St Nicholas Church in Wales Primary School, Vale of Glamorgan

Transport Assessment

Vale of Glamorgan Council

Project number: 60607807

June 2020

Quality information

Prepared by	Prepared by	Checked by
[redacted]		
Matt Parker Consultant	Kirsty Cox Principal Consultant	Spiro Panagi Associate Director

Approved by
To be undertaken following PAC
Jeremy Douch Regional Director

Revision History

Revision	Revision date	Details	Authorized	Name	Position
V1	10/10/2019	Draft for Internal Review	SP	Spiro Panagi	Associate Director
V2	16/06/2020	Updated draft for PAC submission	SP	Spiro Panagi	Associate Director

Distribution List

# Hard Copies	PDF Required	Association / Company Name

Prepared for:

Vale of Glamorgan Council

Prepared by:

AECOM Limited
1 Callaghan Square
Cardiff CF10 5BT
United Kingdom

T: +44 29 2067 4600
aecom.com

Ta l o Co t ts

Ta l s

i r s

dic s

I trod ctio

1.1 Introduction

1.1.1 AECOM has been commissioned by the Vale o Glamorgan (VoG) education department to provide transport planning and highways advice to in orm a planning application or the proposed new development o St Nicholas Church in Wales (CiW) Primary School. The work contained within this report has included scoping discussions and baseline desk studies with an assessment o the current highway network being undertaken along with the commissioning o tra ic surveys across the network.

AECOM have liaised with the VoG in their role as the Local Highway Authority (LHA) during a scoping exercise or the Transport Assessment (TA). A scoping note has been prepared and sent to the LHA to gain an understanding o the level o assessment re uired or the TA. Communication will continue between AECOM and the LHA so that urther additions changes and recommendation can be made where necessary. A copy o the scoping report is in **di** o this document.

1.1.3 This TA addresses the transport planning inputs re uired to in orm the planning application and its level o assessment has been agreed through meetings and discussions with the Local Education Authority (LEA). Although the LHA have not responded directly to the scoping note the LEA have consulted with the LHA and ed back the outcomes and comments to the project team which have then been incorporated into the TA.

1.1.4 The content o this TA has been in ormed by a site visit to the existing school site. this was carried out during standard operating conditions. This site audit was undertaken on 26th September 2019 between 08:00 and 09:15 in order to understand prevailing highway conditions.

1.2 Site Location and Existing Usage

1.2.1 The site is located in St Nicholas a rural village in the VoG which is accessed via the A48 connecting Cardi in the east to Cowbridge in the West. St Nicholas village is located approximately 9.6km west o Cardi City Centre and approximately 9.6km east o Cowbridge. There are small residential areas located to the east south and west o the school site within the village o St Nicholas.

1.2.2 The school is located on School Lane which is supplied by the A48. School Lane eeds into Well Lane to the northeast o the site. The school site is bounded by ields to the north and west and to the south and east by residential areas.

1.2.3 The site is currently occupied by the existing school which is proposed to be demolished and rebuilt.

1.3 Proposed Development

1.3.1 The development proposals are or the expansion o St Nicholas CiW Primary School to enable an increase in pupil intake. The expansion o the school entails demolition o the existing building and construction o a new acility on the same site.

1.3.2 The existing school has a permitted capacity o 126 pupils with 128 currently enrolled. The proposed capacity o the new school is 210 primary school pupils with an additional 24 Full-Time E uivalent (FTE) pupils in a new nursery acility totalling 234 pupils. The number o sta will increase rom 21.5 FTE to 24FTE members o sta .

1.3.3 The proposals include the demolition o the existing school building and being replaced by a new single-storey school building to be constructed on the same site but situated urther north within the site boundary. New sports pitches will be situated in the northern-most part o the site immediately north o the new school building. A new Multi-Use Games area (MUGA) will be located to the east o the new school building. A new car park and service yard is will be accommodated on the ootprint o the existing school building.

1.4 Report Structure

1.4.1 The TA examines the existing transport and highway issues relating to the proposed development. It also considers the expected multi-modal trip generation and tra ic impact on the local highway network and investigates methods o limiting car-based travel to produce a sustainable development in line with national and local planning guidance.

1.4.2 The remainder o the TA is structured as ollows:

- **S ctio isti Sit atio a d Sit cc ssi ility**: Examines the local transport conditions in the vicinity o the site and the accessibility o the site to non-car modes of travel;
- **S ctio D lo m t Pro osals**: Provides a detailed description o the development proposals, including the proposed means of access and parking provision;
- **S ctio Pla i Policy R i** Considers the development in the context o relevant national and local planning and transport policies;
- **S ctio Tri ratio a d Distri tio** Sets out the existing/ orecast trip generation or all modes of travel and method of trip distribution for the proposed development;
- **S ctio Tra ic Im act ss ssm t** Examines the impact o the development proposals on the highway network during the weekday AM and PM peak hours;
- **S ctio Tra s ort Im l m tatio Strat y** Details the key measures recommended to encourage sustainable travel; and
- **S ctio Co cl sio s** Summarises the key indings and conclusions o the TA.

Existing Situation and Site Accessibility

2.1 Introduction

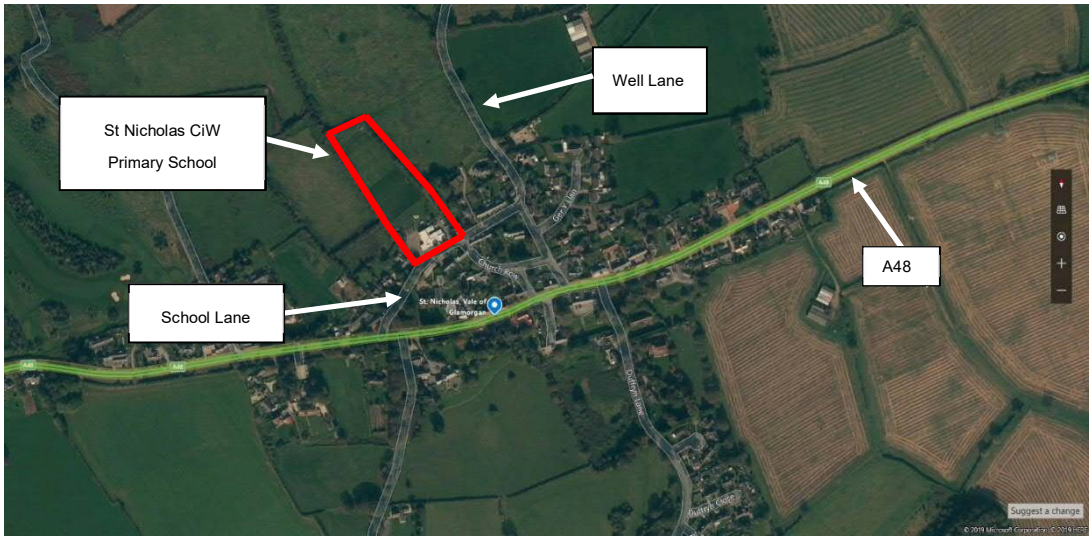
2.1.1 This section of the TA provides a description of the site location and existing usage, the local highway network, current safety and traffic conditions, and accessibility to non-car modes of travel.

2.2 Site Location and Existing Usage

2.2.1 The site is located in the village of St Nicholas, Vale of Glamorgan. It roughly rectangular in its shape with its south-eastern boundary fronting onto School Lane. The remainder of the school site is bounded to the south and east by residential areas and to the north and west by fields. The site is currently occupied by the existing school, which is fully operational.

2.2.2 The geographic location of the site within St Nicholas is shown in **Figure 2-1**.

Figure 2-1: Site Location Plan

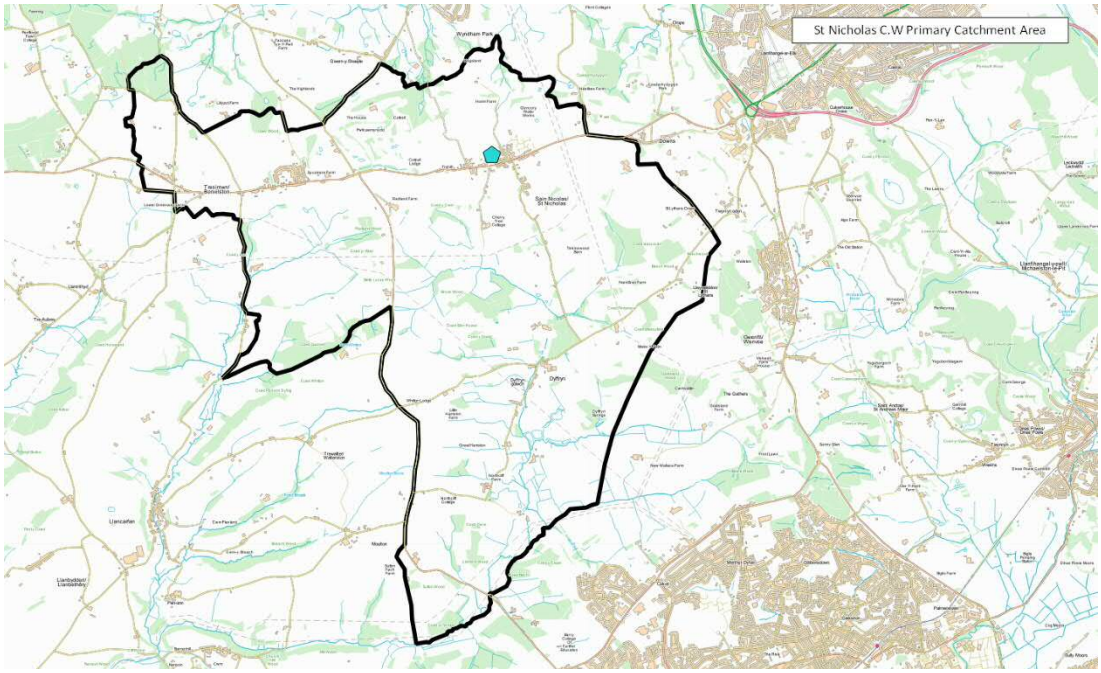


2.2.3 St Nicholas is located off the A48 to the west of Cardiff. Culverhouse Cross is located approximately 3.2km east of St Nicholas, and the settlements of Bonvilston and Cowbridge located to the west by approximately 3.2km and 9.6km respectively. Cardiff City Centre is situated approximately 9.6km to the east of St Nicholas.

2.3 Existing School

2.3.1 St Nicholas CiW Primary School caters for Reception through to Year 6 age pupils. The catchment area includes a number of rural villages situated between Bonvilston and Culverhouse Cross, including St Nicholas, Bonvilston and Duffryn. The catchment of the school is shown in **Figure 2-2**.

i r St Nicholas Ci Primary School Catchm t r a



Source: VoG

2.3.2 Pupil postcode in ormation as supplied by the VoG indicates that the vast majority o pupils reside urther a ield mostly at the western ringe o Cardi rom areas including Caerau and Ely. Just under 90% o pupils reside greater than 3km walking distance rom the school. This distribution is typical o a aith school which tend to have wider catchments rom a regional area.

P ils a d Sta

2.3.3 The existing school has a capacity o 126 pupils with 128 currently enrolled. There are currently 21.5 FTE sta based at the school.

cc ss a d Par i

2.3.4 Vehicle access to the school is via School Lane. School Lane can be accessed directly via the A48 at two separate locations approximately 260m apart. An Unnamed Road also joins to the A48 approximately 50m west o the eastern most junction with School Lane. This Unnamed road connects with School Lane as the minor arm in a priority junction in close proximity and opposite to the School. The south-western junction o School Lane with the A48 provides direct access to St Nicholas Primary School. There are no parking restrictions along these routes except or the school bus bay adjacent to the school. There are School Keep Clear markings along the rontage o the vehicular access to the school. Vehicular access to the school car park is accessed o School Lane through the bus layby indent in the carriageway alignment and is the sole point o vehicle access or all on-site vehicles including sta arrivals / departures visitors and service vehicles. The current school car park accommodates 15 parking spaces. The bus layby is also used as the re use collection point which con irms that re use vehicles serve the school rom the highway.

2.3.5 The sole pedestrian access to the school is achievable via the school gates located also at the south western boundary o the school to the south o the vehicle access and separated by the bus layby which are the primary access or pupils and parents during school drop-o and pick-up times.

P il Dro O Pic rra m ts

2.3.6 The school start and inish times are as ollows:

- 07:50 Be ore school clubs
- 08:50 School starts;
- 15:30 School ends;

- 15:30-16:00 Pupils wait at school or minibus.

2.3.7 There are no ormal acilities or dropping o / picking up children many vehicles use the western School Lane junction to access the school continuing to travel along School Lane to exit at its eastern junction with the A48. These vehicles were observed to either stop outside the school access to drop o children or manoeuvred into a temporary parking space. Vehicles also access the school via the Unnamed junction o the A48 parking along the Unnamed road or along School Lane. These vehicular movements create an in ormal one-way system operating clockwise west to east. It is noted that not all vehicles use this in ormal system and it is considered that urther encouragement rom the school would serve to improve tra ic movements during school arrival and departure times. This is considered urther in **S ctio** o this TA.

2.3.8 The school operates a private minibus service that is predominantly inanced by parents. At the time o this report the bus service costs 2.20 per pupil per journey. The route o the bus is reviewed annually to attempt to accommodate as many pupils as possible. The school runs ive bus service routes (two in the morning and three in the a ternoon). The maximum number o children who can be seated on each bus is 15. A summary o the bus routes and timetable is provided in **Ta l** .

Ta l School Mi i s Ro t a d Tim ta l

s Sto	s Tim				
	M	M	PM	PM	PM
Depart rom School	07:15	08:05	15:29	16:05	16:39
Nant-y-Rhos / Denison Way	07:25	08:15	15:38	16:16	16:48
Grand Avenue / Mostyn Road	07:28	08:17	15:41	16:19	16:50
Grand Avenue / Church o the Resurrection	07:30	08:19	15:43	16:21	16:52
Caeru Road	07:34	08:23	15:46	16:24	16:54
Heol Trelai	07:36	08:25	15:48	16:26	16:56
Arriva at School	07:46	08:35	-	-	-

2.4 Local Highway Network

2.4.1 The site is located on School Lane which connects with the A48 to the south o St Nicholas at a point approximately 150m south-west o the school and also at a point 175m south-east o the school. The western A48 / School Lane junction is a three-arm priority T-junction with a two-lane approach onto School Lane. The eastern A48 / School Lane junction is also a three-arm priority T-junction however the approach to the A48 is narrow (approximately 4m wide) which does not allow or two-way working despite the road marking identi ying it as a two-way carriageway.

2.4.2 Within the village School Lane is narrow wide enough or one vehicle with a speed limit o 30mph. There are sections o the road which are wide enough or two cars to pass but most o these sections are used or car parking by local residents. There is no street lighting provided outside o the school. There are no road marking tra ic regulation orders other than School Keep Clear marking directly outside the school. School Lane provides access to residential roads within St Nicholas.

2.4.3 The A48 is a single lane two-way road with a speed limit varying rom 60mph to 30mph along its length. The speed limit through St Nicholas is 30mph. The A48 links Culverhouse Cross with Cowbridge to the east and west respectively.

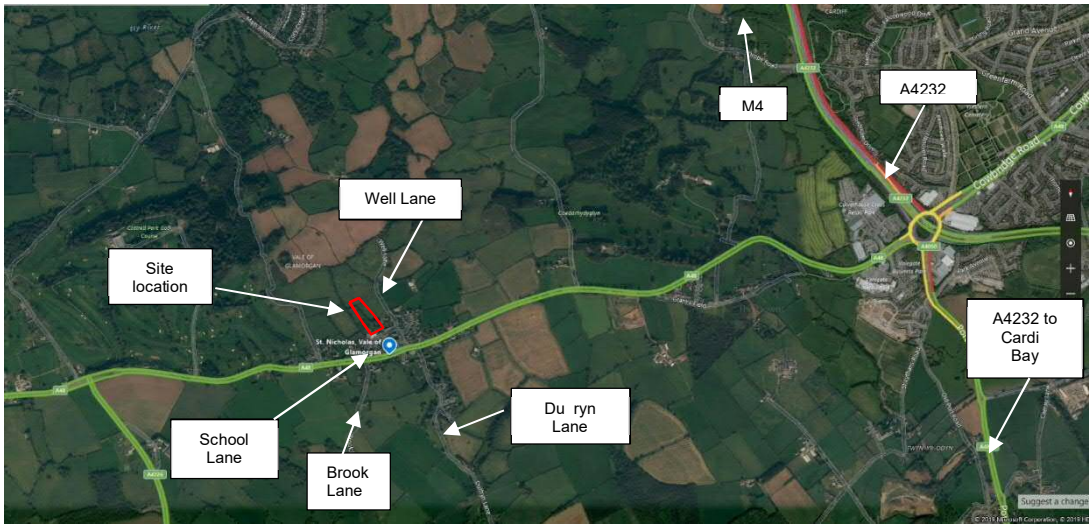
2.4.4 Well Lane connects to School Lane to the east o the school and routes north towards Peterson-super-Ely however it becomes a private road some distance beyond School Lane. It is single lane subject to a national speed limit although it is unlikely that this speed would be sa ely achievable owing to the narrow carriageway width and limited driver visibility.

2.4.5 Du ryn Lane and Brook Lane connects to the A48 and route south. Du ryn Lane routes towards Tinkinswood St Lyathans Dy ryn and Dy ryn Gardens. Brook Lane is a narrow single lane track routeing to several residential properties and a Welsh Water site.

2.4.6 The A4050 is a single carriageway road with a 50mph speed limit, routeing south from Culverhouse Cross towards Barry. The A4232 is a dual carriageway that routes north-northwest from Culverhouse Cross to the M4 Junction 33. It also routes West from Culverhouse Cross into Cardiff Bay. It is subject to the national speed limit along its length. The M4 is located approximately 4.8km to the north of the site.

2.4.7 The local highway network is illustrated in **Figure 2-3**.

Figure 2-3: Local Highway Network



2.5 Existing Traffic Conditions

Traffic Surveys

2.5.1 Traffic surveys have been undertaken at six locations in St Nicholas to understand the existing operational conditions on the local highway network. The extent of the surveys were discussed with the LHA..

2.5.2 The surveys included:

- Junction Turning Count (JTC) and Queue Length surveys, which were carried out between the hours of 07:00-10:00 and 14:30-18:00 on Thursday 6th June 2019, a neutral day during the school term time; and
- Automatic Traffic Count (ATC) surveys which were also undertaken for a seven-day period between from Wednesday 5th June 2019 – Tuesday 11th June 2019, which overlapped with the JTC and Queue Length surveys. ATC surveys record the speed, volume and classification of traffic by direction.

2.5.3 The JTC surveys were carried out at following locations:

1. School Lane / Access to St Nicholas CiW Primary School (three-arm priority T-junction);
2. A48 / School Lane (three-arm priority T-junction) – southwest of the site; and
3. A48 / School Lane (three-arm priority T-junction) – southeast of the site.

2.5.4 Queue Length surveys were carried out at Locations 2 and 3 only.

2.5.5 The ATC surveys were carried out at the following locations:

4. A48, west of School Lane;
5. School Lane; and
6. A48, east of School Lane.

2.5.6 A plan indicating the locations o the tra ic surveys is outlined in **i r** .

i r Tra ic S r y locatio s

2.5.7 A summary o the ATC survey results is included at **Ta l** .

Ta l S mmary o TC S r y R s lts

TC R r c Dir ctio			day ra Tra ic lo			
			M P a Ho r	School PM P a Ho r	PM P a Ho r	Ho r
4	A48 west o School Lane	Eastbound	806	412	379	6 852
		Westbound	293	549	748	6 581
		Two-Way	1 099	961	1 127	13 433
5	School Lane	Northbound	23	12	6	100
		Southbound	10	9	4	61
		Two-Way	33	21	10	161
6	A48 east o School Lane	Eastbound	856	471	392	7 080
		Westbound	315	592	754	6 885
		Two-Way	1 171	1 063	1 146	13 965

2.5.8 The ATC results show that there are currently between 13 000 to 14 000 two-way vehicle movements on the A48 per 24-hour period e uating to between 1 100 and 1 200 per peak hour. Tra ic lows are much lower on School Lane shown to be around 160 two-way movements per day and between with 33 two-way movements during the AM peak hour and 21 two-way movements in the School PM Peak hour (i.e. when school inishes hour commencing 15:00).

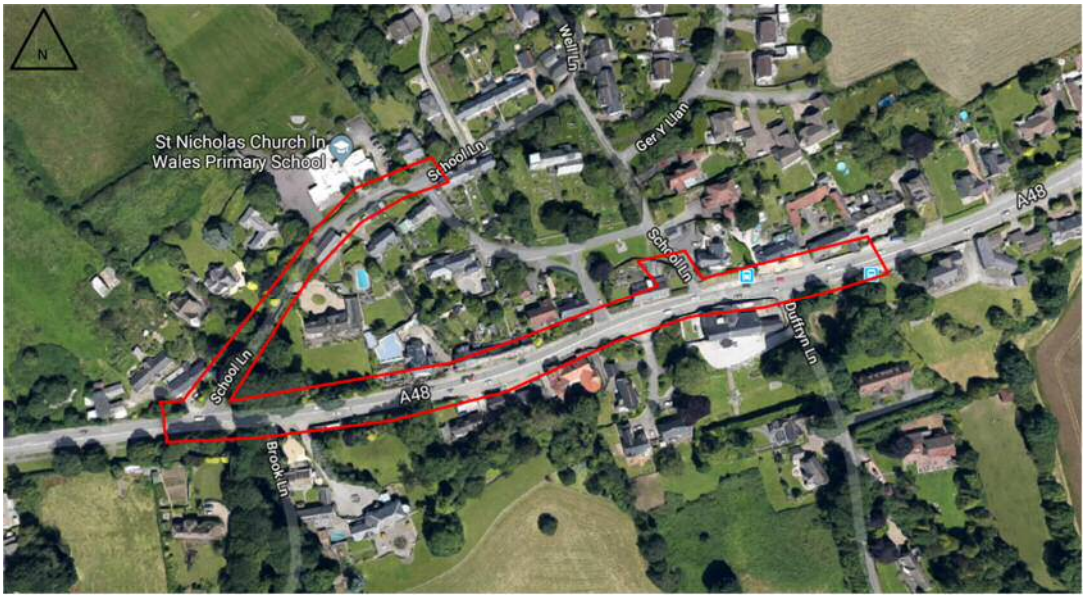
2.5.9 The ATC survey on School Lane demonstrates that vehicles speeds are around 20mph signi icantly lower than the 30mph speed limit.

2.6 Road Sa ety

2.6.1 Personal Injury Collision (PIC) data has been obtained rom the Welsh Government (WG) to determine whether there are any locations on the highway network with poor collision records. Data has been obtained or the most recent ive-year period.

2.6.2 The study area for obtaining PIC data has been determined based on a preliminary review of recorded collisions available from the 'Crashmap' online resource. The areas include the two junctions between School Lane and the local section of the A48. The area is shown in **Figure 2-5**.

Figure 2-5: PIC Study Area



2.6.3 The PIC data is summarised in **Table 2-3**.

Table 2-3: Summary of PICs

Locatio	No o PICs y S rity			
	Sli ht	S rio s	atal	Total
A48 / School Lane Junction (South-West)	0	0	0	0
A48 / School Lane Junction (East)	0	0	0	0
School Lane	0	0	0	0
A48 (Between School Lane junctions)	0	0	0	0
A48 (East o eastern A48 / School Lane junction)	1	0	0	1
Total				

2.6.4 A single PIC has occurred within the study area, which occurred in July 2016 at the signalised junction between the A48 and Duffryn Lane. The collision involved a motorcycle only. The accident description indicates that the rider of the motorcycle braked suddenly causing them to fall and sustain slight injuries. The road surface was wet / damp. The collision occurred at 10:26 during daylight conditions. This collision is considered to be a 'one-off' collision which does not form part of an accident cluster or pattern It is therefore not considered to be indicative of a highway safety issue at this location.

2.6.5 No PICs are recorded at the A48 / School Lane junctions or on School Lane. No 'fatal' or 'serious' PICs are recorded at St Nicholas. No PICs have involved school children or occurred during school arrival / departures times.

2.6.6 Overall, the nature and very low occurrence of PICs recorded on the local highway network confirms that there is not considered to a local highway safety issue.

2.7 Walking and Cycling

2.7.1 There are no ootways on School Lane in the vicinity o St Nicholas CiW School or connecting to the A48 to the southwest or southeast through the village with all pedestrian and cyclist movements re uired to use the carriageway. Whilst this situation is not ideal it is not considered to be a signi icant issue considering that tra ic speeds and volumes are extremely low. Pedestrian and cycle movements on the carriageway may serve to reduce vehicle speeds. The PIC records con irm that there are no recorded collisions on School Lane particularly not involving pedestrians or cyclists.

2.7.2 There is an existing ootway at the school entrance which provides pedestrian access rom the eastern end o School Lane. However the ootway is broken by the school vehicular access and is less than 1m wide and stops at the end o the existing bus bay.

2.7.3 Similarly the Unnamed road has no ootway or paving provided and there ore pedestrians and cyclists are also re uired to use the carriageway. Again there is evidence to suggest that there is no existing sa ety issue with this current operation.

2.7.4 There are paved ootways on either side o the A48 through St Nicholas these are o a standard width and o good uality sur ace and illuminated. Upon entering St Nicholas rom the east the ootway is on the south side o the carriageway only and upon entering rom the west the ootway is on the north side o the carriageway only. There is a signal-controlled crossing over the A48 at the A48 / Du ryn Lane junction.

2.7.5 There are no dedicated cycleways in the vicinity o the site and there ore all cyclists are re uired to use local carriageways.

2.7.6 Du ryn Lane can be used to access several residential streets located approximately 300m south o the A48. A ootway is provided intermittently along Du ryn Lane. Brook Lane south o the A48 / School Lane junction is a single track leading to several residential properties with no ootways or verges either side o the track.

2.7.7 Overall there is limited dedicated in rastructure or pedestrian and cyclists on the local highway network although this is considered to be typical o a rural village setting. The lack o ootways within St Nicholas and along School Lane is not considered to be a signi icant issue or highway sa ety risk owing to the low tra ic speeds and volumes as recorded by an ATC survey. Neither is this considered to be a signi icant barrier or pedestrian / cyclist movements to / rom the school site or existing and new pupils / sta . No PICs have occurred within the vicinity o the school or recorded as involving a pedestrian or cyclist.

2.8 Local Facilities

2.8.1 The Institution or Highways and Transportation s (IHT s) *Guidelines for Providing for Journeys on Foot* published in 2000 identi ies that 2km is the pre erred maximum walking distance or education purposes and commuting. Cycling has been identi ied as having the potential to replace car trips o up to 5km. The travel distance o 5km e uates to approximately a 20-minute journey by bicycle.

2.8.2 **i r** shows an approximate 2km walking distance rom the site. Existing and uture pupils and sta will travel to / rom the site to / rom their place o residence. **i r** shows that that there is not a signi icant level o residential development within walking distance o the school site.

i r m Radi s o th Sit

2.8.3 **Ta l** outlines the local acilities which are located within a reasonable walking and cycling distance o the school site.

Ta l Local aciliti s

	acility	al i Dista c m	Cycli Dista c m	al i Tim mi	Cycli Tim mi
1	Indian Marigold	2200m	2200m	29	7
2	The Red Lion (Pub)	2200m	2200m	28	9
3	Old Village Shop Ca e	2600m	2600m	32	9
4	Marks and Spencer Culverhouse Cross	2600m	2600m	37	9
5	McDonalds Culverhouse Cross	2700m	2700m	36	10
6	Tesco Express	2700m	2700m	38	10

Notes: 1) Distances are approximate and taken from the centre of the proposed development site.
2) Average walking speed of 1.4m/s has been assumed, based on IHT's 'Guidelines for Providing for Journeys on Foot'.
3) Average cycling speed of 6.7m/s has been assumed, based on IHT's 'Cycle-friendly Infrastructure'.

2.8.4 A number o additional acilities are also available at Culverhouse Cross located 2.7km to the east o St Nicholas e uating to approximately a 35-minute walk or a 10-minute cycle.

2.9 Public Transport

s S r ic s

2.9.1 The nearest bus stops to the site are the St Nicholas bus stops located near to the south-eastern junction between School Lane and the A48 and the A48 / Du ryn Lane junction. These are at approximately 230m 300m walking distance e uating to a three to our-minute walk. Both bus stops have a dedicated bus stop lay-by and bus shelter.

2.9.2 Bus stops are also provided at Trehill Church at the western edge o St Nicholas at approximately 300m walking distance e uating to a our-minute walk. The bus stop in the westerly direction has a bus shelter and elevated paving but no dedicated bus stop lay-by. The bus stop or buses travelling east is a pole mounted lag bus stop with no shelter raised paving or dedicated bus stop lay-by.

2.9.3 The IHT s *Guidelines for Providing for Public Transport in Developments* published in 1999 suggests 400m as the acceptable walking distance to a bus stop. These bus stops are there ore considered to be o acceptable walking distance rom the site.

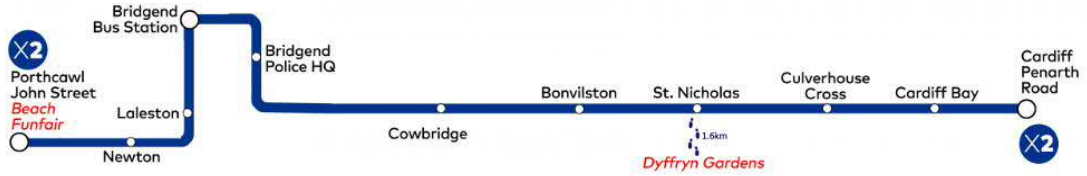
2.9.4 The X2 is the only bus that operates at these bus stops **Ta l** provides a summary o the X2 service timetable. **i r** illustrates the route o the X2 service.

Ta l s S r ic l ormatio

S r ic	Ro t	Days	Dir ctio	irst S r ic	Last S r ic	ro imat r cy
X2	Porthcawl - Cardi	Weekdays and Saturday	Towards Porthcawl	11:31	19:01	15-30 minutes
			Towards Cardi	08:06	23:35	15-30 minutes
		Sundays and Bank Holidays	Towards Porthcawl	10:32	23:47	Hourly
			Towards Cardi	09:28	18:28	Hourly

Notes: 1) Information obtained from First Cymru (August 2019).
2) Service times are arrival/departure times at/from the 'St Nicholas' bus stops on the A48.
3) Service X2 is operated by First Cymru.

i r Ro t o s S r ic



Source: First Cymru.

2.9.5 The X2 service o ers re uent weekday services connecting numerous residential areas and key destinations within Cardi Vale o Glamorgan and Bridgend. It operates approximately every 25-30 mins during the mornings and a ternoons and hourly in the evenings on weekdays and Saturdays. Sundays and bank holidays the buses run hourly services. The service does not provide a easible transport option or AM arrivals to the school site rom Cardi as the irst arrival is a ter the school start-time.

2.9.6 This assessment o bus service provision within walking distance o the site shows that there are opportunities to replace car trips rom the surrounding area although the key journey to / rom Cardi will not be suitable or existing or uture pupils or sta as the irst bus arriving rom the Cardi area is 11:31 past the start o school.

2.9.7 The school manages a parent unded minibus between the school and Cardi or journey to and rom the school.

Rail S r ic s

2.9.8 The nearest railway station is Waun-gron Park located approximately 6.5km away rom the site e uating to a 90-minute walk or a 21-minute cycle. Waun-gron Park rail services connect to Radyr and Cardi . Dinas Powys Railway Station is located approximately 7km away rom St Nicholas a 33min cycle away. This station provides services into Cardi and Barry. Both stations are operated by Transport or Wales.

2.9.9 Railway service in ormation rom both stations is summarised in **Ta l** .

Ta l Rail ay S r ic l ormatio

Dir ctio	Days	irst S r ic	Last S r ic	ro imat r cy
Cardi Central Waun-gron Park	Mon-Fri	07:06	22:55	20 minutes
	Sat	07:06	22:55	30 minutes
	Sun	07:06	22:55	30 minutes
Waun-Gron Park Cardi Central	Mon-Fri	07:12	22:12	30-1-hour minutes
	Sat	07:12	22:12	30 minutes
	Sun	-	-	-
Dinas Powys Cardi Central	Mon-Fri	05:29	23:25	15 minutes
	Sat	05:29	23:25	30-40 minutes
	Sun	09:10	23-10	30 minutes
Cardi Central Dinas Powys	Mon-Fri	05:20	23:31	15 minutes
	Sat	05:20	23:30	30-40 minutes
	Sun	08:25	22:25	30-40 minutes

Notes: 1) Information obtained from National Rail timetable (July 2019).
2) Services times are arrival/departure times for direct services at/from Dinas Powys and Waun-gron Park.
3) "-" means that no service is available for that day.

2.9.10 The walking / cycling distances mean that rail transport to / rom the school unlikely to be a easible option or existing or uture pupils.

2.10 Summary

2.10.1 This section o the report has provided a description o the site location and its existing usage the local highway network current sa ety and tra ic conditions and accessibility o the site to non-car modes o travel.

2.10.2 The site is situated in St Nicholas within the VoG. It lies just o the A48 approximately 6km to the west o Cardi City Centre. The site is occupied by the existing St Nicholas CiW Primary School and is surrounded by small residential areas to the east and south and ields to the north and west. The site is accessed by School Lane which is itsel supplied by the A48.

2.10.3 The school caters or Reception through to Year 6 age pupils with the catchment area including a number o local rural villages with the majority o existing pupils residing at the western ringe o Cardi rom areas including Caerau and Ely. The school currently accommodates 128 pupils and 21.5 FTE members o sta .

2.10.4 The local highway network to the site includes School Lane the A48 Du ryn Lane Well Lane Brook lane the A4050 and the A4232 into Cardi Bay and the M4. Tra ic surveys have been undertaken on roads surrounding the school site to identi y existing operational conditions and to in orm the tra ic impact assessment. The surveys were discussed with and in ormed by the VoG Highways O icers and included:

- Junction Turning Count (JTC) and ueue Length surveys which were carried out between the hours o 07:00-10:00 and 14:30-18:00 on Thursday 6th June 2019 a neutral day during the school term time; and
- Automatic Tra ic Count (ATC) surveys which were also undertaken or a seven-day period between rom Wednesday 5th June 2019 Tuesday 11th June 2019 which overlapped with the JTC and ueue Length surveys. ATC surveys record the speed volume and classi ication o tra ic by direction.

2.10.5 The locations o the surveys are provided at **i r** .

2.10.6 PIC data has been obtained rom the WG or a study area derived using Crashmap . The PIC data indicates that a single collision has occurred within the most recently available ive-year period which involved a rider alling rom a motorcycle at the A48 / Du ryn Lane junction. No pedestrians cyclists or children were involved in the collision and is not considered to be indicative o a highway sa ety issue.

2.10.7 The site has limited access or cyclists and pedestrians. There are no ootways on School Lane in the vicinity o the site. Whilst this situation is not ideal it is not considered to be a signi icant issue considering that tra ic speeds and volumes are extremely low. Pedestrian and cycle movements on the carriageway may serve to reduce vehicle speeds. There are paved ootways on either side o the A48 through St Nicholas and these are o a standard width and o good uality.

2.10.8 Bus services are accessible rom bus stops located on the A48 which are within the IHT s suggested acceptable walking distance. These provide access to a re uent weekday service that serves numerous residential areas and key destinations within Cardi and the Vale o Glamorgan. This will not be suitable or pupils / sta travelling to the school rom the Cardi Direction as the irst bus arrival in St Nicholas is past the school start time. The school provides a parent unded minibus between the school and Cardi or journey to and rom the school.

2.10.9 The nearest railway station to the site is Waun-Gron Park in Fairwater Cardi which provides accesses to high re uency services to/ rom Cardi Central (every 15 minutes on weekdays) and reasonable re uency services to/ rom Radyr. This station is well-beyond reasonable travel distances or trips to / rom school and is unlikely to be a easible option or existing or uture pupils and sta .

D lo m t Pro osals

3.1 Introduction

3.1.1 This section o the TA provides a description o the development proposals including the site access strategy or vehicles pedestrians and cyclists in addition to the on-site parking arrangements or vehicles and bicycles. The construction o the proposed development is also discussed.

3.2 Overview o Proposals

3.2.1 The development proposals are or the expansion o St Nicholas CiW Primary School to enable an increase in pupil intake. The expansion o the school entails demolition o the existing and construction o a new acility on the same site.

3.2.2 The school currently accommodates 128 primary school pupils. The school does not currently include a nursery. There are 23 members o sta based at the school e uating to 21.5 Full-Time E uivalent (FTE). There are (6.5 FTE teaching sta and 15 other / ancillary sta . The proposed expansion will accommodate 210 primary school pupils 24 FTE nursery pupils and 27 members o sta (24 FTE) consisting o 10 teaching sta (8.5 FTE) and 17 support / ancillary sta (15.5 FTE). This is an increase o 82 pupils 24 FTE nursery pupils and our members o sta (2.5 FTE).

3.2.3 The new school building will be constructed within the same site as the existing school to the north-west o the current structure. Ancillary acilities including hard and so t play areas habitat areas a Multi-Use Games Area (MUGA) sports pitches car parking and service yard are also included in the development proposals. A masterplan o the development proposals is provided at **di** .

3.3 Vehicle Access and Movements

3.3.1 Vehicular access to the school site will operate via an internal one-way system using two points o access. Vehicles will enter via the western-most junction (approximate location o current pedestrian access) and egress via the eastern-most o the two junctions (using the existing two-way access junction). These access arrangements have been designed to provide or delivery / servicing minibus drop-o school car park (or use by sta and visitors) and or escorting parent drop-o / pick-up. This represents a signi icant improvement over the current situation.

3.3.2 A service layby is provided to acilitate re use vehicles and service vehicles to the school. A minibus parking space will be located to the ar eastern end o the service layby ensuring sa e arrival o pupils to the school entrance. Parental drop o / pick up spaces are also provided within the school site to minimise the impact on the highway.

3.3.3 The school access junctions will ade uately accommodate the slight orecast intensi ication in use that is associated with the increase in sta numbers particularly with the provision o the internal circulation and one-way system. There will likely be an immaterial increase in service vehicles.

3.3.4 The existing access arrangements are currently used as both and access and exit. The proposals will designate the existing access as an exit only thereby reducing the number o tra ic movements and potential con licts with accessing a narrow internal route. The existing extent o visibility has been considered and this con irms that a splay o 2.4m x 43m can be achieved to the west looking right on exit and 34 metres can be achieved to the east looking le t on exit. The visibility splay re uired or a 30mph street is contained in *Manual for Streets* (M S) (2007) and is 43 metres. The existing character and constraints on this section o School Lane dictates that vehicle speeds are signi icantly lower than the speed limit. The existing junction has operated as a two-way arrangement or a considerable time and does not have any speci ic issues in terms o highway sa ety and incident history associated with it. On the basis that the proposals result in an improved operation o the local area removing servicing and bus movements rom the area immediately in ront o the junction and including these within an internal one-way system resulting in less con licting movements at this location the junction is considered ade uate.

3.3.5 The visibility splays are shown on the drawing included at **di** . These have been taken rom the natural position or joining the highway network on School Lane. It can be seen that the visibility in both directions along School Lane rom the stop line will not be obscured by the boundary ence o the school and in accordance with M S *"will not have a significant impact on road safety."* It can be seen that the visibility splay to the east o School Lane extends along School Lane. Part o the visibility splay includes existing eatures such as hedges which will need to be removed or cut back to ensure maximum visibility is achieved. Visibility is achieved at the junction o School Lane / Unnamed Road in this location.

3.3.6 Swept Path Analysis (SPA) has been undertaken or the proposed access egress and internal circulation. This is included at **di** . The SPA demonstrates that:

- A minibus (6.3m x 2.1m) can enter the site via the western access and exit via the eastern egress without demonstrable issue. A minibus can success ully access designated minibus spaces to the eastern extent o the service bay area to pick-up / drop-o children at the school
- A Phoenix 2 Duo re use vehicle (10.3m x 2.5m) can enter the site via the western access and exit via the eastern egress. The vehicle can manoeuvre into the service bay and reverse back to the bin stores with all reversing undertaken within the bay. The vehicle can then manoeuvre out o the service bay without overrunning the minibus parking space should a vehicle be parked when re use is collected. Appropriate iterations o test and design re inement have been undertaken to ensure the re use vehicle can e iciently undertake this manoeuvre without overrunning the minibus bay.
- A 7.5 tonne Box Van (8.0m x 2.1m) can enter the site via the western access and exit via the eastern egress This vehicle can enter the service bay and approach the minibus parking space then undertaking a reverse manoeuvre contained within the service bay to com ortably park adjacent the kerb and service receiving area.
- A large car (5.1m X 1.9m) can success ully manoeuvre into the radial parking spaces allocated or parent drop o / pick up. The dimensions o the vehicle assessed are larger than a standard (estate) car (4.7m x 1.8m) and longer than a standard design vehicle (4.8m x 2.0m) there ore a robust assessment has been undertaken to ensure these spaces are easily accessible.
- A Dennis Sabre Fire Tender (SWB) (7.0m x 2.4m) can enter the site via the western access success ully manoeuvre into the service bay i re uired and exit via the eastern egress.

3.3.7 The SPA has been undertaken with a le t in le t out scenario using the western access as the entrance and the eastern access as the exit. The SPA demonstrates that the proposed vehicle access and movement strategy or the proposed school is suitable or use by vehicles expected to re uire on-site access.

3.3.8 All vehicle access and areas or vehicle manoeuvres on-site are shown to be segregated rom vulnerable pedestrians by internal encing and bollards. This ensures vehicles would not overhang ootway areas providing sa e spaces or pedestrians on-site.

3.4 Pedestrian and Cycle Access

3.4.1 Primary pedestrian and cycle access will be via the two access points on School Lane. The western-most pedestrian access ootway will be 2m wide with the eastern-most access ootway is proposed to be 2.5m wide. These pedestrian accesses will provide sa e and secure access to the curtilage o the new school building rom which speci ic class arrangements or pupils to be dropped o and collected. The proposed main school o ice will be easily available via these accesses or pedestrian visitors.

3.4.2 A ebra crossing will be provided to acilitate sa e pedestrian crossing to the school entrance rom the sta and visitor car park. The ootpath has been extended into the carriageway at this location reducing the width o the ebra crossing and purpose ully to increase visibility or pedestrians around the minibus parking bay.

3.5 Parking Provision

Car Par i

3.5.1 The existing school car park does not have allocated or marked out parking bays but accommodates around 15 vehicles. Larger vehicles serve the school rom the highway and park in the bay across the school vehicular access.

3.5.2 The VoG Parking Standards 2019 has been adopted as Supplementary Planning Guidance (SPG). The standards identi y how the *CSS Wales Parking Standards 2008* will be applied across the VoG. The parking standards seek to assist developers designers and builders in the preparation and submission o planning applications and to achieve a common approach to the provision o vehicle parking acilities associated with new development and change o use.

3.5.3 The parking standards are de ined according to a oning system based on the number range and characteristics o acilities within walking distance and the level o public transport provision. St Nicholas village alls within one D Countryside.

3.5.4 The relevant parking standards and resulting vehicle parking re uirements or the proposed development are shown in **Ta l** .

Ta l hicl Par i Sta dards

D lo m t Ty	S Cat ory	Par i Ty	Sta dard	Par i R ir m t
Education	Nursery / In ants / Primary Schools	Teaching Sta	1 space per member o sta	9
		Ancillary Sta	0.5 spaces per member o sta	8
		Visitors	3 spaces	3
		Operational	1 space	1
			Total	21

Notes: 1) Provision calculated based on FTE staff.

3.5.5 On the basis that there will be 24 FTE sta based at the school up to 21 spaces will be re uired on-site including one parking space allocated or a commercial vehicle. O the 20 spaces or standard vehicles three should be allocated or visitors with the remainder or sta use. The SPG notes that parking standards indicated are set as the maximum provision meaning that the total car parking provision should not exceed the derived number o spaces.

3.5.6 The on-site provision is in accordance with the standards i.e. 21 spaces total o which 17 are or sta use three or visitor use and one space or operational use (i.e. the service lay-by). One space is designated or disabled use and two o the spaces allowing or Electric Vehicles should uture use be re uired. A minibus space is also proposed adjoining the service layby.

3.5.7 In addition to the above on-site parent drop o / pick up acilities have been considered and provided in a limited acility which will aim to minimise the impact on the local highway.

3.5.8 The SPG also notes that:

- Parking should be calculated based on ull capacity o the nursery. This has been considered within the FTE sta presented in **Ta l** ;
- Where part-time sta are employed they should be aggregated to their ull-time e uivalents. FTE staff have been considered in the calculation;
- A minimum o 15 car spaces will be re uired or most schools but aith schools (i.e. St Nicholas CiW Primary School) may be the exception;
- The parking area should include a acility or vehicles to turn without reversing. A service yard is provided within the site boundary containing all movements o the circulatory;
- Appropriate provision must be provided or parental drop o / pick up o children as dictated by local circumstances and any school travel plan. Drop o areas must be located so that the sa ety

o pupils walking or cycling to school is not jeopardised. This is provided on the local highway network currently. Arrangements or the new school acility are discussed in **S ctio** o this TA.

3.5.9 The parking standards do not speci y provision or disabled blue badge holders or the education land use class but state that *"appropriate provision must be provided for use by disabled people"*. The re uirement or existing employment development is set out in the SPG as 2% plus one additional space additional to the general parking outlined above. On this basis the re uirement or disabled parking at the school is 1.

Cycl Par i

3.5.10 VoG cycle parking standards are set out in Appendix 4 o the Parking Standards SPG. The guidance states that cycle parking should be located in a sa e secure and convenient location and or reasons o security cycle parking acilities should be located in areas that are visible and there ore allow or in ormal surveillance.

3.5.11 **Ta l** summarises the cycle parking standards as outlined in the SPG. Based on the SPG and the number o proposed sta and pupil numbers at the school 18 cycle stands will be provided.

Ta l Cycl Par i Sta dards N rs ry l a ts Primary Schools

D lo m t Ty	S Cat ory	Cycl Par i Ty	Sta dard	llocatio o S ac s
Education	Nursery / In ants / Primary Schools	Short Stay	1 stand per 5 sta and 1 stand per 20 children	16
		Long Stay	1 stand per 100 children	2
			Total	

Notes: 1) Figures are subject to rounding

3.6 Construction Tra ic

3.6.1 Managing the e ects rom the construction o the proposed development will orm part o a Construction Tra ic Management Plan (CTMP) or similar document. The management measures will be intended to protect the environment amenity and sa ety o local residents businesses the general public and the surroundings in the vicinity o the proposed development.

3.6.2 As part o the CTMP a construction vehicle routeing regime or access to the construction site will be identi ied and agreed with the LHA to ensure that drivers o construction related vehicles do not use inappropriate routes which are unsuitable by virtue o their width alignment or character. The CTMP will also consider measures to discourage deliveries during peak tra ic periods on the highway network. There will be ongoing monitoring o the CTMP during the construction phase to establish the e ectiveness o the measures.

3.7 Summary

3.7.1 This section o the TA has provided a description o the development proposals including the site access strategy. The development proposals are or the expansion o St Nicholas CiW Primary School to enable an increase in pupil intake. The expansion o the school entails demolition o the existing and construction o a new acility on the same site.

3.7.2 The new school building will be constructed within the same site as the existing school to the north-west o the current structure. Ancillary acilities including hard and so t play areas habitat areas a MUGA sports pitches car parking service area and parent drop o / pick up are also included in the development proposals. A masterplan o the development proposals is provided at **di** .

3.7.3 The proposed expansion will accommodate 210 primary school pupils 24 FTE nursery pupils and 27 members o sta (24 FTE) consisting o 10 teaching sta (8.5 FTE) and 17 support / ancillary sta (15.5 FTE). This is an increase o 82 pupils 24 FTE nursery pupils and eight members o sta (6.5 FTE).

3.7.4 Vehicular access to the school site will operate via an internal one way system using two points o access Vehicles will enter via the western-most junction (approximate location o current pedestrian access) and egress via the eastern-most o the two junctions (using the existing two way access junction). These access arrangements have been designed to provide or delivery / servicing minibus drop-o school car park (or use by sta and visitors) and or escorting parent drop-o / pick-up. This represents a signi icant improvement over the current situation.

3.7.5 . This access arrangement will provide or delivery / servicing minibus drop-o and parking school car park (or use by sta and visitors) and parent drop o / pick up acilities. The accesses and internal highways have been subject to SPA which demonstrates that these arrangements are suitable or the vehicles likely to access the site in uture.

3.7.6 Primary pedestrian and cycle access will be via the two access points on School Lane. The western-most pedestrian access ootway will be 2m wide with the eastern-most access ootway is proposed to be 2.5m wide. These pedestrian accesses will provide sa e and secure access to the curtilage o the new school building rom which speci ic class arrangements or pupils to be dropped o and collected. The proposed main school o ice will be easily available via these accesses or pedestrian visitors.

3.7.7 A ebra crossing will be provided to acilitate sa e pedestrian crossing to the school entrance rom the sta and visitor car park. The ootpath has been extended into the carriageway at this location reducing the width o the ebra crossing and purpose ully to increase visibility or pedestrians around the minibus parking bay.

3.7.8 The VoG Parking Standards March 2019 has been adopted as Supplementary Planning Guidance (SPG). The parking standards seek to promote and ensure transparent and consistent approaches to the provision o parking. On the basis that there will be a total o 24 FTE members o sta located at the school post-development up to 21 spaces will be re uired on-site with one parking space allocated or a commercial vehicle three spaces allocated or visitors one or disabled access with the remainder or sta use. A total o 18 cycle stands will be provided in an appropriate location within the site and based on the number o proposed sta and pupil numbers at the school.

Pla i Policy R i

4.1 Introduction

4.1.1 This section o the TA provides a review o relevant planning and transport policies at a national and local level.

4.2 National Policy

Pla i Policy al s ditio D c m r

4.2.1 Edition 10 o *Planning Policy Wales* (PPW) was published in December 2018 and sets out the land use planning policies o the Welsh Government (WG). It is supported by a number o Technical Advice Notes (TANs) which provide detailed planning advice on subjects contained within PPW. *TAN 18: Transport* is considered o particular relevance to the proposed development and is included in this policy review. An overarching theme within PPW is the commitment o the WG to sustainability.

4.2.2 Planning policy in Wales is plan-led with up to date Local Development Plans (LDPs) orming a undamental part o the system. PPW states that planning applications *"must be determined in accordance with the adopted plan unless material considerations indicate otherwise"*. This section provides a review o the VoG LDP to demonstrate that the proposed development accords with policy.

4.2.3 PPW outlines the vision or development o a more e ective and e icient transport system the promotion o more sustainable and healthy orms o travel as well as minimising the need to travel. PPW indicates that this will be achieved through integration:

- *"within and between different types of transport;*
- *between transport measures and land use planning;*
- *between transport measures and policies to protect and improve the environment; and*
- *between transport measures and policies for education, health, social inclusion and wealth creation."*

4.2.4 Paragraph 4.1.8 states that the WG is committed to reducing reliance on the private car and supporting a modal shi t to walking cycling and public transport. Delivering this objective will make an important contribution to decarbonisation improving air uality increasing physical activity improving the health o the nation and realising the goals o the *Well-being of Future Generations (Wales) Act 2015*.

4.2.5 The WG outlines a transport hierarchy in relation to the accessibility o new development which prioritises walking and cycling in the irst instance ollowed by public transport and inally private motor vehicles. This TA provides a number o measures to encourage sustainable travel with the view to reduce single occupancy car travel. These measures are set out at **S ctio** o this TA.

4.2.6 Paragraph 4.1.10 o PPW states:

"Development proposals must seek to maximise accessibility by walking, cycling and public transport, by prioritising the provision of appropriate on-site infrastructure and, where necessary, mitigating transport impacts through the provision of off-site measures, such as the development of active travel routes, bus priority infrastructure and financial support for public transport services."

4.2.7 Paragraph 4.1.50 states that car parking provision has a major in luence on both mode choice and development patterns and that *"minimum parking standards are no longer appropriate"*.

4.2.8 Paragraphs 4.1.56 to 4.1.57 identi y the re uirements or development proposals to be accompanied by a TA. It directs pro essionals to the TAN 18 or guidance on the preparation and content o TA s.

T ch ical d ic Not T N Tra s ort

4.2.9 TAN 18 describes how to integrate land use and transport planning and explains how transport impacts should be assessed and mitigated. It supports and should be read in conjunction with PPW.

4.2.10 The integration o land use and transport planning orms part o an overall sustainable development approach by the WG towards strategy and policy objectives. This is predominantly through maximising the accessibility o developments by sustainable modes o transport. This also includes reducing the need to travel and encouraging multi-purpose trips. Accessibility is de ined in TAN 18 as *"the relative ability to take up services, markets or facilities"* (p.8).

4.2.11 The proposed development demonstrates a clear link between land use and transport planning and is accessible by sustainable transport modes in as ar as can be achieved in a deep rural setting. There are opportunities to improve the potential or active travel and creation o a ormal one-way tra ic lows during school opening and closing times or parent drop o and collection. These are discussed urther in **S ctio** o this TA.

4.2.12 Paragraph 4.6 states that parking standards or new development should be determined on an evidence basis which includes accessibility to other modes o transport. The proposed development provides car and cycle parking in accordance with the VoG Parking Standards SPG (2019) as discussed in **S ctio** o this TA.

4.2.13 Section 5 re uires all new development to be designed in a way that is inclusive or all. The design o the development also plays an important role in providing genuine alternatives to car travel. This includes su icient cycle parking in close proximity to the school access as described in **S ctio** o this TA.

4.2.14 Section 6 considers the role o walking and cycling within developments. It states that development should encourage walking or short local journeys whilst ensuring that they are ully accessible and inclusive or pedestrians. Cycling has the potential to replace shorter car journeys or both rural and urban settings which should be encouraged by new developments in the case o a primary school cycle take up is likely to be low. The development is improving pedestrian access into the school whilst also improving the sa ety o pedestrians.

4.2.15 Section 7 considers the role that public transport can play in o ering an alternative to car travel giving emphasis to the provision o new services and acilities as well as acilitating interchange as methods o encouraging uptake. The development proposals include the retention o the existing school bus which undertakes two journeys in the morning and three journeys in the a ternoon.

Th al s Tra s ort Strat y

4.2.16 The *Wales Transport Strategy* (WTS) sets out the WG s main aims in improving transport:

- *"Reducing greenhouse gas emissions and other environmental impacts;*
- *Improving public transport and better integration between modes;*
- *Improving links and access between key settlements and sites across Wales and strategically important all-Wales links; and*
- *Increasing safety and security."*

4.2.17 As discussed in previous sections the proposed development will improve integration between modes acilitate use o existing school transport availability enhance sustainable travel and improve connectivity. It is there ore considered to be aligned with the WTS.

Natio al Tra s ort i a c Pla

4.2.18 The purpose o the *National Transport Finance Plan* (NTFP) is to:

- Provide the timescale or inancing schemes undertaken by the WG;
- Provide the timescale or delivering these schemes and detail the estimated expenditure re uired to deliver the scheme; and
- Identi y the likely source o inancing to allow delivery to take place.

4.2.19 The NTFP is not a policy document nor does it seek to prioritise schemes to be taken orward. It brings together projects already being delivered. Some o these are already under construction. Others are already under development but are not yet being built.

cti Tra l al s ct

4.2.20 The *Active Travel (Wales) Act* became law in Wales in November 2013. The Act makes it a legal re uirement or local authorities in Wales to map and plan or suitable routes or active travel and to build and improve their in rastructure or walking and cycling every year. It also re uires both the WG and local authorities to promote walking and cycling as a mode o transport.

4.2.21 The purpose o this Act is to re uire local authorities to continuously improve acilities and routes or pedestrians and cyclists and to prepare maps identi ying current and potential uture routes or their use. The Act also re uires new road schemes (including road improvement schemes) to consider the needs o pedestrians and cyclists at design stage.

4.2.22 The Act is accompanied by a statutory design guidance document published in December 2014 which provides advice on the planning design construction and maintenance o active travel networks and in rastructure and is to be used at all stages o the process. Re erence will be made to this guidance in the planning and design o the proposed development.

ll i a d t r ratio s al s ct

4.2.23 The *Wellbeing of Future Generations (Wales) Act 2015* has resulted in the WG outlining seven goals in a wellbeing statement (published in 2017) that contribute to sustainable development and details the aims to improve economic social environmental and cultural wellbeing o Wales or uture generations. The Act places a duty on Local Authorities to set wellbeing objectives and contribute to achieving the seven well-being goals which are:

- A prosperous Wales;
- A resilient Wales;
- A healthier Wales;
- A more equal Wales;
- A Wales o cohesive communities;
- A Wales of vibrant culture and thriving Welsh language; and
- A globally responsible Wales.

4.2.24 The seven goals orm the basis or twelve objectives also detailed in the wellbeing statement. Several o these are directly relevant to this proposed scheme:

- Drive sustainable growth and combat climate change;
- Promote good health and well-being or everyone; and
- Build healthier communities and better environments.

4.2.25 By improving sustainable transport in rastructure within the school site and providing a sa er environment within the area surrounding the school a mode shi t away rom car to walking cycling and school bus use will be encouraged. By creating an area that supports active travel the communities that use the area will be healthier and have an improved environment to live and work and be educated in.

4.3 Local Policy

4.3.1 Planning legislation states that applications must be determined in accordance with the LDP unless material considerations indicate otherwise.

Th al o lamor a Local D lo m t Pla

4.3.2 The VoG LDP was updated in June 2017 and covers the period 2011-2026. The vision or the VoG is or a place:

- *"That is safe, clean and attractive, where individuals and communities have sustainable opportunities to improve their health, learning and skills, prosperity and wellbeing; and*
- *Where there is a strong sense of community in which local groups and individuals have the capacity and incentive to make an effective contribution to the future sustainability of the area."*

4.3.3 In support o the social economic and sustainable themes intrinsic to the LDP and Community Strategy Vision ten key strategic objectives have been developed that set the context o the LDP Strategy. The strategic objective most appropriate to this scheme is:

- Objective 3: To reduce the need or VoG residents to travel to meet their daily needs and enabling them greater access to sustainable orms o transport.

4.3.4 The LDP urther develops Strategic Policies to underpin the LDP Strategy and urther develops policies speci ically relating to Managing Growth and Managing Development in the VoG.

4.3.5 Strategic Policy SP7 (Transportation) states:

"Sustainable transport improvements that serve the economic, social and environmental needs of the Vale of Glamorgan and promote the objectives of the South East Wales Regional Transport Plan and the Local Transport Plan will be favoured"; and

"Priority will be given to schemes that improve highway safety and accessibility, public transport, walking and cycling. All new developments that have a direct impact on the strategic transportation infrastructure will be required to deliver appropriate improvements to the network".

4.3.6 The proposed development will include eatures to improve pedestrian sa ety within the site such as dropped kerb and tactile paving crossings at the junctions with internal roads bollards along the boundary o the servicing bay and parent drop o / pick up to segregate vehicular and pedestrian movements and a ebra crossing to sa ely guide pedestrians to / rom the sta and visitor car park.

4.3.7 Policy MG6 (provision o Education Facilities) provides details o land allocations or speci ic school sites however it goes onto state that *"existing schools will be extended or improved to meet demand for school places during the plan period."*

4.3.8 Policy MD2 (Design o New Development) states in relation to transport and highways that development proposals should:

- *"Provide a safe and accessible environment for all users, giving priority to pedestrians, cyclists and public transport users";* and
- *"Have no unacceptable impact on highway safety nor cause or exacerbate existing traffic congestion to an unacceptable degree".*

4.3.9 In respect to this the LDP states:

"All new development should be highly accessible. Walking and cycling have an important role to play in the management of movement across the area, particularly reducing the number of short trips taken by car. Developers will be required to ensure that new developments encourage walking and cycling by giving careful consideration to location, design, access arrangements, travel 'desire lines' through a development, and integration with existing and potential off-site links. Providing safe and convenient walking and cycling environments will help tackle health problems associated with physical inactivity and

social exclusion factors arising from car dependency, poor access to services and public transport facilities."

4.3.10 The proposed development seeks to provide a sa e and accessible environment or all users by encouraging a one-way system in the surrounding school area including School Lane to reduce the potential o congestion and vehicle con licts around parked vehicles. The inclusion o a parent drop o / pick up acility within the school grounds will help to minimise the impact on the local highway network. The proposals also include improvements to the pedestrian access to the school urther improving pedestrian sa ety.

Th al o lamor a Local Tra s ort Pla

4.3.11 The Local Transport Plan (LTP) seeks to identi y the sustainable transport measures re uired to ensure the VoG adheres to current re uirements and good practices to allow or a sustainable transport environment or the period 2015 to 2020 as well as looking orward to 2030. It there ore seeks ways to secure better conditions or pedestrians cyclists and public transport users and to encourage a change in travel choices away rom the single occupancy car.

4.3.12 As most journeys by car particularly or shopping and school travel are relatively short better conditions or pedestrians and cyclists can lead to a reduction in car use. A reduction in car use can promote good health and well-being reduce the negative impacts on the environment that car travel can bring o er better access to services and acilities which in turn can o er improved economic opportunities and reduce the potential or tra ic accidents. Sustainable transport in rastructure and services are there ore an important eature o modern-day li e.

Th al o lamor a Par i Sta dards

4.3.13 The VoG parking standards are set out in SPG to the LDP; the SPG was adopted in March 2019.

4.3.14 The SPG sets out the VoG s parking standards and explains the planning policy or parking re uirements or new developments or changes o use. The parking standards seek to promote and ensure transparent and consistent approaches to the provision o parking. In addition to this it helps to in orm developers and designers what is expected o them in terms o sustainability considerations and travel planning.

4.3.15 The proposed development provides parking in accordance with the SPG as discussed at **S ctio** o this TA.

4.4 Summary

4.4.1 This section o the report has provided a review o existing planning and transport policies at a national and local level that are considered relevant to the proposed development.

4.4.2 Planning law re uires that applications or planning permission must be determined in accordance with the adopted LDP. The proposed development is considered to align with the objectives o the LDP.

4.4.3 The proposed development will acilitate opportunities or sustainable travel through the implementation o a Travel Plan which is a re uirement o the national and local policy. This will not orm part o the planning application submission; however it will be secured as a condition through the planning process. Other measures are outlined in **S ctio** o this TA.

4.4.4 The proposed development will comply with the national and local policy and guidance with access to the site being sa e and suitable or all users. The site is accessible via a range o sustainable travel modes which will be urther encouraged via a range o improvements largely considered within onsite design. In summary the proposals comply with national and local policies.

Tri ratio a d Distri tio

5.1 Introduction

5.1.1 This section o the TA outlines the method or calculating multi-modal trip generation and tra ic distribution / assignment or the existing and redeveloped primary school site. The increase in tra ic lows associated with the new school acility have been derived to in orm the tra ic impact assessment contained later in this TA.

5.2 Existing School

5.2.1 The existing school accommodates 128 FTE primary school pupils and 21.5 FTE members o sta . The existing mode share and tra ic generation or both pupil and sta trips to / rom the school site have been derived in order to understand the likely travel patterns or the expanded school site. Neither the school nor the VoG hold any data on the existing trip generation or mode choice or the pupil or sta population. A irst principles methodology has there ore been developed and applied to both the existing and proposed schools.

P il Tri ratio Distri tio a d ssi m t

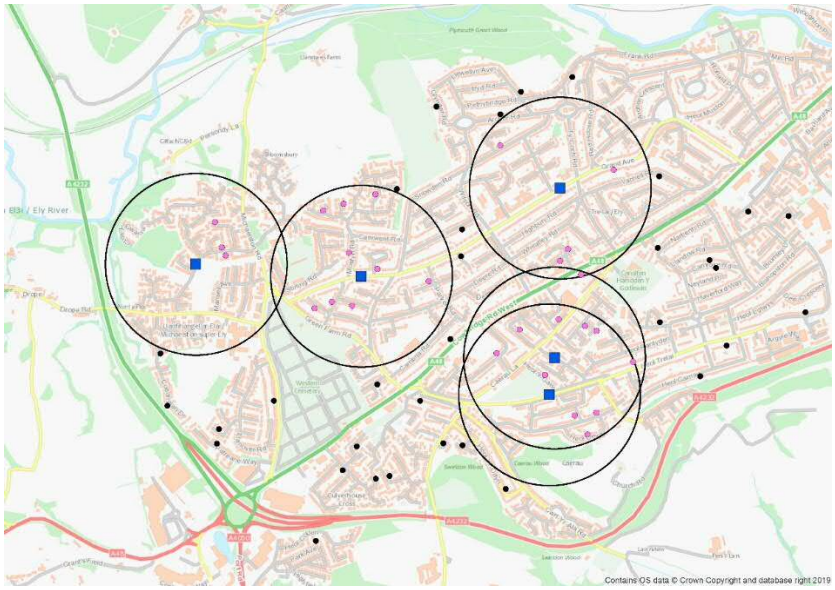
5.2.2 Pupil trip generation has been derived using a irst principles approach based on pupil home postcode data as supplied by the VoG. This data has been analysed to understand where pupils are travelling to / rom school and the likely transport modes used to complete the journey. The vast majority o pupils reside in the residential areas at the western ringe o Cardi (i.e. Caerau Ely).

5.2.3 The school provides a school minibus service which operates between the school site and West Cardi . The current occupancy o the school bus is unknown however or the purposes o this assessment it is assumed that each service would be at ull occupancy o 15 pupils accommodating 30 pupils during the morning (i.e. two runs) and 45 pupils (i.e. three runs) during the a ternoon as per the existing timetable.

5.2.4 Geographic In ormation System (GIS) analysis has been used to determine which pupils are likely to travel to / rom school using the bus. Existing pupil postcodes have been plotted along with a 400m catchment o each o the bus stop on the current route as outlined in **Ta l** . The bus-stop catchment o 400m has been used based on the CIHT guidance or acceptable walking distance as discussed in **S ctio** o this TA. It is recognised that the bus route may vary year-on-year however the existing route is considered to be representative o a typical route and likely catchment.

5.2.5 The GIS analysis is presented in **i r** . Postcodes coloured black are considered to be outside o the school minibus catchment. Postcodes coloured pink are considered to be inside the school minibus catchment.

i r s Catchm t IS alysis



5.2.6 The AM and PM occupancy o the bus 30 and 45 pupils respectively has been apportioned e ually across these postcodes to derive the school bus mode share. These postcodes have then been removed rom the rest o the analysis.

5.2.7 For the remaining postcodes the mode share or trips within two miles o the school has been derived rom the National Travel Survey (NTS) Table NTS0614 (2018). Although there are bus services which stop within acceptable walking distance rom the school this is unlikely to be a easible option or this site as the service between Cardi and St Nicholas does not provide a suitable service or trip to school during the AM peak hour. Any tips to / rom school via bus mode are more likely to be via the dedicated minibus. There ore the bus mode share rom the NTS has been re-assigned proportionately between the car walking and cycling modes. For trips o two miles or greater it has been assumed that pupils travel as a car passenger.

5.2.8 **Ta l** shows the existing number o pupils travelling to school by distance (based on walking distance) and mode. The mode share varies between the AM and PM periods because o the additional school bus capacity during the PM period.

Ta l N m r o P ils y Dista c a d Mod isti School

al i Dista c	Mod								Total	
	Car Pass r		al		Cycl		s			
	M	PM	M	PM	M	PM	M	PM	M	PM
Under 1 mile	3	3	11	11	0	0	0	0	15	15
1 to under 2 miles	1	1	0	0	0	0	0	0	1	1
2 to under 5 miles	80	65	0	0	0	0	30	45	110	110
Over 5 miles	3	3	0	0	0	0	0	0	3	3
Total										
Mode Share	*67%*	*56%*	*9%*	*9%*	*0%*	*0%*	*23%*	*35%*	*100%*	*100%*

Note: 1) Summation errors are due to rounding

5.2.9 The pupil trips under car passenger trips will be accompanied by escorting adult trips accounting or a parent driving to / rom the school to drop-o and pick-up pupils. It is there ore assumed that there is one vehicle trip to the school and one trip rom the school during the AM peak hour (07:45-08:45hrs) and during the School PM peak hour (15:00-16:00hrs) as the trips to / rom the school to pick-up pupils are between 15:20hrs and 15:40hrs as per the existing school timetable. It is assumed that there will be no pupil trips during the PM peak hour (17:00-18:00hrs).

5.2.10 Some vehicle trips will transport more than one pupil or example when siblings or riends travel together in the same vehicle. To account or this a actor o 1.4 pupils per vehicle based on analysis undertaken by the industry standard so tware TRICS has been applied to the car passenger mode share shown in **Ta l** .

5.2.11 The resultant tra ic generation or the existing primary school has been assigned onto the study network based on the most desirable route between the pupil home postcodes and the A48 at St Nicholas. The route between the A48 and the school site has been assigned based on a one-way system with all vehicle arrivals using the westernmost junction between the A48 and School Lane (Junction 2 rom JTC surveys) and all departures via the eastern junction (Junction 3 rom JTC surveys). The behaviours o drivers were observed during the site visit to the school during the AM peak hour. It was observed that the majority o tra ic ollowed this one-way system entering School Lane via the westernmost junction and exiting via the eastern junction.

5.2.12 **Ta l** shows the assignment routes and the number o vehicles which use these routes during each peak hour. Pupil tra ic has been assigned straight ahead at the school access junction to represent vehicles parking and then departing to School Lane east once drop-o / pick-up is complete.

Ta l P il Tra ic ssi m t isti School

Ro t	day M P a Ho r		day School PM P a Ho r	
	rri als	D art r s	rri als	D art r s
Route 1 - A48 (West o St Nicholas)	3	3	3	3
Route 2 - A48 (East o St Nicholas)	58	58	48	48
Total				

Note: 1) Summation errors are due to rounding

5.2.13 This tra ic assignment does not account or any trip chaining that may occur or the escorting adult trips or example onward car journeys to / rom place o work. This in ormation is not available and or the purposes o this assessment a return journey to each pupil home postcode has been assumed.

Sta Tri ratio Distri tio a d ssi m t

5.2.14 Sta trip generation at the existing primary school is based on the existing sta population (21.5 FTE). It has been assumed that all sta journeys to / rom the school will be completed via a single-occupancy vehicle regardless o home location.

5.2.15 The distribution and route assignment o existing sta has been derived using sta postcode data as supplied by the VoG. Tra ic has been assigned to the study area network using the same method as pupil car passenger trips including the one-way routeing. It is assumed that all sta arrivals will occur during the AM peak hour and all departures will be during the PM peak hour.

5.2.16 **Ta l** shows the assignment routes and the number o sta vehicles which use these routes during each peak hour.

Ta l Sta Tra ic ssi m t isti School

Ro t	day M P a Ho r		day School PM P a Ho r	
	rri als	D art r s	rri als	D art r s
Route 1 - A48 (West o St Nicholas)	11	0	0	11
Route 2 - A48 (East o St Nicholas)	10	0	0	10
Total				

Notes: 1) Summation errors are due to rounding.

5.3 Proposed School

5.3.1 The proposed new development will include the expansion o the school and will increase the number o pupils and sta travelling to / rom the school site resulting in 210 FTE primary school pupils 24 FTE nursery pupils and 24 FTE sta . The current orecast anticipating planning consent is granted will see the proposed expansion in number to be in e ect by autumn 2021.

5.3.2 Whilst it is recognised that there may be some changes to the pupil population post-development or the purposes o this assessment the existing distribution o pupils and sta has been retained as it is considered to be re lective o the expanded school catchment.

5.3.3 For the purposes o this assessment it is assumed that the school minibus mode share will not be able to increase in capacity or example by completing more runs during the AM or PM peak hour or through the school obtaining a secondary minibus. There ore the number o pupils using the bus has remained as 30 during the AM peak hour and 45 during the PM peak hour as per the existing conditions. This is considered to orm a robust assessment.

P il Tri ratio Distri tio a d ssi m t

5.3.4 **Ta l** shows the number o pupils travelling to school by distance (based on walking distance) and mode. This table illustrates the total number o pupils (existing and new) ollowing the completion o the new school.

Ta l N m r o P ils y Dista c a d Mod Pro os d School

al i Dista c	Mod								Total	
	Car Pass r		al		Cycl		s			
	M	PM	M	PM	M	PM	M	PM	M	PM
Under 1 mile	6	6	21	21	1	1	0	0	27	28
1 to under 2 miles	2	2	0	0	0	0	0	0	2	2
2 to under 5 miles	168	152	0	0	0	0	30	45	198	197
Over 5 miles	7	7	0	0	0	0	0	0	7	7
Total										
Mode Share	*78%*	*71%*	*9%*	*9%*	*0%*	*0%*	*13%*	*19%*	*100%*	*100%*

Notes: 1) Summation errors are due to rounding.
2) Assumes no increase in school minibus capacity for the proposed development.

5.3.5 The pupil mode share does not account or any measures to be implemented to increase the update o active and sustainable travel or journeys to / rom the school including additional minibus capacity and can there ore be considered a robust assumption o uture tra ic generation.

5.3.6 **Ta l** shows the number o pupil vehicles expected to use each assignment routes ollowing the expansion. As per the existing school it is assumed that pupil car passenger trips will be accompanied by escorting adult trips resulting in a vehicle arrival and departure during each peak hour.

Ta l P il Tra ic ssi m t Pro os d School

Ro t	day M P a Ho r		day School PM P a Ho r	
	rri als	D art r s	rri als	D art r s
Route 1 - A48 (West o St Nicholas)	7	7	8	8
Route 2 - A48 (East o St Nicholas)	123	123	112	112
Total				

Notes: 1) Summation errors are due to rounding.

5.3.7 **Ta l** shows the increase in the number o vehicles on the local highway network as a result o the pupil expansion or the weekday AM peak hour (07:45-08:45) and School PM peak hour (15:00-16:00). The vehicle trip increase across the study area network is shown or the weekday AM peak hour (07:45-08:45) and School PM peak hour (15:00-16:00) on **i r** and **i r** respectively.

Ta l P il Tra ic ssi m t Ro t l cr as

Ro t	day M P a Ho r		day School PM P a Ho r	
	rri als	D art r s	rri als	D art r s
Route 1 - A48 (West o St Nicholas)	4	4	4	4
Route 2 - A48 (East o St Nicholas)	65	65	64	64
Total				

Notes: 1) Summation errors are due to rounding.

5.3.8 It is anticipated that the expansion o the school will result in 137 additional two-way vehicle movements across the local highway network during the AM peak hour and School PM peak hour. This increase has been assessed (along with the increase in sta vehicles) or the tra ic impact assessment (**Cha t r** o this TA).

Sta Tri ratio Distri tio a d ssi m t

5.3.9 **Ta l** shows the number o sta vehicles expected to use each assignment route ollowing the completion o the new school acility.

Ta l Sta Tra ic ssi m t Pro os d School

Ro t	day M P a Ho r		day School PM P a Ho r	
	rri als	D art r s	rri als	D art r s
Route 1 - A48 (West o St Nicholas)	13	0	0	13
Route 2 - A48 (East o St Nicholas)	11	0	0	11
Total				

Notes: 1) Summation errors are due to rounding.

5.3.10 **Ta l** shows the increase in the number o vehicles on the local highway network as a result o the sta population increase or the weekday AM peak hour (07:45-08:45) and PM peak hour (17:00-18:00). The increase sta vehicle trips on the study area network are shown or the weekday AM and PM peak hours on **i r** and **i r** .

Ta l Sta Tra ic ssi m t l cr as

Ro t	day M P a Ho r		day School PM P a Ho r	
	rri als	D art r s	rri als	D art r s
Route 1 - A48 (West o St Nicholas)	1	0	0	1
Route 2 - A48 (East o St Nicholas)	1	0	0	1
Total				

Notes: 1) Summation errors are due to rounding.

5.3.11 It is anticipated that the expansion o the school will result in around three additional two-way vehicle movements across the local highway network during each peak hour period. This increase has been assessed (along with the increase in pupil vehicles) or the tra ic impact assessment.

Tra ic Im act ss ssm t

6.1 Introduction

6.1.1 This section o the TA outlines the assessment method and results o the tra ic impact assessment or the proposed development including the derived assessment scenarios and tra ic growth orecast.

6.2 Assessment Scenarios

6.2.1 A spreadsheet model has been prepared to derive the tra ic lows or each assessment scenario which have then been used or tra ic impact assessment purposes. The spreadsheet model provides network low diagrams or each scenario which have been included at **di** .

ss ssm t P a Ho rs

6.2.2 The tra ic impact assessment uses the ollowing peak hours to account or all movements to / rom the school throughout a typical weekday:

- AM Peak Hour 07:45-08:45;
- School PM Peak Hour / Inter-Peak 15:00-16:00; and
- PM Peak Hour 17:00-18:00

6.2.3 The AM peak hour and School PM peak hour have been determined based on the peak tra ic at the school as determined by the JTC survey conducted or the Unnamed Road / School Lane junction at the school access. Owing to the rural setting o the school and the si e o St Nicholas village it is likely that it the existing school is the major trip generator during peak periods there ore the peak tra ic low in the vicinity o the school access is the tra ic peak o the village as a whole. This is particularly the case during the School PM peak hour which alls outside o conventional network peak periods. The PM peak hour has been determined based on the peak tra ic as surveyed on the A48.

O s r d Sc ario

6.2.4 The 2019 Observed scenario comprises base tra ic lows as surveyed. These lows include tra ic associated with the existing school which has not been removed or the purposes o this assessment (the tra ic impact assessment assesses the increase or new tra ic rom the proposed development). This has been used to provide in ormation o the existing tra ic conditions only.

as

6.2.5 The opening year o the proposed development will be 2021 and is considered to be the point at which the school reaches maximum capacity in terms o pupil and sta population.

6.2.6 The surveyed tra ic lows have been growthed to 2021 using growth actors derived rom TEMPro (NTEM Dataset 7.2) as per industry standard methodology. The TEMPro program is based on the National Trip End Model (NTEM) and considers changes in car ownership and local planning orecasts regarding housing and employment to provide growth actors.

6.2.7 The NTEM orecast has been based on rural all road types or the Vale o Glamorgan 003 Middle Super Output Area (MSOA). The growth actors or each peak hour are set out in **Ta l** .

Ta l ro th actors

P a Ho r	ro th actor
Weekday AM Peak (07:00-10:00)	1.0248
Weekday Inter-Peak (10:-16:00)	1.0301
Weekday PM Peak (16:19:00)	1.0252

6.2.8 The TEMPro growth actors account or local committed growth in residential and employment development within the NTEM assumptions. The growth orecast has not included any manually assigned committed development growth to the highway network.

as D lo m t

6.2.9 The 2021 Base Development scenario has been derived by applying the increase in pupil and sta tra ic to the 2021 Base tra ic lows. The increase in pupil and sta tra ic on the assignment routes to / rom the school are shown in **Ta l** and **Ta l** respectively.

6.3 Tra ic Impact Assessment

6.3.1 To understand the impact o the proposed development on the operation o the highway network a tra ic impact assessment has been completed. This comprises:

- A percentage impact assessment which considers development impacts in the vicinity o the school and on the A48;
- A percentage impact assessment which considers development impacts at the junctions between School Land and the A48; and
- Junction capacity assessments o the two junctions between the A48 and School Lane.

6.3.2 The assessment expresses the increase in school tra ic against the 2021 Base scenario in percentage terms to determine impact.

Li Im act ss ssm t

6.3.3 The tra ic low in the uture-year assessment scenarios and the resulting percentage impact on highway links is presented in **Ta l** .

Ta l Hi h ay Li s P rc ta Im act ss ssm t

Li	Dir ctio	as			I cr as i School Tra ic			D as lo m t			Im act		
		M	IP	PM	M	IP	PM	M	IP	PM	M	IP	PM
School Lane east o School Access	Eastbound	20	14	3	68	68	3	89	83	6	334%	479%	83%
	Westbound	14	4	4	0	0	0	14	4	4	0%	0%	0%
	Two-way	35	18	7	68	68	3	103	87	10	197%	372%	35%
School Lane west o School Access	Eastbound	13	6	5	0	0	0	13	6	5	0%	0%	0%
	Westbound	21	11	3	71	68	0	92	80	3	330%	606%	0%
	Two-way	35	17	8	71	68	0	106	86	8	204%	393%	0%
A48 east o St Nicholas	Eastbound	929	471	424	65	64	1	994	535	426	7%	14%	0%
	Westbound	383	575	850	66	64	0	449	639	850	17%	11%	0%
	Two-way	1 313	1 046	1 274	131	128	1	1 444	1 174	1 276	10%	12%	0%
A48 at St Nicholas	Eastbound	897	437	415	0	0	0	897	437	415	0%	0%	0%
	Westbound	350	552	839	70	68	1	420	621	840	20%	12%	0%
	Two-way	1 247	989	1 254	70	68	1	1 317	1 057	1 255	6%	7%	0%
A48 west o St Nicholas	Eastbound	899	443	415	0	0	0	899	443	415	0%	0%	0%
	Westbound	350	552	839	70	68	1	420	621	840	20%	12%	0%
	Two-way	1 249	995	1 254	70	68	1	1 319	1 064	1 255	6%	7%	0%

Notes: 1) "IP" refers to the school PM peak hour (15:00-16:00)

6.3.4 The assessment shows that the impact o the school expansion on School Lane is anticipated to be material resulting in percentage increases o 200% or greater during the AM Peak hour and over 350% during the School PM peak hour based on two-way movements.

6.3.5 This high percentage increase is owing to the comparatively low baseline o tra ic on School Lane to the increase in tra ic anticipated as a result o the development proposals. In the 2021 Base scenario there is orecast to be no more than 35 two-way vehicle movements during any peak hour period which is set against a maximum increase o around 71 two-way movements during the AM peak hour e uating to just over one movement per minute and 68 two-way movements during the School PM peak hour e uating to just over one movement per minute.

6.3.6 Whist it is recognised that vehicle arrivals / departures are likely to be within a 15 to 20-minute period be ore and a ter the school start and end times it is also noted that this assessment does not account or pupils will arrive / depart outside the assessed peak hours or example to attend be ore school clubs and also does not account or nursery pupils which will have a hal -day timetable and there ore reduce some o the development trips during peak periods. The impacts shown in **Ta l** should there ore considered to be robust.

6.3.7 During the PM peak hour the increase in tra ic is three movements associated with the increase in sta which is a negligible increase in tra ic low in real terms.

6.3.8 The impact on the A48 to the east o St Nicholas will receive an average two-way impact o 10% and 12% or the AM and School PM peak hours respectively. This is considered to be a material impact however the increase in tra ic on this link is orecast to be 131 two-way movements during the AM peak hour during this hour and 128 two-way movements during the School PM peak hour e uating to around 2 two-way movements per minute in each peak hour. As per the assessment on School Lane this level o impact is considered to be robustly derived and assumes all pupils will travel to / rom school during this peak hour. There is a two-way impact o 0% during the PM peak hour.

6.3.9 The impact on the A48 between the eastern and western A48 / School Lane junctions and on the A48 to the west o St Nicholas the two-way tra ic impact is shown to be 6% during the AM peak hour and 7% during the School PM peak hour which is not considered to be a material impact. There is a two-way impact o 0% during the PM peak hour.

6.3.10 Overall whilst the impact o the proposed development will be material on School Lane this is due to the low baseline o background tra ic in the village. The measures to reduce the impact o the increase in vehicle movements are discussed in **S ctio** o this TA

ctio lm act ss ssm t P rc ta lm act

6.3.11 As discussed in **S ctio** o this TA development tra ic has been assigned in accordance with the in ormal one-way system observed on-site. This is proposed to be ormalised or school tra ic with urther details outlined in **S ctio** . The south-western junction serves tra ic arriving to the school site and the eastern junction serves tra ic departing. Some tra ic will also depart via the A48 / Unnamed Road junction. This has not been assessed with all tra ic demand rom the proposed development instead assumed to use the eastern A48 / School Lane junction however this provides a robust assessment o impact at the eastern A48 / School Lane which would in reality be shared with the A48 / Unnamed Road junction.

A48 / School Lane (South-West)

6.3.12 **Ta l** presents the percentage impact or the south-western A48 / School Lane junction. The assessment is based on the tra ic approaching the junction on each arm.

Ta l School La So th st P rc ta Im act ss ssm t

roach rm	as			l cr as i School Tra ic			as D lo m t			Im act		
	M	IP	PM	M	IP	PM	M	IP	PM	M	IP	PM
A48 West	896	440	416	5	4	0	901	444	416	1%	1%	0%
School Lane	13	8	2	0	0	0	13	8	2	0%	0%	0%
A48 East	350	552	839	70	68	1	420	621	840	20%	12%	0%
Total ra Im act												

Notes: 1) "IP" refers to the school PM peak hour (15:00-16:00)

6.3.13 The results o the assessment or this junction show that there will be a material impact on the A48 East arm o the junction during the AM and School PM peak hours owing to an increase o 70 and 68 two-way movements respectively e uating to an impact o 20% and 12% respectively. Whilst this is considered to be a material increase this is not considered to be signi icant as this e uates to an average o just over one movement per minute over the peak hours. All other arms are expected to receive a 1% or lesser impact over each peak hour. The junction is expected to receive an average impact o less than 10% during each peak hour which is not considered to be a signi icant.

6.3.14 This junction has been capacity assessed to urther understand development impact as discussed in the ollowing section.

A48 / School Lane (East)

6.3.15 **Ta l** presents the percentage impact or the south-western A48 / School Lane junction. The assessment is based on the tra ic approaching the junction on each arm.

Ta l School La ast P rc ta Im act ss ssm t

roach rm	as			l cr as i School Tra ic			as D lo m t			Im act		
	M	IP	PM	M	IP	PM	M	IP	PM	M	IP	PM
A48 West	897	437	415	0	0	0	897	437	415	0%	0%	0%
School Lane	36	39	14	68	68	3	104	108	17	191%	175%	17%
A48 East	383	575	850	66	64	0	449	639	850	17%	11%	0%
Total ra Im act												

Notes: 1) "IP" refers to the school PM peak hour (15:00-16:00)

6.3.16 The results o the assessment or this junction show that there will be a total increase o between 68 and 66 two-way vehicle movements on both the School Lane and A48 East arms o the junction during the AM peak hour and between 64 and 68 two-way movements during the School PM peak hour as a result o the proposed development. The average impact o the development proposals is 10% during the AM Peak Hour 13% during the School PM peak hour and 0% during the PM peak hour.

6.3.17 The percentage impact on School Lane is signi icant e uating to 191% during the AM peak hour and 175% during the School PM peak hour. However the high percentage increase is due to the comparatively low baseline compared to development tra ic on this arm. The increase e uates to just over one additional movement per minute during the AM and School PM peak hours respectively which is not considered to be a signi icant increase. As discussed above in practice this level o impact will be reduced owing to the shared impact between the eastern A48 / School Lane and A48 / Unnamed Road junctions.

6.3.18 This junction has been capacity assessed to urther understand development impact. This is discussed in the ollowing section.

ctio Ca acity ss ssm ts

6.3.19 In order to urther understand the impact o the calculated potential increase in school tra ic junction capacity assessments have been undertaken or both A48 / School Lane junctions (south-western and eastern) The modelling has been completed using industry-standard junction modelling so tware Junctions 9 .

6.3.20 The junction models have been constructed and calibrated using desk-based measurements. The models have been validated to tra ic conditions as observed during the site visit.

6.3.21 Vehicle lows have been inputted to the model or each assessment scenario. Junctions 9 re uires in ormation on the classi ication o vehicles using the junction. For this assessment the proportion o HGVs or all scenarios is consistent with surveyed HGVs (i.e. OGV1 OGV2 and PSV classi ications) rom 2019. This means that the real number o HGVs being assessed through the model increases with total tra ic which is considered to be a reasonable and robust approach.

6.3.22 As discussed in **S ctio** o this TA development tra ic has been assigned in accordance with the in ormal one-way system observed on-site. This is proposed to be ormalised or school tra ic with urther details outlined in **S ctio** . The south-western junction serves tra ic arriving to the school site and the eastern junction serves tra ic departing. Some tra ic will also depart via the A48 / Unnamed Road junction. This has not been assessed with all tra ic demand rom the proposed development instead assumed to use the eastern A48 / School Lane junction however this provides a robust assessment o impact at the eastern A48 / School Lane which would in reality be shared with the A48 / Unnamed Road junction.

6.3.23 The results o the modelling are presented as Ratio Flow to Capacity (RFC) ueue Length in PCUs (rounded up to next whole PCU). Movements with an RFC above 0.85 are considered to exceed practical capacity as this is the point above which Random Oversaturation Delay can occur. An RFC o 1.00 denotes the absolute capacity o the junction. The results or Junctions 9 analyses are presented as a summary only or ease o re erence and represent the maximum values experienced by each stream across the AM School PM and PM peak hours.

6.3.24 The Junctions 9 output reports which provide the ull parameters tra ic low entry and results have been included at **di** .

A48 / School Lane (South-West)

6.3.25 The results o the junction capacity modelling assessment are summarised in **Ta l** . For the one-way system this junction serves tra ic arriving at the school and there ore school tra ic has been assigned turning onto School Lane rom the A48 east and west o the junction.

Ta l School La So th st S mmary o ctio Ca acity

ss ssm t Sc ario	Str am Mo m t	M P a Ho r		School PM P a Ho r		PM P a Ho r	
		PC	R C	PC	R C	PC	R C
2019 Observed	Stream B-AC	0.0	0.04	0.0	0.02	0.0	0.00
	Stream C-AB	1.0	0.04	0.0	0.03	0.0	0.01
2021 Base	Stream B-AC	0.0	0.04	0.0	0.02	0.0	0.00
	Stream C-AB	1.0	0.04	0.0	0.03	0.0	0.01
2021 Base Development	Stream B-AC	0.0	0.04	0.0	0.02	0.0	0.00
	Stream C-AB	1.0	0.25	1.0	0.21	0.0	0.01

Notes: 1) Arm A = A48 West, Arm B = School Lane, Arm C = A48 East.
2) Queue lengths have been rounded up to the nearest 1 PCU.

6.3.26 The results o the junction capacity modelling show that the junction is orecast to operate well within practical capacity in all assessment scenarios including the 2021 Base Development scenario and across all peak hour periods.

6.3.27 The impact o the proposed development on the per ormance o this junction is material but cannot be considered severe . During the AM peak hour the introduction o development tra ic is orecast to result in a maximum increase in RFC o 0.21 (rom 0.04 to 0.25). There is no material increase in ueue length remaining at 1 PCU. During the School PM peak hour the impact o the proposed development is a 0.18 increase in RFC (rom 0.03 to 0.21) and a 1 PCU increase in ueue length rom 0 PCUs to 1PCU. The junction continues to per orm well within capacity during these periods.

6.3.28 These impacts occur or movements rom the A48 East to School Lane (Stream C-AB). The junction capacity modelling there ore demonstrates that an increase in the prevalence o right-turning tra ic rom the A48 East to School Lane will not cause unacceptable ueue lengths on the A48 during either the AM or School PM peak hour.

6.3.29 The impact on School Lane (Stream B-AC) is immaterial. Impact during the PM peak hour is negligible or all movements.

6.3.30 Overall the development capacity impact at this junction is considered to be material however as the junction continues to operate well within capacity and the impact on the operation and sa ety to the A48 is negligible the development impact cannot be considered severe .

A48 / School Lane (East)

6.3.31 The results o the junction capacity modelling assessment are summarised in **Ta l** . For the one-way system this junction serves tra ic departing rom the school and there ore school tra ic has been assigned turning rom School Lane to the A48 east and west o the junction. As discussed above school tra ic impact will be shared between the A48 / School Lane and A48 / Unnamed Road junctions and result in a lower level o impact than that shown in **Ta l** .

Ta l School La ast r S mmary o ctio Ca acity

ss ssm t Sc ario	Str am Mo m t	M P a Ho r		School PM P a Ho r		PM P a Ho r	
		PC	R C	PC	R C	PC	R C
2019 Observed	Stream B-AC	1.0	0.11	1.0	0.09	0.0	0.04
	Stream C-AB	0.0	0.02	1.0	0.05	0.0	0.02
2021 Base	Stream B-AC	1.0	0.12	1.0	0.09	0.0	0.04
	Stream C-AB	0.0	0.02	1.0	0.05	0.0	0.02
2021 Base Development	Stream B-AC	1.0	0.33	1.0	0.26	0.1	0.05
	Stream C-AB	0.0	0.02	1.0	0.05	0.0	0.02

Notes: 1) Arm A = A48 West, Arm B = School Lane, Arm C = A48 East.
2) Queue lengths have been rounded up to the nearest 1 PCU.

6.3.32 The results o the junction capacity modelling show that the junction is orecast to operate well within practical capacity in all assessment scenarios including the 2021 Base Development scenario and across all peak hour periods.

6.3.33 The impact o the proposed development on the per ormance o this junction is material. The introduction o development tra ic is orecast to result in a maximum increase in RFC o 0.21 (rom 0.12 to 0.33) during the AM peak hour and 0.17 (rom 0.09 to 0.26) during the School PM peak hour but there are no material increases in ueue lengths. The junction continues to per orm well within capacity during these periods.

6.3.34 These impacts occur or movements rom School Lane to the A48 east and west o the junction. The impact on the A48 (Stream C-AB) is negligible or all arms o the junction meaning the impact on the operation o the A48 is negligible.

6.3.35 Overall the development capacity impact at this junction is considered to be material on School Lane however as the junction continues to operate well within capacity the development impact cannot be considered severe.

6.4 Summary

6.4.1 This section o the TA has outlined the tra ic impact assessment o the proposed development on the local highway network.

6.4.2 The assessment scenarios used in the analysis include:

- 2019 Observed Scenario comprising surveyed tra ic lows.
- 2021 Base Scenario comprising surveyed tra ic lows growthed up to 2021 (the opening year o the proposed development); and
- 2021 Base Development scenario which applies the derived increase in school tra ic as outlined in **S ctio** o this TA to the 2021 Base scenario lows.

6.4.3 The peak hours or assessment are the AM peak hour (07:45-08:45hrs) the School PM peak hour (15:00-16:00hrs) and the PM peak hour (17:00-18:00).

6.4.4 A spreadsheet model has been used to derive the tra ic lows or each assessment scenario. The spreadsheet model provides network low diagrams or each scenario which have been included at **di** .

6.4.5 Tra ic growth between 2019 and 2021 assessment years has been derived using TEMPro as is standard industry practice. The orecast has been based on rural all road types or the Vale o Glamorgan 003 Middle Super Output Area (MSOA).

6.4.6 The tra ic impact assessment has included percentage impact assessments o local highway links and junctions. Junction capacity modelling has been conducted or the two junctions between the A48 and School Lane.

6.4.7 The assessment o highway links shows that there will be a material impact on School Lane in the vicinity o the school site and on the A48 to the east o St Nicholas. However the assessment includes a robust orecast o tra ic generation or the proposed school as it does not account or pupils travelling to / rom school be ore the AM peak hour or a ter the School PM peak hour (or example to attend school clubs). Nevertheless measures to reduce and manage the impact o school tra ic in these areas are outlined in **S ctio** o this TA.

6.4.8 The assessment o junctions by way o a percentage increase and junction capacity modelling show that whilst there will be a material impact on the operation o the junctions this cannot be considered severe. Following detailed capacity assessments it can be concluded that both junctions continue to operate well below capacity in the 2021 Base Development scenario. There will be a negligible impact on the operation o the A48 in its role as a regionally strategic highway.

Tra s ort Im l m tatio Strat y

7.1 Introduction

7.1.1 TAN 18 re uires any TA document to provide the in ormation necessary to assess the suitability o an application in travel demand and tra ic impact terms. It recommends that a Transport Implementation Strategy (TIS) should be included within the TA. The TIS is intended to set objectives and targets in managing travel demand whilst detailing the in rastructure and measures necessary to achieve them. The TIS should also set up a ramework or monitoring the targets including modal travel choice.

7.1.2 A TIS shares many o the same goals as a Travel Plan (TP); therefore the modal in ormation targets and measures set out in this section will in orm the School TP which will be conditioned as part o the planning application. It is understood that the existing school does not have a live TP.

7.2 Mode Share and Targets

7.2.1 Mode share targets are used to evaluate the success o the TIS and to identi y areas on which urther measures should be ocused in order to help to drive travel behaviour change. To enable the setting o valid and realistic targets a valid baseline irst needs to be established.

7.2.2 **S ctio** o this TA sets out the orecast mode share o the school with the development proposals. The sta and pupil mode share which has been calculated as part o the assessments is summarised in **Ta l** .

7.2.3 Table 7-1.

Ta l or cast Mod Shar or

Mod	P ils		Sta	
	M	PM	M	PM
Walk	9%	9%	0%	0%
Cycle	0%	0%	0%	0%
School Bus	13%	19%	0%	0%
Car	78%	71%	100%	100%
Total	100%	100%	100%	100%

7.2.4 This mode share does not consider the bene it o any measures aimed to reduce journey to / rom the school via car modes and it should also be noted that or the purposes o this TA all sta are assumed to travel to / rom the school using a single-occupancy vehicle ollowing the opening o the new school acility.

7.2.5 As the TP will be secured via planning condition and will be re uired to be in place when the school is ully operational it is appropriate to set targets based on the orecast mode share or that time. The target will be to reduce the car mode share by 6% or pupils and or sta over ive years consistent with Smarter Choices report *Changing the way we travel* (2004). Following a baseline travel survey these targets can be con irmed or adjusted as appropriate during the dra ting o the TP and ollowing discussions between the VoG and the Travel Plan Coordinator (TPC).

7.3 Monitoring and Evaluation

7.3.1 The point at which baseline travel surveys are re uired will be subject to agreement with the VoG as the LHA. A minimum response rate to the travel surveys will be re uired to be set and agreed to ensure that the data is representative.

7.3.2 The ormat o the baseline and monitoring surveys will also need to be agreed with the VoG. In general these will seek to establish the actual travel patterns the reasons or travel choice and potential measures to encourage consideration o alternatives. For sta it is envisaged that the surveys will be primarily online based but paper copies will also be made available to sta should they pre er. For pupils and sta at the schools a combination o survey methods could be utilised and is likely to include the ollowing:

- Hands-up surveys of pupils;
- Manual counts at school drop-o /pick-up periods; and
- Pupil/parent and sta uestionnaires.

7.3.3 The results o the baseline travel surveys will be analysed and the actors in luencing travel behaviour will be investigated. It will then be necessary or the TPC to review and update the respective TP to include additional details and the need or any other measures not already included that re uire urther investigation. Speci ic objectives and targets will need to be identi ied separated into short/medium/long term targets and will need to be SMART (Speci ic Measurable Achievable Realistic and Timed). Speci ic actions and measures to encourage sustainable modes o travel will be identi ied. For the on-going management o the TP to be success ul and to deliver the desired outcomes it is important that the parties involved in the delivery o the TP which means the TPC and the VoG work e ectively in partnership to achieve the desired results.

7.3.4 Monitoring o the TP will be re uired or a ive-year period rom the date o the baseline travel surveys. They will be undertaken at intervals o one three and ive years a ter the date (or close to the date) o the baseline travel surveys. The TPC will aim to coordinate the baseline travel surveys and subse uent monitoring surveys to ensure consistency between the collection o data or the TP. Surveys will avoid sustained periods o inclement weather or when there is signi icant disruption to the local road or public transport network.

7.3.5 A monitoring report will be prepared by the TPC or each monitoring survey. These will identi y the results o the surveys and success o the measures implemented in achieving the targets. The reports will be submitted to the VoG or comment. I the targets are not met then it will be necessary to review what remedial measures need to be implemented to mitigate the impact o any under achievement.

7.4 TP Measures and Interventions

7.4.1 In order to achieve the reduction in single occupancy car use and encourage a modal shi t to more sustainable orms o travel a number o TP measures will be implemented.

7.4.2 A TP will be secured as a planning condition and will be produced ready or ull occupancy o the new school development. A TPC will be appointed who will be responsible in ensuring the success o the TP and its targets and objectives. The TP will contain a range o measures additional to those that will be provided as part o the development to enhance the attractiveness o sustainable travel and to encourage the use o the walking cycling and public transport in rastructure. Additional measures include:

- Newsletters;
- Noticeboards advertising sustainable transport information; and
- Promotion o national sustainable transport initiatives such as national walk to school day and bike to school week etc.

7.4.3 The TP will investigate the provision o additional minibus services between the school and key areas o pupil residency. This will either be through additional routes during the AM or School PM peak hours or an additional bus to cover a wider area within the school s catchment. The school will continue to revise the minibus strategy to ensure that the service continues to be inancially operational but will encourage use o the services.

7.5 Physical Measures and Interventions

7.5.1 In addition to TP measures it is also proposed that physical measures are implemented to encourage journeys to / rom the school site using sustainable transport modes and to ensure that sa e and secure access can be provided or non-motorised users.

O Sit M as r s

7.5.2 It is proposed that people o all abilities shall be able to easily enter into and move through the landscape and each space within it via level or ramped entry points where necessary. Existing ootpaths may be re-aligned to suit new desire lines and entry points and internal access roads which re uire crossing will include dropped kerbs and tactile paving.

7.5.3 Primary pedestrian and cycle access will be via two access on School Lane adjacent to the vehicular accesses. The western pedestrian access will be provided at 2m wide with the eastern access being provided at 2.5m wide. These pedestrian accesses will provide sa e and secure access to the curtilage o the new school building rom which speci ic class arrangements or pupils to be dropped o and collected. The proposed main school o ice will be easily available via these accesses or pedestrian visitors.

7.5.4 A ebra crossing will be provided to acilitate sa e pedestrian crossing to the school entrance rom the sta and visitor car park. The ootpath has been extended into the carriageway at this location reducing the width o the ebra crossing to purpose ully increase visibility or pedestrians around the minibus parking bay.

7.5.5 A total o 18 cycle parking spaces are proposed in accordance with parking standards to be located near the main entrance. These will be or both sta and pupil use.

O ay Syst m

7.5.6 There are currently no ootways available along School Lane or the Unnamed road to acilitate the sa e passage o pedestrians to the school site. This is considered to be an acceptable situation or the existing school considering the extremely low tra ic volumes and speeds on School Lane and the rural setting. With the expansion o the school and the resulting increase in tra ic on the local highway network it is proposed that a one-way system is encouraged to minimise the con lict between pedestrians and vehicles.

7.5.7 Following the occupation o the new school acility the school will there ore promote monitor and i necessary work to en orce a one-way system as part o a tra ic management strategy or vehicle trips to / rom the school site during school opening and closing times. An indicative one-way system is shown in **i r** based on the observed situation in St Nicolas during school arrival / departure times. This shows that vehicles travelling to the school site will use the westernmost A48 / School Lane junction and travel along School Lane towards the school. Sta members will be able to access the car park rom school lane. Escorting adults will be able to park on School Lane or Unnamed Road to escort pupils to / rom schools. Vehicles departing rom the school will use either the A48 / Unnamed Road junction or the easternmost A48 / School Lane Junction.

Figure 7-1: Indicative One-Way System

7.5.8 The one-way system shown is indicative and can be revised by the school to meet emerging needs following construction of the proposed development. The school will promote the one-way system to parents / guardians of pupils and will regularly observe traffic behaviours to identify whether the system is effective and adhered to. This system is consistent with the majority of existing travel behaviours observed at the school site, but it is proposed that this is formalised as part of the development proposals. A copy of the one-way system is also included at **Appendix 7-1**.

7.5.9 The benefits of implementing a one-way system are as follows:

- Removal of potential two-way traffic conflicts on narrow highways in St Nicholas. This will also benefit pedestrian / cycle movements as traffic movements will be more predictable with a single prevailing direction of travel.
- Removal of vehicles potentially turning in the road, including use of side roads and residential driveways. This will significantly reduce the potential for vehicles to collide with pedestrians / cyclists during manoeuvres.
- Reduced impact on the operation of the A48 and the A48 Duffryn Lane signalised junction:
  - The eastern A48 / School Lane junction and A48 / Unnamed Road junction will only allow for one-way working near the A48 owing to the width of the minor approach arms. Promoting 'exit only' at these locations will remove conflicts arising where vehicles attempt to exit and access School Lane or Unnamed Road simultaneously.
  - Removal of vehicles waiting to turn right onto School Lane / Unnamed Road from the A48, which would have an impact on the operation of the A48 and potentially the A48 / Duffryn lane signalised junction if queues are significant (e.g. exit blocking).
  - The western junction is a formal priority junction with two-lane working at the A48, which provides a more convenient option for arriving vehicles. Any queuing which occurs for right-turning vehicles will may cause slight delays on the A48, but this would have a lesser impact on local junctions.

7.5.10 It is recognised that it would not be easily enforceable for local residents to use the one-way system for traffic movements during the AM and School PM peak hours, given that this is not a proposal for a formal traffic order. However, it is considered that many will likely choose to follow this layout given that it is the most efficient use of the local route, particularly as this would be an easier option compared to travelling against the proposed prevailing flow.

7.5.11 The one-way system will be managed by the school and the TPC. Marketing material will be produced and provided to all pupils parents / carers and local residents to ensure they are aware and encourage use o the one-way system operation during the school AM and PM Peaks. Summary

7.5.12 Targets have been set or the reduction o private car use and a commitment to a TP and monitoring programme has been made.

7.5.13 The measures that will be implemented as part o the development proposals have been outlined to help to achieve the targets and objectives set. this includes the implementation o a one-way system in St Nicholas or school tra ic which will reduce the con licts between tra ic tra ic and pedestrians and reduce the potential or impact on the operation o the A48.

7.5.14 TP measures will add another layer o interventions once the TP is established. This includes the investigation o additional minibus capacity or pupil journeys to / rom school. to continue to promote and encourage the range o acilities available and improve awareness or provision wherever possible.

Co cl sio s

8.1.1 AECOM has been commissioned by the Vale o Glamorgan (VoG) education department to provide Transport Planning and Highways advice to in orm a planning application or the proposed new development o St Nicholas Church in Wales (CiW) Primary School. The TA has been prepared with regard to pre-application discussions with the VoG in its role as Local Highway Authority (LHA) and has been in ormed by a site visit undertaken during normal operating conditions on 26th September 2019.

8.1.2 The existing school site is located on School Lane in St Nicholas a rural village in the VoG. The existing school has a capacity o 126 pupils (with 128 currently enrolled) and 21.5 Full Time E uivalent (FTE) members o sta . The school catchment includes local rural villages but the majority o existing pupils reside at the western ringe o Cardi .

8.1.3 The development proposals include the demolition o the existing school building and the construction o a new single-storey school building to the north but within the existing site boundary. Ancillary acilities including sports pitches and a service yard proposed. The proposed capacity o the new school will be 210 primary school pupils with an additional 24 Full-Time E uivalent (FTE) pupils in a new nursery acility totalling 24 pupils. The number o sta will increase rom 21.5 FTE to 24 FTE members o sta .

8.1.4 Vehicular access to the school site will operate via an internal one way system using two points o access Vehicles will enter via the western-most junction (approximate location o current pedestrian access) and egress via the eastern-most o the two junctions (using the existing two way access junction). These access arrangements have been designed to provide or delivery / servicing minibus drop-o school car park (or use by sta and visitors) and or escorting parent drop-o / pick-up. This represents a signi icant improvement over the current situation.

8.1.5 The accesses and internal highways have been subject to SPA which demonstrates that these arrangements are suitable or the vehicles likely to access the site in uture.

8.1.6 Sa e and suitable access and egress have been proposed or the school with the egress using the existing site access arrangements. Primary pedestrian and cycle access will be via two access on School Lane adjacent to the vehicular accesses. The western pedestrian access is proposed to l be 2m wide with the eastern access proposed to be 2.5m wide These pedestrian accesses will provide sa e and secure access to the curtilage o the new school building rom which speci ic class arrangements or pupils to be dropped o and collected. The proposed main school o ice will be easily available via these accesses or pedestrian visitors.

8.1.7 The VoG Parking Standards March 2019 has been adopted as Supplementary Planning Guidance (SPG). The parking standards seek to promote and ensure transparent and consistent approaches to the provision o parking. On the basis that there will be a total o 24 FTE members o sta located at the school post-development up to 21 spaces will be re uired on-site with one parking space allocated or a commercial vehicle three spaces allocated or visitors one or disabled access with the remainder or sta use. Some 18 cycle stands will be provided based on the number o proposed sta and pupil numbers at the school.

8.1.8 The development proposals align with existing and emerging planning and transport policy at both a national and local level. The proposals will acilitate sustainable travel through a number o measures including the implementation o a TP which will be conditioned as part o the planning application submission.

8.1.9 PIC data has been re uested rom the WG or the local area. The preliminary assessment advises that a single slight collision has been recorded. No pedestrians cyclists or children were involved in the collision and it is not considered to be indicative o a local highway sa ety issue. In addition to this the study con irms that there are no existing issues at the school access which is proposed to be used as an egress only as part o the proposals.

8.1.10 The TA has utilised a combination o data sources to establish the existing mode share o the pupil and sta population and the orecast mode share o the proposed development. This will also be used to in orm initial mode share targets in the TP. It is understood that the school does not currently have a TP. The mode share calculations have considered the school minibus which operates between the school and the western ringes o Cardi .

8.1.11 The additional school pupil population will generate an additional 137 vehicle movements during the AM peak hour (07:45-08:45hrs) and School PM peak hour (15:00-16:00hrs) accounting or escorting adult arrivals and departures. The additional school sta population will generate an additional three movements during the AM peak hour and PM peak hour (17:00-18:00hrs). Tra ic has been assigned onto the highway network based on pupils and sta home postcode in ormation and based on the in ormal one-way system observed on the local highway network during the site visit. This one-way system will be ormalised as part o the Transport Implementation Strategy (TIS).

8.1.12 The assessment o junctions by way o a percentage increase and junction capacity modelling show that whilst there will be a material impact on the operation o the junctions this cannot be considered severe. Both junctions continue to operate well below capacity in the 2021 Base Development scenario. There will be a negligible impact on the operation o the A48 in its role as a regionally strategic highway.

8.1.13 The TIS sets out the targets or the reduction o private car use and a commitment to a TP and monitoring programme has been made. The measures that will be implemented as part o the development proposals have been outlined to help to achieve the targets and objectives set. This includes the implementation o a one-way system in St Nicholas or school tra ic which will reduce the con licts between tra ic tra ic and pedestrians and reduce the potential or impact on the operation o the A48.

8.1.14 TP measures will add another layer o interventions including investigations into additional minibus capacity or pupil journeys to / rom school. This will continue to promote and encourage the range o acilities available and improve awareness or provision wherever possible.

8.1.15 Further to the indings o this TA it can be concluded that there are no transport reasons why the proposed development should not be granted planning permission.

di Tra s ort ss ssm t Sco i Not

Technical Note

Project:	**St Nicholas Ch rch i al s Primary School St Nicholas**	Job No:	
Subject:	**Tra s ort ss ssm t Sco i Not**		
Prepared by:	**irsty Co Pri ci al Co s lta t**	Date:	
Checked by:	**Matt Da i s S ior Co s lta t**	Date:	
Approved by:	**S iro Pa a i ssociat Dir ctor**	Date:	

The ollowing table sets out the proposed scope o a Transport Assessment (TA) in respect o the proposed redevelopment o a new school building or St Nicholas Primary Church in Wales (CiW) School in the Vale o Glamorgan (VoG) Wales. It is submitted to the VoG in its role as Local Highway Authority (LHA) or agreement and approval.

1	Site Location and Existing Land Use	St Nicholas CiW Primary School is seeking planning permission or redevelopment o the school site in the VoG. A plan indicating the location o the school is attached in **di** . The existing school is a co-educational primary school located on School Lane in St Nicholas which is accessed via the A48 between Culverhouse Cross in the northeast and Bonvilston in the west. The site is approximately 6 miles rom Cardi City Centre which can be also be accessed rom the school via the A48. The existing capacity o the school is 126 pupils with 128 currently attending the school.
2	Planning History	The development site is located in the VoG. It will involve the redevelopment o the existing school site or a new acility. AECOM have been appointed transport consultant as this scheme approaches RIBA Stage 3. The current work has included scoping discussions and baseline desk studies. We have assessed the current highway network and have also commissioned tra ic surveys across the local road network in close proximity to the school. The tra ic survey scoping was carried out and agreed upon with the LHA (see below Data Collection).
3	Development Proposal	The new school is proposed to enrol a total capacity o 210 students with an additional 24 child capacity in the nursery making a total o 234 students on site. The proposed sta numbers will include 23 Full Time E uivalents (FTE). Proposals include the ollowing: ▪ A new one-storey school building located north o the existing school building ▪ Demolition o the existing building near the entrance to the site' ▪ Sports ields located to the north o the new school building. ▪ Multi Use Games Areas (MUGAs) suitable or PE and other lessons as well as in ormal play at break times to be located to the east o the new school building and ▪ A new car park and service yard replacing the current school building.

		The TA will include the ollowing: ▪ Details o the access arrangements ▪ Internal transport layout or the site including cycle and car parking provision (sta and visitor) and circulation along with pedestrian circulation ▪ Consideration o the potential or bus stops layovers and parent drop-o points and ▪ Swept Path Analysis (SPA) to demonstrate that larger vehicles (school buses re use delivery and emergency) can be accommodated.
4	Planning Policy Review	The context o the development proposals will be considered in relation to the ollowing policy and guidance: ▪ Planning Policy Wales (PPW) 10 ▪ Technical Advice Note (TAN) 18: Transport published in March 2007 ▪ The Wales Transport Strategy published in April 2008 ▪ National Transport Finance Plan published in September 2015 ▪ Active Travel (Wales) Act 2013 ▪ Wellbeing o Future Generations (Wales) Act 2015 ▪ Vale o Glamorgan Local Development Plan (LDP) 2011-2026 adopted June 2017 ▪ Vale o Glamorgan Local Transport Plan (LTP) 2015-2030 and ▪ Supplementary Planning Guidance (SPG) to the LDP including Parking Standards (March 2019). The TA will clearly demonstrate the development's compliance to the above policies and corresponding objectives. This will be demonstrated within the policy chapter (ollowing the setting out o the development proposals) linking speci ic development proposals to the policies and their objectives. A summary will be provided within the TA conclusions.
5	Existing Situation and Site Accessibility	The TA will include the ollowing: ▪ Description o the site location and existing usage ▪ Description o the local highway network including carriageway widths speed limits street lighting etc ▪ Description o the existing highway operational conditions with re erence to tra ic survey data along with ueuing conditions at key junctions ▪ Analysis o Personal Injury Collision (PIC) data ▪ Description o existing walking/cycling acilities ▪ Description o public transport services and ▪ Identi ication o key local acilities and their accessibility by sustainable modes.
6	Data Collection	Tra ic surveys have been undertaken on the local highway network surrounding the development to identi y the existing tra ic generation o the school and highway operational conditions. At the time o the tra ic surveys the school had 128 pupils enrolled and there ore or the purposes o the TA this will orm the base scenario (existing situation). The tra ic surveys were carried out ollowing discussion and agreement with the LHA on the extent o the study area prior to commissioning.

		Tra ic surveys included Junction Turning Counts (JTC) ueue Length surveys and Automatic Tra ic Counts (ATCs). The locations o the surveys are shown on the plan at **di** which contains the Survey Brie and Speci ication that was given to the appointed survey specialist These locations are speci ically: <u>Junction Turning Counts (JTC) and ueue Length Surveys:</u> 1. School Lane/ Access to St Nicholas CiW Primary School (three-arm priority T-junction) 2. A48/School Lane (West) (three-arm priority T-junction) and 3. A48/School Lane (East) (three-arm priority T-junction). <u>Automatic Tra ic Counts (ATCs)</u> 4. A48 West o School Lane 5. School Lane and 6. A48 East o School Lane. The JTC and ueue Length surveys were undertaken on Thursday 6th 2019 which was within school term time and therefore reflective of 'normal' conditions. The data was recorded between the hours o 07:00-10:00 and 14:30-18:00 to ensure that the data recorded included both the morning and a ternoon tra ic peaks. The ATC surveys were carried out over a 7-day period rom 5th June 2019 – 11th June 2019 (also within school term time) and covered the same period as the JTC and ueue Length surveys. The data has been received and AECOM has per ormed checks to ensure that the data is complete and with no obvious errors. The junction tra ic data has been used to develop a network study area this will be used to assess and orecast tra ic impact o the proposals and to in orm junction capacity assessments. PIC data will be obtained rom the Welsh Government or the most recent 5-year period covering an appropriate study area. This study area will include the site along with the assessed junctions and will be analysed and reported upon within the TA. Should the data not be returned in good time or the TA to be completed a preliminary assessment will be carried out using an online resource such as Crashmap. This will be ollowed by a more detailed assessment o the PIC data rom Welsh Government as an updated TA or Addendum as appropriate.
7	Trip Generation	Should the school have data on the mode share o pupils and sta such as rom an existing Travel Plan (TP) this will be used to in orm the trip generation orecasts or the growth in pupil and sta population. Should existing mode share data not be available then the trip generation o the growth in pupil population will be orecast based on travel distances (based on analysis o postcodes o the existing pupil population) and mode by distance in ormation (rom the National Travel Survey). For growth in sta it will be assumed that these will travel by car.
8	Trip Distribution	The distribution o pupil trips will be based on analysis o postcodes o the existing pupil population with consideration to growth areas in regard to pupil catchment. The distribution o sta trips will be based on analysis o existing

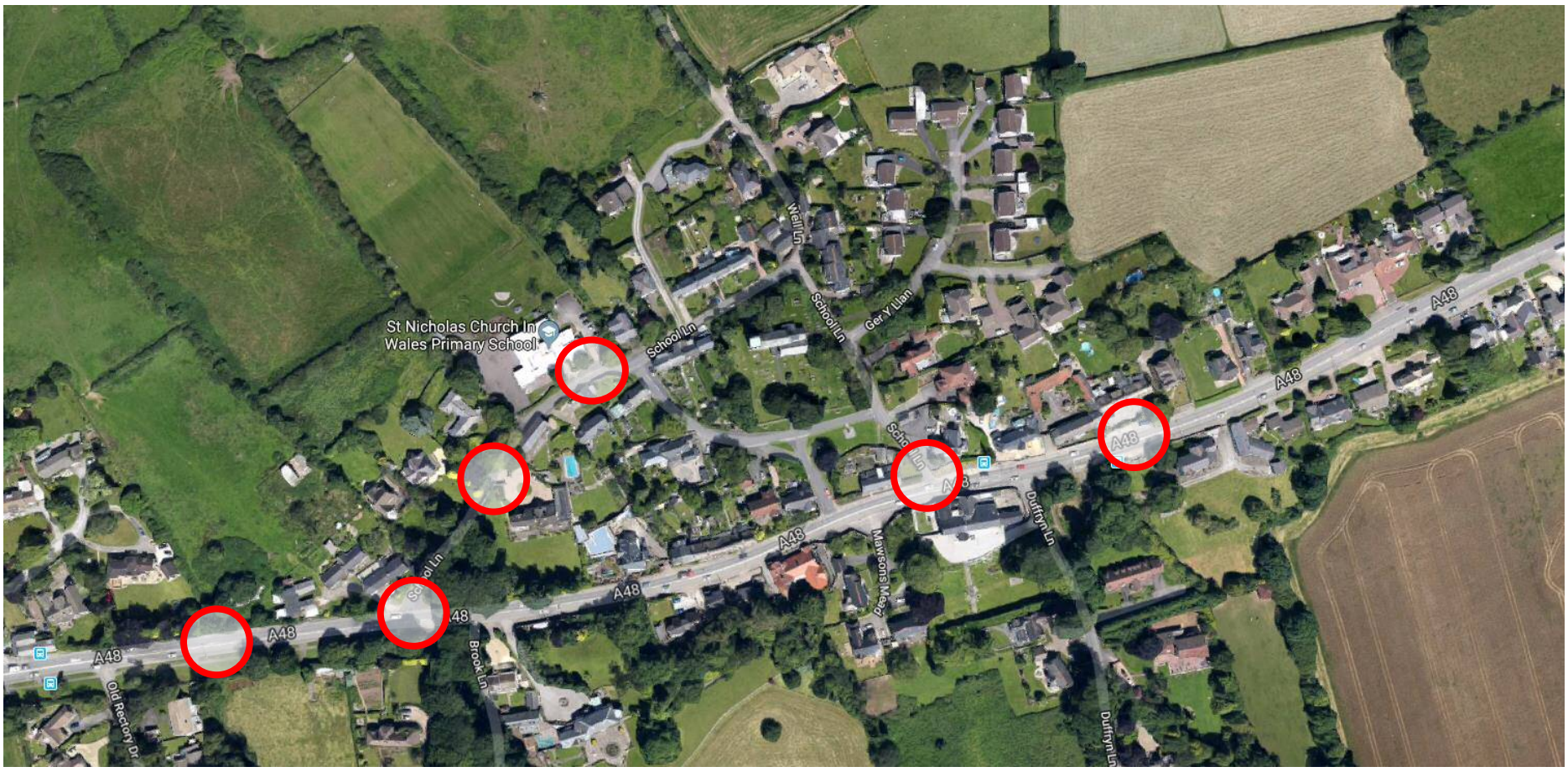
		sta postcodes (i available) or i this is not available analysis o the 2011 Census 'Location of usual residence and place of work' dataset.
9	Tra ic Impact Assessment	Assessment Scenarios: ▪ The TA will assess the impact o the development proposals or the school opening year (2021) both without and with the development proposals. ▪ The 'without development' scenario will include traffic growth (based on growth actors derived rom TEMPro) and the existing school situation with associated tra ic patterns. This is considered the uture baseline. We have undertaken some basic checks and are not aware o any committed development in the surrounding area there ore we will not be including any committed development into our uture baseline. ▪ The 'with development' scenario will be as the 'without development', but with the additional tra ic generated by the growth in pupil and sta population as a result o the proposed development. ▪ The morning and evening weekday drop-o /pick-up hours will be considered. The peak hours or development tra ic generation will be consistent with the peak hours selected or assessment. ▪ Tra ic growth actors derived rom TEMPro (Version 7.2) will be applied to the tra ic data to establish tra ic lows in the opening and orecast years. Impact Assessment: ▪ The assessment will identi y the percentage impact o the proposed development in terms o tra ic lows at the principal access junctions identi ied in Section 6. ▪ Should the increase in tra ic at these junctions be considered to warrant capacity assessment this will be undertaken using the industry-standard TRL so tware program 'Junctions 9' (or priority and roundabout junctions).
10	Transport Implementation Strategy (TIS)	The TA will include a TIS which will consider potential measures and appraise those already being implemented by the wider site to increase the mode share o sustainable travel modes by sta and pupils at the school. In particular the ollowing will be considered: ▪ Feasibility o walking and cycling routes in the surrounding areas including consideration or potential improvements ▪ Cycle parking within the school grounds ▪ Pedestrian and cycle access and circulation within the site and ▪ Bus/parent drop-o points. Determine i a Travel Plan (TP) exists or the current site the outcome o this will be considered in the production o the TIS with appropriate recommendations and actions. A new TP or the site will be secured as part o a planning condition.
11	Construction Tra ic	The TA will include discussion o potential routeing arrangements and estimates o construction tra ic.

Appendix A

Location Plan - St Nicholas Church in Wales Primary School

Appendix B

St Nicholas Vale o Glamorgan – Tra ic Surveys
Location Plan



ctio T r i Co t TC a d L th S r ys – S r y S ci icatio

Locatio s
1. School Lane/Access to St Nicholas CIW Primary School (three-arm priority T-junction).
2. A48/School Lane (three-arm priority T-junction).
3. A48/School Lane (three-arm priority T-junction).

Dat The survey needs to be undertaken on a weekday (pre erably Tuesday Wednesday or Thursday) during term time (i.e. outside school holidays) speci ically w/c 3rd June 2019.

D ratio 07:00–10:00 and 14:30–18:00.

Data to r cord d
- Classi ied turning counts with data split into 15 minute intervals (including a breakdown or vehicle types).
- ueue lengths recorded during 5 minute intervals (the maximum ueue on each arm during each interval) – to be undertaken at Locations 2 and 3 only.

tomatic Tra ic Co t TC S r ys – S r y S ci icatio

Locatio s
4. A48 west o School Lane (location to be con irmed).
5. School Lane (location to be con irmed).
6. A48 east o School Lane (location to be con irmed).

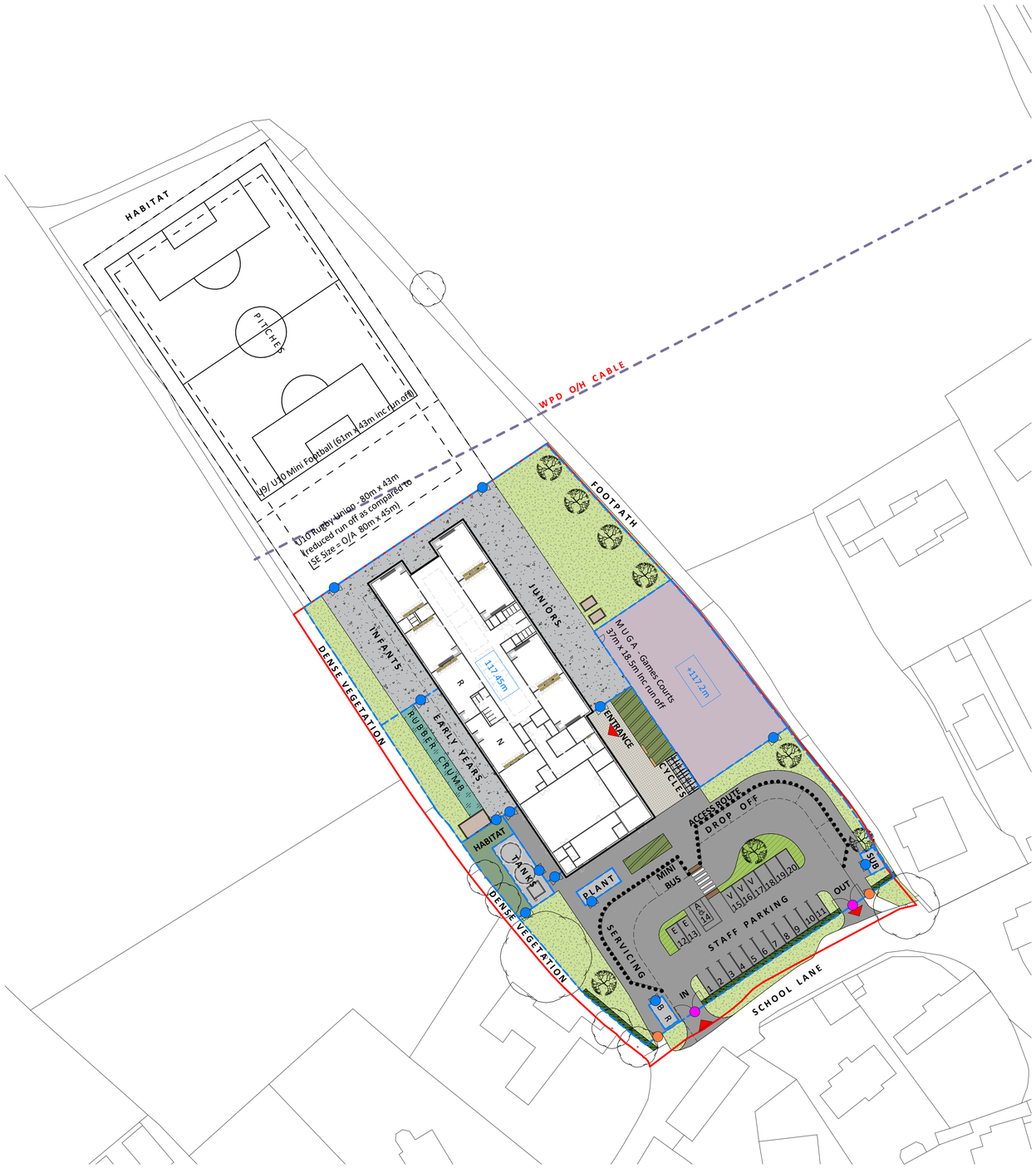
Dat The survey needs to be undertaken over a 7-day period during term time (i.e. outside school holidays) at the same time as the JTC/ ueue Length surveys.

D ratio 7-day period.

Data to r cord d Speed volume and classi ication by direction.

Please note that it is the responsibility o the survey company to obtain any licences re uired to undertake the surveys.

di lll strati Mast r la



General Arrangement Plan
1 : 500

0 5 10 20 30 40 50
GRAPHIC SCALE 1:500

North

Responsibility is not accepted for errors made by others in scaling from this drawing.
All construction information should be taken from figured dimensions only.

0mm 50mm 100mm

Legend

Site boundary.

Fence.
Refer to drawing SNPS-STL-XX-XX-DR-L-9004 Fencing and Security Plan for details.

Gates

Pedestrian single gate.

Site entrance vehicle gate.

Pedestrian and/or maintenance double gate.

R Recycling bins.

B General waste bins.

A Accessible parking space.

E Electric charging space.

Bollard.
Refer to drawing SNPS-STL-XX-XX-DR-L-9002 Hard Landscape Plan for details.

New tree planting.
Refer to drawing SNPS-STL-XX-XX-DR-L-9003 Soft Landscape Plan for details.

Existing trees to be retained to BS 5837:2012.

NOTE:
For levels and drainage information refer to engineers plans and details.

STATUS	REV	DATE	DESCRIPTION
PL	PL01	12/06/20	PAC Submission

CLIENT
Vale of Glamorgan Council

REVISED BY
CCM

CHECKED BY
CS

ORIGINATOR NO
152853

CONSULTANT
STRIDE TREGLOWN
www.stridetreglown.com

PROJECT
St Nicholas Primary School

DRAWING TITLE
General Arrangement Plan

STATUS CODE
PL : Authorized and accepted

SCALE
1 : 500@A1

DRAWING USAGE:

PROJECT - ORIGINATOR - VOLUME - LEVEL - TYPE - ROLE - CLASS. - NUMBER
SNPS-STL-XX-XX-DR-L-9001

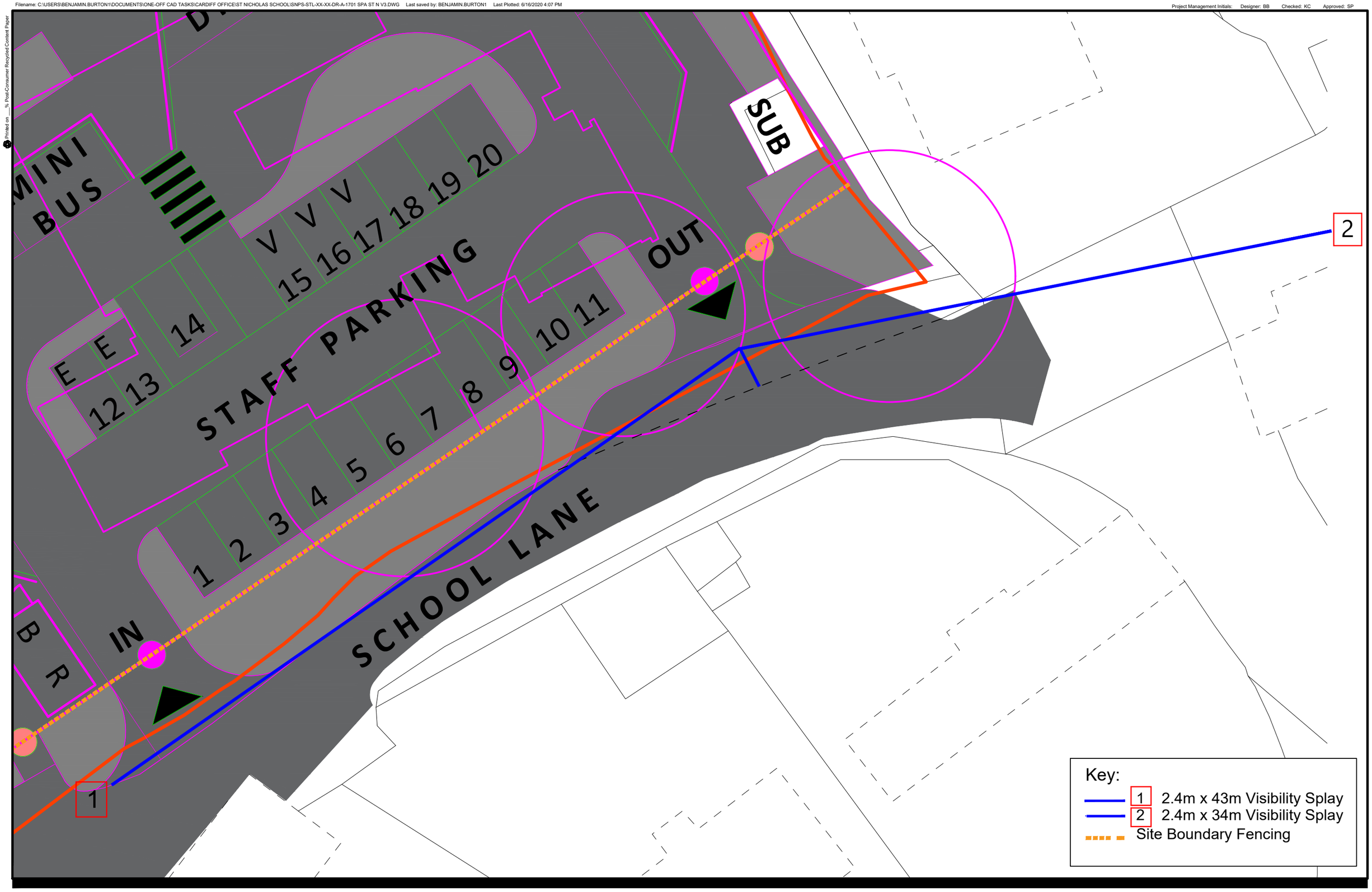
STATUS _ REVISION
PL_PL01

di Visibility S lay & S t Path alysis

Filename: C:\USERS\BENJAMIN.BURTON1\DOCUMENTS\ONE-OFF CAD TASKS\CARDIFF OFFICE\ST NICHOLAS SCHOOL\SNPS-STL-XX-XX-DR-A-1701 SPA ST N V3.DWG Last saved by: BENJAMIN.BURTON1 Last Plotted: 6/16/2020 4:07 PM

Project Management Initials: Designer: BB Checked: KC Approved: SP

Printed on ___% Post-Consumer Recycled Content Paper



St Nicholas Primary School

Transport Assessment

Visibility Splays

AECOM

60607807

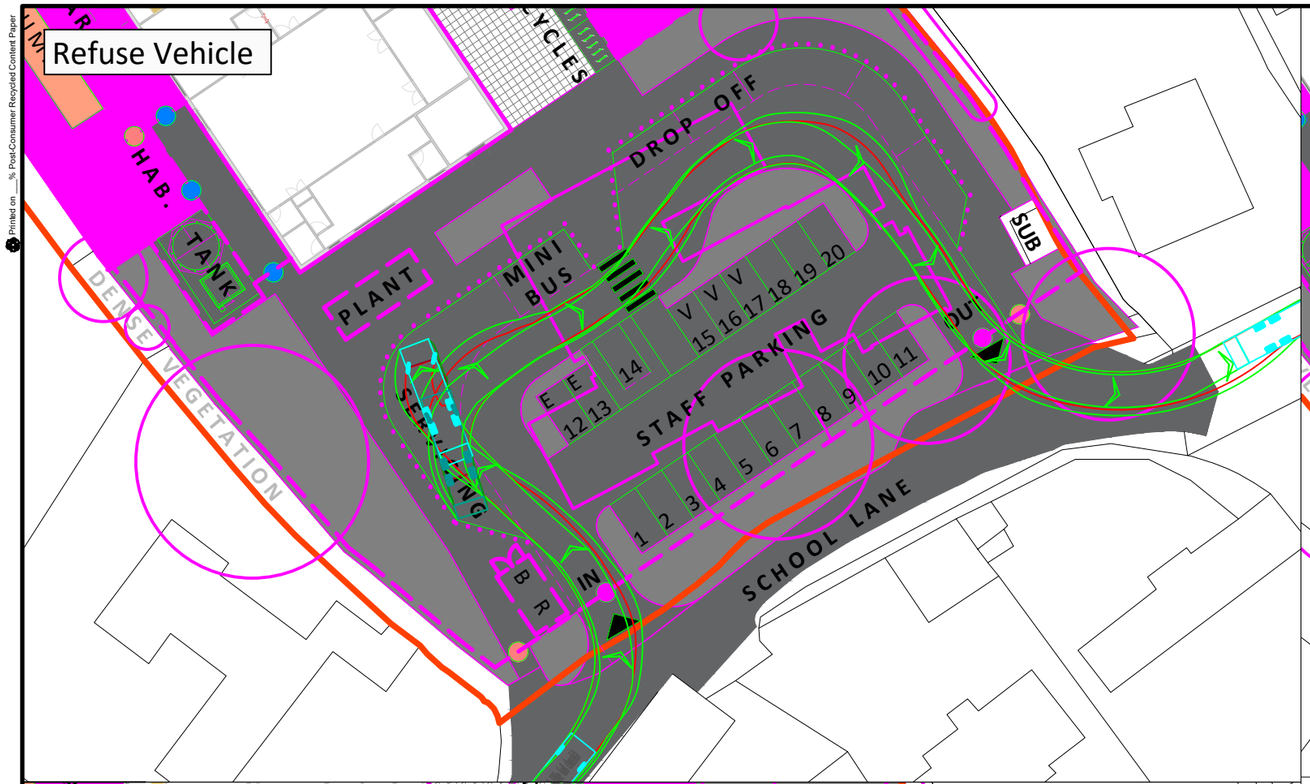
Filename: C:\USERS\BENJAMIN.BURTON1\DOCUMENTS\SNPS-STL-XX-XX-DR-A-1701 SPA ST N V3.DWG Last saved by: BENJAMIN.BURTON1 Last Plotted: 6/11/2020 4:28 PM

Project Management Initials: Designer: BB Checked: KC Approved: SP

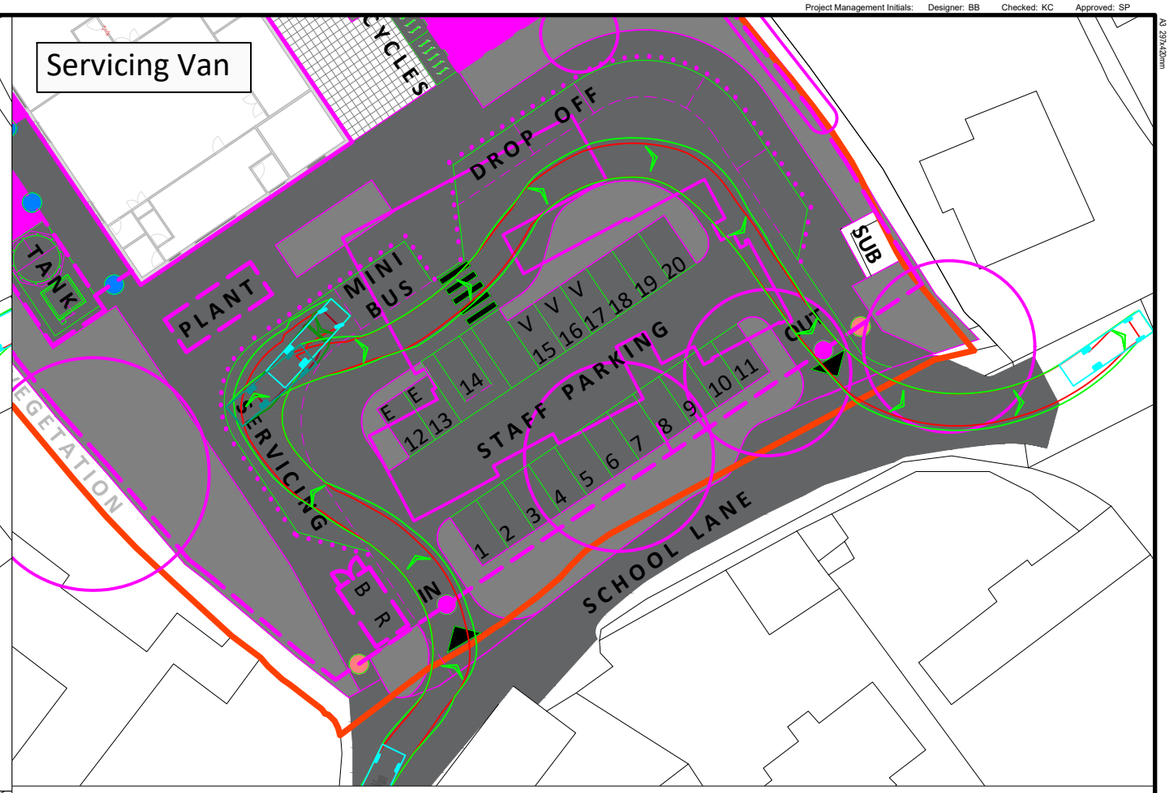
Printed on ___% Post-Consumer Recycled Content Paper

A1 297x420mm

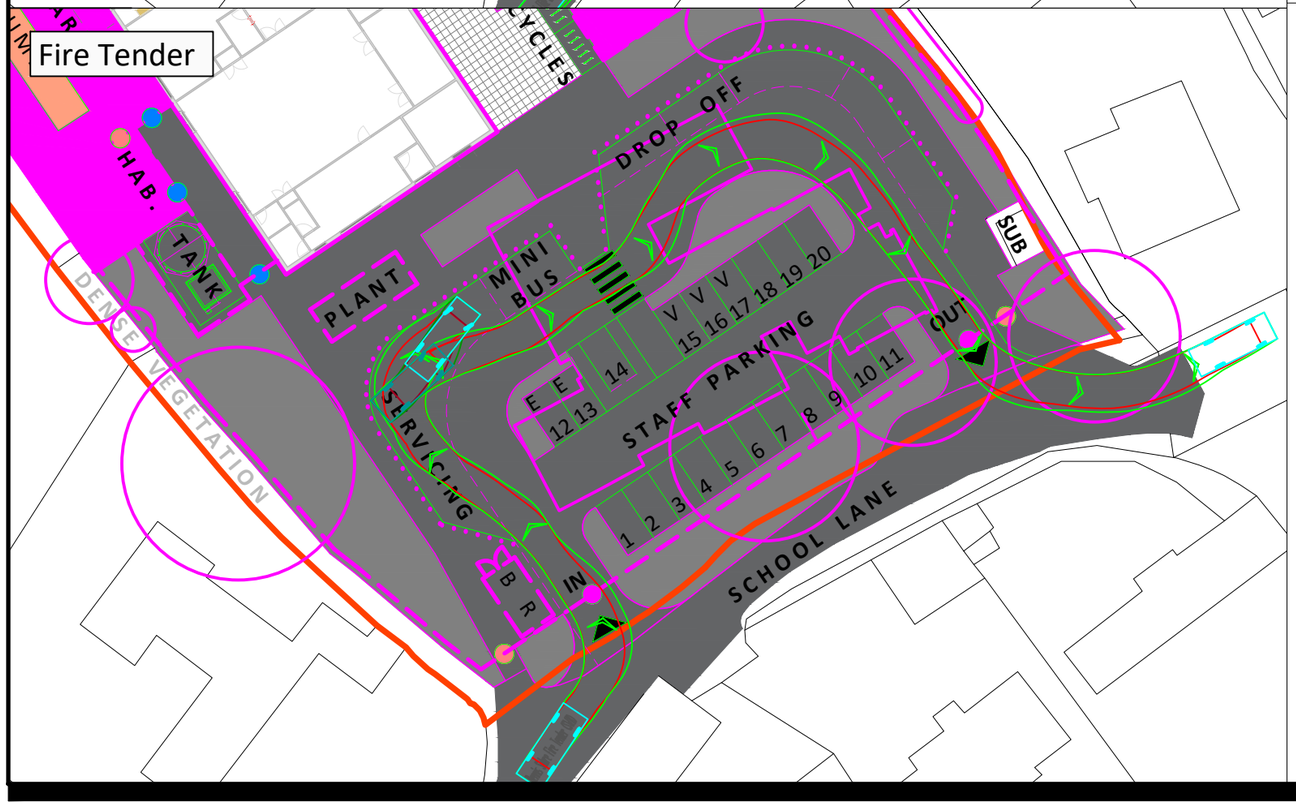
Refuse Vehicle

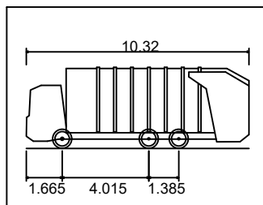


Servicing Van



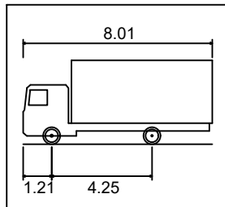
Fire Tender





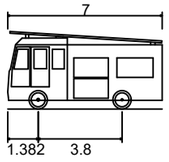
Phoenix 2 Duo Recycler
(P2-12W with Elite 6x4 chassis)

Overall Length	10.320m
Overall Width	2.530m
Overall Body Height	3.756m
Min Body Ground Clearance	0.309m
Track Width	2.530m
Lock to lock time	4.00s
Kerb to Kerb Turning Radius	9.450m



7.5t Box Van

Overall Length	8.010m
Overall Width	2.100m
Overall Body Height	3.556m
Min Body Ground Clearance	0.351m
Track Width	2.064m
Lock to lock time	4.00s
Kerb to Kerb Turning Radius	7.400m



Dennis Sabre Fire Tender (SWB)

Overall Length	7.000m
Overall Width	2.430m
Overall Body Height	3.512m
Min Body Ground Clearance	0.397m
Track Width	2.380m
Lock to lock time	5.00s
Kerb to Kerb Turning Radius	6.835m

Tracking Based on Drawing: SNPS-STL-XX-XX-DR-A-1701

St Nicholas Primary School

Transport Assessment

Vehicle Swept Path Analysis - 1

AECOM

60607807

Filename: C:\USERS\BENJAMIN.BURTON1\DOCUMENTS\SNPS-STL-XX-XX-DR-A-1701 SPA ST N V3.DWG Last saved by: BENJAMIN.BURTON1 Last Plotted: 6/11/2020 4:28 PM

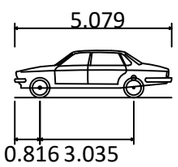
Project Management Initials: Designer: BB Checked: KC Approved: SP

A1 297x420mm

Printed on ___% Post-Consumer Recycled Content Paper

Minibus

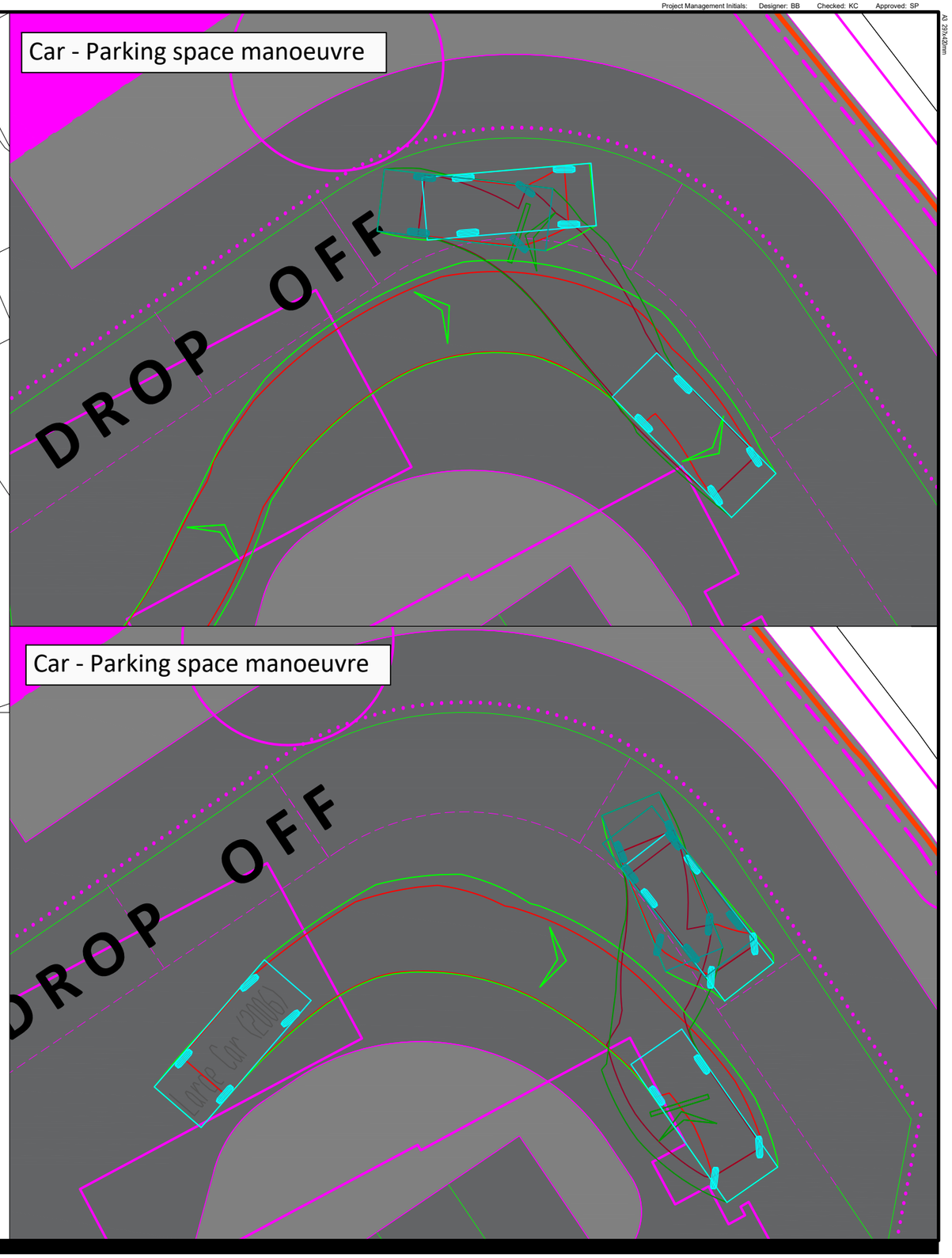
Mini Bus	
Overall Length	6.330m
Overall Width	2.192m
Overall Body Height	2.601m
Min Body Ground Clearance	0.374m
Track Width	2.192m
Lock to lock time	4.00s
Kerb to Kerb Turning Radius	6.450m



Large Car (2006)	
Overall Length	5.079m
Overall Width	1.872m
Overall Body Height	1.525m
Min Body Ground Clearance	0.310m
Max Track Width	1.831m
Lock to lock time	4.00s
Kerb to Kerb Turning Radius	5.900m

Tracking Based on Drawing: SNPS-STL-XX-XX-DR-A-1701

Car - Parking space manoeuvre



Car - Parking space manoeuvre

St Nicholas Primary School

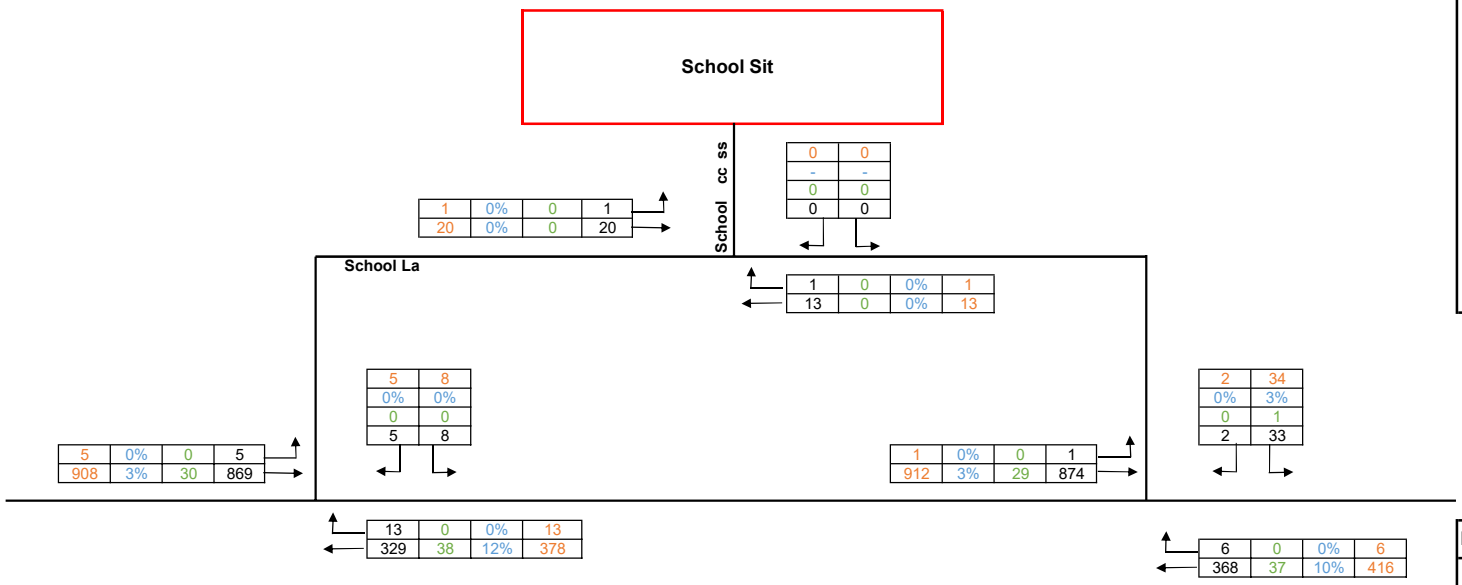
Transport Assessment

Vehicle Swept Path Analysis - 2

AECOM

60607807

di Tra ic lo Dia rams



Not s

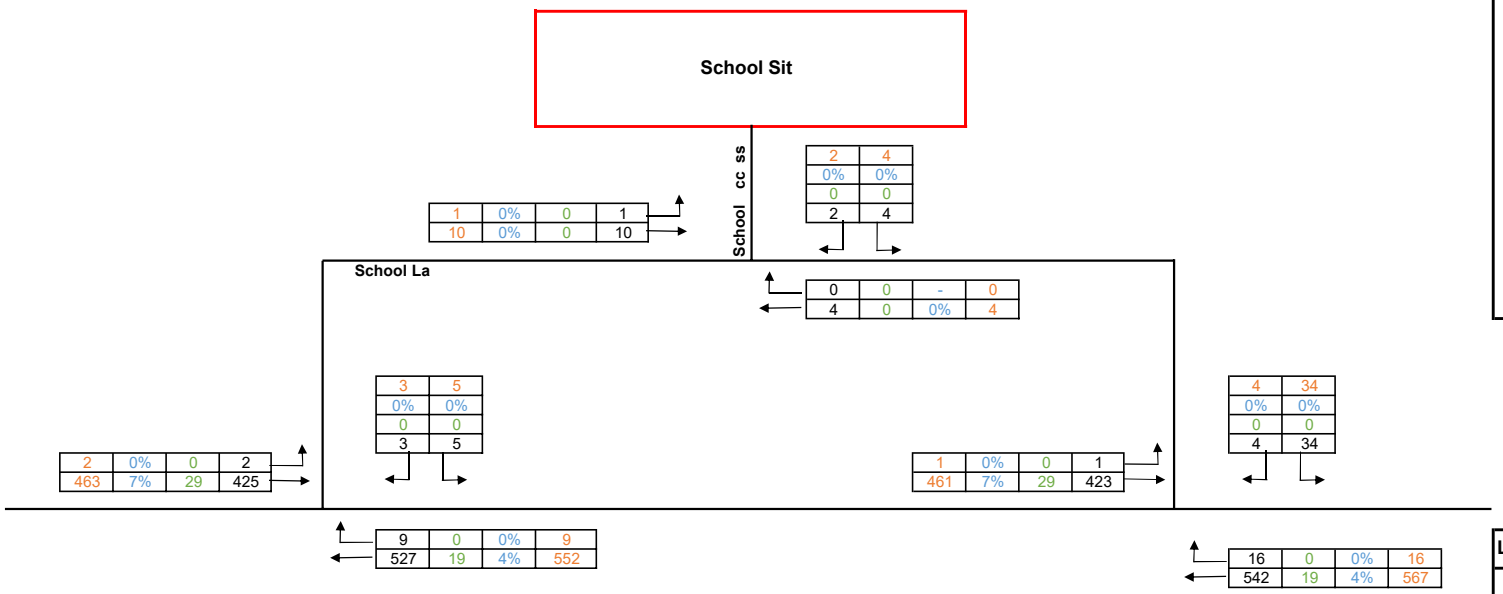
1. Diagram not to scale.
2. Tra ic low taken rom JTC surveys completed 06/06/19.
3. "HGV" lows are taken as OGV1 OGV2 and PSV lows rom JTC surveys.
4. PCU lows derived by applying actor o 2.3 to HGV lows.
5. Peak hour has been derived based on the peak tra ic demand at the school access JTC survey.

L d

xx	Total vehicles
xx	HGVs
xx	% HGVs
xx	PCUs

AECOM
1 Callaghan S uare
Cardi
CF10 5BT
029 2067 4600
.aecom.com

Titl	**O s r d Tra ic lo s M P a Ho r**	**Dra**	**MP**
i r		**Ch c d**	**MD**
Pro ct	**St Nicholas Ch rch i al s Primary School al o lamor a**	**ro d**	**C**
Cli t	**al o lamor a**	**Dat**	



Not s

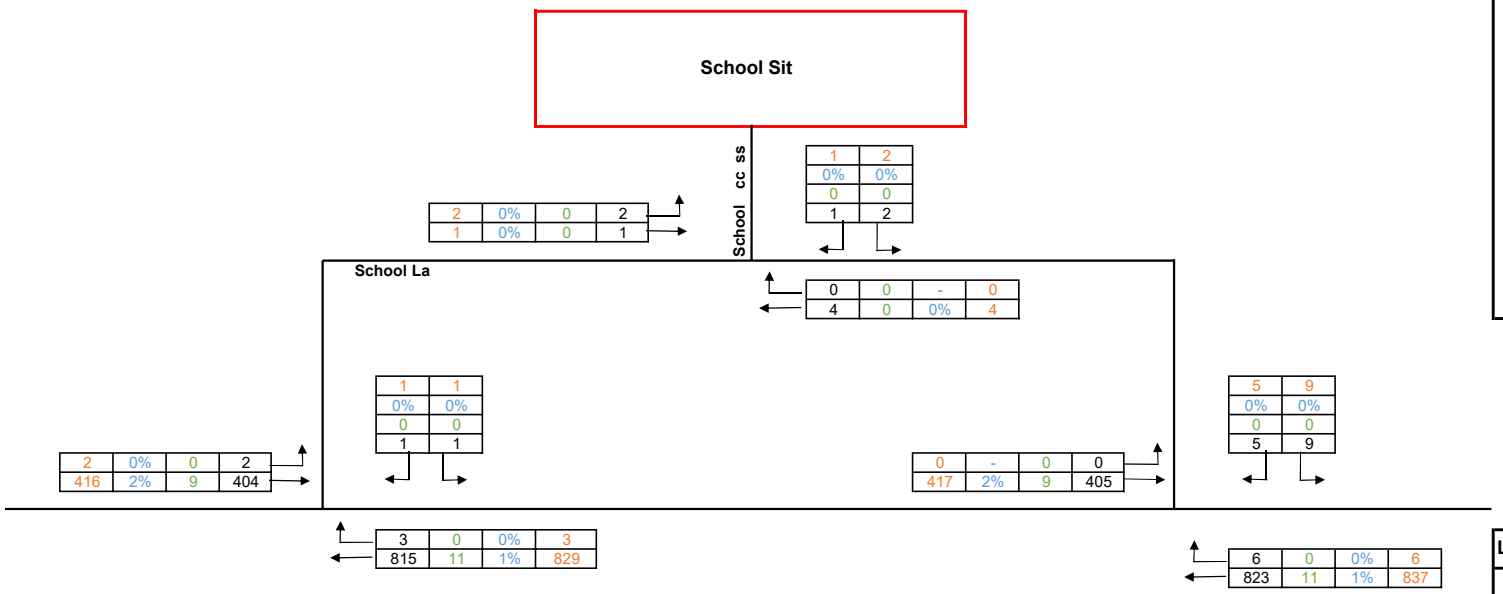
1. Diagram not to scale.
2. Tra ic low taken rom JTC surveys completed 06/06/19.
3. "HGV" lows are taken as OGV1 OGV2 and PSV lows rom JTC surveys.
4. PCU lows derived by applying actor o 2.3 to HGV lows.
5. Peak hour has been derived based on the peak tra ic demand at the school access JTC survey.

L d

xx	Total vehicles
xx	HGVs
xx	% HGVs
xx	PCUs

AECOM
1 Callaghan S uare
Cardi
CF10 5BT
029 2067 4600
.aecom.com

Titl	O s r d Tra ic lo s School PM P a Ho r	Dra	MP
i r		Ch c d	MD
Pro ct	St Nicholas Ch rch i al s Primary School al o lamor a	ro d	C
Cli t	al o lamor a	Dat	



Not s

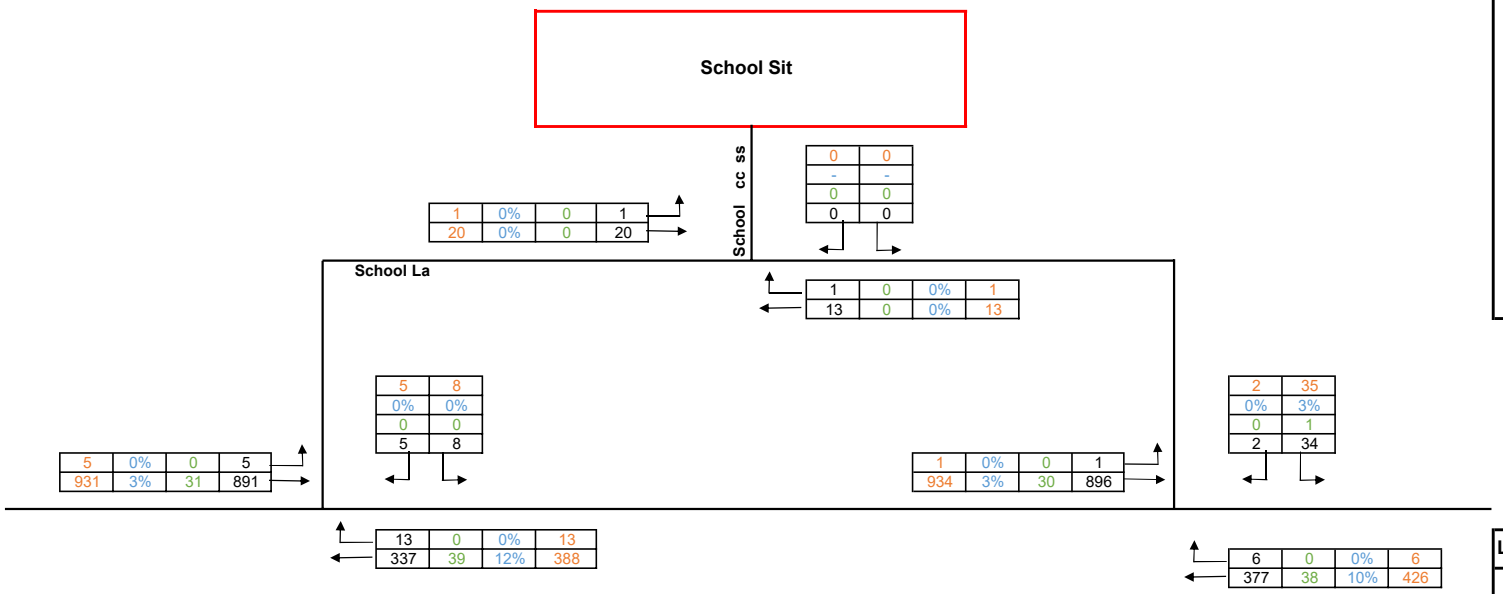
1. Diagram not to scale.
2. Tra ic low taken rom JTC surveys completed 06/06/19.
3. "HGV" lows are taken as OGV1 OGV2 and PSV lows rom JTC surveys.
4. PCU lows derived by applying actor o 2.3 to HGV lows.
5. Peak hour has been derived based on the peak tra ic demand on A48 based on ATC surveys.

L d

xx	Total vehicles
xx	HGVs
xx	% HGVs
xx	PCUs

AECOM
1 Callaghan S uare
Cardi
CF10 5BT
029 2067 4600
.aecom.com

Titl	O s r d Tra ic lo s PM P a Ho r	Dra	MP
i r		Ch c d	MD
Pro ct	St Nicholas Ch rch i al s Primary School al o lamor a	ro d	C
Cli t	al o lamor a	Dat	



Not s

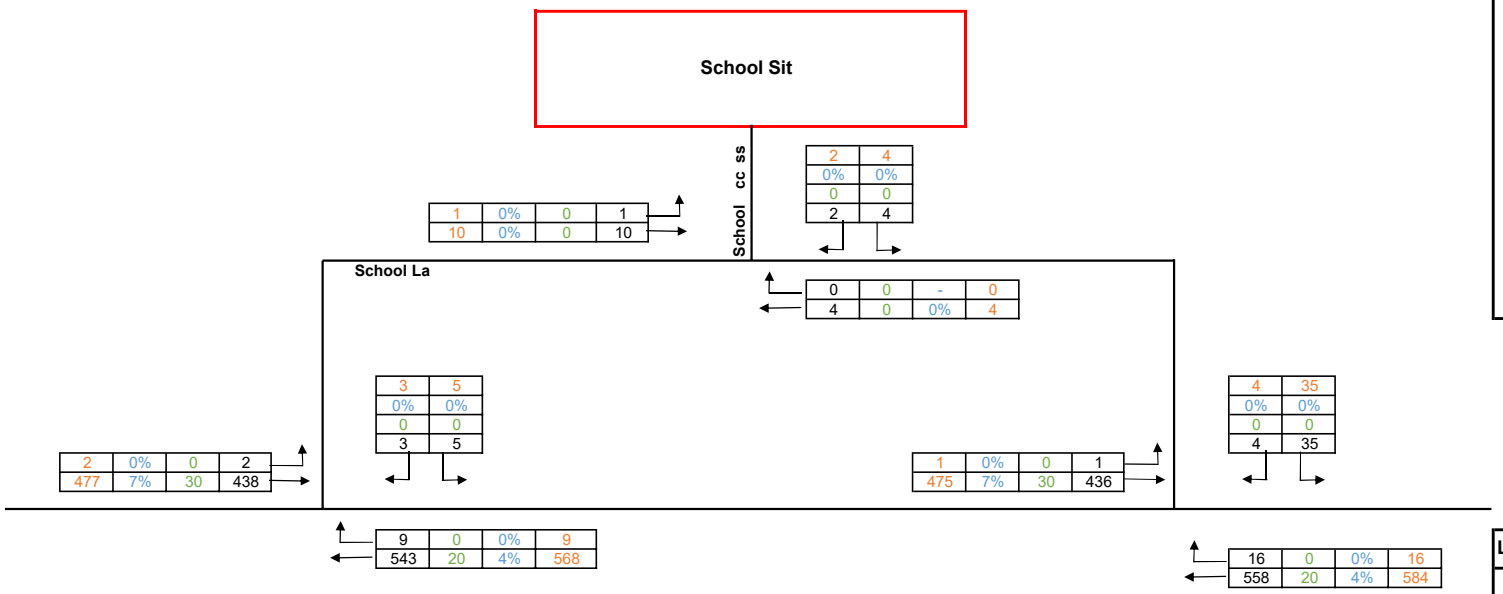
1. Diagram not to scale.
2. Growth to 2021 via application o growth actor derived rom TEMPro (Version 7.2).
3. Growth actor has been applied to total vehicle and HGV lows.
4. Growth actor has not been applied to movements to / rom site access.

L d

xx	Total vehicles
xx	HGVs
xx	% HGVs
xx	PCUs

AECOM
1 Callaghan S uare
Cardi
CF10 5BT
029 2067 4600
.aecom.com

Titl	as Tra ic lo s M P a Ho r	Dra	MP
i r		Ch c d	MD
Pro ct	St Nicholas Ch rch i al s Primary School al o lamor a	ro d	C
Cli t	al o lamor a	Dat	



Not s

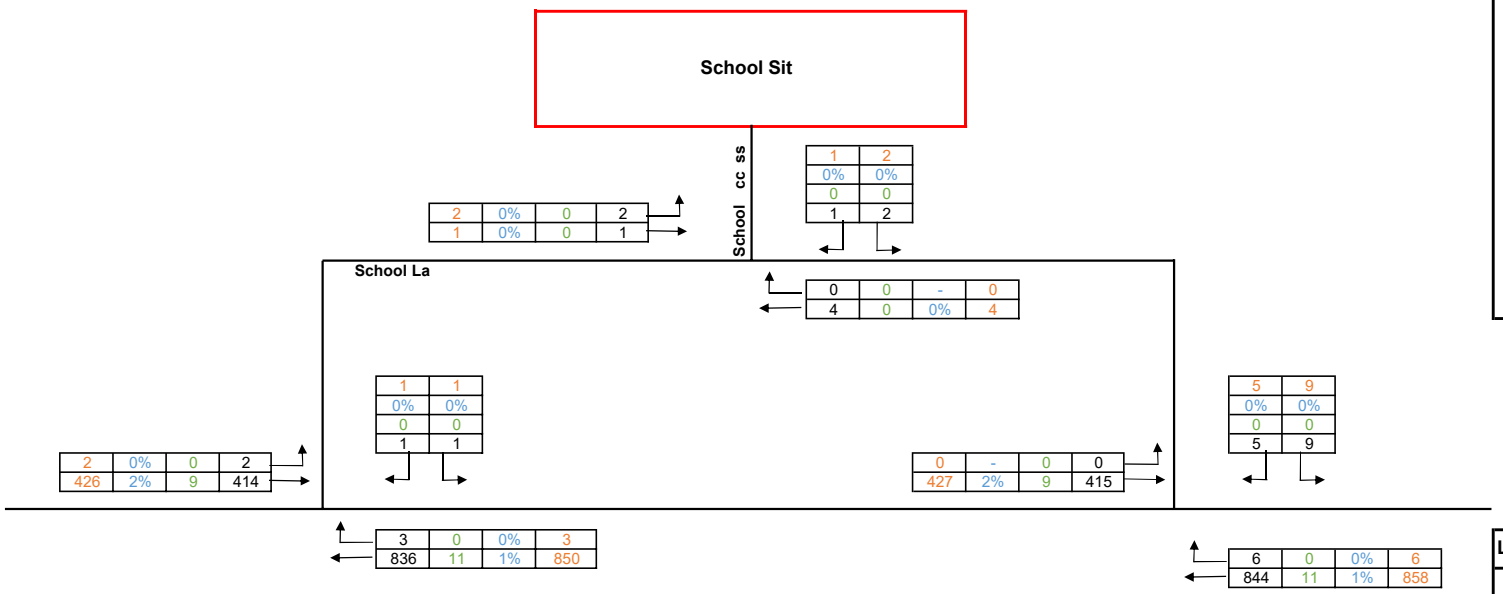
1. Diagram not to scale.
2. Growth to 2021 via application o growth actor derived rom TEMPro (Version 7.2).
3. Growth actor has been applied to total vehicle and HGV lows.
4. Growth actor has not been applied to movements to / rom site access.

L d

xx	Total vehicles
xx	HGVs
xx	% HGVs
xx	PCUs

AECOM
1 Callaghan S uare
Cardi
CF10 5BT
029 2067 4600
.aecom.com

Titl	as Tra ic lo s School PM P a Ho r	Dra	MP
i r		Ch c d	MD
Pro ct	St Nicholas Ch rch i al s Primary School al o lamor a	ro d	C
Cli t	al o lamor a	Dat	



Not s

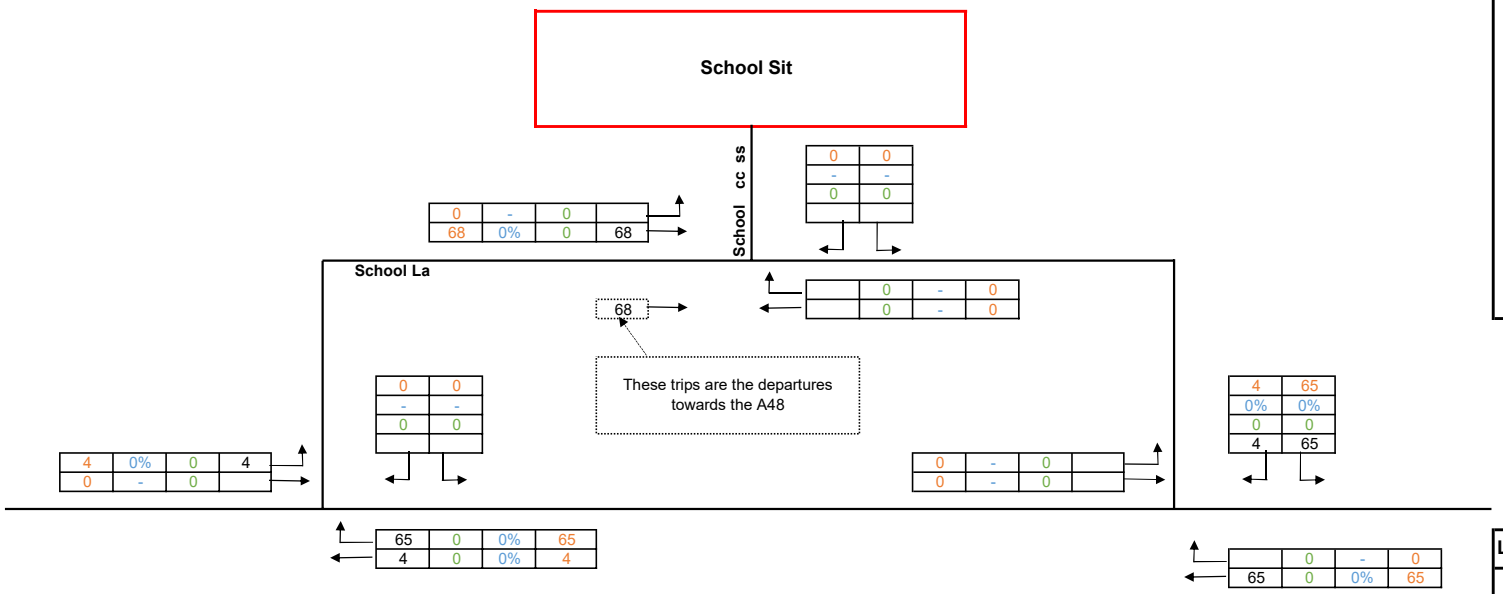
1. Diagram not to scale.
2. Growth to 2021 via application o growth actor derived rom TEMPro (Version 7.2).
3. Growth actor has been applied to total vehicle and HGV lows.
4. Growth actor has not been applied to movements to / rom site access.

L d

xx	Total vehicles
xx	HGVs
xx	% HGVs
xx	PCUs

AECOM
1 Callaghan S uare
Cardi
CF10 5BT
029 2067 4600
.aecom.com

Titl	as Tra ic lo s PM P a Ho r	Dra	MP
i r		Ch c d	MD
Pro ct	St Nicholas Ch rch i al s Primary School al o lamor a	ro d	C
Cli t	al o lamor a	Dat	



Not s

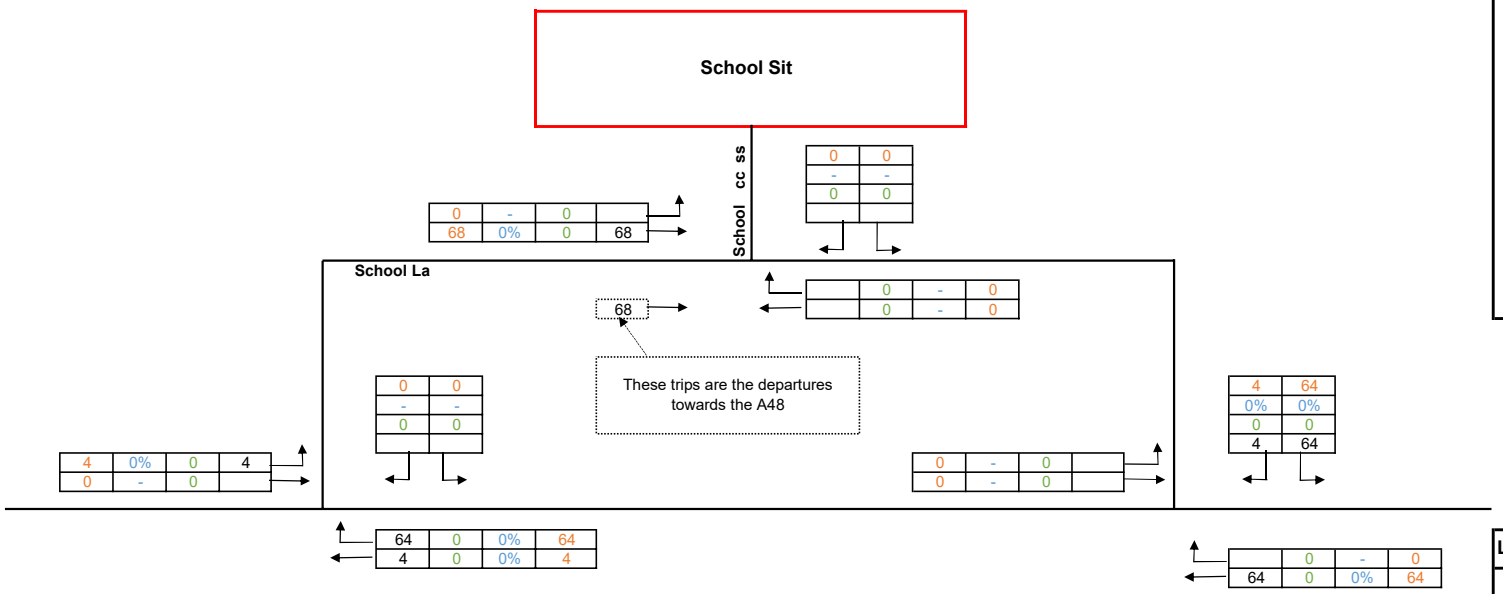
1. Diagram not to scale.
2. Tra ic lows show the increase in pupil tra ic generation i.e. escort-education trips. Tra ic arrives and departs during peak hour.
3. Tra ic assigned via one-way system arriving via Junction 1 and departing via Junction 3.
4. Tra ic assigned ahead at Junction 1 to show parents parking up on School Lane to drop o /pick up pupils.
5. All tra ic lows are in vehicles. No HGVs are generated by the proposed development.
6. Boxes with dashed lines indicate where tra ic leaves the network or its origin/ destination.

L d

xx	Total vehicles
xx	HGVs
xx	% HGVs
xx	PCUs

AECOM
1 Callaghan S uare
Cardi
CF10 5BT
029 2067 4600
.aecom.com

Titl	Tra ic ratio l cr as i P ils M P a Ho r	Dra	MP
i r	i r	Ch c d	MD
Pro ct	St Nicholas Ch rch i al s Primary School al o lamor a	ro d	C
Cli t	al o lamor a	Dat	



Not s

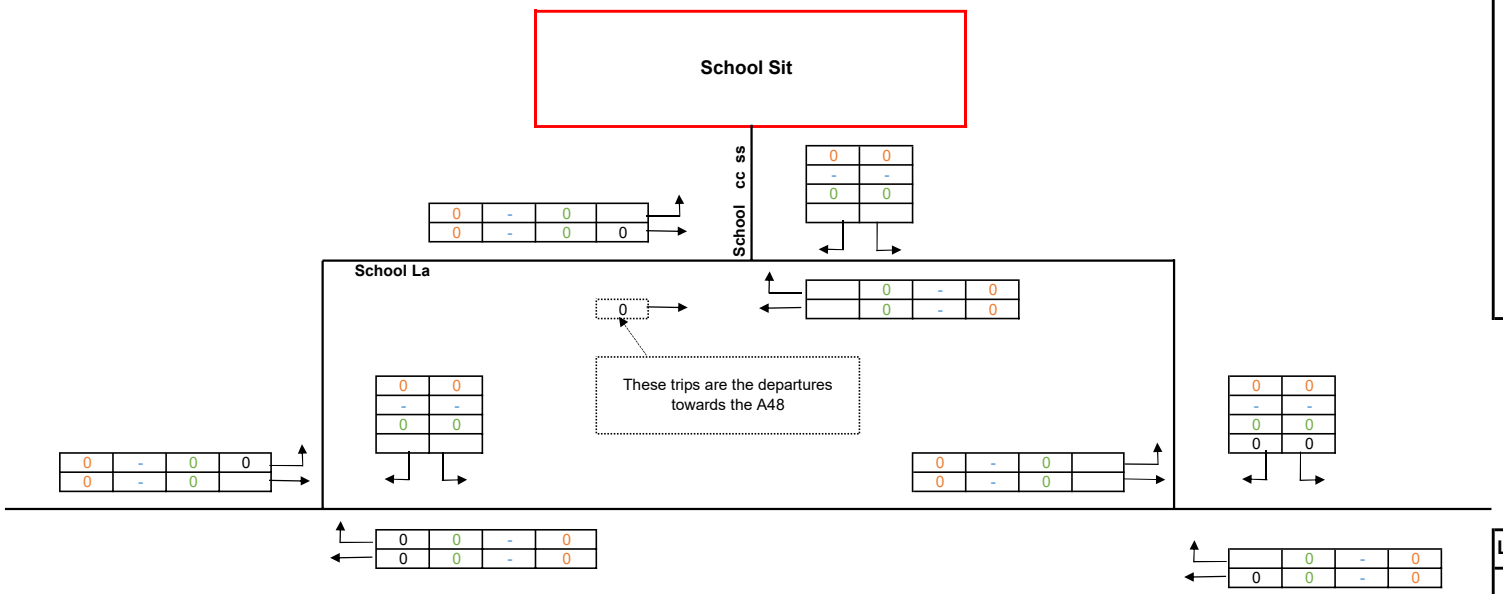
1. Diagram not to scale.
2. Tra ic lows show the increase in pupil tra ic generation i.e. escort-education trips. Tra ic arrives and departs during peak hour.
3. Tra ic assigned via one-way system arriving via Junction 1 and departing via Junction 3.
4. Tra ic assigned ahead at Junction 1 to show parents parking up on School Lane to drop o /pick up pupils.
5. All tra ic lows are in vehicles. No HGVs are generated by the proposed development.
6. Boxes with dashed lines indicate where tra ic leaves the network or its origin/ destination.

L d

xx	Total vehicles
xx	HGVs
xx	% HGVs
xx	PCUs

AECOM
1 Callaghan S uare
Cardi
CF10 5BT
029 2067 4600
.aecom.com

Titl	**Tra ic ratio l cr as i P ils School P a Ho r**	**Dra**	**MP**
i r	**i r**	**Ch c d**	**MD**
Pro ct	**St Nicholas Ch rch i al s Primary School al o lamor a**	**ro d**	**C**
Cli t	**al o lamor a**	**Dat**	



Not s

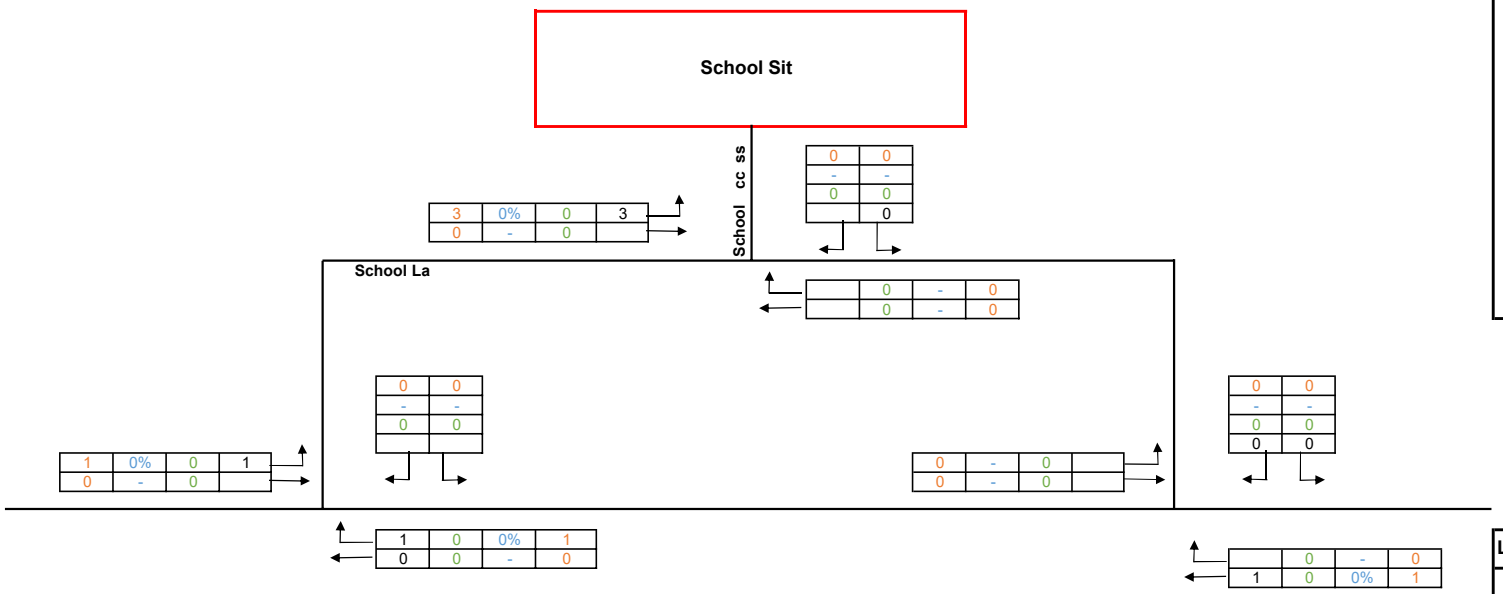
1. Diagram not to scale.
2. Tra ic lows show the increase in pupil tra ic generation i.e. escort-education trips. Tra ic arrives and departs during peak hour.
3. Tra ic assigned via one-way system arriving via Junction 1 and departing via Junction 3.
4. Tra ic assigned ahead at Junction 1 to show parents parking up on School Lane to drop o /pick up pupils.
5. All tra ic lows are in vehicles. No HGVs are generated by the proposed development.
6. Boxes with dashed lines indicate where tra ic leaves the network or its origin/ destination.

L d

xx	Total vehicles
xx	HGVs
xx	% HGVs
xx	PCUs

AECOM
1 Callaghan S uare
Cardi
CF10 5BT
029 2067 4600
.aecom.com

Titl	Tra ic ratio l cr as i P ils PM P a Ho r	Dra	MP
i r		Ch c d	MD
Pro ct	St Nicholas Ch rch i al s Primary School al o lamor a	ro d	C
Cli t	al o lamor a	Dat	



Not s

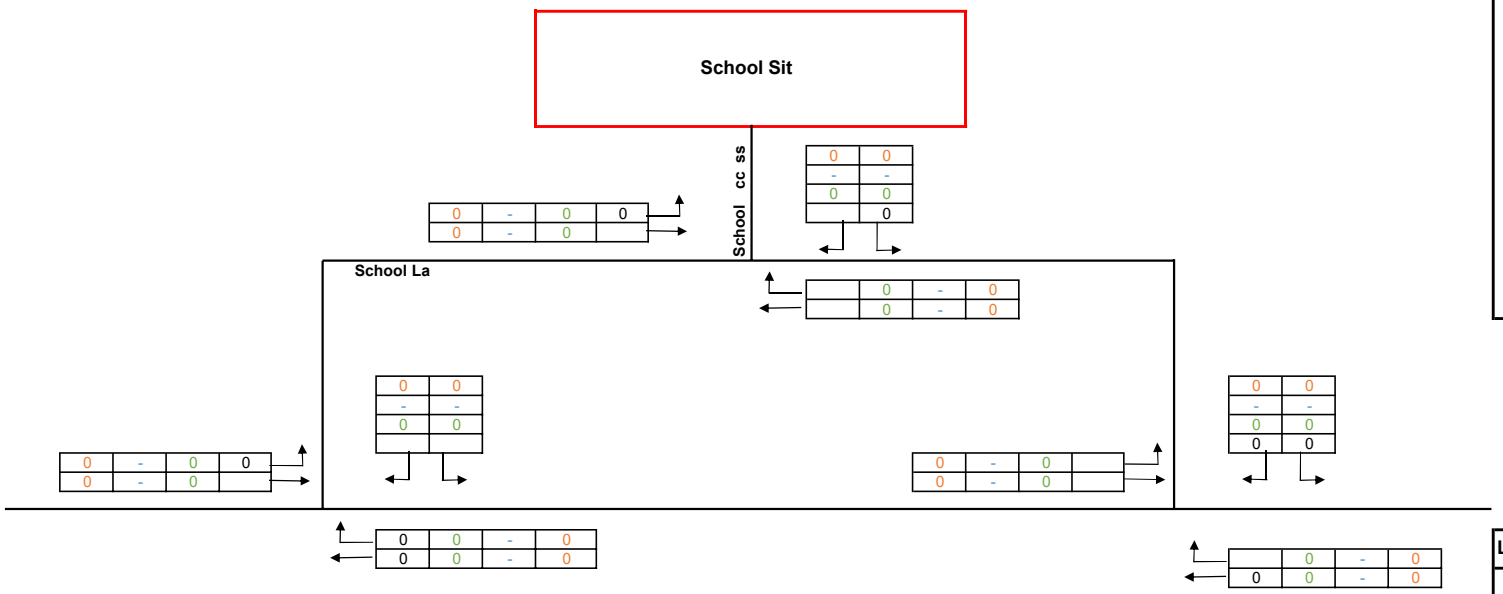
1. Diagram not to scale.
2. Tra ic lows show the increase in sta tra ic generation.
3. Tra ic assigned via one-way system arriving via Junction 1 and departing via Junction 3.
4. All tra ic lows are in vehicles. No HGVs are generated by the proposed development.

L d

xx	Total vehicles
xx	HGVs
xx	% HGVs
xx	PCUs

AECOM
1 Callaghan S uare
Cardi
CF10 5BT
029 2067 4600
.aecom.com

Titl	Tra ic ratio l cr as i P ils M P a Ho r	Dra	MP
i r	i r	Ch c d	MD
Pro ct	St Nicholas Ch rch i al s Primary School al o lamor a	ro d	C
Cli t	al o lamor a	Dat	



Not s

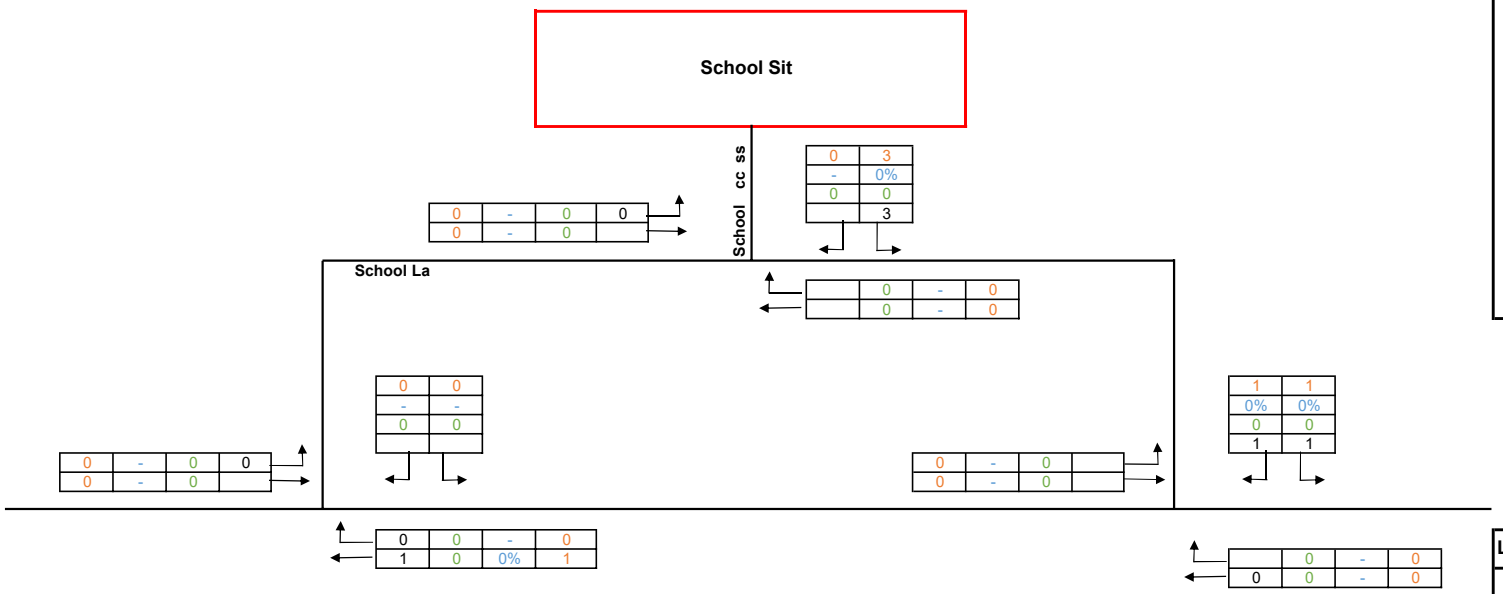
1. Diagram not to scale.
2. Tra ic lows show the increase in sta tra ic generation.
3. Tra ic assigned via one-way system arriving via Junction 1 and departing via Junction 3.
4. All tra ic lows are in vehicles. No HGVs are generated by the proposed development.

L d

xx	Total vehicles
xx	HGVs
xx	% HGVs
xx	PCUs

AECOM
1 Callaghan S uare
Cardi
CF10 5BT
029 2067 4600
.aecom.com

Titl	Tra ic ratio l cr as i P ils School PM P a Ho r	Dra	MP
i r		Ch c d	MD
Pro ct	St Nicholas Ch rch i al s Primary School al o lamor a	ro d	C
Cli t	al o lamor a	Dat	



Not s

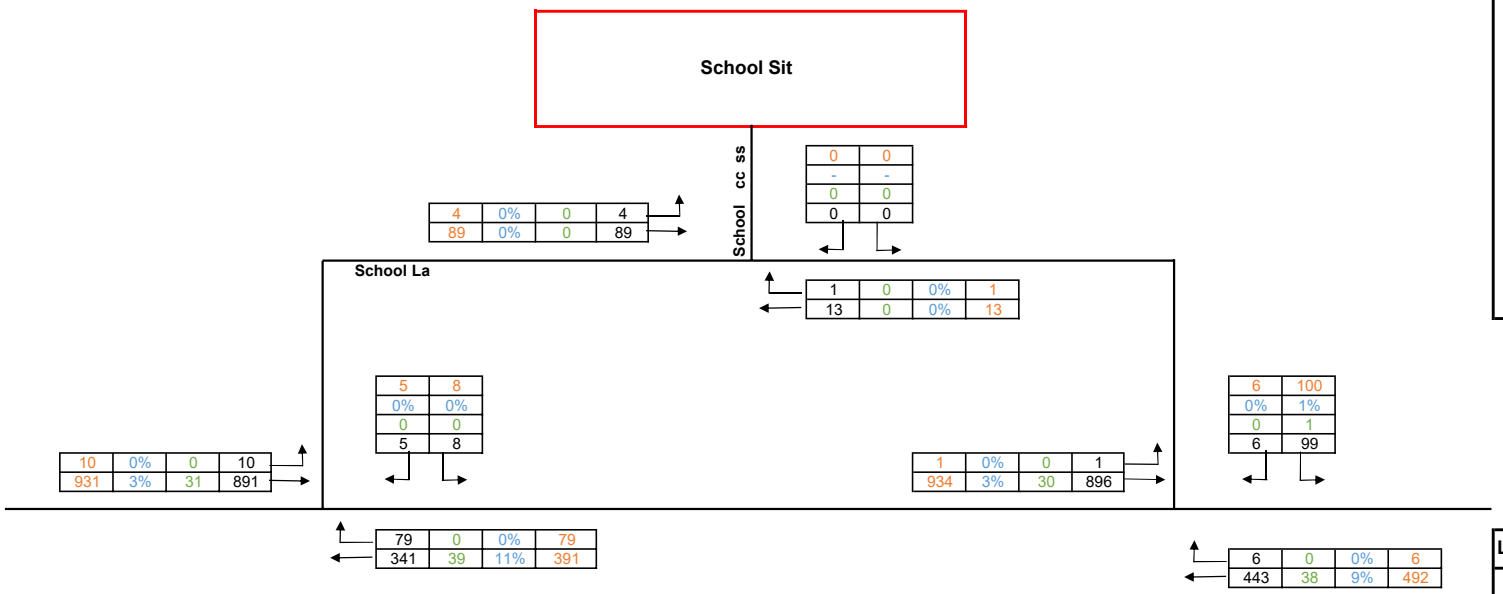
1. Diagram not to scale.
2. Tra ic lows show the increase in sta tra ic generation.
3. Tra ic assigned via one-way system arriving via Junction 1 and departing via Junction 3.
4. All tra ic lows are in vehicles. No HGVs are generated by the proposed development.

L d

xx	Total vehicles
xx	HGVs
xx	% HGVs
xx	PCUs

AECOM
1 Callaghan S uare
Cardi
CF10 5BT
029 2067 4600
.aecom.com

Titl	Tra ic ratio l cr as i P ils PM P a Ho r	Dra	MP
i r	i r	Ch c d	MD
Pro ct	St Nicholas Ch rch i al s Primary School al o lamor a	ro d	C
Cli t	al o lamor a	Dat	



Not s

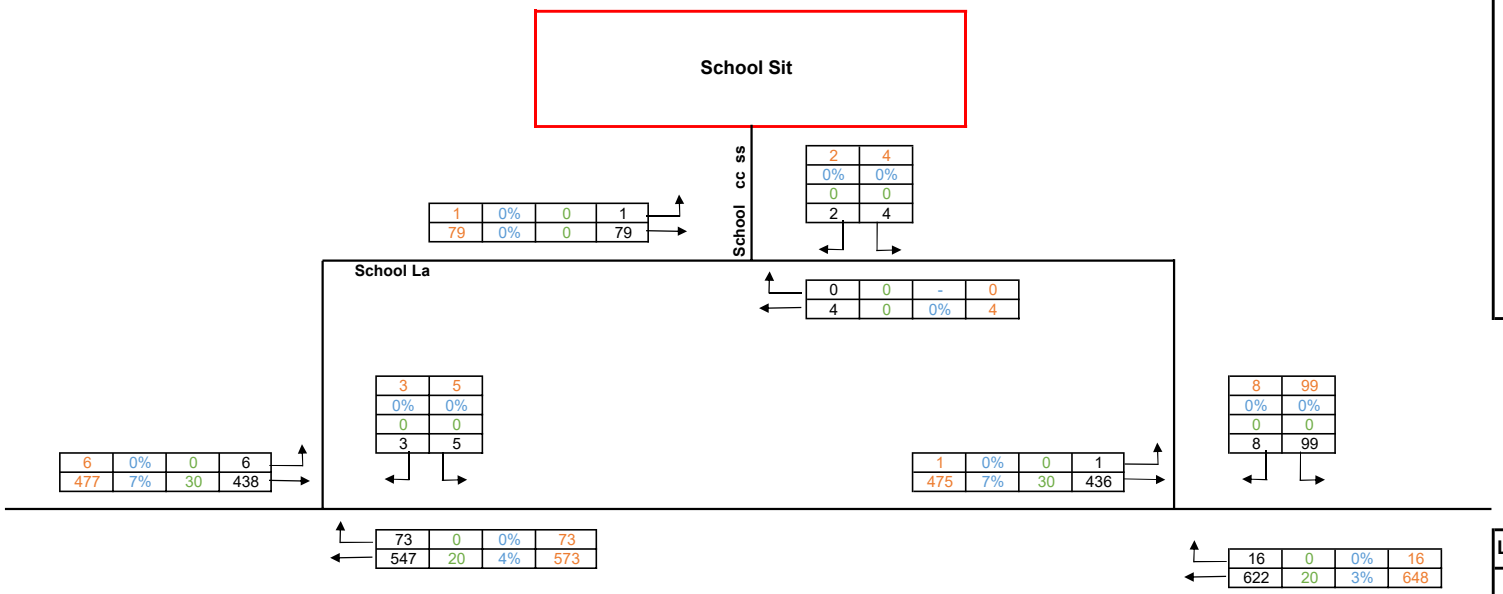
1. Diagram not to scale.
2. Tra ic lows are 2021 Base lows plus total school tra ic ollowing expansion.
3. Growth actor has been applied to total vehicle and HGV lows.
4. Tra ic arrivals / departures between junctions are not shown.

L d

xx	Total vehicles
xx	HGVs
xx	% HGVs
xx	PCUs

AECOM
1 Callaghan S uare
Cardi
CF10 5BT
029 2067 4600
.aecom.com

Titl	as D lo m t Tra ic lo s M P a Ho r	Dra	MP
i r		Ch c d	MD
Pro ct	St Nicholas Ch rch i al s Primary School al o lamor a	ro d	C
Cli t	al o lamor a	Dat	



Not s

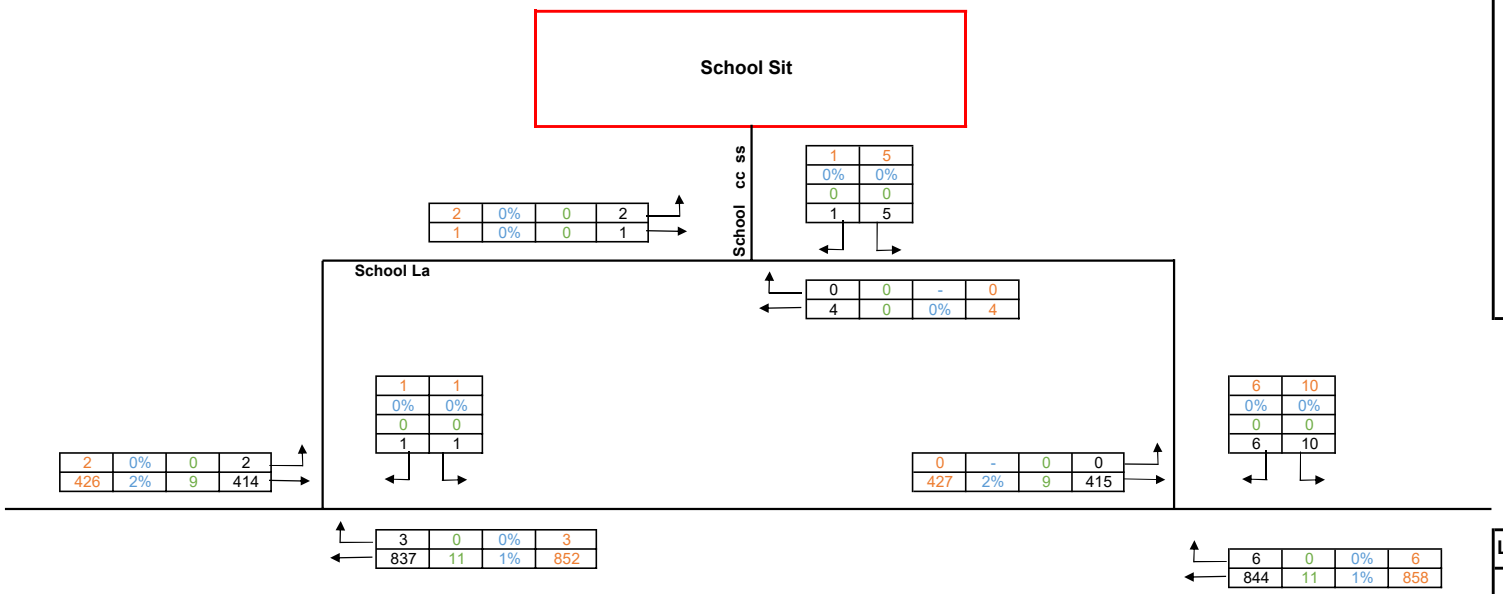
1. Diagram not to scale.
2. Tra ic lows are 2021 Base lows plus total school tra ic ollowing expansion.
3. Growth actor has been applied to total vehicle and HGV lows.
4. Tra ic arrivals / departures between junctions are not shown.

L d

xx	Total vehicles
xx	HGVs
xx	% HGVs
xx	PCUs

AECOM
1 Callaghan S uare
Cardi
CF10 5BT
029 2067 4600
.aecom.com

Titl	as D lo m t Tra ic lo s School PM P a Ho r	Dra	MP
i r		Ch c d	MD
Pro ct	St Nicholas Ch rch i al s Primary School al o lamor a	ro d	C
Cli t	al o lamor a	Dat	



Not s

1. Diagram not to scale.
2. Tra ic lows are 2021 Base lows plus total school tra ic ollowing expansion.
3. Growth actor has been applied to total vehicle and HGV lows.
4. Tra ic arrivals / departures between junctions are not shown.

L d

xx	Total vehicles
xx	HGVs
xx	% HGVs
xx	PCUs

AECOM
1 Callaghan S uare
Cardi
CF10 5BT
029 2067 4600
.aecom.com

Titl	as D lo m t Tra ic lo s PM P a Ho r	Dra	MP
i r		Ch c d	MD
Pro ct	St Nicholas Ch rch i al s Primary School al o lamor a	ro d	C
Cli t	al o lamor a	Dat	

di ctio Ca acity Mod lli O t t R orts

Junctions 9

PICADY 9 - Priority Intersection Module

Version: 9.5.1.7462

For sales and distribution information, program advice and maintenance, contact TRL:
+44 (0)1344 379777 software@trl.co.uk www.trlsoftware.co.uk

Filename: Junction 2 - A48_School Lane (Western)_v0.2.j9
Path: C:\Users\mattJ.parker\Documents\01 Project Work\St Nicks\Junction Modelling\Junction Modelling\Junction 2 - A48_School Lane (Western)
Report generation date: 15/06/2020 14:12:18

Summary of junction performance

	AM					IP					PM				
	Set ID	Queue (PCU)	Delay (s)	RFC	LOS	Set ID	Queue (PCU)	Delay (s)	RFC	LOS	Set ID	Queue (PCU)	Delay (s)	RFC	LOS
	2019														
Stream B-AC	D1	0.0	10.89	0.04	B	D2	0.0	8.21	0.02	A	D3	0.0	0.00	0.00	A
Stream C-AB		0.1	5.16	0.04	A		0.0	4.05	0.03	A		0.0	3.47	0.01	A
	2021 Base														
Stream B-AC	D4	0.0	11.14	0.04	B	D5	0.0	8.31	0.02	A	D6	0.0	0.00	0.00	A
Stream C-AB		0.1	5.15	0.04	A		0.0	4.02	0.03	A		0.0	3.44	0.01	A
	2021 Base + Dev														
Stream B-AC	D7	0.0	11.81	0.04	B	D8	0.0	8.64	0.02	A	D9	0.0	0.00	0.00	A
Stream C-AB		0.7	6.52	0.25	A		0.6	4.52	0.21	A		0.0	3.44	0.01	A

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle.

File summary

File Description

Title	A48 / School Lane (Western)
Location	St Nicholas, Vale of Glamorgan
Site number	
Date	03/10/2019
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	EU\MattJ.Parker
Description	

Units

Distance units	Speed units	Traffic units input	Traffic units results	Flow units	Average delay units	Total delay units	Rate of delay units
m	kph	PCU	PCU	perHour	s	-Min	perMin

Analysis Options

Vehicle length (m)	Calculate Queue Percentiles	Calculate detailed queueing delay	Calculate residual capacity	RFC Threshold	Average Delay threshold (s)	Queue threshold (PCU)
5.75				0.85	36.00	20.00

Demand Set Summary

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D1	2019	AM	ONE HOUR	07:30	09:00	15	✓
D2	2019	IP	ONE HOUR	14:45	16:15	15	✓
D3	2019	PM	ONE HOUR	16:45	18:15	15	✓
D4	2021 Base	AM	ONE HOUR	07:30	09:00	15	✓
D5	2021 Base	IP	ONE HOUR	14:45	16:15	15	✓
D6	2021 Base	PM	ONE HOUR	16:45	18:15	15	✓
D7	2021 Base + Dev	AM	ONE HOUR	07:30	09:00	15	✓
D8	2021 Base + Dev	IP	ONE HOUR	14:45	16:15	15	✓
D9	2021 Base + Dev	PM	ONE HOUR	16:45	18:15	15	✓

Analysis Set Details

ID	Include in report	Network flow scaling factor (%)	Network capacity scaling factor (%)
A1	✓	100.000	100.000

2019, AM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	A48 / School Lane (Western)	T-Junction	Two-way		0.20	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description	Arm type
A	A48 West		Major
B	School Lane		Minor
C	A48 East		Major

Major Arm Geometry

Arm	Width of carriageway (m)	Has kerbed central reserve	Has right turn bay	Visibility for right turn (m)	Blocks?	Blocking queue (PCU)
C	8.61			250.0	✓	0.00

Geometries for Arm C are measured opposite Arm B. Geometries for Arm A (if relevant) are measured opposite Arm D.

Minor Arm Geometry

Arm	Minor arm type	Lane width (m)	Visibility to left (m)	Visibility to right (m)
B	One lane	3.48	28	41

Slope / Intercept / Capacity

Priority Intersection Slopes and Intercepts

Stream	Intercept (PCU/hr)	Slope for A-B	Slope for A-C	Slope for C-A	Slope for C-B
B-A	531	0.086	0.217	0.136	0.309
B-C	681	0.092	0.234	-	-
C-B	719	0.247	0.247	-	-

The slopes and intercepts shown above do NOT include any corrections or adjustments.

Streams may be combined, in which case capacity will be adjusted.

Values are shown for the first time segment only; they may differ for subsequent time segments.

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D1	2019	AM	ONE HOUR	07:30	09:00	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		ONE HOUR	✓	913	100.000
B		ONE HOUR	✓	13	100.000
C		ONE HOUR	✓	391	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	5	908
	B	5	0	8
	C	378	13	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	0	0	3
	B	0	0	0
	C	12	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
B-AC	0.04	10.89	0.0	B	12	18
C-AB	0.04	5.16	0.1	A	23	34
C-A					336	504
A-B					5	7
A-C					833	1250

Main Results for each time segment

07:30 - 07:45

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	10	2	433	0.023	10	0.0	0.0	8.509	A
C-AB	16	4	747	0.021	16	0.0	0.0	5.133	A
C-A	279	70			279				
A-B	4	0.94			4				
A-C	684	171			684				

07:45 - 08:00

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	12	3	396	0.030	12	0.0	0.0	9.361	A
C-AB	21	5	759	0.028	21	0.0	0.0	5.111	A
C-A	330	83			330				
A-B	4	1			4				
A-C	816	204			816				

08:00 - 08:15

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	14	4	345	0.042	14	0.0	0.0	10.892	B
C-AB	31	8	778	0.040	31	0.0	0.1	5.090	A
C-A	400	100			400				
A-B	6	1			6				
A-C	1000	250			1000				

08:15 - 08:30

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	14	4	345	0.042	14	0.0	0.0	10.895	B
C-AB	31	8	778	0.040	31	0.1	0.1	5.114	A
C-A	400	100			400				
A-B	6	1			6				
A-C	1000	250			1000				

08:30 - 08:45

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	12	3	396	0.030	12	0.0	0.0	9.364	A
C-AB	21	5	759	0.028	21	0.1	0.0	5.163	A
C-A	330	83			330				
A-B	4	1			4				
A-C	816	204			816				

08:45 - 09:00

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	10	2	433	0.023	10	0.0	0.0	8.514	A
C-AB	16	4	747	0.021	16	0.0	0.0	5.158	A
C-A	279	70			279				
A-B	4	0.94			4				
A-C	684	171			684				

2019, IP

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	A48 / School Lane (Western)	T-Junction	Two-way		0.14	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D2	2019	IP	ONE HOUR	14:45	16:15	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		ONE HOUR	✓	465	100.000
B		ONE HOUR	✓	8	100.000
C		ONE HOUR	✓	561	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	2	463
	B	3	0	5
	C	552	9	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	0	0	7
	B	0	0	0
	C	0	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
B-AC	0.02	8.21	0.0	A	7	11
C-AB	0.03	4.05	0.0	A	18	28
C-A					496	745
A-B					2	3
A-C					425	637

Main Results for each time segment

14:45 - 15:00

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	6	2	503	0.012	6	0.0	0.0	7.246	A
C-AB	13	3	902	0.014	13	0.0	0.0	4.047	A
C-A	410	102			410				
A-B	2	0.38			2				
A-C	349	87			349				

15:00 - 15:15

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	7	2	480	0.015	7	0.0	0.0	7.615	A
C-AB	17	4	942	0.018	17	0.0	0.0	3.891	A
C-A	487	122			487				
A-B	2	0.45			2				
A-C	416	104			416				

15:15 - 15:30

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	9	2	447	0.020	9	0.0	0.0	8.207	A
C-AB	25	6	1000	0.025	25	0.0	0.0	3.692	A
C-A	592	148			592				
A-B	2	0.55			2				
A-C	510	127			510				

15:30 - 15:45

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	9	2	447	0.020	9	0.0	0.0	8.207	A
C-AB	25	6	1000	0.025	25	0.0	0.0	3.695	A
C-A	592	148			592				
A-B	2	0.55			2				
A-C	510	127			510				

15:45 - 16:00

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	7	2	480	0.015	7	0.0	0.0	7.619	A
C-AB	17	4	942	0.018	17	0.0	0.0	3.892	A
C-A	487	122			487				
A-B	2	0.45			2				
A-C	416	104			416				

16:00 - 16:15

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	6	2	503	0.012	6	0.0	0.0	7.247	A
C-AB	13	3	902	0.014	13	0.0	0.0	4.049	A
C-A	410	102			410				
A-B	2	0.38			2				
A-C	349	87			349				

2019, PM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	A48 / School Lane (Western)	T-Junction	Two-way		0.03	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D3	2019	PM	ONE HOUR	16:45	18:15	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		ONE HOUR	✓	418	100.000
B		ONE HOUR	✓	2	100.000
C		ONE HOUR	✓	832	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	2	416
	B	1	0	1
	C	829	3	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	0	0	2
	B	0	0	0
	C	0	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
B-AC	0.00	0.00	0.0	A	0	0
C-AB	0.01	3.47	0.0	A	9	14
C-A					754	1132
A-B					2	3
A-C					382	573

Main Results for each time segment

16:45 - 17:00

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	0	0	465	0.000	0	0.0	0.0	0.000	A
C-AB	6	1	1043	0.005	6	0.0	0.0	3.469	A
C-A	621	155			621				
A-B	2	0.38			2				
A-C	313	78			313				

17:00 - 17:15

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	0	0	438	0.000	0	0.0	0.0	0.000	A
C-AB	8	2	1112	0.007	8	0.0	0.0	3.260	A
C-A	740	185			740				
A-B	2	0.45			2				
A-C	374	93			374				

17:15 - 17:30

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	0	0	399	0.000	0	0.0	0.0	0.000	A
C-AB	13	3	1211	0.011	13	0.0	0.0	3.005	A
C-A	903	226			903				
A-B	2	0.55			2				
A-C	458	115			458				

17:30 - 17:45

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	0	0	399	0.000	0	0.0	0.0	0.000	A
C-AB	13	3	1211	0.011	13	0.0	0.0	3.007	A
C-A	903	226			903				
A-B	2	0.55			2				
A-C	458	115			458				

17:45 - 18:00

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	0	0	438	0.000	0	0.0	0.0	0.000	A
C-AB	8	2	1112	0.007	8	0.0	0.0	3.260	A
C-A	740	185			740				
A-B	2	0.45			2				
A-C	374	93			374				

18:00 - 18:15

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	0	0	465	0.000	0	0.0	0.0	0.000	A
C-AB	6	1	1043	0.005	6	0.0	0.0	3.469	A
C-A	621	155			621				
A-B	2	0.38			2				
A-C	313	78			313				

2021 Base, AM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	A48 / School Lane (Western)	T-Junction	Two-way		0.20	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D4	2021 Base	AM	ONE HOUR	07:30	09:00	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		ONE HOUR	✓	936	100.000
B		ONE HOUR	✓	13	100.000
C		ONE HOUR	✓	401	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	5	931
	B	5	0	8
	C	388	13	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	0	0	3
	B	0	0	0
	C	12	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
B-AC	0.04	11.14	0.0	B	12	18
C-AB	0.04	5.15	0.1	A	23	35
C-A					345	517
A-B					5	7
A-C					854	1281

Main Results for each time segment

07:30 - 07:45

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	10	2	428	0.023	10	0.0	0.0	8.605	A
C-AB	16	4	748	0.021	16	0.0	0.0	5.129	A
C-A	286	71			286				
A-B	4	0.94			4				
A-C	701	175			701				

07:45 - 08:00

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	12	3	391	0.030	12	0.0	0.0	9.502	A
C-AB	22	5	761	0.028	22	0.0	0.0	5.104	A
C-A	339	85			339				
A-B	4	1			4				
A-C	837	209			837				

08:00 - 08:15

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	14	4	338	0.042	14	0.0	0.0	11.135	B
C-AB	32	8	781	0.041	32	0.0	0.1	5.079	A
C-A	410	102			410				
A-B	6	1			6				
A-C	1025	256			1025				

08:15 - 08:30

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	14	4	338	0.042	14	0.0	0.0	11.137	B
C-AB	32	8	781	0.041	32	0.1	0.1	5.101	A
C-A	410	102			410				
A-B	6	1			6				
A-C	1025	256			1025				

08:30 - 08:45

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	12	3	391	0.030	12	0.0	0.0	9.506	A
C-AB	22	5	761	0.028	22	0.1	0.0	5.155	A
C-A	339	85			339				
A-B	4	1			4				
A-C	837	209			837				

08:45 - 09:00

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	10	2	428	0.023	10	0.0	0.0	8.611	A
C-AB	16	4	749	0.022	16	0.0	0.0	5.154	A
C-A	286	71			286				
A-B	4	0.94			4				
A-C	701	175			701				

2021 Base, IP

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	A48 / School Lane (Western)	T-Junction	Two-way		0.14	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D5	2021 Base	IP	ONE HOUR	14:45	16:15	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		ONE HOUR	✓	479	100.000
B		ONE HOUR	✓	8	100.000
C		ONE HOUR	✓	577	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	2	477
	B	3	0	5
	C	568	9	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	0	0	7
	B	0	0	0
	C	0	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
B-AC	0.02	8.31	0.0	A	7	11
C-AB	0.03	4.02	0.0	A	19	28
C-A					511	766
A-B					2	3
A-C					438	657

Main Results for each time segment

14:45 - 15:00

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	6	2	499	0.012	6	0.0	0.0	7.297	A
C-AB	13	3	908	0.014	13	0.0	0.0	4.022	A
C-A	422	105			422				
A-B	2	0.38			2				
A-C	359	90			359				

15:00 - 15:15

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	7	2	476	0.015	7	0.0	0.0	7.684	A
C-AB	18	4	949	0.018	18	0.0	0.0	3.863	A
C-A	501	125			501				
A-B	2	0.45			2				
A-C	429	107			429				

15:15 - 15:30

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	9	2	442	0.020	9	0.0	0.0	8.308	A
C-AB	26	7	1009	0.026	26	0.0	0.0	3.659	A
C-A	609	152			609				
A-B	2	0.55			2				
A-C	525	131			525				

15:30 - 15:45

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	9	2	442	0.020	9	0.0	0.0	8.308	A
C-AB	26	7	1010	0.026	26	0.0	0.0	3.660	A
C-A	609	152			609				
A-B	2	0.55			2				
A-C	525	131			525				

15:45 - 16:00

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	7	2	476	0.015	7	0.0	0.0	7.685	A
C-AB	18	4	949	0.019	18	0.0	0.0	3.865	A
C-A	501	125			501				
A-B	2	0.45			2				
A-C	429	107			429				

16:00 - 16:15

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	6	2	499	0.012	6	0.0	0.0	7.300	A
C-AB	13	3	908	0.014	13	0.0	0.0	4.022	A
C-A	422	105			422				
A-B	2	0.38			2				
A-C	359	90			359				

2021 Base, PM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	A48 / School Lane (Western)	T-Junction	Two-way		0.03	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D6	2021 Base	PM	ONE HOUR	16:45	18:15	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		ONE HOUR	✓	428	100.000
B		ONE HOUR	✓	2	100.000
C		ONE HOUR	✓	853	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	2	426
	B	1	0	1
	C	850	3	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	0	0	2
	B	0	0	0
	C	0	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
B-AC	0.00	0.00	0.0	A	0	0
C-AB	0.01	3.44	0.0	A	9	14
C-A					773	1160
A-B					2	3
A-C					391	586

Main Results for each time segment

16:45 - 17:00

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	0	0	462	0.000	0	0.0	0.0	0.000	A
C-AB	6	1	1052	0.005	6	0.0	0.0	3.440	A
C-A	636	159			636				
A-B	2	0.38			2				
A-C	321	80			321				

17:00 - 17:15

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	0	0	434	0.000	0	0.0	0.0	0.000	A
C-AB	8	2	1123	0.008	8	0.0	0.0	3.228	A
C-A	758	190			758				
A-B	2	0.45			2				
A-C	383	96			383				

17:15 - 17:30

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	0	0	394	0.000	0	0.0	0.0	0.000	A
C-AB	14	4	1225	0.011	14	0.0	0.0	2.971	A
C-A	925	231			925				
A-B	2	0.55			2				
A-C	469	117			469				

17:30 - 17:45

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	0	0	394	0.000	0	0.0	0.0	0.000	A
C-AB	14	4	1225	0.011	14	0.0	0.0	2.971	A
C-A	925	231			925				
A-B	2	0.55			2				
A-C	469	117			469				

17:45 - 18:00

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	0	0	434	0.000	0	0.0	0.0	0.000	A
C-AB	8	2	1123	0.008	8	0.0	0.0	3.231	A
C-A	758	190			758				
A-B	2	0.45			2				
A-C	383	96			383				

18:00 - 18:15

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	0	0	462	0.000	0	0.0	0.0	0.000	A
C-AB	6	1	1052	0.006	6	0.0	0.0	3.443	A
C-A	636	159			636				
A-B	2	0.38			2				
A-C	321	80			321				

2021 Base + Dev, AM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	A48 / School Lane (Western)	T-Junction	Two-way		0.82	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D7	2021 Base + Dev	AM	ONE HOUR	07:30	09:00	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		ONE HOUR	✓	941	100.000
B		ONE HOUR	✓	13	100.000
C		ONE HOUR	✓	470	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	10	931
	B	5	0	8
	C	391	79	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	0	0	3
	B	0	0	0
	C	12	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
B-AC	0.04	11.81	0.0	B	12	18
C-AB	0.25	6.52	0.7	A	142	213
C-A					289	434
A-B					9	14
A-C					854	1281

Main Results for each time segment

07:30 - 07:45

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	10	2	418	0.023	10	0.0	0.0	8.824	A
C-AB	98	24	749	0.131	97	0.0	0.3	5.760	A
C-A	256	64			256				
A-B	8	2			8				
A-C	701	175			701				

07:45 - 08:00

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	12	3	377	0.031	12	0.0	0.0	9.849	A
C-AB	132	33	762	0.174	132	0.3	0.4	5.992	A
C-A	290	73			290				
A-B	9	2			9				
A-C	837	209			837				

08:00 - 08:15

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	14	4	319	0.045	14	0.0	0.0	11.801	B
C-AB	194	49	783	0.248	193	0.4	0.6	6.463	A
C-A	323	81			323				
A-B	11	3			11				
A-C	1025	256			1025				

08:15 - 08:30

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	14	4	319	0.045	14	0.0	0.0	11.808	B
C-AB	195	49	784	0.249	195	0.6	0.7	6.521	A
C-A	323	81			323				
A-B	11	3			11				
A-C	1025	256			1025				

08:30 - 08:45

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	12	3	377	0.031	12	0.0	0.0	9.858	A
C-AB	133	33	763	0.174	134	0.7	0.4	6.089	A
C-A	290	72			290				
A-B	9	2			9				
A-C	837	209			837				

08:45 - 09:00

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	10	2	417	0.023	10	0.0	0.0	8.836	A
C-AB	99	25	750	0.131	99	0.4	0.3	5.818	A
C-A	255	64			255				
A-B	8	2			8				
A-C	701	175			701				

2021 Base + Dev, IP

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	A48 / School Lane (Western)	T-Junction	Two-way		0.73	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D8	2021 Base + Dev	IP	ONE HOUR	14:45	16:15	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		ONE HOUR	✓	483	100.000
B		ONE HOUR	✓	8	100.000
C		ONE HOUR	✓	646	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	6	477
	B	3	0	5
	C	573	73	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	0	0	7
	B	0	0	0
	C	0	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
B-AC	0.02	8.64	0.0	A	7	11
C-AB	0.21	4.52	0.6	A	154	232
C-A					438	658
A-B					6	8
A-C					438	657

Main Results for each time segment

14:45 - 15:00

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	6	2	489	0.012	6	0.0	0.0	7.445	A
C-AB	105	26	910	0.115	104	0.0	0.2	4.465	A
C-A	382	95			382				
A-B	5	1			5				
A-C	359	90			359				

15:00 - 15:15

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	7	2	463	0.016	7	0.0	0.0	7.895	A
C-AB	144	36	952	0.151	143	0.2	0.3	4.457	A
C-A	437	109			437				
A-B	5	1			5				
A-C	429	107			429				

15:15 - 15:30

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	9	2	426	0.021	9	0.0	0.0	8.636	A
C-AB	214	54	1013	0.212	214	0.3	0.5	4.510	A
C-A	497	124			497				
A-B	7	2			7				
A-C	525	131			525				

15:30 - 15:45

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	9	2	426	0.021	9	0.0	0.0	8.638	A
C-AB	215	54	1013	0.212	215	0.5	0.6	4.519	A
C-A	496	124			496				
A-B	7	2			7				
A-C	525	131			525				

15:45 - 16:00

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	7	2	463	0.016	7	0.0	0.0	7.899	A
C-AB	144	36	953	0.151	145	0.6	0.4	4.470	A
C-A	437	109			437				
A-B	5	1			5				
A-C	429	107			429				

16:00 - 16:15

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	6	2	489	0.012	6	0.0	0.0	7.452	A
C-AB	105	26	910	0.116	106	0.4	0.2	4.483	A
C-A	381	95			381				
A-B	5	1			5				
A-C	359	90			359				

2021 Base + Dev, PM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	A48 / School Lane (Western)	T-Junction	Two-way		0.03	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D9	2021 Base + Dev	PM	ONE HOUR	16:45	18:15	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		ONE HOUR	✓	428	100.000
B		ONE HOUR	✓	2	100.000
C		ONE HOUR	✓	855	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	2	426
	B	1	0	1
	C	852	3	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	0	0	2
	B	0	0	0
	C	0	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
B-AC	0.00	0.00	0.0	A	0	0
C-AB	0.01	3.44	0.0	A	9	14
C-A					775	1163
A-B					2	3
A-C					391	586

Main Results for each time segment

16:45 - 17:00

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	0	0	462	0.000	0	0.0	0.0	0.000	A
C-AB	6	1	1053	0.005	6	0.0	0.0	3.437	A
C-A	638	159			638				
A-B	2	0.38			2				
A-C	321	80			321				

17:00 - 17:15

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	0	0	434	0.000	0	0.0	0.0	0.000	A
C-AB	8	2	1124	0.008	8	0.0	0.0	3.225	A
C-A	760	190			760				
A-B	2	0.45			2				
A-C	383	96			383				

17:15 - 17:30

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	0	0	393	0.000	0	0.0	0.0	0.000	A
C-AB	14	4	1227	0.011	14	0.0	0.0	2.968	A
C-A	927	232			927				
A-B	2	0.55			2				
A-C	469	117			469				

17:30 - 17:45

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	0	0	393	0.000	0	0.0	0.0	0.000	A
C-AB	14	4	1227	0.011	14	0.0	0.0	2.968	A
C-A	927	232			927				
A-B	2	0.55			2				
A-C	469	117			469				

17:45 - 18:00

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	0	0	434	0.000	0	0.0	0.0	0.000	A
C-AB	8	2	1124	0.008	9	0.0	0.0	3.225	A
C-A	760	190			760				
A-B	2	0.45			2				
A-C	383	96			383				

18:00 - 18:15

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	0	0	462	0.000	0	0.0	0.0	0.000	A
C-AB	6	1	1053	0.006	6	0.0	0.0	3.437	A
C-A	638	159			638				
A-B	2	0.38			2				
A-C	321	80			321				

Junctions 9

PICADY 9 - Priority Intersection Module

Version: 9.5.1.7462

Filename: Junction 3 - A48_School Lane (Eastern)_v0.2.j9
Path: C:\Users\mattJ.parker\Documents\01 Project Work\St Nicks\Junction Modelling\Junction Modelling\Junction 3 - A48_School Lane (Eastern)
Report generation date: 15/06/2020 14:14:10

Summary of junction performance

	AM					IP					PM				
	Set ID	Queue (PCU)	Delay (s)	RFC	LOS	Set ID	Queue (PCU)	Delay (s)	RFC	LOS	Set ID	Queue (PCU)	Delay (s)	RFC	LOS
	2019														
Stream B-AC	D1	0.1	11.58	0.11	B	D2	0.1	8.68	0.09	A	D3	0.0	10.14	0.04	B
Stream C-AB		0.0	5.22	0.02	A		0.1	4.30	0.05	A		0.0	3.59	0.02	A
	2021 Base														
Stream B-AC	D4	0.1	11.83	0.12	B	D5	0.1	8.78	0.09	A	D6	0.0	10.30	0.04	B
Stream C-AB		0.0	5.21	0.02	A		0.1	4.27	0.05	A		0.0	3.56	0.02	A
	2021 Base + Dev														
Stream B-AC	D7	0.5	15.81	0.33	C	D8	0.3	10.50	0.26	B	D9	0.1	10.51	0.05	B
Stream C-AB		0.0	4.99	0.02	A		0.1	4.13	0.05	A		0.0	3.56	0.02	A

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle.

File summary

File Description

Title	A48 / School Lane (Eastern)
Location	St Nicholas, Vale of Glamorgan
Site number	
Date	03/10/2019
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	EU\MattJ.Parker
Description	

Units

Distance units	Speed units	Traffic units input	Traffic units results	Flow units	Average delay units	Total delay units	Rate of delay units
m	kph	PCU	PCU	perHour	s	-Min	perMin

Analysis Options

Vehicle length (m)	Calculate Queue Percentiles	Calculate detailed queueing delay	Calculate residual capacity	RFC Threshold	Average Delay threshold (s)	Queue threshold (PCU)
5.75				0.85	36.00	20.00

Demand Set Summary

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D1	2019	AM	ONE HOUR	07:30	09:00	15	✓
D2	2019	IP	ONE HOUR	14:45	16:15	15	✓
D3	2019	PM	ONE HOUR	16:45	18:15	15	✓
D4	2021 Base	AM	ONE HOUR	07:30	09:00	15	✓
D5	2021 Base	IP	ONE HOUR	14:45	16:15	15	✓
D6	2021 Base	PM	ONE HOUR	16:45	18:15	15	✓
D7	2021 Base + Dev	AM	ONE HOUR	07:30	09:00	15	✓
D8	2021 Base + Dev	IP	ONE HOUR	14:45	16:15	15	✓
D9	2021 Base + Dev	PM	ONE HOUR	16:45	18:15	15	✓

Analysis Set Details

ID	Include in report	Network flow scaling factor (%)	Network capacity scaling factor (%)
A1	✓	100.000	100.000

2019, AM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	A48 / School Lane (Eastern)	T-Junction	Two-way		0.35	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description	Arm type
A	A48 West		Major
B	School Lane		Minor
C	A48 East		Major

Major Arm Geometry

Arm	Width of carriageway (m)	Has kerbed central reserve	Has right turn bay	Visibility for right turn (m)	Blocks?	Blocking queue (PCU)
C	6.30			189.0	✓	0.00

Geometries for Arm C are measured opposite Arm B. Geometries for Arm A (if relevant) are measured opposite Arm D.

Minor Arm Geometry

Arm	Minor arm type	Lane width (m)	Visibility to left (m)	Visibility to right (m)
B	One lane	2.73	21	11

Slope / Intercept / Capacity

Priority Intersection Slopes and Intercepts

Stream	Intercept (PCU/hr)	Slope for A-B	Slope for A-C	Slope for C-A	Slope for C-B
B-A	477	0.086	0.217	0.136	0.310
B-C	614	0.093	0.235	-	-
C-B	683	0.261	0.261	-	-

The slopes and intercepts shown above do NOT include any corrections or adjustments.

Streams may be combined, in which case capacity will be adjusted.

Values are shown for the first time segment only; they may differ for subsequent time segments.

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D1	2019	AM	ONE HOUR	07:30	09:00	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		ONE HOUR	✓	913	100.000
B		ONE HOUR	✓	36	100.000
C		ONE HOUR	✓	422	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	1	912
	B	2	0	34
	C	416	6	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	0	0	3
	B	0	0	3
	C	10	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
B-AC	0.11	11.58	0.1	B	33	50
C-AB	0.02	5.22	0.0	A	12	18
C-A					376	563
A-B					0.92	1
A-C					837	1255

Main Results for each time segment

07:30 - 07:45

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	27	7	438	0.062	27	0.0	0.1	8.992	A
C-AB	8	2	729	0.011	8	0.0	0.0	5.192	A
C-A	310	77			310				
A-B	0.75	0.19			0.75				
A-C	687	172			687				

07:45 - 08:00

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	32	8	405	0.080	32	0.1	0.1	9.918	A
C-AB	11	3	745	0.015	11	0.0	0.0	5.119	A
C-A	369	92			369				
A-B	0.90	0.22			0.90				
A-C	820	205			820				

08:00 - 08:15

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	40	10	359	0.110	39	0.1	0.1	11.569	B
C-AB	16	4	772	0.021	16	0.0	0.0	5.019	A
C-A	448	112			448				
A-B	1	0.28			1				
A-C	1004	251			1004				

08:15 - 08:30

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	40	10	359	0.110	40	0.1	0.1	11.578	B
C-AB	16	4	772	0.021	16	0.0	0.0	5.039	A
C-A	448	112			448				
A-B	1	0.28			1				
A-C	1004	251			1004				

08:30 - 08:45

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	32	8	405	0.080	33	0.1	0.1	9.932	A
C-AB	11	3	746	0.015	11	0.0	0.0	5.162	A
C-A	369	92			369				
A-B	0.90	0.22			0.90				
A-C	820	205			820				

08:45 - 09:00

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	27	7	438	0.062	27	0.1	0.1	9.007	A
C-AB	8	2	729	0.011	8	0.0	0.0	5.216	A
C-A	310	77			310				
A-B	0.75	0.19			0.75				
A-C	687	172			687				

2019, IP

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	A48 / School Lane (Eastern)	T-Junction	Two-way		0.45	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D2	2019	IP	ONE HOUR	14:45	16:15	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		ONE HOUR	✓	462	100.000
B		ONE HOUR	✓	38	100.000
C		ONE HOUR	✓	583	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	1	461
	B	4	0	34
	C	567	16	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	0	0	7
	B	0	0	0
	C	4	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
B-AC	0.09	8.68	0.1	A	35	52
C-AB	0.05	4.30	0.1	A	35	52
C-A					500	750
A-B					0.92	1
A-C					423	635

Main Results for each time segment

14:45 - 15:00

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	29	7	502	0.057	28	0.0	0.1	7.591	A
C-AB	23	6	879	0.027	23	0.0	0.0	4.288	A
C-A	415	104			415				
A-B	0.75	0.19			0.75				
A-C	347	87			347				

15:00 - 15:15

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	34	9	484	0.071	34	0.1	0.1	8.009	A
C-AB	32	8	922	0.035	32	0.0	0.0	4.129	A
C-A	492	123			492				
A-B	0.90	0.22			0.90				
A-C	414	104			414				

15:15 - 15:30

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	42	10	457	0.092	42	0.1	0.1	8.674	A
C-AB	48	12	984	0.049	48	0.0	0.1	3.938	A
C-A	594	148			594				
A-B	1	0.28			1				
A-C	508	127			508				

15:30 - 15:45

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	42	10	457	0.092	42	0.1	0.1	8.677	A
C-AB	48	12	984	0.049	48	0.1	0.1	3.946	A
C-A	593	148			593				
A-B	1	0.28			1				
A-C	508	127			508				

15:45 - 16:00

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	34	9	483	0.071	34	0.1	0.1	8.014	A
C-AB	32	8	922	0.035	32	0.1	0.0	4.144	A
C-A	492	123			492				
A-B	0.90	0.22			0.90				
A-C	414	104			414				

16:00 - 16:15

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	29	7	502	0.057	29	0.1	0.1	7.599	A
C-AB	24	6	879	0.027	24	0.0	0.0	4.296	A
C-A	415	104			415				
A-B	0.75	0.19			0.75				
A-C	347	87			347				

2019, PM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	A48 / School Lane (Eastern)	T-Junction	Two-way		0.17	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D3	2019	PM	ONE HOUR	16:45	18:15	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		ONE HOUR	✓	417	100.000
B		ONE HOUR	✓	14	100.000
C		ONE HOUR	✓	843	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	0	417
	B	5	0	9
	C	837	6	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	0	0	2
	B	0	0	0
	C	1	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
B-AC	0.04	10.14	0.0	B	13	19
C-AB	0.02	3.59	0.0	A	19	29
C-A					754	1131
A-B					0	0
A-C					383	574

Main Results for each time segment

16:45 - 17:00

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	11	3	435	0.024	10	0.0	0.0	8.484	A
C-AB	12	3	1021	0.012	12	0.0	0.0	3.588	A
C-A	623	156			623				
A-B	0	0			0				
A-C	314	78			314				

17:00 - 17:15

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	13	3	409	0.031	13	0.0	0.0	9.092	A
C-AB	17	4	1093	0.016	17	0.0	0.0	3.367	A
C-A	740	185			740				
A-B	0	0			0				
A-C	375	94			375				

17:15 - 17:30

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	15	4	370	0.042	15	0.0	0.0	10.140	B
C-AB	29	7	1197	0.024	29	0.0	0.0	3.104	A
C-A	899	225			899				
A-B	0	0			0				
A-C	459	115			459				

17:30 - 17:45

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	15	4	370	0.042	15	0.0	0.0	10.142	B
C-AB	29	7	1197	0.024	29	0.0	0.0	3.105	A
C-A	899	225			899				
A-B	0	0			0				
A-C	459	115			459				

17:45 - 18:00

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	13	3	409	0.031	13	0.0	0.0	9.094	A
C-AB	17	4	1093	0.016	17	0.0	0.0	3.370	A
C-A	740	185			740				
A-B	0	0			0				
A-C	375	94			375				

18:00 - 18:15

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	11	3	435	0.024	11	0.0	0.0	8.490	A
C-AB	12	3	1021	0.012	12	0.0	0.0	3.592	A
C-A	623	156			623				
A-B	0	0			0				
A-C	314	78			314				

2021 Base, AM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	A48 / School Lane (Eastern)	T-Junction	Two-way		0.36	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D4	2021 Base	AM	ONE HOUR	07:30	09:00	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		ONE HOUR	✓	935	100.000
B		ONE HOUR	✓	37	100.000
C		ONE HOUR	✓	432	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	1	934
	B	2	0	35
	C	426	6	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	0	0	3
	B	0	0	3
	C	10	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
B-AC	0.12	11.83	0.1	B	34	51
C-AB	0.02	5.21	0.0	A	12	18
C-A					384	577
A-B					0.92	1
A-C					857	1286

Main Results for each time segment

07:30 - 07:45

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	28	7	435	0.064	28	0.0	0.1	9.091	A
C-AB	8	2	731	0.011	8	0.0	0.0	5.184	A
C-A	317	79			317				
A-B	0.75	0.19			0.75				
A-C	703	176			703				

07:45 - 08:00

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	33	8	401	0.083	33	0.1	0.1	10.063	B
C-AB	11	3	748	0.015	11	0.0	0.0	5.107	A
C-A	377	94			377				
A-B	0.90	0.22			0.90				
A-C	840	210			840				

08:00 - 08:15

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	41	10	354	0.115	41	0.1	0.1	11.817	B
C-AB	17	4	775	0.022	17	0.0	0.0	5.003	A
C-A	459	115			459				
A-B	1	0.28			1				
A-C	1028	257			1028				

08:15 - 08:30

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	41	10	354	0.115	41	0.1	0.1	11.829	B
C-AB	17	4	775	0.022	17	0.0	0.0	5.023	A
C-A	459	115			459				
A-B	1	0.28			1				
A-C	1028	257			1028				

08:30 - 08:45

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	33	8	401	0.083	33	0.1	0.1	10.076	B
C-AB	11	3	748	0.015	11	0.0	0.0	5.151	A
C-A	377	94			377				
A-B	0.90	0.22			0.90				
A-C	840	210			840				

08:45 - 09:00

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	28	7	435	0.064	28	0.1	0.1	9.107	A
C-AB	8	2	731	0.011	8	0.0	0.0	5.209	A
C-A	317	79			317				
A-B	0.75	0.19			0.75				
A-C	703	176			703				

2021 Base, IP

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	A48 / School Lane (Eastern)	T-Junction	Two-way		0.46	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D5	2021 Base	IP	ONE HOUR	14:45	16:15	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		ONE HOUR	✓	476	100.000
B		ONE HOUR	✓	39	100.000
C		ONE HOUR	✓	600	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	1	475
	B	4	0	35
	C	584	16	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	0	0	7
	B	0	0	0
	C	4	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
B-AC	0.09	8.78	0.1	A	36	54
C-AB	0.05	4.27	0.1	A	36	54
C-A					515	772
A-B					0.92	1
A-C					436	654

Main Results for each time segment

14:45 - 15:00

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	29	7	500	0.059	29	0.0	0.1	7.638	A
C-AB	24	6	885	0.027	24	0.0	0.0	4.260	A
C-A	428	107			428				
A-B	0.75	0.19			0.75				
A-C	358	89			358				

15:00 - 15:15

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	35	9	481	0.073	35	0.1	0.1	8.074	A
C-AB	33	8	930	0.036	33	0.0	0.0	4.098	A
C-A	506	127			506				
A-B	0.90	0.22			0.90				
A-C	427	107			427				

15:15 - 15:30

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	43	11	453	0.095	43	0.1	0.1	8.772	A
C-AB	50	13	994	0.050	50	0.0	0.1	3.904	A
C-A	611	153			611				
A-B	1	0.28			1				
A-C	523	131			523				

15:30 - 15:45

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	43	11	453	0.095	43	0.1	0.1	8.776	A
C-AB	50	13	994	0.050	50	0.1	0.1	3.910	A
C-A	611	153			611				
A-B	1	0.28			1				
A-C	523	131			523				

15:45 - 16:00

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	35	9	481	0.073	35	0.1	0.1	8.081	A
C-AB	33	8	930	0.036	33	0.1	0.1	4.114	A
C-A	506	127			506				
A-B	0.90	0.22			0.90				
A-C	427	107			427				

16:00 - 16:15

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	29	7	500	0.059	29	0.1	0.1	7.646	A
C-AB	24	6	885	0.027	24	0.1	0.0	4.269	A
C-A	428	107			428				
A-B	0.75	0.19			0.75				
A-C	358	89			358				

2021 Base, PM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	A48 / School Lane (Eastern)	T-Junction	Two-way		0.17	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D6	2021 Base	PM	ONE HOUR	16:45	18:15	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		ONE HOUR	✓	427	100.000
B		ONE HOUR	✓	14	100.000
C		ONE HOUR	✓	864	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	0	427
	B	5	0	9
	C	858	6	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	0	0	2
	B	0	0	0
	C	1	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
B-AC	0.04	10.30	0.0	B	13	19
C-AB	0.02	3.56	0.0	A	20	30
C-A					773	1159
A-B					0	0
A-C					392	588

Main Results for each time segment

16:45 - 17:00

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	11	3	431	0.024	10	0.0	0.0	8.549	A
C-AB	12	3	1030	0.012	12	0.0	0.0	3.557	A
C-A	638	160			638				
A-B	0	0			0				
A-C	321	80			321				

17:00 - 17:15

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	13	3	405	0.031	13	0.0	0.0	9.185	A
C-AB	18	4	1105	0.016	18	0.0	0.0	3.334	A
C-A	759	190			759				
A-B	0	0			0				
A-C	384	96			384				

17:15 - 17:30

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	15	4	365	0.042	15	0.0	0.0	10.293	B
C-AB	30	8	1211	0.025	30	0.0	0.0	3.070	A
C-A	921	230			921				
A-B	0	0			0				
A-C	470	118			470				

17:30 - 17:45

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	15	4	365	0.042	15	0.0	0.0	10.295	B
C-AB	30	8	1211	0.025	30	0.0	0.0	3.071	A
C-A	921	230			921				
A-B	0	0			0				
A-C	470	118			470				

17:45 - 18:00

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	13	3	404	0.031	13	0.0	0.0	9.189	A
C-AB	18	4	1105	0.016	18	0.0	0.0	3.337	A
C-A	759	190			759				
A-B	0	0			0				
A-C	384	96			384				

18:00 - 18:15

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	11	3	431	0.024	11	0.0	0.0	8.553	A
C-AB	12	3	1030	0.012	12	0.0	0.0	3.561	A
C-A	638	160			638				
A-B	0	0			0				
A-C	321	80			321				

2021 Base + Dev, AM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	A48 / School Lane (Eastern)	T-Junction	Two-way		1.14	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D7	2021 Base + Dev	AM	ONE HOUR	07:30	09:00	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		ONE HOUR	✓	935	100.000
B		ONE HOUR	✓	106	100.000
C		ONE HOUR	✓	498	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	1	934
	B	6	0	100
	C	492	6	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	0	0	3
	B	0	0	3
	C	10	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
B-AC	0.33	15.81	0.5	C	97	146
C-AB	0.02	4.99	0.0	A	13	20
C-A					444	665
A-B					0.92	1
A-C					857	1286

Main Results for each time segment

07:30 - 07:45

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	80	20	433	0.184	79	0.0	0.2	10.426	B
C-AB	9	2	767	0.011	9	0.0	0.0	4.964	A
C-A	366	92			366				
A-B	0.75	0.19			0.75				
A-C	703	176			703				

07:45 - 08:00

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	95	24	399	0.239	95	0.2	0.3	12.161	B
C-AB	12	3	792	0.015	12	0.0	0.0	4.848	A
C-A	435	109			435				
A-B	0.90	0.22			0.90				
A-C	840	210			840				

08:00 - 08:15

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	117	29	351	0.333	116	0.3	0.5	15.716	C
C-AB	19	5	831	0.023	19	0.0	0.0	4.693	A
C-A	529	132			529				
A-B	1	0.28			1				
A-C	1028	257			1028				

08:15 - 08:30

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	117	29	351	0.333	117	0.5	0.5	15.808	C
C-AB	19	5	831	0.023	19	0.0	0.0	4.712	A
C-A	529	132			529				
A-B	1	0.28			1				
A-C	1028	257			1028				

08:30 - 08:45

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	95	24	399	0.239	96	0.5	0.3	12.247	B
C-AB	12	3	792	0.015	12	0.0	0.0	4.892	A
C-A	435	109			435				
A-B	0.90	0.22			0.90				
A-C	840	210			840				

08:45 - 09:00

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	80	20	433	0.184	80	0.3	0.2	10.503	B
C-AB	9	2	767	0.011	9	0.0	0.0	4.988	A
C-A	366	92			366				
A-B	0.75	0.19			0.75				
A-C	703	176			703				

2021 Base + Dev, IP

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	A48 / School Lane (Eastern)	T-Junction	Two-way		1.04	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D8	2021 Base + Dev	IP	ONE HOUR	14:45	16:15	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		ONE HOUR	✓	476	100.000
B		ONE HOUR	✓	107	100.000
C		ONE HOUR	✓	664	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	1	475
	B	8	0	99
	C	648	16	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	0	0	7
	B	0	0	0
	C	4	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
B-AC	0.26	10.50	0.3	B	98	147
C-AB	0.05	4.13	0.1	A	39	59
C-A					570	855
A-B					0.92	1
A-C					436	654

Main Results for each time segment

14:45 - 15:00

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	81	20	507	0.159	80	0.0	0.2	8.416	A
C-AB	26	6	918	0.028	26	0.0	0.0	4.119	A
C-A	474	119			474				
A-B	0.75	0.19			0.75				
A-C	358	89			358				

15:00 - 15:15

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	96	24	488	0.197	96	0.2	0.2	9.185	A
C-AB	36	9	969	0.037	36	0.0	0.1	3.944	A
C-A	561	140			561				
A-B	0.90	0.22			0.90				
A-C	427	107			427				

15:15 - 15:30

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	118	29	461	0.256	117	0.2	0.3	10.477	B
C-AB	56	14	1043	0.054	56	0.1	0.1	3.738	A
C-A	675	169			675				
A-B	1	0.28			1				
A-C	523	131			523				

15:30 - 15:45

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	118	29	461	0.256	118	0.3	0.3	10.499	B
C-AB	56	14	1043	0.054	56	0.1	0.1	3.746	A
C-A	675	169			675				
A-B	1	0.28			1				
A-C	523	131			523				

15:45 - 16:00

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	96	24	488	0.197	97	0.3	0.2	9.211	A
C-AB	36	9	969	0.037	36	0.1	0.1	3.959	A
C-A	561	140			561				
A-B	0.90	0.22			0.90				
A-C	427	107			427				

16:00 - 16:15

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	81	20	507	0.159	81	0.2	0.2	8.454	A
C-AB	26	6	918	0.028	26	0.1	0.0	4.127	A
C-A	474	119			474				
A-B	0.75	0.19			0.75				
A-C	358	89			358				

2021 Base + Dev, PM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	A48 / School Lane (Eastern)	T-Junction	Two-way		0.19	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D9	2021 Base + Dev	PM	ONE HOUR	16:45	18:15	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		ONE HOUR	✓	427	100.000
B		ONE HOUR	✓	16	100.000
C		ONE HOUR	✓	864	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	0	427
	B	6	0	10
	C	858	6	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	0	0	2
	B	0	0	0
	C	1	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
B-AC	0.05	10.51	0.1	B	15	22
C-AB	0.02	3.56	0.0	A	20	30
C-A					773	1159
A-B					0	0
A-C					392	588

Main Results for each time segment

16:45 - 17:00

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	12	3	427	0.028	12	0.0	0.0	8.667	A
C-AB	12	3	1030	0.012	12	0.0	0.0	3.557	A
C-A	638	160			638				
A-B	0	0			0				
A-C	321	80			321				

17:00 - 17:15

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	14	4	400	0.036	14	0.0	0.0	9.336	A
C-AB	18	4	1105	0.016	18	0.0	0.0	3.334	A
C-A	759	190			759				
A-B	0	0			0				
A-C	384	96			384				

17:15 - 17:30

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	18	4	360	0.049	18	0.0	0.1	10.508	B
C-AB	30	8	1211	0.025	30	0.0	0.0	3.070	A
C-A	921	230			921				
A-B	0	0			0				
A-C	470	118			470				

17:30 - 17:45

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	18	4	360	0.049	18	0.1	0.1	10.510	B
C-AB	30	8	1211	0.025	30	0.0	0.0	3.071	A
C-A	921	230			921				
A-B	0	0			0				
A-C	470	118			470				

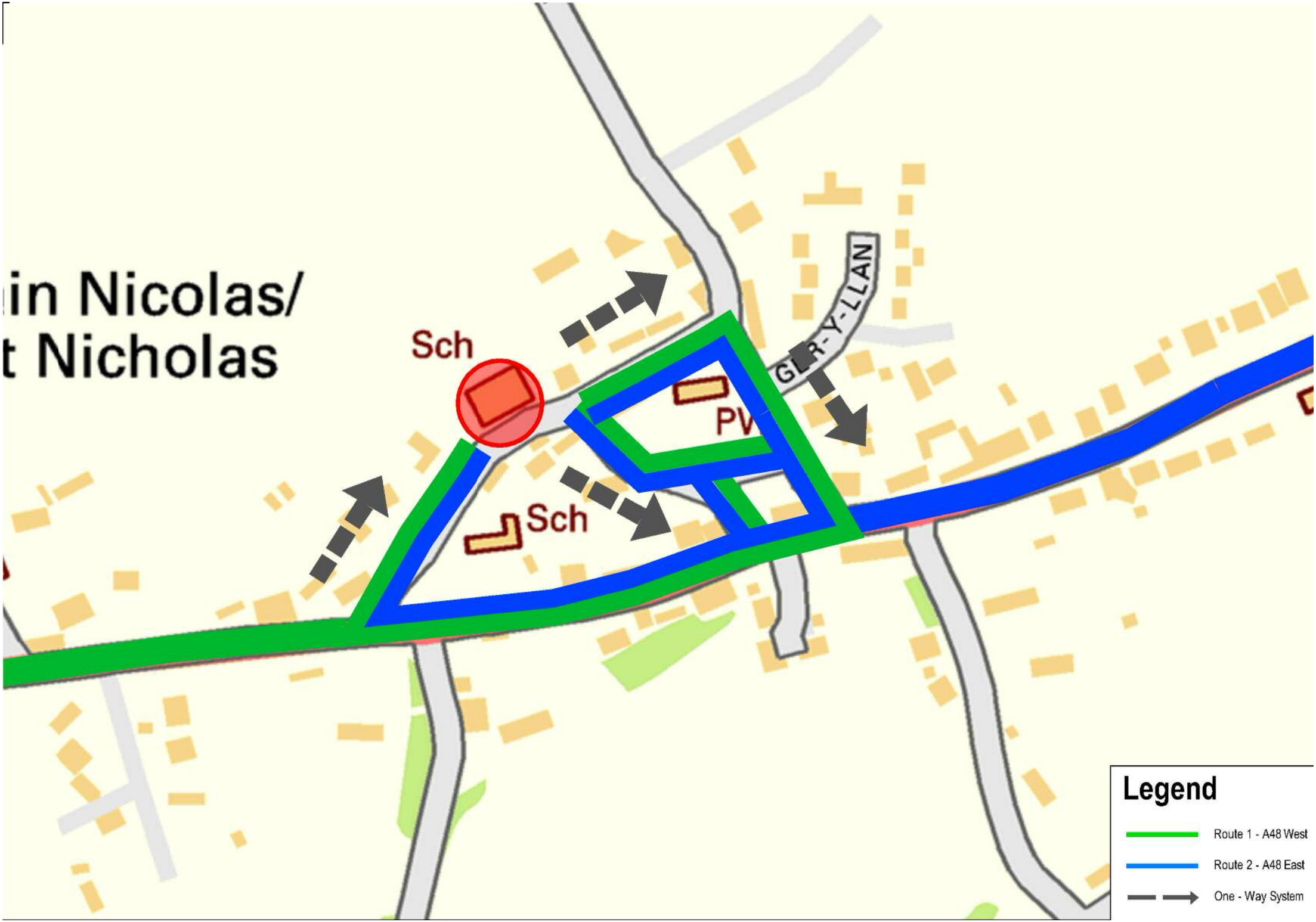
17:45 - 18:00

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	14	4	400	0.036	14	0.1	0.0	9.339	A
C-AB	18	4	1105	0.016	18	0.0	0.0	3.337	A
C-A	759	190			759				
A-B	0	0			0				
A-C	384	96			384				

18:00 - 18:15

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	12	3	427	0.028	12	0.0	0.0	8.672	A
C-AB	12	3	1030	0.012	12	0.0	0.0	3.561	A
C-A	638	160			638				
A-B	0	0			0				
A-C	321	80			321				

di I dicati O ay Syst m


in Nicolas/
t Nicholas
Sch
Sch
PV
GLAN-Y-LLAN
Legend
Route 1 - A48 West
Route 2 - A48 East
One - Way System

AECOM Limited
1 Callaghan S uare
Cardi CF10 5BT
United Kingdom

T: 44 29 2067 4600
aecom.com