

# Ysgol Y Deri Expansion

Transport Assessment  
Proposed Expansion of the Council's Special Education  
Needs (SEN) School

Vale of Glamorgan Education Department

Project Number: 60629450

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## Quality information

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# 1. Introduction

## 1.1 Introduction

- 1.1.1 This Transport Assessment (TA) has been prepared by AECOM on behalf of the Vale of Glamorgan (VoG) Education Department in respect of proposals for a second campus for the Ysgol Y Deri (YYD) Special Educational Needs (SEN) School. The premises will be located on land south of the B4267 near Cosmeston.
- 1.1.2 The site is situated to the south of the B4267, approximately 350m south of Cosmeston, 1.5km northeast of Sully and 2.8km southwest of Penarth. The site is located opposite Cosmeston Medieval Village and Cosmeston Lakes County Park. The land is currently used for agricultural purposes and is bounded to the northwest by the B4267, to the northeast by farm buildings, to the southeast by agricultural land, and to the southwest by Fort Road.
- 1.1.3 The site lies immediately south of land that is allocated for development under the adopted VoG Local Development Plan (LDP) (Reference: MG2 (24)). An Outline Planning Application (OPA) for 576 dwellings and a primary school on the land ('Land at Upper Cosmeston Farm') was submitted in October 2020 and is currently under consideration (Reference: 2020/01170/OUT). AECOM has examined the documents submitted as part of the OPA and has made appropriate reference / consideration to its proposals and associated assessments in developing the proposals for the site and identifying a scope and methodology for the TA that is appropriate to the scale of the development proposed on the site.
- 1.1.4 The existing YYD campus is located to the west of Penarth, approximately 3km north of the site. YYD provides specialist educational facilities to a range of pupils requiring additional needs and support. The school provides educational courses at primary (Foundation and Key Stage 2), secondary (Key Stage 3 and 4) and sixth form levels of education in addition to various therapy services including Speech and Language Therapy, Occupational Therapy and Physiotherapy.
- 1.1.5 The proposed development is for a new SEN school facility as an expansion to the existing YYD services available at the existing campus. The new campus will provide the same core services as the existing school to enable the relocation of some existing pupils and to accommodate growth in the need for SEN schooling in the VoG across both campuses. The new school is proposed to enrol a total capacity of 150 pupils Full Time Equivalents (FTE). The proposed staff numbers will include 103 FTE including teachers, support staff and healthcare / therapists. The illustrative masterplan is included at **Appendix A**.

## 1.2 Scoping and Pre-Application Consultation Submission

- 1.2.1 The proposed development has been informed by collaborative consultation between the VoG Education Department and the Local Highway Authority (LHA). AECOM also introduced the available site information to the LHA seeking initial views and setting out the basic structure of the TA for agreement within a Scoping Note submission on 19<sup>th</sup> November 2020. A copy of the Scope issued is contained at **Appendix B**. A TA was submitted for Pre-Application Consultation (PAC) on 4<sup>th</sup> January 2021. At the time of completing the TA, no response had been received to the Scoping Note. A response to the TA was received from the LHA through the PAC process on 2<sup>nd</sup> February 2021 and is included at **Appendix B**. The comments primarily focused on matters relating to vehicular access, parking provision, traffic data and active travel - these have been referenced and addressed as appropriate within this submission.
- 1.2.2 In addition to the formal consultation responses received, the Education project team liaised with the LHA during the revisions of the masterplan. This has allowed for the layout and TA to be informed in a collaborative manner and the proposals are considered to present a significant level of detail for an outline planning submission.

## 1.3 Report Structure

- 1.3.1 This TA examines the existing transport and highway issues relating to the proposed development; considers the forecast multi-modal trip generation and the traffic impact of the proposals on the local highway network and investigates methods of limiting car-based travel to produce a sustainable development in line with national and local planning guidance.
- 1.3.2 This revised version of the TA has been prepared in order to address comments received from the Highway Authority on matters such as access, junction capacity assessment and internal access and movement. The remaining sections of the report have not been updated and reflect the point in time that the submission was made.
- 1.3.3 The remainder of the TA is structured as follows:
- **Chapter 2 – Existing Situation and Site Accessibility:** Examines the local transport conditions in the vicinity of the site and the accessibility of the site to non-car modes of travel;
  - **Chapter 3 – Development Proposals:** Provides a detailed description of the development proposals, including the proposed means of access and parking provision;
  - **Chapter 4 – Planning Policy Review:** Considers the development in the context of relevant national and local planning and transport policies;
  - **Chapter 5 – Trip Generation and Distribution:** Sets out the existing / forecast trip generation for all modes of travel and method of trip distribution for the proposed development;
  - **Chapter 6 – Traffic Impact Assessment:** Examines the impact of the development proposals on the highway network during the weekday AM and PM peak hours;
  - **Chapter 7 – Transport Implementation Strategy:** Details the key measures recommended to improve the existing conditions, along with encouraging sustainable travel; and
  - **Chapter 8 – Summary and Conclusions:** Summarises the key findings and conclusions of the TA.

## 2. Existing Site and Accessibility

### 2.1 Introduction

- 2.1.1 This chapter of the TA provides a description of the site location and its existing usage, the operation and safety of the local highway network, and the accessibility of the site to local facilities and by walking, cycling and public transport. Information relating to the existing school site is also included for reference throughout the TA.
- 2.1.2 In line with prevailing COVID-19 restrictions, a socially-distanced site visit was undertaken by AECOM staff on Tuesday 17<sup>th</sup> November 2020 to inform the study. This was also supplemented with a school peak hour visit at the existing YYD to survey existing pick-up and drop-off operations. This section of the report was considered correct at the point of planning submission. Given that there were no issues raised with this, no further updates have been applied.

### 2.2 Site Context

- 2.2.1 The site is located to the south of the B4267, approximately 350m south of Cosmeston, 1.5km northeast of Sully and 2.8km southwest of Penarth. The site is located opposite Cosmeston Medieval Village and Cosmeston Lakes County Park. The location of the premises is shown in **Figure 2-1**.
- 2.2.2 The site is currently used for agricultural purposes and is bounded to the northwest by the B4267, to the northeast by farm buildings, to the southeast by agricultural uses (arable), and to the southwest by Fort Road. Known on-site constraints include a sewer main which bisects the site and restricts the orientation and the form of the proposed development.
- 2.2.3 The site lies immediately south of land that is allocated for development under the adopted VoG Local LDP (Reference: MG2 (24)). An OPA for 576 dwellings and a primary school on the land ('Land at Upper Cosmeston Farm') was submitted in October 2020 and is currently under consideration (Reference: 2020/01170/OUT). Access to the development is proposed via the creation of two new junctions on the B4267. The most southerly access junction is located around 70m to the northeast of the site boundary. The masterplan for the neighbouring proposals is included at **Appendix C**.

### 2.3 Existing YYD Campus

- 2.3.1 The existing YYD campus is located to the west of Penarth, approximately 3km north of the site, as shown in **Figure 2-1**.
- 2.3.2 YYD provides specialist educational facilities to a range of pupils requiring additional needs and support. The school provides educational courses at primary (Foundation and Key Stage 2), secondary (Key Stage 3 and 4) and sixth form levels of education in addition to various therapy services including Speech and Language Therapy, Occupational Therapy and Physiotherapy.
- 2.3.3 There is a wide range of staff based at YYD in line with the facility that it provides. This includes teaching staff, department and school head teachers, teaching assistants (higher level support assistants, learning support assistants) the behavioural support team, and other specialist and administrative staff.
- 2.3.4 YYD operates a typical education term timetable, with the Autumn Term between September and December, the Spring Term between January and March and the Summer Term between April and July.

### 2.4 Local Highway Network

- 2.4.1 The highway network local to the development site is described below and presented in **Figure 2-1**.
- 2.4.2 The B4267 is a single carriageway road subject to a 40mph speed limit on the approach to and passing the site, reducing to 30mph through Penarth to the northeast. It provides a highway connection between the A4055 (approximately 3.7km to the north of the site) and the A4055 / A4231 (approximately 3.3km to the west of the site). The B4267 routes through Penarth to the north and Sully to the west.

- 2.4.3 Fort Road is a single-track road providing access from the B4267 to Lavernock and the Marconi Holiday Village at the coast. Lavernock is a small settlement comprised of a limited number of dwellings, a place of worship and a car park. Some dispersed dwellings take access direct from Fort Road. The highway is subject to the national speed limit (60mph); however, owing to the narrow carriageway width and existing alignment, vehicle speeds are likely to be well below this level. There are informal passing places positioned at regular intervals. Fort Road runs approximately north-south along the western boundary of the development site. It connects to the B4267 via a priority T-junction with ghost island right-turn lane; exit visibility commensurate with the current speed limit on the B4267 is achieved, as discussed at **Chapter 3**.
- 2.4.4 St Mary's Well Bay Road is a single-carriageway road and is subject to the national speed (60mph). It leads to the coast at Swanbridge although no vehicle through access is available to the village highway network, although pedestrian / cycle access is possible. The road leads to dwellings located within Swanbridge and Bay Caravan Park.

## 2.5 Strategic Highway Network

- 2.5.1 Access to the Strategic Road Network (SRN) is via the A4232, which routes along the western extent of the Cardiff urban area, providing access to the M4 at Junction 33. The A4232 is a dual-carriageway road subject to the national speed limit (70mph). Access to the A4243 is via the A4055 to the north of Penarth or the A4231 at Sully.

## 2.6 Existing Traffic Conditions

- 2.6.1 The chosen study network for this TA includes the B4267 between the A4055 / A321 / B4267 roundabout to the west of Barry and the B4267 / Victoria Road / Dinas Road signalised junction in Penarth. The following junctions are considered within this area (not inclusive of the site access junctions for the proposed development and neighbouring residential proposals at 'Land at Upper Cosmeston Farm'):
- A4055 / A321 / B4267 roundabout;
  - B4267 / Hayes Road roundabout;
  - B4267 / Cosmeston Lakes priority T-junction;
  - B4267 / Cosmeston Drive priority T-junction;
  - B4267 / Westbourne Road priority T-junction;
  - B4267 / Augusta Road / Castle Rise priority crossroads junction; and
  - B4267 / Victoria Road / Dinas Road signalised junction.
- 2.6.2 At the time of writing, the UK (including Wales) has experienced ongoing atypical traffic conditions associated with the COVID-19 pandemic owing to the various regional and national measures that place restrictions on movements. Given these atypical traffic conditions, which are likely to continue throughout and beyond the application period, bespoke traffic surveys have not been undertaken to inform the TA.
- 2.6.3 The assessment work within this TA instead utilises information on traffic movements for the study network from publicly available data. This data has been obtained pre-COVID and submitted within the TA that accompanied the OPA for 'Land at Upper Cosmeston Farm', therefore directly adjacent and relative for the proposals of this TA. This information includes Junction Turning Count (JTC) surveys undertaken between 06:30-09:30hrs and 15:30-18:30hrs on Tuesday 27th November 2018. A subset of the JTC survey data together with a traffic flow diagram showing the turning movements at each junction on the study network are included at Appendix E and Figure 3.5 of the corresponding TA for that application. The latter presents traffic flows for weekday AM and PM peak hours on the network, identified as 07:45-08:45hrs and 16:30-17:30hrs respectively. The key highway link in the vicinity of the site is the B4267. Two-way traffic flows of 1,400 vehicles during the weekday AM peak hour and 1,100 vehicles during the weekday PM peak hour were recorded on this link where it passes the site.
- 2.6.4 In its response to the TA submitted at PAC, the LHA stated the following in regard to use of the November 2018 survey data:

*“This is not considered a robust survey to accurately determine the traffic data. It is recognised and agreed with the TA that the current pandemic would mean that surveys undertaken today might not provide a true representation of the traffic usage along Lavernock Road and the surrounding highway network. It is advised that additional traffic survey data is provided and any surveys undertaken in the area should be sought as most recent as possible for us to make a determination on whether the data can be used. The afternoon time which starts at 15:30 is not considered accurate in determining school traffic data as often the peak school time begins earlier than this.”*

- 2.6.5 The traffic data is from publicly available information within the TA submitted for the neighbouring ‘Land at Upper Cosmeston Farm’, and therefore is not derived from surveys commissioned as part of this scheme. The traffic surveys were the subject of scoping discussions by the applicant of the adjacent site; the LHA responded to confirm agreement to the overall scope methodology, thereby inherently agreeing the validity of the surveys. To not accept the surveys as representative at this site would mean that the LHA would also need to express similar concern with the adjacent site, particularly given this also includes provision for a school. This can be confirmed as not being raised within the consultation response of that adjacent site. Therefore, the data, as presented and through previous agreement is considered appropriate for use, if following a consistent and fair approach.
- 2.6.6 Notwithstanding the above, in order to ameliorate any concerns, we wish to refer the LHA to guidance on the collection of traffic data set out in the Department for Transport’s (DfT) Transport Analysis Guidance (TAG), specifically *TAG Unit M1.2: Data Sources and Surveys* (May 2020), which is the most recent guidance. This states that traffic data for assessment / analysis should be collected during neutral periods, defined as Mondays to Thursdays from March to November (excluding August and school holidays). Traditional founding guidance from Design Manual for Roads and Bridges (DMRB), specifically *Traffic Appraisal in Urban Areas* (May 1996), also confirms that neutral periods includes Mondays to Thursdays and all of November. The survey was undertaken on Tuesday 27<sup>th</sup> November 2018 and therefore conforms to guidance.
- 2.6.7 In addition to the acceptable survey date, the assessment at **Chapter 6** applies a further layer of robustness in selecting the information from the ‘2019 Base’ scenario, before applying growth factors to form a ‘2022 Base’. At the time of writing, the survey data is around 3½ years old, completely within reasonable and adequate usage. The TA uses a calculated ‘2019 Base’, thereby theoretically reducing the age to under two years. Alternative existing data sources, such as within the LHA databases, are likely to be older and therefore less representative than that which has been used.
- 2.6.8 The network peak hours are the key concern to any LHA audit and any resultant development impact upon them. The school peak in the AM coincides with the network peak hour. In the AM, pupils and staff trips are compounded with the network peak hour. In the PM the school peak is earlier, with pupil-related traffic occurring outside of the network peak periods. Therefore, the network PM peak will not be impacted by the school finishing time and only by staff. Background traffic on the network at the time of school finish (school peak time) is also considerably lower than the network PM peak. The key worst-case periods have been considered in this TA and, in most cases in school development applications, the critical concern is considered to be the AM peak hour.
- 2.6.9 Overall, in consideration of all factors discussed, with reference to the LHA’s response on the adjacent site, guidance on survey data collection, industry-standard approaches to school assessment and current restrictions on data collection, the use of the November 2018 survey data and assessment of associated time periods is considered appropriate.

## 2.7 Road Safety

- 2.7.1 A review of Personal Injury Collision (PIC) data has been undertaken to determine whether there are any locations on the local highway network which could be considered to exhibit a poor collision record. The data was obtained from the Welsh Government (WG) for the five-year period from 1<sup>st</sup> January 2015 to 31<sup>st</sup> December 2019 (the most recent for which data was available at the time of application). The data supplied was in a raw format, containing full details of the recorded PICs. For data protection reasons, this data cannot be reproduced in this report. The study area for the analysis includes the B4267 along the site frontage and a reasonable extent of the approach from the north and the south.

- 2.7.2 Three PICs were recorded in the study area, of which two resulted in 'slight' injuries and one resulted in 'serious' injuries. The 'serious' PIC was recorded on the B4267, between its junctions with Fort Road and St Mary's Well Bay Road (to the southwest of the site). This occurred when a car travelling southwest-bound lost control in wet conditions, collided with the kerb, causing the vehicle to roll over. One 'slight' PIC was recorded at the B4267 / Fort Road junction. This occurred when cyclist travelling northeast-bound along the shared footway / cycleway on the B4267 entered the carriageway to cross the side-road into the path of a van turning left onto the B4267. One 'slight' PIC was recorded on the B4267, in the vicinity of the junction with Cosmeston Drive (to the northeast of the site). This occurred when a cyclist crossed the road into the path of a car travelling northeast-bound. The details included in the report suggest that this occurred just to the southwest of the junction; there is a toucan crossing facility at this location to facilitate safe crossing movements by pedestrians and cyclists.
- 2.7.3 The recorded PICs occurred at unrelated separate locations and under very different circumstances. Overall, it can be concluded there are no inherent existing safety issues in the area around the site that would be exacerbated by the proposed development.

## 2.8 Walking and Cycling

- 2.8.1 A shared footway / cycleway is provided along the south-eastern side of the B4267 along the site frontage. This is between 1.0m and 1.5m wide and is separated from the carriageway by a verge.
- 2.8.2 Within Cosmeston, the shared footway / cycleway widens to between 3.5m and 4.0m. The route crosses over side roads via dropped kerb crossings, with tactile paving provided in most instances. The shared footway / cycleway connects to a well-established network of footways in Cosmeston and Penarth. A signalised toucan crossing is provided over the B4267 to the south of Cosmeston Drive.
- 2.8.3 To the southwest of the site, the shared footway / cycleway continues towards Sully. The route crosses the B4267 just to the northeast of St Mary's Well Bay Road via a dropped kerb crossing and then continues to Sully.
- 2.8.4 National Cycle Route (NCR) 88 commences in Cosmeston at Althorp Drive and routes to the north using a disused railway alignment as a traffic-free route, with some trafficked sections. Access to NCR 88 from the site is achieved via the shared footway / cycleway on the B4267. Through Penarth, NCR 88 is provided as a trafficked route and then as a traffic-free route up to the point it connects to NCR 8 at Cardiff Bay.
- 2.8.5 In addition to the local footway network, there are several Public Rights of Way (PRoW) near to the site, as shown in **Figure 2-2**. These include the West Wales Coast Path and a footpath up to and crossing Cosmeston Lake (through Cosmeston Lakes County Park), which can be accessed via the shared footway / cycleway on the B4267.



Figure 2-2: Public Rights of Way



Source: Vale of Glamorgan online mapping (October 2020).

## 2.9 Local Facilities

- 2.9.1 The proposed development is for a new school site for special educational needs. The Institution for Highways and Transportation's (IHT's) *Guidelines for Providing for Journeys on Foot*, published in 2000, identifies that 2km is the preferred maximum distance that people will walk for education purposes and cycling has been identified as having the potential to replace car trips of up to 5km. 5km equates to approximately a 20-minute journey by bicycle.
- 2.9.2 An indicative 2km walking distance and 5km cycling distance from the development site is presented in **Figure 2-3**. This illustrates that residential areas at the southern extent of Cosmeston and the eastern extent of Sully are within 2km walking distance of the site, accessible via the shared footway / cycleway on the B4267. The neighbouring proposals for residential development on 'Land at Upper Cosmeston Farm' are also well within 2km. Additional residential areas are within the indicative 5km cycling distance. Despite these residential areas being within typically accepted walking / cycling distances, it is acknowledged that a small proportion of the future pupils and staff based at the site will reside within these areas and are instead likely to come from a wider county area in accordance with the YYD catchment area. Furthermore, it is acknowledged that the special requirements of future pupils may limit the number of pupils who would be permitted under duty of care or indeed able to walk / cycle to the site unaccompanied.
- 2.9.3 There are other local complementary facilities available within short walking / cycling distances of the proposed development, including substantial leisure facilities associated with Cosmeston Lakes County Park and Cosmeston Medieval Village. There are also various cafes, shops and other retail opportunities available in Cosmeston and Sully.

## 2.10 Public Transport

- 2.10.1 Existing public transport services operating in the vicinity of the proposed development have been identified with reference to timetable and routeing information prior to the COVID-19 pandemic.

## Bus Services

- 2.10.2 There is a bus stop located on the B4267 adjacent to the site boundary opposite Fort Road. However, these are currently undefined by formal infrastructure (i.e. flag and pole, shelter) and are provided on a 'request' basis. The next-nearest stops are also situated on the B4267, adjacent to the junction with St Mary Well Bay Road, approximately 330m south of the site. The bus stop on the northbound carriageway is marked by a flag and pole and a shelter. A flag and pole are provided for the southbound carriageway. The IHT's *Guidelines for Providing for Public Transport in Developments*, published in 1999, suggests 400m as the acceptable walking distance to a local bus stop. Both sets of stops are therefore well within acceptable walking distance to / from the site.
- 2.10.3 Both stops provide access to Services 88 and 94. The timetable information for these services is summarised in **Table 2-1**.

**Table 2-1: Bus Service Information**

Service	Route	Days	Direction	First Service	Last Service	Approximate Frequency
88	Penarth – Barry	Monday – Friday	Towards Penarth	07:18	15:18	Hourly
			Towards Barry	07:33	14:33	Hourly
	Monday – Friday	Towards Cardiff	07:07	22:36	30 minutes	
		Towards Barry Docks	09:26	23:23	30 minutes	
94	Cardiff – Barry Docks	Saturday	Towards Cardiff	07:37	22:36	30 minutes
			Towards Barry Docks	07:33	23:23	30 minutes
	Sundays and Bank Holidays	Towards Cardiff	06:58	21:29	Hourly	
		Towards Barry Docks	07:52	21:24	Hourly	

Notes: 1) Information obtained from Traveline (October 2020).

2) Service times are arrival / departure times at / from the 'Fort Road' stops on the B4267.

- 2.10.4 The site is served by two bus services which provide a good level of public transport accessibility to Barry, Penarth and Cardiff. There is a half-hourly bus service between Cardiff and Barry which would be available for future pupil / staff use to access the proposed development. It is acknowledged that the special requirements of future pupils may limit the number of pupils who would be permitted or able to use bus services unaccompanied.

## Rail Services

- 2.10.5 The nearest railway station is Penarth, located circa 2.5km to the north of the site. The station is accessible on foot or by bicycle via the shared footway / cycleway on the B4267 and NCR 88, equating to a 35-minute walk or 10-minute cycle. Penarth Railway Station is the terminus for the Penarth branch line which operates to / from Cardiff Central Station. A summary of railway services to / from Penarth is presented in **Table 2-2**.



**Table 2-2: Railway Service Information – Penarth Railway Station**

Direction	Days	First Service	Last Service	Approximate Frequency
Penarth – Merthyr Tydfil (via Cardiff Central)	Mon-Fri	06:52	18:57	60 minutes
	Sat	06:52	20:52	60 minutes
Merthyr Tydfil – Penarth (via Cardiff Central)	Mon-Fri	07:22	20:22	60 minutes
	Sat	07:22	22:22	60 minutes
Penarth – Aberdare (via Cardiff Central)	Mon-Fri	07:28	19:28	60 minutes
	Sat	07:28	20:28	60 minutes
Aberdare – Penarth (via Cardiff Central)	Mon-Fri	07:46	20:46	60 minutes
	Sat	07:46	21:46	60 minutes

Notes: 1) Information obtained from National Rail (October 2020).

2) Intermediary stops between origin / destination stations are not shown.

- 2.10.6 Other railway stations are located nearby, including Cadoxton and Dinas Powys. The next closest station to the site is Eastbrook located circa 3.3km to the north, equating to a 53-minute walk and a 17-minute cycle via Cosmeston Lakes County Park. All three stations are on the Barry branch line connecting Cardiff Central Station with Barry, with onward services to Bridgend.
- 2.10.7 Overall, there is considered to be a reasonable level of rail accessibility to the site. The timetable would allow for pupils / staff to travel to / from Penarth Railway Station from various locations in and around Cardiff and the South Wales Valley lines. It is acknowledged that the special requirements of future pupils may limit the number of pupils who would be permitted or able to use railway services unaccompanied.

## 2.11 Summary

- 2.11.1 This chapter of the TA has provided a description of the site location and its existing usage, the local highway network, current safety and traffic conditions, and accessibility of the site to non-car modes of travel.
- 2.11.2 The site is located to the south of the B4267, approximately 350m south of Cosmeston, 1.5km northeast of Sully and 2.8km southwest of Penarth. The premises is situated opposite Cosmeston Medieval Village and Cosmeston Lakes County Park. The site is currently used for agricultural purposes and is bounded to the northwest by the B4267, to the northeast by farm buildings, to the southeast by agricultural uses (arable), and to the southwest by Fort Road. The site lies immediately south of land that is allocated for development under the adopted VoG Local LDP (Reference: MG2 (24)) and is currently the subject of an OPA for residential development and a primary school (Reference: 2020/01170/OUT), known as 'Land at Upper Cosmeston Farm'.
- 2.11.3 The existing YYD campus is located to the west of Penarth, approximately 3km north of the site. YYD provides specialist educational facilities to a range of pupils requiring additional needs and support. The school provides educational courses at primary (Foundation and Key Stage 2), secondary (Key Stage 3 and 4) and sixth form levels of education in addition to various therapy services including Speech and Language Therapy, Occupational Therapy and Physiotherapy. There are a number of staff based at YYD, including teaching staff, department and school head teachers, teaching assistants (higher level support assistants, learning support assistants) the behavioural support team, and other specialist and administrative staff. YYD operates a typical education term timetable, with the Autumn Term between September and December, the Spring Term between January and March and the Summer Term between April and July.

- 2.11.4 The local highway network includes the B4267, which provides a connection to the A4055 to the north of the site and the A4055 / A4231 to the west of the site. The B4267 routes through Penarth to the north and Sully to the west. Fort Road routes adjacent to the site's western boundary, providing access from the B4267 to Lavernock and a residential tourism site (given their scale they are likely to generate low volumes of traffic on Fort Road). Access to the SRN is via the A4232. Publicly available traffic survey data collected in November 2018 (included in the TA submitted with the OPA for 'Land at Upper Cosmeston Farm') has been utilised in this TA. Two-way traffic flows of 1,400 vehicles during the weekday AM peak hour and 1,100 vehicles during the weekday PM peak hour were recorded on the B4267 where it passes the site. With reference to the LHA's response on the adjacent site, guidance on survey data collection, industry-standard approaches to school assessment and current restrictions on data collection, the use of the November 2018 survey data and assessment of associated time periods is considered appropriate.
- 2.11.5 The analysis of the PIC data has not identified any existing highway safety issues that could be exacerbated by the proposed development.
- 2.11.6 Walking and cycling facilities include a shared footway / cycleway on the southern / eastern side of the B4267. The shared footway / cycleway connects to a well-established network of footways in Cosmeston and Penarth to the north and provides a route to Sully to the southwest. NCR 88 is accessed via the shared footway / cycleway and provides a route towards NCR 8 at Cardiff Bay. There are several PRow located near to the site including the West Wales Coast Path and a footpath up to and crossing Cosmeston Lake (through Cosmeston Lakes County Park), which can be accessed via the shared footway / cycleway on the B4267. A range of facilities and significant residential areas are within walking and cycling distance of the site. It is acknowledged that a small proportion of the future pupils and staff based at the site will reside within these areas and are likely to come from a wider county area in accordance with the YYD catchment area. Furthermore, it is acknowledged that the special requirements of future pupils may limit the number of pupils who would be permitted under a duty of care or indeed be able to walk / cycle to the site unaccompanied. Notwithstanding this, significant opportunities for sustainable travel have been identified and could be taken up by other users.
- 2.11.7 Bus services are accessible from stops located on the B4267, located within the IHT's suggested 'acceptable' walking distance to a bus stop. These provide access to a reasonable frequency of service operating between Barry and Cardiff. Penarth Railway Station is located around 2.5km to the north of the site and is accessible on foot or by bicycle via the shared footway / cycleway on the B4267 and NCR 88. This provides access to a reasonable frequency of services to Cardiff Central, from which access to the wider rail network is achieved.

## 3. Development Proposals

### 3.1 Introduction

- 3.1.1 This chapter of the TA provides a description of the development proposals, including the site access strategy for vehicles, pedestrians and cyclists. In addition, parking arrangements for vehicles and bicycles is set out. The construction of the proposed development is also discussed.
- 3.1.2 The access strategy and internal masterplan have evolved from that presented at PAC submission and original planning submission to take account of comments and recommendations of the LHA. The masterplan has developed through collaborative working between the Education Department and key stakeholders.

### 3.2 Overview of Proposals

- 3.2.1 The development proposals are for the construction of a new and additional campus for YYD. This will be operated by the same senior management team at the existing facility and for the purpose of these outline proposals is known as 'YYD2'. The existing YYD campus is located to the west of Penarth, approximately 3km north of the site. The proposed YYD2 will be a Special Educational Needs (SEN) school. The development of this school will be an expansion to the Penarth Learning Community (PLC) which comprises St Cyres Secondary School and YYD, forming a central learning hub, the largest learning facility in Wales. PLC comprises an 11-18 mainstream comprehensive school (St Cyres) with the capacity for 1,285 pupils, together with a 3-19 SEN school (YYD) catering for pupils with a wide spectrum of learning needs including those with learning and physical difficulties and those on the autism spectrum. The new campus will provide the same core services as the existing school to enable the relocation of some existing pupils and to accommodate growth in the need for SEN schooling in the VoG across both campuses.
- 3.2.2 The SEN facility within the PLC (YYD) is currently oversubscribed and this situation will be exacerbated in the coming academic years and therefore requires a supplementary SEN facility to alleviate the high demand, resulting in the need for YYD2. The school will comprise of 150 pupil places which will be filled with primary aged pupils who are currently in YYD and allow some future expansion. An illustrative masterplan of the development proposals is provided at **Appendix A**. It sets out the general strategy for the proposed development, which will be detailed further at the reserved matters stage.

### 3.3 Access Strategy

#### Vehicle Access

- 3.3.1 Vehicle access to the proposed development will be via a new priority T-junction onto Fort Road, sited approximately 52m south of the B4267 / Fort Road junction (measured between junction centrelines). Vehicles will access and egress via the same junction. An indicative junction arrangement is shown for information purposes in the masterplan, which is appropriate for the purpose of the outline proposals. Junction geometric parameters will be confirmed at the detailed design stage.
- 3.3.2 A reduction from the national speed limit of 60mph to 30mph will be introduced on Fort Road along the site frontage to accommodate the proposed access area. This is more appropriate for the proposed school setting and is promoted by the LHA. On this basis, emerging visibility of 2.4m x 43m will be required at the access junction, commensurate with the nationally applicable standards set out in *Manual for Streets* (MfS) (2007). As shown at **Appendix D**, this level of emerging visibility is achievable to the left (i.e. the south) along the site frontage from the indicative access location, as well as to the right (i.e. the north). This is considered reasonable and appropriate given that vehicle speeds entering from Fort Road (i.e. performing a turning manoeuvre) will be significantly lower than 30mph, likely no more than 20mph (for which visibility of 25m is required). The plan also shows the extent of speed reduction that is required to ensure the access area is within a 30mph zone.

- 3.3.3 As part of the access proposals, there will be a highway improvement requirement to allow for efficient two-way movements on Fort Road between its junction with the B4267 and the site access. This will necessitate widening of the carriageway which, will take place entirely within the site boundary / extent of the public highway.
- 3.3.4 Indicative proposals for widening and tie-in with / modifications to the existing B4267 / Fort Road junction have been prepared based on topographical survey information. The extent of site frontage impact and hedge loss can be viewed together with junction visibility and swept path analysis drawings included within **Appendix D**.
- 3.3.5 The access strategy will result in an intensification in use of the B4267 / Fort Road junction. The B4267 is currently subject to a 40mph speed limit. It is understood that, as part of the access proposals for 'Land at Upper Cosmeston Farm', the existing 30mph speed limit on the B4267, located 260m to the northeast of the B4267 / Fort Road junction, will be extended southeast to the B4267 / Fort Road junction. There is an opportunity to extend the reduction to encompass the approach to the junction from the southwest. Under this arrangement, emerging visibility of 2.4m x 43m will be required in accordance with nationally applicable standards set out within MfS and shown at **Appendix D**, this is achieved at the existing junction. Irrespective of whether the 30mph speed limit is extended to incorporate the junction and its approaches, emerging visibility of 2.4m x 120m in accordance with DMRB standards (CD 123 'Geometric design of at-grade priority and signal-controlled junctions') for a 40mph road (the existing speed limit) is achieved, as shown at **Appendix D**.
- 3.3.6 The proposed internal circulation includes five spurs off the access road. The three northern spurs together form the access and egress lanes for a one-way system for drop-off / pick-up circulating near the school frontage. The two southern spurs together form a one-way system, access and egress, to the main parking areas for staff and visitors.
- 3.3.7 Appropriate and legible access will be developed and provided (i.e. through on-carriageway markings and appropriate signage) to direct users to appropriate areas to maximise efficiency of movement and minimise conflict. Arriving vehicles to the drop-off / pick-up area will be directed to circulate through this area to join the back of the queue / park in nearest available spaces to the exit of the area so as to maximise stacking capacity.
- 3.3.8 Given the status of the application, which is sought as outline planning permission, the masterplan presented is for indicative purposes to show that the building, access arrangements and internal service and circulation routes can be accommodated.
- 3.3.9 Swept Path Analysis (SPA) has been undertaken on the masterplan to demonstrate that the arrangements are suitable and appropriate for accommodating a range of vehicle types anticipated to serve the development. The following vehicle types have been subject to SPA:
- 11.2m Phoenix Duo Refuse Vehicle;
  - 8.7m DB32 Fire Appliance;
  - 6.3m Mini Bus; and
  - 5.1m 'Large Car'.
- 3.3.10 The analysis has demonstrated that all vehicle types are able to access and circulate through the development in a safe manner. SPA drawings for all assessed vehicle types are included within **Appendix D**.

## Pedestrian and Cycle Access

- 3.3.11 A dedicated pedestrian and cycle access will be provided directly from the existing footway / cycleway on the B4267, at the western extent of the site frontage. This will provide a segregated route to the school entrances, separating vehicle access and non-motorised user access. As part of the access proposals for 'Land at Upper Cosmeston Farm', the existing shared footway / cycleway on the B4267 is to be widened to form an active travel route between the junctions with Upper Cosmeston Farm and Fort Road. The pedestrian and cycle access to this proposed school development will directly connect with the widened shared footway / cycleway, this will be an appropriate active travel connection as requested by the LHA. The pedestrian circulation areas outside the school entrances will link to the drop-off / pick-up and car parking areas, with provision of suitable crossing facilities and waiting areas.

- 3.3.12 The Highway Authority has requested that visibility splays are considered for the active travel route to be provided. The dedicated cyclist and pedestrian route will connect with the footway on Lavernock Road and any future shared active travel route that will be provided. The indicative site access layout has been considered in terms of providing a safe connection between the two proposed shared active travel routes. The site access link is considered to be the non-priority connection to the adopted highway active travel route. Therefore the pedestrian visibility splays that are usually applied for the interaction of vehicular access over a footway have been set out, showing a robust 2.4 metres set back and 2.4 metres distance to either side of the path. These short splays highlight the area that will be kept clear of all vegetation with a mature height of 600mm and will also focus and minimise hedge loss.
- 3.3.13 In addition to the splay provided above, it may be appropriate to include additional measures on the Lavernock Road active travel route. This could comprise coloured or texture surface treatments which channel cyclists away from the access. This could be more physically protected through the introduction of flexible bollards, either side of the school access. The school route could be marked and signed to give way at the intersection of the two routes, advisory warnings to look left and right could be installed. The set back that could be created through introduction of these measures is 1.0 metre, this is considered to be an appropriate distance for a stopped cyclist to see and be seen.
- 3.3.14 The final detail will be a matter for detailed consideration and approval with the LHA, the indicative measures set out in **Appendix D** help to illustrate that there is likely to be scope for appropriate and safe interaction.

## 3.4 Parking Provision

### Car Parking

- 3.4.1 The VoG Parking Standards 2019 has been adopted as Supplementary Planning Guidance (SPG). The standards identify 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 of planning applications, and to achieve a common approach to the provision of vehicle parking facilities associated with new development and change of use.
- 3.4.2 The parking standards are defined according to a zoning system based on the number, range and characteristics of facilities within walking distance and the level of public transport provision. The site itself is located within 'Zone E – Deep Rural', the description of which is as:
- “This zone comprises scattered individual buildings and is characterised by areas with no local facilities within walking distance. Motorised travel is required for all journeys but the most local. Public transport services are very infrequent or beyond walking distance. There is no shortage of land for parking provision within the site but the adjacent highway system offers no opportunities to park cars because of the narrowness of the highway.”*
- 3.4.3 With reference to **Chapter 2**, the description for Zone E is not considered to fully align with the characteristics of the site. Whilst facilities within 400m walking distance of the site are limited to a café, there are bus stops within walking distance that provide access to services operating at 30 minute and hourly frequencies. There is also a wider cycling network that neighbouring infrastructure connects to and therefore facilitates cycling to / from the site. However, given its status as an adopted SPG, the definition of the site in terms of zone has been adhered to in identifying parking standards.
- 3.4.4 The parking standards for Zone E are shown in **Table 3-1**. There are no specific standards relating to SEN schools. Standards are therefore presented for all education types.

**Table 3-1: Vehicle Parking Standards (Zone E – Deep Rural)**

Education Type	Parking Type	Standards
Nursery / Infants / Primary Schools	Teaching Staff	1 space per staff member
	Ancillary Staff	1 space per two staff members
	Visitors	3 spaces
Secondary Schools	Teaching Staff	1 space per staff member
	Ancillary Staff	1 space per two staff members
	Visitors	3 spaces
Colleges of Higher / Further Education	Teaching Staff	1 space per staff member
	Ancillary Staff	1 space per two staff members
	Visitors	5 spaces

Notes: 1) All education types are required to provide one commercial space, irrespective of location.

2) Standards are provided for students for 'Secondary Schools' and 'Colleges of Higher / Further Education'. These are not considered to be relevant for the proposed development.

3) Standards for buses / coaches require provision 'as required'.

3.4.5 It is noted from the local policy guidance that there are no specific standards relating to SEN schools, therefore the standards for each education type have considered in determining provision for the proposed development.

3.4.6 The standards for each education land use type were each considered against the proposed indicative staff levels of 103 FTE staff, of which 18 are teaching staff and 85 are ancillary staff. This was carried out in order to identify a potential and informed range for the parking provision requirements. The conclusions were that of the application of the standards for main stream schools could result in a range of between 64 to 66 spaces (61 spaces for teaching / ancillary staff and three to five spaces for visitors). In its PAC response, the LHA suggested that a higher level of provision may be required within this specialist school provision given the operational needs and staffing levels. Therefore the applicant has endeavoured to provide an appropriate higher level of parking provision that achieves a suitable balance between serving specialist operational need and ensuring this is not excessive enough to work to undermine objectives relating to the promotion of sustainable travel.

3.4.7 It has been suggested and it seems reasonable that sufficient spaces are provided, at this early application stage, to accommodate the likely private vehicle mode of travel. As such, the provision of 80 spaces accommodates the likely requirement for staff driving to the site (as set out in **Chapter 5** of this TA). The masterplan indicatively includes provision for a total of 80 car parking spaces. Included within this total is provision for four spaces (5%) designated for disabled use and 10% EV parking. A commercial space is also provided, accessed via the drop-off / pick-up area.

3.4.8 The SPG also notes that:

- Parking should be calculated based on full capacity of the nursery. This has been considered within the FTE staff;
- Where part-time staff are employed, they should be aggregated to their full-time equivalents. FTE staff have been considered in the calculation;
- The parking area should include a facility for vehicles to turn without reversing. In exceptional circumstances a circulation / turning area remote from pupil circulation areas would be acceptable. Suitable provision is included within the masterplan; and
- Appropriate provision must be provided for parental drop-off / pick-up of children as dictated by local circumstances and any School Travel Plan. Drop-off areas must be located so that the safety of pupils walking or cycling to school is not jeopardised. This is discussed below.

3.4.9 The masterplan includes provision for drop-off / pick-up of pupils, dictated by the specific operational requirements for SEN schools. The level of provision has been based on the forecasts at **Chapter 5**. This identified that there could be around 36 vehicles associated with pupil drop-off / pick-up. The masterplan includes sufficient stacking capacity for this level of demand).

- 3.4.10 The fundamental issue is that the masterplan, at present, is a matter for reserved detail. The application seeks to demonstrate at this outline stage that the school and its parking and circulation areas can be accommodated within the site. There will be further detailed updates to the masterplan and associated demonstration of safe, adequate and appropriate parking and circulation as part of a future detailed application.

## Cycle Parking

- 3.4.11 VoG cycle parking standards are set out in Appendix 4 of the Parking Standards SPG. The guidance states that cycle parking should be situated in a safe, secure and convenient location and for reasons of security, cycle parking facilities should be laid out in areas that are visible and therefore allow for informal surveillance.
- 3.4.12 As with the vehicle parking standards set out above, there are no specific standards relating to SEN schools, therefore the standards for each education type have considered in determining cycle provision for the proposed development. **Table 3-2** summarises the cycle parking standards as outlined in the SPG.

**Table 3-2: Cycle Parking Standards**

Education Type	Cycle Parking Type	Standard
Nursery / Infants / Primary Schools	Long Stay	1 stand per 5 staff and 1 stand per 20 children
	Short Stay	1 stand per 100 children
Secondary Schools and Colleges of Higher / Further Education	Long Stay	1 stand per 5 staff and 1 stand per 6 students of age 17
	Short Stay	1 stand per 100 children

- 3.4.13 When applied to the proposed development, the standards require provision of 23 spaces at the low end and 28 spaces at the high end. The illustrative masterplan shows a cycle storage area located between the pedestrian / cycle access and the visitor entrance, which accommodates 28 cycle spaces.

## Motorcycle Parking

- 3.4.14 VoG motorcycle parking standards are set out in Appendix 4 of the Parking Standards SPG. The guidance states that this should be provided at a level of 5% of the car parking provision. With reference to the level of provision within the staff / visitor car parking area (80 spaces), this equates to four spaces. The illustrative masterplan provides this level of motorcycle parking within a prominent area of hardstanding located between the entry and exit of the staff / visitor parking area, accessible via the internal footway network.

## 3.5 Construction Traffic

- 3.5.1 Managing the effects from the construction of the proposed development will form part of a Construction Traffic Management Plan (CTMP) or similar document. The management measures will be intended to protect the environment, amenity and safety of local residents, businesses, the general public and the surroundings in the vicinity of the proposed development.
- 3.5.2 As part of the CTMP, a construction vehicle routing regime for access to the construction site will be identified and agreed with the LHA to ensure that drivers of construction related vehicles do not use inappropriate routes which are unsuitable by virtue of their width, alignment or character. The CTMP will also consider measures to discourage deliveries during peak traffic periods on the highway network. There will be ongoing monitoring of the CTMP during the construction phase to establish the effectiveness of the measures.



## 3.6 Summary

- 3.6.1 The development proposals are for the construction of a new and additional campus for YYD. This will be operated by the same senior management team at the existing facility and for the purpose of these outline proposals is known as 'YYD2'. The school will comprise of 150 pupil places which will be filled with pupils who are currently in YYD and allow some future expansion. An illustrative masterplan has been prepared to set out the general strategy for the proposed development, which will be detailed further at the reserved matters stage.
- 3.6.2 Vehicle access to the proposed development will be via a new priority T-junction onto Fort Road. Vehicles will access and egress via the same junction. An indicative junction arrangement is shown for information purposes in the masterplan. Junction geometric parameters will be confirmed at the detailed design stage. A reduction from the national speed limit of 60mph to 30mph will be introduced on Fort Road along the site frontage, as necessary to encompass the proposed access and associated visibility splays. Emerging visibility commensurate with a speed limit of 30mph is achievable along the site frontage. As part of the access proposals, there will be a requirement to ensure for efficient two-way movements on Fort Road between its junction with the B4267 and the site access. This will necessitate widening of the carriageway within the site boundary / extent of the public highway. Proposals for widening and tie-in with / modifications to the existing B4267 / Fort Road junction has been prepared based on topographical survey information. The extent of site frontage impact and hedge loss required to achieve junction visibility and appropriate carriageway width in Fort Road has been identified. . The access strategy will result in an intensification in use of the B4267 / Fort Road junction; emerging visibility commensurate with both the potential and existing speed limit on the B4267 is achieved.
- 3.6.3 A dedicated pedestrian and cycle access will be provided directly from the existing footway / cycleway on the B4267. This will provide a segregated route to the school entrances from the western area of the site. As part of the access proposals for 'Land at Upper Cosmeston Farm', the existing shared footway / cycleway on the B4267 is to be widened between the junctions with Upper Cosmeston Farm and Fort Road. The pedestrian and cycle access to the proposed development will directly connect with the widened shared footway / cycleway. Pedestrian circulation areas outside the school entrances will link to the drop-off / pick-up and car parking areas, with provision of suitable crossing facilities and waiting areas.
- 3.6.4 The proposed internal circulation includes five spurs off the access road. The three northern spurs together form the access and egress lanes for a one-way system for drop-off / pick-up circulating near the school frontage. The two southern spurs together form a one-way system, access and egress, to the main parking areas for staff and visitors.
- 3.6.5 The internal layout provides a suitable level of car parking for drop-off / pick-up and staff / visitor purposes, with reference to VoG's adopted standards and the specific operational requirements for SEN schools. Appropriate and legible access will be developed and provided (i.e. through on-carriageway markings and appropriate signage) to direct users to appropriate areas to maximise efficiency of movement and minimise conflict. The illustrative masterplan also includes suitable areas for provision of cycle and motorcycle parking. Levels of parking provision will be confirmed at the reserved matters stage. SPA of the internal arrangements has been undertaken for a range of robust vehicle types, all of which are predicted to serve the proposed development. The analysis has demonstrated that the proposals are safe and adequate.
- 3.6.6 Construction impacts of the new school facility will be managed by a CTMP which will outline measures intended to protect the environment, amenity and safety of local residents, businesses, the general public and the surroundings in the vicinity of the proposed development.



# 4. Planning Policy Review

## 4.1 Introduction

- 4.1.1 This chapter of the TA provides a review of relevant planning and transport policies at a national and local level.

## 4.2 National Policy

### Planning Policy Wales

- 4.2.1 Edition 11 of PPW was published in February 2021 and sets out the land use planning policies of the WG. It is supported by a number of Technical Advice Notes (TANs), which provide detailed planning advice on subjects contained within PPW. *TAN 18: Transport* is considered of particular relevance to the proposed development and is included in this policy review. An overarching theme within PPW is the commitment of the WG to sustainability.
- 4.2.2 Planning policy in Wales is plan-led, with up to date LDPs forming a fundamental part of the system. PPW states that planning applications “*must be determined in accordance with the adopted plan unless material considerations indicate otherwise.*” This chapter provides a review of the VoG LDP to demonstrate that the proposed development accords with policy.
- 4.2.3 PPW outlines the vision for development of a more effective and efficient transport system, the promotion of more sustainable and healthy forms of 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 The WG outlines a support for a transport hierarchy in relation to the accessibility of new development that prioritises walking and cycling in the first instance, followed by public transport, ultra-low emissions vehicles and finally other private motor vehicles. The nature of the development site being specialist learning school is such that pupils travel long distances to be schooled here, and are also entitled to school transport provision, therefore, active travel modes are less likely to be use. Therefore, this TA aims to improve the safety of pedestrians around the school site by encouraging the use of a one-way system during school opening and closing times. The proposed measures are set out in **Chapter 7** of this TA.
- 4.2.5 Paragraph 4.1.11 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.”*
- 4.2.6 Paragraph 4.1.40 relates to the provision of facilities for EVs:
- “To encourage the use of Ultra Low Emission Vehicles (ULEVs), the planning system should encourage and support the provision of ULEV charging points as part of new development.”*
- 4.2.7 Paragraph 4.1.49 states that car parking provision has a major influence on both mode choice and development patterns.

- 4.2.8 Paragraphs 4.1.55 to 4.1.56 identify the requirements for development proposals to be accompanied by an appropriate level of transport assessment. It directs professionals to the TAN 18 for guidance on the preparation and content of assessments.

## Technical Advice Note (TAN) 18: Transport

- 4.2.9 TAN 18 was published in March 2007. It 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 of land use and transport planning forms part of an overall sustainable development approach by the WG towards strategy and policy objectives. This is predominantly through maximising the accessibility of developments by sustainable modes of transport. This also includes reducing the need to travel and encouraging multi-purpose trips. Accessibility is defined 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, notably walking from within Cosmeston and school bus provision.
- 4.2.12 Paragraph 4.6 states that parking standards for new development should be determined on an evidence basis which includes accessibility to other modes of transport. The proposed development provides car and cycle parking in accordance with the VoG Parking Standards SPG (March 2019), as discussed in **Chapter 3** of this TA.
- 4.2.13 Section 5 requires all new development to be designed in a way that is inclusive for all. The design of the development also plays an important role in providing genuine alternatives to car travel. This includes sufficient cycle parking in close proximity to the school access, for those pupils able to cycle to school, and ensuring suitable accessibility within the site for all pupils and staff.
- 4.2.14 Section 7 considers the role that public transport can play in offering an alternative to car travel, giving emphasis to the provision of new services and facilities, as well as facilitating interchange, as methods of encouraging uptake. The school bus has capacity should there be new pupils who are eligible for free transport provision.

## Wales Transport Strategy

- 4.2.15 The *Wales Transport Strategy 2021* (WTS) was published in March 2021 and provides a long-term vision for transport over the next 20 years. The vision of the WTS is “*an accessible, sustainable and efficient transport system.*” In order to deliver its vision, the WTS sets out three priorities:
- Priority 1 – Bring services to people in order to reduce the need to travel;
  - Priority 2 – Allows people and goods to move easily from door to door by accessible, sustainable transport; and
  - Priority 3 – Encourage people to make the change to more sustainable transport.
- 4.2.16 As discussed in previous chapters, the proposed development is SEN specialist school which generally caters for a wider catchment with pupils travelling typically longer distances to be schooled, therefore there will naturally be a larger percentage of car-based trips than that associated with state primary schools. The proposed development will aim to improve integration between modes, facilitate the use of existing school transport availability, and improve connectivity. It is therefore considered to be aligned with the WTS.

## National Transport Finance Plan

- 4.2.17 The *National Transport Finance Plan* (NTFP) provides the timescales for financing and delivery of schemes in Wales. The NTFP is not a policy document and nor does it prioritise schemes to be taken forward. It was published in 2015 and an update was since published in 2018.

- 4.2.18 The purpose of the NTFP is to:
- Provide the timescale for financing schemes undertaken by the WG;
  - Provide the timescale for delivering these schemes and detail the estimated expenditure required to deliver the scheme; and
  - Identify the likely source of financing 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 forward. It brings together projects already being delivered. Some of these are already under construction. Others are already under development but are not yet being built.

## Active Travel (Wales) Act 2013

- 4.2.20 The *Active Travel (Wales) Act* became law in Wales in November 2013. The Act makes it a legal requirement for local authorities in Wales to map and plan for suitable routes for active travel, and to build and improve their infrastructure for walking and cycling every year. It also requires both the WG and local authorities to promote walking and cycling as a mode of transport.
- 4.2.21 The purpose of this Act is to require local authorities to continuously improve facilities and routes for pedestrians and cyclists and to prepare maps identifying current and potential future routes for their use. The Act also requires new road schemes (including road improvement schemes) to consider the needs of 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 of active travel networks and infrastructure, and is to be used at all stages of the process. Reference will be made to this guidance in the planning and design of the proposed development.

## Well-being and Future Generations (Wales) Act 2015

- 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 of Wales for future 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 of cohesive communities;
  - A Wales of vibrant culture and thriving Welsh language; and
  - A globally responsible Wales.
- 4.2.24 The seven goals form the basis for twelve objectives, also detailed in the wellbeing statement. Several of these are directly relevant to this proposed scheme:
- Drive sustainable growth and combat climate change;
  - Promote good health and well-being for everyone;
  - Build healthier communities and better environments; and
  - Deliver modern and connected infrastructure.
- 4.2.25 By improving pedestrian safety in the vicinity of the school with the introduction of an informal one-way system for cars a mode shift away from car to walking, cycling and bus use will be encouraged. By creating an area that supports active travel that communities 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.

### The Vale of Glamorgan Local Development Plan

- 4.3.2 The VoG LDP was updated in June 2017 and covers the period 2011-2026. The vision for the VoG is for 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 of 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 of the LDP Strategy. The strategic objective most appropriate to this scheme is:

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

- 4.3.4 The LDP further develops ‘Strategic Policies’ to underpin the LDP Strategy and further develops policies specifically 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 Policy MG6 (provision of Education Facilities) provides details of land allocations for specific 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.”*

- 4.3.7 Policy MD2 (Design of 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”.*

- 4.3.8 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.”*

- 4.3.9 The proposed development seeks to provide a safe and accessible environment, particularly for pedestrians and cyclists, and to ensure efficient and safe movement of vehicles on site through provision of appropriate drop-off / pick-up facilities to meet the school's requirements.

## The Vale of Glamorgan Local Transport Plan 2015-2030

- 4.3.10 The Local Transport Plan (LTP) seeks to identify the sustainable transport measures required to ensure the VoG adheres to current requirements and good practices to allow for a sustainable transport environment for the period 2015 to 2020 as well as looking forward to 2030. It therefore seeks ways to secure better conditions for pedestrians, cyclists and public transport users and to encourage a change in travel choices away from the single occupancy car.
- 4.3.11 As most journeys by car, particularly for shopping and school travel, are relatively short, better conditions for 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, offer better access to services and facilities, which in turn can offer improved economic opportunities and reduce the potential for traffic accidents. Sustainable transport infrastructure and services are therefore an important feature of modern-day life.

## The Vale of Glamorgan Parking Standards

- 4.3.12 The VoG parking standards are set out in SPG to the LDP; the SPG was adopted in March 2019.
- 4.3.13 The SPG sets out the VoG's parking standards and explains the planning policy for parking requirements for new developments or changes of use. The parking standards seek to promote and ensure transparent and consistent approaches to the provision of parking. In addition to this, it helps to inform developers and designers what is expected of them in terms of sustainability considerations and travel planning.
- 4.3.14 The proposed development provides parking in accordance with the SPG, as discussed at **Chapter 3** of this TA.

## 4.4 Summary

- 4.4.1 This chapter of the report has provided a review of existing planning and transport policies at a national and local level that are considered relevant to the proposed development.
- 4.4.2 Planning law requires that applications for planning permission must be determined in accordance with the adopted LDP. The proposed development is considered to align with the objectives of the LDP.
- 4.4.3 The proposed development will facilitate opportunities for sustainable travel through the implementation of a TP, which is a requirement of the national and local policy. This will not form part of the planning application submission; however, it will be secured as a condition, through the planning process.
- 4.4.4 The proposed development will comply with the national and local policy and guidance, with access to the site being safe and suitable for all users. The site is accessible via a range of sustainable modes which will be further encouraged via a number of improvements, further detailed in **Chapter 7** of this TA. In summary, the proposals comply with national and local policies.

# 5. Trip Generation and Distribution

## 5.1 Introduction

- 5.1.1 This chapter of the TA outlines the traffic generation for the proposed development as well as its distribution and assignment to the local highway network. The method for deriving traffic generation and distribution for this specialist education facility uses a first-principles approach with respect to the proposed number of pupils and staff and information available for the existing school.

## 5.2 Pupil Traffic Generation

- 5.2.1 The proposed development will accommodate 150 pupils. Pupil traffic generation has been derived on a pro-rotas basis using information on pupil travel for the existing campus. The existing YYD campus has 262 pupils at the school; details of the travel arrangements for 243 pupils have been supplied, which is considered a very strong representative proportion of the existing pupil population to identify existing travel behaviour for application to the proposed development. Mode share data for the remaining 19 pupils (those that are not entitled to free school transport) is not available and has therefore not been accounted for in terms of pupil travel for the existing campus, although it is likely that these will either walk or travel as a passenger in a car. No allowance has been made for walking or car sharing in the forecasts (with the exception for contracted vehicles discussed in paragraph 5.2.2), so the pro-rata calculation based on the behaviour of 243 pupils is considered reasonable.
- 5.2.2 Of the 243 pupils at the existing campus for which data has been supplied, 229 (94%) are provided with transport to / from the existing campus. There are currently 45 vehicles travelling to / from the school during the drop-off / pick-up periods. These vehicles operate on a 'contract' which entails dropping off and picking up a number of students within one vehicle. Pro-rata, this equates to 28 vehicles for the proposed development.
- 5.2.3 The remaining 14 pupils (6%) are provided with funding to arrange their own transport to / from YYD. Pro-rata, this equates to nine pupils who are assumed to travel to / from school as the sole passenger of a vehicle. This assumption accounts for the rural setting of the proposed development (which is likely to generate higher levels of car-based trips) and also provides a robust assumption for the purposes of assessment.
- 5.2.4 This results in a total traffic generation of 36 'pupil' vehicle trips for the proposed development. The vehicles used to transport pupils to / from the proposed development are not expected to remain on-site throughout the day, but will instead depart after dropping off, and arrive prior to picking up pupils. As such, the total pupil traffic generation is therefore considered to be 74 two-way movements during the pupil drop-off and pick-up periods. No before or after school clubs are to be provided at the proposed campus and therefore it is reasonable to assume that all pupils will arrive and depart during the same time periods.
- 5.2.5 It is likely that the proportion of pupils provided with transport and pupils allocated funding for arranging their own transport will vary year on year following the opening of the proposed development. However, use of the existing year data is considered to be a reasonable interpretation of this ratio for future pupil trips to / from the school and far more informed than any information that could be gleaned from national datasets.

## 5.3 Staff Traffic Generation

- 5.3.1 The proposed development will accommodate 103 FTE members of staff, including teaching staff, support staff and healthcare staff.



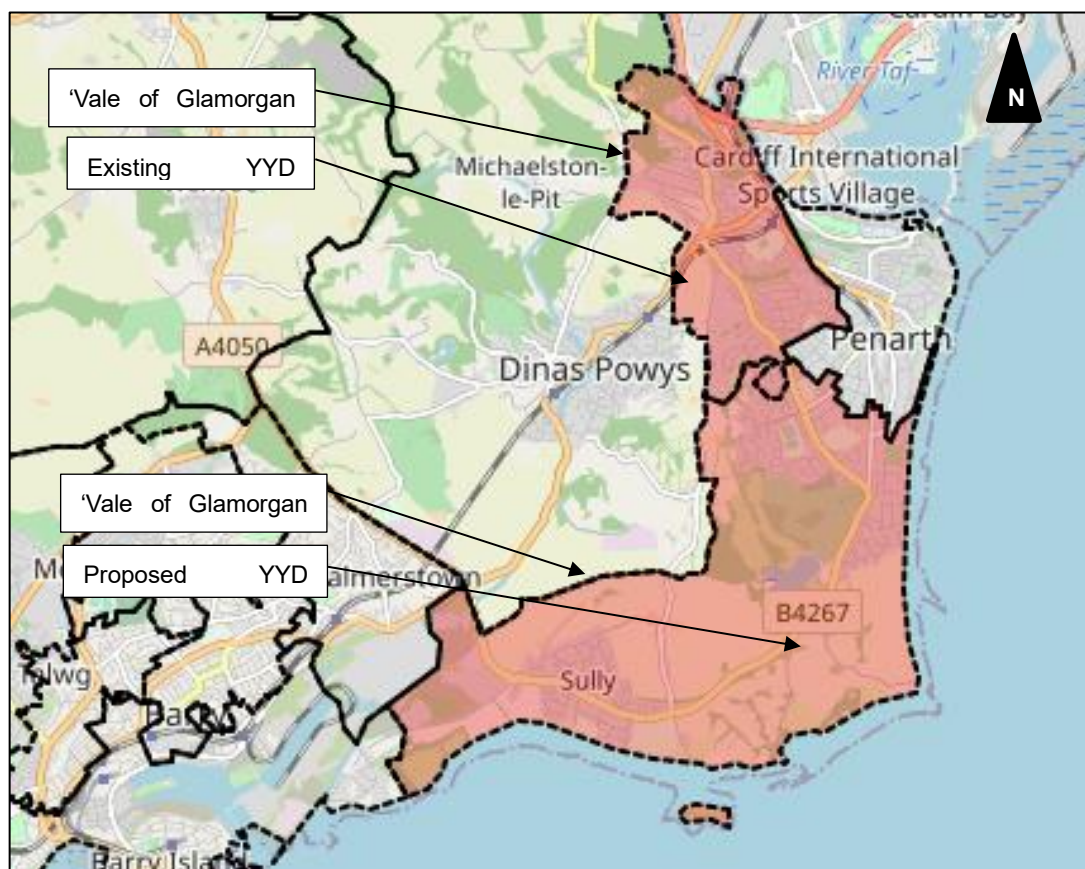
5.3.2 To calculate the method of travel for staff to / from the proposed campus, a mode share has been derived using 2011 Census data ('WU03EW - Location of usual residence and place of work by method of travel to work (MSOA level)' dataset). The 'Vale of Glamorgan 004' Middle Super Output Area (MSOA) has been selected as the 'place of work' for this analysis. Whilst the proposed development falls within the boundary of the 'Vale of Glamorgan 008' MSOA, the 'Vale of Glamorgan 004' MSOA has been used as it includes more representative employment locations, including the existing YYD campus, and also results in a more robust mode share for vehicle travel. The mode shares for each of the MSOA areas are presented in **Table 5-1** for comparison. The geographic extent of each MSOA is presented in **Figure 5-1**.

**Table 5-1: Staff Mode Share Comparison**

Main Mode of Travel	Middle Super Output Area (MSOA)	
	Vale of Glamorgan 004 (Mode Share for Assessment)	Vale of Glamorgan 008 (Mode Share Provided as Comparison)
Driving a Car/Van	77%	75%
On Foot	8%	10%
Passenger in a Car/Van	7%	4%
Bus	4%	4%
Bicycle	1%	2%
Motorcycle	1%	1%
Rail	1%	1%
Taxi	0%	3%
Other	0%	1%
<b>Total</b>	<b>100%</b>	<b>100%</b>

Notes: 1) Summation errors are due to rounding.

**Figure 5-1: Extent of the 'Vale of Glamorgan 004' and 'Vale of Glamorgan 008' MSOAs**



Source: Nomis / OpenStreetMap, 2020.

- 5.3.3 The mode share derived for the 'Vale of Glamorgan 004' MSOA has been applied to the proposed number of staff. The resulting mode split of staff is presented in **Table 5-2**.

**Table 5-2: Staff Modal Split**

Mode Share	Percentage	Number of Staff
Driving a Car/Van	77%	80
On Foot	8%	8
Passenger in a Car/Van	7%	7
Bus	4%	4
Rail	1%	1
Bicycle	1%	1
Motorcycle	1%	1
Taxi	0%	0
Other	0%	0
<b>Total</b>	<b>100%</b>	<b>103</b>

Notes: 1) Summation errors are due to rounding.

- 5.3.4 The 'Vale of Glamorgan 004' mode share shows that 80 members of staff are expected to travel to / from the school as the driver of a car, seven as a passenger in a car and eight are forecast to walk from within the local area. The remaining staff are envisaged to travel via public transport or by bicycle. This mode share is reflective of the sustainable transport provision locally which includes reasonable connections by public transport, walking and cycling but is still located in a predominately rural area where travelling by car remains the most convenient option for most people.

## 5.4 Development Traffic Distribution and Assignment

- 5.4.1 The distribution of pupil and staff traffic on the local highway network has been determined using postcode information supplied for the existing YYD campus. The home locations of the existing pupils are considered to be a reasonable proxy for the proposed development as the catchment of the new school will remain as per that of the existing campus.
- 5.4.2 The routes between pupil / staff home postcodes and the site have been determined using online route planning software for a neutral peak hour period (pre-COVID). The route with the shortest distance / time has been selected for the traffic assignment.
- 5.4.3 Pupil trips are assumed to arrive during the assessed AM peak hour (07:45-08:45hrs) but depart outside of the assessed highway network PM peak hour (16:30-17:30hrs). This is consistent with the proposed school timetable (i.e. 09:00-15:00hrs). The pupil traffic distribution and assignment to the study network entry / exit points is presented in **Table 5-3** for the AM peak hour (07:45-08:45) and pupil departure period (15:00-16:00). Traffic flow diagrams presenting the pupil traffic assignment during the AM peak hour and pupil departure period are included at **Appendix E**.

**Table 5-3: Pupil Traffic Distribution and Assignment**

Network Entry / Exit	Percentage Distribution	AM Peak Hour (07:45-08:45)			School PM Peak Hour (15:00-16:00)		
		Arrivals	Departures	Two-Way	Arrivals	Departures	Two-Way
A4055 Cardiff Rd (SW)	40%	14	14	29	14	14	29
A4231	42%	15	15	31	15	15	31
A4055 Cardiff Rd (NE)	4%	1	1	3	1	1	3
Hayes Rd	0%	0	0	0	0	0	0
Sully, north of B4267	0%	0	0	0	0	0	0
Sully, south of B4267	1%	0	0	1	0	0	1



Network Entry / Exit	Percentage Distribution	AM Peak Hour (07:45-08:45)			School PM Peak Hour (15:00-16:00)		
		Arrivals	Departures	Two-Way	Arrivals	Departures	Two-Way
Swanbridge Rd	2%	1	1	1	1	1	1
Beach Rd	0%	0	0	0	0	0	0
Fort Rd	0%	0	0	0	0	0	0
Cosmeston Dr	0%	0	0	0	0	0	0
Westbourne Rd	5%	2	2	4	2	2	4
Augusta Rd	0%	0	0	0	0	0	0
Castle Ave	0%	0	0	0	0	0	0
Victoria Rd	0%	0	0	0	0	0	0
Dinas Rd	0%	0	0	0	0	0	0
B4267 Lavernock Rd	5%	2	2	4	2	2	4
<b>Total</b>	<b>100%</b>	<b>36</b>	<b>36</b>	<b>73</b>	<b>36</b>	<b>36</b>	<b>73</b>

Notes: 1) Summation errors are due to rounding.

- 5.4.4 Staff trips are assumed to arrive during the assessed AM peak hour (07:45-08:45hrs) and depart during the assessed PM peak hour (16:30-17:30hrs). The staff traffic distribution and assignment to the study network entry / exit points is presented in **Table 5-4** for the AM peak hour (07:45-08:45) and PM peak hour (16:30-17:30). Traffic flow diagrams presenting the staff traffic assignment during the AM and PM peak hours are included at **Appendix E**.

**Table 5-4: Staff Traffic Distribution and Assignment**

Network Entry / Exit	Percentage Distribution	AM Peak Hour (07:45-08:45)			PM Peak Hour (16:30-17:30)		
		Arrivals	Departures	Two-Way	Arrivals	Departures	Two-Way
A4055 Cardiff Rd (SW)	20%	16	0	16	0	16	16
A4231	30%	24	0	24	0	24	24
A4055 Cardiff Rd (NE)	3%	2	0	2	0	2	2
Hayes Rd	0%	0	0	0	0	0	0
Sully, north of B4267	0%	0	0	0	0	0	0
Sully, south of B4267	0%	0	0	0	0	0	0
Swanbridge Rd	1%	1	0	1	0	1	1
Beach Rd	0%	0	0	0	0	0	0
Fort Rd	0%	0	0	0	0	0	0
Cosmeston Dr	2%	1	0	1	0	1	1
Westbourne Rd	12%	10	0	10	0	10	10
Augusta Rd	0%	0	0	0	0	0	0
Castle Ave	1%	1	0	1	0	1	1
Victoria Rd	0%	0	0	0	0	0	0
Dinas Rd	3%	2	0	2	0	2	2
B4267 Lavernock Rd	28%	22	0	22	0	22	22
<b>Total</b>	<b>100%</b>	<b>80</b>	<b>0</b>	<b>80</b>	<b>0</b>	<b>80</b>	<b>80</b>

Notes: 1) Summation errors are due to rounding.

- 5.4.5 The total development traffic assignment for the assessed AM and PM peak hours (the product of the previous two Tables) are presented in **Table 5-5**.

**Table 5-5: Total Development Traffic Assignment**

Network Entry / Exit	AM Peak Hour (07:45-08:45)			PM Peak Hour (16:30-17:30)		
	Arrivals	Departures	Two-Way	Arrivals	Departures	Two-Way
A4055 Cardiff Rd (SW)	30	14	45	0	16	16
A4231	40	15	55	0	24	24
A4055 Cardiff Rd (NE)	4	1	5	0	2	2
Hayes Rd	0	0	0	0	0	0
Sully, north of B4267	0	0	1	0	0	0
Sully, south of B4267	0	0	1	0	0	0
Swanbridge Rd	2	1	3	0	1	1
Beach Rd	0	0	0	0	0	0
Fort Rd	0	0	0	0	0	0
Cosmeston Dr	1	0	1	0	1	1
Westbourne Rd	11	2	13	0	10	10
Augusta Rd	0	0	0	0	0	0
Castle Ave	1	0	1	0	1	1
Victoria Rd	0	0	0	0	0	0
Dinas Rd	2	0	2	0	2	2
B4267 Lavernock Rd	24	2	26	0	22	22
<b>Total</b>	<b>117</b>	<b>36</b>	<b>153</b>	<b>0</b>	<b>80</b>	<b>80</b>

Notes: 1) Summation errors are due to rounding.

- 5.4.6 The proposed development is forecast to generate 153 two-way movements during the AM peak hour, of which 109 two-way trips will be to / from the west of the site access and 44 two-way movements to / from the east of the site access. During the PM peak hour, the proposed development will generate 80 trips associated with staff departures from the site.

## 5.5 Summary

- 5.5.1 Pupil traffic generation has been calculated pro-rotas based on existing pupil travel to / from YYD. The majority of pupils currently travel by arranged transport, as would be expected of the specialist facility. There are currently 45 vehicles travelling to / from the school during the drop-off and collection periods. This equates to 28 vehicles for the proposed development. The remaining pupils are provided with funding to arrange their own transport. Pro-rotas, this equates to nine pupils for the proposed development. These pupils are assumed to arrive as the sole passenger of a vehicle. This results in a total traffic generation of 37 vehicles equating to 74 two-way movements during the pupil arrival and departure periods.
- 5.5.2 Staff traffic generation has been derived by applying a mode share to the proposed number of staff (103 FTE). The mode share has been calculated from 2011 census data, using the 'Vale of Glamorgan 004' MSOA as the 'place of work'. The 'Vale of Glamorgan 004' MSOA provides a robust vehicle mode share compared to the 'Vale of Glamorgan 008' MSOA, the location of the proposed development site. The mode share calculates that 80 staff will travel to / from the school by car, equating to 80 vehicle trips during the weekday AM and PM peak hours.
- 5.5.3 Pupil and staff traffic has been distributed and assigned onto the local highway network using home postcode data of existing staff / pupils. The route between the pupil / staff home postcodes and the proposed development site has been determined using an online route planning software for a neutral peak hour period (pre-COVID). The route with the shortest distance / time has been selected for the traffic assignment.

- 5.5.4 Pupils are assumed to arrive during the assessed AM peak hour (07:45-08:45hrs) but pupil departure will occur outside of the assessed highway network PM peak hour (16:30-17:30hrs). This is consistent with the proposed school timetable. Staff are assumed to arrive during the assessed AM peak hour (07:45-08:45hrs) and depart during the assessed PM peak hour (16:30-17:30hrs).
- 5.5.5 The proposed development is forecast to generate 154 two-way movements during the AM peak hour, of which 110 two-way trips will be to / from the west of the site and 44 two-way movements to / from the east of the site. During the PM peak hour, the proposed development will generate 80 trips associated with staff departures from the site.

# 6. Traffic Impact Assessment

## 6.1 Introduction

- 6.1.1 This chapter of the TA outlines the method and results of the traffic impact assessment for the proposed development, including the derived assessment scenarios and traffic growth forecast. Local junction capacity assessments have been undertaken at both the B4267 Lavernock Road / Fort Road T-Junction and the proposed Site Access junction with Fort Road. A further impact assessment has been undertaken based on the percentage change in traffic flows that could be experienced at the junctions on the wider study network.

## 6.2 Assessment Scenarios

- 6.2.1 A spreadsheet model has been prepared to derive the traffic flows for each assessment scenario, which have then been used for traffic impact assessment purposes. The spreadsheet model provides traffic flow diagrams for each scenario which have been included at **Appendix E**.

### '2022 Base' Scenario

- 6.2.2 Traffic surveys were commissioned by AECOM and conducted by a third-party on Thursday 17<sup>th</sup> March 2022 to provide existing turning movements at the priority T-Junction between the B4267 Lavernock Road and Fort Road, which provides access to the proposed development. These flows have been used to form the basis of a '2022 Base' scenario.
- 6.2.3 To assess the impact of development on the wider study network, 2019 traffic flows have been taken from the publicly available information contained in the TA for the proposed residential development of 'Land at Upper Cosmeston Farm' (Reference: 2020/01170/OUT). '2019 Base' flows are presented on Figure 3.5 of the TA for that development for the network peak hours of 07:45-08:45hrs and 16:30-17:30hrs. These flows were calculated in the work undertaken by that applicant team by applying growth factors to observed traffic flows from 27<sup>th</sup> November 2018. A sub-set of the raw 2018 survey data is available within Appendix E of the corresponding TA; however, this does not include all junctions on the study network for this application and therefore the traffic flows from the '2019 Base' scenario have been used to inform this assessment.
- 6.2.4 The raw data available for the B4267 corridor passing the site has been reviewed and has determined that, on average, 2% of traffic comprises HGVs. This proportion has been applied to traffic flows across the study network.
- 6.2.5 A growth forecast has been applied to the 2019 flows using growth factors derived from TEMPro (Version 7.2) and manual application of committed development traffic flows to the study network. This approach is consistent with the growth methodology used for the 'Land at Upper Cosmeston Farm' application. TEMPro forecasts changes in traffic volumes using the National Trip End Model (NTEM) which in turn considers changes in local residential and employment development, car ownership and population.
- 6.2.6 TEMPro has been used to calculate growth factors for the following periods:
- 2019-2022; and
  - 2022-2023
- 6.2.7 These have been 'locally adjusted' for 'All' road types within the 'The Vale of Glamorgan 008' MSOA. The growth factors have also had 'alternative assumptions' applied to remove the growth considered separately through the application of committed development traffic flows.
- 6.2.8 The committed developments considered in the growth forecast are as follows:
- Land West of Swanbridge Road (Reference: 2013/01279/OUT). An application for 350 dwellings was consented by VoG in May 2016. The site is allocated within the VoG Local Plan (Reference: MG2 (37) and referred to as 'Land South of Cog Road'. This site was also included in the growth forecast for the development at 'Land at Upper Cosmeston Farm'; and

- Land at Upper Cosmeston Farm (Reference: 2020/01170/OUT). An application for 576 dwellings was submitted in October 2020. Although this application is not yet consented, the site is allocated in the adopted VoG LDP (Reference: MG2 (24)) and therefore there is a reasonable likelihood of this being consented and implemented. This site is adjacent to the proposed development and therefore it is important that the specific traffic flow behaviours are captured in the growth forecast.

6.2.9 The traffic flows available from the corresponding planning applications have been manually applied to the study network. For 'Land West of Swanbridge Road' the traffic generation has been assigned to the study network by adapting the distribution presented in the TA as the study network for that application does not directly translate to the network for this assessment. Movements have therefore been assigned with 50% of traffic to the B4267 east and 40% to the B4267 west. 10% of the committed development traffic is assigned to Cog Road north of the site and does not appear on the study network for this application. Traffic flow diagrams showing the committed development flows on the study network during the weekday AM and PM peak hours are included at **Appendix E**.

6.2.10 The combined committed residential development (926 dwellings) has been removed from the TEMPro / NTEM assumptions of local housing growth to avoid double counting and provide a more accurate assessment. The alternative assumptions applied are presented in **Table 6-1**. The TEMPro 'standard assumption' assumes a housing growth of 93 dwellings between 2019 and 2023 and 32 dwellings between 2022 and 2023. The manually applied committed developments will deliver 926 dwellings. As such, the housing assumption has been retained at the respective 2019 and 2022 base levels of housing, effectively 'zeroing off' any residential growth within the growth factor calculation (although local employment growth is retained as per the 'standard assumption').

**Table 6-1: TEMPro Alternative Assumptions**

Growth Period	Assumption (2019-2022)	Assumption (2022-2023)
Base Housing	4,551 dwellings	4,644 dwellings
Base Jobs	1,888 jobs	1,910 jobs
Future Housing (Standard Assumption)	4,644 dwellings	4,676 dwellings
Future Jobs (Standard Assumption)	1,910 jobs	1,915 jobs
Future Housing (Alternative Assumption)	4,551 dwellings	4,644 dwellings
Future Jobs (Alternative Assumption)	1,910 jobs	1,915 jobs

6.2.11 The resulting growth factors for the periods 2019 to 2022 and 2022 to 2023 are as follows:

- 2019 to 2022: AM Peak Hour – 1.0197; PM Peak Hour – 1.0175; and
- 2022 to 2023: AM Peak Hour – 1.0047; PM Peak Hour – 1.0043.

6.2.12 The traffic flows for the 2022 Base scenario are presented on traffic flow diagrams for the AM and PM peak hours at **Appendix E**.

## '2023 Base' Scenario

6.2.13 The opening year of the proposed development is anticipated to be 2023. A future assessment year of 2023 has been derived by applying a growth forecast to the '2022 Base' traffic flows, as outlined above. Traffic flows for the 2023 Base scenario are presented on traffic flow diagrams for the AM and PM peak hours at **Appendix E**.

## '2023 Base + Development' Scenario

6.2.14 The '2023 Base + Development' scenario has been derived by applying the proposed development traffic to the '2023 Base' flows for the AM and PM peak hours. The assignment of pupil and staff traffic to / from the proposed development is shown in **Tables 5-3** and **5-4** respectively. The traffic flows for the '2023 Base + Development' scenario is presented on traffic flow diagrams for the AM and PM peak hours at **Appendix E**.

## 6.3 Junction Capacity Assessment

6.3.1 Junction capacity modelling has been carried out for the following junctions which provide access to the proposed site, in order to demonstrate that the proposed design can successfully accommodate peak hour development traffic demand without undue impact on the existing highway network:

- B4267 Lavernock Road / Fort Road Priority T-Junction; and
- Proposed Site Access / Fort Road Priority T-Junction.

6.3.2 The junction modelling assessment has been undertaken using the industry-standard software package 'Junctions 9'. Operational performance is summarised for all arms in terms of their Ratio of Flow to Capacity (RFC). Priority junctions are typically considered to operate satisfactorily in terms of capacity when the RFC is below 0.85 ('practical' capacity). An RFC value of 1.00 represents 'absolute' capacity. Queues have been rounded up to the nearest vehicle.

6.3.3 Full junction modelling results can be found at **Appendix F**.

### B4267 Lavernock Road / Fort Road Priority T-Junction

6.3.4 For both the 2022 and 2023 Base scenarios, the junction has been modelled as it currently exists, with junction geometries for assessment based upon a topographical survey. For the '2023 Base + Development' scenario, an alternative model has been used, which addresses the requirement for widening on Fort Road, in order for and leading to an appropriate access to the proposed development to be achieved.

6.3.5 **Table 6-2** shows the junction capacity modelling results for the B4267 Lavernock Road / Fort Road priority T-Junction for the AM (07:45-08:45) and PM peak hours (16:30-17:30). This shows that the junction is forecast to operate well within practical capacity in both the weekday AM and PM peak hours, with maximum RFC forecast to be 0.22 in the PM peak hour in the '2023 Base + Development' scenario.

**Table 6-2: Junction Modelling Results – B4267 Lavernock Road / Fort Road**

Scenario	Arm	AM (07:45-08:45)		PM (16:30-17:30)	
		RFC	Queue (PCUs)	RFC	Queue (PCUs)
2022 Base	Stream B-C	0.01	0	0.02	0
	Stream B-A	0.05	0	0.06	1
	Stream C-AB	0.01	0	0.02	0
2023 Base	Stream B-C	0.01	0	0.02	0
	Stream B-A	0.05	1	0.06	1
	Stream C-AB	0.01	0	0.02	0
2023 Base + Development	Stream B-C	0.08	1	0.14	1
	Stream B-A	0.08	1	0.22	1
	Stream C-AB	0.16	1	0.02	0

*Note: Stream B-C = Flows from Fort Rd to B4267 Lavernock Rd S; Stream B-A = Flows from Fort Rd to B4267 Lavernock Rd N; Stream C-AB = Ahead / Right movements from Lavernock Rd S. Queues are rounded up to the nearest PCU.*

### Proposed Site Access / Fort Road Priority T-Junction

6.3.6 As identified for use in the modelling of the '2023 Base + Development' scenario for the B4267 Lavernock Road / Fort Road junction, the model of the Site Access / Fort Road junction assesses a widened Fort Road, as is necessary to accommodate access to the proposed development access.

- 6.3.7 **Table 6-3** shows the junction capacity modelling results for the Site Access / Fort Road priority T-Junction for the AM (07:45-08:45) and PM peak hours (16:30-17:30). This shows that the junction is forecast to operate well within practical capacity in both the AM and PM peak hours, with maximum RFC forecast to be 0.17 in the PM peak hour in the '2023 Base + Development' scenario.

**Table 6-3: Junction Modelling Results – Site Access / Fort Road**

Scenario	Arm	AM (07:45-08:45)		PM (16:30-17:30)	
		RFC	Queue (PCUs)	RFC	Queue (PCUs)
2023 Base + Development	Stream B-C	0.00	0	0.00	0
	Stream B-A	0.08	1	0.17	1
	Stream C-AB	0.00	0	0.00	0

*Note: Stream B-C = Flows from Site Access to Fort Rd S; Stream B-A = Flows from Site Access to Fort Rd N; Stream C-AB = Ahead / Right movements from Fort Rd S. Queues are rounded up to the nearest PCU.*

## 6.4 Percentage Impact Assessment

- 6.4.1 To understand and quantify the potential impact of the proposed development on the wider highway network, the percentage change in traffic flow at each of the junctions on the study network has been calculated. The following sections outline the results at each junction. The traffic flows are presented in Passenger Car Units (PCUs). The traffic flows are the sum of all arrivals at the arm of the junction.
- 6.4.2 Where appropriate and where details are available, reference has been made to the junction capacity assessments included in the TA for 'Land at Upper Cosmeston Farm' to provide additional context for the likely impact of the proposed development.

### Junction 1: A321 Barry Docks Link Road / A4055 Cardiff Road / B4267 Sully Moors Drive Roundabout

- 6.4.3 The A321 Barry Docks Link Road / A4055 Cardiff Road / B4267 Sully Moors Drive roundabout is a priority roundabout located approximately 3.3km to the west of the site. The percentage change in traffic flows at this location is presented in **Table 6-4**.

**Table 6-4: Junction 1 – Change in Traffic Flows**

Arm	2023 Base		2023 Base + Development		Difference		Percentage Difference	
	AM	PM	AM	PM	AM	PM	AM	PM
A A321 Barry Docks Link Rd	1,041	560	1,080	560	40	0	3.8%	0.0%
B A4055 Cardiff Rd (NE)	794	659	798	659	4	0	0.5%	0.0%
C B4267 Sully Moors Dr	827	585	858	628	31	43	3.8%	7.3%
D A4055 Cardiff Rd (SW)	1,238	917	1,269	917	30	0	2.5%	0.0%
<b>Total</b>	<b>3,900</b>	<b>2,722</b>	<b>4,005</b>	<b>2,764</b>	<b>105</b>	<b>43</b>	<b>2.7%</b>	<b>1.6%</b>

*Notes: 1) All flows are in PCUs.*

*2) Summation errors are due to rounding.*

- 6.4.4 The proposed development is forecast to result in increases in total traffic entering the junction of 2.7% and 1.6% during the AM and PM peak hour respectively. This is not considered to be a significant increase in total traffic. During the AM peak hour, all arms experience an increase of under 5%. During the PM peak hour, there is a sole increase of 7.3% on the B4267 Sully Moors Drive arm which in real terms is an increase of 43 vehicles, or less than an average increase of one vehicle per minute. This is not considered to be material.
- 6.4.5 Overall, this junction is not likely to experience any significant deterioration in performance as a result of the proposed development.

## Junction 2: B4267 Sully Moors Drive / Hayes Road Roundabout

- 6.4.6 The B4267 Sully Moors Drive / Hayes Road roundabout is a priority roundabout located approximately 3km to the southwest of the proposed development.. The percentage change in traffic flows at this location is presented in **Table 6-5**.

**Table 6-5: Junction 2 – Change in Traffic Flows**

Arm	2023 Base		2023 Base + Development		Difference		Percentage Difference	
	AM	PM	AM	PM	AM	PM	AM	PM
A B4267 Sully Moors Drive	729	625	803	625	74	0	10.1%	0.0%
B B4267 South Road	820	745	851	788	31	43	3.8%	5.7%
C Hayes Road	358	292	358	292	0	0	0.0%	0.0%
<b>Total</b>	<b>1,908</b>	<b>1,663</b>	<b>2,013</b>	<b>1,705</b>	<b>105</b>	<b>43</b>	<b>5.5%</b>	<b>2.6%</b>

Notes: 1) All flows are in PCUs.

2) Summation errors are due to rounding.

- 6.4.7 It is noted that this junction was not specifically assessed within the TA for the significantly larger development which is proposed on the neighbouring site. The proposed development is forecast to result in increases in total traffic entering the junction of 5.5% during the AM peak hour and 2.6% during the PM peak hour. During the AM peak hour, all arms experience an increase of less than 5% with the exception of the B4267 Sully Moors Drive arm which shows an increase of 10.1% which in real terms is an increase of 73 vehicles or an average increase of over one vehicle per minute. During the PM peak hour, there is a sole increase of 5.7% on the B4267 South Road arm which in real terms is an increase of 43 vehicles, or less than an average increase of one vehicle per minute which is not considered to be material.

## Junction 3: B3267 Lavernock Road / Cosmeston Lakes Country Park T-Junction

- 6.4.8 The B4267 Lavernock Road / Cosmeston Lakes Country Park access junction is a priority T-junction located approximately 400m to the northeast of the proposed development site. The percentage change in traffic flows at this location is presented in **Table 6-6**.

**Table 6-6: Junction 3 – Change in Traffic Flows**

Arm	2023 Base		2023 Base + Development		Difference		Percentage Difference	
	AM	PM	AM	PM	AM	PM	AM	PM
A B4267 Lavernock Road (W)	1,147	597	1,151	633	4	36	0.3%	6.1%
B Cosmeston Lakes Access	16	23	16	23	0	0	0.0%	0.0%
C B4267 Lavernock Road (E)	749	898	789	898	40	0	5.4%	0.0%
<b>Total</b>	<b>1,912</b>	<b>1,518</b>	<b>1,956</b>	<b>1,554</b>	<b>44</b>	<b>36</b>	<b>2.3%</b>	<b>2.4%</b>

Notes: 1) All flows are in PCUs.

2) Summation errors are due to rounding.



- 6.4.9 It is noted that this junction was not specifically assessed within the TA for the significantly larger development which is proposed on the neighbouring site. The proposed development is forecast to result in increases in total traffic entering the junction of 2.3% during the AM peak hour and 2.4% during the PM peak hour. This is not considered to be a significant increase in total traffic. During the AM peak hour, all arms experience an increase of under 5% with the exception of the B4267 Lavernock Road East arm which shows an increase of 5.4%. In real terms this is an increase of 43 vehicles, equating to an average increase of less than one vehicle per minute which is not considered to be a material impact. During the PM peak hour, there is a sole increase of 6.1% on the B4267 Lavernock Road West arm, which in real terms is an increase of 36 vehicles, or less than an average increase of one vehicle per minute. This is also not considered to be a material impact.
- 6.4.10 It should be noted that during the weekday AM and PM peak hours, the use of the Cosmeston Lakes Country Park access is likely to be very low as this access is mostly utilised outside of peak hours including during the evenings. The predominant use is during weekends when the traffic generation of the proposed development will be minimal.
- 6.4.11 Overall, this junction is unlikely to experience any significant impact in performance as a result of the proposed development.

## Junction 4: B3267 Lavernock Road / Cosmeston Drive T-Junction

- 6.4.12 The B4267 Lavernock Road / Cosmeston Drive junction is a priority T-junction located approximately 450m to the northeast of the proposed development site. The percentage change in traffic flows at this location is presented in **Table 6-7**.

**Table 6-7: Junction 4 – Change in Traffic Flows**

Arm	2023 Base		2023 Base + Development		Difference		Percentage Difference	
	AM	PM	AM	PM	AM	PM	AM	PM
A B4267 Lavernock Road (N)	749	1,027	787	1,027	39	0	5.2%	0.0%
B Cosmeston Drive	145	45	147	45	1	0	1.0%	0.0%
C B4267 Lavernock Road (S)	1,121	609	1,125	646	4	36	0.3%	6.0%
<b>Total</b>	<b>2,015</b>	<b>1,682</b>	<b>2,059</b>	<b>1,718</b>	<b>44</b>	<b>36</b>	<b>2.2%</b>	<b>2.2%</b>

Notes: 1) All flows are in PCUs.

2) Summation errors are due to rounding.

- 6.4.13 The proposed development is forecast to result in increases in total traffic entering the junction of 2.2% during the AM and PM peak hours. This is not considered to be a significant increase in total traffic. During the AM peak hour, all arms experience an increase of under 5% with the exception of the B4267 Lavernock Road North arm which shows an increase of 5.2%. During the PM peak hour, there is a sole increase of 6.0% on the B4267 Lavernock Road South arm. The real increase in traffic is 44 and 36 vehicles respectively which equate to an average impact of less than one additional vehicle per minute which is not considered to be a material impact.
- 6.4.14 Overall, this junction is unlikely to experience any significant deterioration in performance as a result of the proposed development.

## Junction 5: B3267 Lavernock Road / Westbourne Road T-Junction

- 6.4.15 The B4267 Lavernock Road / Westbourne Road junction is a priority T-junction located approximately 1km to the northeast of the proposed development site. The percentage change in traffic flows at this location is presented in **Table 6-8**.

**Table 6-8: Junction 5 – Change in Traffic Flows**

Arm	2023 Base		2023 Base + Development		Difference		Percentage Difference	
	AM	PM	AM	PM	AM	PM	AM	PM
A B4267 Lavernock Road (N)	467	565	494	565	27	0	5.9%	0.0%
B Westbourne Road	308	542	320	542	11	0	3.7%	0.0%
C B4267 Lavernock Road (S)	1,285	784	1,289	819	4	35	0.3%	4.4%
<b>Total</b>	<b>2,060</b>	<b>1,891</b>	<b>2,103</b>	<b>1,926</b>	<b>43</b>	<b>35</b>	<b>2.1%</b>	<b>1.8%</b>

Notes: 1) All flows are in PCUs.

2) Summation errors are due to rounding.

6.4.16 The proposed development is forecast to result in increases in total traffic entering the junction of 2.1% during the AM peak hour and 1.8% during the PM peak hour. This is not considered to be a significant increase in traffic. During the AM peak hour, all arms experience an increase of under 5% with the exception of the B4267 Lavernock Road North arm which experiences an increase of 5.9%. In real terms this is an increase of 27 vehicles, equating to an average increase of less than one vehicle every two minutes which is not considered to be a material impact. During the PM peak hour, all arms experience an increase of under 5%.

6.4.17 Overall, this junction is unlikely to experience any significant deterioration in performance as a result of the proposed development.

## Junction 6: B3267 Lavernock Road / Castle Avenue / Augusta Road Crossroads

6.4.18 The B3267 Lavernock Road / Castle Avenue / Augusta Road junction is a priority crossroads located approximately 1.3km to the northeast of the proposed development site. The percentage change in traffic flows at this location is presented in **Table 6-9**.

**Table 6-9: Junction 6 – Change in Traffic Flows**

Arm	2023 Base		2023 Base + Development		Difference		Percentage Difference	
	AM	PM	AM	PM	AM	PM	AM	PM
A B4267 Lavernock Road (N)	448	434	474	434	27	0	5.9%	0.0%
B Augusta Road	64	73	64	73	0	0	0.0%	0.0%
C B4267 Lavernock Road (S)	670	431	672	456	2	25	0.3%	5.9%
D Castle Avenue	115	63	116	63	1	0	0.6%	0.0%
<b>Total</b>	<b>1,297</b>	<b>1,000</b>	<b>1,326</b>	<b>1,026</b>	<b>29</b>	<b>25</b>	<b>2.3%</b>	<b>2.5%</b>

Notes: 1) All flows are in PCUs.

2) Summation errors are due to rounding.

6.4.19 The proposed development is forecast to result in increases in total traffic entering the junction of 2.3% during the AM peak hour and 2.5% during the PM peak hour. This is not considered to be a significant increase in traffic. During the AM peak hour, all arms experience an increase of under 5% with the exception of the B4267 Lavernock Road North arm which experiences an increase of 5.9%. During the PM peak hour, there is a sole increase of 5.9% on the B4267 Lavernock Road South arm. In real terms is an increase of 29 and 25 vehicles respectively which equates to an average increase of one vehicle every two minutes during each period. This is also not considered to be a material impact.

6.4.20 Overall, this junction is unlikely to experience any significant deterioration in performance as a result of the proposed development.

## Junction 7: B3267 Lavernock Road / Dinas Road / Victoria Road Signalised Junction

6.4.21 The B3267 Lavernock Road / Dinas Road / Victoria Road junction is a signal-controlled crossroad junction located approximately 1.8km to the northeast of the proposed development site. The percentage change in traffic flows at this location is presented in **Table 6-10**.

**Table 6-10: Junction 7 – Change in Traffic Flows**

Arm	2023 Base		2023 Base + Development		Difference		Percentage Difference	
	AM	PM	AM	PM	AM	PM	AM	PM
A B4267 Lavernock Road (N)	365	632	390	632	24	0	6.6%	0.0%
B Victoria Road	178	72	178	72	0	0	0.2%	0.0%
C B4267 Lavernock Road (S)	581	428	583	452	2	25	0.3%	5.8%
D Dinas Road	377	74	380	74	2	0	0.6%	0.0%
<b>Total</b>	<b>1,502</b>	<b>1,206</b>	<b>1,530</b>	<b>1,230</b>	<b>29</b>	<b>25</b>	<b>1.9%</b>	<b>2.0%</b>

Notes: 1) All flows are in PCUs.

2) Summation errors are due to rounding.

6.4.22 The proposed development is forecast to result in increases in total traffic entering the junction of 1.9% during the AM peak hour and 2.0% during the PM peak hour when considering the increase in traffic across the junction as a whole. This is not considered to be a significant increase in traffic. During the AM peak hour, all arms experience an increase of under 5% with the exception of the B4267 Lavernock Road North arm which experiences an increase of 6.6%. During the PM peak hour, there is a sole increase of 5.8% on the B4267 Lavernock Road South arm. In real terms is an increase of 29 and 25 vehicles respectively which equates to an average increase of one vehicle every two minutes during each period. This is also not considered to be a material impact.

6.4.23 Overall, this junction is unlikely to experience any noticeable impact on performance as a result of the proposed development.

## Junction 8: B3267 Lavernock Road / Land at Upper Cosmeston Farm Southern Access

6.4.24 The B4267 Lavernock Road / Land at Upper Cosmeston Farm southern access junction is a proposed priority T-junction which will be located approximately 100m northeast of the proposed development site. The percentage change in traffic flows at this location is presented in **Table 6-11**.

**Table 6-11: Junction 8 – Change in Traffic Flows**

Arm	2023 Base		2023 Base + Development		Difference		Percentage Difference	
	AM	PM	AM	PM	AM	PM	AM	PM
A B4267 Lavernock Road (N)	711	804	751	804	40	0	5.7%	0.0%
B Westbourne Road	98	27	98	27	0	0	0.0%	0.0%
C B4267 Lavernock Road (S)	972	551	976	587	4	36	0.4%	6.6%
<b>Total</b>	<b>1,781</b>	<b>1,382</b>	<b>1,825</b>	<b>1,418</b>	<b>44</b>	<b>36</b>	<b>2.5%</b>	<b>2.6%</b>

Notes: 1) All flows are in PCUs.

2) Summation errors are due to rounding.

- 6.4.25 The proposed development is forecast to result in increases in total traffic entering the junction of 2.48% during the AM peak hour and 2.62% during the PM peak hour when considering the increase in traffic across the junction as a whole. This is not considered to be a significant increase in traffic. During the AM peak hour, all arms experience an increase of under 5% with the exception of the B4267 Lavernock Road North arm which shows an increase of 5.7%. During the PM peak hour, there is a sole increase of 6.6% on the B4267 Lavernock Road South arm. In real terms, these increases are of 40 and 36 vehicles respectively, which equates to an average increase of less than one vehicle per minute during each peak hour. This is not considered to be material.
- 6.4.26 The results of the junction capacity modelling in the TA for 'Land at Upper Cosmeston Farm' have been reviewed for this junction (as shown in Table 7.3 of the corresponding TA). The results of the '2025 Future Year Assessment' show that the junction will operate well within capacity with a maximum RFC of 0.34 during the AM peak hour and 0.42 during the PM peak hour. The addition of the proposed development traffic (44 and 36 vehicle movements during the AM and PM peak hour respectively) is unlikely to result in a material change in the capacity position of this junction.
- 6.4.27 Overall, the proposed development is unlikely to result in any material impact on junction performance.

## Junction 9: B3267 Lavernock Road / Land at Upper Cosmeston Farm Northern Access

- 6.4.28 The B4267 Lavernock Road / Land at Upper Cosmeston Farm northern access junction is a proposed priority T-junction which will be located approximately 200m northeast of the proposed development site. The percentage change in traffic flows at this location is presented in **Table 6-12**.

**Table 6-12: Junction 9 – Change in Traffic Flows**

Arm	2023 Base		2023 Base + Development		Difference		Percentage Difference	
	AM	PM	AM	PM	AM	PM	AM	PM
A B4267 Lavernock Road (N)	626	838	666	838	40	0	6.4%	0.0%
B Westbourne Road	155	66	155	66	0	0	0.0%	0.0%
C B4267 Lavernock Road (S)	1,031	568	1,035	604	4	36	0.4%	6.4%
<b>Total</b>	<b>1,812</b>	<b>1,472</b>	<b>1,856</b>	<b>1,508</b>	<b>44</b>	<b>36</b>	<b>2.4%</b>	<b>2.5%</b>

Notes: 1) All flows are in PCUs.

2) Summation errors are due to rounding.

- 6.4.29 The proposed development is forecast to result in an increase in total traffic entering the junction of 2.4% during the AM peak hour and 2.5% during the PM peak hour. This is not considered to be a significant increase in traffic. During the AM peak hour, all arms experience an increase of under 5% with the exception of the B4267 Lavernock Road North arm which shows an increase of 6.4%. During the PM peak hour, there is a sole increase of 6.4% on the B4267 Lavernock Road South arm. In real terms, these increases are of 40 and 36 vehicles respectively, which equates to an average increase of less than one vehicle per minute during each peak hour. This is not considered to be material.
- 6.4.30 The results of the junction capacity modelling in the TA for 'Land at Upper Cosmeston Farm' have been reviewed for this junction (as shown in Table 7.2 of the corresponding TA). The results of the '2025 Future Year Assessment' show that the junction will operate well within capacity with a maximum RFC of 0.18 during the AM peak hour and 0.07 during the PM peak hour. The addition of the proposed development traffic (44 and 36 vehicle movements during the AM and PM peak hour respectively) is unlikely to result in a material change in the capacity position of this junction.
- 6.4.31 Overall, the proposed development is unlikely to result in any significant deterioration in junction performance.

## 6.5 School Departure Period Analysis

- 6.5.1 In accordance with the proposed school timetable, pupil departures are assumed to occur during the hour commencing 15:00hrs which is outside of the network PM peak hour. Consideration has been made as to the likely impact of development traffic during this period.
- 6.5.2 As outlined in **Table 5-3**, there is forecast to be a total of 66 two-way movements to / from the west of the development site and 8 two-way movements to / from the east of the site. In both directions, this is lower than the staff departure assignment considered for the network PM peak hour assessment (16:30-17:30). Background traffic will be lower during the pupil departure period than assessed in the PM peak hour. It is therefore reasonable to conclude that the level of development impact during the period 15:00-16:00hrs will be well within those reported for the PM peak hour; which, as outlined above, has been demonstrated to be low and unlikely to result in a material worsening of junction or highway operation.
- 6.5.3 A traffic flow diagram illustrating pupil departure trips during the period 15:00-16:00hrs has been included at **Appendix E**.

## 6.6 Summary

- 6.6.1 Traffic surveys were conducted by a third party specialist on behalf of AECOM on Thursday 17<sup>th</sup> March 2022 to provide existing turning movements at the priority T-Junction between the B4267 Lavernock Road and Fort Road, which provides access to the proposed development. These flows have been used to form the basis of a '2022 Base' scenario.
- 6.6.2 2019 traffic flows have been obtained from the publicly-available information in the TA for 'Land at Upper Cosmeston Farm'. These flows were 'growthed' to 2019 within that submission from traffic surveys undertaken in November 2018. The 2019 traffic flows have been 'growthed' to 2022 and 2023 using a growth forecast which includes TEMPro growth factors as well as the manual application of traffic flows from local developments. The local developments considered include the adjacent 'Land at Upper Cosmeston Farm' application which, although not yet granted planning consent, is an allocated development site in the VoG Local Development Plan. The TEMPro growth factors have been locally adjusted for 'All' road types within the 'Vale of Glamorgan 008' MSOA. The factors have also had alternative assumptions applied to remove the housing growth accounted for through the manual application of local development flows. This avoids double counting growth on the network and provides for a more accurate assessment method.
- 6.6.3 The application of the growth forecast to the 2019 traffic flows generates the '2022 Base' and '2023 Base' scenarios. The opening year of the proposed development is 2023. The application of the assigned pupil and staff development traffic to the '2023 Base' scenario generates the '2023 Base + Development' scenario.
- 6.6.4 Junction capacity modelling has been carried out for the proposed site access junction with Fort Road and the existing junction of Fort Road with the B4267 Lavernock Road, in order to demonstrate that the proposed design can successfully accommodate peak hour development traffic demand without undue impact on the existing highway network. The junction modelling assessment has been undertaken using the industry-standard software package 'Junctions 9'. Both junctions are forecast to operate well within practical capacity in both the weekday AM and PM peak hours in all assessment scenarios.
- 6.6.5 The impact of the proposed development on the wider highway network has been examined in terms of the percentage changes in traffic flows at each junction (in terms of both total flows and by individual arm) within the study area for the network AM and PM peak hour periods. The AM peak hour includes both pupil and staff arrival trips to the development site. The PM peak hour includes only staff departures as pupils are assumed to depart from the site earlier in the day in accordance with the proposed school timetable. Analysis of the results demonstrate that, the increase in traffic as a result of the proposed development is unlikely to result in a material deterioration in junction performance, with the increase equating to less than one additional vehicle movement per minute. The development traffic impact during the pupil departure period has been confirmed to be less than that assessed for the PM peak hour as the number of pupil trips is lower than staff trips and background traffic is lower outside of the PM peak hour.

- 6.6.6 Overall, the proposed development is not considered to result in a significant impact on the surrounding highway network.

# 7. Transport Implementation Strategy

## 7.1 Introduction

- 7.1.1 TAN 18 requires any TA document to provide the information necessary to assess the suitability of an application in travel demand and traffic impact terms. It recommends that a TIS should be included within the TA. The TIS is intended to set objectives and targets in managing travel demand, whilst detailing the infrastructure and measures necessary to achieve them. The TIS should also set up a framework for monitoring the targets including modal travel choice.
- 7.1.2 A TIS shares many of the same goals as a TP; therefore, the modal information, targets and measures set out in this chapter will inform the TP which will be conditioned as part of the planning application.
- 7.1.3 Owing to the specific nature of the proposed development as a SEN school, there is limited opportunity to promote a mode shift to sustainable modes of travel amongst the pupil population of the site, and the needs of these pupils must come first. Whilst the opportunities for pupils to travel to / from school by walking and cycling will be a possibility for those residing close to the campus, this is likely to be a small proportion of pupils. Public transport use will also likely be limited, although it should be acknowledged that the majority of pupils are expected to travel as a passenger in a multi-modal vehicle. As such, the TP will focus primarily on the campus as a workplace and seek to encourage sustainable travel amongst staff members. Staff travel makes up the majority of trips to / from the development site during the AM and PM peak hours.

## 7.2 Mode Share and Targets

- 7.2.1 Mode share targets are used to evaluate the success of the TIS and to identify areas on which further measures should be focused in order to help to drive travel behaviour change. To enable the setting of valid and realistic targets, a valid baseline first needs to be established.
- 7.2.2 **Table 5-2** sets out the forecast mode share of the staff based at the proposed development. This has been determined from 2011 census data using respondents who work in the 'Vale of Glamorgan 004' MSOA. This shows that 77% of staff are forecast to travel as a driver of a car / van, 7% as a passenger in a car / van, 8% on foot, 5% via public transport (including rail), 1% via bicycle and 1% via motorcycle.
- 7.2.3 This mode share does not consider any site-specific measures to reduce journey to / from the school via car modes and is therefore considered to be a robust case for car travel to / from the site. It should also be noted that the 'Vale of Glamorgan 004' MSOA was chosen over the 'Vale of Glamorgan 008' MSOA, the location of the proposed development, for the purposes of a robust assessment owing to the higher car-based mode share provided.
- 7.2.4 It is envisioned that the TP will be secured as a Planning Condition and will be required to be in place when the school is fully operational, it is appropriate to set targets based on the forecast mode share for that time. The target will be to reduce the 'car' mode share by 6% for staff over five years, consistent with the DfT report *Smarter choices: Changing the way we travel* (2004). Following a baseline travel survey these targets can be confirmed or adjusted as appropriate, during the drafting of the TP and following 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 required will be subject to agreement with the VoG as the LHA. A minimum response rate to the travel surveys will be required to be set and agreed to ensure that the data is representative.
- 7.3.2 The format of 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 for travel choice and potential measures to encourage consideration of alternatives. For staff, it is envisaged that the surveys will be primarily online-based, but paper copies will also be made available to staff should they prefer. The arrangements for the survey of pupil trips to / from the site will also need to be agreed with the VoG.



- 7.3.3 The results of the baseline travel surveys will be analysed and the factors influencing travel behaviour will be investigated. It will then be necessary for the TPC to review and update the respective TP to include additional details and the need for any other measures not already included that require further investigation. Specific objectives and targets will need to be identified, separated into short/medium/long term targets, and will need to be SMART (Specific, Measurable, Achievable, Realistic, and Timed). Specific actions and measures to encourage sustainable modes of travel will be identified. For the on-going management of the TP to be successful and to deliver the desired outcomes, it is important that the parties involved in the delivery of the TP, which means the TPC, and the VoG, work effectively in partnership to achieve the desired results.
- 7.3.4 Monitoring of the TP will be required for a five-year period from the date of the baseline travel surveys. They will be undertaken at intervals of one, three and five years after the date (or close to the date) of the baseline travel surveys. The TPC will aim to coordinate the baseline travel surveys and subsequent monitoring surveys to ensure consistency between the collection of data for the TP. Surveys will avoid sustained periods of inclement weather or when there is significant disruption to the local road or public transport network.
- 7.3.5 A monitoring report will be prepared by the TPC for each monitoring survey. These will identify the results of the surveys and success of the measures implemented in achieving the targets. The reports will be submitted to the VoG for comment. If the targets are not met, then it will be necessary to review what remedial measures need to be implemented to mitigate the impact of any under achievement.

## 7.4 Travel Plan Measures and Interventions

- 7.4.1 In order to achieve the reduction in single occupancy car use and encourage a modal shift to more sustainable forms of travel, a number of TP measures will be implemented.
- 7.4.2 It is envisioned that the TP will be secured as a Planning Condition and will be produced ready for full occupancy of the new school development. A TPC will be appointed who will be responsible in ensuring the success of the TP and its targets and objectives. The TP will contain a range of measures additional to those that will be provided as part of the development to enhance the attractiveness of sustainable travel and to encourage the use of the walking, cycling and public transport infrastructure. Additional measures include:
- Newsletters to staff members;
  - Noticeboards within the staff / visitor areas advertising sustainable transport information; and
  - Promotion of national sustainable transport initiatives such as national walk to school day and bike to school week, etc.
- 7.4.3 As discussed, it is unlikely that significant mode shift measures can be implemented successfully amongst the pupils at the proposed development. Where possible, the TPC will work alongside staff to identify what additional measures could be implemented. Where appropriate, 'travel training' will be provided to SEN pupils.

## 7.5 Physical Measures and Interventions

- 7.5.1 Physical measures will be implemented to encourage journeys to / from the school site using sustainable transport modes and to ensure that safe and secure access can be provided for non-motorised users. Whilst the masterplan is still illustrative and will be refined as appropriate at the reserved matters stage, the following measures, which are summarised in the following sub-sections, will be implemented.

### On-Site Measures

- 7.5.2 It is proposed that people of 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. Internal footways will be aligned to suit desire lines and entry points and internal access roads which require crossing will include dropped kerbs, tactile paving and on-carriageway markings as appropriate. The focus will also be on the easy and direct transition to and from transport mode and the school.



- 7.5.3 A dedicated pedestrian and cycle access will be provided from the proposed active travel route along the B4267. This will provide safe and secure access to the curtilage of the new school building. No other pedestrian accesses are to be provided so as to create a secure boundary around the school site.
- 7.5.4 Cycle parking will be provided in accordance with parking standards. This will be detailed further at the reserved matters stage.

## 7.6 Summary

- 7.6.1 Targets have been set for the reduction of private car use and a commitment to a TP and monitoring programme has been made. The measures that will be implemented as part of the development proposals have been outlined to help to achieve the targets and objectives set. This will include the implementation of an appropriate internal circulation system for school traffic which will reduce the conflicts between traffic and between traffic and pedestrians, pick-up and drop-off areas in recognition of the specialist facility, and cycle parking in close proximity to the school access.
- 7.6.2 There is limited opportunity to promote a mode shift to sustainable modes of travel amongst the pupil population of the site, and the needs of these pupils must come first. Whilst the opportunities for pupils to travel to / from school by walking and cycling will be a possibility for those residing close to the campus, this is likely to be a small proportion of pupils.
- 7.6.3 TP measures will add another layer of interventions once the TP is established. This will continue to promote and encourage the range of facilities available and improve awareness or provision wherever possible.

# 8. Summary and Conclusions

## 8.1 Summary

- 8.1.1 This TA has been prepared by AECOM on behalf of the VoG Education Department in respect of proposals for a second campus for the YYD SEN School, to be located on land south of the B4267 near Cosmeston.
- 8.1.2 The development proposals are for the construction of a new and additional campus for YYD. This will be operated by the same senior management team at the existing facility and for the purpose of these outline proposals is known as 'YYD2'. The school will comprise of 150 pupil places which will be filled with pupils who are currently in YYD and allow some future expansion. An illustrative masterplan has been prepared to set out the general strategy for the proposed development, which will be detailed further at the reserved matters stage.
- 8.1.3 The site is located on a bus route with nearby stops available and adjacent a wide footway network that could see upgrade to a shared pedestrian and cyclist active travel route. It is acknowledged that a small proportion of the future pupils and staff based at the site will reside within these areas and are likely to come from a wider county area in accordance with the YYD catchment area. Furthermore, it is acknowledged that the special requirements of future pupils may limit the number of pupils who would be permitted under a duty of care or indeed be able to walk / cycle to the site unaccompanied. Notwithstanding this, significant opportunities for sustainable travel have been identified and could be taken up by other users such as staff and visitors.
- 8.1.4 The analysis of the PIC data has not identified any existing highway safety issues that could be exacerbated by the proposed development.
- 8.1.5 Vehicle access to the proposed development will be via a new priority T-junction onto Fort Road. An indicative junction arrangement is shown for information purposes in the masterplan. Junction geometric parameters will be confirmed at the detailed design stage. A reduction from the national speed limit of 60mph to 30mph will be introduced on Fort Road along the site frontage, as necessary to encompass the proposed access and associated visibility splays.
- 8.1.6 A dedicated pedestrian and cycle access will be provided directly from the existing footway / cycleway on the B4267. This will provide a segregated route to the school entrances. As part of the access proposals for 'Land at Upper Cosmeston Farm', the existing shared footway / cycleway on the B4267 is to be widened between the junctions with Upper Cosmeston Farm and Fort Road. The pedestrian and cycle access to the proposed development will directly connect with the widened shared footway / cycleway. Internal layout areas outside the school entrances will link to the drop-off / pick-up and car parking areas, with provision of suitable crossing facilities and waiting areas.
- 8.1.7 The indicative masterplan presented within this report demonstrated that appropriate access, internal circulation for all modes can be achieved and that a pick up and set down area and adequate car, motorcycle and cycle parking can be provided. SPA of the internal arrangements has been undertaken for a range of robust vehicle types, all of which are predicted to serve the proposed development. The analysis has demonstrated that the proposals are safe and adequate.
- 8.1.8 Construction impacts of the new school facility will be managed by a CTMP which will outline measures intended to protect the environment, amenity and safety of local residents, businesses, the general public and the surroundings in the vicinity of the proposed development.
- 8.1.9 The site lies immediately south of land that is allocated for development under the adopted VoG LDP (Reference: MG2 (24)). An OPA for 576 dwellings and a primary school on the land ('Land at Upper Cosmeston Farm') was submitted in October 2020 and is currently under consideration (Reference: 2020/01170/OUT). AECOM has examined the documents submitted as part of that OPA and has made appropriate reference / consideration to its proposals and associated assessments in developing the proposals for this site and identifying a scope and methodology for the TA that is appropriate to the scale of the development proposed on this site.

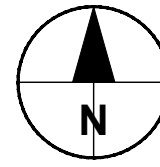
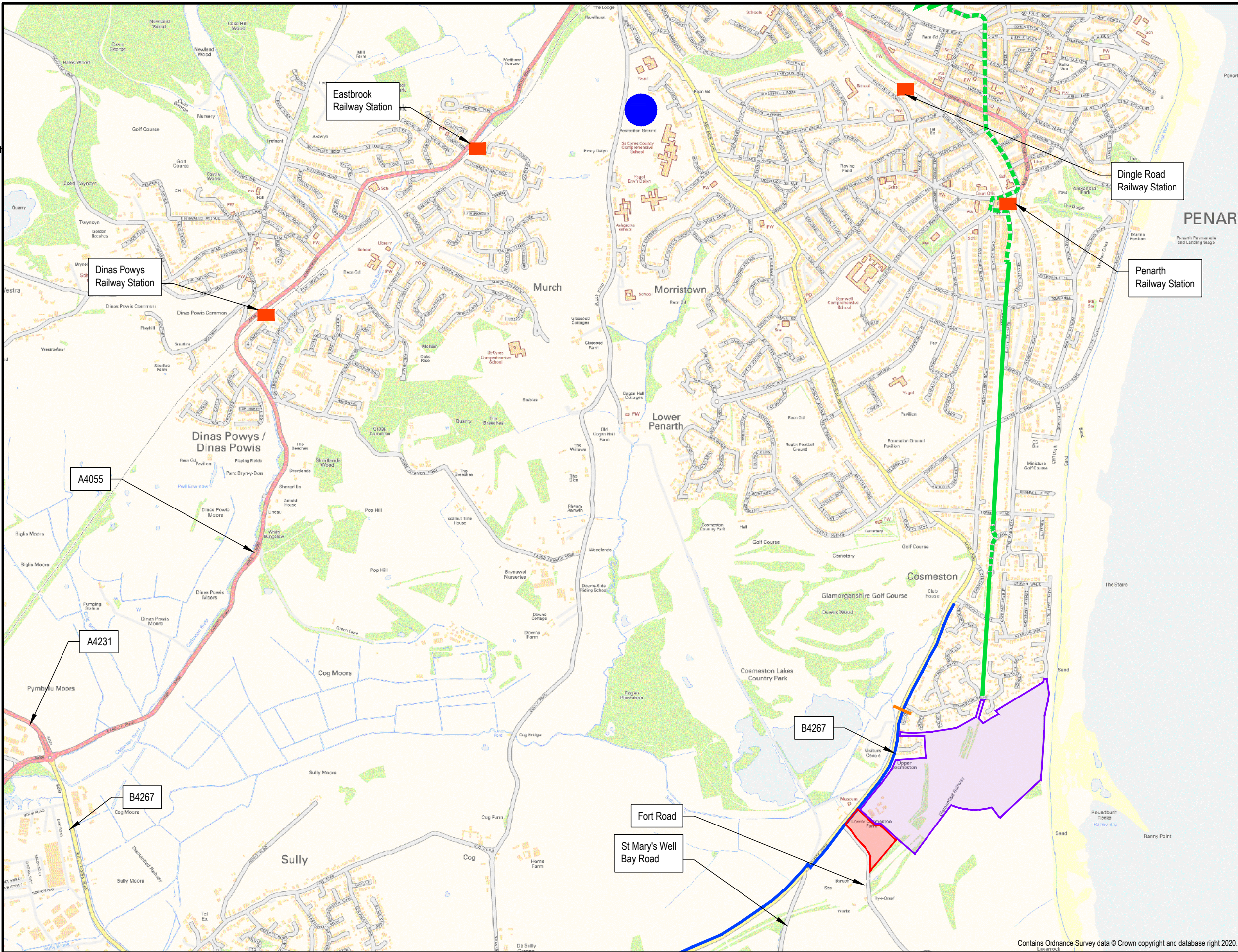
- 8.1.10 The proposed development layout and this Transport Assessment have been informed by collaborative consultation between the VoG Education Department and the LHA. AECOM has also undertaken scoping discussions with the LHA and presented a TA to the LHA as part of the PAC submission. The LHA's comments on the PAC submission comments primarily focused on matters relating to vehicular access, parking provision, traffic data and active travel; these have been referenced and addressed as appropriate within this submission.
- 8.1.11 The traffic analysis has employed robust assumptions using census data to determine forecast modal travel information. The mode share calculates that 80 staff will travel to / from the school by car, equating to 80 vehicle trips during the AM and PM peak hours.
- 8.1.12 Pupil and staff traffic has been distributed and assigned onto the local highway network using home postcode data of existing staff / pupils. The proposed development is forecast to generate 154 two-way movements during the AM peak hour, of which 110 two-way trips will be to / from the west of the site and 44 two-way movements to / from the east of the site. During the PM peak hour, the proposed development will generate 80 trips associated with staff departures from the site.
- 8.1.13 Junction capacity modelling has been carried out for the proposed site access junction with Fort Road and the existing junction of Fort Road with the B4267 Lavernock Road, in order to demonstrate that the proposed design can successfully accommodate peak hour development traffic demand without undue impact on the existing highway network. The junction modelling assessment has been undertaken using the industry-standard software package 'Junctions 9'. Both junctions are forecast to operate well within practical capacity in both the AM and PM peak hours in all assessment scenarios.
- 8.1.14 The impact of the proposed development on the wider highway network has also been examined in terms of the percentage changes in traffic flows at each junction (in terms of both total flows and by individual arm) within the study area for the network AM and PM peak hour periods. Analysis of the results demonstrate that, the increase in traffic as a result of the proposed development is unlikely to result in a material deterioration in junction performance, with the increase equating to less than one additional vehicle movement per minute. The development traffic impact during the pupil departure period has been confirmed to be less than that assessed for the PM peak hour as the number of pupil trips is lower than staff trips and background traffic is lower outside of the PM peak hour.
- 8.1.15 Overall, the proposed development is not considered to result in any significant impact on the surrounding highway network.
- 8.1.16 Targets have been set for the reduction of private car use and a commitment to a TP and monitoring programme has been made. The measures that will be implemented as part of the development proposals have been outlined to help to achieve the targets and objectives set. This will include the implementation of an appropriate internal circulation system for school traffic which will reduce the conflicts between traffic and pedestrians, pick-up and drop-off areas in recognition of the specialist facility, and cycle parking in close proximity to the school access.
- 8.1.17 TP measures will add another layer of interventions once the TP is established. This will continue to promote and encourage the range of facilities available and improve awareness or provision wherever possible.

## 8.2 Conclusions

- 8.2.1 The proposed development will comply with the national and local policy and guidance, with access to the site being safe and suitable for all users. The site is accessible via a range of sustainable modes which will be further encouraged via a number of improvements. In summary, the proposals comply with national and local policies.
- 8.2.2 In transport planning terms, the application has submitted an appropriate amount of detail for consideration an outline planning application.
- 8.2.3 Further to the findings of this TA, it can be concluded that there would be no transport planning reasons why the proposed development should not be granted planning permission.

## Figures





### Legend

- Development Site Boundary
- Existing YYD Campus
- 'Land at Upper Cosmeston Farm' Residential Development
- Railway Stations
- National Cycle Route (Off-Carriageway)
- National Cycle Route (On-Carriageway)
- Shared Cycle / Footway
- Signalised Crossing

### Notes:

- 1) Figure not to scale.

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# Ysgol Y Deri Expansion

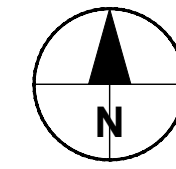
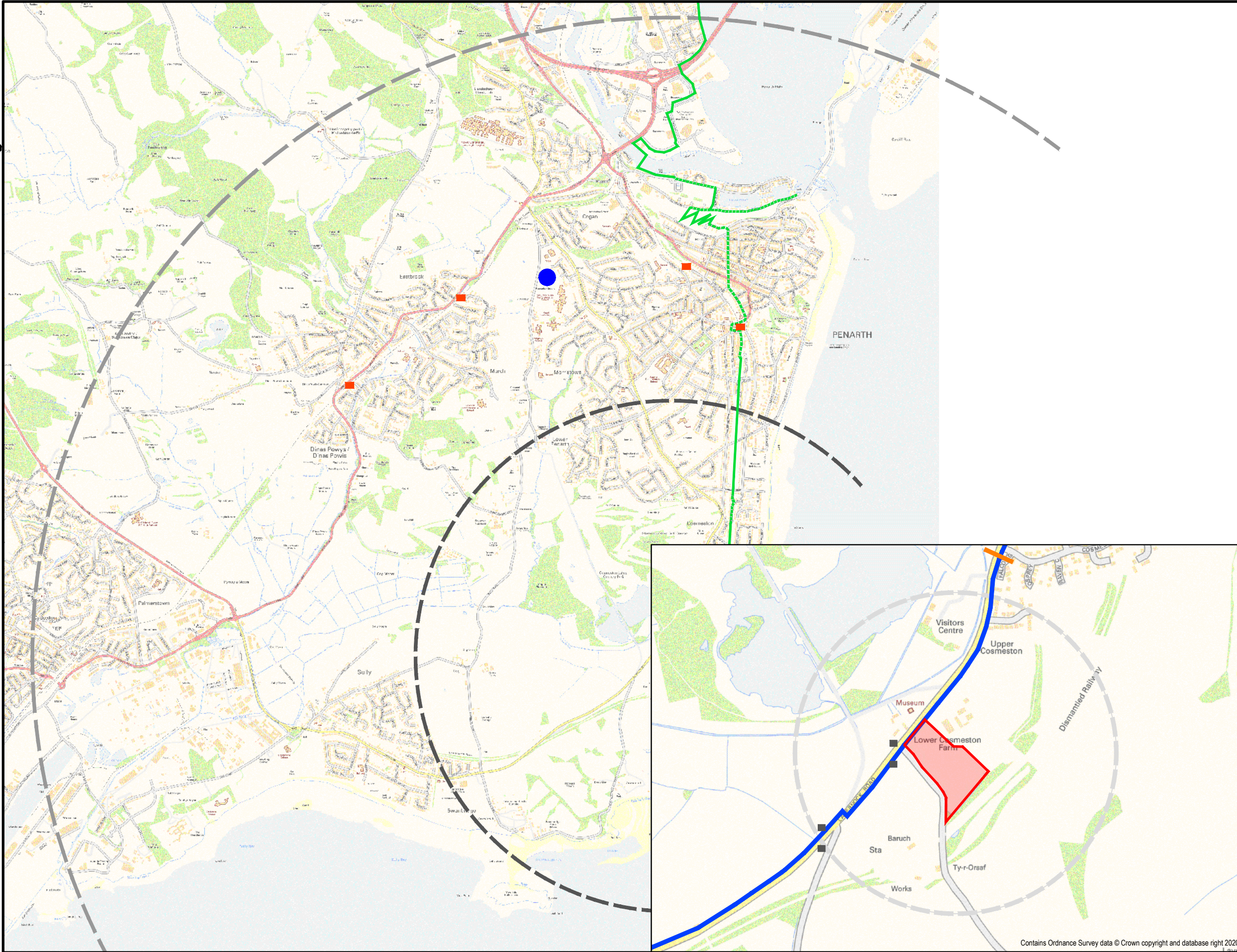
Transport Assessment

Figure 2-1: Site Location and Local Context



60629450





### Legend

- Development Site Boundary
- Existing YYD Campus
- Railway Stations
- National Cycle Route (Off-Carriageway)
- National Cycle Route (On-Carriageway)
- Shared Cycle / Footway
- Signalised Crossing
- Indicative 400m Walking Distance
- Indicative 2km Walking Distance
- Indicative 5km Cycling Distance

### Notes:

- 1) Figure not to scale.

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# Ysgol Y Deri Expansion

Transport Assessment

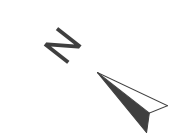
Figure 2-3: Indicative Walking and Cycling Catchment





## Appendix A – Illustrative Masterplan





**Notes**  
 Check all dimensions on site. Do not scale from this drawing.  
 Report any discrepancies and omissions to HLM Architects.  
 This Drawing is Copyright ©

- Soft Landscaping Strategy**
- Designed to connect the proposed school with the surrounding context, creating a cohesive landscape character within the site, which will aid the biodiversity of the site and define a range of external spaces for all
  - Planting provides seasonal and sensory diversity with chosen species providing visual interest, through form, colour, texture and movement.
  - We will review the use of planting to subdivide areas of surfacing. Existing trees and hedgerow will be retained as much as possible with further enhancements proposed to enhance wildlife such as birds, bees and insects
  - Soft landscaping will provide the school with opportunities to play, explore, and study as well as further enhance the biodiversity of the site, the areas will include:
    - Areas to socialise and dine
    - Place for relaxation and calm with seating and shelter from the elements
    - Habitat areas created using natural materials such as logs, boulders and landform
    - A safe, accessible, and stimulating environment with fencing where appropriate with a high-quality attention to design and material choice

- Porous block paving**  
to car park
- Pedestrian Resin Bound Gravel**
- Feature Flag Paving**
- Porous Macadam**  
Colour: To be confirmed  
To MUGA
- Pedestrian grade macadam**  
with possible MEWP access
- Playground Safety Rubber Mat**  
Colour: To be confirmed
- Artificial pitch**  
Artificial grass
- Concrete Base**  
To bin store and sprinkler tank.  
Note that bin store will have a central gully.  
With bin store with capacity for 10no. 660L bins
- Retaining wall with guardrail**  
Indicative only. Extent to be confirmed

- SOFT LANDSCAPE**
- Existing Hedge**  
To be protected and retained. Areas that are removed are to be translocated to a suitable location within the site as advised by ecologist.
  - Area allocated for translocated hedge species**  
Area allocated along Laverock Road
  - Existing Tree**  
Retained
  - Proposed Trees**
  - Proposed Shrub planting**
  - Proposed Rain Gardens**  
Ornamental Shrub Planting
  - Proposed Grass**  
General amenity mix. Existing grass to be made good where necessary with this mix too.
  - Proposed Meadow Mix**  
For ecological benefit.
  - Proposed Planting to Raised Beds in Horticulture Area**  
To be planted by school students

- SITE FURNITURE**
- Fixed Seating**  
With back & arm rest
  - Pergola**  
Timber pergola
  - Cycle Shelter**  
with green roof. Cycle and scooter storage underneath.
  - Raised Planters**  
Timber planters. A number to have wheelchair accessible design.
  - Storage shed**  
A large metal shed, with security features to keep all playground equipment locked away safely
  - Play equipment**  
A range of play equipment to be provided across all play areas. Exact type to be confirmed with school.
  - Thermoplastic playground markings**  
A range of playground linemarkings in various colours to be provided across all play areas. Indicative graphics indicated only.
  - Canopy / shelter**  
Anticlimb design

P07	ISSUED FOR PLANNING	24.03.2022	SL	IB
P06	ISSUED FOR STAGE 3 REPORT	10.03.2022	IB	HLM
P05	Updated with new road layout and FFL +15.800	03.03.2022	IB	HLM
P04	Issued for Client engagement meeting	10.02.2022	IB	HLM
P03	Issued for Stage 2 Report	13.01.2022	SL	IB
P02	Tender Submission	21.10.2021	AMS	GW
P01	Preliminary Issue for Comment	07.10.2021	AMS	GW
Rev	Description	Date	By	Chk
Revisions				Suitability
Project				S4

**15-1077-01**  
**Ysgol Y Deri -**  
**Primary School**

Client

**Vale of Glamorgan Council**

**VALE of GLAMORGAN**  
**BRO MORGANNWG**

**Proposed Site Layout -**  
**Facing Fort Road**

Drawing No. **YYDE-HLM-00-00-DR-L-00005** P07

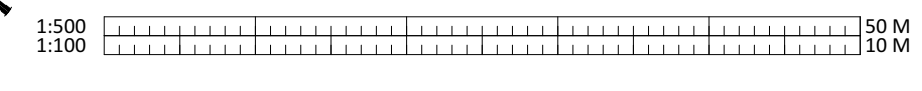
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## **Appendix B – Pre-Application Consultation with Local Highway Authority**

## ***Transport Assessment Scoping Note***

Project:	<b>Ysgol Y Deri, Cosmeston</b>	Job No:	<b>60629450</b>
Subject:	<b>Transport Assessment Scoping Note</b>		
Prepared by:	<b>Matthew Parker (Consultant)</b>	Date:	<b>11/11/2020</b>
Checked by:	<b>Matthew Davies (Principal Consultant)</b>	Date:	<b>11/11/2020</b>
Approved by:	<b>Spiro Panagi (Associate Director)</b>	Date:	<b>19/11/2020</b>

**Version 1**

AECOM Transport are appointed by the Vale of Glamorgan (VoG) Education Department to provide highway and transport planning inputs into a planning application for a new campus for Ysgol Y Deri (YYD) to be situated at Cosmeston, Vale of Glamorgan. YYD provides Specialist Educational Needs (SEN) support for pupils from Early Years to Sixth Form.

This Technical Note (TN) sets out the proposed scope of a Transport Assessment (TA) which will inform a forthcoming planning application for the proposed development. This TN is submitted to the VoG, in its role as Local Highway Authority (LHA), for agreement and approval.

<b>1</b>	<p><b>Site Location and Existing Land Use</b></p>	<p>A second campus for YYD (known as YYD2) is proposed on land located to the south of the B4267, approximately 350m south of the Penarth built-up area (Cosmeston) and 1.5km north-east of Sully and opposite Cosmeston Lakes County Park and Cosmeston Medieval Village. The location of the site is shown on the figure below:</p> <p><b>Site Location Plan</b></p> <p>Source: OpenStreetMap, 2020.</p> <p>The site is currently used for agricultural purposes and is bounded to the north-west by the B4267, to the north-east by farm buildings, to the south-east by agricultural uses (arable) and to the south-west by Fort Road.</p>
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		<p>The existing YYD campus is located to the west of Penarth, approximately 3km north of the site. The location of the existing campus is shown on the figure above. The school provides educational courses at primary (Key Stage 1 and 2), secondary (Key Stage 3 and 4) and Sixth Form levels of education in addition to various therapy services including Speech and Language Therapy, Occupational Therapy and Physiotherapy. The proposed second campus will be operated in conjunction with the existing YYD facility.</p>
<p><b>2</b></p>	<p><b>Planning History</b></p>	<p>It is understood that the site is not subject to any extant or lapsed planning permissions. The site is currently in use for agricultural purposes.</p> <p>An outline planning application for up to 576 dwellings and a primary school at 'Land at Upper Cosmeston Farm' was submitted to VoG in October 2020 (Reference: 2020/01170/OUT). The proposed residential development is located immediately to the north of the site with access proposed via the creation of two new junctions on the B4267. At the time of producing this TN, the application has not been determined. The site is allocated in the adopted VoG Local Development Plan (Reference: MG2 (24)).</p> <p>Owing to the proximity of the proposed residential development to the site, AECOM has examined the documents submitted to VoG to inform the planning application. This has included the indicative masterplan (included at <b>Appendix A</b> for information) to ensure that suitable consideration has been given in design of the proposed development in addition to the technical transport information.</p> <p>AECOM has reviewed the details of pre-application discussions held between the transport consultant and the LHA with regard to the neighboring proposals and agreement of an appropriate scope and methodology for the corresponding TA. This has then been considered in order to identify a scope and methodology for the YYD2 TA, that will be relatively appropriate to the scale of development proposed on the site.</p> <p>The proposed methodology also draws on the approaches used by AECOM to secure planning consent for recent applications relating to several school schemes in the VoG.</p>
<p><b>3</b></p>	<p><b>Development Proposals</b></p>	<p>The proposed development is for a new SEN school facility as an expansion to the existing YYD services available at the existing campus. The new campus will provide the same basic services as the existing school to enable the relocation of some existing pupils and to accommodate growth in the need for SEN schooling in the VoG across both campuses.</p> <p>The new school is proposed to enrol a total capacity of 150 pupils Full Time Equivalent (FTE). The proposed staff numbers will include 103 FTE including teachers, support staff and healthcare / therapists.</p> <p><b>School Operation</b></p> <p>The proposed school timetable will operate between 09:00hrs and 15:00hrs. On this basis, it is assumed that all pupils and staff will arrive during the hour commencing 08:00hrs, with pupils departing during the hour commencing 15:00hrs and staff departing during the hour commencing 17:00hrs. This is as per the approach taken by AECOM and accepted by the LHA in regard to the assessment of recent proposals for other school schemes in the VoG.</p>

As is the case at the existing YYD campus, the majority of pupils will have arranged transport to and from the site via private mini-bus and taxi services, as appropriate to their specific needs. The remaining pupils will likely be awarded grants to secure daily transport to / from the proposed development. The nature of the proposed development excludes the opportunity for pupils to use sustainable modes of travel such as walking, cycling and public transport (owing to both the wide catchment area of the school and also the SEN requirements of the school and its pupils).

No before or after school provision is understood to be proposed owing to the specialist nature of the school.

**Indicative Site Layout**

The indicative site layout for the proposed development is shown below and is also included at **Appendix B** for further reference.

**Indicative Site Layout**



Source: HLM Architects, 2020.

The indicative site layout includes the new school building and sports pitches to the south-east of the site with a formal drop-off area and general car park to be provided to the north-west. The main entrance to the school will be the south-west of the building. Pupils will be able to arrive via a separate access to the north of the building. Deliveries will be to the rear of the school building (north-west).

**Access Arrangements**

Vehicle and pedestrian access to the proposed development will be via a new junction with the B4267 at the northernmost point of the site.

	<p>The nature and design of the access will be confirmed by the masterplanning team; however, this will be a priority T-junction, considered to be appropriate to the scale of the proposals and is consistent with existing junction provision along the B4267 corridor.</p> <p>The access junction will be designed in accordance with Design Manual for Roads and Bridges (DMRB) guidance (CD 123 ‘<i>Geometric design of at-grade priority and signal-controlled junctions</i>’) as is appropriate for the highway in the vicinity of the proposed development. The emerging visibility of the junction will accommodate 2.4m x 120m splays in accordance with the speed limit of the B4267 at the proposed point of access (40mph). A separate pedestrian access will be provided from the existing footway on the B4267.</p> <p>In relation to the spacing of priority junctions, DMRB CD 123 states that:</p> <p><i>“new priority junctions shall not be sited where they encroach on the visibility requirements of adjacent priority junctions on major roads with:</i></p> <ol style="list-style-type: none"> <li>1) <i>A speed limit of greater than 40mph; or</i></li> <li>2) <i>A speed limit of 40mph or less, where the minor road forms part of a through route.”</i></li> </ol> <p>The proposed access junction will be sited within 70m of the southernmost access proposed for the neighbouring residential development and would therefore encroach on the emerging visibility splay of that junction (i.e. a y-distance of 120m). However, the speed limit on the B4267 is 40mph in the vicinity of the proposed site access and the minor arm of the access will serve only the proposed development and will not form a through-route. Therefore, based on the guidance provided in CD 123, it is considered that the siting of the proposed access is appropriate in relation to the proposed neighbouring junctions.</p> <p>The access junction will also be sited opposite a minor access to Cosmeston Medieval Village / Cosmeston Lakes Country Park which is mainly used by service vehicles to access the site. The junction can be subject to occasional use for private functions and events, but these are held infrequently throughout the year. It is considered that the location of the access junction would not impede the safe operation of this access, or vice versa.</p> <p>Full details of the access arrangements will be included in the TA.</p> <p><b>Internal Movement and Accessibility</b></p> <p>The TA will include Swept Path Analysis (SPA) of the site layout to demonstrate that all vehicles expected to require access to the site can do so. It is proposed that SPA is included for the following:</p> <ul style="list-style-type: none"> <li>- Access to and suitable movements within the car parking and formal drop-off / pick-up areas for a large car (5.0m x 1.9m);</li> <li>- A mini-bus (6.33m x 2.19m) accessing the drop-off / pick-up areas;</li> <li>- Refuse vehicle (10.32m x 2.53m) access to refuse storage areas;</li> <li>- Emergency vehicle access (Fire Tender of 7.0m x 2.43m); and</li> <li>- A 7.5 tonne box van (8.0m x 2.1m) access for deliveries to the school.</li> </ul>
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		<p>These SPA vehicles / dimensions are consistent with the assessments undertaken by AECOM for consented school redevelopment schemes within the VoG.</p> <p><b>Vehicle and Bicycle Parking</b>                  Vehicle and bicycle will be provided in accordance with VoG standards as outlined in the adopted Parking Standards SPG (March 2019).</p> <p>The parking standards are defined according to a zoning system based on the number, range and characteristics of facilities within walking distance and the level of public transport provision. The development site falls within 'Zone E – Deep Rural' but is located on the boundary of 'Zone C – Suburban'.</p> <p>The size of the drop-off / pick-up area for pupil transport will be informed by the traffic generation forecasts.</p>
<p>4</p>	<p><b>Planning Policy Review</b></p>	<p>The context of the development proposals will be considered in relation to the following policy and guidance:</p> <ul style="list-style-type: none"> <li>▪ Planning Policy Wales (PPW) 10;</li> <li>▪ Technical Advice Note (TAN) 18: Transport, published in March 2007;</li> <li>▪ The Wales Transport Strategy, published in April 2008;</li> <li>▪ National Transport Finance Plan, published in September 2015;</li> <li>▪ Active Travel (Wales) Act 2013;</li> <li>▪ Wellbeing of Future Generations (Wales) Act 2015;</li> <li>▪ VoG Local Development Plan (LDP) 2011-2026 [adopted June 2017];</li> <li>▪ VoG Local Transport Plan (LTP) 2015-2030; and</li> <li>▪ Supplementary Planning Guidance (SPG) to the LDP, including Parking Standards (March 2019).</li> </ul> <p>The TA will clearly demonstrate the proposed development's compliance to the above policies and corresponding objectives. This will be presented within the policy chapter (following the setting out of the development proposals), linking specific development proposals to the policies and their objectives. A summary will be provided within the TA conclusions.</p>
<p>5</p>	<p><b>Existing Situation and Site Accessibility</b></p>	<p>The TA will include the following:</p> <ul style="list-style-type: none"> <li>▪ Description of the site location and existing usage;</li> <li>▪ Description of the local planning context of the site, including the neighbouring proposals at 'Land at Upper Cosmeston Farm'.</li> <li>▪ Description of the local highway network, including carriageway widths, speed limits, street lighting, etc;</li> <li>▪ Description of the existing highway operational conditions with reference to traffic survey data;</li> <li>▪ Analysis of Personal Injury Collision (PIC) data for the purposes of a highway safety record review;</li> <li>▪ Description of existing walking/cycling facilities;</li> <li>▪ Description of public transport services; and</li> <li>▪ Identification of key local facilities and their accessibility by sustainable modes in addition to residential areas within suitable walking / cycling distance of the proposed development as a school and place of work.</li> </ul>

<p>6</p>	<p><b>Study Area and Data Collection</b></p>	<p><b>Study Network</b></p> <p>The study network includes the B3267 between the A4055 / A321 / B4267 roundabout to the west of Barry and the B4267 / Victoria Road / Dinas Road signalised junction in Penarth. The following junctions are considered within this area (not inclusive of the site access junctions for the proposed development and neighbouring residential proposals at 'Land at Upper Cosmeston Farm'):</p> <ul style="list-style-type: none"> <li>▪ A4055 / A321 / B3267 roundabout;</li> <li>▪ B3267 / Hayes Road roundabout;</li> <li>▪ B3267 / Cosmeston Lakes priority T-junction;</li> <li>▪ B3267 / Cosmeston Drive priority T-junction;</li> <li>▪ B3267 / Westbourne Road priority T-junction;</li> <li>▪ B3267 / Augusta Road / Castle Rise priority crossroads junction; and</li> <li>▪ B3267 / Victoria Road / Dinas Road signalised junction.</li> </ul> <p><b>Traffic Survey Data</b></p> <p>At the time of producing this TN, the UK (including Wales) has experienced ongoing atypical traffic conditions associated with COVID-19 owing to the various regional and national measures that place restrictions on movements. Given these atypical traffic conditions, which are likely to continue throughout the application period, bespoke traffic surveys will not be undertaken to inform the TA.</p> <p>The TA will instead utilise information on traffic movements for the study network from publicly available data including in the application submitted for the development at 'Land at Upper Cosmeston Farm'; this includes Junction Turning Count (JTC) surveys undertaken between 06:30-09:30hrs and 15:30-18:30hrs on Tuesday 27<sup>th</sup> November 2018. No Automatic Traffic Count (ATC) surveys were included in the TA submission. A subset of the JTC survey data is available in Appendix E of the TA for that application but a network flow diagram showing the turning movements at each junction on the proposed study network for this application is provided at Figure 3.5 of the TA. Whilst this data is from November 2018, it remains within three years of the expected planning submission and is therefore considered to be within an acceptable date range.</p> <p>It is proposed that the survey data for the junctions on the proposed study network be used to inform the TA.</p> <p><b>Personal Injury Collision (PIC) Data</b></p> <p>PIC data will be obtained from the Welsh Government for the most recent five-year period, covering the proposed study area included at <b>Appendix C</b>. The study area covers the B4267 between Cosmeston Drive and a point approximately 150m south of St Mary's Well Bay Road.</p> <p>Should the data not be returned in good time for the TA to be completed, a preliminary assessment will be carried out using the 'Crashmap' online resource. This will be followed by a more detailed assessment using the PIC data from Welsh Government and submitted as an updated TA or as an Addendum, as appropriate.</p>
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<p>7</p>	<p><b>Trip Generation &amp; Distribution</b></p>	<p>The trip generation for of the proposed development will be based on a first-principles assessment, informed by details on the proposed school population and data available from the existing YYD campus and information provided by the VoG Education Department.</p> <p><b>Pupil Traffic Generation and Distribution</b></p> <p>Pupils travel to / from the existing YYD campus by arranged transport. These vehicles operate on a ‘contract’ which entail dropping off and collecting a number of students within one vehicle. There are currently 45 vehicles travelling to / from the school during the drop-off and collection periods. Of these 10 are larger vehicles accommodating five or more pupils (i.e. mini-bus) and the remainder are vehicles accommodating up to five pupils (i.e. car / taxi).</p> <p>A pro-rata application of these existing arrangements to the proposed number of pupils at the new campus (150 pupils) is proposed to determine the effective pupil traffic generation. Based on the same ratios as the existing school, it is forecast that the development will generate 28 vehicles under contracts during the drop-off / pick-up periods.</p> <p>Additionally, some pupils are provided with funding to make their own transport arrangements to / from school. For the existing campus this is 14 pupils, which pro-rotata for the proposed development equates to nine pupils. For the purposes of this assessment, it will be assumed that these pupils travel as the sole passenger of a vehicle.</p> <p>The pupil traffic generation for the proposed development is therefore forecast as 37 vehicles (74 two-way movements) during the pupil drop-off and collection periods.</p> <p>Pupil traffic generation will be distributed to the local highway network based on the existing pupil postcode information. This is an appropriate methodology because the existing and proposed YYD campuses will have the same catchment area (i.e. the VoG local authority area) and therefore the existing postcodes represent a likely spread of future home addresses of the proposed pupil population.</p> <p>The route between the pupil home postcode and the proposed development site has been determined using an online route planning software. The route with the shortest distance / time has been selected for pupil traffic assignment.</p> <p>The pupil traffic distribution to the study network entry / exit points is presented in the table below. The indicative pupil traffic assignment to the proposed study network is presented at <b>Appendix D</b>. This will be confirmed for the TA submission.</p> <p>Pupil trips will be assumed to arrive during the assessed AM peak hour (07:45-08:45hrs) for, but pupil departure trips will be assumed to occur outside of the assessed PM peak hour (16:30-17:30hrs) for the TA. This is consistent with the proposed school timetable (i.e. 09:00-15:00hrs). There will be both vehicle arrivals and departures during the AM peak hour as the contracted vehicles will not remain on the school site throughout the day.</p>
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**Distribution of Pupil Trips based on Existing Pupil Postcode Data**

Network Entry / Exit	Percentage Distribution
A4055 Cardiff Road (SW)	39.51%
A4231 Barry Docks Link Road	42.39%
A4055 Cardiff Road (NE)	3.70%
Hayes Road	0.00%
Sully, north of B4267	0.41%
Sully, south of B4267	1.23%
Swanbridge Road	2.06%
Beach Road	0.00%
Fort Road	0.00%
Cosmeston Drive	0.00%
Westbourne Road	4.94%
Augusta Road	0.00%
Castle Avenue	0.41%
Victoria Road	0.00%
Dinas Road	0.41%
B4267 Lavernock Road	4.94%
<b>Total</b>	<b>100.00%</b>

**Staff Trip Generation and Distribution**

The proposed development will accommodate 103 members of staff (FTE) including teaching, support and healthcare staff.

The mode share for staff trips to / from the proposed development site will be determined using 2011 Census data for the 'WU03EW - Location of usual residence and place of work by method of travel to work (MSOA level)' dataset.

The development site is located in the 'Vale of Glamorgan 008' Middle Super Output Area (MSOA) and the existing YYD Campus is located in the 'Vale of Glamorgan 004' MSOA. A staff journey to work mode share has been derived by using each as the 'Place of Work' in the census dataset. The resulting mode shares are presented in the table below.

**Staff Mode Share – Comparison of Place of Work MSOAs**

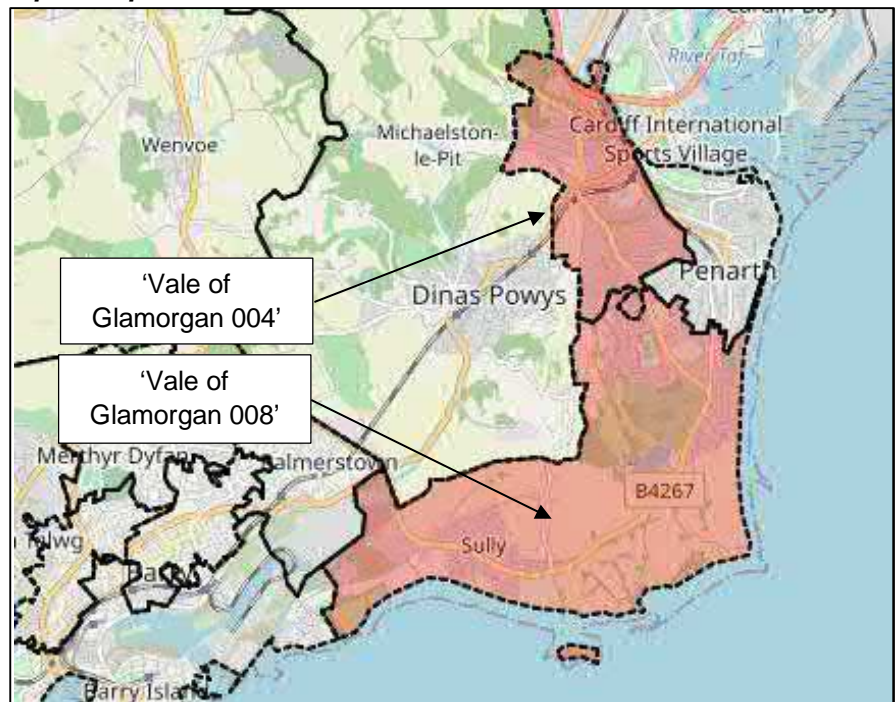
Mode	Mode Share	
	Vale of Glamorgan 004	Vale of Glamorgan 008
Driving a Car/Van	77%	75%
On Foot	8%	10%
Passenger in a Car/Van	7%	4%
Bus	4%	4%
Bicycle	1%	2%
Motorcycle	1%	1%
Rail	1%	1%
Taxi	0%	3%
Other	0%	1%
<b>Total</b>	<b>100%</b>	<b>100%</b>

Notes: 1) Summation errors are due to rounding.

It is proposed that the staff mode share will be derived using the 'Vale of Glamorgan 004' MSOA as this results in the higher level of traffic generation compared to the 'Vale of Glamorgan 008 MSOA' despite it being located within an urban area (which would typically be expected to demonstrate higher levels of non-car modes, including walking, cycling and public transport). This results in a robust analysis of staff traffic generation.

The extent of the 'Vale of Glamorgan 004' and 'Vale of Glamorgan 008' MSOAs are presented below:

**Extent of 'Vale of Glamorgan 004' and 'Vale of Glamorgan 008' Middle Super Output Areas**



Source: Nomis / OpenStreetMap, 2020.

The 'Vale of Glamorgan 004' mode share shows that the majority of staff would be expected to travel to / from the school as the driver of a car, and a further 7% will arrive as a passenger in a car. 8% would be expected to walk from within the local area.

Staff vehicle trips have been distributed to the local highway network based on the existing staff postcodes. The route between the staff home postcode and the proposed development site has been determined using an online route planning software. The route with the shortest distance / time has been selected for staff traffic assignment. The resulting distribution is presented in the table below. The indicative staff traffic assignment to the proposed study network is presented at **Appendix D**.

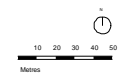
		<p><b>Proposed Distribution of Staff Trips based on Existing Postcode Data</b></p> <table border="1"> <thead> <tr> <th data-bbox="528 253 932 320">Network Entry / Exit</th> <th data-bbox="932 253 1278 320">Percentage Distribution</th> </tr> </thead> <tbody> <tr> <td data-bbox="528 320 932 353">A4055 Cardiff Road (SW)</td> <td data-bbox="932 320 1278 353">20.00%</td> </tr> <tr> <td data-bbox="528 353 932 387">A4231 Barry Docks Link Road</td> <td data-bbox="932 353 1278 387">30.00%</td> </tr> <tr> <td data-bbox="528 387 932 421">A4055 Cardiff Road (NE)</td> <td data-bbox="932 387 1278 421">2.96%</td> </tr> <tr> <td data-bbox="528 421 932 454">Hayes Road</td> <td data-bbox="932 421 1278 454">0.00%</td> </tr> <tr> <td data-bbox="528 454 932 488">Sully, north of B4267</td> <td data-bbox="932 454 1278 488">0.37%</td> </tr> <tr> <td data-bbox="528 488 932 521">Sully, south of B4267</td> <td data-bbox="932 488 1278 521">0.00%</td> </tr> <tr> <td data-bbox="528 521 932 555">Swanbridge Road</td> <td data-bbox="932 521 1278 555">1.48%</td> </tr> <tr> <td data-bbox="528 555 932 589">Beach Road</td> <td data-bbox="932 555 1278 589">0.00%</td> </tr> <tr> <td data-bbox="528 589 932 622">Fort Road</td> <td data-bbox="932 589 1278 622">0.00%</td> </tr> <tr> <td data-bbox="528 622 932 656">Cosmeston Drive</td> <td data-bbox="932 622 1278 656">1.85%</td> </tr> <tr> <td data-bbox="528 656 932 689">Westbourne Road</td> <td data-bbox="932 656 1278 689">11.85%</td> </tr> <tr> <td data-bbox="528 689 932 723">Augusta Road</td> <td data-bbox="932 689 1278 723">0.00%</td> </tr> <tr> <td data-bbox="528 723 932 757">Castle Avenue</td> <td data-bbox="932 723 1278 757">0.74%</td> </tr> <tr> <td data-bbox="528 757 932 790">Victoria Road</td> <td data-bbox="932 757 1278 790">0.37%</td> </tr> <tr> <td data-bbox="528 790 932 824">Dinas Road</td> <td data-bbox="932 790 1278 824">2.59%</td> </tr> <tr> <td data-bbox="528 824 932 857">B4267 Lavernock Road</td> <td data-bbox="932 824 1278 857">27.78%</td> </tr> <tr> <td data-bbox="528 857 932 891"><b>Total</b></td> <td data-bbox="932 857 1278 891"><b>100.00%</b></td> </tr> </tbody> </table> <p data-bbox="528 958 1449 1093">Staff trips will be assumed to arrive during the assessed AM peak hour (07:45-08:45hrs) and depart during the assessed PM peak hour (16:30-17:30hrs). During the AM peak hour there will be staff arrival trips only and during the PM peak hour there will be staff departure trips only.</p>	Network Entry / Exit	Percentage Distribution	A4055 Cardiff Road (SW)	20.00%	A4231 Barry Docks Link Road	30.00%	A4055 Cardiff Road (NE)	2.96%	Hayes Road	0.00%	Sully, north of B4267	0.37%	Sully, south of B4267	0.00%	Swanbridge Road	1.48%	Beach Road	0.00%	Fort Road	0.00%	Cosmeston Drive	1.85%	Westbourne Road	11.85%	Augusta Road	0.00%	Castle Avenue	0.74%	Victoria Road	0.37%	Dinas Road	2.59%	B4267 Lavernock Road	27.78%	<b>Total</b>	<b>100.00%</b>
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<b>Total</b>	<b>100.00%</b>																																					
<p><b>8</b></p>	<p><b>Traffic Impact Assessment</b></p>	<p><b>Assessment Peak Hours</b></p> <p>The peak hours for the assessment will be retained as per those identified for the local highway network in the TA for 'Land at Upper Cosmeston Farm' which are 07:45-08:45hrs during the AM period and 16:30-17:30hrs during the PM period.</p> <p>As discussed above, it will be assumed that only departing staff trips will occur within the assessed PM peak hour. All pupil traffic will be assumed to depart earlier in the afternoon in accordance with the school timetable (i.e. hour commencing 15:00). No before or after school clubs are proposed for the school. Pupil trips will therefore fall outside of the network PM peak hour and will not be included in the assessment of this period.</p> <p>The TA will present the pupil traffic generation and include commentary on the likely effect of this during the pick-up period. It should be noted that the effect of an additional 37 vehicles, for pupil travel, on the local highway network during this period is not considered to be severe.</p> <p><b>Assessment Scenarios</b></p> <p>It is proposed that the traffic assessment consider the development impact for the opening year of the proposed development (2023).</p> <p>The 2019 baseline traffic flows (as determined from the information available from the TA for the 'Land at Upper Cosmeston Farm' application) will be 'growthed' to the opening year to derive the future year base scenario.</p>																																				

		<p>The growth forecast will be calculated using a combination of growth factors derived from TEMPro (Version 7.2) and manual application of committed development traffic flows. This is consistent with the methodology used for the 'Land at Upper Cosmeston Farm' application.</p> <p>The growth forecast will include any local committed developments which are consented but were not fully built-out at the time of the surveys.</p> <p>It is suggested that this includes the development at 'Land to the South of Cog Road / Land West of Swanbridge Road' (Reference: 2013/01279/OUT) which was included in the growth forecast for the assessment of development traffic at 'Land at Upper Cosmeston Farm'. This site is also allocated within the VoG Local Plan (Reference: MG2 (37)).</p> <p>It is also proposed that the traffic from the 'Land at Upper Cosmeston Farm' development is manually added to the growth forecast as, although this is not yet consented, the site is allocated in the adopted VoG LDP (Reference: MG2 (24)) and therefore there is a reasonable likelihood of this being built-out.</p> <p>We request that the VoG (as the LPA) provide details of any other committed developments which should be included in the growth forecast.</p> <p>TEMPro growth factors will be obtained for the 'The Vale of Glamorgan 008' MSOA, which includes the site in addition to Sully and the residential areas to the south of Penarth. The extent of the MSOA area is shown above. The growth factors will be 'locally adjusted' for 'All' road types. The factors will also have 'alternative assumptions' applied to remove the housing growth added manually through the committed development sites. This is an appropriate methodology as both are allocated in the adopted VoG Local Plan.</p> <p>The assigned development traffic will be added to the future year base scenario to derive the future year 'base + development' scenario. The difference between the two will form the basis of the traffic impact assessment.</p> <p><b>Impact Assessment</b></p> <p>Junction capacity modelling of the proposed site access with the B4267 will be undertaken based on the confirmed design for the planning application; this will demonstrate that the site access is suitable to serve the proposed development and will not result in undue impact on the B4267. The modelling will be undertaken using industry-standard Junctions 9 software.</p> <p>The TA will include a percentage impact of the following junctions and the associated commentary will include reference to the forecast capacity position reported in the TA for the proposed development at 'Upper Cosmeston Farm' which assessed a higher level of development traffic than is forecast by the proposed YYD campus. The junctions to be considered are as follows:</p> <ul style="list-style-type: none"> <li>▪ A4055 / A321 / B3267 roundabout;</li> <li>▪ B3267 / Hayes Road roundabout;</li> <li>▪ B3267 / Cosmeston Lakes priority T-junction;</li> <li>▪ B3267 / Cosmeston Drive priority T-junction;</li> <li>▪ B3267 / Westbourne Road priority T-junction;</li> <li>▪ B3267 / Augusta Road / Castle Rise priority crossroads junction; and</li> </ul>
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		<ul style="list-style-type: none"> <li>▪ B3267 / Victoria Road / Dinas Road signalised junction.</li> </ul> <p>The proposed site accesses to the development at 'Land at Upper Cosmeston Farm' will also be included in the percentage impact assessment.</p>
<b>9</b>	<b>Transport Implementation Strategy (TIS)</b>	<p>The TA will include a TIS, which will consider potential measures, and appraise those already being implemented by the adjacent residential site, to encourage the mode share of sustainable travel modes by staff and pupils at the school. In particular, the following will be considered:</p> <ul style="list-style-type: none"> <li>▪ Feasibility of walking and cycling routes in the surrounding areas including consideration for potential improvements;</li> <li>▪ Provision of cycle parking within the school grounds;</li> <li>▪ Pedestrian and cycle access and circulation within the site; and</li> <li>▪ Bus/parent drop-off points.</li> </ul> <p>A new Travel Plan for the site will be secured as part of a planning condition.</p> <p>It should be noted that owing to the specialist nature of the proposed development as a SEN school, there are limited alternatives to travelling by vehicle available for pupils. The TIS will therefore include measures which are only appropriate for the future site use.</p>
<b>10</b>	<b>Construction Traffic</b>	<p>The TA will include discussion of potential routeing arrangements for construction traffic to access the proposed development site. It is envisioned that a Construction Traffic Management Plan will be conditioned as part of the sought planning consent.</p>





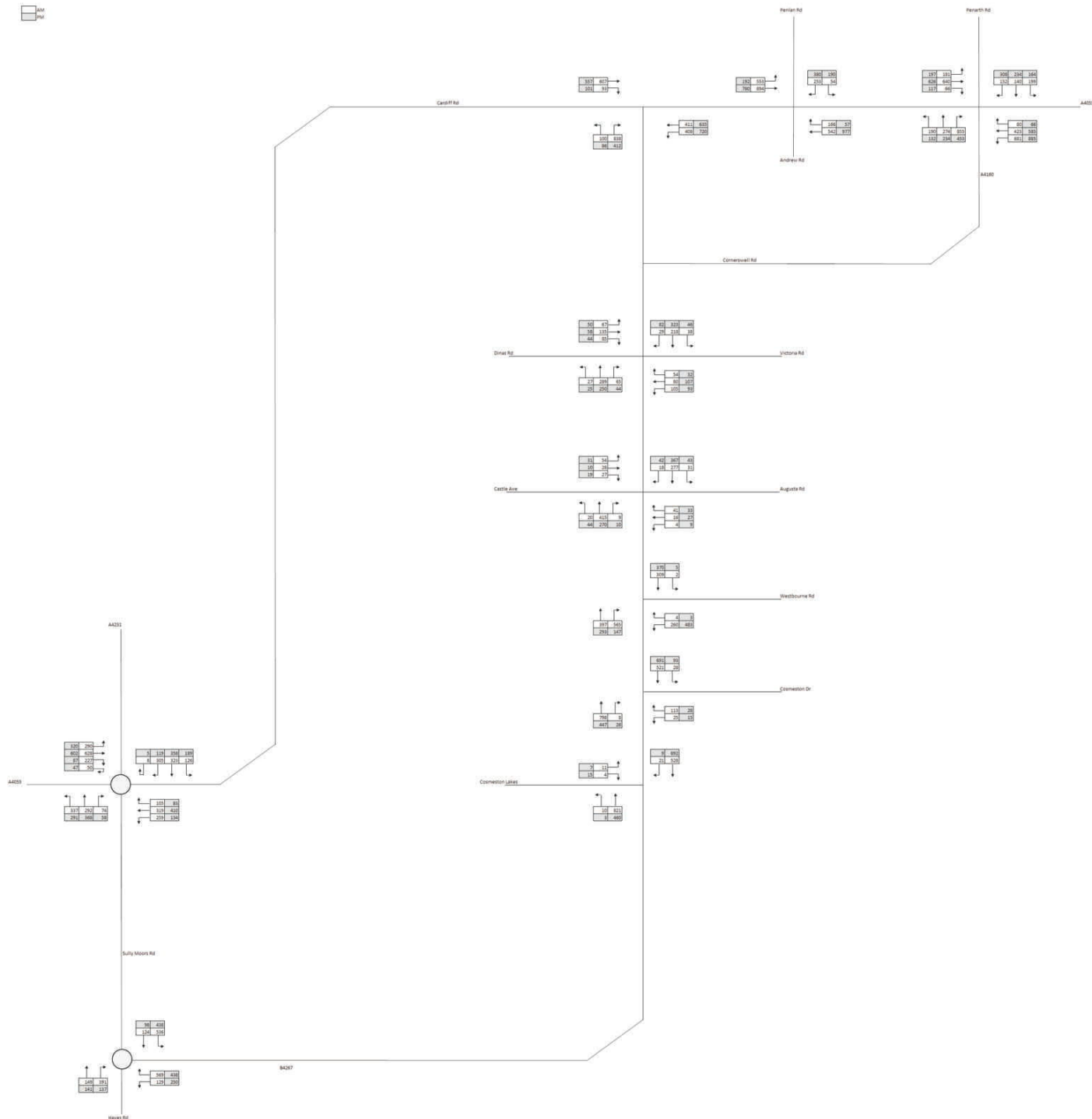
**KEY**

	NEAP	1000 m <sup>2</sup>
	LEAP	3x 400 m <sup>2</sup>
	LAP	4x 100 m <sup>2</sup>
	Retained hedgerow	29 600 m <sup>2</sup>
	New hedgerow	10 300 m <sup>2</sup>
	Grass/meadow, orchards or allotments	19 600 m <sup>2</sup>
	Private gardens soft landscape	25 000 m <sup>2</sup>
	SuDS swales and reed beds	24 100 m <sup>2</sup>
	Attenuation pond (surface area)	2000 m <sup>2</sup>


**2 Proposed Masterplan**  
1:1000

Client: Austin Smith & Lord  
 Project: Cosmeston Lakes and Country Park  
 Date: 03.06.2020  
 Scale: 1:1000  
 Austin Smith & Lord  
 1, Lord's Avenue, London, W1P 9LW  
 Tel: 020 7462 0000  
 Email: info@asmithandlord.com

**Austin Smith & Lord**  
 Landscape Architects  
 1, Lord's Avenue, London, W1P 9LW  
 Tel: 020 7462 0000  
 Email: info@asmithandlord.com



Contains Ordnance Survey data @ Crown copyright and database right (2014)

Drawing Title  2019 Baseline Traffic Flows	Client  Welsh Government	 Unit 9 Oak Tree Court Mulberry Drive Cardiff Gate Business Park Cardiff CF23 3RS T 029 2073 2652	Scale: NTS	File Extension:
	Job Title  Cosmeston		Designed by: KW	
			Drawn by: KW	
			Ckd/Appd: POC	
			Issued: July 2019	Dwg No:
			Job No: T18,165	Figure 3.5

**Appendix B – Indicative Site Layout**



Appendix C – Proposed Personal Collision Injury (PIC) Study Area



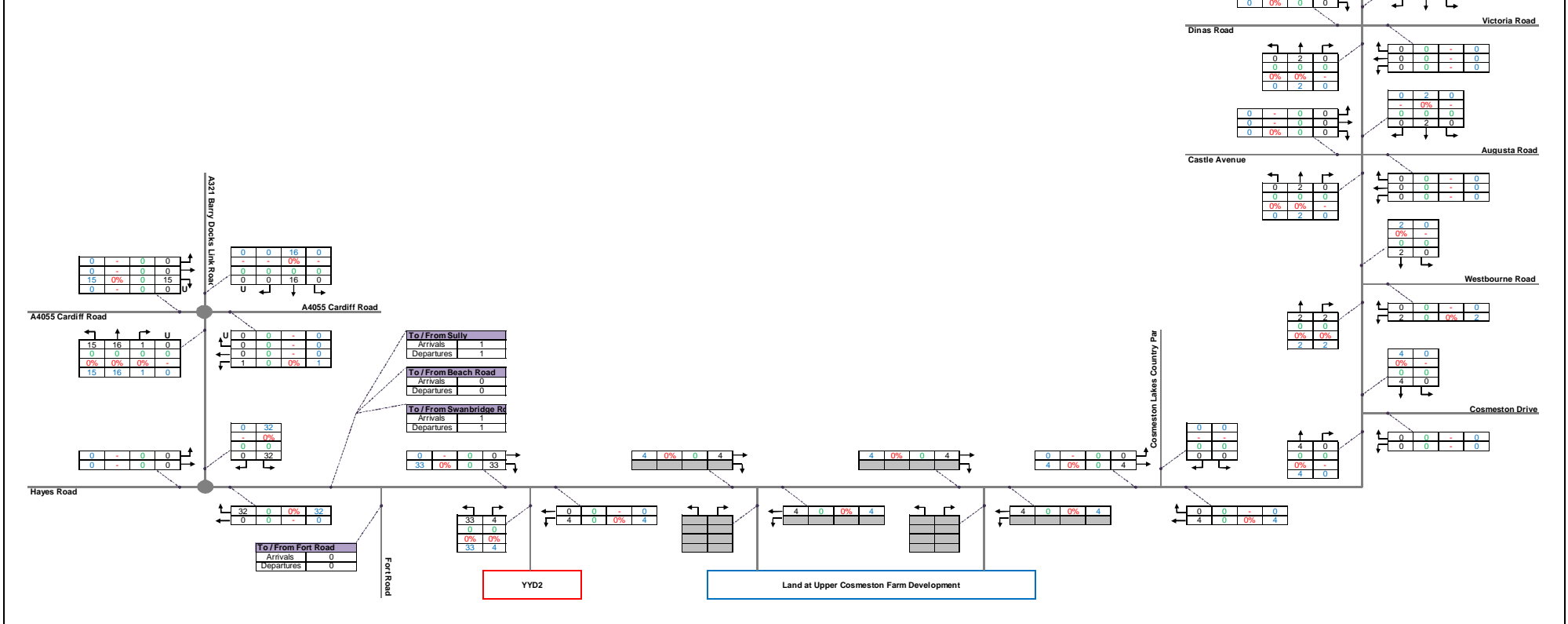






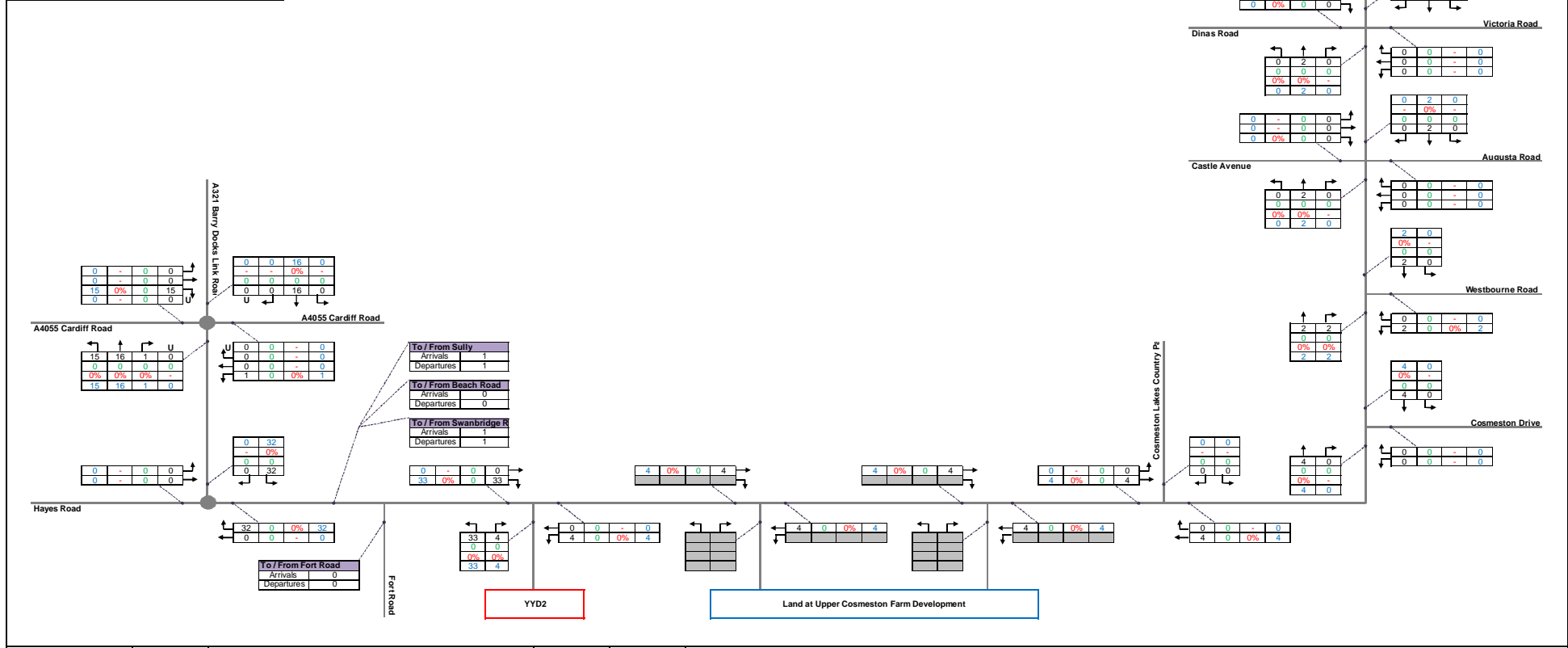
**Key**

- XX Total Vehicles
- XX HGVs
- XX HGV %
- XX PCUs
- █ Movement Not Available
- ▭ Development Site
- ▭ Local Development Site



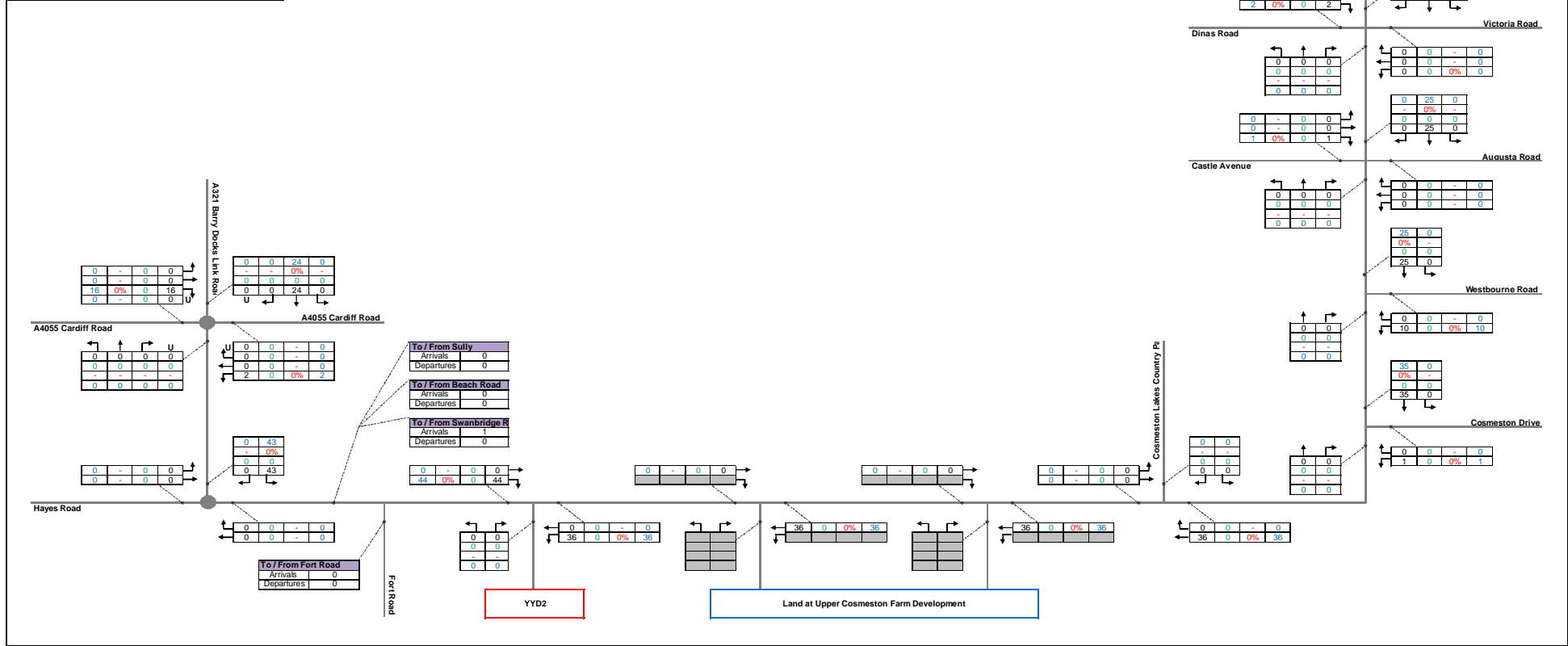
<p>AECOM 1 Caughan Square Cardiff CF10 5BT 029 2087 4600 www.aecom.com</p>	<b>Project</b>	Ysgol Y Deri, Transport Assessment	<b>Drawn</b>	MP	<b>Notes:</b> 1) Diagram not to scale. 2) Pupil traffic generation determined pro-rola from travel to existing YYD Campus. Traffic generation = 37 vehicles (74 movements) during the pupil drop-off and collection periods. 3) Pupil traffic distribution derived from postcode data of existing pupils at YYD. The route between pupil home locations and the development site has been determined using online route planning software for neutral weekday periods. The shortest / quickest route has been used for assignment purposes. 4) No HGVs are generated by the proposed development during peak hour periods. 5) Locations and volume of traffic 'disappearing' off of the study network are shown in purple boxes.
	<b>Title</b>	Pupil Traffic Assignment - AM Peak Hour (07:45-08:45)	<b>Checked</b>	MD	
	<b>Fig No.</b>	-	<b>Approved</b>	SP	
	<b>Client</b>	Vale of Glamorgan Council Education Department	<b>Verified</b>	JD	
	<b>Date</b>	11/11/2020	<b>Scale</b>	NTS	

Key	
XX	Total Vehicles
XX	HGVs
XX	HGV %
XX	PCUs
■	Movement Not Available
■	Development Site
■	Local Development Site



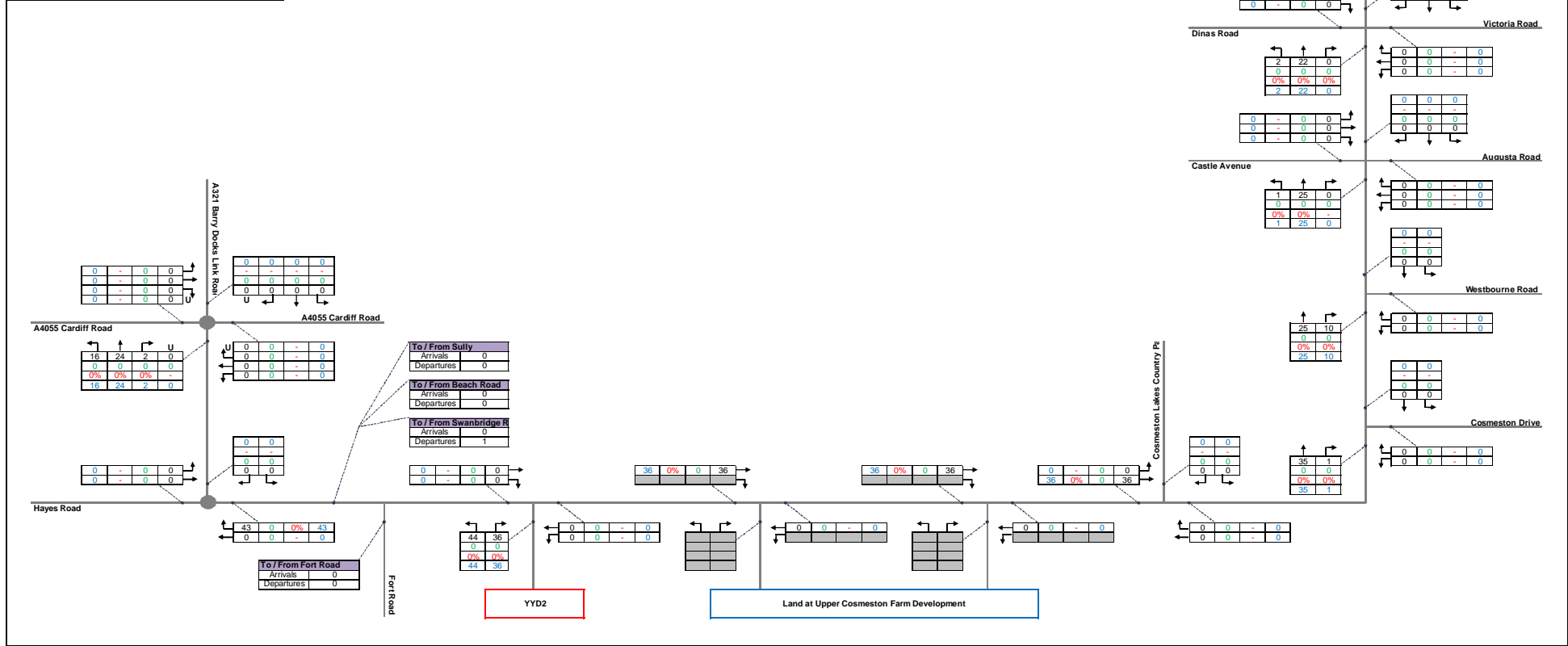
<b>AECOM</b> AECOM 1 Callaghan Square Cardiff CF10 5BT 029 2067 4600 <a href="http://www.aecom.com">www.aecom.com</a>	<b>Project</b>	Ysgol Y Deri, Transport Assessment	<b>Drawn</b>	MP	<b>Notes:</b> 1) Diagram not to scale. 2) Pupil traffic generation determined pro-rata from travel to existing YYD Campus. Traffic generation = 37 vehicles (74 movements) during the pupil drop-off and collection periods. 3) Pupil traffic distribution derived from postcode data of existing pupils at YYD. The route between pupil home locations and the development site has been determined using online route planning software for neutral weekday periods. The shortest/ quickest route has been used for assignment purposes. 4) No HGVs are generated by the proposed development during peak hour periods. 5) Locations and volume of traffic 'disappearing' off of the study network are shown in purple boxes.
	<b>Title</b>	Pupil Traffic Assignment - Collection Period (15:00-16:00)	<b>Checked</b>	MD	
	<b>Fig No.</b>	-	<b>Approved</b>	SP	
	<b>Client</b>	Vale of Glamorgan Council Education Department	<b>Verified</b>	JD	
	<b>Date</b>	11/11/2020	<b>Scale</b>	NTS	

Key	
XX	Total Vehicles
XX	HGVs
XX	HGV %
XX	PCUs
█	Movement Not Available
▭	Development Site
▭	Local Development Site



<b>AECOM</b> AECOM 1 Callaghan Square Cardiff CF10 5BT 029 2067 4600 <a href="http://www.aecom.com">www.aecom.com</a>	<b>Project</b>	Ysgol Y Deri, Transport Assessment	<b>Drawn</b>	MP	<b>Notes:</b> 1) Diagram not to scale. 2) Staff traffic generation determined by applying a mode share to number of proposed number of staff (103). The mode share has been derived using 2011 Census Journey to Work data with The Vale of Glamorgan 004 MSOA as the 'Place of Work'. 3) Staff traffic distribution derived from postcode data of existing staff at YYD. The route between staff home locations and the development site has been determined using online route planning software for neutral weekday periods. The shortest/ quickest route has been used for assignment purposes. 4) No HGVs are generated by the proposed development during peak hour periods. 5) Locations and volume of traffic 'disappearing' off of the study network are shown in purple boxes.
	<b>Title</b>	Staff Traffic Assignment - AM Peak Hour (07:45-08:45)	<b>Checked</b>	MD	
	<b>Fig No.</b>	-	<b>Approved</b>	SP	
	<b>Client</b>	Vale of Glamorgan Council Education Department	<b>Verified</b>	JD	
	<b>Date</b>	11/11/2020	<b>Scale</b>	NTS	

Key	
XX	Total Vehicles
XX	HGVs
XX	HGV %
XX	PCUs
■	Movement Not Available
■	Development Site
■	Local Development Site



<b>AECOM</b> AECOM 1 Callaghan Square Cardiff CF10 5BT 029 2067 4600 <a href="http://www.aecom.com">www.aecom.com</a>	<b>Project</b>	Ysgol Y Deri, Transport Assessment	<b>Drawn</b>	MP	<b>Notes:</b> 1) Diagram not to scale. 2) Staff traffic generation determined by applying a mode share to number of proposed number of staff (103). The mode share has been derived using 2011 Census Journey to Work data with The Vale of Glamorgan 004 MSOA as the 'Place of Work'. 3) Staff traffic distribution derived from postcode data of existing staff at YD. The route between staff home locations and the development site has been determined using online route planning software for neutral weekday periods. The shortest/ quickest route has been used for assignment purposes. 4) No HGVs are generated by the proposed development during peak hour periods. 5) Locations and volume of traffic 'disappearing' off of the study network are shown in purple boxes.
	<b>Title</b>	Staff Traffic Assignment - PM Peak Hour (16:30-17:30)	<b>Checked</b>	MD	
	<b>Fig No.</b>	-	<b>Approved</b>	SP	
	<b>Client</b>	Vale of Glamorgan Council Education Department	<b>Verified</b>	JD	
	<b>Date</b>	11/11/2020	<b>Scale</b>	NTS	

## ***Local Highway Authority Response to PAC Submission***

## **Ysgol Y Deri Expansion (SEN School), Cosmeston**

### **PAC Consultation – Initial Highway observations and comments**

The Proposal is for the expansion of the current Ysgol Y Deri School located in Penarth to provide a secondary campus in Cosmeston. The proposed site lies immediately to the South of the future development of Cosmeston Farm which will include approximately 576 residential dwellings and a new primary school provision. The highway authority has commented below on the current information and proposals and given the suggested changes further consultation with the highway authority in the near future is welcomed to discuss any issues or queries with the suggested amendments.

The transport assessment referenced in these comments refer to the Transport Assessment dated December 2020 conducted by AECOM.

#### Vehicular Access

Section 3.3 of the Transport Assessment submitted indicates that there will be a new priority T-Junction onto the B4267 Lavernock Road. The highway authority would advise that given the number of accesses along Lavernock Road and the proposed new access for the future Cosmeston Farm development it is required that the school shall be accessed off Fort Road. This will require the localised widening of Fort Road up to the new access. There is currently a right hand turn lane on Lavernock Road for Fort Road. The Speed limit of Fort Road which is currently National Speed limit will also need to be moved past the proposed new school access and a limit of 30mph imposed from the junction with Lavernock Road/Fort Road and the new school access. The location of this access will also allow vehicular stacking along Fort Road.

Section 3.3.7 states that swept paths will be provided however a 15m Coach should be included in this assessment as well as an 11.2m refuse vehicle in accordance with Manual for Streets 2007.

#### Parking

In terms of the level of parking for the pick-up and drop off provision this is generally acceptable. However, the layout of the pick-up and drop off area is not favoured and this is required to be revised. A pick up and drop off area should be provided to allow safe parking of vehicles and to maintain free flow of traffic. The pick-up and drop off area should be provided as close to the school entrance as possible and kept separate from the staff parking area. As the vehicular access is to be amended this provision can be amended to suit. No bus/coach parking has been provided on site and this is required.

The highway authority would require clarification on the ancillary staff and their occupations. SEN schools require large amounts of support staff and classroom assistants and whilst they are not considered teachers a lot are full time and present throughout the school day. This is based on other SEN school operations so clarification on this would be welcomed to accurately determine the level of staff parking provided. A level of parking closer to the FTE amount might be more suitable.

The disabled parking provision has been provided with 4 spaces however given the nature of the proposed school the highway authority would recommend that more disabled parking

bays are provided on top of the current provision and again, these should be provided as nearby to the school entrance as possible. Many of the children will arrive in organised transport some vehicles being specially adapted so this needs to be taken into consideration.

The commercial space should be provided separate to the minibus parking bays. There is enough space on the site to provide separate parking areas for each provision required.

### Traffic Data

Section 2.6 of the TA indicates that the data used was from a survey undertaken on 27<sup>th</sup> November 2018 between the hours of 06:30 – 09:30 and 15:30 – 18:30. This is not considered a robust survey to accurately determine the traffic data. It is recognised and agreed with the TA that the current pandemic would mean that surveys undertaken today might not provide a true representation of the traffic usage along Lavernock Road and the surrounding highway network. It is advised that additional traffic survey data is provided and any surveys undertaken in the area should be sought as most recent as possible for us to make a determination on whether the data can be used. The afternoon time which starts at 15:30 is not considered accurate in determining school traffic data as often the peak school time begins earlier than this.

### Active Travel

As per the future development at Land at Cosmeston Farm, there is a proposal to provide a 3.5m shared cycleway/footway for the site frontage which will link up to the existing route to the North and provide a controlled crossing across Lavernock Road.

The Highway Authority would require that the development for Ysgol Y Deri should provide a equivalent route from its entrance to connect to the proposed route for the Cosmeston Farm development. This will provide excellent connectivity through the village, promote the use of sustainable transport for the YYD School, allow better implementation of the Travel Plan and enable safe walking routes from the YYD School to the surrounding area.

### Other Comments.

- Provide visibility splays on a drawing for the proposed new access.
- Ensure active travel route is illuminated.
- Look at any TRO's required for Fort Road or Lavernock Road in conjunction with our Traffic Management Section.
- Provide Travel Plan as early as possible for review.



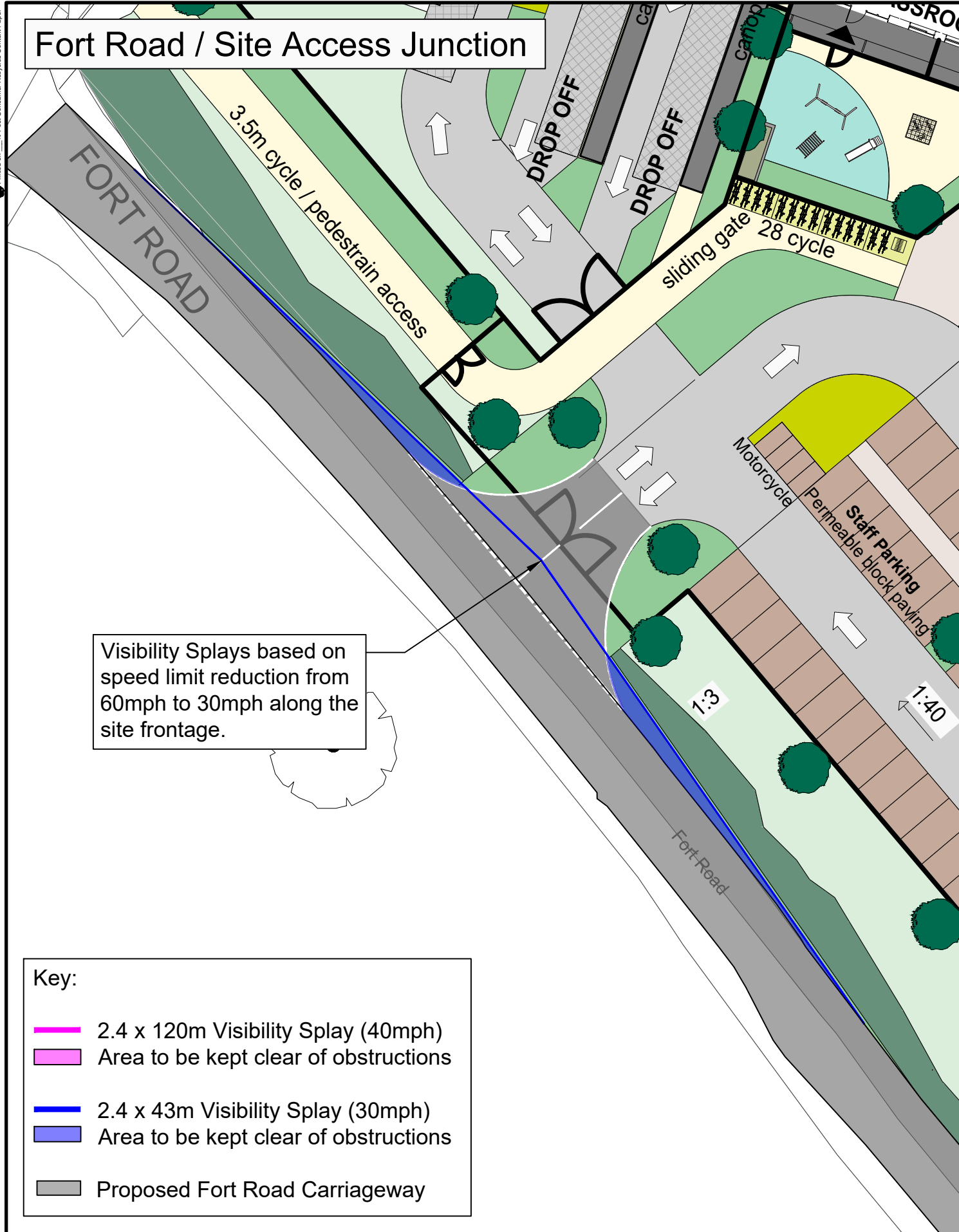
## Appendix C – Masterplan for ‘Land at Upper Cosmeston Farm’



## Appendix D – Visibility Splays and Swept Path Analysis (SPA)



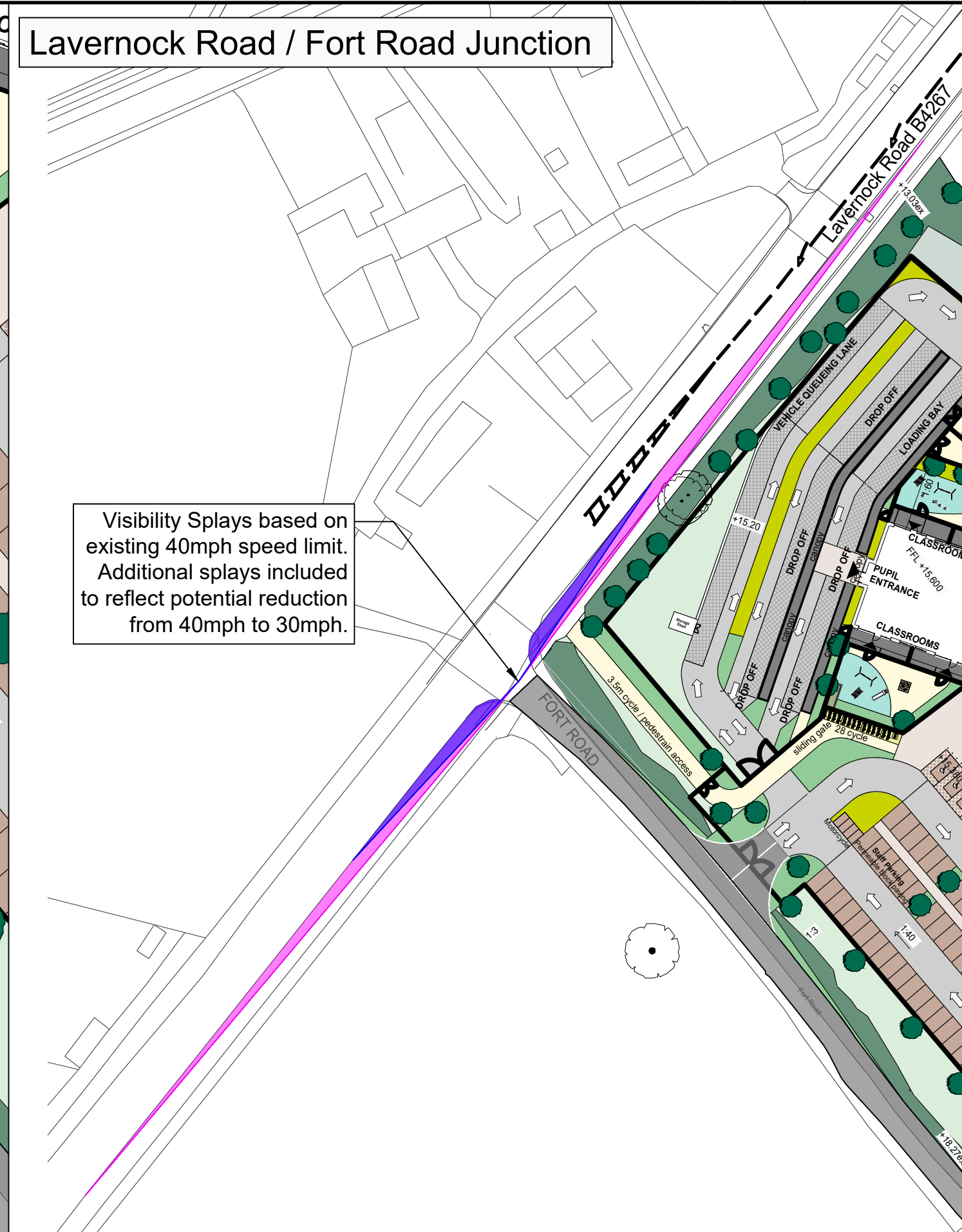
### Fort Road / Site Access Junction



Visibility Splays based on speed limit reduction from 60mph to 30mph along the site frontage.

- Key:**
- 2.4 x 120m Visibility Splay (40mph)
  - Area to be kept clear of obstructions
  - 2.4 x 43m Visibility Splay (30mph)
  - Area to be kept clear of obstructions
  - Proposed Fort Road Carriageway

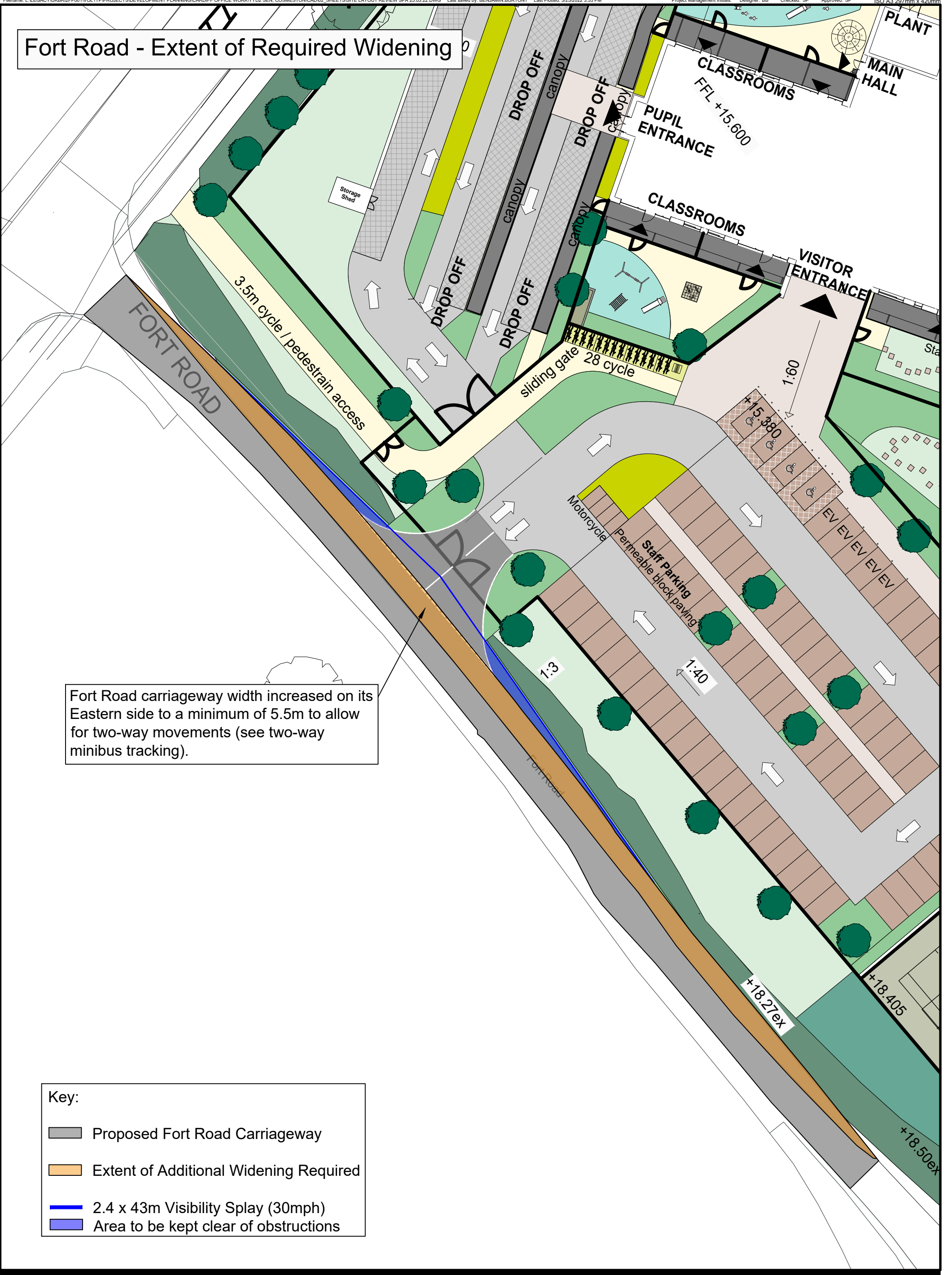
### Lavernock Road / Fort Road Junction



Visibility Splays based on existing 40mph speed limit. Additional splays included to reflect potential reduction from 40mph to 30mph.

Note: Indicative design shown. Exact detail to be confirmed through discussion with the Local Highway Authority.

# Fort Road - Extent of Required Widening



Fort Road carriageway width increased on its Eastern side to a minimum of 5.5m to allow for two-way movements (see two-way minibus tracking).

**Key:**

- Proposed Fort Road Carriageway
- Extent of Additional Widening Required
- 2.4 x 43m Visibility Splay (30mph)
- Area to be kept clear of obstructions

Note: Indicative design shown. Exact detail to be confirmed through discussion with the Local Highway Authority.



# Pedestrian / Cycle Access Junction

**Note:** Indicative design shown. Exact detail and extent to be confirmed through discussion with the Local Highway Authority.

Surface treatment to channel cyclists to the centre of the shared-use facility to allow for appropriate visibility splays. This could include cyclist-friendly bollards to encourage a reduction in speed within the vicinity of the proposed pedestrian / cycle access.




Set back 'x distance' of 1.0m, appropriate for cyclists stopping and joining the shared-use facility.

Bilingual lettering to advise pedestrians / cyclists to look in each direction prior to joining the adjacent shared path.

LOOK LEFT AND RIGHT

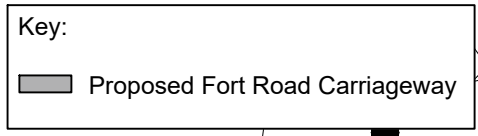
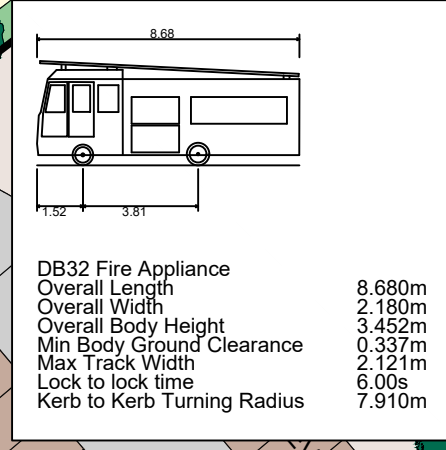
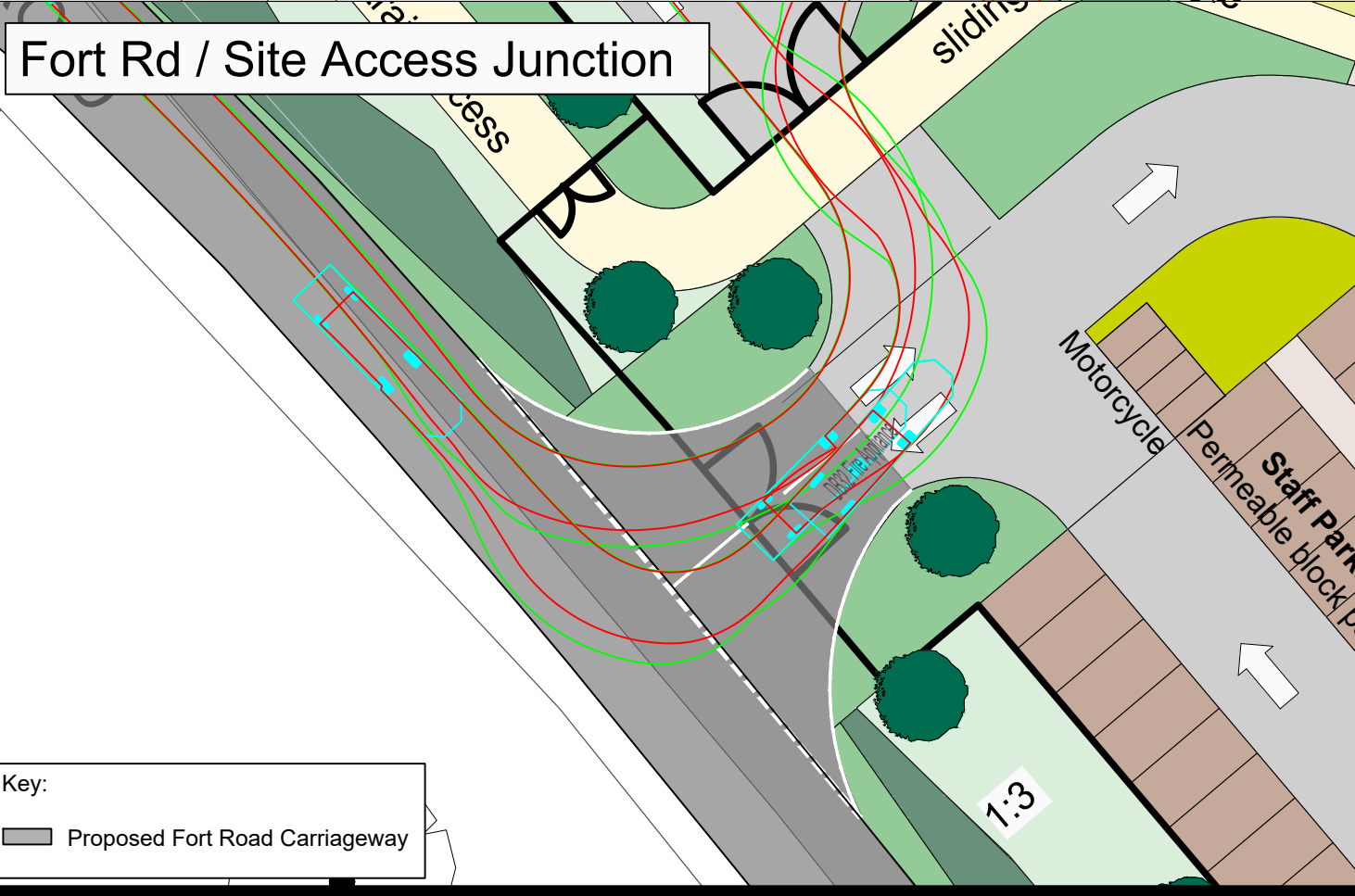
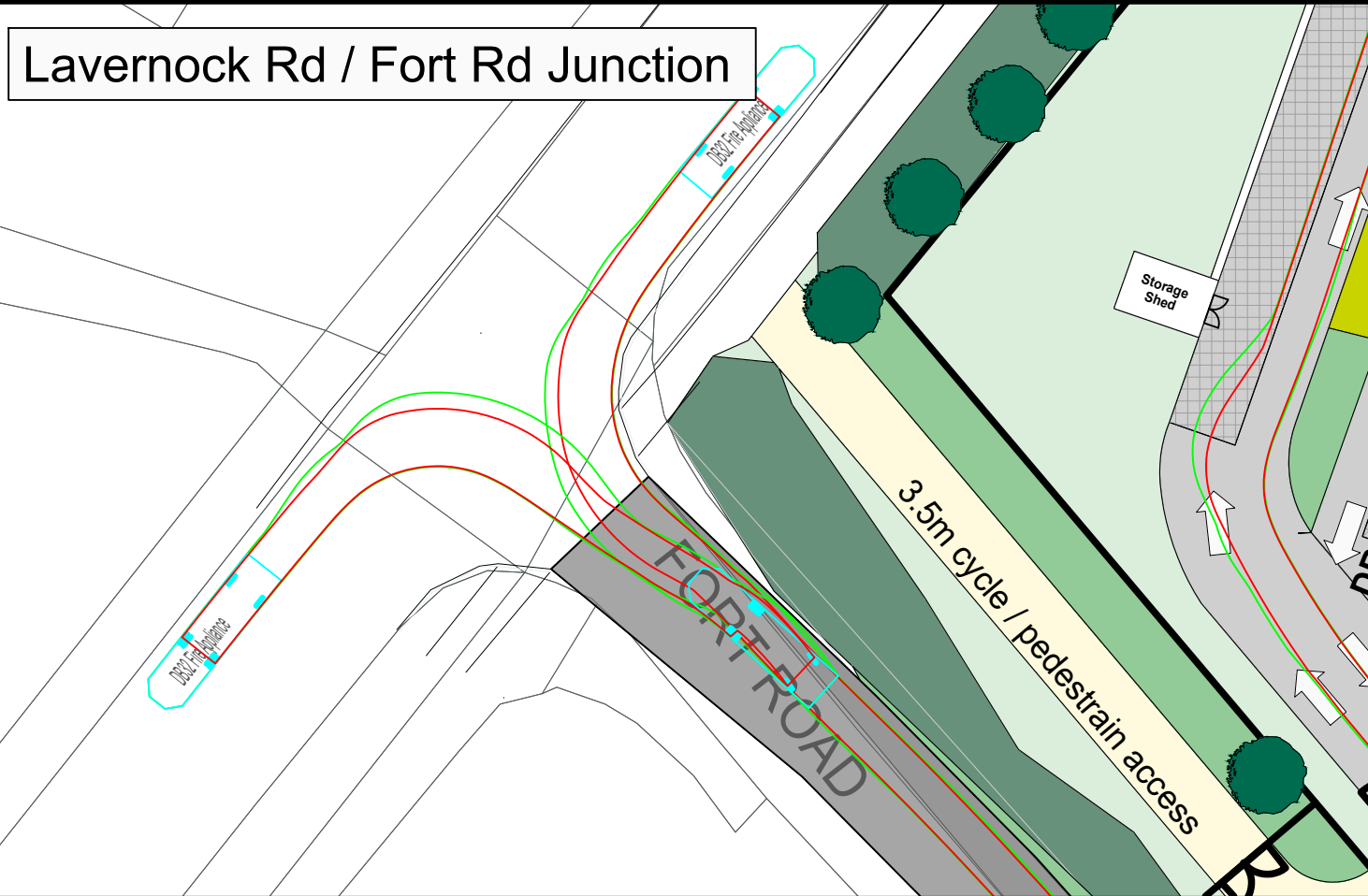
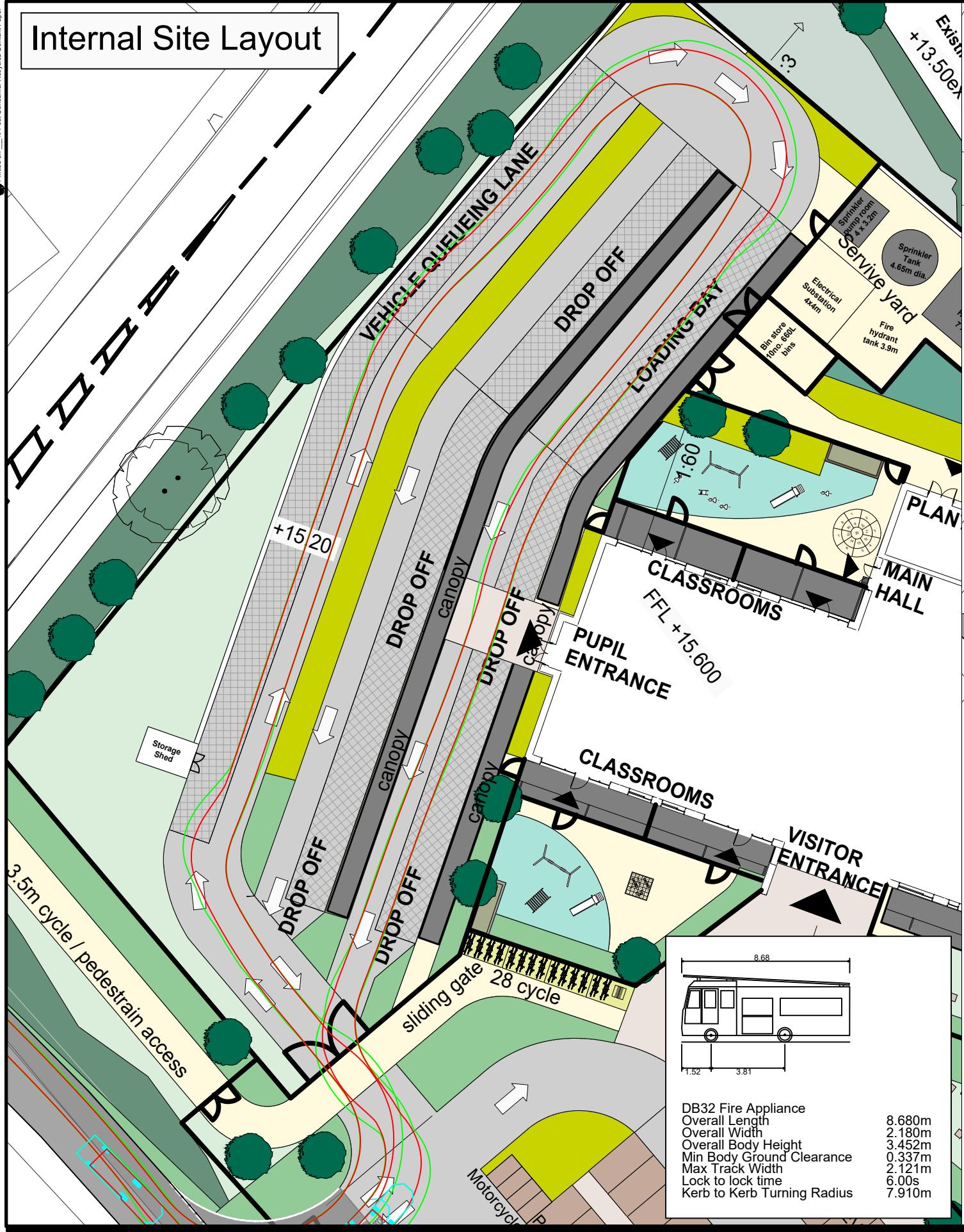
Storage Shed

**Key:**

-  2.4 x 2.4m Pedestrian Visibility Splay
-  Area to be kept clear of obstructions
-  Proposed Fort Road Carriageway

3.5m C





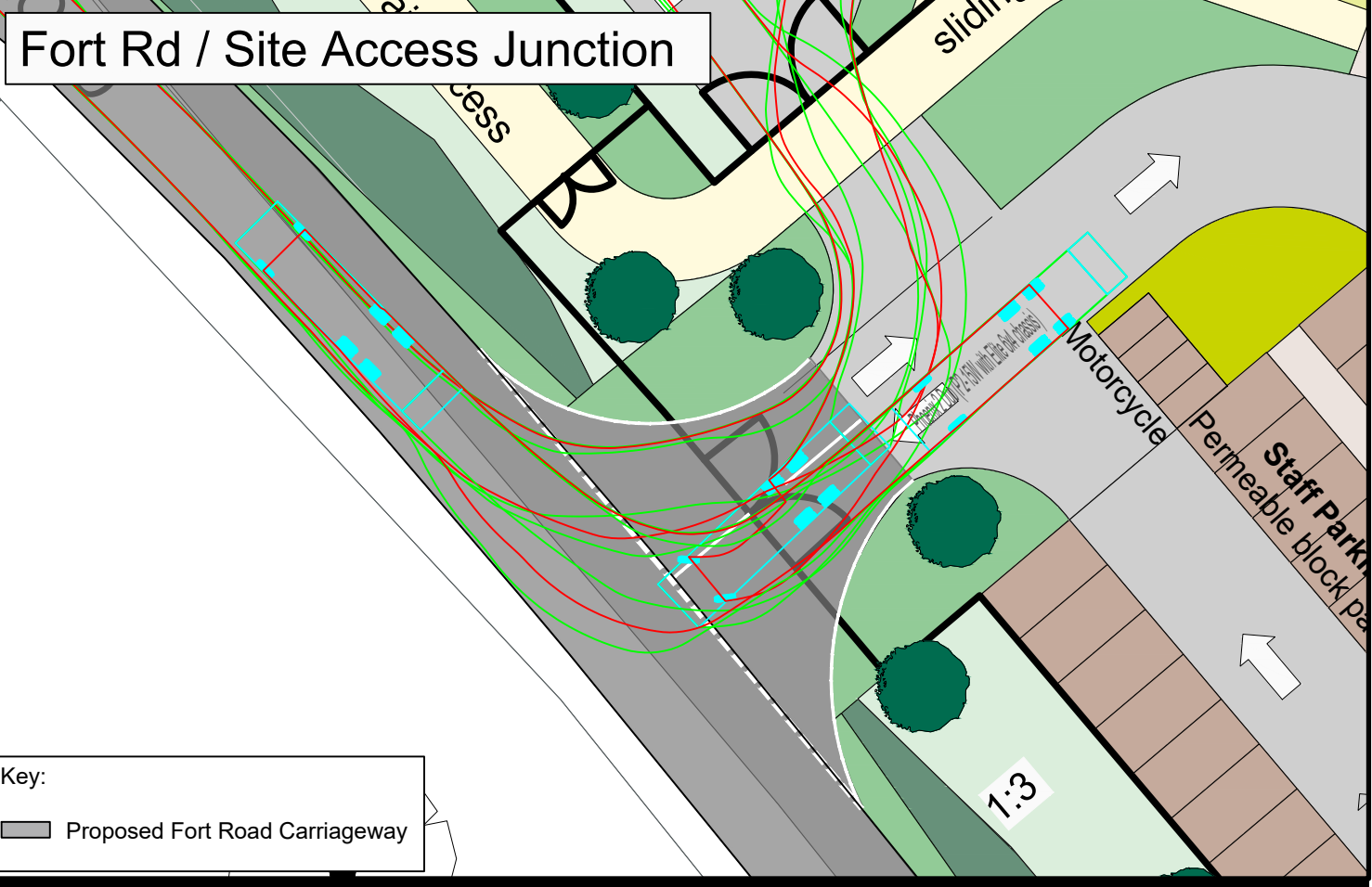
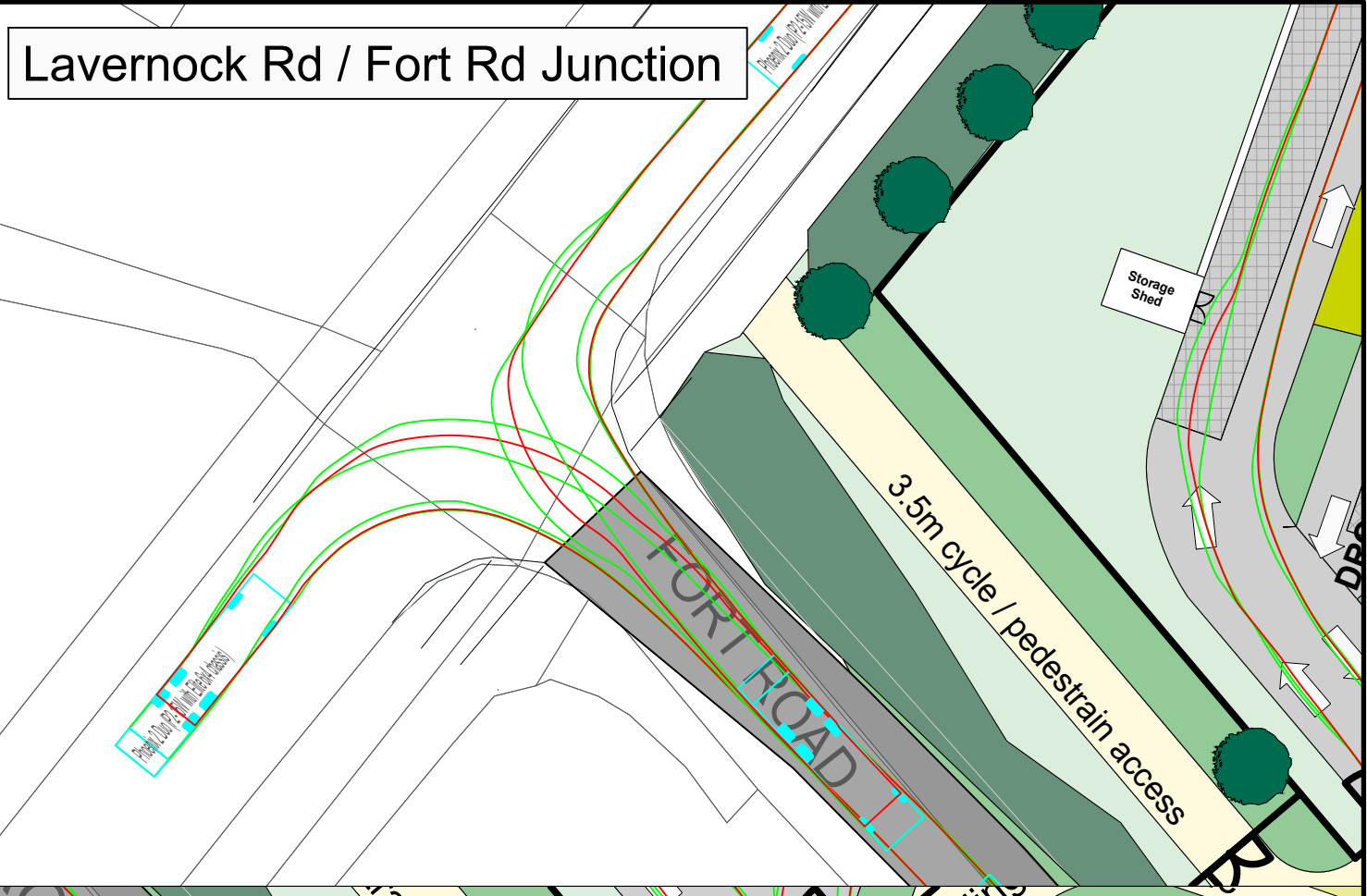
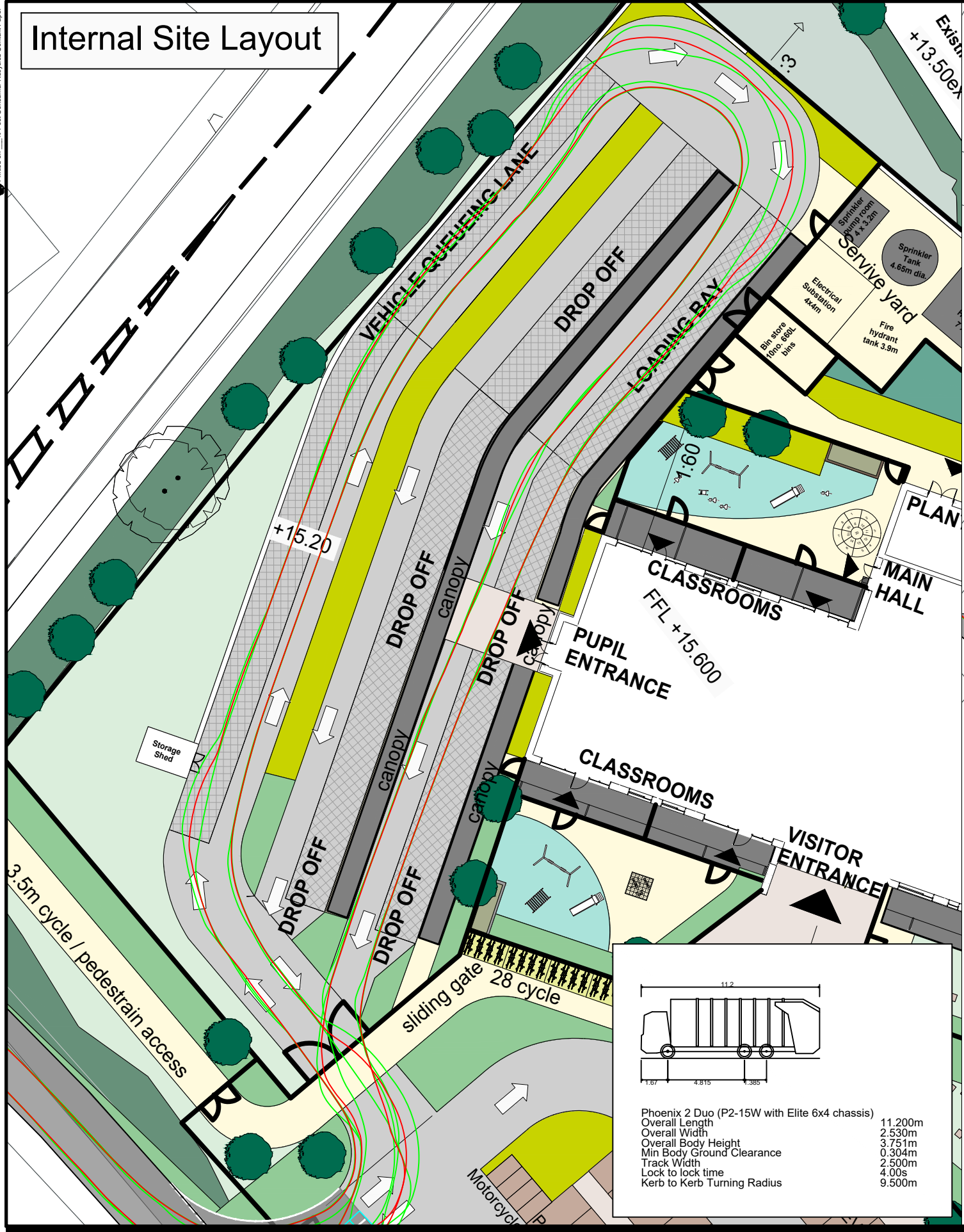
# Ysgol Y Deri Expansion

Transport Assessment  
Swept Path Analysis (SPA) of Site Layout - Fire Tender

Note: Indicative design shown. Exact detail to be confirmed through discussion with the Local Highway Authority.





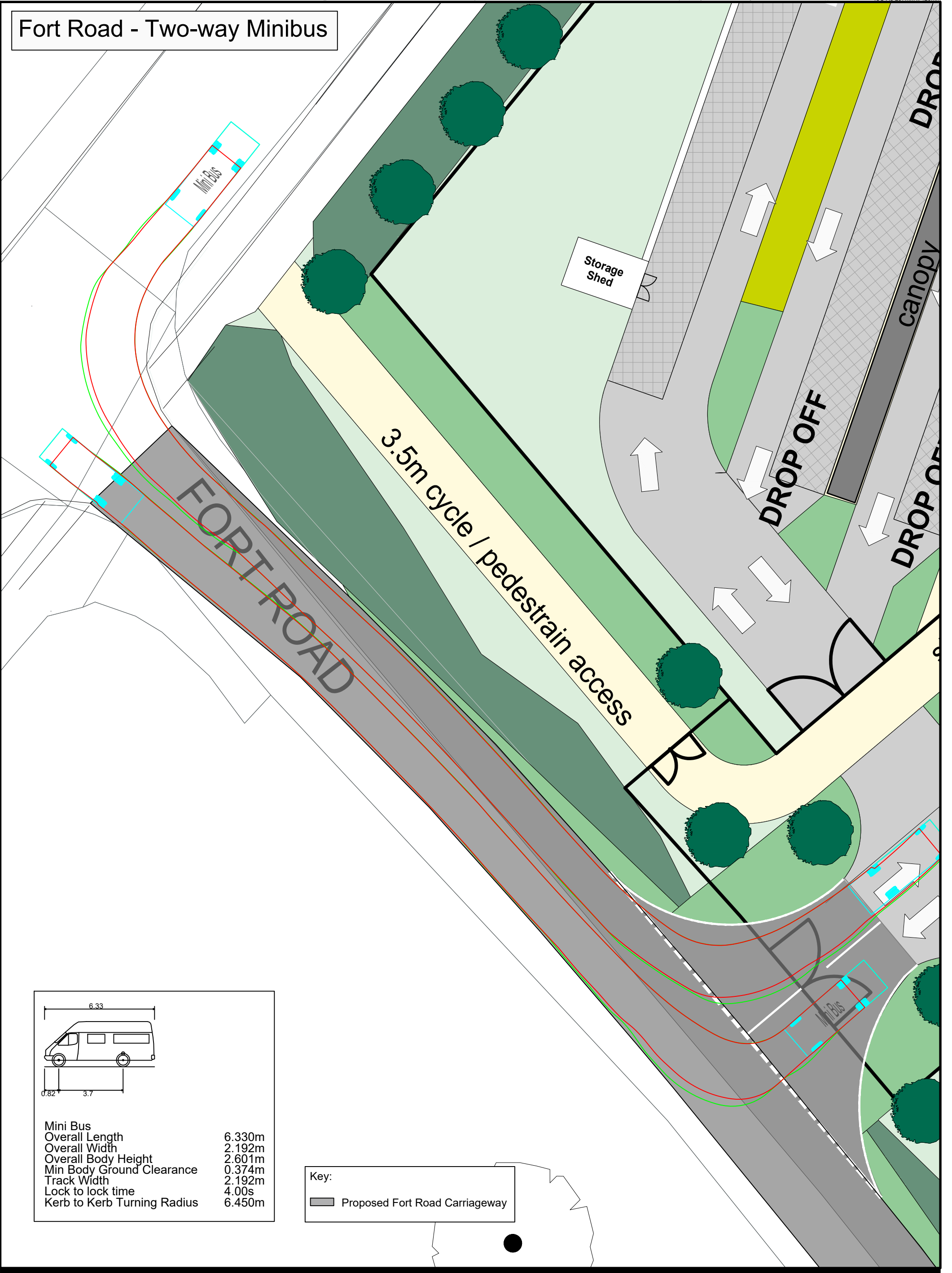


Note: Indicative design shown. Exact detail to be confirmed through discussion with the Local Highway Authority.





# Fort Road - Two-way 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

Key:
Proposed Fort Road Carriageway

## Ysgol Y Deri Expansion

Transport Assessment

Swept Path Analysis (SPA) of Site Layout - Minibus Passing

Note: Indicative design shown. Exact detail to be confirmed through discussion with the Local Highway Authority.



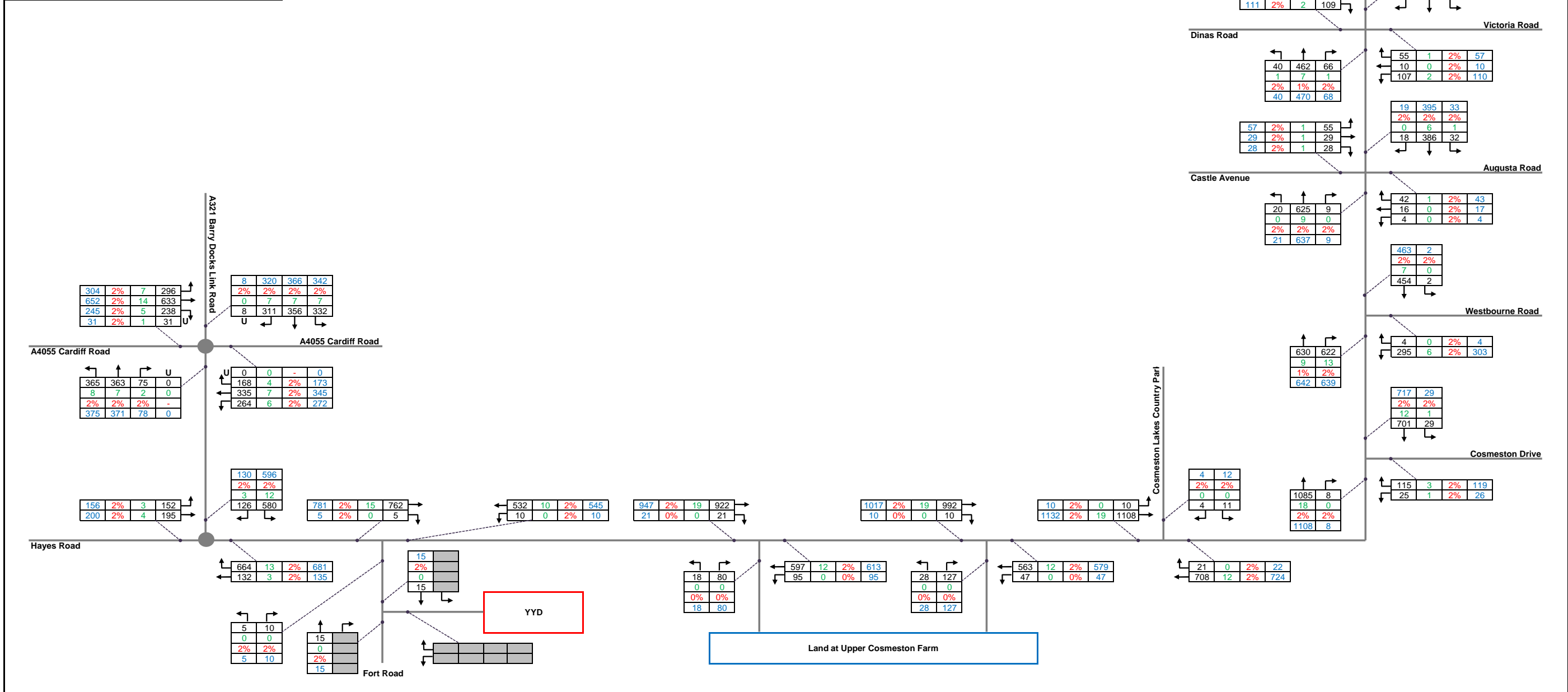
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## Appendix E – Traffic Flow Diagrams



**Key**

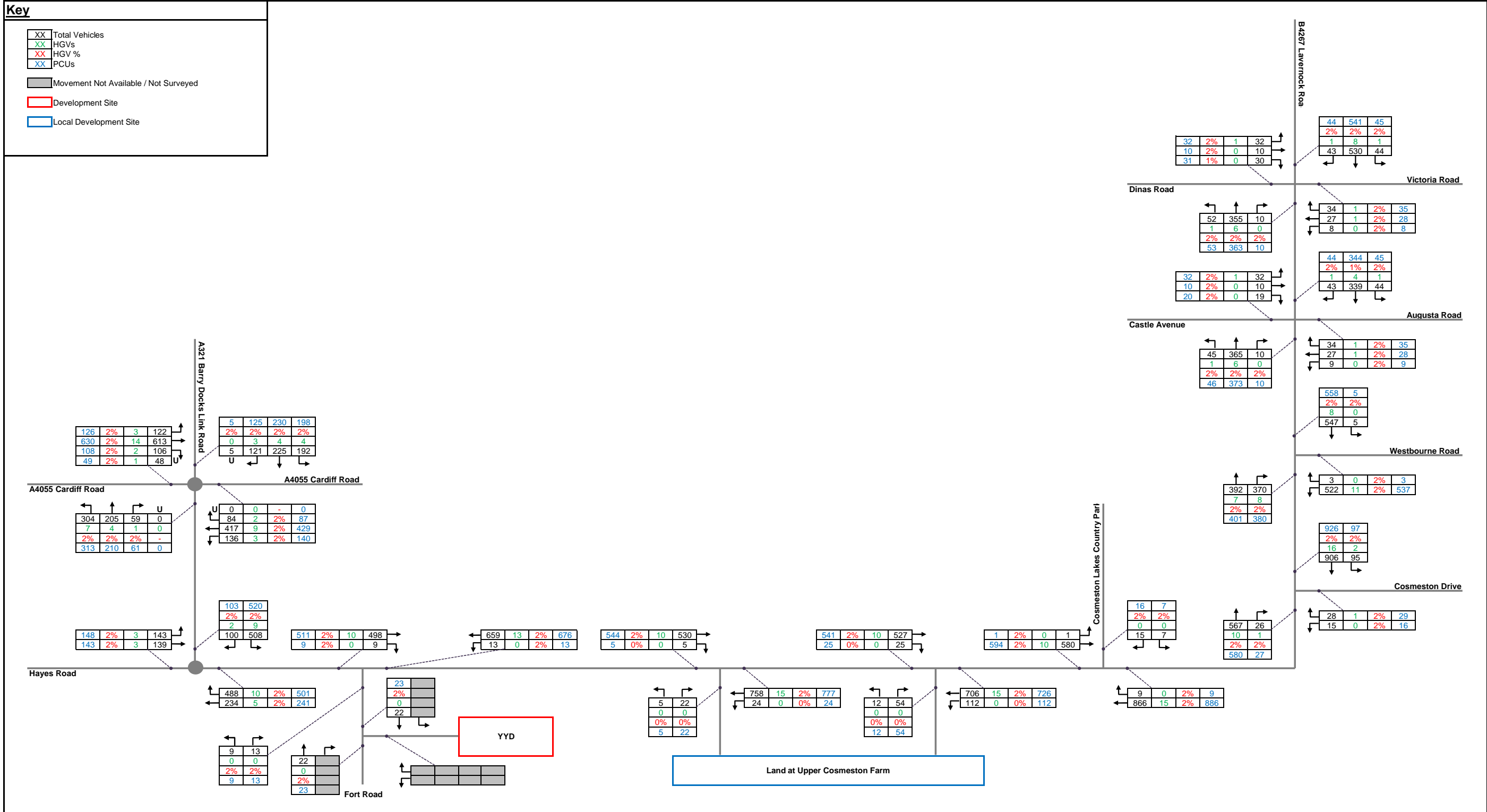
- XX Total Vehicles
- XX HGVs
- XX HGV %
- XX PCUs
- █ Movement Not Available / Not Surveyed
- ▭ Development Site
- ▭ Local Development Site



<p>AECOM 1 Callaghan Square Cardiff CF10 5BT 029 2067 4600 <a href="http://www.aecom.com">www.aecom.com</a></p>	<b>Project</b>	Ysgol Y Deri Expansion	<b>Drawn</b>	MP	<b>Notes:</b> 1. Traffic flows include 2019-2022 traffic growth and committed development.
	<b>Title</b>	Traffic Flows - 2022 Base: AM Peak Hour (07:45-08:45)	<b>Checked</b>	MD	
	<b>Fig No.</b>	-	<b>Approved</b>	SP	
	<b>Client</b>	Vale of Glamorgan Council Education Department	<b>Verified</b>	JD	
	<b>Date</b>	25/03/2022	<b>Scale</b>	NTS	



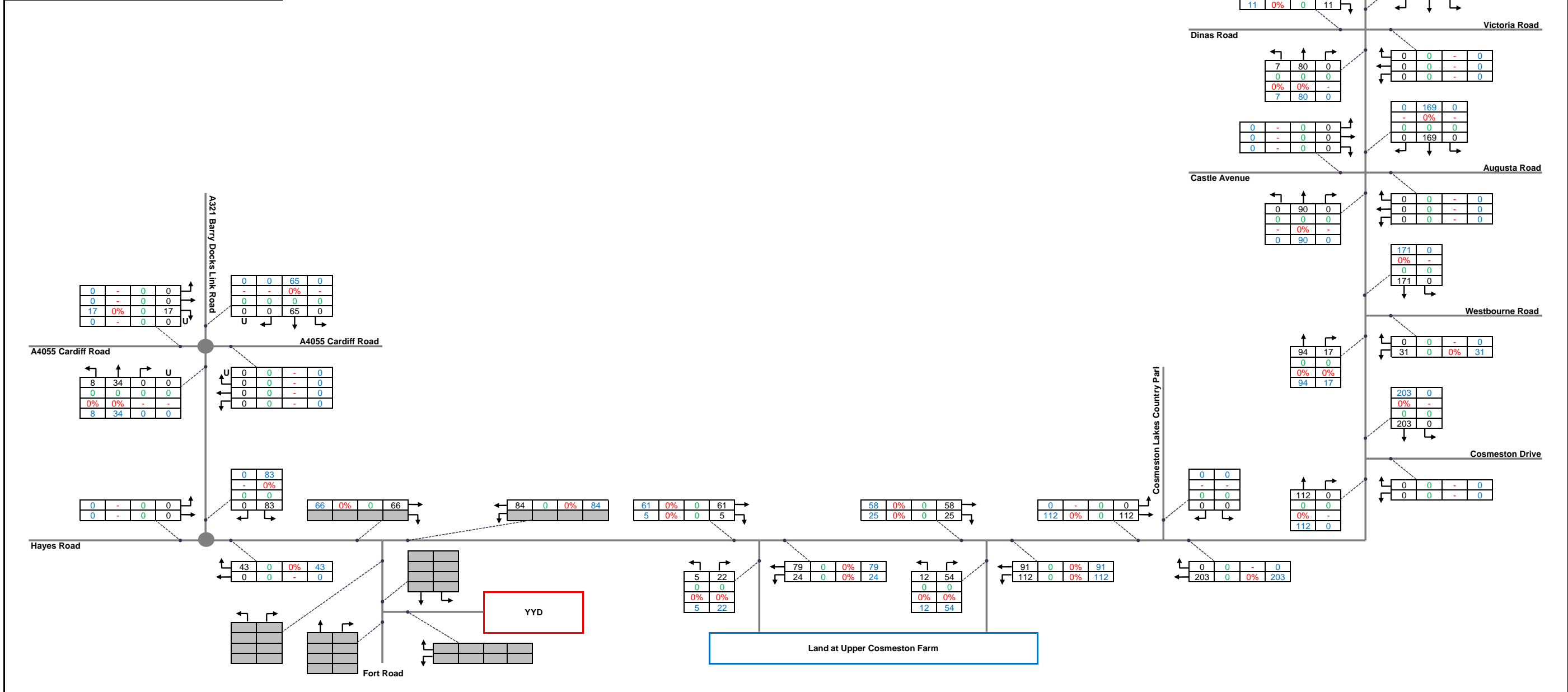
Key	
XX	Total Vehicles
XX	HGVs
XX	HGV %
XX	PCUs
■	Movement Not Available / Not Surveyed
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<p>AECOM 1 Callaghan Square Cardiff CF10 5BT 029 2067 4600 www.aecom.com</p>	<b>Project</b>	Ysgol Y Deri Expansion	<b>Drawn</b>	MP	<b>Notes:</b> 1. Traffic flows include 2019-2022 traffic growth and committed development.
	<b>Title</b>	Traffic Flows - 2022 Base: PM Peak Hour (16:30-17:30)	<b>Checked</b>	MD	
	<b>Fig No.</b>	-	<b>Approved</b>	SP	
	<b>Client</b>	Vale of Glamorgan Council Education Department	<b>Verified</b>	JD	
	<b>Date</b>	25/03/2022	<b>Scale</b>	NTS	



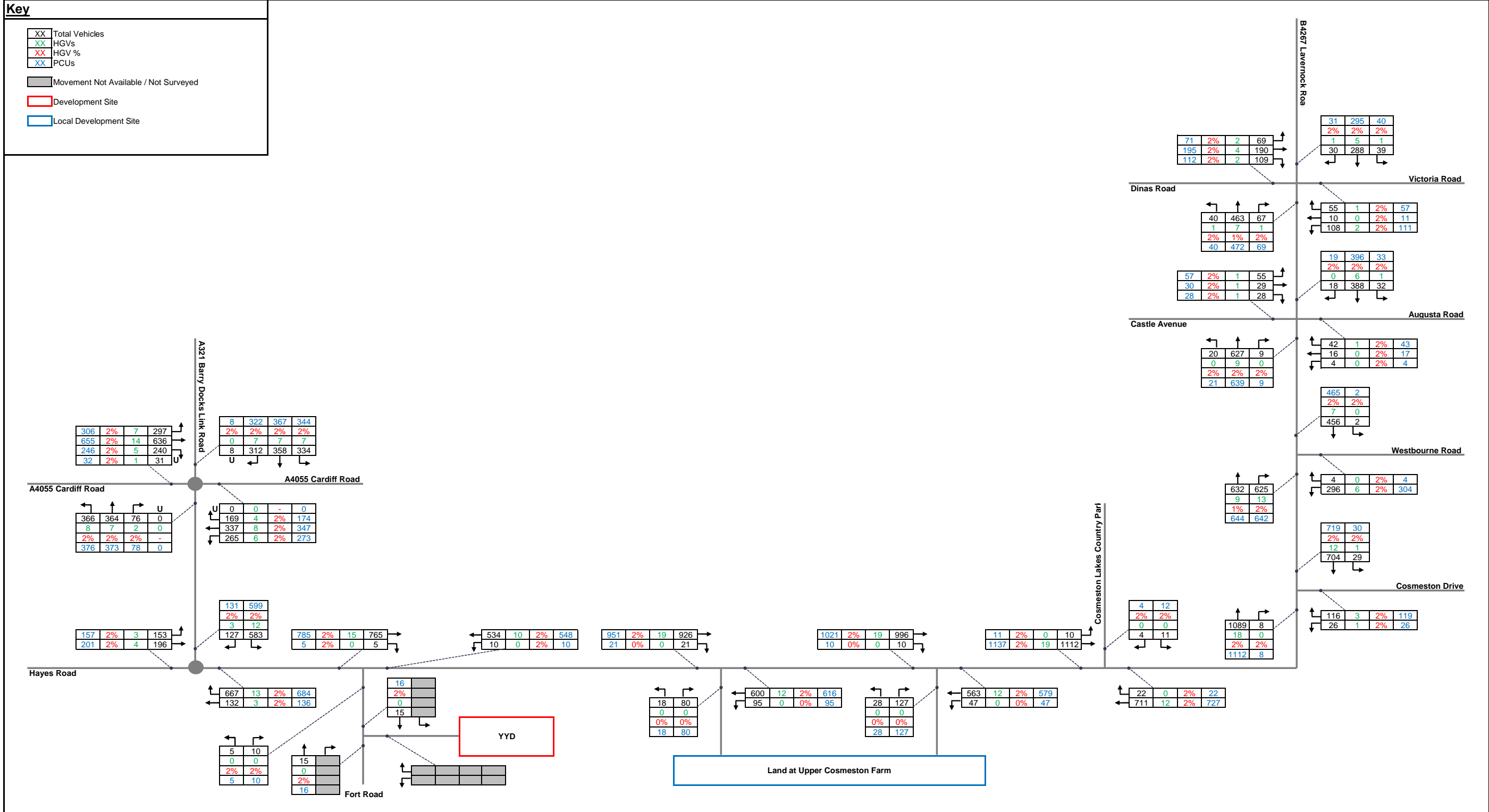
Key	
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XX	HGVs
XX	HGV %
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 AECOM 1 Callaghan Square Cardiff CF10 5BT 029 2067 4600 <a href="http://www.aecom.com">www.aecom.com</a>	<b>Project</b>	Ysgol Y Deri Expansion	<b>Drawn</b>	MP	<b>Notes:</b> 1. Traffic flows are for committed developments at 'Land at Upper Cosmeston Farm' (Reference: 2020/01170/OUT) and 'Land adjacent to Swanbridge Lane / Land South of Cog Road' (Reference: 2013/01279/2/CD).
	<b>Title</b>	Traffic Flows - Committed Development Flows: PM Peak Hour (16:30-17:30)	<b>Checked</b>	MD	
	<b>Fig No.</b>	-	<b>Approved</b>	SP	
	<b>Client</b>	Vale of Glamorgan Council Education Department	<b>Verified</b>	JD	
	<b>Date</b>	21/05/2021	<b>Scale</b>	NTS	

**Key**

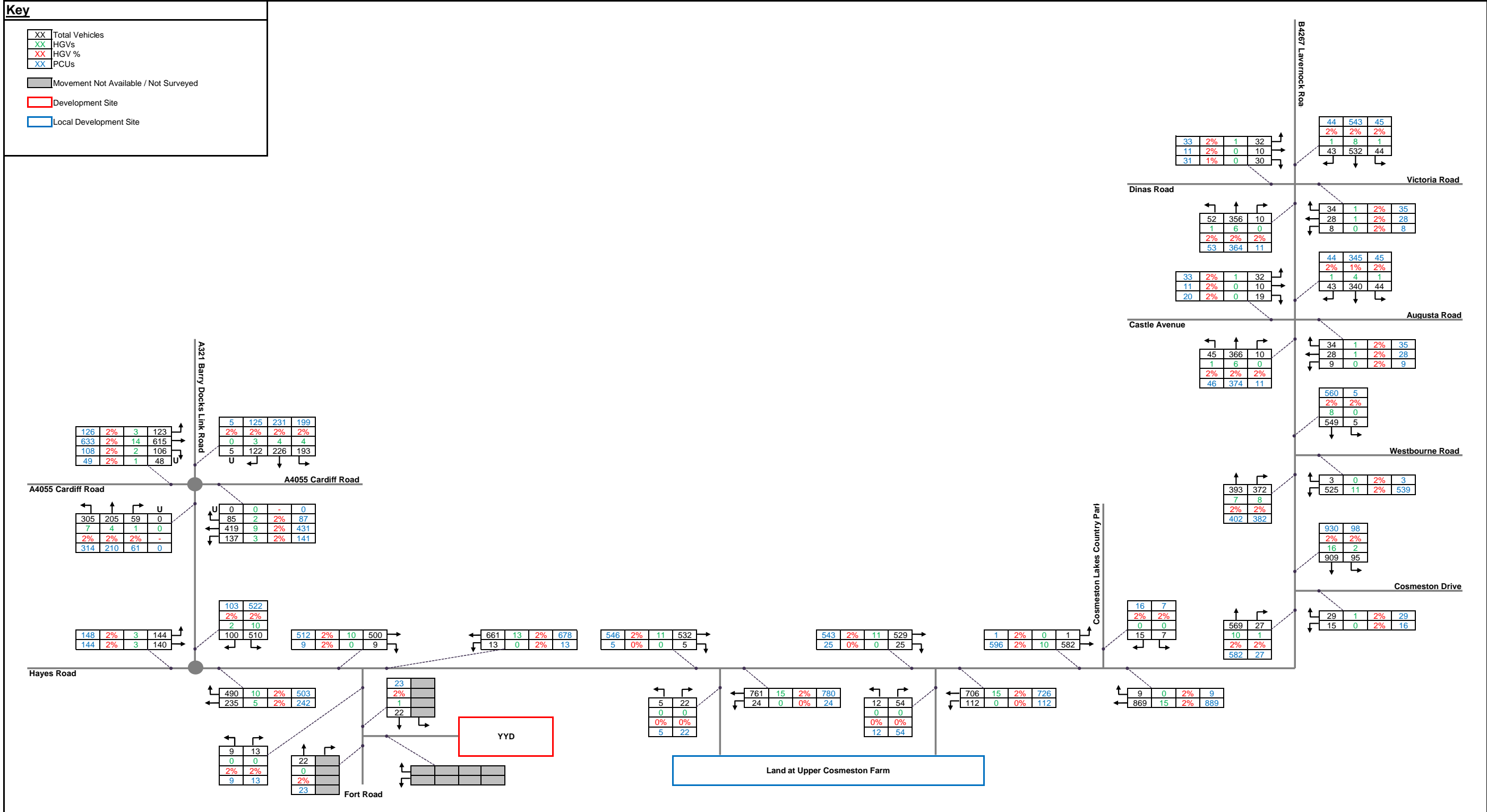
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- XX HGVs
- XX HGV %
- XX PCUs
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<p>AECOM 1 Callaghan Square Cardiff CF10 5BT 029 2067 4600 <a href="http://www.aecom.com">www.aecom.com</a></p>	<b>Project</b>	Ysgol Y Deri Expansion	<b>Drawn</b>	MP	<b>Notes:</b> 1. Traffic flows include 2019-2023 traffic growth and committed development.
	<b>Title</b>	Traffic Flows - 2023 Base: AM Peak Hour (07:45-08:45)	<b>Checked</b>	MD	
	<b>Fig No.</b>	-	<b>Approved</b>	SP	
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	<b>Date</b>	25/03/2022	<b>Scale</b>	NTS	

**Key**

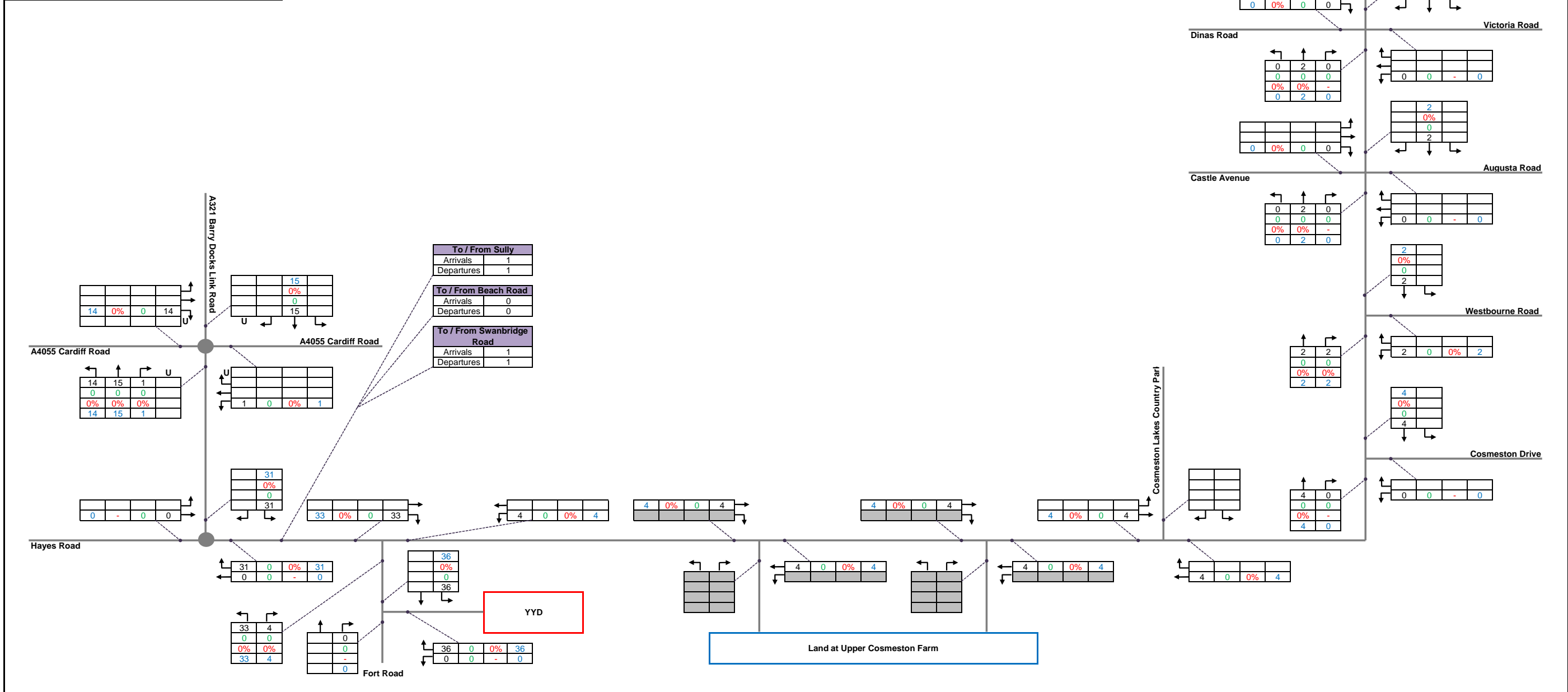
- XX Total Vehicles
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<p>AECOM 1 Callaghan Square Cardiff CF10 5BT 029 2067 4600 <a href="http://www.aecom.com">www.aecom.com</a></p>	<b>Project</b>	Ysgol Y Deri Expansion	<b>Drawn</b>	MP	<b>Notes:</b> 1. Traffic flows include 2019-2023 traffic growth and committed development.
	<b>Title</b>	Traffic Flows - 2023 Base: PM Peak Hour (16:30-17:30)	<b>Checked</b>	MD	
	<b>Fig No.</b>	-	<b>Approved</b>	SP	
	<b>Client</b>	Vale of Glamorgan Council Education Department	<b>Verified</b>	JD	
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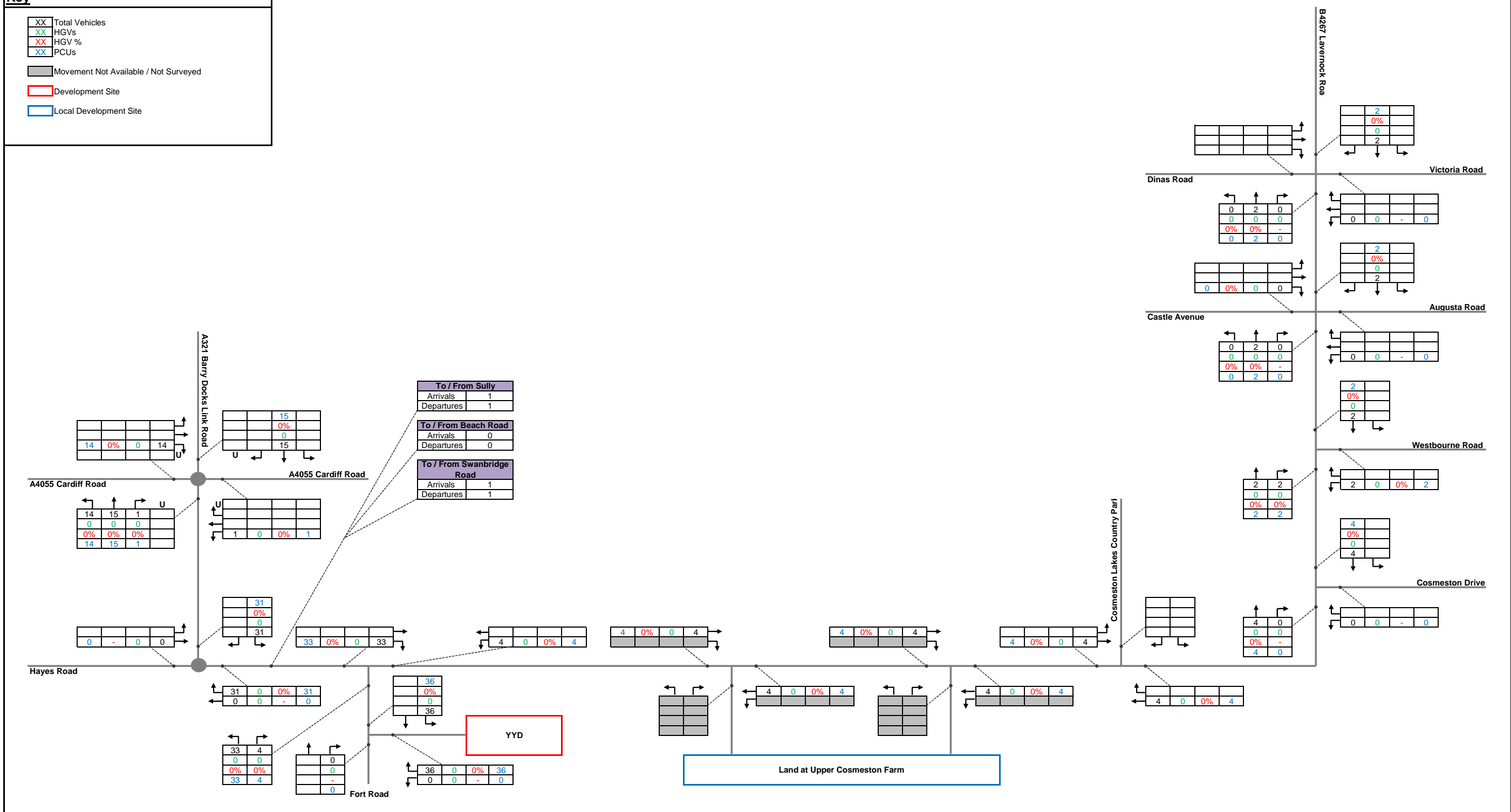


<p>AECOM 1 Callaghan Square Cardiff CF10 5BT 029 2067 4600 www.aecom.com</p>	<b>Project</b>	Ysgol Y Deri Expansion	<b>Drawn</b>	MP	<b>Notes:</b> 1. Pupil traffic generation determined pro-rotta from travel to existing YYD Campus. Traffic generation = 37 vehicles (74 movements) during the pupil drop-off / pick-up periods. 2. Pupil traffic distribution derived from postcode data of existing pupils at YYD. The route between pupil home locations and the development site has been determined using online route planning software for neutral weekday periods. The shortest / quickest route has been used for assignment purposes. 3. No HGVs are generated by pupil travel during peak hour periods. 4. Locations and volume of traffic 'disappearing' off of the study network are shown in purple boxes.
	<b>Title</b>	Traffic Flows - Proposed Development (Pupil Travel): AM Peak Hour (07:45-08:45)	<b>Checked</b>	MD	
	<b>Fig No.</b>	-	<b>Approved</b>	SP	
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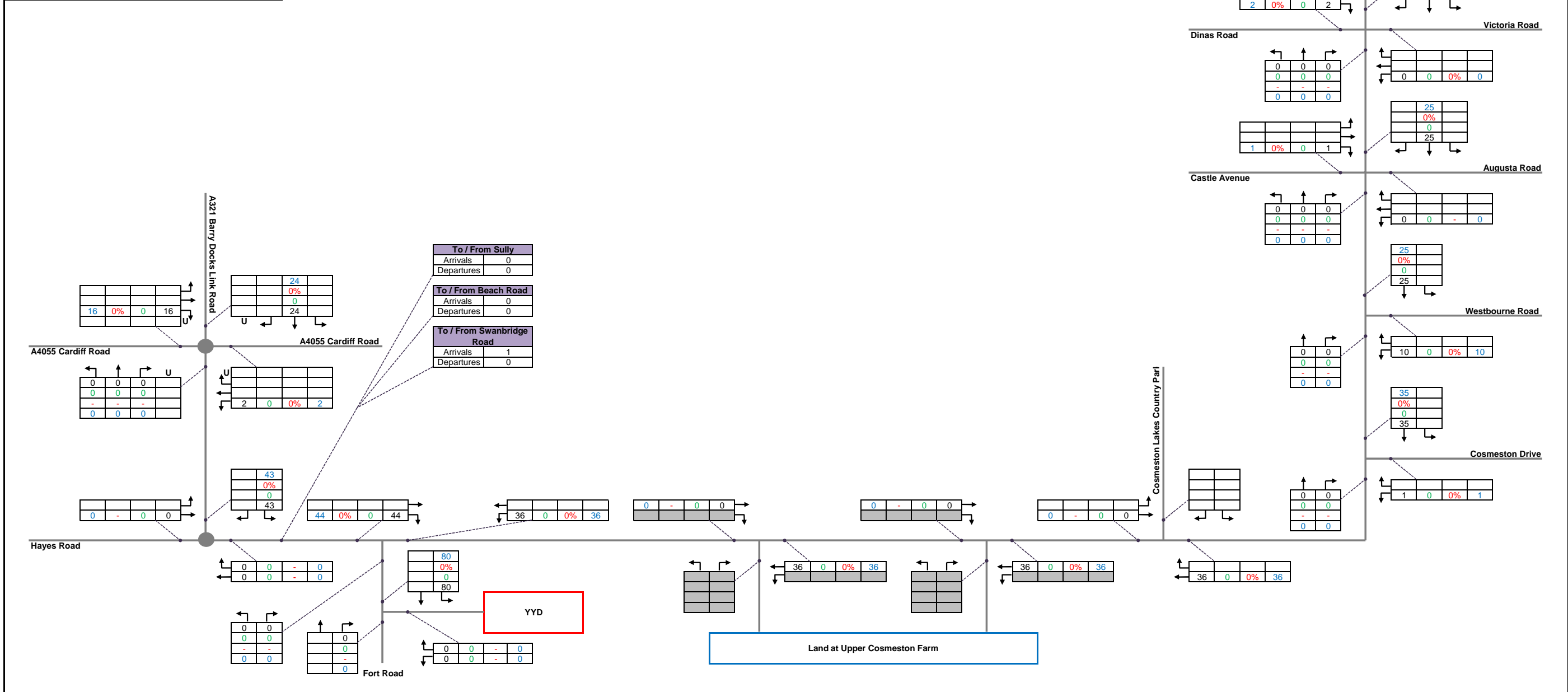
**Key**

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- XX HGV %
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	<b>Title</b>	Traffic Flows - Proposed Development (Pupil Travel): Collection Period (15:00-16:00)	<b>Checked</b>	MD	
	<b>Fig No.</b>	-	<b>Approved</b>	SP	
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	<b>Date</b>	21/05/2021	<b>Scale</b>	NTS	

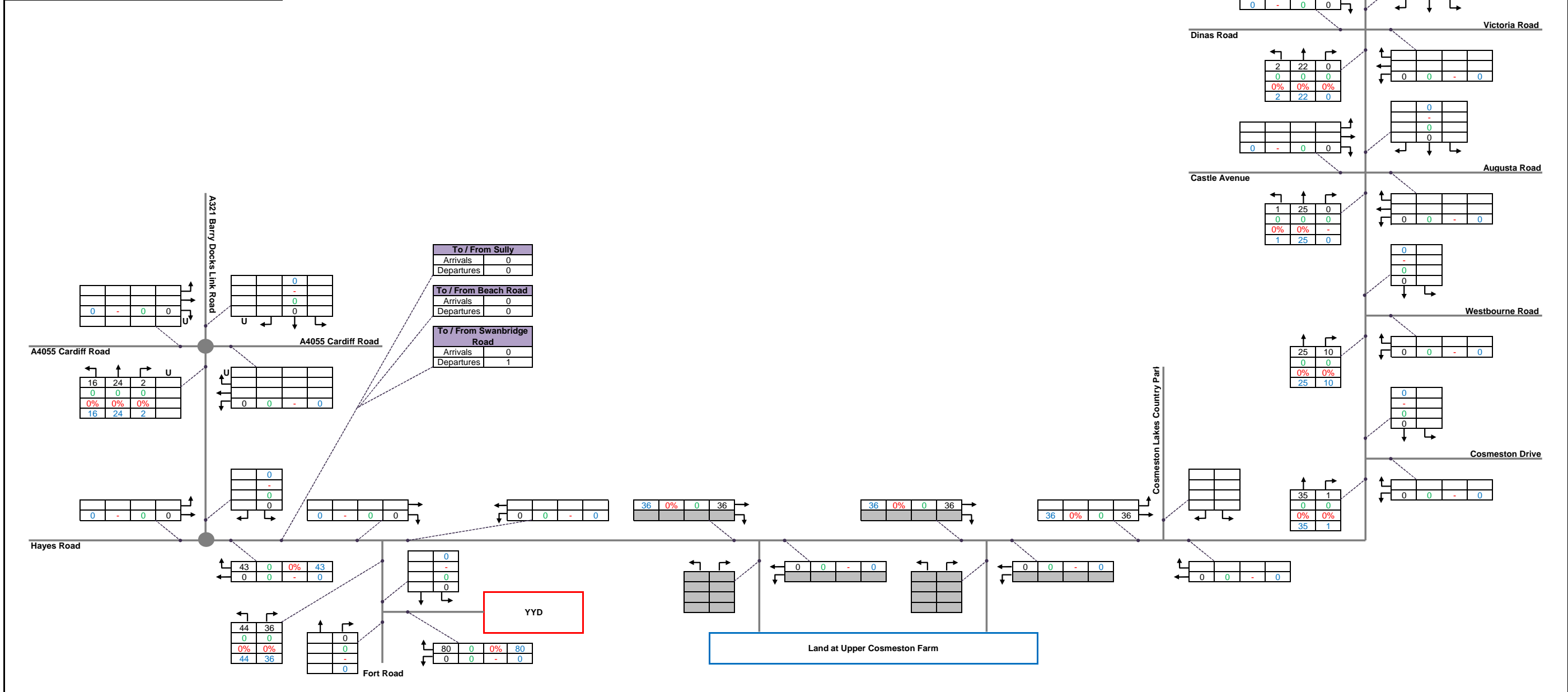
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XX	HGVs
XX	HGV %
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 AECOM 1 Callaghan Square Cardiff CF10 5BT 029 2067 4600 <a href="http://www.aecom.com">www.aecom.com</a>	<b>Project</b>	Ysgol Y Deri Expansion	<b>Drawn</b>	MP	<b>Notes:</b> 1. Staff traffic generation determined by applying a mode share to proposed number of staff (103). The mode share has been derived using 2011 Census 'Journey to Work' data with 'The Vale of Glamorgan 004' MSOA as the 'Place of Work'. 2. Staff traffic distribution derived from postcode data of existing staff at YYD. The route between staff home locations and the development site has been determined using online route planning software for neutral weekday periods. The shortest / quickest route has been used for assignment purposes. 3. No HGVs are generated by staff travel during peak hour periods. 4. Locations and volume of traffic 'disappearing' off of the study network are shown in purple boxes.
	<b>Title</b>	Traffic Flows - Proposed Development (Staff Travel): AM Peak Hour (07:45-08:45)	<b>Checked</b>	MD	
	<b>Fig No.</b>	-	<b>Approved</b>	SP	
	<b>Client</b>	Vale of Glamorgan Council Education Department	<b>Verified</b>	JD	
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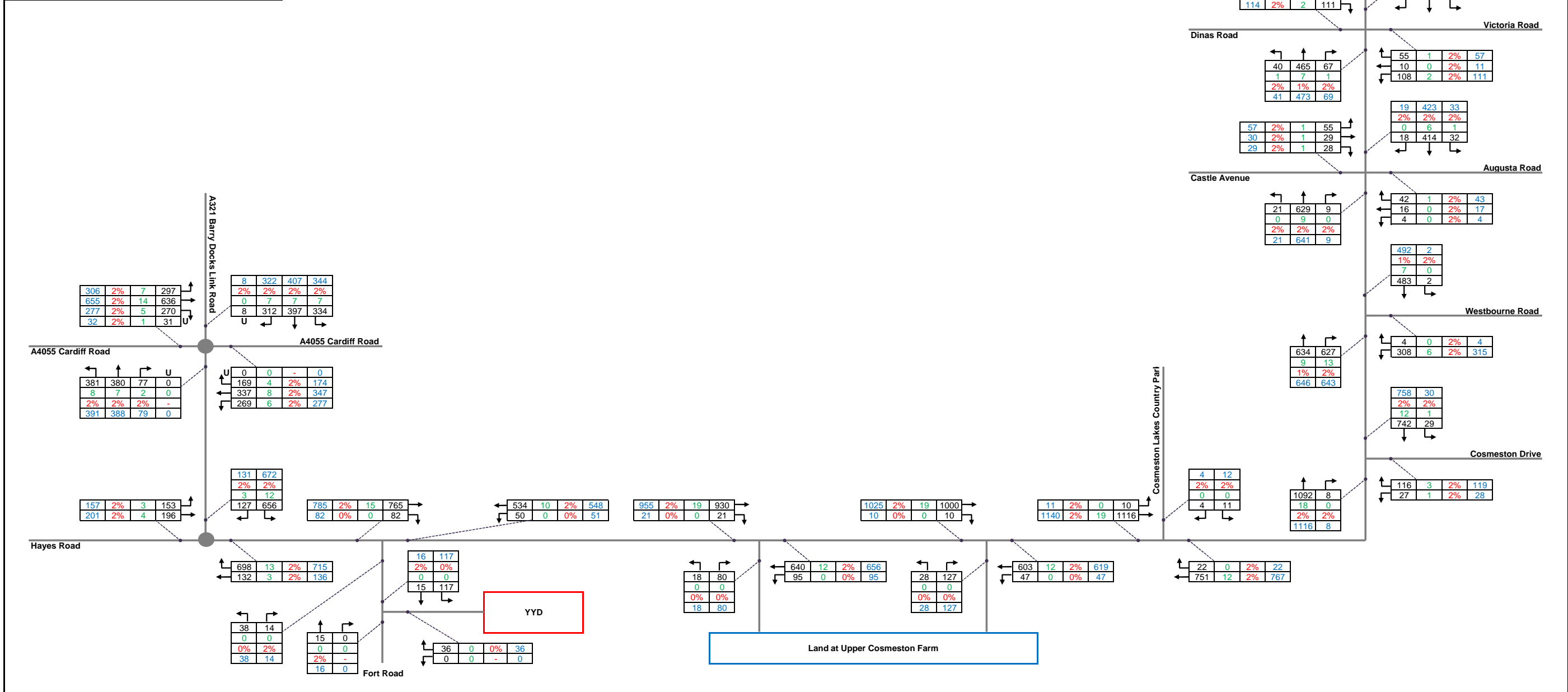
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	<b>Title</b>	Traffic Flows - Proposed Development (Staff Travel): PM Peak Hour (16:30-17:30)	<b>Checked</b>	MD	
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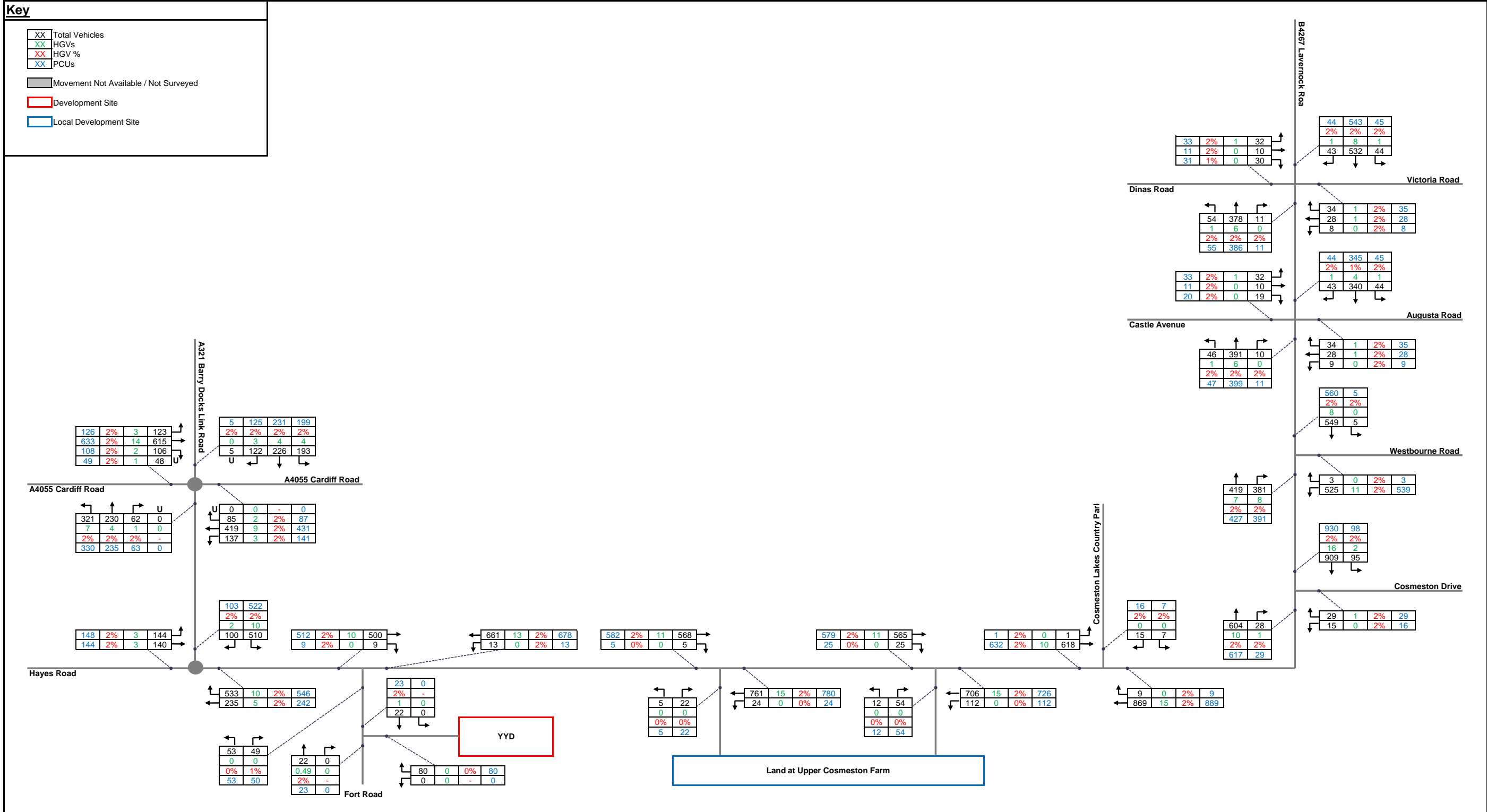
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- █ Movement Not Available / Not Surveyed
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<p>AECOM 1 Callaghan Square Cardiff CF10 5BT 029 2067 4600 www.aecom.com</p>	<b>Project</b>	Ysgol Y Deri Expansion	<b>Drawn</b>	MP	<b>Notes:</b> 1. Traffic flows are '2023 Base' flows with the addition of proposed development traffic (pupil and staff).
	<b>Title</b>	Traffic Flows - 2023 Base + Development: AM Peak Hour (07:45-08:45)	<b>Checked</b>	MD	
	<b>Fig No.</b>	-	<b>Approved</b>	SP	
	<b>Client</b>	Vale of Glamorgan Council Education Department	<b>Verified</b>	JD	
	<b>Date</b>	25/03/2022	<b>Scale</b>	NTS	

**Key**

- XX Total Vehicles
- XX HGVs
- XX HGV %
- XX PCUs
- Movement Not Available / Not Surveyed
- Development Site
- Local Development Site



<p>AECOM 1 Callaghan Square Cardiff CF10 5BT 029 2067 4600 www.aecom.com</p>	<b>Project</b>	Ysgol Y Deri Expansion	<b>Drawn</b>	MP	<b>Notes:</b> 1. Traffic flows are '2023 Base' flows with the addition of proposed development traffic (staff). 2. Pupil departure trips are not included as these fall between 15:00-16:00 (outside the peak hour assessment).
	<b>Title</b>	Traffic Flows - 2023 Base + Development: PM Peak Hour (16:30-17:30)	<b>Checked</b>	MD	
	<b>Fig No.</b>	-	<b>Approved</b>	SP	
	<b>Client</b>	Vale of Glamorgan Council Education Department	<b>Verified</b>	JD	
	<b>Date</b>	25/03/2022	<b>Scale</b>	NTS	



## Appendix F – Junction Modelling Output Reports

Junctions 9
PICADY 9 - Priority Intersection Module
Version: 9.5.1.7462 © Copyright TRL Limited, 2019
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**Filename:** B4267 Lavernock Road\_Fort Road EXISTING.j9  
**Path:** L:\Legacy\UKBRI2FP001\VOL1TP\projects\Development Planning\Cardiff Office Work\YYD2 SEN, Cosmeston\Modelling  
**Report generation date:** 25/03/2022 16:51:19

- »2022 Base, AM
- »2022 Base, PM
- »2023 Base, AM
- »2023 Base, PM

**Summary of junction performance**

	AM				PM			
	Set ID	Queue (PCU)	Delay (s)	RFC	Set ID	Queue (PCU)	Delay (s)	RFC
<b>2022 Base</b>								
Stream B-C	D1	0.0	8.05	0.01	D2	0.0	8.40	0.02
Stream B-A		0.0	16.47	0.05		0.1	16.29	0.06
Stream C-AB		0.0	6.54	0.01		0.0	7.14	0.02
<b>2023 Base</b>								
Stream B-C	D3	0.0	8.07	0.01	D4	0.0	8.41	0.02
Stream B-A		0.1	16.58	0.05		0.1	16.34	0.06
Stream C-AB		0.0	6.56	0.01		0.0	7.15	0.02

There are warnings associated with one or more model runs - see the 'Data Errors and Warnings' tables for each Analysis or Demand Set.

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

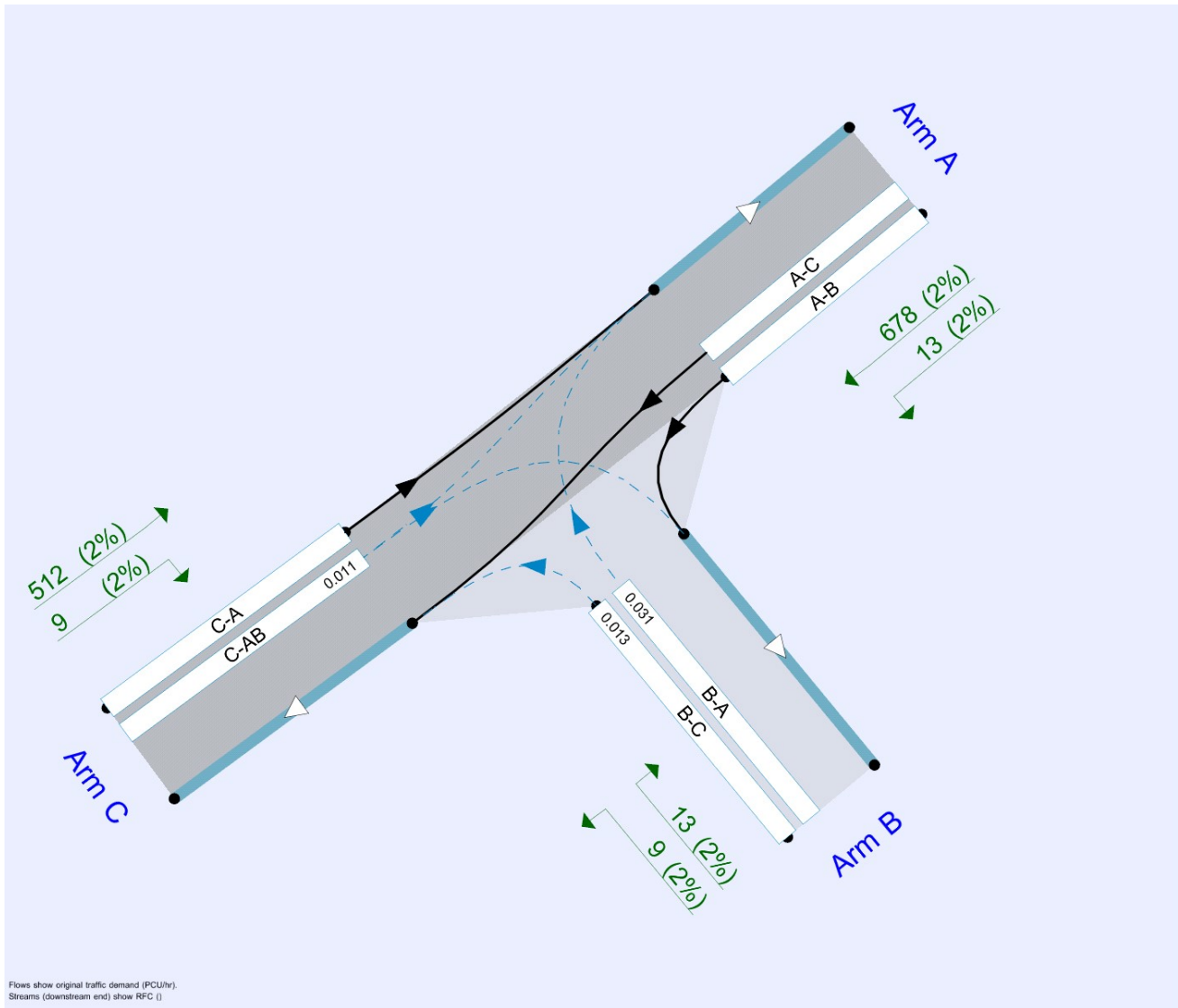
**File summary**

**File Description**

<b>Title</b>	
<b>Location</b>	
<b>Site number</b>	
<b>Date</b>	24/03/2022
<b>Version</b>	
<b>Status</b>	(new file)
<b>Identifier</b>	
<b>Client</b>	
<b>Jobnumber</b>	
<b>Enumerator</b>	EU\Benjamin.Burton1
<b>Description</b>	

**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



The junction diagram reflects the last run of Junctions.

### Analysis Options

Calculate Queue Percentiles	Calculate residual capacity	RFC Threshold	Average Delay threshold (s)	Queue threshold (PCU)
		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)
D1	2022 Base	AM	ONE HOUR	07:30	09:00	15
D2	2022 Base	PM	ONE HOUR	16:15	17:45	15
D3	2023 Base	AM	ONE HOUR	07:30	09:00	15
D4	2023 Base	PM	ONE HOUR	16:15	17:45	15

### Analysis Set Details

ID	Network flow scaling factor (%)
A1	100.000

# 2022 Base, AM

## Data Errors and Warnings

Severity	Area	Item	Description
Warning	Minor arm flare	Arm B - Minor arm geometry	Is flare very short? Estimated flare length is zero but has been increased to 1 because a zero flare length is not allowed.

## Junction Network

### Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		0.18	A

### Junction Network Options

Driving side	Lighting
Left	Normal/unknown

## Arms

### Arms

Arm	Name	Description	Arm type
A	B4267 Lavernock Road N		Major
B	Fort Road		Minor
C	B4267 Lavernock Road S		Major

### Major Arm Geometry

Arm	Width of carriageway (m)	Has kerbed central reserve	Has right turn bay	Width for right turn (m)	Visibility for right turn (m)	Blocks?	Blocking queue (PCU)
C	6.00		✓	2.50	250.0	✓	6.00

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	Width at give-way (m)	Width at 5m (m)	Width at 10m (m)	Width at 15m (m)	Width at 20m (m)	Estimate flare length	Flare length (PCU)	Visibility to left (m)	Visibility to right (m)
B	One lane plus flare	7.63	3.33	2.85	2.38	2.20	✓	1.00	19	15

## 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	499	0.091	0.230	0.144	0.328
B-C	610	0.093	0.236	-	-
C-B	742	0.288	0.288	-	-

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)
D1	2022 Base	AM	ONE HOUR	07:30	09:00	15

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.00

### Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		✓	555	100.000
B		✓	15	100.000
C		✓	786	100.000

## Origin-Destination Data

### Demand (PCU/hr)

	To			
	A	B	C	
From	A	0	10	545
	B	10	0	5
	C	781	5	0

## Vehicle Mix

### Heavy Vehicle Percentages

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

## Results

### Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
B-C	0.01	8.05	0.0	A
B-A	0.05	16.47	0.0	C
C-AB	0.01	6.54	0.0	A
C-A				
A-B				
A-C				



### Main Results for each time segment

#### 07:30 - 07:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	4	509	0.007	4	0.0	7.263	A
B-A	8	318	0.024	7	0.0	11.834	B
C-AB	4	622	0.006	4	0.0	5.938	A
C-A	588			588			
A-B	8			8			
A-C	410			410			

#### 07:45 - 08:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	4	489	0.009	4	0.0	7.572	A
B-A	9	282	0.032	9	0.0	13.423	B
C-AB	4	599	0.008	4	0.0	6.178	A
C-A	702			702			
A-B	9			9			
A-C	490			490			

#### 08:00 - 08:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	6	461	0.012	5	0.0	8.052	A
B-A	11	234	0.047	11	0.0	16.464	C
C-AB	6	566	0.010	5	0.0	6.544	A
C-A	860			860			
A-B	11			11			
A-C	600			600			

#### 08:15 - 08:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	6	461	0.012	6	0.0	8.053	A
B-A	11	234	0.047	11	0.0	16.475	C
C-AB	6	566	0.010	6	0.0	6.544	A
C-A	860			860			
A-B	11			11			
A-C	600			600			

#### 08:30 - 08:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	4	489	0.009	5	0.0	7.574	A
B-A	9	282	0.032	9	0.0	13.435	B
C-AB	4	599	0.008	5	0.0	6.178	A
C-A	702			702			
A-B	9			9			
A-C	490			490			

08:45 - 09:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	4	509	0.007	4	0.0	7.267	A
B-A	8	318	0.024	8	0.0	11.846	B
C-AB	4	622	0.006	4	0.0	5.940	A
C-A	588			588			
A-B	8			8			
A-C	410			410			

# 2022 Base, PM

## Data Errors and Warnings

Severity	Area	Item	Description
Warning	Minor arm flare	Arm B - Minor arm geometry	Is flare very short? Estimated flare length is zero but has been increased to 1 because a zero flare length is not allowed.

## Junction Network

### Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		0.29	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)
D2	2022 Base	PM	ONE HOUR	16:15	17:45	15

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.00

### Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		✓	689	100.000
B		✓	22	100.000
C		✓	520	100.000

## Origin-Destination Data

### Demand (PCU/hr)

		To		
		A	B	C
From	A	0	13	676
	B	13	0	9
	C	511	9	0

## Vehicle Mix

### Heavy Vehicle Percentages

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

## Results

### Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
B-C	0.02	8.40	0.0	A
B-A	0.06	16.29	0.1	C
C-AB	0.02	7.14	0.0	A
C-A				
A-B				
A-C				

### Main Results for each time segment

#### 16:15 - 16:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	7	510	0.013	7	0.0	7.299	A
B-A	10	320	0.031	10	0.0	11.826	B
C-AB	7	593	0.011	7	0.0	6.262	A
C-A	385			385			
A-B	10			10			
A-C	509			509			

#### 16:30 - 16:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	8	484	0.017	8	0.0	7.722	A
B-A	12	286	0.041	12	0.0	13.368	B
C-AB	8	564	0.014	8	0.0	6.603	A
C-A	459			459			
A-B	12			12			
A-C	608			608			

#### 16:45 - 17:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	10	447	0.022	10	0.0	8.392	A
B-A	14	240	0.060	14	0.1	16.284	C
C-AB	10	524	0.019	10	0.0	7.141	A
C-A	563			563			
A-B	14			14			
A-C	744			744			

#### 17:00 - 17:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	10	447	0.022	10	0.0	8.398	A
B-A	14	240	0.060	14	0.1	16.293	C
C-AB	10	524	0.019	10	0.0	7.141	A
C-A	563			563			
A-B	14			14			
A-C	744			744			

17:15 - 17:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	8	483	0.017	8	0.0	7.735	A
B-A	12	286	0.041	12	0.0	13.375	B
C-AB	8	564	0.014	8	0.0	6.606	A
C-A	459			459			
A-B	12			12			
A-C	608			608			

17:30 - 17:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	7	509	0.013	7	0.0	7.313	A
B-A	10	320	0.031	10	0.0	11.839	B
C-AB	7	593	0.011	7	0.0	6.262	A
C-A	385			385			
A-B	10			10			
A-C	509			509			

# 2023 Base, AM

## Data Errors and Warnings

Severity	Area	Item	Description
Warning	Minor arm flare	Arm B - Minor arm geometry	Is flare very short? Estimated flare length is zero but has been increased to 1 because a zero flare length is not allowed.

## Junction Network

### Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		0.18	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)
D3	2023 Base	AM	ONE HOUR	07:30	09:00	15

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.00

### Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		✓	558	100.000
B		✓	15	100.000
C		✓	790	100.000

## Origin-Destination Data

### Demand (PCU/hr)

		To		
		A	B	C
From	A	0	10	548
	B	10	0	5
	C	785	5	0

## Vehicle Mix

### Heavy Vehicle Percentages

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



## Results

### Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
B-C	0.01	8.07	0.0	A
B-A	0.05	16.58	0.1	C
C-AB	0.01	6.56	0.0	A
C-A				
A-B				
A-C				

### Main Results for each time segment

#### 07:30 - 07:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	4	509	0.007	4	0.0	7.271	A
B-A	8	317	0.024	7	0.0	11.870	B
C-AB	4	621	0.006	4	0.0	5.944	A
C-A	591			591			
A-B	8			8			
A-C	413			413			

#### 07:45 - 08:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	4	489	0.009	4	0.0	7.583	A
B-A	9	281	0.032	9	0.0	13.479	B
C-AB	4	598	0.008	4	0.0	6.186	A
C-A	706			706			
A-B	9			9			
A-C	493			493			

#### 08:00 - 08:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	6	461	0.012	5	0.0	8.067	A
B-A	11	232	0.047	11	0.0	16.569	C
C-AB	6	566	0.010	5	0.0	6.556	A
C-A	864			864			
A-B	11			11			
A-C	603			603			

#### 08:15 - 08:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	6	461	0.012	6	0.0	8.067	A
B-A	11	232	0.047	11	0.1	16.579	C
C-AB	6	566	0.010	6	0.0	6.556	A
C-A	864			864			
A-B	11			11			
A-C	603			603			

**08:30 - 08:45**

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	4	489	0.009	5	0.0	7.584	A
B-A	9	281	0.032	9	0.0	13.488	B
C-AB	4	598	0.008	5	0.0	6.186	A
C-A	706			706			
A-B	9			9			
A-C	493			493			

**08:45 - 09:00**

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	4	509	0.007	4	0.0	7.275	A
B-A	8	317	0.024	8	0.0	11.883	B
C-AB	4	621	0.006	4	0.0	5.947	A
C-A	591			591			
A-B	8			8			
A-C	413			413			

# 2023 Base, PM

## Data Errors and Warnings

Severity	Area	Item	Description
Warning	Minor arm flare	Arm B - Minor arm geometry	Is flare very short? Estimated flare length is zero but has been increased to 1 because a zero flare length is not allowed.

## Junction Network

### Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		0.29	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)
D4	2023 Base	PM	ONE HOUR	16:15	17:45	15

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.00

### Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		✓	691	100.000
B		✓	22	100.000
C		✓	521	100.000

## Origin-Destination Data

### Demand (PCU/hr)

		To		
		A	B	C
From	A	0	13	678
	B	13	0	9
	C	512	9	0

## Vehicle Mix

### Heavy Vehicle Percentages

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

## Results

### Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
B-C	0.02	8.41	0.0	A
B-A	0.06	16.34	0.1	C
C-AB	0.02	7.15	0.0	A
C-A				
A-B				
A-C				

### Main Results for each time segment

#### 16:15 - 16:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	7	509	0.013	7	0.0	7.304	A
B-A	10	320	0.031	10	0.0	11.844	B
C-AB	7	593	0.011	7	0.0	6.267	A
C-A	385			385			
A-B	10			10			
A-C	510			510			

#### 16:30 - 16:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	8	483	0.017	8	0.0	7.730	A
B-A	12	286	0.041	12	0.0	13.394	B
C-AB	8	564	0.014	8	0.0	6.609	A
C-A	460			460			
A-B	12			12			
A-C	610			610			

#### 16:45 - 17:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	10	447	0.022	10	0.0	8.403	A
B-A	14	239	0.060	14	0.1	16.332	C
C-AB	10	523	0.019	10	0.0	7.149	A
C-A	564			564			
A-B	14			14			
A-C	746			746			

#### 17:00 - 17:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	10	447	0.022	10	0.0	8.409	A
B-A	14	239	0.060	14	0.1	16.341	C
C-AB	10	523	0.019	10	0.0	7.149	A
C-A	564			564			
A-B	14			14			
A-C	746			746			

17:15 - 17:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	8	482	0.017	8	0.0	7.741	A
B-A	12	286	0.041	12	0.0	13.402	B
C-AB	8	564	0.014	8	0.0	6.610	A
C-A	460			460			
A-B	12			12			
A-C	610			610			

17:30 - 17:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	7	509	0.013	7	0.0	7.316	A
B-A	10	320	0.031	10	0.0	11.854	B
C-AB	7	593	0.011	7	0.0	6.267	A
C-A	385			385			
A-B	10			10			
A-C	510			510			

Junctions 9
PICADY 9 - Priority Intersection Module
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**Filename:** B4267 Lavernock Road\_Fort Road PROPOSED.j9  
**Path:** L:\Legacy\UKBRI2FP001\VOL1TP\projects\Development Planning\Cardiff Office Work\YYD2 SEN, Cosmeston\Modelling  
**Report generation date:** 25/03/2022 16:53:20

- »2023 Base + Development, AM
- »2023 Base + Development, PM

**Summary of junction performance**

	AM				PM			
	Set ID	Queue (PCU)	Delay (s)	RFC	Set ID	Queue (PCU)	Delay (s)	RFC
2023 Base + Development								
Stream B-C	D1	0.1	7.99	0.08	D2	0.2	9.66	0.14
Stream B-A		0.1	20.95	0.08		0.3	18.19	0.22
Stream C-AB		0.2	7.79	0.16		0.0	7.15	0.02

There are warnings associated with one or more model runs - see the 'Data Errors and Warnings' tables for each Analysis or Demand Set.

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

**File summary**

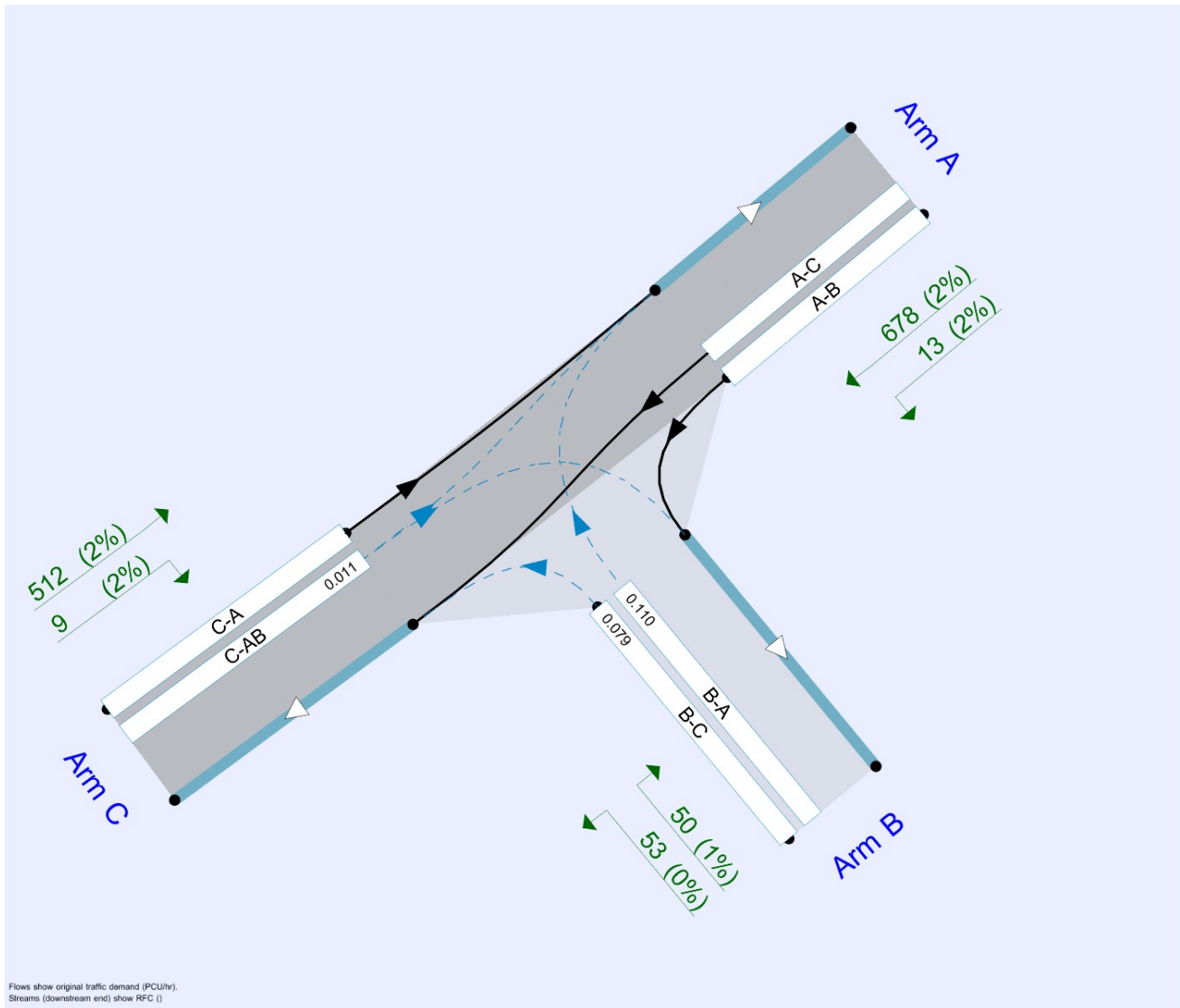
**File Description**

<b>Title</b>	
<b>Location</b>	
<b>Site number</b>	
<b>Date</b>	24/03/2022
<b>Version</b>	
<b>Status</b>	(new file)
<b>Identifier</b>	
<b>Client</b>	
<b>Jobnumber</b>	
<b>Enumerator</b>	EU\Benjamin.Burton1
<b>Description</b>	

**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





The junction diagram reflects the last run of Junctions.

**Analysis Options**

Calculate Queue Percentiles	Calculate residual capacity	RFC Threshold	Average Delay threshold (s)	Queue threshold (PCU)
		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)
D1	2023 Base + Development	AM	ONE HOUR	07:30	09:00	15
D2	2023 Base + Development	PM	ONE HOUR	16:15	17:45	15

**Analysis Set Details**

ID	Network flow scaling factor (%)
A1	100.000

# 2023 Base + Development, AM

## Data Errors and Warnings

Severity	Area	Item	Description
Warning	Minor arm flare	Arm B - Minor arm geometry	Is flare very short? Estimated flare length is zero but has been increased to 1 because a zero flare length is not allowed.

## Junction Network

### Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		0.81	A

### Junction Network Options

Driving side	Lighting
Left	Normal/unknown

## Arms

### Arms

Arm	Name	Description	Arm type
A	B4267 Lavernock Road N		Major
B	Fort Road		Minor
C	B4267 Lavernock Road S		Major

### Major Arm Geometry

Arm	Width of carriageway (m)	Has kerbed central reserve	Has right turn bay	Width for right turn (m)	Visibility for right turn (m)	Blocks?	Blocking queue (PCU)
C	6.00		✓	2.50	250.0	✓	6.00

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	Width at give-way (m)	Width at 5m (m)	Width at 10m (m)	Width at 15m (m)	Width at 20m (m)	Estimate flare length	Flare length (PCU)	Visibility to left (m)	Visibility to right (m)
B	One lane plus flare	7.63	3.33	3.15	2.96	2.77	✓	1.00	19	19

## 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	475	0.086	0.219	0.138	0.312
B-C	664	0.102	0.257	-	-
C-B	742	0.288	0.288	-	-

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)
D1	2023 Base + Development	AM	ONE HOUR	07:30	09:00	15

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.00

### Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		✓	599	100.000
B		✓	52	100.000
C		✓	867	100.000

## Origin-Destination Data

### Demand (PCU/hr)

	To			
	A	B	C	
From	A	0	51	548
	B	14	0	38
	C	785	82	0

## Vehicle Mix

### Heavy Vehicle Percentages

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

## Results

### Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
B-C	0.08	7.99	0.1	A
B-A	0.08	20.95	0.1	C
C-AB	0.16	7.79	0.2	A
C-A				
A-B				
A-C				

### Main Results for each time segment

#### 07:30 - 07:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	29	549	0.052	28	0.1	6.914	A
B-A	11	281	0.038	10	0.0	13.575	B
C-AB	62	613	0.101	61	0.1	6.525	A
C-A	591			591			
A-B	38			38			
A-C	413			413			

#### 07:45 - 08:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	34	526	0.065	34	0.1	7.325	A
B-A	13	243	0.052	13	0.1	15.935	C
C-AB	74	587	0.126	74	0.1	7.005	A
C-A	706			706			
A-B	46			46			
A-C	493			493			

#### 08:00 - 08:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	42	492	0.085	42	0.1	7.985	A
B-A	15	191	0.081	15	0.1	20.914	C
C-AB	90	553	0.163	90	0.2	7.781	A
C-A	864			864			
A-B	56			56			
A-C	603			603			

#### 08:15 - 08:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	42	492	0.085	42	0.1	7.990	A
B-A	15	191	0.081	15	0.1	20.953	C
C-AB	90	553	0.163	90	0.2	7.787	A
C-A	864			864			
A-B	56			56			
A-C	603			603			

#### 08:30 - 08:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	34	525	0.065	34	0.1	7.332	A
B-A	13	243	0.052	13	0.1	15.967	C
C-AB	74	587	0.126	74	0.1	7.016	A
C-A	706			706			
A-B	46			46			
A-C	493			493			

08:45 - 09:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	29	549	0.052	29	0.1	6.923	A
B-A	11	281	0.038	11	0.0	13.604	B
C-AB	62	613	0.101	62	0.1	6.540	A
C-A	591			591			
A-B	38			38			
A-C	413			413			

# 2023 Base + Development, PM

## Data Errors and Warnings

Severity	Area	Item	Description
Warning	Minor arm flare	Arm B - Minor arm geometry	Is flare very short? Estimated flare length is zero but has been increased to 1 because a zero flare length is not allowed.

## Junction Network

### Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		1.13	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)
D2	2023 Base + Development	PM	ONE HOUR	16:15	17:45	15

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.00

### Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		✓	691	100.000
B		✓	103	100.000
C		✓	521	100.000

## Origin-Destination Data

### Demand (PCU/hr)

		To		
		A	B	C
From	A	0	13	678
	B	50	0	53
	C	512	9	0

## Vehicle Mix

### Heavy Vehicle Percentages

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



## Results

### Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
B-C	0.14	9.66	0.2	A
B-A	0.22	18.19	0.3	C
C-AB	0.02	7.15	0.0	A
C-A				
A-B				
A-C				

### Main Results for each time segment

#### 16:15 - 16:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	40	506	0.079	40	0.1	7.716	A
B-A	38	341	0.110	37	0.1	11.933	B
C-AB	7	593	0.011	7	0.0	6.267	A
C-A	385			385			
A-B	10			10			
A-C	510			510			

#### 16:30 - 16:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	48	476	0.100	48	0.1	8.408	A
B-A	45	305	0.147	45	0.2	13.951	B
C-AB	8	564	0.014	8	0.0	6.609	A
C-A	460			460			
A-B	12			12			
A-C	610			610			

#### 16:45 - 17:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	58	431	0.135	58	0.2	9.643	A
B-A	55	255	0.216	55	0.3	18.138	C
C-AB	10	523	0.019	10	0.0	7.149	A
C-A	564			564			
A-B	14			14			
A-C	746			746			

#### 17:00 - 17:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	58	431	0.135	58	0.2	9.658	A
B-A	55	255	0.216	55	0.3	18.192	C
C-AB	10	523	0.019	10	0.0	7.149	A
C-A	564			564			
A-B	14			14			
A-C	746			746			

17:15 - 17:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	48	475	0.100	48	0.1	8.428	A
B-A	45	306	0.147	45	0.2	13.994	B
C-AB	8	564	0.014	8	0.0	6.612	A
C-A	460			460			
A-B	12			12			
A-C	610			610			

17:30 - 17:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	40	505	0.079	40	0.1	7.739	A
B-A	38	342	0.110	38	0.1	11.970	B
C-AB	7	593	0.011	7	0.0	6.267	A
C-A	385			385			
A-B	10			10			
A-C	510			510			

Junctions 9
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**Filename:** Site Access\_Fort Road.j9  
**Path:** L:\Legacy\UKBRI2FP001\VOL1TP\projects\Development Planning\Cardiff Office Work\YYD2 SEN, Cosmeston\Modelling  
**Report generation date:** 25/03/2022 16:55:00

- »2023 Base + Development, AM
- »2023 Base + Development, PM

**Summary of junction performance**

	AM				PM			
	Set ID	Queue (PCU)	Delay (s)	RFC	Set ID	Queue (PCU)	Delay (s)	RFC
2023 Base + Development								
Stream B-C	D1	0.0	0.00	0.00	D2	0.0	0.00	0.00
Stream B-A		0.1	7.51	0.08		0.2	8.17	0.17
Stream C-AB		0.0	0.00	0.00		0.0	0.00	0.00

There are warnings associated with one or more model runs - see the 'Data Errors and Warnings' tables for each Analysis or Demand Set.

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

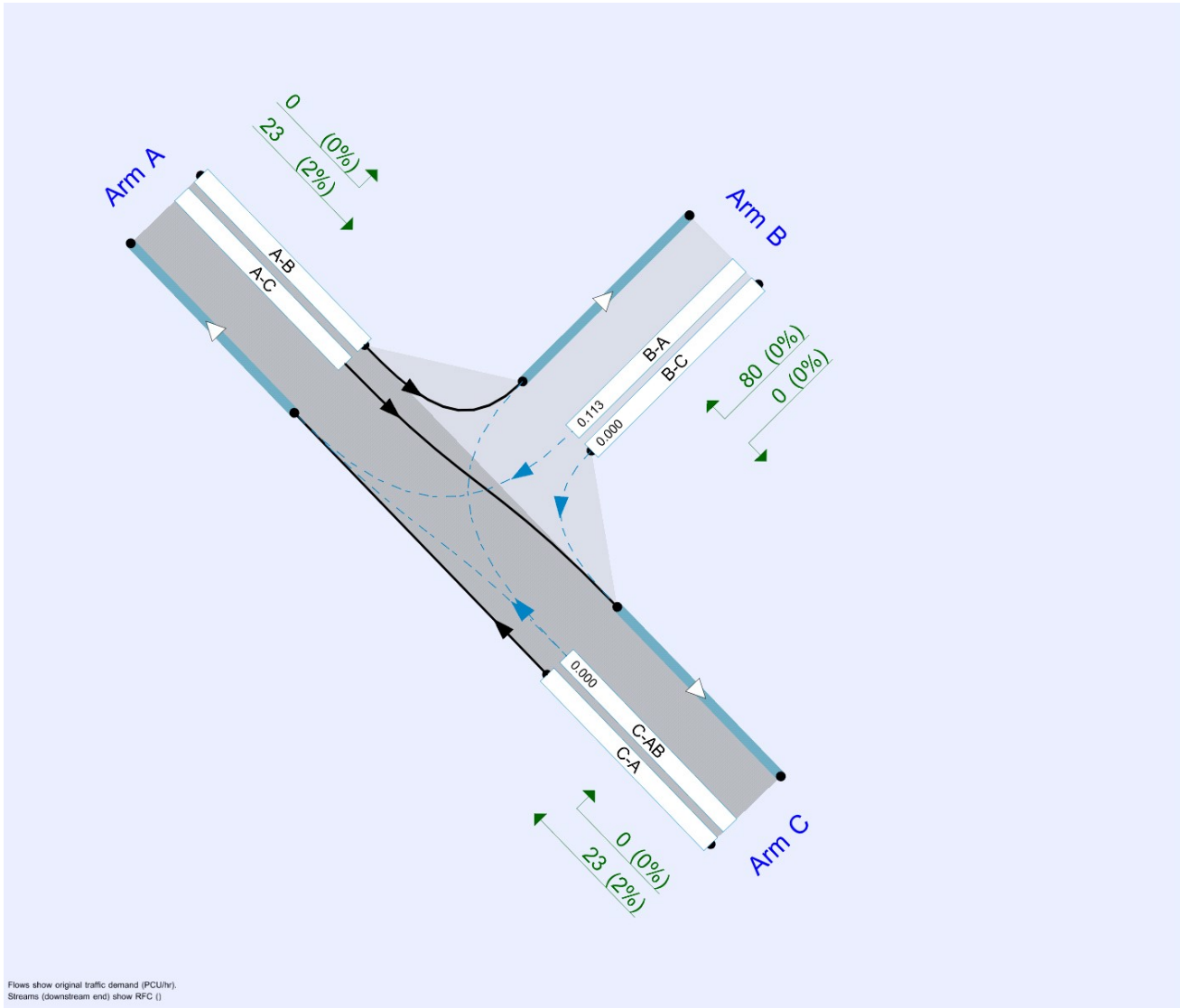
**File summary**

**File Description**

<b>Title</b>	
<b>Location</b>	
<b>Site number</b>	
<b>Date</b>	24/03/2022
<b>Version</b>	
<b>Status</b>	(new file)
<b>Identifier</b>	
<b>Client</b>	
<b>Jobnumber</b>	
<b>Enumerator</b>	EU\Benjamin.Burton1
<b>Description</b>	

**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**

Calculate Queue Percentiles	Calculate residual capacity	RFC Threshold	Average Delay threshold (s)	Queue threshold (PCU)
		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)
D1	2023 Base + Development	AM	ONE HOUR	07:30	09:00	15
D2	2023 Base + Development	PM	ONE HOUR	16:15	17:45	15

**Analysis Set Details**

ID	Network flow scaling factor (%)
A1	100.000

# 2023 Base + Development, AM

## Data Errors and Warnings

Severity	Area	Item	Description
Warning	Major arm width	Arm C - Major arm geometry	For two-way major roads, please interpret results with caution if the total major carriageway width is less than 6m.

## Junction Network

### Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		1.46	A

### Junction Network Options

Driving side	Lighting
Left	Normal/unknown

## Arms

### Arms

Arm	Name	Description	Arm type
A	untitled		Major
B	untitled		Minor
C	untitled		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	5.50			55.0	✓	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	Width at give-way (m)	Width at 5m (m)	Width at 10m (m)	Width at 15m (m)	Width at 20m (m)	Estimate flare length	Flare length (PCU)	Visibility to left (m)	Visibility to right (m)
B	One lane plus flare	10.00	5.33	3.41	3.17	3.17	✓	1.00	21	16

## 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	539	0.100	0.254	0.160	0.362
B-C	613	0.096	0.243	-	-
C-B	606	0.240	0.240	-	-

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)
D1	2023 Base + Development	AM	ONE HOUR	07:30	09:00	15

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.00

### Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		✓	133	100.000
B		✓	36	100.000
C		✓	16	100.000

## Origin-Destination Data

### Demand (PCU/hr)

	To			
	A	B	C	
From	A	0	117	16
	B	36	0	0
	C	16	0	0

## Vehicle Mix

### Heavy Vehicle Percentages

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

## Results

### Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
B-C	0.00	0.00	0.0	A
B-A	0.08	7.51	0.1	A
C-AB	0.00	0.00	0.0	A
C-A				
A-B				
A-C				



## Main Results for each time segment

### 07:30 - 07:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	0	594	0.000	0	0.0	0.000	A
B-A	27	525	0.052	27	0.1	7.219	A
C-AB	0	582	0.000	0	0.0	0.000	A
C-A	12			12			
A-B	88			88			
A-C	12			12			

### 07:45 - 08:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	0	590	0.000	0	0.0	0.000	A
B-A	32	523	0.062	32	0.1	7.342	A
C-AB	0	577	0.000	0	0.0	0.000	A
C-A	14			14			
A-B	105			105			
A-C	14			14			

### 08:00 - 08:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	0	585	0.000	0	0.0	0.000	A
B-A	40	519	0.076	40	0.1	7.510	A
C-AB	0	571	0.000	0	0.0	0.000	A
C-A	18			18			
A-B	129			129			
A-C	18			18			

### 08:15 - 08:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	0	585	0.000	0	0.0	0.000	A
B-A	40	519	0.076	40	0.1	7.510	A
C-AB	0	571	0.000	0	0.0	0.000	A
C-A	18			18			
A-B	129			129			
A-C	18			18			

### 08:30 - 08:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	0	590	0.000	0	0.0	0.000	A
B-A	32	523	0.062	32	0.1	7.344	A
C-AB	0	577	0.000	0	0.0	0.000	A
C-A	14			14			
A-B	105			105			
A-C	14			14			

08:45 - 09:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	0	594	0.000	0	0.0	0.000	A
B-A	27	525	0.052	27	0.1	7.229	A
C-AB	0	582	0.000	0	0.0	0.000	A
C-A	12			12			
A-B	88			88			
A-C	12			12			

# 2023 Base + Development, PM

## Data Errors and Warnings

Severity	Area	Item	Description
Warning	Major arm width	Arm C - Major arm geometry	For two-way major roads, please interpret results with caution if the total major carriageway width is less than 6m.

## Junction Network

### Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		5.19	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)
D2	2023 Base + Development	PM	ONE HOUR	16:15	17:45	15

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.00

### Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		✓	23	100.000
B		✓	80	100.000
C		✓	23	100.000

## Origin-Destination Data

### Demand (PCU/hr)

	To			
	A	B	C	
From	A	0	0	23
	B	80	0	0
	C	23	0	0

## Vehicle Mix

### Heavy Vehicle Percentages

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

## Results

### Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
B-C	0.00	0.00	0.0	A
B-A	0.17	8.17	0.2	A
C-AB	0.00	0.00	0.0	A
C-A				
A-B				
A-C				

### Main Results for each time segment

#### 16:15 - 16:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	0	591	0.000	0	0.0	0.000	A
B-A	60	532	0.113	60	0.1	7.615	A
C-AB	0	602	0.000	0	0.0	0.000	A
C-A	17			17			
A-B	0			0			
A-C	17			17			

#### 16:30 - 16:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	0	587	0.000	0	0.0	0.000	A
B-A	72	531	0.136	72	0.2	7.845	A
C-AB	0	601	0.000	0	0.0	0.000	A
C-A	21			21			
A-B	0			0			
A-C	21			21			

#### 16:45 - 17:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	0	581	0.000	0	0.0	0.000	A
B-A	88	529	0.167	88	0.2	8.162	A
C-AB	0	600	0.000	0	0.0	0.000	A
C-A	25			25			
A-B	0			0			
A-C	25			25			

#### 17:00 - 17:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	0	581	0.000	0	0.0	0.000	A
B-A	88	529	0.167	88	0.2	8.170	A
C-AB	0	600	0.000	0	0.0	0.000	A
C-A	25			25			
A-B	0			0			
A-C	25			25			

17:15 - 17:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	0	587	0.000	0	0.0	0.000	A
B-A	72	531	0.136	72	0.2	7.856	A
C-AB	0	601	0.000	0	0.0	0.000	A
C-A	21			21			
A-B	0			0			
A-C	21			21			

17:30 - 17:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	0	591	0.000	0	0.0	0.000	A
B-A	60	532	0.113	60	0.1	7.637	A
C-AB	0	602	0.000	0	0.0	0.000	A
C-A	17			17			
A-B	0			0			
A-C	17			17			

