

PROPOSED MASTER PLAN

CHARLTON CHRISTIAN COLLEGE

FASSIFERN ROAD, FASSIFERN



TRAFFIC IMPACT ASSESSMENT

Prepared by:

ROB CALDWELL MITE(Life) MAITPM

TRAFFIC ENGINEERING SERVICES

NELSON BAY

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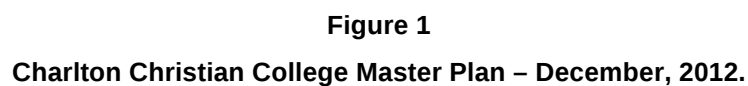
Proposed Master Plan - Charlton Christian College
Fassifern Road, Fassifern.

TRAFFIC IMPACT ASSESSMENT

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A revised master plan for the future development of Charlton Christian College has been prepared by Stanton Dahl Architects. This plan, shown as Figure 1 below, provides for a development footprint that will not extend beyond that already approved by Council (in 1998). The revised master plan includes an amended arrangement for additional buildings and an increase in student numbers from the current enrolment of approximately 600 students to a maximum of 880 students. The school will operate as a K-12 facility together with a preschool unit. There is currently a separate preschool operating on the school grounds and this function will continue.



Stanton Dahl Architects have engaged Rob Caldwell of Traffic Engineering Services (TES) to prepare a traffic impact assessment to address the potential increase in student numbers and the revised car parking layout. The number of staff members, which is presently 70 (including part-time staff), will not increase as some part-time staff will become full-time staff as student numbers grow.

The College is Located on Fassifern Road, between Narara Street and the Fassifern Railway Station as shown in Figure 2 below.



Figure 2

**Google Earth Image Showing Location of Charlton Christian College
(When Sports Field was under construction.)**

This assessment is based on the completed project with 880 students and 70 full-time staff members.

2. Existing Traffic Conditions on Fassifern Road

Fassifern Road forms part of a distributor Road through the suburbs of Fennell Bay, Fassifern, Blackall's Park and Toronto. The northern section of the distributor road is Macquarie Road which links to the arterial road, Toronto Road. Toronto Road is an RMS Classified Main Road, MR 217.

The southern section of the distributor road is South Road, Railway Parade and Cook Street, linking to MR 220, Awaba Road, and MR217, Carey Street, in the Toronto Central Business District.

Fassifern Road also provides a link to Wakefield, Barnsley and the Newstan Colliery, via Wakefield Road, to the west of Fassifern.

Fassifern Road is a two lane two-way road and its capacity is severely restricted due to a one-lane, low clearance (2.8m) underpass, just to the north of the Charlton Christian College site. Whilst this bridge apparently has some heritage value, the restriction and hazards it poses to traffic movement may justify some form of remedial action, particularly as it is in a bushfire prone area where the distributor road may provide the only means of escape or evacuation in an emergency.



Photograph 1



Photograph 2

One lane underpass on Fassifern Road. Queue can extend back past Cooper Avenue.

Northbound traffic must stop and give way to southbound traffic, and in peak times queuing traffic can back up to past Cooper Avenue, blocking both school driveways.

A simple remedial measure is to install traffic signals, similar in operation to roadworks signals used in partial road closures. Instead of a portable generator, the signals could be hard wired and employ either infrared detectors or magnetic induction loops inserted into the road surface. The operation of the signals would not only eliminate long queues to the south, but would create controlled gaps in southbound traffic. This will enhance safety for vehicles making right turns out of the school driveways. The traffic Signals could be installed without any road widening. It is understood that Lake Macquarie Council has this project in its program, but funds are unavailable at this time.

As pointed out in the previous Traffic Impact Assessment (2009), there is a footpath adjacent to the Fassifern Road carriageway where it crosses a storm water culvert. Pedestrians, including the 60+ school children who travel to the College by train are separated from the vehicular traffic by a wire fence structure. This structure has no vehicle deflection capability and poses a significant hazard to pedestrians, particularly as it is on the outside of a bend where traffic is randomly stopping and queuing for the underpass.



Photograph 3
Fenced footpath across culvert between the railway station access and the college.



Photograph 4,

The 2009 study recommended that the fence be replaced with an appropriate safety barrier to ensure that an errant vehicle does not endanger pedestrians. The report also identified the lack of continuity in the footpath, between the College and the Railway Station.



Photograph 5.



Photograph 6.

Parents who are picking up or dropping off students park their cars on both sides of Fassifern Road, before walking to or from the College.

Observations made during traffic surveys recorded up to 14 cars parked between the driveway and the culvert, up to 12 cars parked between the two College driveways and up to 9 cars parked on the north-eastern side of Fassifern Road. The occupants of the latter cars, of course, have to negotiate the two way traffic on Fassifern Road, the cars parked on the south side, and the internal driveway before entering the College.

These activities, which involve high pedestrian-vehicle conflicts are seen as extremely hazardous, and should not be tolerated at any school site. In addition to this, the parked cars also restrict sight distance for vehicles leaving the College Driveway, as shown in the Photographs 7 and 8.

A major objective of the design of new facilities is to eliminate the hazards identified above.



Photograph 7



Photograph 8.

Parked cars can restrict sight distance for vehicles leaving the College Driveway

3. Capacity Analysis of Existing Traffic.

Traffic Engineering Services has updated intersection turning movement surveys at each of the College driveways.

The surveys were conducted between 8.15 am and 9.30 am and between 2.15 pm and 3.30 pm on Thursday 24 May, 2012.

The morning and afternoon peak hour traffic volumes are shown in Figure 3.

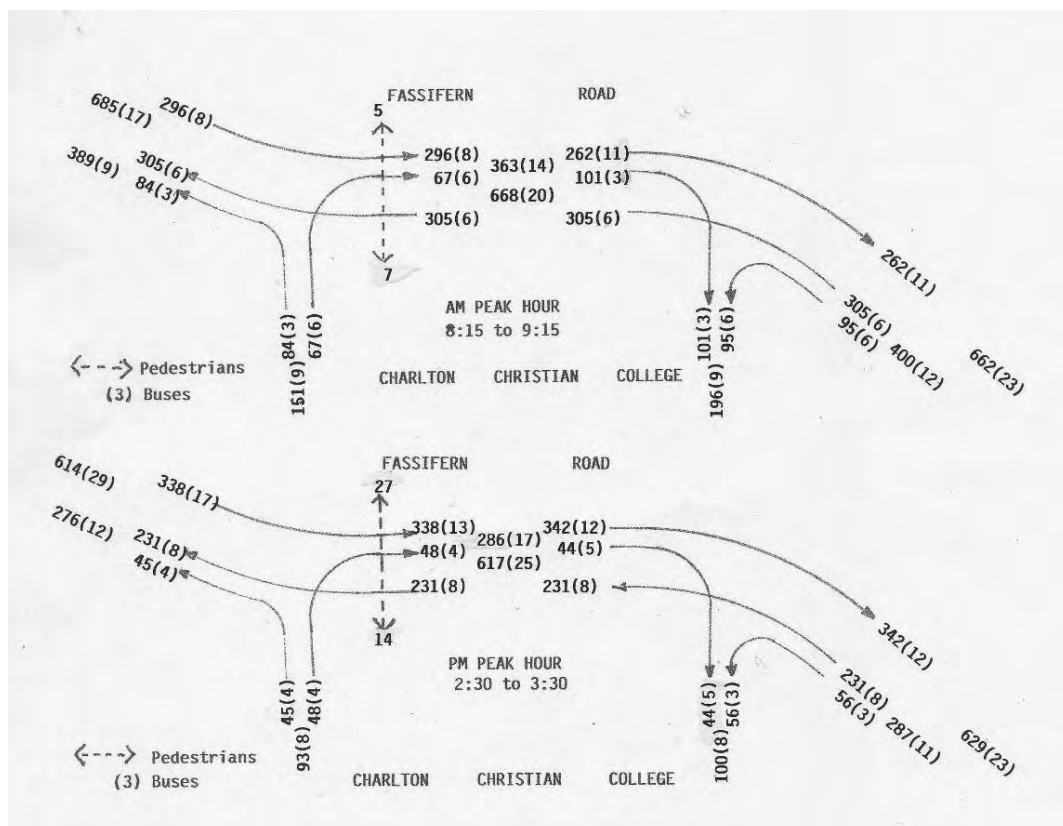


Figure.3
2012 Peak Hour Traffic Volumes at Driveways to Charlton Christian College
Thursday, 24 May, 2012

The diagram shows the peak hour volumes of vehicles for each turning movement with the number of buses shown in brackets. The numbers of pedestrians crossing Fassifern Road is represented by the dotted lines. The top diagram is the morning peak hour and the bottom diagram is the afternoon peak hour.

Traffic capacity analyses have been carried out using the Australian Road Research Board/ Akcelik & Associates' developed SIDRA 5.1 program. This program measures the performance level of traffic conditions, including volume/capacity ratios, average delays experienced by motorists, queue lengths and Level of Service criteria.

There are five Level of Service (LoS) measures, from A to F. LoS A indicates free flow, no delay conditions, and LoS F indicates severe congestion with frequent, long delays. The maximum LoS for design purposes is LoS C.

To allow SIDRA 5.1 to simulate the peak conditions the traffic volume entries for the College must be adjusted to account for the fact that most of the traffic generated is concentrated in a half hour period. The school generated traffic in the peak half hour has been doubled so that SIDRA computes the volume/capacity ratio, average delay, queue lengths and Level of Service for a one hour period equivalent.

At the egress driveway, the SIDRA output given in Table 1 shows all approaches at LoS A, with the right turn movement out of the driveway showing LoS B. This is because the average delays exceed 10 seconds. The v/c ratio is only 0.247, and this indicates that there is adequate capacity to accommodate additional traffic.

MOVEMENT SUMMARY

Site: New Site - 1

Fassifern Road West Driveway
 Giveway / Yield (Two-Way)

Movement Performance - Vehicles											
Mov ID	Turn	Demand Flow veh/h	HV %	Dep. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Egress Driveway											
1	L	88	3.0	0.106	3.2	LOS A	0.4	2.8	0.41	0.47	20.4
3	R	71	9.0	0.247	14.9	LOS B	1.0	7.2	0.73	0.90	12.2
Approach		159	5.7	0.247	8.4	LOS A	1.0	7.2	0.55	0.66	15.8
East: Fassifern Road											
5	T	321	3.0	0.168	0.0	LOS A	0.0	0.0	0.00	0.00	40.0
Approach		321	3.0	0.168	0.0	NA	0.0	0.0	0.00	0.00	40.0
West: Fassifern Road W											
11	T	312	3.0	0.163	0.0	LOS A	0.0	0.0	0.00	0.00	40.0
Approach		312	3.0	0.163	0.0	NA	0.0	0.0	0.00	0.00	40.0
All Vehicles		792	3.5	0.247	1.7	NA	1.0	7.2	0.11	0.13	36.6

Table 1

MOVEMENT SUMMARY

Site: New Site - 1

Fassifern - Cooper Existing AM
Giveway / Yield (Two-Way)

Movement Performance - Vehicles											
Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
East: Fassifern Road East											
4	L	59	6.0	0.162	6.1	LOS A	1.3	9.6	0.57	0.22	35.7
5	T	243	4.0	0.162	2.0	LOS A	1.3	9.6	0.57	0.00	36.0
6	R	1	0.0	0.162	6.7	LOS A	1.3	9.6	0.57	0.73	35.8
Approach		303	4.4	0.162	2.8	NA	1.3	9.6	0.57	0.05	36.0
North: Cooper Avenue											
7	L	2	0.0	0.013	7.9	LOS A	0.0	0.3	0.57	0.48	16.1
8	T	1	0.0	0.013	6.5	LOS A	0.0	0.3	0.57	0.49	12.5
9	R	2	0.0	0.013	8.3	LOS A	0.0	0.3	0.57	0.65	15.7
Approach		5	0.0	0.013	7.8	LOS A	0.0	0.3	0.57	0.55	15.4
West: Fassifern Road											
10	L	2	0.0	0.238	6.1	LOS A	2.0	14.4	0.52	0.25	31.2
11	T	360	4.0	0.238	2.0	LOS A	2.0	14.4	0.52	0.00	32.7
12	R	46	11.0	0.238	7.2	LOS A	2.0	14.4	0.52	0.75	30.7
Approach		408	4.8	0.238	2.6	NA	2.0	14.4	0.52	0.09	32.5
All Vehicles		717	4.6	0.238	2.7	NA	2.0	14.4	0.54	0.07	34.5

Table 2.

At the ingress driveway, traffic volumes for movements into and out of Cooper Avenue have been added to those shown in Figure 3. Table 2 shows that all approaches to the intersection are operating at LoS A with the highest v/c ratio of 0.238 for traffic approaching from the west. This again indicates that there is adequate capacity to accommodate additional traffic.

4. Access and Parking

The site master plan's access and parking arrangement is shown in Figure 4 on the following page. The existing off-street parking areas are shown in the light mauve and the darker shaded areas show the proposed extensions (carpark 1 and carpark 2). Parking is to be provided such that vehicles dropping off or picking up students can be encouraged to do so off-street. The north side of Fassifern Road, between the underpass and Cooper Avenue could be designated a **NO STOPPING** zone, and this means that there will be no cars parked on Fassifern Road, thus eliminating pedestrian vehicle conflicts which now occur.

This supply of parking adequately meets the requirements of Lake Macquarie City Council's DCP No. 1, Part 2.6 – "Transport, Parking, Access and Servicing". This document specifies 1 parking space per 1.5 full time staff plus 1 space per 50 students. For the proposed expansion's 70 staff and 880 students, this computes to 47 staff parking spaces and 18 spaces for students, making a total of 65 long stay parking spaces.

The master plan shows a total provision of 204 parking spaces, with 139 short stay parking spaces to cater for off-street drop-off and pick-up. This will enhance the safety of students and parents, by eliminating the need for parking along Fassifern Road. There is also an internal Bus Stop and this means that there will be no requirement for on-street bus stops. “NO STOPPING” zones could therefore be applied to both sides of Fassifern Road.

“Kiss and Drop” activities could continue in the bus zone as the activity does not interfere with buses stopping to drop off students. Cars dropping off students generally do so in less than 20 seconds, whereas a bus can take several minutes for all passengers to alight. “Kiss and Drop” can also take place in both of the one-way parking aisles, as direct access to the central pathway is available. The pedestrian crossing provides safety for students, between the central pathway and the school grounds.

The short stay spaces are all adjacent to a path that leads into the College and therefore there will be no pedestrian/vehicle conflicts. Staff parking spaces, identified by the letter “S” in Figure 4, will generally be filled prior to student arrivals, and vacated after student departure, thereby minimizing conflicts. Parking spaces should be 2.7m wide to allow full rear door opening for parental access to child restraints. Rear-to-kerb parking will also enhance safety in access between passenger doors and the footpath, and for accessing the boot or rear door without conflict with moving traffic.



Figure 4. Charlton Christian College showing Access and Parking in the Master Plan.

The plan shows a future extension of existing parking (carpark 2 with a new egress driveway (East Exit) at a point on Fassifern Road where suitable sight distances can be achieved. In order to meet sight distance requirements, a portion of the security fence, east of the exit, will need to be relocated as shown in Figure 5, below. The additional parking will increase the parking provision in this area to 128 spaces, with up to 55 spaces allocated to staff and student cars.

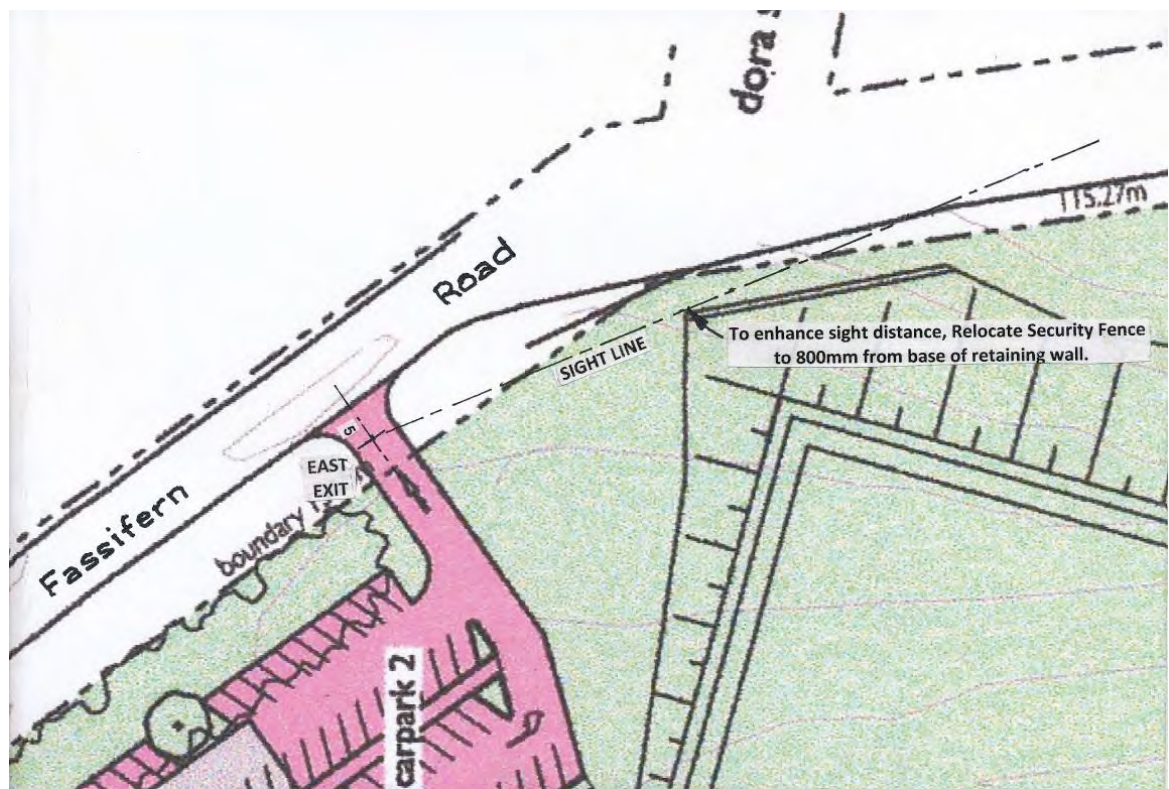


Figure 5

The Proposed East Exit driveway will require improved sight distance through relocation of part of the security fence. The sight line shown will provide a Safe Intersection Sight Distance (SISD) of 100 metres.

The plan also shows additional off-street parking to the west of the Junior School area, shown as Carpark 1 in Figure 4.. This will provide an off-street drop-off and pick-up facility, with 76 parking spaces, and up to 20 of these spaces could be allocated to staff parking.

The access road to this carpark will intersect with Fassifern Road at a point where there is adequate sight distances for entering traffic.. The layout of the intersection is illustrated in Figure 6 on the following page.. The positioning of the kerb and footpath on Fassifern road is dependent on Lake Macquarie Council's future requirements for the road, and whether the underpass is to remain as is, be provided with traffic signals, be enlarged for two-way traffic, or, be removed altogether.



Figure 6.

Illustration of possible intersection of the driveway to Carpark 1, and Fassifern Road.

The design illustrated is based on the existing kerb return at the western driveway at the school, and the kerb and footpath at the culvert, towards the railway station. This alignment leaves approximately 4 metres to the existing edgeline on Fassifern Road and a total carriageway width of 11 metres.

5. Transportation Survey.

Traffic Engineering Services, with the co-operation of staff and students, conducted a transport survey in which students and staff provided information on transport to and from the school. The results, shown in Table 3 on the following page, show that 12 of the 21 year 12 students drove a car to the school and parked, whilst 35 of the 70 staff drove cars and parked. Only 2 students rode bicycles to school even though there is a good cycleway between Fassifern Railway Station and Toronto. Perhaps the use of cycles could increase with a better connection between the school and the cycleway, along with facilities for secure bike storage at the school.

43.4% of students travelled to the school as car passengers, almost 38% travelled by bus, and 10% travelled by train. In the afternoon some students who had arrived by car in the morning, travelled home by bus. (38% left as car passengers and 44% left on buses.)

Buses enter the school and drop-off or pick-up students at the internal bus stops. The students walk into the school without any conflict with other traffic.

Students who travel as car passengers, particularly those who are dropped off or picked up along Fassifern Road are placed at a higher risk than bus passengers, as their access to the school involves conflict with both car and bus movements.

It can therefore be seen that by providing internal facilities for car passenger drop-off and pick-up, the risks associated with vehicle conflicts will be significantly reduced .

Further, with more than 10% of students travelling by train, the requests for Lake Macquarie Council to provide enhancements to the pedestrian link to the station can be justified.

Traffic Engineering Services - Transport Survey

24 May, 2012.

Charlton Christian College - Fassifern.

Transport Mode to and from school.

To School										From School									
Year	Walk	Cycle	Car Passenger	Car Driver	Bus	Train	Bus & Train	Car & Train	Total	Walk	Cycle	Car Passenger	Car Driver	Bus	Train	Train & Bus	Train & car	Total	
12	0	0	2	12	2	1	1	3	21	0	0	1	12	3	1	1	3	21	
11	1	0	2	0	9	2	2	1	17	1	0	0	0	11	2	2	1	17	
10	1	0	12	0	23	9	3	5	53	1	0	12	0	24	8	3	5	53	
9	0	0	7	0	11	4	0	1	23	0	0	4	0	14	4	0	1	23	
8	0	0	10	0	18	5	1	3	37	0	0	7	0	18	5	3	4	37	
7	0	0	13	0	19	8	2	3	45	1	0	10	0	22	6	3	3	45	
6	0	0	22	0	13	3	0	2	40	0	0	18	0	16	4	0	2	40	
5	0	1	21	0	16	1	0	0	39	0	1	18	0	19	1	0	0	39	
4	1	1	11	0	6	0	0	0	19	0	1	11	0	7	0	0	0	19	
3	0	0	18	0	19	0	0	0	37	0	0	18	0	19	0	0	0	37	
2	0	0	25	0	11	0	0	0	36	0	0	27	0	9	0	0	0	36	
1	0	0	25	0	5	0	0	0	30	0	0	19	0	11	0	0	0	30	
Kinda	0	0	10	0	3	0	0	0	13	0	0	10	0	3	0	0	0	13	
Total.	3	2	178	12	155	33	9	18	410	3	2	155	12	176	31	12	19	410	
%	0.73	0.49	43.41	2.93	37.80	8.05	2.20	4.39	100	0.73	0.49	37.80	2.93	42.93	7.56	2.93	4.63	100	
Total Train						60	trips	14.60%								62	trips	15.12%	
Total Bus						215	trips	53%								238	trips	58%	
Staff	2	2	18	35	8	5			70	2	2	19	35	7	5			70	
%	2.86	2.86	25.71	50.00	11.43	7.14				2.86	2.86	27.14	50.00	10.00	7.14				

Table 3. - Results of a Student/Staff Transport Mode Survey.

6. Traffic Generation at the School.

The provision of on-site drop-off and pick-up parking areas, instead of the current informal arrangement of using Fassifern Road, will obviously increase turning traffic volumes at the driveways. An allowance of 40 additional turning vehicles has been made for this, and the turn directions have been assessed as being in the same proportions as existing turning movements.

30 additional vehicles have been added for the increase in student numbers, and these have been distributed in the same proportions.

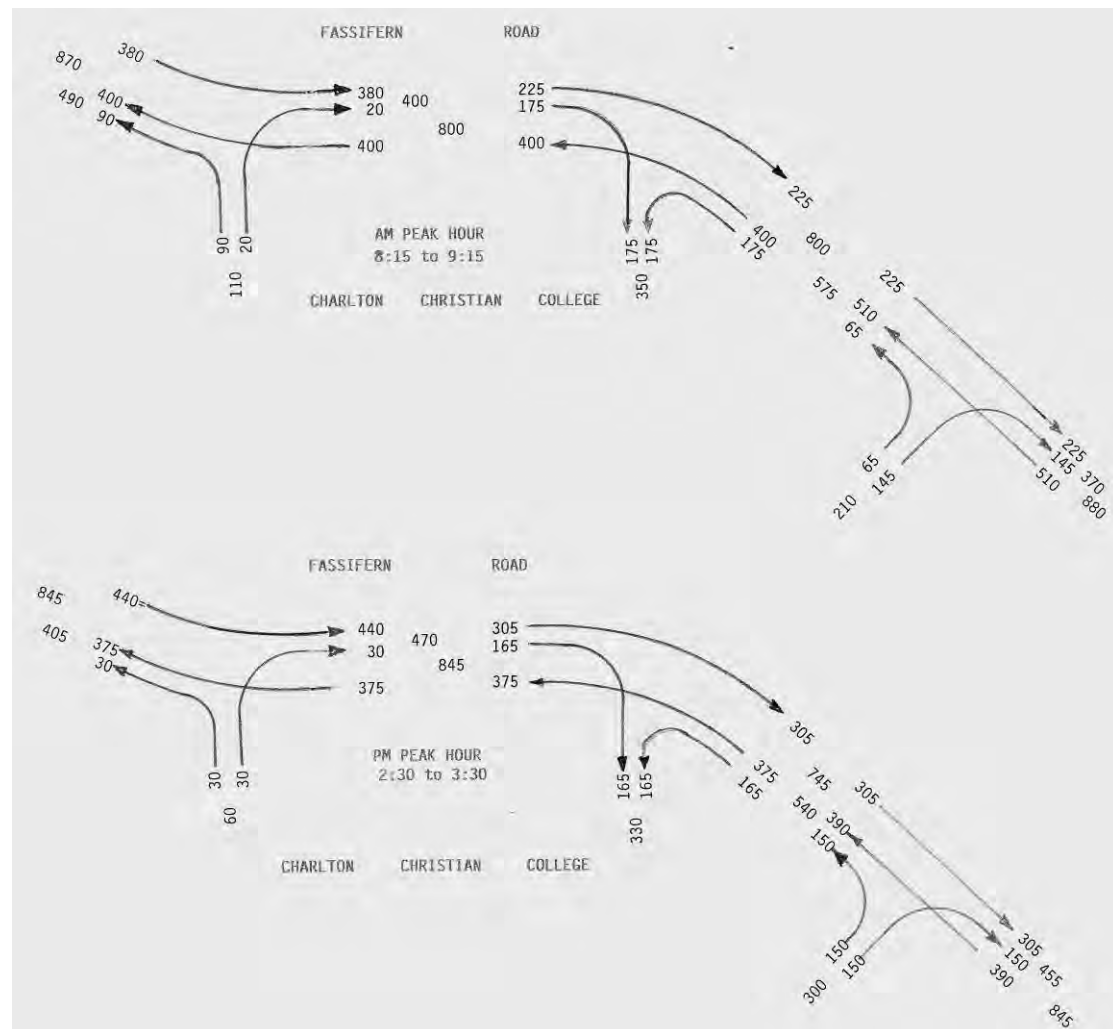


Figure 7.

Estimated Traffic Turning Volumes with 880 Students at the School.

In the following SIDRA 5.1 output tables the traffic volumes shown in Figure 7 have also been increased automatically in the program to allow for passenger car equivalent (Passenger car units, or pcu's) of heavy vehicles, in this case, buses.

7. Traffic Impact

The effects of this additional traffic can be measured by adding it to the existing turning movements at the driveways and applying them to the SIDRA 5.1 analyses. The SIDRA program also includes a 2% annual increase in Fassifern Road traffic, irrespective of increases generated by the school. The SIDRA Outputs for the AM Peak Hour are shown in Tables 4, a,b, and c, and the outputs for the PM Peak Hour are shown in Table 5, a, b, and c..

7.1 AM Peak Hour

Tables 5 a,b and c, show the outputs for the three driveways and all will operate satisfactorily at LoS A.

At the west egress driveway the analysis shows that all approaches will be operating at LoS A, even though the right turn egress movement is showing LoS B. The reason for this is that the average delays will be more than 15 seconds. The volume/capacity ratio is only 0.077, and this indicates that there is still ample capacity to accommodate future traffic.

At the ingress driveway, both approaches on Fassifern Road will operate at LoS A, and Cooper Avenue approach is also showing LoS A.

At the east egress driveway all approaches will operate at LoS A, although the right turn exit is showing LoS B. This is because of the average delays being 16 seconds. The volume/capacity ratio for this movement is only 0.418.

7.2 PM Peak Hour

Tables 5 a,b and c, show the outputs for the three driveways and all will operate satisfactorily at LoS A.

LoS B is shown for the right turn out of the west exit driveway, and this is again due to the of 21 seconds. The volume/capacity ratio is only 0.167.

Similarly, LoS B is shown for Cooper Avenue thru movement where the average delay is 15.4 seconds. This movement will only take place if a student who lives in Cooper Avenue is being picked up from school.

The additional traffic generated by the proposed expansion of Charlton Christian College will have no significant impact on the capacity of the intersections on Fassifern Road.

The parking and access plans will actually enhance safety for both vehicular and pedestrian traffic, not only at the driveway intersections, but for the length of Fassifern Road between Narara Street and the Railway Station access road.

The only movements which could be of concern is the right turn from Fassifern Road, into the ingress driveway, and the right turn into Cooper Avenue from Fassifern Road where it is not possible for a following vehicle to pass a stationary right turning vehicle on its' left.

MOVEMENT SUMMARY

Site: New Site - 1

Fassifern West Egress - AM
Giveaway / Yield (Two-Way)

Movement Performance - Vehicles											
Mov ID	Turn	Demand Flow veh/h	HV %	Deq. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Bus Egress Driveway											
1	L	89	5.0	0.123	4.1	LOS A	0.4	3.2	0.48	0.55	19.6
3	R	16	5.0	0.077	18.7	LOS B	0.3	1.8	0.78	0.88	12.8
Approach		105	5.0	0.123	6.3	LOS A	0.4	3.2	0.53	0.60	18.2
East: Fassifern Road E.											
5	T	421	3.0	0.220	0.0	LOS A	0.0	0.0	0.00	0.00	40.0
Approach		421	3.0	0.220	0.0	NA	0.0	0.0	0.00	0.00	40.0
West: Fassifern Road W											
11	T	400	3.0	0.209	0.0	LOS A	0.0	0.0	0.00	0.00	40.0
Approach		400	3.0	0.209	0.0	NA	0.0	0.0	0.00	0.00	40.0
All Vehicles		926	3.2	0.220	0.7	NA	0.4	3.2	0.06	0.07	36.8

MOVEMENT SUMMARY

Site: New Site - 1

Fassifern Road - Cooper & Ingress - AM
Giveaway / Yield (Two-Way)

Movement Performance - Vehicles											
Mov ID	Turn	Demand Flow veh/h	HV %	Deq. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
East: Fassifern Road E											
4	L	184	3.0	0.406	5.8	LOS A	3.2	22.7	0.59	0.21	35.6
5	T	421	3.0	0.406	1.7	LOS A	3.2	22.7	0.59	0.00	35.8
6	R	2	0.0	0.406	6.5	LOS A	3.2	22.7	0.59	0.73	35.7
Approach		607	3.0	0.406	3.0	NA	3.2	22.7	0.59	0.07	35.8
North: Cooper Avenue											
7	L	3	0.0	0.020	10.9	LOS A	0.1	0.5	0.57	0.44	14.2
8	T	1	0.0	0.020	13.6	LOS A	0.1	0.5	0.57	0.78	31.3
9	R	2	0.0	0.020	11.3	LOS A	0.1	0.5	0.57	0.70	14.0
Approach		6	0.0	0.020	11.5	LOS A	0.1	0.5	0.57	0.58	19.5
West: Fassifern Road W											
10	L	2	0.0	0.419	10.5	LOS A	3.8	27.4	0.80	0.10	26.6
11	T	237	3.0	0.419	6.4	LOS A	3.8	27.4	0.80	0.00	28.2
12	R	184	3.0	0.419	11.5	LOS A	3.8	27.4	0.80	1.07	26.4
Approach		423	3.0	0.419	8.6	NA	3.8	27.4	0.80	0.47	27.4
All Vehicles		1037	3.0	0.419	5.3	NA	3.8	27.4	0.68	0.23	33.4

MOVEMENT SUMMARY

Site: New Site - 1

Fassifern East Egress - AM
Giveaway / Yield (Two-Way)

Movement Performance - Vehicles											
Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: East Egress Driveway											
1	L	68	0.0	0.066	3.6	LOS A	0.3	1.9	0.52	0.54	20.0
3	R	153	0.0	0.418	16.0	LOS B	2.2	15.3	0.80	1.10	11.8
Approach		221	0.0	0.418	12.1	LOS A	2.2	15.3	0.71	0.93	13.5
East: Fassifern Road East											
5	T	537	3.0	0.313	0.0	LOS A	0.0	0.0	0.00	0.00	40.0
Approach		537	3.0	0.313	0.0	NA	0.0	0.0	0.00	0.00	40.0
West: Fassifern Road West											
11	T	237	3.0	0.138	0.0	LOS A	0.0	0.0	0.00	0.00	40.0
Approach		237	3.0	0.138	0.0	NA	0.0	0.0	0.00	0.00	40.0
All Vehicles		995	2.3	0.418	2.7	NA	2.2	15.3	0.16	0.21	36.1

Tables 4a, 4b, and 4c – SIDRA Movement Summaries AM Peak Hour – Year 2025.

MOVEMENT SUMMARY

Site: New Site - 1

Fassifern West Egress - PM
Giveaway / Yield (Two-Way)

Movement Performance - Vehicles											
Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Bus Egress Driveway											
1	L	32	5.0	0.042	3.7	LOS A	0.1	1.1	0.44	0.48	19.9
3	R	32	5.0	0.167	21.0	LOS B	0.6	4.0	0.82	0.90	12.1
Approach		63	5.0	0.167	12.4	LOS A	0.6	4.0	0.63	0.69	15.1
East: Fassifern Road E											
5	T	395	3.0	0.206	0.0	LOS A	0.0	0.0	0.00	0.00	40.0
Approach		395	3.0	0.206	0.0	NA	0.0	0.0	0.00	0.00	40.0
West: Fassifern Road W											
11	T	463	3.0	0.242	0.0	LOS A	0.0	0.0	0.00	0.00	40.0
Approach		463	3.0	0.242	0.0	NA	0.0	0.0	0.00	0.00	40.0
All Vehicles		921	3.1	0.242	0.8	NA	0.6	4.0	0.04	0.05	37.3

MOVEMENT SUMMARY

Site: New Site - 1

Fassifern Road - Cooper & Ingress - PM
Giveaway / Yield (Two-Way)

Movement Performance - Vehicles											
Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
East: Fassifern Road E											
4	L	174	3.0	0.392	6.5	LOS A	3.3	23.5	0.68	0.16	35.4
5	T	411	3.0	0.392	2.4	LOS A	3.3	23.5	0.68	0.00	35.3
6	R	2	0.0	0.392	7.2	LOS A	3.3	23.5	0.68	0.80	35.6
Approach		586	3.0	0.392	3.7	NA	3.3	23.5	0.68	0.05	35.3
North: Cooper Avenue											
7	L	3	0.0	0.023	12.7	LOS A	0.1	0.5	0.64	0.52	13.3
8	T	1	0.0	0.023	15.4	LOS B	0.1	0.5	0.64	0.82	30.4
9	R	2	0.0	0.023	13.0	LOS A	0.1	0.5	0.64	0.76	13.1
Approach		6	0.0	0.023	13.2	LOS A	0.1	0.5	0.64	0.65	18.5
West: Fassifern Road W											
10	L	2	0.0	0.451	10.7	LOS A	4.8	34.5	0.84	0.08	26.3
11	T	321	3.0	0.451	6.6	LOS A	4.8	34.5	0.84	0.00	28.0
12	R	174	3.0	0.451	11.7	LOS A	4.8	34.5	0.84	1.11	26.2
Approach		497	3.0	0.451	8.4	NA	4.8	34.5	0.84	0.39	27.4
All Vehicles		1089	3.0	0.451	5.9	NA	4.8	34.5	0.76	0.21	32.7

MOVEMENT SUMMARY

Site: New Site - 1

Fassifern East Egress - PM.
Giveaway / Yield (Two-Way)

Movement Performance - Vehicles											
Mov ID	Turn	Demand Flow veh/h	HV %	Delay Satn 1/s	Average Delay 1/s	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: East Egress Driveway											
1	L	158	0.0	0.131	3.0	LOS A	0.6	4.1	0.47	0.49	20.3
3	R	158	0.0	0.400	14.5	LOS A	2.1	14.7	0.77	1.07	12.4
Approach		316	0.0	0.400	8.7	LOS A	2.1	14.7	0.62	0.78	15.4
East: Fassifern Road East											
5	T	411	3.0	0.239	0.0	LOS A	0.0	0.0	0.00	0.00	40.0
Approach		411	3.0	0.239	0.0	NA	0.0	0.0	0.00	0.00	40.0
West: Fassifern Road West											
11	T	321	3.0	0.187	0.0	LOS A	0.0	0.0	0.00	0.00	40.0
Approach		321	3.0	0.187	0.0	NA	0.0	0.0	0.00	0.00	40.0
All Vehicles		1047	2.1	0.400	2.6	NA	2.1	14.7	0.19	0.24	35.1

Tables 5a, 5b, and 5c – SIDRA Movement Summaries PM Peak Hour – Year 2025.

Table 4.

8. Summary.

The 2009 Traffic Impact Assessment identified several road safety issues along Fassifern Road, in the vicinity of the Charlton Christian College. None of these safety issues have been addressed by Lake Macquarie City Council. It is again recommended that, rather than simply identifying these issues in this Traffic Impact Assessment, the College could submit a separate and specific request that the following existing deficiencies along Fassifern Road be addressed, stressing that they are not issues resulting from the proposed Master Plan.

1. The one-lane low clearance underpass to the west of the College severely restricts the capacity of Fassifern Road and this could be of concern in the event of evacuation should a bushfire threaten the area. This is an existing infrastructure deficiency and is not related to the proposed expansion of the College.
2. Queuing of northbound traffic often reaches past the College ingress driveway at Cooper Avenue. Such queuing could be eliminated by installing vehicle actuated traffic signals at the underpass. The proposed revision to vehicular access to the College will also enhance traffic flow.

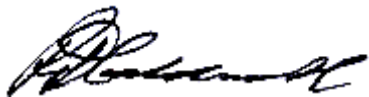
3. The flimsy wire barrier separating vehicle traffic from pedestrians at the culvert between the College and the railway station access road offers no protection for pedestrians and the 60+ students who travel to the College by train and then walk along Fassifern Road. The potential for an errant vehicle to crash through the barrier is exacerbated by the queuing for the underpass stop sign, and the right hand bend alignment in the road. Again, this is an existing infrastructure deficiency and is not related to the proposed expansion of the College.
4. There is no footpath between the culvert and the College and pedestrians are in conflict with cars parking to drop-off or pick-up students. This also is an existing infrastructure deficiency, and is not related to the proposed expansion.
5. Many parents park their cars along Fassifern Road and walk their children to or from the College. This is seen as a hazardous practice because of conflicts with traffic on Fassifern Road, and with traffic on the internal roadways. The College's proposals to provide for a Bus Stop, "Kiss and Go", Drop-off and Pick-up parking, as well as additional long stay parking, all within the grounds means that NO STOPPING zones can be implemented along Fassifern Road. There will be no demand generated by the College, to justify any pedestrian crossing facility across Fassifern Road.
6. Very few students travel to and from the school by bicycle, even though there is an off road cycleway linking Fassifern Station to Toronto CBD. The provision of a cycle path between the school and the cycleway, along with facilities at the school for secure, covered bike storage, could encourage more students to cycle to school.

The intersection analysis program, SIDRA 5.1, shows that additional traffic generated by the proposed expansion will not adversely affect traffic conditions on Fassifern Road. The proposed access and parking plan will actually enhance traffic safety in the vicinity of the College.

Parking supply is in excess of Council requirements. Councils in general, throughout NSW, along with the Roads and Maritime Services, and Education Department do not have any requirement for off-street drop-off or pick-up parking at schools, even though the activity is clearly the issue that initially led to the introduction of 40km/h zones at schools.

The proposed access road to Carpark 1 intersects with Fassifern Road at a point where there is adequate sight distances. The lane configuration on Fassifern Road will be dependant on Lake Macquarie Council's requirements and whether the underpass is to be left as is, controlled by traffic signals, enlarged to allow for two-way traffic, or removed altogether. The College should not be expected to make any monetary contribution to works on Fassifern Road as the need for such works has not arisen as a result of the proposal to increase the number of students.

The proposed eastern egress driveway onto Fassifern Road will not have sufficient sight distance for drivers to observe traffic coming from the south along Fassifern Road. To improve this sight distance, it will be necessary to relocate part of the School's security fence.



Robert D. Caldwell MITE(Life) MAITPM

Traffic Engineer.