

File Name	Prepared	Reviewed	Issued by	Date	Issued to
P4606.001T Saints Peter and Paul Assyrian Primary School Cecil Park TIA Peer Review	S. Daizli	A. Giyahi	A. Giyahi	10/06/2020	David.Way@planning.nsw.gov.au

Saints Peter and Paul Assyrian Primary School, Cecil Park

Traffic Impact Assessment Peer Review

1. Introduction

A State Significant Development Application (SSD-9210) for the Saints Peter and Paul Assyrian Primary School at 17-19 Kosovich Place, Cecil Park, is currently being assessed by the Department of Planning, Industry and Environment (DPIE). The proposal includes:

- A 2-storey building for 630 students from Kindergarten to Year 6 and 35 staff with 21 classrooms, a library, canteen, multipurpose hall, administration offices and staff facilities
- Outdoor open play areas, sports courts and a sports field
- Off-street car park with 37 car spaces, two People with Disabilities car spaces and a 30-vehicle pick-up/drop-off area
- Site preparation works, bulk earthworks and soil remediation
- Associated landscaping works and signage.

Bitzios Consulting (Bitzios) was engaged by the DPIE to undertake an independent peer review of the traffic and parking impact assessment report and SIDRA models prepared by McLaren Traffic Engineering (McLaren, dated 4 September 2018) as part of the Environmental Impact Statement (EIS), and:

- Review the Applicant's EIS prepared by Willowtree Planning
- Review the Applicant's, McLaren's, Fairfield City Council's (Council), Roads and Maritime Services' (Roads and Maritime, now Transport for NSW) and Transport for NSW's Responses to Submissions and subsequent Responses to Submissions
- Provide comments and advice relating to the following:
 - If the EIS adequately assesses the traffic impacts on the locality due to the existing school and proposed increase in student numbers
 - Appropriateness of the methodology of assessment (SIDRA)
 - Specifying any additional information required from the Applicant or any other recommendations if issues are not adequately addressed.

The following sections identify the relevant sections of each document where additional detail is required and/or where there are deficiencies.

2. Traffic and Parking Impact Assessment Report

2.1 2. Existing Site and Surrounding Conditions

2.1.1 2.3.2 Intersection Performances

The AM and PM peak hours assessed in SIDRA have not been stipulated.

2.2 4. Traffic Assessment

2.2.1 4.1 Traffic Generation

The directional Stage 1 student traffic generation in Tables 4 and 5 does not equal the total trips and should be rounded up to the nearest whole number. Thus, the estimated student traffic generation for the AM and PM peaks should be 114 trips in and 114 trips out.

2.2.2 4.3.2 Final Development – Completed School for 630 Students

If negative growth rates were applied to calculate the 2028 turning volumes, then the 2018 volumes should be retained to avoid misinterpretation and maintain robust volumes. Technical rationale would be required to justify negative growth rates. In the absence of any reasonable rationale, Sydney Strategic forecast model should be used to assist with the forecast volumes in the surrounding road network for the future year.

2.3 Annexure A

The staff parking spaces will conflict with parents/carers using the pick-up/drop-off spaces and as such, a separate staff parking area should be provided.

Pick-up/drop-off spaces 3, 4, 16 and 17 should not encroach the adjacent crossing to maintain drivers' sightlines to pedestrians and vice-versa. If these spaces cannot be relocated/resized, then these will need to be removed. Additionally, there should be 20-metre and 10-metre No Stopping zones before and after the crossing respectively in both directions of travel.

The proposed location of the southern crossing is adjacent to the "Keep Clear" area where multiple, conflicting vehicle movements will be made and drivers leaving the queueing area and U-turning will have little sight distance. One of the following alternatives should be considered:

1. Relocate the southern crossing further north along the driveway and comply with the above No Stopping zone requirements. Adjacent pick-up/drop-off spaces will need to be removed if they cannot be relocated/resized. An additional staff member ("7") will be required to fulfil the same role as Staff Member "2" at the relocated southern crossing. They will need to work with Staff Member "3" to ensure efficient traffic operations
2. As per Option 1, but also ban the U-turn arrangement. This will require drivers leaving pick-up/drop-off spaces 15 to 28 to exit the school either via the circulating loop or a bypass lane
3. Remove the northern and southern crossings and provide one crossing in the middle of the driveway. This would be managed by Staff Member "2".

3. SIDRA Models

3.1 Intersection Geometry

3.1.1 General

All Approach Distances, Lane and Circulating Widths, Island Diameters and Strip Islands should be confirmed using aerial imagery (i.e. Google Maps, Google Earth, Nearmap etc.) and the Wallgrove Road/Kosovich Place intersection concept plan, and applied to the models where necessary.

3.1.2 The Horsley Drive / Wallgrove Road

Lane 1 on the Wallgrove Road south approach should be 25 metres.

3.1.3 Wallgrove Road / Kosovich Place

The Approach Distance for the Wallgrove Road north leg should be 85 metres.

The Approach Distance for the Kosovich Place west leg should be 330 metres.

3.1.4 Wallgrove Road / Villiers Road

The Approach Distance for the Wallgrove Road south leg should be 85 metres.

3.2 Model Parameters

3.2.1 General

The Approach and Exit Cruise Speeds for all turning movements should be the same as the respective speed limit in all models.

It is not clear why the Total & % Volume Data Method was used in any of the models. The Separate Volume Data Method should be used in all models and the growth rates in Annexure C of the traffic and parking impact assessment report should be applied to the 2018 turning volumes to calculate the 2028 volumes.

3.2.2 Elizabeth Drive / Wallgrove Road / M7 Northbound Off-ramp

All pedestrian crossings should have priority over the conflicting turning movement in all models.

3.2.3 The Horsley Drive / Wallgrove Road

Arrival Type 4 was used for all movements on The Horsley Drive east approach in all models. This is likely due to the adjacent The Horsley Drive/Westlink M7 Motorway interchange. Justification should be given, otherwise all Arrival Types should be set to Program.

3.2.4 Wallgrove Road / Kosovich Place

The Exit Cruise Speed for all turning movements into and out of Kosovich Place should be 50km/h in the existing and existing+10-year growth models.

The Approach and Exit Cruise Speeds for all turning movements into and out of Kosovich Place should be 40km/h in the “with development” models.

3.3 Model Calibration and Validation

There is no evidence showing that the models have been properly calibrated based on actual signal phasing/timings derived from the Transport for NSW Intersection Diagnostic Monitor (IDM) data and SIDRA Environmental Factors or validated based on back-of-queue survey data and site observations.

There is no comparison between the model vs. observed queue data and IDM data vs. SIDRA phase times. Hence, the models cannot be verified.

The calibration and validation of the SIDRA models should be detailed in a modelling report and considered together with any assumptions to verify the modelling results.

3.4 Signal Timings and Methods

3.4.1 General

The existing models should use User-Given Phase Times incorporating the Transport for NSW IDM data to reflect actual traffic conditions. The existing+10-year growth and “with development” models can use Practical or Optimal Cycle Time where necessary.

The intergreen times used in all models need to be checked against either the Transport for NSW LX file or site observations.

3.4.2 The Horsley Drive / Wallgrove Road

Confirm whether filter right turns operate during Phase A for both Wallgrove Road approaches.

4. Conclusions

Bitzios Consulting has reviewed the traffic and parking impact assessment report, SIDRA models prepared by McLaren Traffic Engineering (McLaren, dated 4 September 2018) and supplementary documents.

Additional information is required regarding:

- Confirmation of the AM and PM peak hours assessed in SIDRA
- Methodology used to calculate the 2028 turning volumes
- Conflict between the staff parking spaces and parents/carers queueing to access the pick-up/drop-off area
- Pick-up/drop-off spaces 3, 4, 16 and 17 not encroaching the adjacent crossing to maintain drivers' sightlines to pedestrians and vice-versa
- Relocation of the southern crossing further north along the driveway away from multiple, conflicting vehicle movements in the "Keep Clear" area. Consequently, it will be necessary to assign an additional staff member ("7") to fulfil the same role as Staff Member "2" at the relocated southern crossing.

The following deficiencies were identified in the SIDRA models:

- Intersection coding, particularly in relation to Approach Distances, Lane and Circulating Widths, Island Diameters and Strip Islands
- Use of the Total & % Volume Data Method instead of Separate
- Use of Approach and Exit Cruise Speeds which do not reflect the current and proposed speed limits
- No evidence of model calibration against traffic signal phasing/timing data or SIDRA Environmental Factors or validation of queue lengths
- Use of Practical or Optimal Cycle Time instead of User-Given Phase Times in the existing models
- All intergreen times need to be verified against either the LX file or site observations.

The most common responses from local and state government stakeholders in relation to traffic and transport issues related to:

- The traffic generation and impacts on the surrounding road network
- The number of pick-up/drop-off spaces proposed
- Potential queueing and resulting traffic and parking impacts on Kosovich Place
- The need for bus parking on Kosovich Place
- The car occupancy rate used
- Proposed Wallgrove Road/Kosovich Place intersection treatments.

The key issues raised and those recommended as needing a specific response by the Applicant are summarised in **Attachments A** and **B**.

Attachment A: Responses to Submissions

Table A.1: Responses to Submissions – Fairfield City Council

Issue Raised	Applicant's Response	Bitzios' Response
A. Planning		
<p>The proposed 30 kiss and drop off spaces is unlikely to be sufficient in order to accommodate up to 665 school children and staff onsite. This will likely result in unacceptable queuing and parking within Kosovich Place.</p>	<p>It is noted that the 30 kiss-and-drop spaces are intended to accommodate the drop-off and pick-up of the 630 students proposed for the school. Staff would be separately accommodated by the staff car park proposed in the south-eastern corner of the site.</p> <p>The number of kiss-and-drop spaces and proposed queuing arrangements have been designed in conjunction with a qualified Traffic Engineer (refer Traffic and Parking Impact Assessment at Appendix 13 of the original SSDA). The following provides a summary of the utilisation of kiss-and-drop spaces and maximum queue lengths. The results demonstrate that the parking demands of the development and all queuing can be accommodated within the site.</p> <p>To ensure the proposed kiss and drop facilities operate with high levels of efficiency and safety, the following management practices will be implemented:</p> <ul style="list-style-type: none"> ▪ Traffic control by school staff at internal pedestrian crossing locations; ▪ Traffic control by school staff to direct queued vehicles into vacant kiss and drop spaces; ▪ Organisation of students into general kiss and drop areas by year-group to speed pick-up operations; ▪ Assistance of school staff to load vehicles with children and bags. <p>Full details are provided in the Traffic and Parking Impact Assessment at Appendix 13 of the original SSDA.</p>	<p>It is noted in Section 3.2 of the traffic and parking impact assessment report that an Aimsun microsimulation model has been used to simulate the operation of this kiss and drop system, resulting in a maximum queue of 35 vehicles for the final stage of development, all of which can be accommodated within the site.</p> <p>Evidence of adequate calibration and validation of the microsimulation model must be provided in order to ensure that models are fit for purpose and modelling results can be verified. The model calibration and validation process should be documented in a modelling report and include justification for all assumptions.</p>

Issue Raised	Applicant's Response	Bitzios' Response
<p>The proposed bus zone is located within the road reserve and potentially will leave insufficient space for cars and or other vehicles to manoeuvre in Kosovich Place. The proposed bus zone will also likely impact on sight distances for vehicles entering and exiting the site as well hinder pedestrian movement.</p>	<p>To accommodate the two-way passing and standing of buses in the indented bus bay, Kosovich Place is proposed to be widened from 6.5m to 7.0m from the intersection of Wallgrove Road to the site boundary, and to 10.0m from the driveway to the termination of the street.</p> <p>This road widening will enable bus access and provide sufficient width for up to four (4) buses to pick-up or drop-off passengers without interrupting traffic flow along the street. Light vehicles are able to enter and depart the site without conflicting with queued or manoeuvring buses. It has been advised and demonstrated by the bus operator, Transit Systems, that the existing turning bulb is sufficient to facilitate U-turns by buses.</p> <p>As also confirmed in the Traffic and Parking Impact Assessment (refer Appendix 13 of the original SSDA), all vehicular and pedestrian facilities have been designed to meet relevant Australian Standards, including in relation to sight lines for all driveways and pedestrian crossings.</p> <p>Safe pedestrian movement between the bus stop and school entry point will be facilitated via the footpath proposed for construction along the extent of the site frontage. The siting of the bus stop west of the driveway means students will be able to walk between the bus stop and school entry without needing to cross the driveway. The safety of children has been a primary consideration in the design solution proposed.</p>	<p>The widening of Kosovich Place as proposed will provide sufficient space for vehicles to manoeuvre and pass each other.</p> <p>It may be necessary to remove the easternmost bus zone space to improve sight distance for drivers exiting the site and provide sufficient clearance from parked buses. Depending on overall bus usage and service frequency at the Final Development Stage, the four bus zone spaces proposed may be considered excessive.</p>

B. Traffic and Transport

<p>The traffic generated by the school will have significant impacts on the residents of Kosovich Place.</p>	<p>As described in the following sections of this table and demonstrated in the Traffic and Parking Impact Assessment (Appendix 13 of the original SSDA), the proposed school will be suitably accommodated by Kosovich Place (subject to the proposed upgrade works) and will not unreasonably compromise neighbouring amenity.</p>	<p>A large-scale development such as the one proposed is expected to generate a significant number of trips (nearly 600 in both the AM and PM peak periods) and hence impact the environmental capacity of Kosovich Place during only short periods of the AM and PM peaks. The proposed upgrade works, including Kosovich Place widening and onsite pick-up/drop-off area, is unlikely to cause any unreasonable impacts on Kosovich Place or unreasonably compromise neighbouring amenity.</p>
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Issue Raised	Applicant's Response	Bitzios' Response
<p>As per the traffic report submitted for the application, estimated traffic generation for Stage 1 during morning and afternoon peak will be 239 trips. The final development will generate 579 trips during morning and afternoon peak.</p> <p>This traffic generation has been estimated based on car occupancy rate of 1.85 children. The proposed development will be in a cul-de-sac and have to rely on Wallgrove Road for entry and exit. Based on the traffic generation levels, the development is not supported.</p>	<p>It is acknowledged that, as detailed in the Traffic and Parking Impact Assessment (Appendix 13 of the original SSDA), the proposed school would generate 239 trips during the morning and afternoon peaks for Stage 1 and 579 trips for the ultimate development.</p> <p>As Kosovich Place is a cul-de-sac, all traffic will access the school via the intersection of Wallgrove Road and Kosovich Place. SIDRA Modelling demonstrates that this intersection currently operates at LOS B during the morning and afternoon peak hours. As a result of the Stage 1 development, the intersection would operate at LOS A (accounting for the proposed right-turn restriction from Kosovich Place onto Wallgrove Road). The ten (10) year growth projection for the intersection demonstrates it would still operate at LOS B in 2028, and as a result of the ultimate school development would operate at LOS B in the morning peak hour and LOS A in the afternoon peak hour.</p> <p>The development is therefore demonstrated to be supportable on the basis of the impact of traffic generation on the operation of the Wallgrove Road / Kosovich Place intersection.</p>	<p>We acknowledge the significant traffic that will be generated by the proposed school, however, we are satisfied with the SIDRA modelling outcomes for the Wallgrove Road/Kosovich Place intersection. Ultimately, the traffic will then split between the north and south based on analysis of routes to and from the site, school catchment areas and Journey to Work data.</p>
<p>The car occupancy rate of 1.85 children is adopted for the development based on car occupancy for St Hermizd Primary School in Greenfield Park.</p> <p>This needs to be justified as St Hermizd Primary School is located in an urban area where the options for student travel to school (i.e. cycle, walk, additional bus services) is far broader and less restricted than the subject site.</p>	<p>The car occupancy rate of 1.85 children has been based off surveys of the associated St Hurmizd Assyrian Primary School.</p> <p>This car occupancy rate is considered relevant to the proposed school as it is a reasonable assumption that the average number of children per family attending the school would be consistent with the children/family rates of St Hurmizd. Likewise, it is a reasonable assumption that when driving one (1) child to school, other children in that family would be driven in the same car.</p> <p>It is important to note that the car occupancy rate is not taken to be the same as the private vehicle use rate or mode share. As detailed in the Traffic Report, mode share assumptions have not been based off St Hurmizd, and instead adopt 100% private vehicle use for Stage 1 and 80% for the ultimate school. The adoption of alternative modes of travel and correspondingly reduced private car use, rely on the measures detailed in the Sustainable Travel Plan (Appendix 14 of the original SSDA). Such measures relate to the establishment of the school bus service and promotion of car pooling.</p>	<p>It is acknowledged that St Hurmizd Assyrian Primary School is located in an urban area, is accessible by bus, walking and cycling, and has a higher student capacity than the subject school. However, undertaking a survey of a similar development provides adequate justification and a basis for the 1.85 car occupancy rate. Furthermore, given the rural location of the subject school, worst-case scenarios of 100% private vehicle use for Stage 1 and 80% for the ultimate school have been assumed. The proposed Sustainable Travel Plan, establishing the school bus service and promoting carpooling will reduce single-student vehicle trips.</p>

Issue Raised	Applicant's Response	Bitzios' Response
<p>With the traffic generation associated with the proposal there will be adverse impact on safety at the intersection of Wallgrove Road/Kosovich Place. The applicant is proposing to restrict right turn movement from Kosovich Place into Wallgrove Road. This will restrict current right turn movements undertaken by the residents in Kosovich Place.</p> <p>The proposed "Right Turn" restriction at the intersection of Wallgrove Road and Kosovich Place would require motorists exiting Kosovich Place and wanting to travel southbound in Wallgrove Road, to undertake U-turn movements at the roundabout at Wallgrove Road/Villers Road.</p> <p>Considering the volume of traffic using Wallgrove Road and the lane arrangement in Wallgrove Road (one lane in each direction), there is a significant detrimental impact on traffic safety at the intersection of Wallgrove Road/Villers Road with the proposed development.</p>	<p>The traffic impact of the development has been assessed using SIDRA modelling based on the traffic generation and assignment detailed in the Traffic Report.</p> <p>With respect to the Wallgrove Road/Kosovich Place intersection, SIDRA modelling demonstrates that this intersection currently operates at LOS B during the morning and afternoon peak hours. As a result of the Stage 1 development, the intersection would operate at LOS A (accounting for the proposed right-turn restriction from Kosovich Place onto Wallgrove Road). The ten (10) year growth projection for the intersection demonstrates it would still operate at LOS B in 2028, and as a result of the ultimate school development would operate at LOS B in the morning peak hour and LOS A in the afternoon peak hour.</p> <p>The development is therefore demonstrated to be supportable on the basis of the impact of traffic generation on the operation of the Wallgrove Road/Kosovich Place intersection, with no safety concerns.</p> <p>Additionally, it is proposed to widen Kosovich Place from the intersection of Wallgrove Road to the termination of the street, in order to accommodate school buses. This will allow the two-way passing of all vehicles (including school buses) in Kosovich Place. As such, no safety issues would arise.</p> <p>Whilst the traffic modelling completed does not indicate that the intersection of Kosovich Place/Wallgrove Road will be pushed to capacity by the traffic associated with the site, the <i>Austrroads Guide to Road Design</i> suggests that a CHR treatment is appropriate for an intersection with the traffic volumes that are proposed. Consequently, it is proposed that the intersection be adjusted to include a CHR treatment. The traffic modelling outlined in the Traffic Report demonstrates that the intersection will perform satisfactorily with the proposed layout.</p> <p>It is acknowledged that, as a result of the proposed right-turn restriction from Kosovich Place, traffic wanting to travel south-bound will need to turnaround using the roundabout at the intersection of Wallgrove Road/Villiers Road. The existing and resulting performance of the Wallgrove Road/Villiers Road intersection has been assessed using SIDRA modelling, as detailed in the Traffic Report.</p>	<p>Given the extensive consultation between McLaren and Transport for NSW on proposed treatments at the Wallgrove Road/Kosovich Place intersection, we agree that the right turn from Kosovich Place into Wallgrove Road should be banned on safety grounds.</p> <p>It is not believed that the proposed right turn bay on the Wallgrove Road north approach would be a safety hazard, particularly as low right turn volumes are forecast and there is less crash risk with crossing one lane as opposed to multiple lanes, albeit the 80km/h speed limit along Wallgrove Road. A right turn bay would reduce the likelihood of 'rear end' crashes and minimise congestion for through vehicles. Without a right turn bay, drivers turning right would feel even more pressured to find a gap in traffic as through drivers would be stuck behind.</p> <p>In addition to the above, there is unlikely to be any unnecessary pressure resulting from drivers performing U-turns at the adjacent Wallgrove Road/Villiers Road roundabout to travel south, given Villiers Road is fenced off to the public and only movements between the north and south along Wallgrove Road are permitted.</p> <p>We are satisfied with the SIDRA modelling outcomes and McLaren's response.</p>

Issue Raised	Applicant's Response	Bitzios' Response
	<p>In summary of the traffic assessment, this intersection currently operates at LOS A during the morning and afternoon peak hours. As a result of the Stage 1 development, the intersection would continue to operate at LOS A (accounting for the proposed right-turn restriction from Kosovich Place onto Wallgrove Road). The ten (10) year growth projection for the intersection demonstrates it would still operate at LOS A in 2028, and as a result of the ultimate school development would continue to operate at LOS A in the morning and afternoon peak hours.</p> <p>The development is therefore demonstrated to be supportable on the basis of the impact of traffic generation on the operation of the Wallgrove Road/Villiers Road intersection, with no safety concerns.</p>	
<p>The applicant is proposing buses to service the development. The proposed bus services will not benefit other stakeholders. Therefore, the bus parking on Kosovich Place is not justified. It is unclear whether the proposed bus services will be public or private.</p>	<p>Consistent with the operational arrangements for many schools in the area and throughout Greater Sydney, a school bus service is proposed to transport students to and from school. The proposal is for a State government-funded, contract school bus service. The bus service would 'piggy-back' off the existing service for St Narsai (being the link high school).</p> <p>As well as directly benefitting students and parents of the school, the proposed bus service would promote benefits for other stakeholders associated with reduced car use and therefore reduced volumes of traffic in Kosovich Place and on the surrounding road network.</p> <p>Together with the proposed widening of Kosovich Place, the proposed 'indented' bus bay will allow for up to four (4) buses to pick-up and drop-off passengers without interrupting traffic flow in the street.</p>	<p>The Applicant has planned to use an existing school bus service with its associated high school, St Narsai Christian College in Horsley Park (approximately 6 minutes away).</p> <p>It is agreed that the proposed bus service will only directly benefit the school given its rural location. As such, the bus parking on Kosovich Place should be time restricted to between 8:00am-9:30am and 2:30pm-4:00pm on school days to prevent prolonged impacts to the public.</p> <p>It should be noted that any benefits associated with the proposed bus parking will extend to the local community by reducing car use on Kosovich Place and the surrounding road network.</p>

Issue Raised	Applicant's Response	Bitzios' Response
	<p>Based on the data received to date from the RMS, it is therefore suggested that such an upgrade should be performed to the intersection prior to the opening of the completed school. However, analysis should be undertaken with the latest traffic volumes and projections nearer to the time of construction of the final stage of the school to confirm that such an upgrade is necessary, as there may be significant reductions in the traffic using the Elizabeth Drive/Wallgrove Road intersection after the construction of the M12 Motorway.</p>	

Table A.2: Responses to Submissions – Roads and Maritime Services

Issue Raised	McLaren's Response	Bitzios' Response
<p>From the submitted SIDRA modelling report it was noted that 47 vehicles will turn right into Kosovich Place from Wallgrove Road during morning peak hour against 1021 opposite direction traffic (including 107 turning left into Kosovich Place from Wallgrove Road), in Stage-1 development. And in ultimate development 83 vehicles will turn right into Kosovich Place from Wallgrove Road during morning peak hour against 1120 opposite directional traffic.</p> <p>Considering Wallgrove Road is an 80 km/hr speed zone road and right turning traffic has to negotiate with heavy volume of through traffic Roads and Maritime does not support proposed right turn bay (CHR) treatment on Wallgrove Road at Kosovich Place intersection. This would be a potential safety hazard for right turn traffic as motorists have to wait for a safe gap which could frustrate the drivers due to the high through traffic volume. In addition, Roads and Maritime does not support proposed banning of right turn from Kosovich Place into Wallgrove Road as this would increase unnecessary pressure at the roundabout of Wallgrove Road and Villiers Road.</p>	<p>The SIDRA intersection modelling undertaken to accompany the application indicates that in the AM and PM peak hours the right turn into Kosovich Place from Wallgrove Road will operate with a level of service of "A" or "B", which is indicative of low delays and queue lengths. This analysis takes into consideration 10 years of background traffic growth in addition to the traffic generation of the site.</p> <p>The SIDRA analysis indicates that right turning movements into Kosovich Place will experience low delays and limited queues will form. The proposed CHR treatment includes a queue storage length of 26.6m, which is more than sufficient to cater for the 6.3m of queues expected in the AM peak hour.</p> <p>Considering the SIDRA results, it is unclear on what basis the RMS speculates that a safety hazard could be caused by right turning motorists waiting for a safe gap in traffic. SIDRA Intersection is a widely used and accepted intersection model in NSW and internationally and is relied upon regularly for the analysis of intersections.</p> <p>Traffic counts undertaken during the August 2018 period have been analysed to provide platooning and gap characteristics. Using the relevant 4-second critical and 2-second follow up parameters in AUSTRROADS Guide to Road Design Part 4A Table 3.5, analysis of the data indicates that on an average weekday between 8:00 am and 9:00 am, a total of 123 gaps occur of at least 4 seconds length in the northbound traffic flow. When a follow-up headway of 2-seconds is considered, the ultimate capacity of a right turn across the northbound traffic flows is 281 vehicles.</p> <p>As noted in the McLaren Report, a total of 83 vehicles will be required to turn right into the site from the north during the AM peak hour. This represents approximately 29.5% of the capacity of the right turn movement and is therefore acceptable, consistent with the results of the SIDRA intersection modelling.</p>	<p>Given the extensive consultation between McLaren and Transport for NSW on proposed treatments at the Wallgrove Road/Kosovich Place intersection, we agree that the right turn from Kosovich Place into Wallgrove Road should be banned on safety grounds.</p> <p>It is not believed that the proposed right turn bay on the Wallgrove Road north approach would be a safety hazard, particularly as low right turn volumes are forecast and there is less crash risk with crossing one lane as opposed to multiple lanes, albeit the 80km/h speed limit along Wallgrove Road. A right turn bay would reduce the likelihood of 'rear end' crashes and minimise congestion for through vehicles. Without a right turn bay, drivers turning right would feel even more pressured to find a gap in traffic as through drivers would be stuck behind.</p> <p>In addition to the above, there is unlikely to be any unnecessary pressure resulting from drivers performing U-turns at the adjacent Wallgrove Road/Villiers Road roundabout to travel south, given Villiers Road is fenced off to the public and only movements between the north and south along Wallgrove Road are permitted.</p> <p>We are satisfied with the SIDRA modelling outcomes and McLaren's response.</p>

Issue Raised	McLaren's Response	Bitzios' Response
<p>Based on the above and considering safety for the school children Roads and Maritime suggest a roundabout at the intersection of Kosovich Place and Wallgrove Road. It would improve the safety for turning traffic and also would reduce the approach speed at the subject intersection.</p>	<p>Pre-DA consultation with RMS and TFNSW was undertaken to better inform the proposed design, with meetings held on 12 April 2018 and 23 July 2018; meeting minutes are provided in Annexure B for reference.</p> <p>Whilst the option of a roundabout was discussed at the meeting, the overriding advice provided was that:</p> <ul style="list-style-type: none"> ▪ A new roundabout would be too close to the roundabout of Wallgrove Road/Villiers Road; ▪ The impacts of an additional roundabout on the operation of Wallgrove Road would be unreasonably great for the purposes of providing access to a single school; ▪ A roundabout may not be able to be constructed within the RMS land, as the motorway road reserve opposite is privately owned by Transurban. <p>On the basis of the above and the outcomes of the SIDRA Intersection modelling, a roundabout option is not needed and has not been investigated further.</p>	<p>We agree with the overriding advice and as such, a right turn bay should be considered as an alternative.</p>

Table A.3: Responses to Submissions – Transport for NSW

Issue Raised	Applicant's Response	Bitzios' Response
<p>Section 5.11 of the EIS identifies the potential to extend the existing bus route that services the St Narsai Christian College (linked to the proposed school) to also service the proposed primary school. The Applicant should:</p> <ul style="list-style-type: none"> ▪ As the St Narsai Christian College is some distance from the subject site, there is a need to consider the impacts on school bell times, to account for bus travel time, should the route be modified as suggested; and ▪ Continue liaising with the local bus operator regarding school bus services. <p>Notwithstanding, the provision of any extension of school bus services would be subject to demand and funding.</p>	<p>No direct response to this issue.</p>	<p>The Applicant should consider the distance of St Narsai Christian College when planning school bus services.</p>
<p>TAB A – Suggested draft conditions of approval</p>		
<p>Green Travel Plan</p> <p><u>Recommended Condition:</u></p> <p>As part of the ongoing operation of the school, a detailed Green Travel Plan (GTP), which includes target mode shares for both staff and students to reduce the reliance on private vehicles, shall be prepared in consultation with Fairfield City Council. The GTP must be implemented accordingly and updated annually.</p> <p><u>Reason:</u></p> <p>To ensure sustainable transport outcomes and achieve the overall strategic planning objectives in the:</p> <ul style="list-style-type: none"> ▪ Future Transport 2056 Strategy; ▪ Sydney's Bus Future 2013; ▪ Sydney's Cycling Future 2013; and ▪ Sydney's Walking Future 2013. 	<p>A Sustainable Travel Plan was prepared by McLaren Traffic Engineering & Road Safety Consultants, and included at Appendix 14 of the original SSDA. The Sustainable Travel Plan incorporates the details requested by TfNSW as part of the 'Green' Travel Plan, with no further updates required.</p> <p>It is accepted that the Sustainable Travel Plan (being the document submitted as Appendix 14 of the original SSDA) should be implemented as a Condition of Consent.</p>	<p>We have reviewed the Sustainable Travel Plan prepared by McLaren and believe it is adequate, given the walking and cycling constraints.</p>

Issue Raised	Applicant's Response	Bitzios' Response
<p>Traffic and Parking Management Plan</p> <p><u>Recommended Condition:</u></p> <p>The Applicant shall prepare a Traffic and Parking Management Plan, which details the measures to safely manage the daily transport task to/from the school. Traffic management measures that need to be addressed include:</p> <p>To ensure sustainable transport outcomes and achieve the overall strategic planning objectives in the:</p> <ul style="list-style-type: none"> ▪ kerbside vehicle pick-up/drop-off management (if any) and orderly vehicle queuing; ▪ maintaining bus accessibility and student waiting areas; ▪ safe parent and student behaviour during pick-up/drop-off; and ▪ safe pedestrian movements to the school entrances, minimising vehicle-pedestrian conflicts. <p>The plan shall also detail the responsibilities of various personnel executing the plan and include measures to monitor, review the performance and make improvements to the plan. This plan should be implemented as part of the ongoing operation of the redeveloped school.</p> <p><u>Reason:</u></p> <p>To minimise the risk that the capacity of the proposed short-term parking and pick-up/drop-off zones would be insufficient and manage the high volume of traffic (vehicular and pedestrian) movements, which generally occur within a short timeframe before and after school hours.</p>	<p>An Operational Traffic and Parking Management Plan (OPTMP) is provided at Appendix C. Key items relate to:</p> <ul style="list-style-type: none"> ▪ Management of on-street car parking ▪ Management of off-street car parking (staff and visitors) ▪ Internal kiss and drop operations ▪ Bus operations ▪ Delivery/service vehicle management ▪ Management of feedback and complaints ▪ Review and monitoring of the OPTMP <p>Full details of operational traffic management are provided at Appendix C.</p> <p>To ensure the proposed kiss and drop facilities operate with high levels of efficiency and safety, the following management practices will be implemented:</p> <ul style="list-style-type: none"> ▪ Traffic control by school staff at internal pedestrian crossing locations; ▪ Traffic control by school staff to direct queued vehicles into vacant kiss and drop spaces; ▪ Organisation of students into general kiss and drop areas by year-group to speed pick-up operations; ▪ Assistance of school staff to load vehicles with children and bags. <p>With respect to the capacity of the pick-up/drop-off facilities, it is noted that the number of kiss-and-drop spaces (30 spaces) and proposed queuing arrangements have been designed in conjunction with a qualified Traffic Engineer. The following provides a summary of the utilisation of kiss-and-drop spaces and maximum queue lengths. The results demonstrate that the parking demands of the development and all queuing can be accommodated within the site.</p>	<p>We have reviewed the Operational Traffic and Parking Management Plan (OPTMP) prepared by McLaren. Alternative arrangements are proposed in Section 2.3 of this review due to safety concerns in the "Keep Clear" area. Should an alternative arrangement be chosen, the OPTMP will need to be updated to reflect this arrangement and revised staff roles.</p>

Issue Raised	Applicant's Response	Bitzios' Response
	<p>Having further regard to traffic safety, the proposed widening of Kosovich Place has been designed to accommodate the two-way passing and standing of buses in the indented bus bay. Road widening will provide sufficient width for up to four (4) buses to pick-up or drop-off passengers without interrupting traffic flow along the street. Light vehicles are able to enter and depart the site without conflicting with queued or manoeuvring buses. It has been advised and demonstrated by the bus operator, Transit Systems, that the existing turning bulb is sufficient to facilitate U-turns by buses.</p> <p>As also confirmed in the Traffic and Parking Impact Assessment, all vehicular and pedestrian facilities have been designed to meet relevant Australian Standards, including in relation to sight lines for all driveways and pedestrian crossings.</p> <p>Safe pedestrian movement between the bus stop and school entry point will be facilitated via the footpath proposed for construction along the extent of the site frontage. The siting of the bus stop west of the driveway means students will be able to walk between the bus stop and school entry without needing to cross the driveway. The safety of children has been a primary consideration in the design solution proposed.</p> <p>Full details are provided in the Traffic and Parking Impact Assessment at Appendix 13 of the original SSDA and in the Operational Traffic and Parking Management Plan (OPTMP) at Appendix C.</p>	

Issue Raised	Applicant's Response	Bitzios' Response
<p>Signage and Linemarking Plan</p> <p><u>Recommended Condition:</u></p> <p>The Applicant shall prepare a detailed signage and linemarking plan of the proposed changes to kerbside parking restrictions to accommodate the various vehicle movements to/from the development within the local road network. The preparation of the plan should be made in consultation with and approved by the Fairfield City Council. The approved kerbside parking restrictions must be implemented to the satisfaction of Council, prior to issue of occupation certificate for Stage 1.</p> <p><u>Reason:</u></p> <p>Approval would be required from the relevant roads authority for any proposed changes to traffic and parking operations.</p>	<p>In accordance with this recommended condition of consent, a Signage and Linemarking Plan would be prepared prior to the issue of the Occupation Certificate for Stage 1.</p>	<p>We have reviewed the Indicative Signposting Plan and suggest the following modifications be made in the detailed design:</p> <ul style="list-style-type: none"> ▪ The Bus Zone signage should display have time restrictions between 8:00am-9:30am and 2:30pm-4:00pm on school days ▪ The Bus Zone area should only extend to the east of the western driveway, not across it ▪ The same No Stopping restrictions proposed on the southern side of Kosovich Place should also be imposed on the northern side.

Attachment B: Assessment of Responses to Submissions

Table B.1: Assessment of Responses to Submissions – Fairfield City Council

Issue Raised	Applicant's Response	Bitzios' Response
B. Traffic and Transport		
<p>The development is situated in a rural cul-de-sac setting. The traffic generation and vehicle access arrangement will detrimentally impact the neighbouring properties and local road network based on the operation of the final development to accommodate the number of staff and students. In relation to traffic and transport, the following concerns have not been adequately addressed by the application.</p> <p>The proposed auxiliary right-turn lane on Wallgrove Road into Kosovich Place and 'No Right Turn' restriction from Kosovich Place into Wallgrove Road is considered a safety hazard for motorists at the intersection and to school children. RMS recommend that a roundabout be proposed at the intersection to improve the safety of turning traffic at Kosovich Place/ Wallgrove Road; it will also benefit the safety of the road network by reducing the approach speed by motorists.</p> <p>It should be noted that the proponent must consult with RMS regarding placing 'School Zone' signage.</p>	<p>Extensive consultation with TfNSW (RMS) is ongoing and the TfNSW (RMS) has reached the conclusion that a roundabout is not a viable treatment for this intersection due to the physical constraints present. The placement of the school-zone signage will occur along Kosovich Place, as agreed with the RMS.</p> <p>The proposed modifications to the intersection of Kosovich Place/Wallgrove Road include the following, as outlined in accompanying Traffic Assessment (Appendix B):</p> <ul style="list-style-type: none"> ▪ A 26.6m long auxiliary lane providing for the storage of vehicles waiting to turn right from Wallgrove Road into Kosovich Place: <ul style="list-style-type: none"> - It is noted that this does not include the taper length of 18m. - This length is the longest lane length that can be accommodated considering the proximity of the roundabout to the north and the narrow culvert across Ropes Creek. - A 26.6 long lane is sufficient to accommodate the 98th percentile queue predicted by SIDRA analysis sensitivity testing and can accommodate two 12.5m long Heavy Rigid Vehicles. 	<p>Given the extensive consultation between McLaren and Transport for NSW on proposed treatments at the Wallgrove Road/Kosovich Place intersection, we agree with the conclusion that a roundabout is not feasible and the treatments proposed in the Applicant's response should be implemented.</p> <p>It is not believed that the proposed right turn bay on the Wallgrove Road north approach would be a safety hazard, particularly as low right turn volumes are forecast and there is less crash risk with crossing one lane as opposed to multiple lanes, albeit the 80km/h speed limit along Wallgrove Road. A right turn bay would reduce the likelihood of 'rear end' crashes and minimise congestion for through vehicles. Without a right turn bay, drivers turning right would feel even more pressured to find a gap in traffic as through drivers would be stuck behind.</p> <p>School zone signage and pavement markings will be installed along Kosovich Place, as agreed with Transport for NSW.</p>

Issue Raised	Applicant's Response	Bitzios' Response
	<ul style="list-style-type: none"> ▪ A 100m long (including taper) auxiliary lane providing for the deceleration of vehicles turning left into Kosovich Place. ▪ “No Right Turn” and “Left Only” signage, complemented by a concrete island, restricting right turns out of Kosovich Place. ▪ Lane and shoulder widths will generally match the existing geometry of Wallgrove Road. ▪ All intersection turns have been designed to accommodate a 12.5m long Heavy Rigid Vehicle. <p>The proposed changes to the Kosovich Place/Wallgrove Road intersection will significantly improve the safety of the intersection by:</p> <ul style="list-style-type: none"> ▪ Restricting right turns from Kosovich Place into Wallgrove Road, which is presently an unsafe movement during peak times; ▪ Addition of deceleration facilities for the left turn into Kosovich Place from Wallgrove Road, significantly reducing the risk of rear-end collisions and side-on collisions involving vehicles making this turn; ▪ Addition of storage facilities for the right turn into Kosovich Place from Wallgrove Road, significantly reducing the risk of rear-end collisions and side-on collisions involving vehicles making this turn. <p>In light of the above, it is incorrect to assert that the proposal will detrimentally impact the traffic safety at the Kosovich Place/Wallgrove Road intersection, as the intersection will be significantly safer post upgrade. Any negative traffic safety implications related to the additional school traffic are outweighed by the significant upgrade works proposed.</p>	

Issue Raised	Applicant's Response	Bitzios' Response
<p>Off-street parking</p> <p>It is estimated that the traffic generation of the final development will generate 579 trips during the morning and afternoon peak based off the occupancy rate similar to St Hermizd Primary School. St Hermizd is within an urban setting and therefore the occupancy rates need to be justified as the proposal is situated in a rural cul-de-sac setting adjoining an arterial road.</p> <p>The proponent responded that installation of a right turn bay at Wallgrove Road onto Kosovich Place, 'No Right Turn' at Kosovich Place onto Wallgrove Road, and 30 pick-up/drop-off car spaces will reduce the traffic impact onto Kosovich Place. Given the limited number of pick-up/drop-off spaces to accommodate the final development, the traffic mitigation measures proposed are considered unacceptable as it will likely impact on-street parking and the local rural road network.</p> <p>In addition, the 37 car parking spaces for staff will result in conflict between parents/carers using those spaces. The overall off-street parking for the primary school is non-compliant with the car-parking rate in the Fairfield Citywide DCP 2013 and should be considered as part of the application.</p> <p>It is understood that the school parking will be utilised during church events adjoining the site based on the association and history of overflow on-street parking. The proposed parking for the school should take also consider the impact of overflow of parking for the adjoining Church.</p>	<p>The car occupancy of 1.85 students per vehicle is based on data provided by the St Hurmizd Assyrian School regarding the number of siblings that each student has at the school. The St Hurmizd School caters to the same community and a significant proportion of the initial population of the school will be comprised of students moving from St Hurmizd to the proposed school. It is therefore likely that the number of siblings each child has at the school will remain similar to the St Hurmizd School. The 1.85 students per vehicle assumes that no students walk or catch public transport as applied to the "Stage 1" population of 210 students.</p> <p>With regards to the "Final Development" scale of 630 students, it has been assumed that 20% of these students will catch the bus, with a 1.85 car occupancy rate applied to the remainder. A 20% uptake of school bus services is typical for primary schools, with a higher rate of bus usage usually observed for children in years 3 – 6 or for students in years K – 2 with older siblings. In this case, the proposed bus service will be shared with the St Narsai Assyrian Christian College, which the proposed school will feed. There will, therefore, be a higher than usual proportion of students with siblings catching the bus and it is expected that the 20% bus usage assumed will be easily achieved.</p> <p>In light of the above, the forecast traffic generation is deemed to be reasonable for the Site.</p> <p>In relation to car parking, the Fairfield City Council DCP provides the following guidelines for the provision of car parking for Educational Establishments:</p> <p><i>1 space per employee plus 1 space per 10 students in Year 12 (where applicable)</i></p>	<p>It is acknowledged that St Hurmizd Assyrian Primary School is located in an urban area, is accessible by bus, walking and cycling, and has a higher student capacity than the subject school. However, undertaking a survey of a similar development provides adequate justification and a basis for the 1.85 car occupancy rate.</p> <p>Furthermore, given the rural location of the subject school, worst-case scenarios of 100% private vehicle use for Stage 1 and 80% for the ultimate school have been assumed.</p> <p>It is noted in Section 3.2 of the traffic and parking impact assessment report that an Aimsun microsimulation model has been used to simulate the operation of this kiss and drop system, resulting in a maximum queue of 35 vehicles for the final stage of development, all of which can be accommodated within the site.</p> <p>The Applicant will provide the required car parking spaces in accordance with the Fairfield DCP, as well as two People with Disabilities car spaces and 30 pick-up/drop-off spaces within the site. We do agree, however, that the staff parking spaces will conflict with parents/carers using the pick-up/drop-off spaces and as such, a separate staff parking area should be provided.</p> <p>It is understood that any events at the adjacent church will occur outside of school hours and parking will be provided by the school.</p>

Issue Raised	Applicant's Response	Bitzios' Response
	<p>The proposal includes a total of 35 staff, with no Year 12 students to be on-site. The parking requirement for the proposed school is therefore 35 spaces. A total of 37 spaces are provided for use by staff, with an additional two (2) allocated for disabled visitors. Surplus to the requirements of the DCP, a total of 30 kiss and drop spaces are proposed to cater to the drop-off and pick-up operations of the school. On this basis, it is unclear under what pretences Fairfield City Council regards to the proposal to have a "limited number of pick-up/drop-off spaces", as the proposal far exceeds the requirements of the FCC DCP which does not require the provision of any kiss and drop facilities.</p> <p>The Traffic and Parking Impact Assessment by McLaren Traffic Engineering submitted with the application provides a robust analysis of the requirements of the school in terms of kiss and drop facilities, with the results demonstrating that the 30 spaces will be sufficient to serve the needs of the school without overflow into Kosovich Place. The 39 spaces in the car park were not included in this analysis and are not needed to provide for sufficient car parking for parents during drop-off and pick-up times.</p> <p>With regards to the proposed usage of the school's parking by the adjacent Church, it is emphasised that this will occur outside of school operational hours only. With this in mind, the use of the school's on-site parking will substantially reduce the chance that parking associated with the Church will overflow onto the street, without any negative ramifications.</p>	

Issue Raised	Applicant's Response	Bitzios' Response
<p>Site servicing vehicles</p> <p>Bus services are proposed at the bus bay/zone on Kosovich Place via 'piggy-back' off the existing bus services for St Narsai Assyrian Christian Collage. Given the bus services for St Narsai Assyrian Christian Collage are privately operated, the bus service will not benefit other stakeholders therefore the bus bay/zone must be providing within the boundary of the subject site.</p> <p>A heavy rigid vehicle for loading / deliveries and waste operations will also service the site. Swept path for heavy rigid vehicles enter/ exiting the site and onto Kosovich Place must be provided to ensure servicing vehicles are able to manoeuvre in a suitable manner. The proponent has only provided swept paths for B85 vehicles within the car parking area therefore unable to assess the application. It is noted that the plans also do not depict a designated loading area for servicing vehicles.</p>	<p>The proposed bus parking along Kosovich Place is to be used by a state-operated school bus service. Discussions with Transit Systems the present provider of school bus services in the area indicate that the most cost-efficient option is to modify the existing state-funded bus route servicing St Narsai Assyrian Christian College to include the proposed school.</p> <p>Transit Systems indicated that it would not accept on-site facilities, as entering and leaving the site would unacceptably delay the service. In view of this, the proposal includes an indented on-street facility which will provide sufficient width to cater for buses whilst maintaining two-way passing along Kosovich Place.</p> <p>Swept path testing has been undertaken to demonstrate the circulation of a 12.5m long Heavy Rigid Vehicle through the site and accompanies the submission as Appendix B.</p> <p>The occasional loading operations will be undertaken in the staff car park adjacent to the Bin Store outside of peak drop-off and pick-up hours.</p>	<p>It is agreed that the proposed bus service will only directly benefit the school given its rural location and Transit Systems has stated that using onsite facilities is unacceptable. As such, the bus parking on Kosovich Place should be time restricted to between 8:00am-9:30am and 2:30pm-4:00pm on school days to prevent prolonged impacts to the public.</p>

Table B.2: Assessment of Responses to Submissions – Roads and Maritime Services

Issue Raised	McLaren's Response	Bitzios' Response
<p>Roads and Maritime has reviewed the submitted information and does not support the proposed CHR (channelized right turn bay) treatment on Wallgrove Road at Kosovich Place intersection based on road safety and network efficiency grounds. The proposal would be a potential safety hazard for right turning traffic as motorists have to wait for a safe gap which could frustrate the drivers due to the high through traffic volume.</p> <p>Based on the above and considering safety for the school children Roads and Maritime requires provision of a roundabout at the intersection of Kosovich Place and Wallgrove Road. A roundabout at this location will improve safety for turning traffic and also will reduce the approach speed at the subject intersection.</p>	<p>Refer to McLaren's supplementary traffic advice letter to PMDL (dated 10 February 2020).</p>	<p>We agree with the outcomes of the stakeholder meeting on 13 January 2020 and the treatments proposed at the Wallgrove Road/Kosovich Place intersection as detailed in McLaren's letter should be implemented, including the including the right turn ban, right turn bay from the north and left turn deceleration lane from the south.</p>

Issue History

File Name	Prepared	Reviewed	Issued by	Date	Issued to
P4606.001T Saints Peter and Paul Assyrian Primary School Cecil Park TIA Peer Review	S. Daizli	A. Giyahi	A. Giyahi	02/06/2020	David.Way@planning.nsw.gov.au
P4606.002T Saints Peter and Paul Assyrian Primary School Cecil Park TIA Peer Review	J. Yang	A. Giyahi	A. Giyahi	30/11/2020	David.Way@planning.nsw.gov.au

Saints Peter and Paul Assyrian Primary School, Cecil Park

Traffic Impact Assessment Peer Review

1. Introduction

A State Significant Development Application (SSD-9210) for the Saints Peter and Paul Assyrian Primary School at 17-19 Kosovitch Place, Cecil Park, is currently being assessed by the Department of Planning, Industry and Environment (DPIE). The proposal includes:

- A 2-storey building for 630 students from Kindergarten to Year 6 and 35 staff with 21 classrooms, a library, canteen, multipurpose hall, administration offices and staff facilities
- Outdoor open play areas, sports courts and a sports field
- Off-street car park with 37 car spaces, two People with Disabilities car spaces and a 30-vehicle pick-up/drop-off area
- Site preparation works, bulk earthworks and soil remediation
- Associated landscaping works and signage.

Bitzios Consulting (Bitzios) was previously engaged by the DPIE to undertake an independent peer review of the traffic and parking impact assessment report and SIDRA models prepared by McLaren Traffic Engineering (McLaren, dated 4 September 2018) as part of the Environmental Impact Statement (EIS).

The peer review (ref: P4606.001T) identified a number of deficiencies with the methodology and requested further information to be provided by the Applicant. It is understood in response a Supplementary Traffic Assessment has been prepared by McLaren (dated 9 November 2020).

2. Traffic and Parking Impact Assessment Report

2.1 Summary

The adequacy of Applicant responses to our original peer review comments are detailed in **Attachment A (Table A.1 – Response Matrix)**.

Overall, the Applicant has addressed a portion of our initial concerns. However, there are a number of items which we consider to have been inadequately addressed. These are summarised in Section 2.3.

2.2 Modelling Results

The modelling results show that:

- The performance of the *Existing 2018* intersections are all optimal, shown to operate at LOS C or better
- The performance of the *Existing 2018 + Stage 1 Development* intersections are similar to the Existing 2018, with no change in intersection LOS and minor increases in delays
- The performance of the *Ten-Year Growth 2028* intersections show that Wallgrove Road / The Horsley Drive and Wallgrove Road / Elizabeth Drive are at capacity, with LOS E and F respectively and DOS over 1.0

- The performance of the *Ten-Year Growth 2028 + Stage 2 Development* intersections show that the same intersections are at capacity, but notes an exacerbation of performance issues under the development traffic loads.

In addition to the above, it is noted that:

- There is additional pressure on the M7 / The Horsley Drive intersection, with DOS increasing from 0.81 to 0.95 in the 2028 AM Stage 2 Development scenario. While this doesn't exceed 1.0, Roads and Maritime's Traffic Modelling Guidelines advises that the Maximum Practical DOS at traffic signals is 0.90.
- The local intersections at Wallgrove Road / Kosovich Place and Wallgrove Road / Villiers Road perform optimally in all scenarios, with minimal queueing and delays.
- There is a slightly discrepancy in that the Supplementary Traffic Assessment reports 95th Percentile Queues, but the SIDRA models are set to 98th Percentile Queues.

Notwithstanding the above, it is agreed that the deterioration of the traffic network is caused by the projected background growth in traffic as estimated from STM growth plots. Upgrades would be triggered by the 10-year background growth to ensure smooth operation of the intersections can continue prior to the introduction of development traffic. It is understood that Transport for NSW (TfNSW) has planned works along the corridor.

2.3 Outstanding Concerns

2.3.1 Parking Operations

Our outstanding concerns with the parking are:

- Operational issues caused by long queues within the circulating roadway blocking staff vehicles
- Safety concerns around the location of the proposed pedestrian crossings, with inadequate sight lines to pedestrians caused by parked vehicles

2.3.2 SIDRA Modelling

Our outstanding concerns with the modelling are:

- Inadequate evidence of validation of existing base models to real-life conditions, resulting in a subsequent lack of confidence in 'fitness' of the model for future testing
- Minor syntax and coding inconsistencies with the models
- Missing Existing AM peak scenario in the provided files for the Wallgrove Road / Kosovich Place intersection.

2.3.3 Other

No comment has been made regarding the compromise to restrict bus parking on Kosovich Place to between 8:00 AM – 9:30 AM and 2:30 – 4:00 PM on school days, to mitigate prolonged impacts to the public.

3. Conclusions

Bitzios Consulting has reviewed the addendum traffic and impact assessment report and updated SIDRA models prepared by McLaren Traffic Engineering (dated 9 November 2020).

While a portion of the previously raised issues have been addressed, a number of outstanding concerns remain, revolving around safety concerns within the on-site car park and insufficiencies with the SIDRA modelling.

Notwithstanding the above, we are generally satisfied that the modelling results indicate that the development impacts are negligible to the local intersections, and should be able to be accommodated by the future upgrades by TfNSW.

Attachment A: Response Matrix

Table A.1: Applicant Responses to Peer Review

Bitzios Peer Review Comment	McLaren Traffic Engineering Response	Bitzios Response
AM and PM Peak Hours		
The AM and PM peak hours assessed in SIDRA have not been stipulated.	The revised modelling presented in Section 0 is based on an AM peak of 8:00 AM – 9:00 AM and a PM peak of 2:45 PM – 3:45 PM, which are the peaks most affected by the traffic travelling to and from a primary school.	Agreed. These are acceptable peak hour periods for a primary school.
Traffic Generation		
The directional Stage 1 student traffic generation in Tables 4 and 5 does not equal the total trips and should be rounded up to the nearest whole number. Thus, the estimated student traffic generation for the AM and PM peaks should be 114 trips in and 114 trips out.	This relates to a minor typographical error in the text of the report which did not translate to the modelling. The volumes modelled are 113 IN and 113 OUT.	Noted.
Growth Volumes		
If negative growth rates were applied to calculate the 2028 turning volumes, then the 2018 volumes should be retained to avoid misinterpretation and maintain robust volumes. Technical rationale would be required to justify negative growth rates. In the absence of any reasonable rationale, Sydney Strategic forecast model should be used to assist with the forecast volumes in the surrounding road network for the future year.	Revised STM growth rates have been obtained from TfNSW which have been used in the updated traffic modelling as detailed in Section 0. The updated STM growth rates are provided in ANNEXURE for reference and now include only one negative growth rate.	It is assumed that this refers to the STM growth plots attached in Annexure A. Annual growth rate percentages have been adequately applied to the modelling. The growth rate has been linearly applied for a 10-year period to all movements on each approach. It is acknowledged that this may not be reflective of actual growth as the STM growth plots do not provide the necessary level of detail. In our experience this may overestimate the growth of turning movements, causing the intersection to reach capacity earlier than expected. In lieu of any more detailed information, this methodology is considered to overall be acceptable.

Bitzios Peer Review Comment	McLaren Traffic Engineering Response	Bitzios Response
Operation of Car Parking Areas		
<p>The staff parking spaces will conflict with parents/carers using the pick-up/drop-off spaces and as such, a separate staff parking area should be provided</p>	<p>With regards to the obstruction of the staff spaces, it is accepted that staff parking spaces will be temporarily obstructed during peak drop-off and pick-up hours. Only staff will be affected by this for approximately 15 minutes during the pick-up operations every afternoon, which is acceptable.</p>	<p>Based on the queueing analysis in Table 3 of the Traffic and Parking Impact Assessment, the expected number of vehicles in the car park in the Final Development Stage at the end of the 15-minute 'Prior to Pick Up' stage is 30 vehicles within the Kiss and Drop Spaces and 36 vehicles queueing. There are a number of factors which may lead to a longer period of congestion than remarked in the report, including:</p> <ul style="list-style-type: none"> ▪ Kiss and Drop Spaces 15-28 can only be accessed by inbound vehicles entering the school premises. Vehicles in the circulating roadway cannot access these spaces without travelling on the wrong side of the access road and reversing. ▪ It is expected that there will be delays caused by pedestrian crossing movements, slowing down operations of the Kiss and Drop zone. ▪ It is considered likely that there will be a spike of incoming traffic around school release time, with a greater arrival rate during this short peak flow period. The report has optimistically assumed that arriving vehicles are distributed uniformly across the 45 minutes during the pick-up period. <p>This entails that the duration of time within which there is congestion build-up within the car park may exceed the reported 15 minutes. During this period, staff vehicles will be 'trapped' by queues on the circulating roadway.</p> <p>It is acknowledged that this will be a necessary consequence of the car park design. If parking operations are not changed, staff members should be advised to not attempt to leave during this period, to prevent any friction and potential conflicts between staff and parent traffic.</p>

Bitzios Peer Review Comment	McLaren Traffic Engineering Response	Bitzios Response
<p>Pick-up/drop-off spaces 3, 4, 16 and 17 should not encroach the adjacent crossing to maintain drivers' sightlines to pedestrians and vice-versa. If these spaces cannot be relocated/resized, then these will need to be removed. Additionally, there should be 20-metre and 10-metre No Stopping zones before and after the crossing respectively in both directions of travel.</p> <p>The proposed location of the southern crossing is adjacent to the "Keep Clear" area where multiple, conflicting vehicle movements will be made and drivers leaving the queueing area and U-turning will have little sight distance.</p>	<p>The proposed crossings are not on a public road and the car parking does not need to be restricted as such. Parents will be travelling at low speed and with special care when within the school grounds. Further, the crossings are proposed to be staffed such that traffic will be stopped at each of the crossings when children are crossing.</p>	<p>It is acknowledged that the proposed crossings are not on a public road, and therefore are not <i>required</i> to follow the requirements for parking restrictions near crossings (as described by RTA Technical Directions).</p> <p>However, it is noted that these standards are adopted at pedestrian crossings for safety reasons. The underlying principle is still applicable, even if it is private property. This is particularly relevant given the vulnerable nature of young school students.</p> <p>While the aspiration will obviously be that parents will be travelling at low speeds and driving safely, it is our opinion that the road environment will not be forgiving in the case of any mistakes. The proposed pedestrian crossing between Spaces 3 and 4 and 17 and 18 (minor correction on our original comment) poses safety risks due to restricted sight lines in the case of vehicles parked in the aforementioned spaces.</p> <p>It is acknowledged that the crossings are proposed to be staffed by traffic controllers who will stop traffic when children are crossing. While this would have a beneficial effect in terms of safety, the same comments apply to visibility of the traffic controller, who may not be noticed until they are well and truly on the roadway itself.</p>
	<p>The kiss and drop facility will operate under an operational plan of management, which is to be regularly reviewed based on the performance of the facility. The comments provided in the Peer Review will be taken into consideration on the first performance review of the facility after operating for 6 months.</p>	<p>Noted.</p>

Bitzios Peer Review Comment	McLaren Traffic Engineering Response	Bitzios Response
SIDRA Geometric Modelling Parameters		
<p>All Approach Distances, Lane and Circulating Widths, Island Diameters and Strip Islands should be confirmed using aerial imagery (i.e. Google Maps, Google Earth, Nearmap etc.) and the Wallgrove Road/Kosovich Place intersection concept plan, and applied to the models where necessary.</p> <p>[specific suggested geometry changes]</p>	<p>Each of the above changes has been made as part of the revised traffic modelling which is presented in Section 2.</p>	<p>Noted that the above changes have been made to the model geometries.</p>
SIDRA Input Parameters – General		
<p>The Approach and Exit Cruise Speeds for all turning movements should be the same as the respective speed limit in all models.</p> <p>It is not clear why the Total & % Volume Data Method was used in any of the models. The Separate Volume Data Method should be used in all models and the growth rates in Annexure C of the traffic and parking impact assessment report should be applied to the 2018 turning volumes to calculate the 2028 volumes.</p>	<p>The approach speeds, exit speeds and data input methods have been modified as per the above.</p>	<p>There are inconsistencies between the Approach and Exit Cruise Speeds for the AM and PM scenarios at the Existing Wallgrove Road / The Horsley Drive intersection.</p> <p>Volumes are confirmed to now be entered as Separate volumes for Light and Heavy vehicles.</p>

Bitzios Peer Review Comment	McLaren Traffic Engineering Response	Bitzios Response
SIDRA Input Parameters – Pedestrian Crossing Priority – Elizabeth Drive / Wallgrove Road / M7 Off Ramp		
<p>All pedestrian crossings should have priority over the conflicting turning movement in all models.</p>	<p>The pedestrian crossings have been given priority as per the above.</p>	<p>We have confirmed that priorities have been adjusted for the Elizabeth Drive / Wallgrove Road / M7 Off Ramp intersection to give pedestrian crossings priority over conflicting turning movements.</p> <p>However, it is noted that this includes the left-turn from Elizabeth Drive (W) to Wallgrove Road (N). As a slip lane, this movement does not conflict with the signalised pedestrian crossing.</p>
SIDRA Input Parameters – Arrival Type – The Horsley Drive / Wallgrove Road		
<p>Arrival Type 4 was used for all movements on The Horsley Drive east approach in all models. This is likely due to the adjacent The Horsley Drive/Westlink M7 Motorway interchange. Justification should be given, otherwise all Arrival Types should be set to Program.</p>	<p>The Horsley Drive / Wallgrove Road and The Horsley Drive / M7 Interchange intersections have been modelled as a network and the corresponding arrival types reset to “Program”.</p>	<p>Noted that the two intersections have been networked together. The Arrival Type has been reset to “Program” for the AM model, but is still Arv. Type 4 for the Horsley Drive / Wallgrove Road PM model.</p> <p>Per the PM Network Diagnostics, the specification of Arrival Type will override signal platoon calculations based on Signal Offsets.</p> <p>This is inconsistent with McLaren’s statement that corresponding arrival types have been reset to “Program”.</p>
SIDRA Input Parameters – Approach and Exit Speeds – Kosovich Place / Wallgrove Road		
<p>The Exit Cruise Speed for all turning movements into and out of Kosovich Place should be 50km/h in the existing and existing+10-year growth models.</p> <p>The Approach and Exit Cruise Speeds for all turning movements into and out of Kosovich Place should be 40km/h in the “with development” models.</p>	<p>The approach and exit cruise speeds have been adjusted as per the above.</p>	<p>The provided SIDRA model “Kosovich Wallgrove Network.sip8” does not contain the AM Existing scenario for the Wallgrove Road / Kosovich Place intersection, nor the corresponding AM Existing network.</p> <p>The Approach and Exit Cruise Speeds have been updated satisfactorily for the Future Year AM scenarios and all PM scenarios.</p>

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Model Calibration / Validation		
<p>There is no evidence showing that the models have been properly calibrated based on actual signal phasing/timings derived from the Transport for NSW Intersection Diagnostic Monitor (IDM) data and SIDRA Environmental Factors or validated based on back-of-queue survey data and site observations.</p> <p>There is no comparison between the model vs. observed queue data and IDM data vs. SIDRA phase times. Hence, the models cannot be verified.</p> <p>The calibration and validation of the SIDRA models should be detailed in a modelling report and considered together with any assumptions to verify the modelling results.</p>	<p>The calibration of the models as part of the revised modelling is detailed in Section 2.4. It is noted that at the time of writing of this report (November 2020), COVID-19 was affecting traffic volumes and additional surveys to ascertain queue lengths etc. could not be reliably undertaken.</p>	<p>Calibration of the modelled signal phasing / timing to historical Intersection Diagnostic Monitor (IDM) and LX file outputs is acceptable and within minimum / maximum phase time bounds.</p> <p>However, it must be stated that no evidence has been provided of model validation to back-of-queue data or site observations. For us and any other parties to be confident that the base model is fit for purpose for future year option testing, there needs to be verification of the model behaviour against real-life traffic behaviour.</p> <p>It is understood that COVID-19 effects may affect the quality of traffic and queue surveys undertaken at this time. It is our opinion that at current, traffic levels have reverted to a moderate level of activity in NSW which will be representative of typical conditions.</p> <p>If some adjustment is necessary, over the last year our methodology for dealing with this has typically been to cross-reference the survey data with historical data (where available) and apply a scaling factor.</p>
Signal Timing – General		
<p>The existing models should use User-Given Phase Times incorporating the Transport for NSW IDM data to reflect actual traffic conditions. The existing+10-year growth and “with development” models can use Practical or Optimal Cycle Time where necessary.</p> <p>The intergreen times used in all models need to be checked against either the Transport for NSW LX file or site observations.</p>	<p>The calibration of the models as part of the revised modelling is detailed in Section 2.4.</p>	<p>Calibration of the modelled signal phasing / timing to historical Intersection Diagnostic Monitor (IDM) and LX file outputs is acceptable and within minimum / maximum phase time bounds.</p> <p>Optimum Cycle Time has been adopted for the future year assessment, which is acceptable.</p>

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<p>Confirm whether filter right turns operate during Phase A for both Wallgrove Road approaches.</p>	<p>Site visits were undertaken on 5 November 2020 during the AM and PM peaks as outlined in Section 1.1. It was confirmed that right “filter” turns operate on both The Horsley Drive approaches during the AM and PM peak hours at the intersection, with an inter-green period of approximately 5 seconds. This finding has been applied to the models.</p>	<p>Noted.</p>