak hour issue is well addressed. However, the trip generation for CELC should consider RMS guidelines which is discussed in item 20	Not resolved
22	6	Queue analysis for each access for AM and PM peak are missing.	**High**	We were asking for queue analysis for the drop off pick up areas, which was not provided for each access road.	Not resolved
23	6/35-36	Detailed calculations for drop-off pick up rates are missing. Analyse scenarios where a portion of parents will stay for longer time (to meet the teacher or official enquiries) in the drop off-pick up zone. Scenario of AM and PM peak should analyse separately.	**High**	Discussed adequately under item 65	No
24	7.1/38	Point 6 mentioned "*The CELC is proposed to operate between 6:00am-6:00pm. Traffic movements associated with CELC staff and children/ parents would occur before and after the school peak periods (i.e. approximately 5:30am-6:30am and 5:30pm-6:30pm). Therefore, trips generated by the CELC would have no impact on the local road network during school peak periods*." Please refer to item 21	**High**	Discussed in item 20/21	Not resolved
25	7.2/39	What is the basis of the directional splits? It is mentioned that "*10% would depart during the afternoon peak*." Nothing is mentioned about the remaining 90% staff (about 240 car trips). It should be noted that, the regular PM peak hour, assumed from 5 PM, and it is to be clear that how many trips will be undertaken during that period.	**High**	Discussed adequately	No

Item	Section/Page	Bitzios Comments	Priority	Comments on the Ethos Urban responses	Required Action
26	7.2/40	A significant mismatch of traffic generation between the traffic survey and the interview survey is seen from Table 7.3. The survey underestimates the AM peak traffic by 27% and 31% for the two different directions (IN and OUT respectively). Again, the survey overestimates the PM peak traffic by 117% and 32% for IN and OUT direction respectively. Therefore, it is clear that the occupancy rate or the directional splits (or both) is not aligned with the existing traffic generation. The flaw of computing occupancy rate for two different level (primary and high) is mentioned in comment # 19. It may be acceptable if the occupancy rate/directional splits are calibrated or adjusted to reflect the existing situation and then apply the calibrated rate to get the future trip generation.	**High**	Discussed in item 19	Not resolved
27	7.2/40	The report mentions that "*The theoretical and surveyed existing traffic generation in the morning peak appears to be very similar while there is a substantial difference in the afternoon peak*." We do not agree with this statement, as the theoretical estimation significantly underestimates the AM peak trips (160 less IN trips and 137 less OUT trips which is about 27% and 31% less than the actual trips). Again, it is not clear as why the future 2023 AM trip generation is lower than the existing year of 2019 trip generation.	**High**	The flaw of occupancy rate calculation is discussed in item 19. However, the proponent did not respond to this comment clearly.	Not resolved
28	7.2/40	"*This suggests that there may have been an extraordinary event in the traffic counts which rendered the traffic counts much lower than normal*." The theoretical trip rate can also have flaws as discussed in the previous comments.	**Medium**	N/A	
29	7.2	What will be the trip generation and distribution from the two separate precinct accesses? The methodology and detailed analysis are required to understand the future traffic situation.	**High**	Adequately discussed	No
30	7.3/41	Section 7.3 is not clear. This section is an important part of the future traffic situation, therefore more information is required. Again, the methodology should be discussed in detail. Some key information includes: Which scenario of STFM is considered? Was Sydney Metro considered in the scenario? Which PLR scenario (PLR 1 or 2 or both) was considered? What was the growth rate and for which section? How the growth rate is calculated for 2033?	**High**	Adequately discussed. The version of STFM model used to get the future traffic growth considered PLR1 and PLR2.	No
31	7.6/42	The SIDRA models and modelling methodology was reviewed and detailed comments are made in section 2.3. Generally, the review found major flaws in the SIDRA modelling which questions the acceptability of the Sidra modelling results. The base models are not considered to be suitably validated and are therefore not fit for the purpose of using these as a basis for developing future modelling scenarios.	**High**	Sufficiently addressed. See section 2.3	No
32	8.3/50	Objective1 third point "*Limit convenience of car access and parking within the School*". In the current proposal, more parking (almost double) is provided which is contradictory to the GTP objective.	**Low**	N/A	

Item	Section/Page	Bitzios Comments	Priority	Comments on the Ethos Urban responses	Required Action
33	8.4/51	We also anticipate a modal shift in that area. However, assumption of 10% modal shift seem to be too high, where 3-5% is considered as achievable (as mentioned in this report). Again, the primary school is far from the nearby residential zones, therefore, 90% of the primary students are using private cars. Moreover, considering higher modal shift is somewhat “best-case” scenario, whereas in traffic impact analysis the convention is to analyse the worst-case scenario.	**High**	Adequately addressed. The proponent mentioned their logic and provided an example.	No
34	8.2/54	It is mentioned that some intersections would operate at capacity or over capacity (those intersections with an LoS D or worse) even with the 10% modal shift. The report further mentioned that these intersections would require additional measures. However, no detail is provided about the type of measures.	**High**	Adequately discussed	No
35	10/63	No discussion is provided for the historical records of the traffic accidents in the study area.	**Medium**	N/A	
36	10	Very high pedestrian activity near the train station (majority of pedesetrians are students) was evident during the site visit especially in the AM peak period. The footpath was blocked, and long queues of pedestrians were observed. This issue was not discussed in this section or in any part of the report. Again, the proposed multi-deck carpark’s entry and exit locations currently has low demands. However, this is expected to change. This change will affect the pedestrian activity and requires more information on the pedestrian activity and the mitigation measures.	Minor	N/A	
37	11/65	Second Point: The future traffic volume extracted from RMS/TfNSW should have considered the future transport infrastructure and is used in the SIDRA analysis. Therefore, the SIDRA modelling already considered the "alleviated traffic volumes" in the analysis. This means that any further required upgrades are the proponent’s responsibility.	**High**	The version of STFM model used to get the future traffic growth already considered PLR1 and PLR2. Therefore, our point on “SIDRA modelling already considered the alleviated traffic volumes" is valid.	Not resolved

Item	Section/Page	Bitzios Comments	Priority	Comments on the Ethos Urban responses	Required Action
38	Appendix A: Page 153 (pdf)	A 485 metre queue is predicted in 2033 AM peak with development scenario for the right turn from Darcy Road eastbound approach to the site access (Mother Teresa). However, the queue storage length is 75 metres. The queue will go approximately 150 metres beyond the Darcy Road/Bridge Road intersection. This will pose a negative impact on these two intersections as queue spill and queue push back will occur. Even, with the 10% modal shift (page 169 pdf), this queue is predicted to be 250 metres. SIDRA outputs for this movement in PM peak showed some unexplained results. The 2023 with development scenario predicts 682 metre long queue (average or 85th percentile?) with an average delay of only 12 seconds. However, the queue is predicted to be reduced to 500 metres in 2033 with development scenario and with an average delay of 433 seconds.	**High**	The proponent has discussed measures which might alleviate the queuing on the site access and that can help the left turning movements from the Darcy Road to the site access (item 39). However, the queuing issue for the right turn movement from Darcy Road to the site access may not be alleviated, as this right turn is also related to the opposing through and left turning movements.	Not resolved
39	Appendix A: Page 249 (pdf)	The left turning movement from Darcy Road west bound to the site is predicted to be 200 metres and 700 metres in AM and PM peak hours respectively. This means in the PM peak, the queue will be approximately 100 metres beyond the Darcy Road / Hawkesbury intersection, impacting the other intersections including the Darcy Road / Institute Road intersection and Darcy Road / Site Access (Catherine McCauley) intersections. However, mitigation measures have been proposed to address this impact.	**High**	The proponent has discussed measures which may alleviate the queuing on the site access and the can help the left turning movements from the Darcy Road to the site access.	No

2.3 SIDRA Modelling

Source Documents: ***1. Memorandum Traffic Modelling Purpose and Scope (18173-R01v01-200928 Sidra Technical Note)***

2. SIDRA Models

Item	Section/Page	Bitzios Comments	Priority	Comments on the Ethos Urban responses	Required Action
40	General Comments	▪ SCATS history data was not collated from TfSNW SCATS data and the corresponding '.LX' file containing traffic signal cycle time, phase time, phase sequence and signal co-ordination information including offsets does not appear to have been used. These should be provided so that we can verify the signal timings. ▪ It is an industry wide practice to use SCATS history data to develop, calibrate and validate SIDRA models. No credible phase or cycle time data was available to compare with the SIDRA models. ▪ No information was provided on the average observed queue lengths. ▪ The base models have some issues with the model network settings and parameters which will impact key modelling results. One example is the use of inaccurate approach distances which will impact the network analysis.	**High**	Adequately discussed. However, cannot be confirmed as the updated Sidra Models and revised calibration validation report were not made available.	Not resolved
41	General Comments	A quick comparison of some base and future models shows changes in volumes only. However, intersection layout and traffic signal settings (e.g. inclusion of PLR) do not appear to change.	**High**	Adequately discussed	No
42	Signal Coordination	Co-ordination was applied at signalised sites 8, 6, and 4. However. with 'offset' set as 0 second. It was not possible to verify the offset as no '.LX' file data was available. However, it is highly unlikely that offsets are set as 0 seconds in this corridor.	**High**	The proponent tried to resolve the issue with the video footage but unfortunately this does not verify the detailed SCATS signal data information that is required.	Not resolved
43	Modelling Settings	The resulting SIDRA phase times vary substantially with the observed phase times. This is due to the selection of 'user given cycle time' option in the traffic signal settings. The use of this setting will enable SIDRA to maintain the cycle time. However, SIDRA will optimise the phase time. The resulting phase times are often very different from the observed phase times. This explains the substantial differences as reported in the technical note between the observed and modelled phase times.	**High**	Adequately discussed and updated in the revised Sidra Models. However, cannot be confirmed as the updated Sidra Models were not made available.	Not resolved

Item	Section/Page	Bitzios Comments	Priority	Comments on the Ethos Urban responses	Required Action
44	Future Scenarios (Page 3)	The future intersection performance within the study area will be substantially impacted by the introduction of Parramatta Light Rail (PLR). As part of PLR project, the operation of a number of intersections including the Darcy Road / Hawkesbury Road intersection will be substantially impacted. It is not clear how the PLR operations are considered in the future SIDRA models.	**High**	Adequately discussed why they did not make any changes for the PLR Operations. However, this is a critical intersection to understand the likely impact in future. Some logical assumptions can be made to model this intersection.	Not resolved
45	Signal Coordination (Page 3)	Three signalised intersections are considered as coordinated. However, no information is provided about the source of this assumption. Again, other intersections on Hawkesbury Road are also likely to be coordinated due to their proximity.	**High**	Adequately discussed and updated in the revised Sidra Models. However, cannot be confirmed as the updated Sidra Models were not available.	Not resolved
46	Intersection LoS (Page 3)	No discussion is provided for how the observed intersection level of service was determined. This method should be clearly documented and justified as it appears to be unconventional and subjective.	**Medium**	N/A	
47	Model Calibration and Validation (Page 3)	It is mentioned that the Sidra 95th percentile queue was compared against the 'average maximum' observed queues. The comparison is summarised in Table 3. The key issues are: ▪ It was not defined how 'average maximum' observed queues were calculated ▪ No calibration criteria were defined ▪ At a number of locations the observed queues vary significantly against the Sidra queue. Some of these are highlighted in the report. However, no explanations were provided as why the observed queues vary significantly	**High**	The proponent has revised the SIDRA models. However, no revised calibration/validation table is provided. Again, No calibration criteria were defined.	Not resolved
48	Page 3	The comparison of observed cycle/phase time is presented in Table 1. However, no justifications are discussed between the adopted time and observed time. These include: ▪ Hawkesbury Road – Alexandra Avenue & Hawkesbury Road – Railway Parade phase A, B and E AM peak, phase E PM peak ▪ Hawkesbury Road – Darcy Road phase C AM peak, phase E PM peak ▪ Darcy Road – UWS Car Park Access – Westmead Hospital Access a new phase C is introduced in both peaks ▪ Darcy Road – Mons Road – Institute Road phase A, B and E in AM peak and A, B, D, E for PM peak ▪ Darcy Road – Bridge Road the cycle time is significantly reduced.	**High**	Adequately discussed and updated in the revised Sidra Models. However, cannot be confirmed as the updated Sidra Models were not available.	Not resolved

Item	Section/Page	Bitzios Comments	Priority	Comments on the Ethos Urban responses	Required Action
49	SIDRA Models	Detailed comments on SIDRA models are provided in **Attachment A**	**N/A**	N/A	

2.4 Response to Submission

Source Document: ***Response to Submission: Appendix C Memorandum (Dated 25 August)***

Item	Section/Page	Bitzios Comments	Priority	Comments on the Ethos Urban responses	Required Action
50	6, Submission 1	Adequately addressed	**N/A**	N/A	
51	7, Submission 2	Adequately addressed	**N/A**	N/A	
52	7, Submission 3	Adequately addressed	**N/A**	N/A	
53	8, Submission 4	Adequately addressed	**N/A**	N/A	
54	9, Submission 5	Adequately addressed	**N/A**	N/A	
55	10, Submission 6	Adequately addressed	**N/A**	N/A	
56	11, Submission 7	We have some concerns about OOSH facility (details are in item number 20, 21 and 82 to 88)	**High**	See comments of item number 20, 21 and 82 to 88	Not resolved
57	12, Submission 7	We have some concerns about OOSH facility (details are in item number 20, 21 and 82 to 88). Again, as mentioned in section 2.3 and comments/item 31, the SIDRA models contain critical errors. We also need to see the detailed SIDRA model results.	**High**	Discussed	No
58	12, paragraph 2	Disagree with the comment. TfNSW/RMS develop and maintain different strategic models including STFM and SMPM. They also developed different scenario combinations including Sydney Metro, PLR phase 1 and 2. These models predict the future traffic flows under various land use and infrastructure assumptions.	**High**	The version of STFM model used to get the future traffic growth already considered PLR1 and PLR2. Therefore, some modal shift for the PLR project is already considered in the model.	Not resolved
59	13, Submission 8	Adequately addressed	**N/A**	N/A	
60	13, Submission 9	See comment 57	**High**	Discussed	No
61	14, Submission 10	See comment 57	**High**	Discussed	No
62	15, Submission 11	Not addressed adequately. Need to develop appropriate traffic models to study the impacts of this connectivity	**High**	Discussed adequately	No
63	16, Submission 12	Not addressed adequately. A sensitivity analysis can be carried out to demonstrate the effect of increasing number of students on the studied road network.	**Medium**	N/A	
64	16, Submission 13	Not addressed adequately. More information is needed regarding the SIDRA modelling including the revised SIDRA Models.	**Medium**	N/A	

Item	Section/Page	Bitzios Comments	Priority	Comments on the Ethos Urban responses	Required Action
65	17, Submission 14	Not addressed adequately. Paragraph 3 of page 17 stated, "*Student travel information has been obtained to understand how students arrive and depart school based on 15-minute intervals*". More information is required including the survey methodology.	**High**	Adequately discussed	No
66	18, Submission 15	Not addressed adequately. There was no comments/discussion provided to nullify the two points (small catchment and accessibility by walking) raised by the council.	**High**	Adequately discussed	No
67	19, Submission 16	Not addressed adequately.	**High**	Adequately discussed	No
68	20, Submission 17	The concern regarding the OOSH facility (details are in item number 20, 21 and 82 to 88) needs to be addressed further.	**High**	See details in item 20, 21 and 82 to 88	Not resolved
69	20, Submission 18	The main point is that a large primary school is unlikely to benefit from public transport as primary school students are unlikely to use public transport. The response is not convincing.	**High**	The proponent made some discussion around this which was not convincing. Again, OOSH facilities will generate some traffic in the peak hours which is not considered (see item 20 and 21).	Not resolved
70	21, Submission 19	Not addressed adequately	**High**	Adequately addressed	No
71	21, Submission 20	Addressed adequately	**N/A**	N/A	
72	23, Submission 21	Addressed adequately	**N/A**	N/A	
73	23, Submission 22	Addressed adequately	**N/A**	N/A	
74	23, Submission 23	Addressed adequately	**N/A**	N/A	
75	24, Submission 24	Addressed adequately	**N/A**	N/A	
76	24, Submission 25	Addressed adequately	**N/A**	N/A	
77	24, Submission 26	Addressed adequately	**N/A**	N/A	
78	25, Submission 27	Addressed adequately	**N/A**	N/A	
79	25, Submission 28	Addressed adequately	**N/A**	N/A	
80	26, Submission 29	Addressed adequately	**N/A**	N/A	
81	28, Submission 30	Addressed adequately	**N/A**	N/A	

Item	Section/Page	Bitzios Comments	Priority	Comments on the Ethos Urban responses	Required Action
82	Attachment 3, page 2	Existing OOSH facility accommodates for an average of 11% of the primary school students. The target population for the OOSH facility is considered to be 40% of the primary school population in future. However, no information/study/justifications are provided why and how 40% primary school students will avail OOSH facility. Again, more information on the arrival and departure patterns of the existing OOSH trips are needed to understand the impact of the OOSH facility on the existing road network.	**High**	Some discussions were made. However, according to the RMS GTTGD some trips will be generated for this service in the adjacent road peak hours. Please see discussions in item 20, 21.	Not resolved
83	Attachment 3, page 2	It is mentioned that "*The arrival and departure times of OOSH attendees fall outside of the school peak periods and surrounding road network peak periods, namely 7:45am to 8:45am and 3:00pm to 4:00pm*." However, there is no analysis/profiling presented to determine the existing school peak and the surrounding network peak. In fact, the traffic survey conducted in this study was limited to 2.30 to 4.30PM for the PM peak. However, normally, the PM peak occurs between 4.00 pm and 6.00 pm.	**High**	Some discussions were made. However, according to the RMS GTTGD some trips will be generated for this service in the adjacent road peak hours. Please see discussions in item 20, 21.	Not resolved
84	Attachment 3, page 2	It is mentioned that 672 to 806 students attending the OOSH facility during each of the before-school and after-school periods. This means a significant portion of this traffic will coincide with the network PM peak. Therefore, the network PM peak must be assessed accordingly.	**High**	The proponent argued that no trips will be generated during AM and PM peak hour for the OOSH facility. However, this is not accurate. Please see discussions in item 20, 21.	Not resolved
85	Attachment 3, page 2	As an OOSH facility is proposed to expand for 40%-48% of the primary school students, it is anticipated that more staff will be needed. However, nothing is mentioned about this in the memorandum.	**High**	Discussed sufficiently	No
86	Attachment 3, page 2	Two additional scenarios (40% OOSH and 48%) were modelled. As it is highly unlikely that this high percentage will be achieved, we propose that two additional sensitivity analysis are done; one with 20% OOSH and the other with 30% OOSH.	**High**	No comments were found regarding the sensitivity analysis	Not resolved
87	Attachment 3, page 7	It is difficult to make comprehensive comments without investigating the models and detailed modelling results. These should be presented in the modelling report. Table 4 and 5 shows that a number of intersections will reach at capacity by 2023 with the proposed development and one intersection (Hawkesbury Rd – Alexandra Ave) will show unacceptable LoS with more than 100 seconds of delay. Additionally, Table 6 and 7 show that the following two intersections will provide unacceptable LoS: ▪ Darcy Road /Hawkesbury Road ▪ Hawkesbury Road - Alexandra Avenue (with more than 100 seconds delay) Again, no measures are proposed to mitigate these adverse impacts.	**High**	Discussed sufficiently	No

Item	Section/Page	Bitzios Comments	Priority	Comments on the Ethos Urban responses	Required Action
88	Attachment 3, page 14	The queue analysis provided is not appropriate or acceptable. The analysis from the SIDRA models should be provided.	**High**	Our comment was regarding the queue analysis provided from the site observation. The queue analysis of the SIDRA modelling was not provided to compare with the site observation.	Not resolved

Source Document: ***City of Parramatta (COP) Response to Submission (Dated 01 October)***

Item	Page, Heading	Bitzios Comments	Priority	Comments on Ethos Urban responses	Required Action
89	3, Traffic Volumes / Modelling	The CoP comments are valid. Please refer to our detailed comments in item 20, 21 and 82 to 88.	**High**	Discussed in item 20, 21 and 82 to 88	Not resolved
90	3, Intersection of Bridge Road and Darcy Road	The CoP comments are valid. However, as mentioned in item 62, this requires appropriate traffic models to study the impacts of this connectivity.	**High**	Discussed in earlier items	
91	3, Connectivity – Urban Design	We also agree with the comment regarding connectivity.	**High**	Discussed in earlier items	

Source Document: ***TfNSW Response to Submission (Dated 06 October)***

Item	Page, Heading	Bitzios Comments	Priority	Comments on Ethos Urban responses	Required Action
92	1	TfNSW comments on the SIDRA modelling was anticipated and is valid.	**High**	Adequately addressed.	No

2.5 TfNSW SIDRA Model Review

Source Document: ***TfNSW SIDRA Model Review – Westmead Catholic Community Education Campus Redevelopment – 2 Darcy Road, Westmead (Dated 9 December 2020)***

Item	Page	Bitzios Comments	Priority	Ethos Urban response and action
93	1, Paragraph 2 and 3	It is agreed that providing two exit lanes on Catherine McAuley Street at the Darcy Road intersection may allow the existing signal timings to be maintained. However, issues with the SIDRA modelling outlined in Section 2.3 of this technical note should be addressed prior to testing potential intersection upgrades.	**Medium**	
94	1, Paragraph 4	TfNSW comments are valid. Please refer to our detailed comments in item 44.	**High**	
95	1, Paragraph 5	TfNSW comments are valid. Please refer to our detailed comments in item 87.	**High**	
96	1, Paragraph 6	TfNSW comments are valid. The relevance of the dummy intersection should be clarified.	**Medium**	

2.6 Proponent Response

Source Document: ***Proponent Response Letter to DPIE (Dated 20 December 2020)***

Item	Page (pdf document) / Reference	Bitzios Comments	Priority	Ethos Urban response and action
97	18, DPIE point 1	Adequately discussed	**N/A**	
98	20, DPIE point 2a	Need more information. From the response it is mentioned that the highest OOSH uptake is 33% for North Ryde Public School, which has only 247 students (see http://house.speakingsame.com/school.php?id=6012) compared to the proposed development (1,680 seats in primary school). Therefore, total student's availing OOSH facility is around 90 (33%) compared to 672 (40%) in the proposed development. We acknowledge that the "percentage of availing OOSH facility" is a good indicator to compare. However, the number is also important in this regard. Therefore, it would be better to see both these indicators in a tabular format which will give a better understanding. Please also give the references from where these numbers/percentages are taken. DPIE's comments on more discrete information on the arrival and departure patterns of existing OOSH trips (Bullet-point 2) was not discussed at all.	**High**	
99	22, DPIE point 3	No discussion is provided regarding the methodology of the observed intersection LoS.	**Note**	
100	24, DPIE point 4	Site observations is neither an appropriate or accurate way to measure signal timings for a complex network of signals. Timings such as start and end lags, early cut-offs, frequency of demand dependent phases and any other controller specific operations, pedestrian protection type and timings and how the signals are coordinated must be verified using SCATS data provided by TfNSW. The comments on Paramatta Light Rail (Bullet-point b) was not discussed. Please also see item 44 in this regard. The comment on signal coordination (Bullet-point c) was discussed and dismissed as they cannot retrieve the signal coordination from the survey videos.	**High**	
101	28, DPIE point 5	Adequately discussed	**N/A**	
102	29, DPIE point 6	Adequately discussed	**N/A**	
103	31, DPIE point 7	Some explanation is given. However, there was no distinction between primary and high school students or whether the students are in the same campus or from different school. Therefore, the occupancy rate calculation has flaws and needed to be adjusted as discussed in item 26. It may be acceptable if the occupancy rate / directional splits are calibrated or adjusted to reflect the existing trips and then apply the calibrated rate to get the future trip generation.	**High**	

Item	Page (pdf document) / Reference	Bitzios Comments	Priority	Ethos Urban response and action
104	32, DPIE point 8a	Proponent did not include the CELC trips arguing that the centre peak will be before or after the modelled peak hour (which is 8-9am and 3-4pm). We defer with them in this issue. We refer to “2015 RMS Trip Generation Surveys Child Care Centres” summary table (**Attachment B**). We think it will be appropriate to use the rates (highlighted in Attachment B) indicating “Centre vehicle trips per licensed place during adjacent road's peak hour” instead of “Centres Peak hour trips per licensed place”. This will give us the trip generation for the network peak which needed to be used for the modelling purpose. It is noted that the rate for Centre vehicle trips per licensed place during adjacent road's peak hour in AM is 0.51 and PM is 0.29. This means in 2033, 92 AM trips and 52 PM trips will be generated in the modelled peak hour for CELC, which is currently ignored. This rate can also be adopted for the OOSH facilities as this document considers centres that have the OOSH facility.	**High**	
105	32, DPIE point 8a	Discussed sufficiently	**N/A**	

3. Conclusions

This report summarises the review of the traffic and transport items for this state significant development including the SEARs, TAIA, the SIDRA network models discussed in the TAIA and the proponent's responses to the submissions from DPIE, City of Parramatta, Transport for New South Wales and Bitzios Comments (item 1-92). The key outcomes of this review are as follows:

- Some SEARs requirements were not addressed adequately such as items 1, 2, 3, 5, 6, 8, 11 and 13 in Section 2.1 of this report However, in the response letter some of these were addressed adequately and some items (1, 5 and 6) remains unresolved.
- Trip generation calculations for the development are not supported due to assumed trip rates (especially for CELC and OOSH facilities) and car occupancy rates. These should be revised in line with existing surveys and RMS guidelines and detailed justification should be provided.
- The assumptions for the OOSH facility anticipated use is not supported due to the lack of adequate analysis and justifications. Again, number of trips for peak hours for this facility is assumed to be zero which does not comply with the RMS Guideline (Roads and Maritime Services Validation Trip Generation Surveys Child Care Centres Analysis Report, 2015).
- The Sidra network modelling had major flaws in signal coding. Pedestrians and cyclists have not been considered in the modelling. Again, in the future Sidra models the future network impacts or infrastructure requirements, especially inclusion of Parramatta Light Rail (PLR) has not been considered. Furthermore, modelling has not been updated as part of the applicant's latest submission in response to our comments on 1st December.
- The Sidra model results showed unacceptable level of services in some intersections, however, no mitigation measures were discussed to address the traffic issues.
- The Sidra model showed very long queues for the right turn from Darcy Road eastbound approach to the site access (Mother Teresa) in the initial modelling. However, there was no mention of the Sidra model queues in the revised results; instead, the proponent showed a queue analysis which is inappropriate for the purposes of network capacity assessment.

4. Recommendations

The traffic assessment has major flaws in trip generation, estimation of background traffic growths and Sidra model coding which significantly reduce the acceptability of the Sidra model results. In order to assess the DA proposal appropriately, our recommendations are as follows:

- There are major concerns in the modelling process, especially trip generation for CELC and OOSH facilities. These should comply with the RMS guidelines.
- The calculation of future background traffic growth is unclear. The project case future road network and impacts to approved infrastructure projects such as Sydney Metro and Parramatta Light Rail have not been assessed. We recommend using PLR1 scenario and updating the future SIDRA models accordingly.
- The modelling contains fundamental errors (for example: signal timings), and the modelling report does not demonstrate that the base models are fit for purpose.
- Parramatta Light Rail (PLR) has not been included in the future year scenarios. We recommend using PLR1 scenario and updating the future SIDRA models accordingly.
- There are major concerns with the OOSH facility and its anticipated use. The assumptions on the percentage of students that will use OOSH facility has not been justified or supported by comparable data. Therefore, we suggest doing a sensitivity analysis for the following scenarios
  - 11% (existing)
  - 20%
  - 30%
  - 40%
  - 48% (Maximum)

- No mitigation measures have been proposed such as road network or intersection upgrades. The impacts to Darcy Road are significant and have not been adequately managed. A staged development should be considered to manage impacts as well as assess effectiveness of the green travel plan and therefore projected mode shift targets.
- Connectivity is identified as one of the major concerns by the City of Parramatta Council. They have suggested an east-west connection which is also supported by the proponent. This connection can mitigate impacts on some intersections including Bridge Road / Darcy Road and Darcy Road / Site Access (Mother Teresa). We recommend testing this scenario in SIDRA
- Section 4.3 of the *Request for SEARs* recognises the use of sophisticated traffic modelling (e.g. microsimulation modelling) to assess the full impact of the proposed development. We support this suggestion in principal because:
  - The study area traffic currently experiences congestion during the peak periods. The substantial growth expected in Westmead precinct and the surrounding areas along with the introduction of Parramatta Light Rail, will exacerbate the current traffic congestion. Moreover, the development is expected to generate over 850 trips in the critical AM peak. SIDRA has limitations in modelling queue propagations and impacts.
  - A number of intersections within the study area have sophisticated signal phases including current bus and future PLR priorities. SIDRA cannot effectively model complex signal operations
  - At a number of intersections, pedestrian demands are very high. SIDRA cannot effectively model the interaction between pedestrians and vehicles at intersections.

ATTACHMENT A: COMMENTS ON SIDRA MODELS

ATTACHMENT B: TRIP GENERATION TABLE FOR CHILD CARE

Table 4.1 Summary of trip and parking rates.

All sites	Min	Max	Avg	St Dev
Development details:				
Total site area (m^2)	112	3014	1070	823
Total GFA (m^2)	112	1041	445	296
No. of licensed places for children	20	105	56	28
No. of employees	3	15	8	4
Vehicle trips:				
Centre peak hour vehicle trips (in+out) AM	4	93	35	25
Centre peak hour vehicle trips per licensed place (AM)	0.06	1.25	0.66	0.34
Centre peak hour vehicle trips per 100m^2 of total GFA (AM)	1.04	19.31	9.00	5.14
Centre peak hour vehicle trips (in+out) PM	6	77	36	21
Centre peak hour vehicle trips per licensed place (PM)	0.24	1.38	0.68	0.32
Centre peak hour vehicle trips per 100m^2 of total GFA (PM)	1.89	30.36	10.81	8.45
Centre vehicle trips during adjacent road's peak hour (AM)	0	72	24	22
Centre vehicle trips per licensed place during adjacent road's peak hour (AM)	0.00	1.20	0.51	0.40
Centre vehicle trips per 100m^2 of GFA during adjacent road's peak hour (AM)	0.00	14.55	6.32	4.90
Centre vehicle trips during adjacent road's peak hour (PM)	0	50	17	17
Centre vehicle trips per licensed place during adjacent road's peak hour (PM)	0.00	0.70	0.29	0.25
Centre vehicle trips per 100m^2 of GFA during adjacent road's peak hour (PM)	0.00	24.75	5.01	6.31
Parking:				
No of public car spaces	0	22	7	8
Peak parking accumulation	3	16	9	4
Peak parking accumulation per number of licensed places	0.07	0.34	0.19	0.09
Peak parking accumulation per 100m^2 of total GFA	0.39	5.94	2.80	1.61

***Reference**: Roads and Maritime Services Validation Trip Generation Surveys Child Care Centres Analysis Report, 2015.*

The document can be accessed from the following link
https://media.opengov.nsw.gov.au/pairtree_root/e0/67/05/10/fb/27/47/e2/bb/59/8e/b1/3b/fa/e9/f0/obj/164790.pdf

2 Darcy Road Westmead EIS Peer Review

TAIA Report Review Comments

Key
High
Medium
Low

Document: ***Westmead Catholic Community Education Campus Transport & Accessibility Impact Assessment. Dated: 25 August 2021***

Sl	Items	Bitzios Comments	Priority	Close / Open ?
1	Previous comments by DPTI	A. No further discussions offered in chapter 7 on the theoretic estimation of trip generation. Moreover, the discussions included in the previous has been deleted from this version		Open
		B. Queue analysis was not included in the report		Open
		C. No reference was made to the SIDRA model calibration and validation report		Open
2	SIDRA Model Calibration and Validation	A. The Sidra model calibration and validation report were not included in the appendices		Open
		B. Bitzios review of the base SIDRA model identified a number of issues related to the development, calibration and validation of the base SIDRA model. None of the issues identified before has been addressed		Open
		A few key comments from the Bitzios SIDRA model review include: a) The modelled trip number to and from the site was significantly lower than the reported trip generation. b)The method for validating the model is not discussed and no evidence is provided. c) The cycle timing for the coordinated set of signals were found to be different		Open
3	Occupancy rate calculation	Bitzios review identified a number of issues related to the calculation of vehicle occupancy rate (Item 19, 26, 27 and 103). The latest report did not offer any responses to Bitzios comments. The occupancy rate was not updated to address the comments		Open
4	Trip generation assumptions	A. **OOSH trip rate**: Our comments with related to the OOSH rtip generation rate has been addressed. In the new modelling the proponent adopted the TfNSW guidelines as suggested in the review		Closed
		B. **OOSH percentage**: In our understanding, from the data presented, there can be three approaches to assume a fair OOSH enrolment rate. i) LGA average (which is 20.8%) ii) similar size school average (which is 17.4%) or iii) Current CEDP-school average (which is 22%). In summary, the enrolment rate can be between 17.4% to 22%. However, the proponent adopted 30%. This is considered to be substantially high and is certainly not a conservative approach. Therefore, we strongly suggest the OOSH percentage is amended to between 17.4% and 22%.		Open
5	Trip Distribution	There is no mention in the report that how the trips from the development are distributed through the network and the extent of development traffic for each intersection		Open
6	Background Traffic Growth	From the Model Calibration and Validation Report we understand that the background traffic growth was only considered on the main roads (Darcy Road and Hawksbury Road). However, no traffic is growths were considered from the side roads.		Open
7	Modal Shift	The proponent ran a sensitivity test (at 5% modal shift) for the year 2023 only. A similar test should be run for 2033 as the 2033 scenarios are the key design consideration.		Open
8	Model Results	Bitzios review identified a number of issues related to the development, calibration and validation of the Base and future year SIDRA models. Until these issues are addresses, the SIDRA results would not be considered as reliable.		Open