PENRHOS FARM, PENRHOS, LLANSANTFFRAID-YM-MECHAIN, POWYS SY22 6QH

Transport Statement

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PENRHOS FARM, PENRHOS, LLANSANTFFRAID-YM-MECHAIN, POWYS SY22 6QH

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CONTENTS

INTRODUCTION	1
EXISTING HIGHWAY NETWORK	2
C2034/C2035 Junction	2
ACCESSIBILITY	3
Walking	9
Cycle	9
Bus	10
Rail	10
EXISTING TRAFFIC FLOWS	. 11
HIGHWAY SAFETY	14
PROPOSED DEVELOPMENT	. 15
DEVELOPMENT TRAFFIC	16
Haulage Yard	17
TRICS Data	19
DEVELOPMENT TRAFFIC IMPACT	. 20
Highway Capacity	21
Highway Safety	23
C2034 / C2035 Junction	24
POTENTIAL ROAD IMPROVEMENTS	. 28
Site Access	29
C2034 / C2035 Junction	30
Passing Bays / Places	30
Delivery of Potential Highway Improvements	31
SUMMARY	32
	INTRODUCTION EXISTING HIGHWAY NETWORK C2034/C2035 Junction ACCESSIBILITY Walking Cycle Bus Rail EXISTING TRAFFIC FLOWS HIGHWAY SAFETY PROPOSED DEVELOPMENT DEVELOPMENT TRAFFIC Haulage Yard TRICS Data DEVELOPMENT TRAFFIC IMPACT Highway Capacity Highway Safety C2034 / C2035 Junction POTENTIAL ROAD IMPROVEMENTS Site Access C2034 / C2035 Junction Passing Bays / Places Delivery of Potential Highway Improvements. SUMMARY

FIGURES

- 1 Public Footpaths and Bus Stops
- 2 Proposed Parking Layout
- 3 Articulated HGV Turning in Yard to Enter / Leave in a Forward Gear
- 4 Potential Access Revision to Prevent Articulated HGV Access To / From North
- 5 Potential Improvement to C2034 / C2035 Junction
- 6 Approximate Areas of Localised Widening to Create Potential Passing Places

APPENDICES

- A Traffic Survey Data
- B TRICS Information
- C Passing Place Study

1 INTRODUCTION

- 1.1 James Owen, Rebo UK Ltd (the Applicant) is seeking planning permission for: "Change of use of land and buildings from agricultural to storage use (Class B8), with ancillary business use (Class B1), erection of a steel portal frame building (including demolition of agricultural buildings), associated access, fence and gate, hardstanding, and landscaping, and retention of haulage yard in haulage use" at Penrhos Farm, Penrhos, Llansantffraid-ym-Mechain, SY22 6QH.
- 1.2 The application is retrospective in some respects, as much of the proposed development has already taken place and is the subject of ongoing Appeal proceedings. However, since the previous planning applications which are the subject of the Appeals were refused planning permission, the Applicant has acquired control of the neighbouring haulage yard immediately to the north of and abutting Penrhos Farm.
- 1.3 The acquisition of the haulage yard is a material consideration and has a significant influence on the potential fall-back against which the highway impact of the proposed activities at Penrhos Farm should be assessed.
- 1.4 Whilst the Highway Evidence submitted for the Appeal on behalf of the Applicant / Appellant sought to address the concerns of the Council and makes reference to the implications of the haulage yard acquisition since the previous planning permission was refused, it was determined that a new planning application which includes the haulage yard should be prepared and submitted to Powys County Council for consideration, which would, if approved, allow the ongoing Appeals to be curtailed.
- 1.5 In terms of the planning application, whilst the haulage yard falls within the red line of the site, it has been annotated to remain as existing, as there are no proposals to change its current lawful use as a haulage yard. However, the haulage yard, which has an Operator's Licence for 15 HGVs and 11 trailers, will be limited to being used only in association with the proposed uses at the neighbouring Penrhos Farm through a S106 planning obligation.
- 1.6 The proposed development within Penrhos Farm reflects the uses proposed and being considered within the planning Appeals in association with the Applicant's business, as set out in the description of the development above.
- 1.7 Having prepared the Highway Evidence for the more recent ongoing Appeals, The Hurlstone Partnership Limited was instructed to prepare a Transport Statement to accompany the new planning application, which incorporates the haulage yard and considers its impact on the assessment of the proposed development.
- 1.8 The remainder of this report details the review undertaken and confirms that in terms of highway and transport matters, the proposed development would not have a significant adverse impact and should therefore be considered acceptable.

2 EXISTING HIGHWAY NETWORK

- 2.1 Penrhos Farm is a former dairy farm which is located approximately 3.2km from the A483 via the C2034 and C2035, which is the route the majority of traffic and all HGVs associated with the Applicant's business travels. Penrhos Farm is accessed from the C2034 approximately 275m to the north of its junction with the C2035 through a 6.7m wide gated access, with the gate set back approximately 8.9m from the edge of the carriageway.
- 2.2 The access to the haulage yard is located approximately 27m to the north (centreline to centreline) and has a width of 6.6m. It is also gated, and the gates are set back approximately 3.5m from the edge of the carriageway.
- 2.3 During the previous planning applications, the Highway Authority confirmed its requirement for visibility splays extending 43m in each direction from a 2.4m set-back along the centreline, based on speed surveys undertaken on the C2034 in the vicinity of the site accesses. There were concerns raised regarding the ability to achieve these requirements from the Penrhos Farm access due to the northern visibility splay crossing over third party land to the north, which was believed to form part of the haulage yard site, rather than being within the public highway verge. However, as the Applicant has now acquired control of the haulage yard, which falls within the planning application boundary, this constraint has now been overcome.
- 2.4 The width of the C2034 and C2035 predominantly varied between approximately 4.5m and 5.5m along its length between the site and the A483, however there are some areas of localised widening to facilitate turning movements at accesses / junctions and the passing of larger vehicles travelling in opposite directions.
- 2.5 The routes are rural in nature with no pedestrian footways or street lighting. The carriageways are generally flanked by verges of various widths with hedgerows interspersed with trees beyond.
- 2.6 The roads are subject to the national speed limit of 60 mph for single carriageway routes, but speeds are generally lower due to the meandering horizontal alignment of the route, which also incorporates variable vertical geometry in places.
- 2.7 The local roads serve a variety of dwellings, businesses and agricultural land via numerous accesses and junctions distributed along their length. As a result, a full range of vehicles use the roads which are also shared with pedestrians, cyclists and equestrians, all of which have been observed during visits to the site.

C2034/C2035 Junction

2.8 The junction between the C2034 and C2035 is controlled by Give Way markings. The C2034 approaches the C2035 as the minor arm of the priority T junction via one of two sections forming two sides of a grass triangle within which a direction sign is located.

- 2.9 At present, traffic travelling to / from the west tends to pass along the northwest side of the triangle. As marked, the short northwest link effectively forms a minor arm on the C2034, as vehicles passing along the northeast part of the triangle take priority on the C2034 until reaching the C0235, which has priority over both sections of the C2034.
- 2.10 This means that drivers travelling south along the C0234 with the intention of heading west via the northwest link would effectively make a right turn into the northwest link and should therefore give way to traffic heading north along the C2034 from the C2035 on the northeast side of the triangle. Similarly, drivers entering the C2034 via the northwest link should also give way to those travelling along the C2034 on the northeast link of the triangle.
- 2.11 The lateral visibility for drivers emerging from the C2034 onto the C2035 is restricted to approximately 18.4m to the east to the nearside edge of the carriageway, due to the proximity of the boundary to the carriageway edge on the east side of the junction. However, the measurements on site revealed that the forward visibility from the east towards the junction extended some 177.5m to the vehicle at the Give Way line with a slight increase beyond that distance when looking along the part of the vehicle between the Give Way line and the hedge boundary of the property on the southeast corner of the junction.
- 2.12 By way of comparison, the forward visibility splay to the front of a vehicle waiting at the Give Way on the eastern side of the central triangle extended 72.1m from the west (i.e. for eastbound traffic). However, due to the alignment of the carriageway to the west of the junction, an oncoming driver could see along the length of the waiting vehicle, which extends the practical visibility splay to more than 120m.
- 2.13 As will be demonstrated by reference to speed data recorded by Powys County Council, the recent safety record of the network and current design guidance contained in Manual for Streets (MfS) and Manual for Streets 2 (MfS2) the visibility at the junction is demonstrably sufficient to maintain adequate levels of highway safety.

3 ACCESSIBILITY

- 3.1 The accessibility of the site should be considered in the context of its rural location and the fact that Powys itself is a predominantly rural County.
- 3.2 Whilst Penrhos Farm may not be as accessible as a town centre or edge of centre location, with no convenient public transport provision available, when reading TAN 18 it is apparent that a degree of flexibility is appropriate when considering rural areas, as recognised at paragraph 3.10: "The distinctive characteristics of rural areas including low population densities, the dispersion of job opportunities and the concentration of services in larger settlements restrict travel options. The car is important for accessibility in rural areas and is likely to remain so for the foreseeable future."
- 3.3 Paragraph 3.11 advises: "Development in rural locations should embody sustainability principles, balancing the need to support the rural economy, whilst maintaining and enhancing the environmental, social and cultural quality of rural areas. Most development

should be located in places accessible by a range of travel modes. As part of the settlement strategy of the development plan, planning authorities should consider identifying key local service centres¹⁷. These centres may comprise a market town, large village or closely associated group of villages. Such service centres should be the preferred locations for most new development including housing and employment provision. The identification of key service centres will help to promote the use of public transport, walking and cycling and minimise the need for journeys to larger centres."

- 3.4 The balance in terms of supporting the rural economy is a key consideration, as is the fact that TAN 18 does not preclude development in rural locations which are not accessible by a range of travel modes. This is apparent by the use of the phrase "*Most development*", not "*All development*". By its very definition, if only most development should be, the guidance must accept that some development will not be accessible. Similarly, TAN 18 only requires Authorities to consider identifying key local services centres; they are not obliged to do so. Where they are identified, the guidance is clear that they should be the preferred locations for most new development, not that they must be the only locations for all development.
- 3.5 Paragraph 3.13 expands on the principle of flexibility in rural locations: "Transport issues in rural areas will vary depending on the relative isolation from major urban centres. Long distance out-commuting from rural areas raises sustainability issues given the length of the journey and the rural location means that conventional public transport is unlikely to be viable in response. Local authorities should therefore consider whether different policy approaches are required depending on the proximity of rural areas to urban centres. For example, the development plan strategy may require a more decentralised approach to employment location in order to minimise overall private car mileage in an area without strong functional linkages to larger settlements."
- 3.6 Whether the journey is from residential development at a location to employment at a location or vice-versa, the distance between the two points will be the same. The guidance recognises that employment provision in a rural area, even one in a relatively remote location can be beneficial in terms of reducing overall mileage when compared with forcing residents of the area to travel to larger centres; hence the suggestion that a decentralised approach may be required.
- 3.7 This is logical in some respects, as whilst an employment development may source employees not only from the immediate rural area but also from nearby towns, there is a greater likelihood of achieving car sharing from a town travelling to a single employment site than there is between residents spread widely amongst sporadic rural dwellings who are likely to work for different employers distributed over a wider area of a town, which may have different start and finish times.
- 3.8 That is the case at Penrhos Farm. Of the 30 employees at the Farm there are 4 who carshare with colleagues travelling from Newtown, Llanfair Caereinion and Welshpool. There are also 3 who walk or cycle to work and 1 resident on site in the farmhouse who walks across the yard. Should the permitted dwelling currently being created from a barn conversion be completed then this will also provide potential accommodation for another employee (or employees).

- 3.9 Based on the residential addresses of all 30 employees, the travel distances to Penrhos Farm have been assessed.
- 3.10 It was established that the average travel distance across the workforce is 14.668 miles / 23.6 km at present.
- 3.11 This may be compared with the average for Powys of 22.2 km / 13.795 miles based on the 2011 Census data provided on page 15 of the Summary statistics for Mid Wales region: 2020 and page 139 of Future Wales The National Plan 2040.
- 3.12 Given that the average distance within Powys includes the main towns and service centres which have superior public transport facilities and opportunities, in the context of travel within the County, the commuting distances to Penrhos Farm in its rural location are considered to be acceptable and relatively local.
- 3.13 In the event the approved additional dwelling at Penrhos Farm is complete, if it were occupied by another employee, the average journey distance would reduce and may fall below the County average.
- 3.14 It should be recognised that the analysis of Penrhos Farm staff assumes all travel to /from the site, whereas 13.33% of the employees also work partly from home and do not travel every day, which reduces the average journey length for all staff activity throughout the year.
- 3.15 In terms of modal share, the 2011 census data presented on page 17 of the Summary statistics indicate within the Mid-Wales Region 67.9% arrive by driving a car, van, motorcycle, scooter or moped, 15.8% by foot or bike, 2.3% by train, bus, minibus or coach and 14.1% by other means.
- 3.16 For Powys alone, the proportion driving increases to 73.8%, foot or bicycle increases to 17.4%, train, bus, minibus and coach reduces to 2% and other means reduces to 6.8%. For Powys County, this may be summarised as 73.8% driving and 26.2% by other sustainable modes.
- 3.17 Based on the existing travel modes by employees at Penrhos Farm, 73.34% drive, 13.33% walk or cycle and 13.33% car share. At present, it is therefore apparent that driving is slightly lower, and whilst the proportions amongst methods are slightly different, overall, the sustainable travel mode uptake to Penrhos Farm is 0.46% higher than is experienced across the County.
- 3.18 However, should the barn conversion be completed for residential occupation by an employee, the proportions will change. Converting a single car trip to a walk across the yard represents a 3.33% shift, which would reduce driving to 70.01% and increase walking / cycling to 16.66%. This would further increase the balance in favour of sustainable modes for the workforce at Penrhos Farm when compared with that across the County.

- 3.19 Having considered the foregoing, it is apparent that despite the site being located in a rural area where there is no convenient access to public transport, it nevertheless compares favourably with the County as a whole, in terms of sustainable travel mode uptake amongst the workforce.
- 3.20 Notwithstanding this, the Applicant is keen to support sustainable transport initiatives and will operate a Travel Plan to try and further reduce independent car travel by encouraging car sharing amongst staff and also the use of bicycles by supporting the Cycle to Work scheme. Cycle parking will also be provided within the site to facilitate cycling to/from work.
- 3.21 If an employee chooses to cycle just 1 day per week out of 5, rather than drive, this represents a 20% reduction in car use for that employee, whereas car-sharing can result in a 100% reduction in independent commuting trips for an individual.
- 3.22 Paragraph 3.1.2 of the Local Development Plan states in bold type: "Powys' rural areas will be a working countryside of sustainable communities supported by a thriving and diverse rural economy of small businesses." It therefore supports businesses in rural areas, which are unlikely to be as accessible as the towns and main service centres.
- 3.23 "Section 5.6 The Rural Economy" of Planning Policy Wales Edition 11 of February 2021 (PPW) states at 5.6.1 "The rural economy must develop a wide base if it is to be adaptable and resilient to the challenges it faces now and in the future. Events such as the climate emergency, the coronavirus pandemic and exiting the European Union all bring economic and societal uncertainty, and the ability to respond flexibly to these issues will be key to the future success of rural areas".
- 3.24 Paragraph 5.6.2 of PPW continues: "Planning authorities should plan positively to meet rural employment needs by identifying policies in their development plans. By supporting the development of a broad range of employment opportunities in rural areas planning authorities can increase economic prosperity and help address the effects of rural decline or depopulation where it occurs. Greater opportunity can support and strengthen the future well-being and sustainability of rural communities."
- 3.25 Paragraph 5.6.3 of PPW adds: "Many commercial and light manufacturing activities can be located in rural areas without causing unacceptable disturbance or other adverse effects⁵¹. Micro and small enterprises have a vital role to play in the rural economy, and contribute to both local and national competitiveness and prosperity. While some employment can be created in rural locations by the re-use of existing buildings⁵², new development will be required in many areas."
- 3.26 Paragraph 5.6.4 confirms: "To unlock the full potential of rural areas, planning authorities should adopt a positive approach to employment arising from foundation and innovative and technology based sectors, including research and development, in addition to employment arising from the traditional agriculture, forestry and leisure sectors. Proposals for diversification, new start-ups and micro-businesses should also be encouraged, where appropriate, to generate new job and wealth-creating opportunities."

- 3.27 PPW paragraph 5.6.6 advises: "New development sites are, in most instances, likely to be small and, with the exception of rural diversification and agricultural development to which separate criteria apply⁵³, should generally be located within or adjacent to defined settlement boundaries, preferably where there is public transport provision. However, some industries may have specific land requirements which cannot be accommodated within settlements. The absence of allocated employment sites should not prevent authorities from accommodating proposals for appropriate small-scale enterprises in or adjoining rural settlements, including small rural settlements. Planning authorities should include criteria based policy in development plans to consider such proposals when they are outside settlement boundaries. Whilst the protection of the open countryside should be maintained wherever possible, the expansion of existing businesses located in the open countryside should be supported provided there are no unacceptable impacts."
- 3.28 Paragraph 5.6.7 of PPW advises: "Although new businesses in rural areas are essential to sustain and improve rural communities, developments which only offer short-term economic gain are unlikely to be appropriate."
- 3.29 Whilst PPW seeks to direct most development to within or adjacent to defined settlement boundaries, this is a general, not essential requirement, as recognised by section 5.6 of PPW, from which it is apparent that Policy would not preclude the proposed development in its location, and in many ways PPW recognises the benefits such businesses may offer in rural areas, which may be less accessible than the main service centres in the Country.
- 3.30 These principles reflect the overarching objectives of Future Wales The National Plan 2040, which confirms within the notes accompanying 'Policy 1 – Where Wales will grow', at page 64: "Communities in rural areas are strongly supported; the aim is to secure sustainable economic and housing growth which is focused on retaining and attracting working age population and maintaining and improving access to services."
- 3.31 Page 68 within the notes accompanying 'Policy 5 Supporting the rural economy' recognises: "A rural location within proximity of major urban areas experiences different issues compared with a more isolated rural location. It may not be appropriate for policies to be applied to both types of location equally"
- 3.32 Page 69 states "The Welsh Government strongly supports enhanced public transport and active travel modes but recognises that travel by car may be the only realistic mode of travel for some, especially in remote areas...

It is important that rural communities develop strong economies and support local enterprise. The presence of local rural business and employment opportunities can reduce the need to travel long distances and reduce the reliance on larger economic centres.

Lack of employment is a key reason behind rural depopulation, particularly in the younger workforce; it can also contribute to deprivation and inequality. Developing local opportunities, particularly in higher paid sectors, is important to retain workers, broaden the skills base and help sustain communities. Rural areas should develop a broad economic base which supports a strong foundational sector, agricultural and forestry industry, innovative and emerging technology based enterprise, start-ups and micro businesses".

- 3.33 The principle of benefits by locating complimentary businesses close to each other is recognised at page 70: *"Regional assessments of potential clustering opportunities for rural businesses gaining mutual benefit from close proximity should be investigated."* This principle is considered to be supported at the local level based on the direct proximity of a haulage yard to the warehouse in order to reduce potential traffic impact, as previously explained.
- 3.34 Policy 12 Regional Connectivity on page 83 advises: "In rural areas our priorities are supporting the uptake of ultra-low emission vehicles and diversifying and sustaining local bus services." Under the sub-heading 'The transition to low emission vehicles' page 86 advises: "The Welsh Government will embrace the adoption of electric vehicles in an inclusive manner, supported by the necessary investment in charging infrastructure. We recognise this will be a greater challenge in rural areas." Page 87 adds: "We expect business and industry to drive much of the roll-out of charging infrastructure."
- 3.35 With specific reference to the Mid Wales Regional Growth Area at Policy 25, which includes Powys, Future Wales recognises on page 130: "There is a high degree of mobility between places, where people travel to access services, facilities and jobs outside the play they live. Trips are typically longer than those made in more built-up and urbanised areas and reliant on road based travel given the absence of frequent bus and rail services.

There is a need for careful balance to be struck between what individual settlements in the region can provide and what people may have to access in neighbouring places."

- 3.36 Page 134 confirms: "The region's rural areas are supported by policies 4 and 5 which will ensure rural communities thrive, supported by a rural economy which recognises the diverse range of activity that contribute to rural society and life...Strategic and Local Development Plans will plan positively for the rural communities in the region and consider the balance to be struck between focusing development in the main built-up, urban areas and the rural areas."
- 3.37 The notes accompanying 'Policy 27 Movement in Mid Wales' advise on page 140: "The overall aim is to reduce the need to travel, particularly by private vehicles, and support a modal shift to walking, cycling and public transport...In rural areas, such as Mid Wales, our priorities are also aimed at supporting the uptake of ultra-low emission vehicles and diversifying and sustaining local bus services.

The Welsh Government recognises that travel by road and car is central to regional movement across Mid Wales. Alongside its investment to support increased use of public transport (including rail) and active travel, we will continue to invest in the region's road network and, in accordance with policy 12, support the uptake of ultra-low emission vehicles."

3.38 The Applicant is supportive of Policy by investing in electric vehicles. Charging points within the site may also be provided to meet demands of staff, as required.

3.39 Notwithstanding the constraints with and flexibility afforded to rural areas within the policy guidance, the potential for access to Penrhos Farm by sustainable travel modes has been reviewed:

Walking

- 3.40 Whist there are no pedestrian footways close to the site, the local roads do not carry high volumes of traffic. Traffic surveys undertaken by the County Council, which are reported in the following section of this Transport Statement, have confirmed that the existing traffic flows are below the levels that would allow them to be designated as Quiet Lanes, which are identified as routes along which people may consider walking, cycling or riding, whilst sharing the road space with vehicles.
- 3.41 For example, it is approximately 3.1 km (2 miles) to Arddleen via the local lanes.
- 3.42 There are also public footpaths through the beautiful countryside which may provide attractive alternative routes to roads and villages in the area, as illustrated in Figure 1, within the Figures section of this document.

Cycle

- 3.43 As indicated above, the traffic flows on the local roads are consistent with those along which shared use between cyclists and vehicles may be considered acceptable.
- 3.44 The Institution of Highways and Transportation's "Planning for Cycling" advises "The majority of cycling trips are for short distances, with 80% being less than five miles and with 40% being less than two miles. However, the majority of trips by all modes are also short distances (67% are less than five miles, and 38% are less than two miles); therefore, the bicycle is a potential mode for many of these trips (DfT, 2014a). Electric bicycles extend the range that can be cycled comfortably, and combined cycle-rail or cycle-bus journeys offer an alternative to car travel for many longer trips."
- 3.45 The established cycle patterns and distances should not be seen as a barrier, as there are many people who cycle significantly longer distances than 5 miles on a daily basis. The assistance provided by electric bikes and their increasing popularity increase the opportunities for more people to begin cycling and to cycle over significantly longer distances than they may have previously considered to be possible.
- 3.46 "Planning for Cycling" also confirms: "The bicycle has many advantages over other modes and is one of the most sustainable forms of transport. It requires only one-fifth the energy of walking and causes negligible climate change, air pollution and noise. Compared with motor vehicles, it causes less severance, requires less space for parking and in congested urban traffic conditions can support higher passenger flows per metre of road width than cars."

- 3.47 In terms of health benefits, "Planning for Cycling" advises: "Cycling encourages and enables people to take regular exercise. Research has found that regular exercise can reduce the risk of heart disease, diabetes and obesity by 50% and the risk of high blood pressure by 30%. Research has also found increases in productivity and general well-being amongst people who exercise regularly."
- 3.48 The perception of risk of injury can be a barrier to people when considering cycling. However, "Planning for Cycling" confirms: "Overall, however, the risk of a cyclist being a road casualty is low compared with many other activities. In the UK there is, on average, one cyclist death per 33 million kilometres of cycling, whereas lack of exercise presents a much greater risk. Over 50,000 people die in the UK each year because of coronary heart disease related to insufficient physical activity; and research suggests that the health benefits of cycling outweigh the safety risks by a factor of around twenty-to-one"

Bus

- 3.49 The nearest bus stop to the site is at Arddleen near the Tabernacle Church on the B4392 (3.1 km / 2miles) via the local lanes, which is visited by service 71 Llanymynech to Welshpool (a School service) and T12 Machynlleth Wrexham via Newtown Welshpool Oswestry, which arrives at 07:04, 09:04 11:04, 13:04, 15:04, 15:54 (school days), 17:14 and 18:59 Monday to Friday (Excluding Bank Holidays), with the same on Saturday except for the 15:54 school service. The return T12 service from Wrexham to Machynlleth arrives at 07:32, 08:16 (school days), 08:52, 10:52, 12:52, 14:52, 16:52 and 18:12 Monday to Friday (excluding Bank Holidays), with the same on Saturday except for the 08:16 school service.
- 3.50 The T12 services call at Chirk, Oswestry, Morda, Llynclys, Pant, Llanymynech, Four Crosses and Llandrinio between Wrexham and Arddleen (i.e. to the north of the stops) and at Guilsfield, Welshpool, Berriew, Kingswood, Montgomery, Abermule, Newtown, Caersws, Clatter, Carno, Llanbrynmair, Glantwymyn / Cammaes Road, Penegoes and Machynlleth to the south, providing connections to a wide range of towns and villages.
- 3.51 Bus stops are also provided at Llandrinio approximately 4.5 km / 2.8 miles from Penrhos Farm, which, in addition to the T12 service, are visited by Service 74 and 74A Shrewsbury Llanfyllin via Ford Crew Green. However, the 74/74A services are limited in terms of their travel time and may not tie in with normal working hours at present.
- 3.52 The locations of the bus stops are also illustrated in Figure 1.

Rail

- 3.53 The nearest railway station is located in Welshpool, approximately 13.5 km (8.4 miles) from Penrhos Farm
- 3.54 The rail station provides connections to local and mainline stations throughout the week.

- 3.55 The bus service T12 provides connections between Welshpool and Arddleen via the stop near Smithfield Car Park, approximately 300m from the Station. Bus Service 74/74 A provide connections to Shrewsbury Station via a 250m walk from the Bus Station where services begin and end.
- 3.56 Whilst recognising that the site is not as accessible as a town centre or edge of centre location, having considered the foregoing and the policy guidance in Future Wales, PPW, TAN 18 and the Local Development Plan, it is apparent that when considered in the local context of a rural location, the principle of such development is acceptable, as is the accessibility of Penrhos Farm.

4 EXISTING TRAFFIC FLOWS

- 4.1 During the course of the previous planning applications, Powys County Council undertook traffic surveys on the C2034 and C2035 to provide acceptable baseline data against which the impact of the proposed development could be assessed.
- 4.2 The traffic surveys at the 4 locations were undertaken using Automatic Traffic Counters (ATCs), which recorded data between Saturday 04 May and Friday 17th May 2019 inclusive, which included the ongoing activities at both Penrhos Farm and the neighbouring haulage yard. However, the data for Friday 17th May is incomplete as the ATCs were removed between 09:00 10:00.
- 4.3 The locations of the ATCs are illustrated on the plan provided with the results summaries created from the raw data files at Appendix A. The reference numbers for the ATCa and their respective locations are as follows:
 - M1232 = C2034 South of Penrhos Farm Access
 - M1233 = C2034 North of Penrhos Farm Access
 - M1234 = C2035 East of C2034 Junction
 - M1235 = C2035 West of C2034 Junction
- 4.4 The raw data files provided by Powys County Council were forwarded to Auto Surveys, the survey company which we normally use for data collection. It was found that the results provided by Powys County Council were derived assuming a 4 second headway between vehicles. Apparently, this can lead to an under estimation of actual traffic volumes if two vehicles are travelling closer together. That headway was therefore removed in order to ensure no vehicles were excluded from the total traffic flow.
- 4.5 The 'corrected' results from the ATCs revealed that at Site M1233 the daily traffic flows along C2034 to the north of the Penrhos Farm ranged between 176 (Sunday 5th) and 267 (Thursday 16th), giving a day to day variation of 91 vehicle movements. The HGV flows on this section of the C2034 ranged between 1 (Saturday 04th) and 16 (Tuesday 14th), giving a day to day variation of 15 HGV movements.

- 4.6 Excluding the weekend traffic reduced the daily variation of the 5 day (Monday to Friday) period to 60 movements based on the lower flow of 206 on Wednesday 08th. The HGV variation reduced to 14 as the lowest flow became 2 HGV movements on Wednesday 8th.
- 4.7 The peak hour flow was 27 movements between 15:00 16:00 on Wednesday 15th May (12 northbound / 15 southbound). None of the recorded movements during the peak hour period were HGVs, but a bus was recorded in the northbound direction.
- 4.8 To the north of the Penrhos Farm access the range of hourly HGV activity was 0 to 4 movements, with the peak occurring on Thursday 16th May between 09:00 10:00 (3 northbound / 1 southbound).
- 4.9 At Site M1232 to the south of Penrhos Farm, the daily traffic flows ranged between 180 (Sunday 12th) and 343 (Tuesday 14th) giving a daily variation of 163 vehicle movements. The HGV movements ranged between 3 (Sunday 12th) and 37 (Tuesday 14th), giving a daily variation of 34 HGV movements per day.
- 4.10 Excluding the weekend data gave a daily variation of 134 based on the lower flow of 209 movements on Monday 06th over the 5 day period. The HGV variation reduced to 24 HGV movements based on the lower flow of 13 HGVs on Monday 6th.
- 4.11 The peak hour traffic flow was found to be 39 movements between 16:00 17:00 on Wednesday 8th May (23 northbound / 16 southbound). There were 5 northbound and no southbound HGV movements recorded during the peak hour period, plus a bus movement in each direction.
- 4.12 Between 0 and 8 HGV movements per hour were recorded on the C2034 to the south of the Penrhos Farm access. The peak of 8 (6 northbound / 2 southbound) occurred on Tuesday 14th May between 14:00 15:00.
- 4.13 At Site M1234, on the C2035 to the east of the C2034 junction, the daily traffic flows ranged between 341 (Sunday 5th) and 594 (Wednesday 15th), giving a daily variation of 253 movements. The HGV flows ranged between 7 (Sunday 12th) and 43 (Tuesday 14th) giving a daily variation of 36 HGV movements per day.
- 4.14 Over the 5 day period, the daily traffic flow variation reduced to 213 movements based upon the lower flow of 381 on Monday 6th. The HGV variation reduced to 30 movements based on the lower flow of 9 on Monday 06th.
- 4.15 The peak hour flow recorded on this section was 61 movements between 16:00 17:00 on Tuesday 07th May (27 eastbound / 34 westbound) of which 7 were HGVs (1 eastbound / 6 westbound), plus 1 bus eastbound.
- 4.16 On the C2035 to the east of the junction, the HGV flows varied between 0 and 9 movements per hour. The peak flow occurred between 16:00 17:00 on Wednesday 8th May (6

westbound / 3 eastbound) and also between 14:00 – 15:00 on Tuesday 14th May (7 westbound / 2 eastbound).

- 4.17 To the west of the C2034 junction Site M1235 recorded daily traffic flows to range between 307 (Sunday 12th) and 437 (Monday 13th), giving a daily variation of 130 vehicle movements. The HGV flows were found to range between 6 (Saturday 4th) and 27 (Thursday 16th), giving a day to day variation of 21 HGV movements.
- 4.18 Between Monday and Friday inclusive, the daily traffic flow variation reduced to 54 movements based on the lower flow of 383 on Monday 6th. The HGV variation fell to 15 based on the lower flow of 12 on Tuesday 14th.
- 4.19 The peak hour flow to the west of the junction was recorded to be 42 movements between 08:00 09:00 on Thursday 09th (30 eastbound / 12 westbound) of which 4 (1 eastbound / 3 westbound) were HGVs with no buses.
- 4.20 On the C2035 to the west of the junction, the HGV flows varied between 0 and 5 per hour, with the peak occurring on Monday 13th September between 14:00 15:00 (2 westbound / 3 eastbound).
- 4.21 As is apparent from the foregoing survey results, the traffic flows on the roads in the immediate vicinity of the site are low in absolute terms. The link with the highest traffic flow is that to the east of the C2034 junction which heads in a generally easterly direction to meet the A483 approximately 2.9km distant, which carried a peak daily flow of 594 movements and a peak hourly flow of 61 movements during the survey period.
- 4.22 By way of comparison, a flow of 1000 vehicles per day is considered to be low in DfT "*Circular 02/2006 The Quite Lanes and Home Zones (England) Regulations 2006*", which states at paragraph 4: "*Quiet Lanes are minor rural roads or networks of minor rural roads appropriate for shared use by walkers, cyclists, horse riders and other vehicles.*" Paragraph 6 advises: "*The Department considers that only minor roads or networks of minor roads which have low flows of motorised vehicles travelling at low speeds and are suitable for shared use by walkers, cyclists equestrians and motorists are appropriate for designation as Quiet Lanes."* Paragraph 7 confirms: "*It is recommended that designated Quiet Lanes should have no more than about 1000 motor vehicles per day.*" Within the Home Zones section of the document, paragraph 10 confirms: *"Within a designated Home Zone, traffic flows should be low: no more than about 100 motor vehicles in the afternoon peak hour is recommended..."*
- 4.23 It is therefore evident that the highest flows on the local roads represent just 60% of the upper level of what is considered to be a low flow, which suggests increases of approximately 400 movements per day and 40 movements per hour on the absolute peaks recorded could be accommodated until the classification of a "low flow" was no longer applicable.

- 4.24 The Council's traffic surveys also recorded vehicle speeds on the C2035, which have been used to assess the visibility at its junction with the C2034. The 85th percentile speed eastbound from ATC M1235 was 36.9 mph (59.4 kph) whilst the equivalent westbound speed from ATC M1234 was 37.1 mph (59.7 kph), both of which are within the recommended threshold for the application of MfS criteria.
- 4.25 The relevant stopping distances based on the observed speeds for both light and heavy vehicle deceleration rates (0.45g and 0.375g respectively) have been considered for completeness.
- 4.26 For eastbound traffic, the distance required for a light vehicle to stop is 57.960m, which increases to 64.123m for large vehicles based on the same speed. The comparable distances for westbound traffic are 58.492m for light vehicles and 64.663m for large vehicles.
- 4.27 By comparing these distances with the on-site measurements reported in the previous section, it is apparent that the forward visibility towards the traffic emerging from the minor arm exceeds the required safe stopping distance for large and light vehicles in both directions, which affords oncoming drivers with ample opportunity to observe a vehicle cautiously edging out from the C2034, then slow down and stop if necessary to avoid a collision.

5 HIGHWAY SAFETY

- 5.1 A review of collision data on the Crashmap website reveals that there have been no recorded personal injury accidents recorded on the local road network in the vicinity of the site for the most recent 5 year period available (2016 2020 inclusive).
- 5.2 There was one recorded slight accident at the junction between the C2035 and A483 in March 2017. It appears that a car was waiting to turn right when another approaching from behind, which was slowing, was run into by a third car, pushing the second into the back of the stationary car waiting to turn.
- 5.3 In the event there is a particular characteristic of the local highway network that significantly compromises safety, it is common to find a number of incidents in the locality that share similar characteristics. It is noted that in this case there has only been a single recorded injury accident within the 5 year period, which did not involve a goods vehicle.
- 5.4 Given the traffic survey data confirms the use of the road network by a variety of vehicle types, its safety record indicates the existing road geometry is sufficient to safely accommodate the existing traffic activity on the local routes.

6 PROPOSED DEVELOPMENT

- 6.1 The Applicant's business involves the importing of leisure products either complete or in component form to be built-up / sold to customers. The products are delivered to the site and stored prior to being sold, at which point they are distributed to customers. Both imported and exported products are transported in either vans or HGVs.
- 6.2 The site operates between 07:30 17:00 Monday to Friday. There are currently 30 staff based at Penrhos Farm. Some of the staff also work partly from home. A total of 4 people mix work from home and the Farm. In addition to the core staff, there are also periods when seasonal staff may be employed to assist during the busier times.
- 6.3 The Applicant has provided a breakdown of monthly sales proportions over the 2018-2020 trading period, which confirm the following annual distribution:

October 18/19	3.45%	April 19/20	15.02%
November 18/19	8.43%	May 19/20	15.87%
December 18/19	9.91%	June 19/20	10.95%
January 19/20	2.18%	July 19/20	9.36%
February19/20	2.33%	August 19/20	7.46%
March 19/20	10.09%	September 19/20	4.95%

- 6.4 As can be seen from the preceding table, May is the busiest month of the year. Given the nature of the products sold, which are predominantly large items for outdoor use, it is not surprising that sales peak as the weather is anticipated to improve for Spring and Summer seasons.
- 6.5 The internal site surfacing is predominantly gravel with no formal marked parking bays. However, based on the actual parking demand, this has not led to problems as there is more than adequate space to accommodate staff and visitor vehicles.
- 6.6 Notwithstanding this, the Highway Authority calculated that parking is required for 57 vehicles based on the CSS Wales Parking Standards for Distribution Centres, and the 3,3553.23 m² floorspace. These spaces comprise 44 car spaces + 3 disabled, plus 3 cycle + 7 motorcycle spaces.
- 6.7 To demonstrate how this requirement could be met within the site, the plan forming Figure 2, which is provided in the Figures section of this report, has been prepared. However, whilst the parking spaces could be provided, in order to avoid the potential to attract staff to travel by car on the basis that marked spaces are clearly available, it is not proposed to formally mark out the bays unless the Council specifically insists the Applicant does so via a formal planning condition.
- 6.8 Service vehicles entering the site use the existing access then turn around within the yard where they are loaded or unloaded. To illustrate how this may be accommodated with the parking capacity delivered within the site, Figure 3 has been prepared which the ability of

a large, articulated HGV to enter and leave the site in a forward gear, confirming that the site access and internal circulation should not be considered a constraint in the context of the planning application.

7 DEVELOPMENT TRAFFIC

- 7.1 The Applicant provided details of the peak levels of activity experienced at the site on any given day when preparing the Appeal Evidence, in order to allow the worst-case impact to be assessed. The maximum number of HGVs travelling to the site was identified to be up to 10 per day (20 movements) with up to 4 vans per day (8 movements) at peak times. These numbers reduce with sales as part of the seasonal variations and do not occur every day, even at peak trading times
- 7.2 Due to the different seasonal demands, the vehicle mix can switch in addition to the volumes changing. For example, in January, the number of vans normally increases but the number of HGVs decreases. This is because of the number of pallets being delivered in any load is smaller due to reduced demand. Therefore, a van is used rather than transporting a part load in an HGV.
- 7.3 Due to problems with couriers / hauliers availability as a result of the increased demand for such services nationally, arising from the Covid 19 restrictions, which have led to an upsurge in home deliveries etc. the Applicant has invested in 7 vans to service the business; and anticipates increasing to a fleet of 10 vans in the near future. This has been necessary to provide a reliable delivery service to customers.
- 7.4 The vans, whose drivers are self-employed, have in part replaced some of the HGV activity that historically occurred, which has led to a reduction of 1 2 HGVs per day (2 4 HGV movements) on the local road network. At present, 6 of the vans service areas within a 2 hour drive radius of the site, and 1 van is involved in installation of the component-based products nationally. The latter tends to be away from site for a couple of days at a time, whereas those serving the more local areas tend to return to the site daily. Some of the vans are based at the site, whilst in other cases the van driver may take the vehicle home rather than return at the end of the day.
- 7.5 The predicted future increase in vans, would add a further 2 for installation work and the third would be added to the more local delivery service, resulting in a further reduction in HGV traffic movements.
- 7.6 Based on the foregoing, on a day when the peak number of HGV movements occurs, and when all of the vans return to site (based on the proposed 10 van fleet), assuming all staff travel independently by car, the Penrhos Farm site could attract the following movements per day on the local road network:

30 Staff	60 Movements
10 Van Drivers	20 Movements
10 Vans	20 Movements
10 HGVs	20 Movements

4 Ad-hoc Vans8 Movements64 vehicles128 movements

- 7.7 The peak hours of activity would be in the morning when the majority of staff arrive for work between 07:00 08:00, and when they leave between 17:00 -18:00.
- 7.8 Given the staff arrive in the morning and leave in the evening, up to 30 staff movements could be expected in normal conditions, plus the 10 van drivers, giving up to 40 staff movements in an hour. Should all of the vans be loaded the night before, and kept on site overnight, potentially there could be a further 10 outbound movements. In addition, there could possibly be up to a maximum of 6 HGV movements in an hour (3 in / 3 out) based on the time taken to load / unload each vehicle once at site. There is also the potential for adhoc van deliveries to occur, which could theoretically coincide with the peak hour periods. If all 4 vans arrived in the peak hour period, this would add a further 8 movements, giving a total of 64 movements.
- 7.9 In reality, this is an over-estimate of activity, because it is known that not all staff travel independently (or in vehicles), some work from home and others live on-site. Also, staff in different roles work at different times, so their travel would take place over an extended 2 3 hour period between 07:00 10:00 and 16:00 18:00. Similarly, it is unlikely that other ad-hoc vans and 3 HGVs would be visiting the site during the AM or PM peak hours when the site is opening or closing.
- 7.10 As a result, adopting a peak hour flow of 64 movements would represents a robust basis for the assessment.
- 7.11 However, for the purposes of demonstrating the ability of the local road network to accommodate the proposed development when preparing the Appeal Evidence, the daily traffic flows identified at that time were doubled to allow a 100% margin for potential growth of the business, giving a total of 60 staff (120 movements), 20 HGVs (40 movements) and 8 vans (16 movements) per day at peak season, giving a total of 176 movements (88 in / 88 out) per day. These movements were then artificially assumed to occur within an hour and added to the peak hour flow observed on the local roads.
- 7.12 For consistency with the Appeal submissions, which the Highway Authority has reviewed as part of that process, and as that figure represents 2.75 times the peak hour flow of 64 movements associated with the business identified in paragraph 7.8 above, the previously artificially high figure of 176 movements within an hour has been retained in for assessment purposes in this case.

Haulage Yard

7.13 Information provided by the operator of the haulage yard (submitted with the Appeals) confirms it has existed since 1949, during which time HGVs have operated from the site associated with the general haulage business, which has also included storage and distribution of feed and fertilizer.

- 7.14 HGVs run from the site typically between 04:00 19:00, travelling to /from the south of the site, passing the access to Penrhos Farm on route to the wider highway network.
- 7.15 In addition to the vehicles and trailers based at the site, HGVs would also travel from another site in Shrewsbury to the yard for servicing due to the requirement for 6 weekly checks. The servicing attracted around 3 vehicles per week, which typically travelled along the roads between 07:00 17:00.
- 7.16 Historically, the yard employed 20 people, who all travelled by car. However, at present, as the business is being wound down towards the operator's retirement, there are only 4 people working at the yard and 3 HGVs operating primarily between 04:00 18:00.
- 7.17 It is understood that there are no planning constraints limiting the number of daily HGV movements or operating hours at the haulage yard, beyond the restriction of only 15 HGVs and 11 trailers being permitted to be based at the site, in accordance with the Operator's Licence.
- 7.18 Essentially, this creates an unrestricted fall-back in terms of the potential number of HGV movements that may occur on the local road network in any given day or hour.
- 7.19 The current operator of the yard is not intending to relocate the business as he intends to retire.
- 7.20 As the Applicant now has control over the haulage yard, through a similar process followed via the acquisition of a fleet of vans to provide a more reliable service to customers, it would also be possible for the Applicant to acquire a fleet of HGVs to service his business, or to rent the yard to a haulier, such as the existing operator, to provide the haulage services required.
- 7.21 Given the scope of the Operator's Licence and the limited number of vehicles required to meet the needs of the Applicant's and the current haulier's businesses, it would be possible to establish a haulage fleet within the neighbouring haulage yard without increasing the number of HGV movements above the level previously associated with the haulage yard itself.
- 7.22 This is an important and material consideration, because in practical terms, the fact that vehicles travelling to / from Penrhos Farm to service the business may not be based onsite does not affect number of vehicle movements required to fulfil the demands for transportation of products. Whether the vehicles are based at the haulage yard or elsewhere, the same number of vehicles would be required to transport the same products in the same loads via the same road network.
- 7.23 Based on the historic activities at the haulage yard, assuming just a single journey out and back each day results in 30 HGV movements, which exceeds the 20 HGV movements attracted to the site based on a busy day of trading.

- 7.24 The operator of the haulage yard has confirmed that some of the vehicles made multiple trips per day with 2 of the HGVs used to service the deliveries of feed and fertilizer stored at the site.
- 7.25 Taking this into account, together with the additional vehicle servicing movements, it is apparent that the cumulative HGV activity at the haulage yard approaches and could easily exceed the 40 HGV movements per day, which have been included within the 176 movements to be used to assessed the impact of the Applicant's business, based on a doubling of the peak demand.
- 7.26 If the feed / fertilizer vehicles made just 4 deliveries each per day, the total of 40 HGV movements would be exceeded before the servicing movements are added.

TRICS Data

- 7.27 The Highway Authority requested TRICS data be provided and agreed as the basis of the trip rate assessment for the proposed development. However, the TRICS Good Practice Guide 2016 warns users at paragraph 4.3: "*Care should also be taken to ensure that data fields used in site selection filtering are relevant to each individual case*" and at paragraph 4.5: "The most important data fields in terms of site selection compatibility are the main category and sub-category location types. Sites in a town centre with good local public transport accessibility will naturally, as a rule, achieve a different type of modal split to a site in the countryside without any public transport. Mixing sites which are clearly incompatible in a set for trip rate calculation could lead to the production of misleading trip rates. A general guide to compatibility by main location category is shown in the table below."
- 7.28 Extracts from the Guide and the Table are provided at Appendix B for information. The Table confirms that only Free Standing sites are compatible with Free Standing locations and that there is no potential crossover.
- 7.29 Paragraph 4.7 advises: "In the first instance, it is recommended that users include sites across location types that are possibly compatible, and then examine the individual site locations in more detail using facilities such as Google Maps, before refining the dataset further based on visual location."
- 7.30 Following interrogation of the TRICS database in accordance with the recommended process, and having reviewed all of the free standing / stand-alone B8 warehousing sites, it is apparent that there are none directly comparable with the Penrhos Farm site.
- 7.31 Notwithstanding this, by way of comparison, taking the 3353.23 m² floor area for the proposed development and the 176 vehicle movements used in the assessment identified above, gives a trip rate of 5.249 trips per 100 m² per hour. For comparison purposes, a review of all default commercial warehousing sites within TRICS reveals the peak hour of activity occurs between 07:30 08:30, with an average of 0.324 movements per 100 m².

- 7.32 If ranking the sites, the highest rate for any business during this period was found to be 1.238 movements per 100 m². It is therefore apparent that the trip rate used in the assessment based on the artificial scenario created by adding 176 movements to a single hour represents more than 4 times the highest trip rate for comparable land uses within the TRICS output, which is provided at Appendix B for information.
- 7.33 It is therefore apparent that the artificially high worst-case assessment flows of 176 movements within a single peak hour should adequately cater for any potential alternative comparable use businesses that may occupy the site in the future, particularly when considering the development and network peak hour flows are not coincident in terms of their timings during the day.

8 DEVELOPMENT TRAFFIC IMPACT

- 8.1 Notwithstanding the fact that the acquisition of the haulage yard provides an unrestricted lawful baseline against which to offset the impact of the proposed activities at Penrhos Farm, which can only reasonably lead to a conclusion that proposed development no adverse impact on the highway network when assessed against the historic scenario, to demonstrate the road network can readily accommodate the traffic associated with the Applicant's business, the 176 daily movements identified within the previous section of this report have been superimposed onto the peak hourly flow observed on the local road network during the traffic surveys undertaken by Powys County Council.
- 8.2 It should be noted the assessment of 176 movements in an hour remains significantly above the worst-case identified based on the predicted activities with the 10 van fleet in operation in the future, by retaining an additional margin of 175% in excess of the identified flow 64 movements derived from that scenario.
- 8.3 The 176 movements per day also remains above the daily flow of 148 movements in a day established on the basis of a 10 van fleet being operated, with all vehicles visiting the site on one day, combined with 10 HGVs visiting the site plus 4 ad-hoc vans, even though it is known the van movements are in part replacing the HGV movements. As a result, the 148 movements per day itself includes an element of double-counting, providing a further margin to the 176 movements assessed.
- 8.4 As established when considering the existing traffic movements observed during the Council's surveys, the highest number of vehicle movements recorded was 61 between 16:00 17:00 on Tuesday 7th May, which included 7 HGV movements. Whilst this period is not coincident with the peak associated with the development, the respective peaks have been artificially combined to create a worst-case and onerous test to demonstrate the ability of the road network to accommodate the activities at Penrhos Farm.
- 8.5 Adding 176 movements to this observed flow gives a total of 237 movements per hour, including 47 HGV movements.

Highway Capacity

- 8.6 There are parts of the local road network which are not wide enough for 2 HGVs or for HGVs and cars travelling in opposite directions to pass freely, which effectively creates a single-track lane with passing places. At present there are areas of localised widening along the roads where HGVs can pass other HGVs / vehicles. However, despite the constraint imposed by HGVs, the roads are wide enough to two cars travelling in opposite directions to pass each other, albeit with care in some places.
- 8.7 The peak hour flows on the C2035 of 61 movements, as observed, and 237 movements assuming double the artificially high hourly flows assumed at Penrhos Farm for the purposed of this assessment, may be compared with the capacity of a single track road with passing places.
- 8.8 A study undertaken by the Transport and Roads Research Laboratory (TRRL) now TRL considered the capacity of single-track roads carrying traffic flows of between 50 and 300 movements per hour. A copy of the study is provided at Appendix C for information.
- 8.9 The findings of the study advise: "Results from the TRRL studies indicate that simply in terms of their capacity for carrying moving traffic single lane carriageways, correctly designed, are unlikely to incur significant increases in delay compared with traffic in free flow conditions, at flow levels of up to 300 vph (total two-way)".
- 8.10 In this case, as the lanes are wide enough for two cars to pass each other, which increases capacity and reduces delay, the practical capacity is higher. As it is the HGV activity which reduces the routes to single lane working, effectively the comparative flow in this case is the 47 HGV movements in the worst case and 7 as observed during the 2019 survey, because without an HGV being encountered, traffic can flow along the roads.
- 8.11 By reviewing the TRRL study, the table forming Figure 3 provides timings for the use of passing places which represent the amount of delay incurred at various flow levels with various directional splits. The right-hand column of the table indicates the maximum number of vehicles waiting.
- 8.12 By comparing the figures within the top 6 rows representing between 0 5 passing places within the 25/25 flow range (i.e. 50 vehicle movements per our), with those within the bottom 18 rows representing the results based on 300 vehicles per hour at various directional splits (150/150, 200/100 and 250/50), it is apparent that irrespective of the number of passing places where flows of up to 50 movements per hour create circumstances where vehicles must give way to one another, the associated delays are significantly less than occur at 300 vehicles per hour with 5 passing places provided.
- 8.13 Given the findings of the study that significant delays are unlikely to occur at flows of up to 300 vehicles per hour with correctly designed passing places when compared to free-flow conditions, it can only be concluded that the delays are insignificant in circumstances where 50 vehicles per hour cause obstructions, even if no passing places are provided.

- 8.14 Based on this research, it can only be concluded that capacity and delay would not be a significant constraint to the continuation of operations at Penrhos Farm, even if more than the total daily site traffic flows occurred within an hour which coincided with the observed highest hourly flow on the local roads, despite those peaks actually occurring at different times of the day. This is because even under this most onerous scenario, acceptable network performance would not be breached, despite making no allowance for the offsetting and inherent double-counting included within the assessment undertaken.
- 8.15 Given that the actual flows would be significantly lower and occurring primarily outside the network peak hour, it is apparent that the existing road network could readily accommodate the cumulative traffic associated with unrelated uses together with the business activities at Penrhos Farm.
- 8.16 This conclusion is reinforced by considering guidance within *"TA79/99 Traffic Capacity of Urban Roads"*.
- 8.17 Table 2 within TA79/99, identifies the hourly capacity of various types of route, which are expressed in terms of the busiest single direction of flow based on a 60/40 directional split. Therefore, to obtain the combined two-direction total hourly flow the figures identified in Table 2 should be multiplied by 1.667.
- 8.18 Within Table 2 a 6.1m wide UAP4 road has a one-way capacity of 750 movements, which corresponds with a total 2 way flow of 1250 movements. A UAP4 route is described in Table 1 of the document as a busy high street carrying predominantly local traffic, with frontage activity, a 30 mph speed limit, unlimited access to houses shops and businesses, unrestricted parking and loading, frequent at-grade pedestrian crossings and bus stops at the kerbside.
- 8.19 Based on the potential for disruption due to pedestrian crossings, on street parking, bus stops etc. it is clear that the busy high street would work as a single track road in places, where vehicles travelling in opposite directions would have to give way to one another. The on-street parking would certainly reduce the residual carriageway width of the high street to less than exists on the C2034 and C2035 in the vicinity of the site. Deducting 1.8m from 6.1m results in a residual width of 4.3m, whilst deducting 2.5m to represent a service HGV parked on-street results in a residual width of just 3.6m (i.e. narrower than the C2034 and C2035).
- 8.20 Table 4 of TA79/99 confirms reductions of 225 vehicles per hour are appropriate for HGV contents of 20 25% and 150 for HGV contents of 15 20%. It is therefore apparent that when identifying an hourly flow of 1250 movements on a busy high street, up to 186 of the movements (14.9% of 1250) could be anticipated to be HGVs before any correction is required.
- 8.21 On the busiest hour of activity on the C2035 the observed flow of 61 movements included 7 HGVs. Under the artificial worst-case scenario considered, the flow of 237 movements includes 47 HGVs, which equates to 19.8% HGV traffic. The comparable capacity is therefore reduced by 150 to 1100 vehicles per hour.

- 8.22 Therefore, even under the artificial worst case scenario established above, it is apparent that there would be a significant reserve or spare capacity when considered in the context of the design flows capable of being accommodated on a road network of comparable and narrower residual width when allowing for on-street parking.
- 8.23 As a result, highway capacity should not be considered a constraint to the proposed development.

Highway Safety

- 8.24 The traffic data reveals that there is clearly a level of historic use of the highway network by HGV traffic associated with Penrhos Farm and other businesses / activities in the area such as the neighbouring haulage yard, which, as previously explained, has an operator's licence for 15 HGVs plus 11 trailers.
- 8.25 As a result, irrespective of whether or not the Penrhos Farm site is operational, there is clearly potential for users of the road network to encounter an HGV when they travel along the roads at any point, and also the potential for HGVs to meet, both of which are known to occur from time to time. When such meetings occur, the vehicles are apparently able to manoeuvre past each other without leading to any significant level of personal injury accidents, as demonstrated by reference to the collision data previously reviewed within this Transport Statement.
- 8.26 Whilst the local road network comprising the C2034 and C2035 may not be ideally suited to HGV or other motor vehicle access when compared with modern desirable standards, due to the combinations of widths, gradient and alignment it is apparent that the roads nevertheless demonstrably accommodate a full range of vehicles without leading to a significant problem in terms of highway safety.
- 8.27 Whilst the proposed development would result in additional HGV activity if assessed in isolation, it would not alter the implications of either another road user encountering an HGV or should two HGVs meet.
- 8.28 Whilst the statistical probability of a vehicle meeting would increase, given the relatively low number of daily HGV movements associated with the site, which when distributed throughout the day would fall within the range of normal hour to hour variations experienced on the route, in practical terms the impact of an additional HGV movement or two in an hour is not considered to be significant in the local context.
- 8.29 Given the evident good safety record, and the confirmed use of the local routes by a both light and HGV traffic, including that associated with the Penrhos Farm, it is apparent that HGV impact on highway safety should not lead to a conclusion that the proposed development is unacceptable, based on the clear evidence of use.
- 8.30 A flexible evidence-based approach is advocated in current design guidance as is explained below with reference to the C2034 / C2035 junction.

C2034 / C2035 Junction

- 8.31 As established through the review of highway safety previously undertaken, there have been no recorded accidents at the junction within the most recent and preferred 5 year period for which data is available. It is also apparent that lateral visibility for drivers emerging from the C2034 onto the C2035 is restricted to the east by the boundary to the property sitting on the eastern corner of the junction.
- 8.32 Despite this constraint, the evidence suggests that this has not led to a significant highway safety issue, despite the use of the route by various types of traffic, including HGVs associated with Penrhos Farm, the neighbouring haulage yard and other activities.
- 8.33 Over a period of 5 years there would be 1826 days (365 days x 5 years + 1 day leap year).
- 8.34 To avoid potentially under-estimating the average daily flow by including the data from the second incomplete week of the survey period, which did not include data from Friday and therefore excludes higher flows than Saturday and Sunday, the first complete week of data was used to establish there would be around 1826 x 130 = 273,380 vehicle movements out of the junction over the 5 year period.
- 8.35 On the same basis there would be combined with 1826 x 240 = 438,240 westbound movements towards the junction and 1826 x 196 = 357,896 eastbound movements towards the junction.
- 8.36 In total the junction has therefore accommodated in the order of 1,069,516 vehicle movements over the 5 year period without a single personal injury accident being recorded, despite the apparent restricted visibility for emerging drivers and all types of vehicle known have used the roads including cars, HGVs and agricultural machinery.
- 8.37 The reason for the good safety performance at the junction may be explained by referring to guidance in Manual for Streets 2 (MfS2).
- 8.38 MfS2, which was launched in September 2010, provides additional information in terms of the application of the principles of MfS1 to the wider highway network and confirms "...that most MfS advice can be applied to a highway regardless of speed limit. It is therefore recommended that as a starting point for any scheme affecting non-trunk roads, designers should start with MfS" –emphasis as per paragraph 1.3.2 of MfS2.
- 8.39 As neither the C2034 nor C2035 are trunk roads, it is apparent that the UK national guidance confirms MfS should be the starting point.
- 8.40 At paragraph 1.3.7 MfS2 confirms that *"in rural areas many parts of the highway network are subject to the national speed limit but have traffic speeds significantly below 60 mph. Again, in these situations where speeds are lower than 40 mph, MfS SSD parameters are recommended."*

- 8.41 MfS2 confirms that HGVs and buses have different rates of deceleration to cars and light vehicles. However, at paragraph 10.1.8 it states: "As a guide, it is suggested that bus/HGV SSD should not need to be assessed when the combined proportion of HGV and bus traffic is less than 5% of traffic flow, subject to consideration of local circumstances". This is likely to be due to the fact that large vehicles (HGVs and Buses) typically travel at speeds below the 85th percentile. For example, paragraph 10.1.12 of MfS2 advises "Based on free flow vehicle speeds travelling in 30mph limits given in Transport Statistics Bulletin 2008, buses travel at 90% of the average speed for all vehicles"; noting that this is below the average speed and therefore well below the 85th percentile speeds.
- 8.42 The deceleration rate for large vehicles is identified as 0.375g, which is slower than that for light vehicles of 0.45g under MfS guidance. It is also significantly slower than the 0.67g adopted in the Highway Code when assessing emergency stopping distances.
- 8.43 The 0.375g rate of deceleration is referenced for HGV and Bus stopping distances, and as the basis of establishing the absolute minimum stopping distances for all vehicles on the trunk road where speeds exceed 60 kph in Table 10.1 of MfS2. It is noted that 60 kph (37.28 mph) is referenced within Table 10.1 whereas 40 mph (64.37 kph) is referenced in paragraph 1.3.7 of MfS2.
- 8.44 Paragraph 10.1.4 of MfS2 advises that the visibility splay requirements are based on the requirement to stop: "Stopping sight distance (SSD) is the distance drivers need to be able to see ahead and they can stop within from a given speed. It is calculated from the speed of the vehicle, the time required for a driver to identify a hazard and then begin to brake (the perception-reaction time), and the vehicle's rate of deceleration. For new streets, the design speed for the location under consideration is set by the designer. For existing streets, the 85th percentile wet-weather speed is used".
- 8.45 The 85th percentile speed referred to is that recorded on the priority route, which in this case is the C2035. It is therefore apparent that the purpose of the visibility splay is to allow the oncoming driver on the main road to see a potential hazard ahead and stop safely if necessary, rather than to allow the emerging driver to stop, as the latter's speed is not taken into account. Similarly, the quantum of traffic using the access road is not taken into account when assessing the visibility splay lengths, as it is the ability of a vehicle travelling on the priority route to stop that is the key consideration in terms of safety.
- 8.46 Whilst it is desirable to provide lateral visibility for the emerging driver to see oncoming traffic over the length of the SSD, it is not essential in order to maintain an acceptable level of highway safety.
- 8.47 Notwithstanding this, there is also a degree of flexibility in terms of the length of the visibility splays, as is recognised in paragraph 10.5.9 of MfS2, which advises: "The Y distance should be based on the recommended SSD values. However, based on the research referred to above, unless there is local evidence to the contrary, a reduction in visibility below recommended values will not necessarily lead to a significant problem." (Our emphasis).

- 8.48 This evidence-based approach is reiterated in an article contained in the November 2010 edition of Transportation Professional, the magazine of the Chartered Institution of Highways and Transportation. The Cover Story article "Manual for Streets 2" quotes Alan Young, the principal author of MfS1 and MfS2: "The advice is to look at speed first, then detailed assessment of local context and vehicle and pedestrian collision records. If there is a problem of safety, deal with it as appropriate; if collision records are acceptable, avoid rigorous following of standards and focus on the quality of the place," says Mr. Young." The article concludes with a further quotation "This research combined with what's been recognised before suggests greater visibility could be increasing hazards, but the important message is do not get hung up on standards. Be flexible and make decisions based on evidence."
- 8.49 The advice of Alan Young and MfS2 is underpinned by independent research into the relationship between restricted lateral visibility and collisions, which is reported in section 10.4 of MfS2.
- 8.50 Section 10.4 of MfS2 considers Visibility at Priority Junctions on pages 076 and 077. Paragraph 10.4.2 states "It has often been assumed that a failure to provide visibility at priority junctions in accordance with the values recommended in MfS1 or DMRB (as appropriate) will result in an increased risk of injury collisions. Research carried out by TMS consultancy for MfS2 has found no evidence of this."
- 8.51 The study reported on pages 76 and 77 of MfS2 advises "A series of "high risk" priority junctions was identified as the basis for research. Uncontrolled crossroads and T-junctions were selected for all classes of road throughout Nottinghamshire, Sandwell, Lambeth and Glasgow...A series of collision types at high risk locations where Y distance was less than 45m were compared with locations with more than 45m visibility. There were no statistically significant differences between the two sets of data. The data analysed included main road bus and large vehicle collisions, and the research did not find high numbers of collisions involving these types of vehicles at low visibility sites."
- 8.52 The report concludes "This study has been unable to demonstrate that road safety concerns regarding reduced Y distance are directly associated with increased collision risk at "high-risk" urban sites; Previous research for MfS1 demonstrated that main road speed is influenced by road width and forward visibility. Many of the locations in this study were straight roads with good forward visibility. The ability of a driver to stop is likely to be affected by more than just what is happening in the side road and an understanding of the factors influencing main road speed is important when assessing visibility requirements."
- 8.53 The fact that the sites reviewed provided good forward visibility explains why there was no link to collisions despite the restricted lateral visibility at these junctions. There are few drivers who are intent on having a collision, and any reasonable driver would take steps to avoid a collision where possible; even if this means slowing down on the priority route.
- 8.54 This principle of driver behaviour is recognised at Page 80 of MfS2, which considers obstacles to visibility. Paragraph 10.7.1 states: *"Parking in visibility splays in built-up areas is quite common, yet it does not appear to create significant problems in practice. Ideally, defined parking bays should be provided outside the visibility splay. However, in some*

circumstances, where speeds are low, some encroachment may be acceptable (See Example below)".

8.55 The text accompanying the Example referred to advises: "At urban junctions where visibility is limited by buildings and parked cars, drivers of vehicles on the minor arm tend to nose out carefully until they can see oncoming traffic and vice-versa.

In the images above, the blue car moves forward slowly until it can see past the parked vehicles to see that the gap to the next oncoming vehicle is long enough for it to pull out. Drivers on the major route will also be able to see the vehicle pulling forward slowly and may slow down or stop to allow it to pull out".

- 8.56 As reported in MfS2 at paragraph 3.1.8, the Highway Code provides advice to drivers to "take the road and traffic conditions into account. Be prepared for unexpected or difficult situations, for example, the road being blocked beyond a blind bend. Be prepared to adjust your speed as a precaution...where there are junctions, be prepared for road users emerging." Paragraph 3.1.10 of MfS2 advises that drivers are responsible for their own safety and cites a ruling "The overriding imperative is that those who drive on the public highway do so in a manner and at speed which is safe having regard to such matters as the nature of the road, the weather conditions and the traffic conditions. Drivers are first and foremost responsible for the own safety."
- 8.57 MfS2 is critical of the approach of some practitioners at paragraph 3.2.1 which states: *"For* some time there have been concerns expressed over designers slavishly adhering to guidance regardless of local context." The document goes on to state in the following paragraphs "Designers are expected to use their professional judgement when designing schemes and should not be over-reliant on guidance....Available guidance is just that, guidance, and cannot be expected to cover the precise conditions and circumstances applying at the site under examination....The authors of guidance, how ever accomplished, will not be cognizant of the site and situation in question. It would be neither reasonable nor rational to presume that anyone could produce an optimal design in abstract. The informed judgement of trained professionals on-site, should logically take precedence over guidance".
- 8.58 Specific guidance is given for rural areas at section 2.8 of MfS2, which states at paragraph 2.8.1: "Rural roads are an integral part of the landscape, often reflecting and preserving historic landscape features such as ancient routes or field boundaries and set within outstanding countryside. Elements such as hedges, verges, banks and fingerposts may contribute strongly to local character and historic significance." Paragraph 2.8.2 continues: "There is a considerable variation in the highway network running through rural areas from motorways to Green Lanes. The majority of other rural roads follow old pathways and boundaries and do not conform to present guidance on highway standards. Indeed to do so could be to the detriment of local character and lead to intrusion into some of our most outstanding landscapes."
- 8.59 MfS2 refers to Devon County Council's good practice advice, with the following text: "Junction improvements will only be considered where there is a proven safety need...There should be a presumption of retaining trees hedges and verges including any central grass

areas....If a traditional Devon hedge needs to be removed for the realignment of a road, the practicality of translocation/moving the hedgebank should be considered in the first instance. Where this is not feasible, the next option should be to carefully dismantle and reconstruct the hedge. Archaeological recording and supervision may be required."

- 8.60 As is clear, MfS2 seeks to steer away from the slavish adherence to guidance and encourages practitioners to think about the circumstances of the case.
- 8.61 Based on the preceding guidance, it is apparent that restrictions to lateral visibility may be acceptable subject to the provision of adequate forward visibility and a good safety record.
- 8.62 It has been established that the access has an excellent safety record with no recorded injury accidents occurring in the most recent 5 year period. By reference to the speeds recorded during the Council's traffic surveys and the relevant stopping distances derived from them, it was previously demonstrated in section 3 of this Transport Statement that the forward visibility is sufficient to provide for safe stopping.
- 8.63 Given the advice in rural areas regarding only requiring improvements where there is a proven safety need, having established that capacity is not a material constraint in this case and that the safety record is good, it may reasonably be concluded that the impact of the proposed development at Penrhos Farm on the existing highway network is acceptable if assessed as additional activity with no offsetting for existing / permitted activity.
- 8.64 When taking into account the offsetting of the potential traffic attractions to the neighbouring haulage yard, which the Applicant has confirmed will only be used to service his business at Penrhos Farm, it can only be reasonably concluded that there is no adverse impact on the road network at all.

9 POTENTIAL ROAD IMPROVEMENTS

- 9.1 Through the process of the previous applications and the Appeals process, various potential road improvement schemes have been offered to overcome concerns raised by the Council and / or interested parties. These include revising the existing site access to prevent HGVs turning left out of and right into Penrhos Farm; removing the grass triangle at the C2034/C2035 junction to increase the road-space available to accommodate turning movements; and the provision of passing places along the C2034 and C2035 to assist in the movement of traffic along the route.
- 9.2 Given that it has been demonstrated that the existing road network can satisfactorily accommodate the activities at Penrhos Farm even when assessed under artificially onerous conditions, and that there can be no adverse highway impact in practical terms when taking into account the offsetting of the lawful fall-back provided by the adjacent haulage yard, there is a compelling case to suggest that no improvements are necessary or justified in this case. Notwithstanding that, the Applicant has confirmed his willingness to deliver the potential improvements previously offered, or a reasonable variation of them, subject to the requirements of the Highway Authority when taking into account any representations made.

Site Access

- 9.3 The potential revisions to the existing site access illustrated in Figure 4 were designed to overcome concerns raised regarding HGVs travelling to / from Penrhos Farm via the route from / to the north through Deytheur to Llansantffraid, by physically preventing the left turn out of the site and the right turn in.
- 9.4 The swept path analysis provided at Figure 4 provides for two-way articulated HGV movement whilst also preventing the vehicles entering and leaving via the northern route.
- 9.5 Notwithstanding this, the Applicant has confirmed that drivers of HGVs are instructed to enter and leave Penrhos Farm via the route to the south of the access only, and has proposed a S106 planning obligation offering a routing agreement.
- 9.6 The Applicant is confident that the routing of HGVs visiting Penrhos Farm may be controlled in the same way that paragraph 5.14.49 of PPW specifically advocates the use of S106 agreements and conditions to secure routeing of mineral-related vehicles: "As mineral development usually takes place in rural locations where the road network may be inadequate to accommodate a significant number of heavy vehicles, the impact of traffic generated by mineral development needs careful consideration and a traffic impact assessment may be required. If necessary, the routes to be used by mineral vehicles should be controlled through Section 106 agreements or by planning conditions to encourage certain directions of movement through careful access design and appropriate signage."
- 9.7 As routeing agreements are clearly acceptable for mineral development, there is no reason in principle why they should not be acceptable for other kinds of development. Restricting vehicle routes is relatively common within Construction Management Plans for development, which are often required through planning conditions.
- 9.8 It is understood that historically an HGV has attempted to leave Penrhos Farm via the northern route, which subsequently led to the Applicant introducing requirements that access for such vehicles be via the south only. Notwithstanding this apparent adherence to the existing vehicle routing, which is proposed to be formalised through the S106 agreement, if considered necessary, the Applicant would be willing to revise the existing access as illustrated at Figure 4, in order to physically prevent entry to / exit from Penrhos Farm via a right turn and left turn respectively. This would effectively make the routing agreement self-enforcing.
- 9.9 However, the Highway Authority raised concerns that should an HGV approach from the north, contrary to the routeing requirements imposed upon hauliers by the Applicant, which are monitored by CCTV at the site access and may be controlled through contractual obligations, the HGV would have nowhere nearby to conveniently and safely turn around. The Highway Authority suggested that preventing the right turn into the site may not be desirable.

9.10 It would be relatively straight-forward to amend the access layout illustrated on Figure 4 to allow any movement should the Highway Authority have a preference. However, given the unrestricted access available to vehicles travelling to / from the haulage yard and the fact that CCTV and contractual obligations imposed on external hauliers visiting the site may monitor / control activity, the need for any further restrictions at the site access may be questioned.

C2034 / C2035 Junction

- 9.11 The potential improvements to the C2034 / C2035 junction involve creating additional roadspace for the manoeuvring of vehicles by removing an existing grass triangle which sits between the western and eastern parts of the C2034 at the existing bellmouth.
- 9.12 This would change how the existing junction operates in terms of movements to and from the C2034, which forms the minor arm.
- 9.13 Removing the central triangle would result in the C2034 minor arm approach becoming a standard T arrangement whereby there is one approach lane to and one exit lane from the C2035, which are controlled by Give Way markings. It would also be necessary to relocate the existing direction sign mounted within the triangle to the opposite side of the road where there is a wide verge.
- 9.14 The potential revisions to the junction are provided with vehicle swept path analyses at Figure 5 for information / consideration; however, it is noted that representations were made associated with the Appeals process by local residents who sought to retain the green triangle and the junction in its current form, as it contributes to the local character / context.
- 9.15 As previously demonstrated the evidence available demonstrates that the existing junction operates satisfactorily and that there is no reason to believe it could not continue to do so when taking into account the findings of the impact assessment undertaken and reported within this Transport Statement.

Passing Bays / Places

- 9.16 Despite the evidence demonstrating that passing places are not necessarily justified on capacity or safety grounds, it is recognised that increasing the ability for vehicles to pass freely would, by definition reduce the potential for delay to occur, even if the delays in the absence of additional provision are not significant or unacceptable in the context of highway design considerations.
- 9.17 On this basis, recognising that the activities at Penrhos Farm would attract some HGV movement and in response to local concerns, passing places could be provided along the route between the site and A483.

- 9.18 Whilst the Council has a standard detail for the design of passing places, formed with formal tapers to / from the widened bay, following a review of the local road network locations were identified where it was considered localised widening to facilitate the passage of HGV traffic would be most beneficial, taking into account the areas of existing localised widening, significant verge over-running and available passing opportunities along the lanes.
- 9.19 In order to minimise their visual impact, which has been raised as a concern by local objectors, rather than creating formal passing bays, which can provide an unnecessarily urbanised appearance, it is considered localised widening on one or both sides of the carriageway within the existing adopted highway verges at each location would create a more sympathetic solution whilst creating the additional carriageway area to achieve the 6.3m width preferred by the Highway Authority. The localised widening would be in keeping with that already provided along the route where the tapers are gently curved rather than being straight lines between the carriageway edge and the widest point of the passing place.
- 9.20 Six locations for additional localised widening to create passing places were identified, to supplement the existing provision, as illustrated in Figure 6 for information

Delivery of Potential Highway Improvements

- 9.21 Having considered the scale of the potential works, it is anticipated that either / all schemes could be delivered via either a minor works licence or S278 Agreement, in accordance with a standard planning condition imposed on a planning permission.
- 9.22 Subject to the requirements of the Highway Authority, the final, more detailed designs would be submitted for approval prior to construction by approved contractors within an agreed timeframe.

10 SUMMARY

- 10.1 The Applicant is seeking planning permission at Penrhos Farm for "Change of use of land and buildings from agricultural to storage use (Class B8), with ancillary business use (Class B1), erection of a steel portal frame building (including demolition of agricultural buildings), associated access, fence and gate, hardstanding, and landscaping, and retention of haulage yard in haulage use".
- 10.2 The site has an extensive planning history and the proposed development is the subject of ongoing Appeals. A new planning application has been submitted which includes the recently acquired haulage yard immediately to the north and adjoining Penrhos Farm, as this is a material planning consideration when assessing potential transport and highway impacts of the business activities.
- 10.3 It is intended that the new application will overcome the Council's reasons for refusal of the earlier applications, which, if approved, will allow the Appeals to be curtailed.
- 10.4 In terms of the planning application, whilst the haulage yard falls within the red line of the site, it has been annotated to remain as existing, as there are no proposals to change its current lawful use as a haulage yard. However, the use of the haulage yard, which has an Operator's Licence for 15 HGVs and 11 trailers, will be limited to being used only in association with the proposed uses at the neighbouring Penrhos Farm through a S106 planning obligation.
- 10.5 The proposed development within Penrhos Farm reflects the uses proposed and being considered within the planning Appeals in association with the Applicant's business, as set out in the description of the development above.
- 10.6 Having prepared the Highway Evidence for the more recent Appeals, The Hurlstone Partnership Limited was instructed to prepare a Transport Statement to accompany the new planning application, which incorporates the haulage yard and considers its impact on the assessment of the proposed development.
- 10.7 As part of the review, there have been several site visits together with a review of empirical traffic survey data, the visibility at the site access and neighbouring junction, local collision data, the relevant planning history and current design guidance.
- 10.8 Having completed the review it was found that the existing road network can safely accommodate the development traffic whilst retaining sufficient capacity to ensure delays do not reach unacceptable levels when considered against current guidance, even if more than the total daily traffic attractions to the site are artificially compressed to a single hour then added to the peak hour flow observed on the busiest route within the study area, with no allowance of offsetting of trips.

- 10.9 It was therefore found that there is no over-riding conflict with Policy that would justify refusal on transport grounds.
- 10.10 In addition to technical highway design and geometry matters, the transport accessibility of Penrhos Farm was assessed with reference to national and local policy which is appropriate for rural areas.
- 10.11 Despite its rural location, it was found that average journey to work distances and modal choice for staff travel to / from Penrhos Farm were comparable with those for the County as a whole.
- 10.12 Given policy provides for flexibility in rural areas it was found that transport accessibility should not justify refusal of planning permission.
- 10.13 Notwithstanding the demonstrable acceptability of the proposed development in transport terms based on the proposed development using the existing road network, the Applicant has offered betterment in the form of potential highway improvements to be delivered by way of a planning condition or conditions, should they be deemed desirable and acceptable. The Applicant will also operate a Travel Plan to further encourage a shift towards sustainable travel, even though sustainable modes are already used by a larger percentage of the Penrhos Farm workforce than within Powys as a whole.
- 10.14 Since the previous planning applications were refused, the Applicant has acquired the neighbouring haulage yard, which is licenced to run 15 HGVs and 11 trailers from the site, with no known restrictions on vehicle movements or operating hours. Based on minimal activity by each of the permitted HGVs, the total number of HGV movements would already exceed that associated with the Penrhos Farm site on a busy trading day during peak season.
- 10.15 Notwithstanding the conclusion that the assessment undertaken confirmed the impact of the proposed development would be acceptable, when assessed as a stand-alone enterprise, this acquisition of the haulage yard could meet the demands of the Applicant's business at peak trading times whilst remaining well within the range of normal daily activity historically occurring at that site.
- 10.16 The fact that the Applicant's hauliers may not be based at the neighbouring haulage yard does not detract from the fact that due to the reduced activities as the haulage yard operator's business is wound down, the cumulative HGV flows on the same road network, when the Applicant's business is operating at peak levels, would remain below those previously associated with the haulage yard alone.
- 10.17 Having considered the foregoing it can only be reasonably concluded that planning permission should not be refused on highway grounds either with or without the highway improvements offered by the Applicant being provided.
- 10.18 Notwithstanding this, as a further potential benefit in terms of highway and transport matters, the applicant has confirmed that the use of the haulage yard would be limited to only serving the proposed uses at Penrhos Farm, thereby offering further reductions and control over the lawful fall-back in terms of HGV activity on the local road network.
- 10.19 Having considered the findings of the review it is apparent that there are no reasonable or justifiable grounds for preventing planning permission for the proposed development from being granted based upon highway or transport matters.

FIGURES









+ + + + + + + + + + + + + + + + + + +	+ + + + + + + + + + + + + + + + + + +	2.89 PF +112.86 112.79 112.57 + 112.67	• IC cl 111.7	+	+ + + + + + + + + + + + + + + + + + +	
The Hurlstone Partnership Seven Oaks Farm, Crew Green, Shrewsbury SY5 9AS	Pernhos Farr Pot to Prevent Art	n, Penrhos, Llansan ential Access Revisi iculated HGV Acces	tffraid, Powys on s to / From North			
e-mail: <u>office@hurlstones.com</u>	SCALE: 1:500 @ A3	DATE: May 2021	DWG NO. Figure 4	Rev	Amendments	Date





@ A3	
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APPENDIX A

Traffic Survey Data



		POWYS								
		MAY 2019			Posted Speed					
Site	Location	Direction	Start Date	End Date	Limit (PSL)	Total Vehicles	5 Day Ave.	7 Day Ave.	85%ile Speed	Mean Speed
Site No:	Site M1232 - C2034 (S)	Channel: Southbound	Sat 04-May-19	Fri 17-May-19	60	1828	140	131	31.9	25.5
00001232	N of C2035	Channel: Northbound	Sat 04-May-19	Fri 17-May-19	00	1782	137	127	31.7	25.6

0		POWYS		Site No: 000	001232	Location	Site M1232 -	- C2034 (S) N	l of C2035									
				Channel: So	uthbound													
TIME	Sat	Sun	Mon	Tue	Wed	Thu	Fri	5-Day	7-Day	Sat	Sun	Mon	Tue	Wed	Thu	Fri	5-Day	7-Day
PERIOD	04/05/19	05/05/19	06/05/19	07/05/19	08/05/19	09/05/19	10/05/19	Av	Av	11/05/19	12/05/19	13/05/19	14/05/19	15/05/19	16/05/19	17/05/19	Av	Av
Week Begi	n: 04-May-1	.9																
00:00	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
01:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
02:00	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:00	0	0	0	0	0	1	1	0	0	0	0	1	1	1	0	0	1	0
04:00	2	2	0	2	1	1	3	1	2	3	1	0	1	2	0	1	1	1
05:00	1	1	1	3	3	5	2	3	2	5	1	3	4	4	5	4	4	4
06:00	1	0	1	3	4	2	4	3	2	0	0	1	4	5	6	0	3	2
07:00	2	3	3	9	8	11	12	9	7	7	0	8	9	10	14	7	10	8
08:00	9	0	7	12	15	18	10	12	10	14	3	15	12	13	16	12	14	12
09:00	12	7	13	15	10	11	12	12	11	18	6	9	14	10	9	1	9	10
10:00	14	12	8	8	6	13	12	9	10	7	7	5	11	12	10	0	8	7
11:00	7	8	8	9	5	5	6	7	7	11	8	9	14	6	8	0	7	8
12:00	6	10	12	12	2	12	5	9	8	8	13	7	7	6	8	0	6	7
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15:00	10	7	8	13	16	9	20	13	12	9	9	9	19	20	7	0	11	10
16:00	4	3	7	17	16	20	14	15	12	5	7	16	15	19	18	0	14	11
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18:00	7	1	8	12	7	13	7	9	8	5	4	14	7	12	16	0	10	8
19:00	4	3	5	5	5	4	5	5	4	6	3	9	10	11	6	0	7	6
20:00	4	5	5	1	2	3	4	3	3	8	1	6	9	2	6	0	5	5
21:00	2	0	2	2	1	3	2	2	2	1	6	5	0	5	7	0	3	3
22:00	2	0	0	0	1	1	0	0	1	0	1	0	0	0	2	0	0	0
23:00	2	2	0	1	0	0	1	0	1	2	2	0	0	0	1	0	0	1
12H,7-19	92	71	99	133	125	147	121	125	113	110	82	122	143	134	142	20	112	108
16H,6-22	103	79	112	144	137	159	136	138	124	125	92	143	166	157	167	20	131	124
18H,6-24	107	81	112	145	138	160	137	138	126	127	95	143	166	157	170	20	131	125
24H,0-24	111	85	113	150	142	167	143	143	130	136	97	147	172	164	176	25	137	131

0		POWYS		Site No: 000	001232	Location	Site M1232	- C2034 (S) N	l of C2035									
				Channel: No	rthbound													
				channet. No	intibound													
TIME	Sat	Sun	Mon	Tue	Wed	Thu	Fri	5-Dav	7-Day	Sat	Sun	Mon	Tue	Wed	Thu	Fri	5-Dav	7-Day
PERIOD	04/05/19	05/05/19	06/05/19	07/05/19	08/05/19	09/05/19	10/05/19	Av	Av	11/05/19	12/05/19	13/05/19	14/05/19	15/05/19	16/05/19	17/05/19	Av	Av
Week Begi	n: 04-May-1	9	,,	07700710	00,00,10	,,						10/00/10	- 1/ 00/ 10					
00:00	0	1	0	0	0	0	0	0	0	1	0	1	0	0	1	1	1	1
01:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:00	1	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
03:00	0	0	0	0	0	1	1	0	0	0	0	1	1	1	0	0	1	0
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05:00	0	0	0	2	2	4	1	2	1	3	0	3	2	3	2	2	2	2
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11:00	8	15	6	7	6	13	5	7	9	6	9	5	4	6	3	0	4	5
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14:00	14	7	7	8	5	16	15	10	10	11	7	8	14	8	10	0	8	8
15:00	4	9	9	14	16	13	11	13	11	9	5	15	16	17	10	0	12	10
16:00	15	8	13	18	23	15	5	15	14	9	10	15	18	18	17	0	14	12
17:00	3	9	9	12	12	15	13	12	10	8	3	15	15	19	13	0	12	10
18:00	8	1	8	13	11	14	9	11	9	9	10	12	5	14	11	0	8	9
19:00	7	8	4	10	3	9	6	6	7	4	3	9	8	9	11	0	7	6
20:00	4	8	4	3	3	5	8	5	5	1	0	10	4	4	6	0	5	4
21:00	3	1	2	4	3	4	3	3	3	5	3	4	4	3	7	0	4	4
22:00	1	1	0	1	0	2	1	1	1	2	2	3	1	2	3	0	2	2
23:00	2	1	0	1	1	0	1	1	1	4	0	1	1	0	1	0	1	1
12H,7-19	86	74	85	127	125	129	119	117	106	110	73	119	143	135	126	17	108	103
16H,6-22	101	92	95	147	135	148	139	133	122	120	81	143	165	153	153	18	126	119
18H,6-24	104	94	95	149	136	150	141	134	124	126	83	147	167	155	157	18	129	122
24H 0_24	107	97	96	153	141	157	146	139	128	133	83	153	171	161	161	23	134	126

0		POWYS		Site No: UUU	01232	Location	Site M1232 -	C2034 (S) N	1 of C2035									
				Channel: Co	mbined													
TIME	Sat	Sun	Mon	Tue	Wed	Thu	Fri	5-Day	7-Day	Sat	Sun	Mon	Tue	Wed	Thu	Fri	5-Day	7-Day
PERIOD	04/05/19	05/05/19	06/05/19	07/05/19	08/05/19	09/05/19	10/05/19	Av	Av	11/05/19	12/05/19	13/05/19	14/05/19	15/05/19	16/05/19	17/05/19	Av	Av
Week Beg	in: 04-May-:	19																
00:00	0	2	0	0	0	0	0	0	0	2	0	1	0	0	1	1	1	1
01:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
02:00	2	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
03:00	0	0	0	0	0	2	2	0	0	0	0	2	2	2	0	0	2	0
04:00	4	3	1	4	4	3	6	3	4	5	1	1	2	4	1	3	2	2
05:00	1	1	1	5	5	9	3	5	3	8	1	6	6	7	7	6	6	6
06:00	2	1	1	6	5	3	7	5	3	0	2	2	10	7	9	1	6	4
07:00	5	4	4	16	14	20	21	15	12	15	2	16	20	18	23	15	19	16
08:00	11	2	8	24	26	24	19	20	16	19	3	28	23	26	27	20	25	21
09:00	24	11	23	24	19	19	26	22	20	32	12	16	26	14	23	2	17	18
10:00	16	16	14	19	13	18	20	16	16	17	7	14	22	20	16	0	15	13
11:00	15	23	14	16	11	18	11	14	16	17	17	14	18	12	11	0	11	13
12:00	13	21	18	19	12	19	14	17	16	19	23	14	22	16	18	0	14	16
13:00	16	13	19	18	24	21	20	20	18	19	20	12	19	22	23	0	16	16
14:00	21	12	14	17	19	28	22	20	19	22	14	17	27	16	19	0	16	16
15:00	14	16	17	27	32	22	31	26	23	18	14	24	35	37	17	0	23	20
16:00	19	11	20	35	39	35	19	30	26	14	17	31	33	37	35	0	28	23
17:00	9	14	17	20	23	25	21	21	18	14	12	29	29	25	29	0	22	19
18:00	15	2	16	25	18	27	16	20	17	14	14	26	12	26	27	0	18	17
19:00	11	11	9	15	8	13	11	11	11	10	6	18	18	20	17	0	14	12
20:00	8	13	9	4	5	8	12	8	8	9	1	16	13	6	12	0	10	9
21:00	5	1	4	6	4	(5	5	5	6	9	9	4	8	14	0	7	7
22:00	3	1	0	1	1	3	1	1	2	2	3	3	1	2	5	0	2	2
23:00	4	3	0	2	1	0	2	1	2	6	2	1	1	0	2	U	1	2
12H,7-19	178	145	184	260	250	276	240	242	219	220	155	241	286	269	268	37	220	211
16H,6-22	204	1/1	207	291	272	307	2/5	2/1	246	245	1/3	286	331	310	320	38	257	243
18H,6-24	211	1/5	207	294	2/4	310	2/8	2/2	250	253	1/8	290	333	312	327	38	260	247
74H 0-74	218	182	209	503	283	.524	289	187	258	1 269	180	.500	-543		-537	48		257

0		PO	WYS		Site No: 000012	232	Location	Site M1232 - C	2034 (S) N of C2	035	
Sat 04-May-19 to	o Fri 17-May-19				Channel: South	bound					
TIME	TOTAL	MOTOR-	MOTOR-								
PERIOD	VEHICLES	CYCLES	CYCLES%	CARS	CARS %	LGV	LGV %	HGV	HGV %	BUS	BUS %
Daily Totals											
Sat 04-May-19	111	7	6.3	92	82.9	9	8.1	3	2.7	0	0.0
Sun 05-May-19	85	1	1.2	74	87.1	7	8.2	3	3.5	0	0.0
Mon 06-May-19	113	3	2.7	95	84.1	8	7.1	7	6.2	0	0.0
Tue 07-May-19	150	2	1.3	116	77.3	14	9.3	15	10.0	3	2.0
Wed 08-May-19	142	1	0.7	100	70.4	30	21.1	9	6.3	2	1.4
Thu 09-May-19	167	1	0.6	130	77.8	20	12.0	12	7.2	4	2.4
Fri 10-May-19	143	3	2.1	98	68.5	27	18.9	14	9.8	1	0.7
Sat 11-May-19	136	2	1.5	115	84.6	13	9.6	6	4.4	0	0.0
Sun 12-May-19	97	7	7.2	84	86.6	4	4.1	2	2.1	0	0.0
Mon 13-May-19	147	3	2.0	113	76.9	15	10.2	14	9.5	2	1.4
Tue 14-May-19	172	3	1.7	125	72.7	23	13.4	19	11.1	2	1.2
Wed 15-May-19	164	1	0.6	128	78.1	17	10.4	15	9.2	3	1.8
Thu 16-May-19	176	3	1.7	138	78.4	21	11.9	10	5.7	4	2.3
Fri 17-May-19	25	0	0.0	17	68.0	2	8.0	5	20.0	1	4.0
Total Vehicles											
[]	1828	37	2.1	1425	78.1	210	10.9	134	7.7	22	1.2

0		PO	WYS		Site No: 000012	232	Location	Site M1232 - C	2034 (S) N of C2	035	
Sat 04-May-19 to	Fri 17-May-19				Channel: North	bound					
	TOTAL	MOTOR-	MOTOR-	CADS				ЦСУ		DUE	
Daily Totals	VEHICLES	CYCLES	CICLES%	CARS	CARS %	LGV	LGV %	HGV	HGV %	BU2	BU3 %
Sat 04-May-19	107	8	7.5	87	81.3	9	8.4	3	2.8	0	0.0
Sun 05-May-19	97	2	2.1	83	85.6	10	10.3	2	2.1	0	0.0
Mon 06-May-19	96	0	0.0	83	86.5	7	7.3	6	6.3	0	0.0
Tue 07-May-19	153	3	2.0	113	73.9	17	11.1	18	11.8	2	1.3
Wed 08-May-19	141	0	0.0	102	72.3	25	17.7	12	8.5	2	1.4
Thu 09-May-19	157	2	1.3	121	77.1	19	12.1	13	8.3	2	1.3
Fri 10-May-19	146	4	2.7	110	75.3	22	15.1	9	6.2	1	0.7
Sat 11-May-19	133	4	3.0	113	85.0	9	6.8	7	5.3	0	0.0
Sun 12-May-19	83	3	3.6	76	91.6	3	3.6	1	1.2	0	0.0
Mon 13-May-19	153	6	3.9	113	73.9	20	13.1	13	8.5	1	0.7
Tue 14-May-19	171	0	0.0	127	74.3	24	14.0	18	10.5	2	1.2
Wed 15-May-19	161	4	2.5	124	77.0	20	12.4	12	7.5	1	0.6
Thu 16-May-19	161	2	1.2	125	77.6	16	9.9	14	8.7	4	2.5
Fri 17-May-19	23	0	0.0	13	56.5	7	30.4	3	13.0	0	0.0
Total Vehicles											
[]	1782	38	2.1	1390	77.7	208	12.3	131	7.2	15	0.7

		POWYS								
		MAY 2019			Posted Speed					
Site	Location	Direction	Start Date	End Date	Limit (PSL)	Total Vehicles	5 Day Ave.	7 Day Ave.	85%ile Speed	Mean Speed
Site No:	Site M1233 - C2034 (N)	Channel: Southbound	Sat 04-May-19	Fri 17-May-19	60	1532	114	110	38.2	30.3
00001233	N of C2035	Channel: Northbound	Sat 04-May-19	Fri 17-May-19		1482	109	106	37.5	29.4

0		POWYS		Site No: 000	001233	Location	Site M1233 -	C2034 (N) N	N of C2035									
				Channel: So	uthbound													
				channet, 50	athbound													
TIME	Sat	Sun	Mon	Tue	Wed	Thu	Fri	5-Day	7-Day	Sat	Sun	Mon	Tue	Wed	Thu	Fri	5-Day	7-Day
PERIOD	04/05/19	05/05/19	06/05/19	07/05/19	08/05/19	09/05/19	10/05/19	Av	Av	11/05/19	12/05/19	13/05/19	14/05/19	15/05/19	16/05/19	17/05/19	Av	Av
Week Begi	n: 04-May-1	9										· · · ·						
00:00	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
01:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
02:00	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:00	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
04:00	1	2	0	0	0	0	1	0	1	1	1	0	0	0	0	0	0	0
05:00	1	1	1	1	1	2	1	1	1	3	1	1	2	1	3	2	2	2
06:00	1	0	1	2	1	1	2	1	1	0	0	0	4	5	5	0	3	2
07:00	2	3	3	9	8	11	13	9	7	5	0	9	9	11	16	7	10	8
08:00	8	0	7	11	14	18	8	12	9	12	3	13	11	13	14	15	13	12
09:00	11	5	13	13	9	8	10	11	10	13	5	8	12	8	5	0	7	7
10:00	14	12	8	7	6	13	10	9	10	8	7	4	10	11	9	0	7	7
11:00	4	7	7	9	6	5	5	6	6	7	10	8	11	5	7	0	6	7
12:00	6	10	12	12	1	11	4	8	8	7	12	7	5	5	7	0	5	6
13:00	8	8	9	9	6	12	6	8	8	6	9	7	7	9	8	0	6	7
14:00	7	5	7	5	13	11	7	9	8	10	6	7	11	7	8	0	7	7
15:00	10	7	9	10	10	4	15	10	9	11	8	3	11	15	5	0	7	8
16:00	3	3	7	6	4	12	11	8	7	3	7	7	9	10	12	0	8	7
17:00	6	5	9	6	10	7	5	7	7	4	10	12	7	6	9	0	7	7
18:00	7	1	8	11	6	10	6	8	7	4	4	13	5	8	13	0	8	7
19:00	4	3	5	5	5	4	5	5	4	5	3	9	10	11	6	0	7	6
20:00	4	6	5	1	2	3	4	3	4	8	1	6	9	3	4	0	4	4
21:00	2	0	2	2	1	3	2	2	2	1	6	5	1	4	6	0	3	3
22:00	2	0	0	0	1	1	0	0	1	0	1	0	0	0	2	0	0	0
23:00	2	2	0	1	0	0	1	0	1	2	2	0	0	0	1	0	0	1
12H,7-19	86	66	99	108	93	122	100	104	96	90	81	98	108	108	113	22	90	89
16H,6-22	97	75	112	118	102	133	113	116	107	104	91	118	132	131	134	22	107	105
18H,6-24	101	77	112	119	103	134	114	116	109	106	94	118	132	131	137	22	108	106
24H,0-24	104	81	113	120	104	136	116	118	111	111	96	119	134	133	141	24	110	108

0		POWYS		Site No: UUC	01233	Location	Site M1233 -	C2034 (N) I	N OT C2035									
				Channel: No	rthbound													
TIME	Sat	Sun	Mon	Tue	Wed	Thu	Fri	5-Day	7-Day	Sat	Sun	Mon	Тие	Wed	Thu	Fri	5-Day	7-Day
PERIOD	04/05/19	05/05/19	06/05/19	07/05/19	08/05/19	09/05/19	10/05/19	Δv	Δv	11/05/19	12/05/19	13/05/19	14/05/19	15/05/19	16/05/19	17/05/19	Δν	Δν
Week Begi	in: 04-May-1	9	00/00/10	07700710	00/00/13	03/03/13	10/03/13	~		11/03/13	12/03/13	13/03/13	14/03/13	10/00/10	10/00/10	1//05/15		
00:00	0	1	0	0	0	0	0	0	0	1	0	1	0	0	1	1	1	1
01:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:00	1	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
03:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:00	1	1	1	0	1	1	1	1	1	0	0	1	0	1	0	1	1	0
05:00	0	0	0	0	0	1	0	0	0	1	0	0	0	0	2	0	0	0
06:00	0	1	0	2	0	1	0	1	1	0	2	0	7	2	2	1	2	2
07:00	3	1	1	4	3	4	6	4	3	2	2	4	6	4	4	3	4	4
08:00	2	2	1	8	7	4	5	5	4	2	0	11	8	10	8	7	9	7
09:00	11	4	10	10	8	7	12	9	9	9	7	6	8	4	10	1	6	6
10:00	1	4	6	10	6	5	7	7	6	8	0	7	9	7	6	0	6	5
11:00	9	14	5	7	6	13	4	7	8	6	10	5	2	4	3	0	3	4
12:00	8	9	6	6	5	5	8	6	7	9	10	6	13	8	9	0	7	8
13:00	8	3	7	7	5	6	8	7	6	9	11	6	9	7	9	0	6	7
14:00	13	7	7	5	3	11	12	8	8	10	7	4	7	6	6	0	5	6
15:00	4	8	10	10	9	9	8	9	8	9	5	9	14	12	6	0	8	8
16:00	14	9	14	11	15	12	4	11	11	8	10	13	10	15	14	0	10	10
17:00	4	9	9	14	14	12	13	12	11	8	4	14	16	18	10	0	12	10
18:00	8	1	8	12	10	14	9	11	9	8	10	10	5	14	11	0	8	8
19:00	7	8	5	10	3	9	6	7	7	3	3	10	8	9	9	0	7	6
20:00	4	9	4	3	3	5	8	5	5	1	0	10	4	4	6	0	5	4
21:00	3	1	2	4	3	4	3	3	3	5	3	4	4	3	6	0	3	4
22:00	1	1	0	1	0	2	1	1	1	2	2	3	1	2	3	0	2	2
23:00	2	1	0	1	1	0	1	1	1	4	0	1	1	0	1	0	1	1
12H,7-19	85	71	84	104	91	102	96	95	90	88	76	95	107	109	96	11	84	83
16H,6-22	99	90	95	123	100	121	113	110	106	97	84	119	130	127	119	12	101	98
18H,6-24	102	92	95	125	101	123	115	112	108	103	86	123	132	129	123	12	104	101
24H.0-24	104	95	96	125	102	125	116	113	109	106	86	125	132	130	126	14	105	103

0		POWYS		Site No: 000	01233	Location	Site M1233 -	· C2034 (N) N	of C2035									
				Channel: Co	mbined													
TIME	Sat	Sun	Mon	Tue	Wed	Thu	Fri	5-Day	7-Day	Sat	Sun	Mon	Tue	Wed	Thu	Fri	5-Day	7-Day
PERIOD	04/05/19	05/05/19	06/05/19	07/05/19	08/05/19	09/05/19	10/05/19	Av	Av	11/05/19	12/05/19	13/05/19	14/05/19	15/05/19	16/05/19	17/05/19	Av	Av
Week Beg	in: 04-May-:	19																
00:00	0	2	0	0	0	0	0	0	0	2	0	1	0	0	1	1	1	1
01:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
02:00	2	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
03:00	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
04:00	2	3	1	0	1	1	2	1	2	1	1	1	0	1	0	1	1	0
05:00	1	1	1	1	1	3	1	1	1	4	1	1	2	1	5	2	2	2
06:00	1	1	1	4	1	2	2	2	2	0	2	0	11	7	7	1	5	4
07:00	5	4	4	13	11	15	19	13	10	7	2	13	15	15	20	10	14	12
08:00	10	2	8	19	21	22	13	17	13	14	3	24	19	23	22	22	22	19
09:00	22	9	23	23	17	15	22	20	19	22	12	14	20	12	15	1	13	13
10:00	15	16	14	17	12	18	17	16	16	16	7	11	19	18	15	0	13	12
11:00	13	21	12	16	12	18	9	13	14	13	20	13	13	9	10	0	9	11
12:00	14	19	18	18	6	16	12	14	15	16	22	13	18	13	16	0	12	14
13:00	16	11	16	16	11	18	14	15	14	15	20	13	16	16	17	0	12	14
14:00	20	12	14	10	16	22	19	17	16	20	13	11	18	13	14	0	12	13
15:00	14	15	19	20	19	13	23	19	17	20	13	12	25	27	11	0	15	16
16:00	17	12	21	17	19	24	15	19	18	11	17	20	19	25	26	0	18	17
17:00	10	14	18	20	24	19	18	19	18	12	14	26	23	24	19	0	19	17
18:00	15	2	16	23	16	24	15	19	16	12	14	23	10	22	24	0	16	15
19:00	11	11	10	15	8	13	11	12	11	8	6	19	18	20	15	0	14	12
20:00	8	15	9	4	5	8	12	8	9	9	1	16	13	7	10	0	9	8
21:00	5	1	4	6	4	7	5	5	5	6	9	9	5	7	12	0	6	7
22:00	3	1	0	1	1	3	1	1	2	2	3	3	1	2	5	0	2	2
23:00	4	3	0	2	1	0	2	1	2	6	2	1	1	0	2	0	1	2
12H,7-19	171	137	183	212	184	224	196	199	186	178	157	193	215	217	209	33	174	172
16H,6-22	196	165	207	241	202	254	226	226	213	201	175	237	262	258	253	34	208	203
18H,6-24	203	169	207	244	204	257	229	228	217	209	180	241	264	260	260	34	212	207
24H.0-24	208	176	209	245	206	261	232	231	220	217	182	244	266	263	267	38	215	211

0		PO	WYS		Site No: 000012	233	Location	Site M1233 - 0	2034 (N) N of C2	2035	
Sat 04-May-19 to	o Fri 17-May-19				Channel: South	bound					
TIME	TOTAL	MOTOR-	MOTOR-								
PERIOD	VEHICLES	CYCLES	CYCLES%	CARS	CARS %	LGV	LGV %	HGV	HGV %	BUS	BUS %
Daily Totals											
Sat 04-May-19	104	7	6.7	88	84.6	8	7.7	1	1.0	0	0.0
Sun 05-May-19	81	1	1.2	72	88.9	6	7.4	2	2.5	0	0.0
Mon 06-May-19	113	3	2.7	96	85.0	8	7.1	6	5.3	0	0.0
Tue 07-May-19	120	2	1.7	103	85.8	9	7.5	5	4.2	1	0.8
Wed 08-May-19	104	0	0.0	82	78.9	20	19.2	1	1.0	1	1.0
Thu 09-May-19	136	1	0.7	117	86.0	12	8.8	5	3.7	1	0.7
Fri 10-May-19	116	5	4.3	84	72.4	20	17.2	6	5.2	1	0.9
Sat 11-May-19	111	3	2.7	95	85.6	11	9.9	2	1.8	0	0.0
Sun 12-May-19	96	7	7.3	82	85.4	5	5.2	2	2.1	0	0.0
Mon 13-May-19	119	2	1.7	97	81.5	13	10.9	6	5.0	1	0.8
Tue 14-May-19	134	3	2.2	104	77.6	17	12.7	9	6.7	1	0.8
Wed 15-May-19	133	1	0.8	110	82.7	15	11.3	5	3.8	2	1.5
Thu 16-May-19	141	3	2.1	115	81.6	16	11.4	6	4.3	1	0.7
Fri 17-May-19	24	0	0.0	17	70.8	4	16.7	2	8.3	1	4.2
Total Vehicles											
[]	1532	38	2.4	1262	81.9	164	10.9	58	3.9	10	0.8

0		PO	WYS		Site No: 000012	233	Location	Site M1233 - C	2034 (N) N of C2	2035	
Sat 04-May-19 to	o Fri 17-May-19				Channel: North	bound					
TIME	TOTAL	MOTOR-	MOTOR-								
PERIOD	VEHICLES	CYCLES	CYCLES%	CARS	CARS %	LGV	LGV %	HGV	HGV %	BUS	BUS %
Daily Totals											
Sat 04-May-19	104	11	10.6	87	83.7	6	5.8	0	0.0	0	0.0
Sun 05-May-19	95	2	2.1	83	87.4	6	6.3	4	4.2	0	0.0
Mon 06-May-19	96	1	1.0	84	87.5	7	7.3	4	4.2	0	0.0
Tue 07-May-19	125	4	3.2	104	83.2	13	10.4	3	2.4	1	0.8
Wed 08-May-19	102	0	0.0	85	83.3	15	14.7	1	1.0	1	1.0
Thu 09-May-19	125	1	0.8	109	87.2	10	8.0	4	3.2	1	0.8
Fri 10-May-19	116	4	3.5	95	81.9	16	13.8	0	0.0	1	0.9
Sat 11-May-19	106	3	2.8	98	92.5	5	4.7	0	0.0	0	0.0
Sun 12-May-19	86	6	7.0	76	88.4	3	3.5	1	1.2	0	0.0
Mon 13-May-19	125	5	4.0	102	81.6	14	11.2	3	2.4	1	0.8
Tue 14-May-19	132	1	0.8	109	82.6	14	10.6	7	5.3	1	0.8
Wed 15-May-19	130	4	3.1	107	82.3	14	10.8	4	3.1	1	0.8
Thu 16-May-19	126	2	1.6	107	84.9	10	7.9	6	4.8	1	0.8
Fri 17-May-19	14	0	0.0	10	71.4	4	28.6	0	0.0	0	0.0
Total Vehicles											
[]	1482	44	2.9	1256	84.1	137	10.3	37	2.3	8	0.5

		POWYS								
		MAY 2019			Posted Speed					
Site	Location	Direction	Start Date	End Date	Limit (PSL)	Total Vehicles	5 Day Ave.	7 Day Ave.	85%ile Speed	Mean Speed
Site No: Sit	Site M1234 - C2035 E of	Channel: Westbound	Sat 04-May-19	Fri 17-May-19	60	3267	246	234	37.1	27.1
00001234	C2034	Channel: Eastbound	Sat 04-May-19	Fri 17-May-19		3336	250	238	37.6	26.3

				Channel: We	estbound													
TIME PERIOD	Sat 04/05/19	Sun 05/05/19	Mon 06/05/19	Tue 07/05/19	Wed 08/05/19	Thu 09/05/19	Fri 10/05/19	5-Day Av	7-Day Av	Sat 11/05/19	Sun 12/05/19	Mon 13/05/19	Tue 14/05/19	Wed 15/05/19	Thu 16/05/19	Fri 17/05/19	5-Day Av	7-Day Av
	n: 04-May-1	.9	0	0	4	0	1	4	4	5	0	0	0	0	4	1	4	0
00:00	0	3	2	0	1	0	1	1	1	5	2	2	0	0	1	1	1	2
01.00	0	0	0	0	0	0	0	0	0	3	1	0	0	1	1	1	0	0
02:00	0	0	1	0	0	0	1	0	0	0	0	0	0	2	0	0	0	0
03:00	1	1	0	1	1	2	1	1	1	1	1	0	2	2	1	1	1	1
04.00	0	0	0	1	1	2	1	1	1	1	0	3	2	2	2	2	2	2
06:00	2	0	1	9	7	6	9	6	5	2	2	4	6	5	7	4	5	4
07:00	3	1	4	9	11	12	14	10	8	11	0	14	15	14	13	15	14	12
08:00	7	1	6	17	17	12	12	13	10	2	2	11	14	17	11	9	12	9
09:00	19	9	9	11	12	11	20	13	13	15	12	18	17	10	19	0	13	13
10:00	12	13	6	18	14	7	13	12	12	14	9	12	11	15	8	0	9	10
11:00	21	11	11	16	11	22	13	15	15	9	18	13	11	17	15	0	11	12
12:00	21	15	16	7	12	16	14	13	14	19	12	15	20	22	15	0	14	15
13:00	16	15	14	17	19	14	21	17	17	18	15	14	19	14	17	0	13	14
14:00	31	12	17	10	18	22	23	18	19	17	17	15	25	19	14	0	15	15
15:00	15	9	11	23	24	24	21	21	18	10	6	24	22	25	24	0	19	16
16:00	23	14	20	34	27	25	17	25	23	14	14	28	30	24	29	0	22	20
17:00	14	13	16	27	27	33	28	26	23	15	8	27	38	34	35	0	27	22
18:00	19	16	11	30	20	19	20	20	19	14	19	27	18	27	24	0	19	18
19:00	11	15	11	18	16	15	16	15	15	17	20	19	14	18	24	0	15	16
20:00	8	11	10	9	7	8	13	9	9	5	3	16	16	14	7	0	11	9
21:00	10	3	6	10	6	13	5	8	8	11	4	9	9	4	13	0	7	7
22:00	7	4	5	6	4	6	7	6	6	11	5	8	6	8	5	0	5	6
23:00	3	3	1	4	6	1	3	3	3	2	4	3	2	4	2	0	2	2
12H,7-19	201	129	141	219	212	217	216	201	191	158	132	218	240	238	224	24	189	176
16H,6-22	232	158	169	265	248	259	259	240	227	193	161	266	285	279	275	28	227	212
18H,6-24	242	165	175	275	258	266	269	249	236	206	170	277	293	291	282	28	234	221
24H 0-24	245	172	179	277	262	272	273	253	240	216	174	282	298	297	287	33	239	227

POWYS Site No: 00001234 Location Site M1234 - C2035 E of C2034

				Channel: Ea	stbound													
TIME PERIOD Week Begi	Sat 04/05/19 n: 04-May-1	Sun 05/05/19 9	Mon 06/05/19	Tue 07/05/19	Wed 08/05/19	Thu 09/05/19	Fri 10/05/19	5-Day Av	7-Day Av	Sat 11/05/19	Sun 12/05/19	Mon 13/05/19	Tue 14/05/19	Wed 15/05/19	Thu 16/05/19	Fri 17/05/19	5-Day Av	7-Day Av
00:00	1	2	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
01:00	3	2	0	0	1	0	0	0	1	0	1	0	0	0	1	1	0	0
02:00	1	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0
03:00	0	0	1	0	0	2	3	1	1	0	0	2	2	1	0	0	1	1
04:00	2	0	1	4	2	2	3	2	2	4	0	1	3	4	1	2	2	2
05:00	1	1	1	7	4	8	3	5	4	7	0	7	5	8	10	8	8	6
06:00	5	4	2	19	16	14	16	13	11	1	2	15	17	17	15	14	16	12
07:00	5	8	6	21	16	24	26	19	15	10	5	25	29	22	33	25	27	21
08:00	25	8	16	26	35	43	30	30	26	19	14	29	28	34	34	12	27	24
09:00	21	10	19	16	26	16	24	20	19	32	17	14	25	16	11	1	13	17
10:00	38	16	13	18	17	18	22	18	20	9	14	10	13	23	13	0	12	12
11:00	17	13	16	12	11	10	9	12	13	17	17	13	20	16	16	0	13	14
12:00	20	28	24	16	4	18	12	15	17	12	21	16	16	11	11	0	11	12
13:00	14	16	19	18	29	17	18	20	19	13	13	8	12	19	19	0	12	12
14:00	14	8	9	14	19	16	14	14	13	16	11	20	16	14	13	0	13	13
15:00	17	10	6	16	27	19	24	18	17	13	14	20	24	24	15	0	17	16
16:00	15	5	16	27	18	26	25	22	19	15	14	17	26	26	19	0	18	17
17:00	14	10	21	22	15	18	5	16	15	13	16	16	17	10	20	0	13	13
18:00	17	7	13	10	12	18	11	13	13	12	11	21	14	23	19	0	15	14
19:00	6	10	6	11	5	7	10	8	8	9	6	9	12	17	11	0	10	9
20:00	8	5	6	7	5	6	6	6	6	8	3	13	12	4	13	0	8	8
21:00	5	5	4	5	0	3	5	3	4	3	5	8	0	5	7	0	4	4
22:00	3	0	3	1	2	2	0	2	2	3	1	4	1	3	2	0	2	2
23:00	1	1	0	1	0	0	5	1	1	4	5	0	1	0	2	0	1	2
12H,7-19	217	139	178	216	229	243	220	217	206	181	167	209	240	238	223	38	190	185
16H,6-22	241	163	196	258	255	273	257	248	235	202	183	254	281	281	269	52	227	217
18H,6-24	245	164	199	260	257	275	262	251	237	209	189	258	283	284	273	52	230	221
24H,0-24	253	169	202	271	265	287	271	259	245	222	190	268	293	297	285	63	241	231

Location Site M1234 - C2035 E of C2034

POWYS

0

Site No: 00001234

Produced by Auto Surveys Ltd

0		POWYS		Site No: 000	001234	Location	Site M1234 -	- C2035 E of	C2034									
				Channel: Co	mbined													
TIME	Sat	Sun	Mon	Tue	Wed	Thu	Fri	5-Dav	7-Day	Sat	Sun	Mon	Tue	Wed	Thu	Fri	5-Dav	7-Day
PERIOD	04/05/19	05/05/19	06/05/19	07/05/19	08/05/19	09/05/19	10/05/19	Av	Av	11/05/19	12/05/19	13/05/19	14/05/19	15/05/19	16/05/19	17/05/19	Av	Av
Week Beg	in: 04-May-	19	00,00,10	07700720	,,	00/00/10	10,00,10					10/00/10	- 1/ 00/ 10		10/00/10			
00:00	2	5	2	0	1	0	1	1	1	6	2	2	0	0	1	1	1	2
01:00	3	2	0	0	1	0	0	0	1	3	2	0	0	0	2	2	0	1
02:00	2	3	1	0	2	0	0	0	1	1	0	0	0	1	0	0	0	0
03:00	0	0	2	0	0	2	4	1	1	0	0	2	2	3	0	0	1	1
04:00	3	1	1	5	3	4	4	3	3	5	1	1	5	5	2	3	3	3
05:00	1	1	1	8	5	12	4	6	5	8	0	10	8	10	12	10	10	8
06:00	7	4	3	28	23	20	25	19	16	3	4	19	23	22	22	18	21	16
07:00	8	9	10	30	27	36	40	29	23	21	5	39	44	36	46	40	41	33
08:00	32	9	22	43	52	55	42	43	36	21	16	40	42	51	45	21	39	33
09:00	40	19	28	27	38	27	44	33	32	47	29	32	42	26	30	1	26	30
10:00	50	29	19	36	31	25	35	30	32	23	23	22	24	38	21	0	21	22
11:00	38	24	27	28	22	32	22	27	28	26	35	26	31	33	31	0	24	26
12:00	41	43	40	23	16	34	26	28	31	31	33	31	36	33	26	0	25	27
13:00	30	31	33	35	48	31	39	37	36	31	28	22	31	33	36	0	25	26
14:00	45	20	26	24	37	38	37	32	32	33	28	35	41	33	27	0	28	28
15:00	32	19	17	39	51	43	45	39	35	23	20	44	46	49	39	0	36	32
16:00	38	19	36	61	45	51	42	47	42	29	28	45	56	50	48	0	40	37
17:00	28	23	37	49	42	51	33	42	38	28	24	43	55	44	55	0	40	35
18:00	36	23	24	40	32	37	31	33	32	26	30	48	32	50	43	0	34	32
19:00	17	25	17	29	21	22	26	23	23	26	26	28	26	35	35	0	25	25
20:00	16	16	16	16	12	14	19	15	15	13	6	29	28	18	20	0	19	17
21:00	15	8	10	15	6	16	10	11	12	14	9	17	9	9	20	0	11	11
22:00	10	4	8	7	6	8	7	8	8	14	6	12	7	11	7	0	7	8
23:00	4	4	1	5	6	1	8	4	4	6	9	3	3	4	4	0	3	4
12H,7-19	418	268	319	435	441	460	436	418	397	339	299	427	480	476	447	62	379	361
16H,6-22	473	321	365	523	503	532	516	488	462	395	344	520	566	560	544	80	454	429
18H,6-24	487	329	374	535	515	541	531	500	473	415	359	535	576	575	555	80	464	442
24H,0-24	498	341	381	548	527	559	544	512	485	438	364	550	591	594	572	96	480	458

0		PO	WYS		Site No: 000012	234	Location	Site M1234 - 0	2035 E of C2034		
Sat 04-May-19 to	o Fri 17-May-19				Channel: Westb	ound					
TIME	TOTAL	MOTOR-	MOTOR-								
PERIOD	VEHICLES	CYCLES	CYCLES%	CARS	CARS %	LGV	LGV %	HGV	HGV %	BUS	BUS %
Daily Totals											
Sat 04-May-19	245	6	2.5	201	82.0	33	13.5	5	2.0	0	0.0
Sun 05-May-19	172	6	3.5	144	83.7	16	9.3	6	3.5	0	0.0
Mon 06-May-19	179	3	1.7	147	82.1	24	13.4	5	2.8	0	0.0
Tue 07-May-19	277	6 3.5 3 1.7 7 2.5		213	76.9	36	13.0	21	7.6	0	0.0
Wed 08-May-19	262	2	0.8	185	70.6	55	21.0	20	7.6	0	0.0
Thu 09-May-19	272	3	1.1	204	75.0	44	16.2	19	7.0	2	0.7
Fri 10-May-19	273	7	2.6	204	74.7	45	16.5	17	6.2	0	0.0
Sat 11-May-19	216	5	2.3	172	79.6	30	13.9	9	4.2	0	0.0
Sun 12-May-19	174	6	3.5	148	85.1	17	9.8	2	1.2	1	0.6
Mon 13-May-19	282	6	2.1	214	75.9	46	16.3	16	5.7	0	0.0
Tue 14-May-19	298	4	1.3	207	69.5	61	20.5	25	8.4	1	0.3
Wed 15-May-19	297	7	2.4	219	73.7	56	18.9	15	5.1	0	0.0
Thu 16-May-19	287	9	3.1	203	70.7	55	19.2	19	6.6	1	0.4
Fri 17-May-19	33	0	0.0	19	57.6	11	33.3	3	9.1	0	0.0
Total Vehicles											
[]	3267	71	2.1	2480	75.5	529	16.8	182	5.5	5	0.1

0		PO	WYS		Site No: 000012	234	Location	Site M1234 - 0	2035 E of C2034		
Sat 04-May-19 to	o Fri 17-May-19				Channel: Eastbo	ound					
TIME	TOTAL	MOTOR-	MOTOR-								
PERIOD	VEHICLES	CYCLES	CYCLES%	CARS	CARS %	LGV	LGV %	HGV	HGV %	BUS	BUS %
Daily Totals											
Sat 04-May-19	253	5	2.0	218	86.2	25	9.9	5	2.0	0	0.0
Sun 05-May-19	169	4	2.4	150	88.8	8	4.7	7	4.1	0	0.0
Mon 06-May-19	202	3	1.5	180	89.1	15	7.4	4	2.0	0	0.0
Tue 07-May-19	271	5	1.9	212	78.2	33	12.2	20	7.4	1	0.4
Wed 08-May-19	265	4	1.5	204	77.0	39	14.7	18	6.8	0	0.0
Thu 09-May-19	287	2	0.7	226	78.8	39	13.6	19	6.6	1	0.4
Fri 10-May-19	271	5	1.9	206	76.0	36	13.3	24	8.9	0	0.0
Sat 11-May-19	222	4	1.8	180	81.1	23	10.4	15	6.8	0	0.0
Sun 12-May-19	190	9	4.7	168	88.4	8	4.2	5	2.6	0	0.0
Mon 13-May-19	268	4	1.5	211	78.7	32	11.9	21	7.8	0	0.0
Tue 14-May-19	293	6	2.1	224	76.5	45	15.4	18	6.1	0	0.0
Wed 15-May-19	297	6	2.0	232	78.1	37	12.5	21	7.1	1	0.3
Thu 16-May-19	285	8	2.8	225	79.0	32	11.2	20	7.0	0	0.0
Fri 17-May-19	63	2	3.2	48	76.2	9	14.3	4	6.4	0	0.0
Total Vehicles											
[]	3336	67	2.1	2684	80.9	381	11.1	201	5.8	3	0.1

		POWYS								
		MAY 2019			Posted Speed					
Site	Location	Direction	Start Date	End Date	Limit (PSL)	Total Vehicles	5 Day Ave.	7 Day Ave.	85%ile Speed	Mean Speed
Site No:	Site M1235 - C2035 W	Channel: Westbound	Sat 04-May-19	Fri 17-May-19	60	2539	186	181	35.6	26.6
00001235	of C2034	Channel: Eastbound	Sat 04-May-19	Fri 17-May-19	00	2570	187	184	36.9	28.8

0		POWYS		Site No: 000	01235	Location	Site M1235	- C2035 W of	C2034									
				Channel: We	estbound													
TIME	Sat	Sun	Mon	Tue	Wed	Thu	Fri	5-Day	7-Day	Sat	Sun	Mon	Tue	Wed	Thu	Fri	5-Day	7-Day
PERIOD	04/05/19	05/05/19	06/05/19	07/05/19	08/05/19	09/05/19	10/05/19	Av	Av	11/05/19	12/05/19	13/05/19	14/05/19	15/05/19	16/05/19	17/05/19	Av	Av
Week Begi	n: 04-May-1	L9																
00:00	1	3	2	0	1	0	1	1	1	4	2	1	0	0	1	1	1	1
01:00	0	0	0	0	0	0	0	0	0	3	1	0	0	0	1	1	0	1
02:00	0	3	1	0	1	0	0	0	1	0	0	0	0	1	0	0	0	0
03:00	0	0	1	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0
04:00	2	2	1	1	1	1	1	1	1	2	2	1	2	2	1	1	1	2
05:00	1	1	1	1	1	1	1	1	1	1	1	2	2	1	2	2	2	2
06:00	1	0	2	6	6	6	6	5	4	2	1	3	3	5	6	4	4	3
07:00	3	3	5	6	8	5	6	6	5	5	1	10	8	10	7	8	9	7
08:00	8	1	10	13	14	12	5	11	9	5	2	8	8	8	4	6	7	6
09:00	12	8	7	16	10	9	11	11	10	7	13	14	14	12	10	0	10	10
10:00	9	20	5	11	12	8	13	10	11	10	12	8	9	14	11	0	8	9
11:00	20	9	13	15	9	12	7	11	12	10	14	10	15	12	17	0	11	11
12:00	18	12	14	12	5	17	13	12	13	13	14	12	14	17	12	0	11	12
13:00	9	14	16	14	10	11	11	12	12	12	7	12	15	10	9	0	9	9
14:00	15	11	16	5	14	16	18	14	14	14	15	12	15	13	9	0	10	11
15:00	16	10	15	8	18	14	20	15	14	9	4	16	16	16	12	0	12	10
16:00	15	11	19	18	22	16	12	17	16	9	10	19	16	12	20	0	13	12
17:00	16	8	16	18	21	23	18	19	17	13	6	21	25	21	28	0	19	16
18:00	18	16	13	28	12	15	16	17	17	8	9	18	14	16	20	0	14	12
19:00	9	11	11	9	18	10	12	12	11	18	17	18	14	11	17	0	12	14
20:00	6	7	8	7	5	5	9	7	7	8	4	22	15	10	5	0	10	9
21:00	9	4	7	8	4	11	3	7	7	4	7	9	7	2	10	0	6	6
22:00	7	4	5	6	4	6	6	5	5	9	4	5	5	6	5	0	4	5
23:00	3	4	1	3	5	1	3	3	3	0	4	2	1	4	1	0	2	2
12H,7-19	159	123	149	164	155	158	150	155	151	115	107	160	169	161	159	14	133	126
16H,6-22	184	145	177	194	188	190	180	186	180	147	136	212	208	189	197	18	165	158
18H,6-24	194	153	183	203	197	197	189	194	188	156	144	219	214	199	203	18	171	165
24H,0-24	198	162	189	205	201	199	193	197	192	166	150	223	218	204	208	23	175	170

				Channel: Ea	stbound													
TIME PERIOD	Sat 04/05/19 p: 04-May-1	Sun 05/05/19	Mon 06/05/19	Tue 07/05/19	Wed 08/05/19	Thu 09/05/19	Fri 10/05/19	5-Day Av	7-Day Av	Sat 11/05/19	Sun 12/05/19	Mon 13/05/19	Tue 14/05/19	Wed 15/05/19	Thu 16/05/19	Fri 17/05/19	5-Day Av	7-Day Av
00.00	1	2	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0
01:00	3	2	0	0	1	0	0	0	1	0	1	0	0	0	0	2	0	0
02:00	0	1	0	0	1	0	0	0	0	2	0	0	0	0	0	0	0	0
03:00	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
04.00	1	0	2	1	2	0	2	1	1	1	0	2	1	2	1	1	1	1
05:00	1	1	1	5	2	4	1	3	2	2	0	4	4	3	5	5	4	3
06:00	4	5	2	16	12	13	12	11	9	1	3	15	14	14	11	15	14	10
07:00	7	7	5	13	9	15	14	11	10	7	7	17	20	15	22	18	18	15
08:00	20	11	12	22	25	30	23	22	20	13	11	22	21	25	22	11	20	18
09:00	17	9	14	16	23	12	14	16	15	23	19	9	18	13	11	0	10	13
10:00	22	15	11	15	16	11	18	14	15	8	9	10	10	17	11	0	10	9
11:00	16	17	15	7	9	10	5	9	11	14	14	6	12	9	13	0	8	10
12:00	19	24	16	17	6	14	10	13	15	8	20	14	20	10	10	0	11	12
13:00	7	7	19	14	15	10	15	15	12	7	8	10	12	13	13	0	10	9
14:00	17	8	8	8	11	14	15	11	12	15	9	16	10	9	9	0	9	10
15:00	12	14	12	7	17	12	14	12	13	10	10	15	17	13	9	0	11	11
16:00	12	7	22	16	18	14	12	16	14	14	10	9	16	14	13	0	10	11
17:00	9	10	22	14	11	14	2	13	12	12	10	11	7	11	11	0	8	9
18:00	16	7	15	9	10	17	7	12	12	10	9	22	10	14	14	0	12	11
19:00	7	11	5	8	5	7	10	7	8	8	4	10	7	8	11	0	7	7
20:00	8	5	4	7	4	5	7	5	6	4	4	13	6	3	8	0	6	5
21:00	4	7	5	4	0	2	4	3	4	2	5	5	2	1	3	0	2	3
22:00	3	1	3	2	1	3	0	2	2	4	1	4	2	3	3	0	2	2
23:00	1	1	0	0	0	0	5	1	1	2	3	0	1	0	1	0	0	1
12H,7-19	174	136	171	158	170	173	149	164	162	141	136	161	173	163	158	29	137	137
16H,6-22	197	164	187	193	191	200	182	191	188	156	152	204	202	189	191	44	166	163
18H,6-24	201	166	190	195	192	203	187	193	191	162	156	208	205	192	195	44	169	166
24H 0-24	207	172	194	201	198	207	191	198	196	167	157	214	210	197	202	53	175	171

Location Site M1235 - C2035 W of C2034

POWYS

0

Site No: 00001235

Produced by Auto Surveys Ltd

0		POWYS		Site No: 000	01235	Location	Site M1235 -	C2035 W OT	C2034									
				Channel: Co	mbined													
TIME	Sat	Sun	Mon	Tue	Wed	Thu	Fri	5-Dav	7-Day	Sat	Sun	Mon	Tue	Wed	Thu	Fri	5-Day	7-Day
PERIOD	04/05/19	05/05/19	06/05/19	07/05/19	08/05/19	09/05/19	10/05/19	Av	Av	11/05/19	12/05/19	13/05/19	14/05/19	15/05/19	16/05/19	17/05/19	Av	Av
Week Beg	in: 04-May-	19																
00:00	2	5	2	0	1	0	1	1	1	4	2	1	0	0	2	2	1	1
01:00	3	2	0	0	1	0	0	0	1	3	2	0	0	0	1	3	0	1
02:00	0	4	1	0	2	0	0	0	1	2	0	0	0	1	0	0	0	0
03:00	0	0	2	0	0	0	2	0	0	0	0	0	0	1	0	0	0	0
04:00	3	2	3	2	3	1	3	2	2	3	2	3	3	4	2	2	2	3
05:00	2	2	2	6	3	5	2	4	3	3	1	6	6	4	7	7	6	5
06:00	5	5	4	22	18	19	18	16	13	3	4	18	17	19	17	19	18	13
07:00	10	10	10	19	17	20	20	17	15	12	8	27	28	25	29	26	27	22
08:00	28	12	22	35	39	42	28	33	29	18	13	30	29	33	26	17	27	24
09:00	29	17	21	32	33	21	25	27	25	30	32	23	32	25	21	0	20	23
10:00	31	35	16	26	28	19	31	24	26	18	21	18	19	31	22	0	18	18
11:00	36	26	28	22	18	22	12	20	23	24	28	16	27	21	30	0	19	21
12:00	37	36	30	29	11	31	23	25	28	21	34	26	34	27	22	0	22	24
13:00	16	21	35	28	25	21	26	27	24	19	15	22	27	23	22	0	19	18
14:00	32	19	24	13	25	30	33	25	26	29	24	28	25	22	18	0	19	21
15:00	28	24	27	15	35	26	34	27	27	19	14	31	33	29	21	0	23	21
16:00	27	18	41	34	40	30	24	33	30	23	20	28	32	26	33	0	23	23
17:00	25	18	38	32	32	37	20	32	29	25	16	32	32	32	39	0	27	25
18:00	34	23	28	37	22	32	23	29	29	18	18	40	24	30	34	0	26	23
19:00	16	22	16	17	23	17	22	19	19	26	21	28	21	19	28	0	19	21
20:00	14	12	12	14	9	10	16	12	13	12	8	35	21	13	13	0	16	14
21:00	13	11	12	12	4	13	7	10	11	6	12	14	9	3	13	0	8	9
22:00	10	5	8	8	5	9	6	7	7	13	5	9	7	9	8	0	6	7
23:00	4	5	1	3	5	1	8	4	4	2	7	2	2	4	2	0	2	3
12H,7-19	333	259	320	322	325	331	299	319	313	256	243	321	342	324	317	43	270	263
16H,6-22	381	309	364	387	379	390	362	377	368	303	288	416	410	378	388	62	331	321
18H,6-24	395	319	373	398	389	400	376	387	379	318	300	427	419	391	398	62	340	331
24H 0-24	405	334	383	406	399	406	384	395	388	333	307	437	428	401	410	76	350	341

0 POWYS				Site No: 000012	235	Location	Site M1235 - 0	2035 W of C2034			
Sat 04-May-19 to Fri 17-May-19				Channel: Westbound							
TIME	TOTAL	MOTOR-	MOTOR-								
PERIOD	VEHICLES	CYCLES	CYCLES%	CARS	CARS %	LGV	LGV %	HGV	HGV %	BUS	BUS %
Daily Totals											
Sat 04-May-19	198	5	2.5	168	84.9	22	11.1	3	1.5	0	0.0
Sun 05-May-19	162	4	2.5	143	88.3	8	4.9	7	4.3	0	0.0
Mon 06-May-19	189	6	3.2	153	81.0	20	10.6	10	5.3	0	0.0
Tue 07-May-19	205	1	0.5	169	82.4	25	12.2	9	4.4	1	0.5
Wed 08-May-19	201	1	0.5	156	77.6	35	17.4	8	4.0	1	0.5
Thu 09-May-19	199	1	0.5	164	82.4	23	11.6	11	5.5	0	0.0
Fri 10-May-19	193	2	1.0	160	82.9	20	10.4	10	5.2	1	0.5
Sat 11-May-19	166	2	1.2	145	87.4	15	9.0	4	2.4	0	0.0
Sun 12-May-19	150	5	3.3	128	85.3	12	8.0	5	3.3	0	0.0
Mon 13-May-19	223	4	1.8	180	80.7	25	11.2	14	6.3	0	0.0
Tue 14-May-19	218	6	2.8	167	76.6	38	17.4	6	2.8	1	0.5
Wed 15-May-19	204	4	2.0	162	79.4	31	15.2	6	2.9	1	0.5
Thu 16-May-19	208	4	1.9	167	80.3	24	11.5	13	6.3	0	0.0
Fri 17-May-19	23	0	0.0	16	69.6	5	21.7	1	4.4	1	4.4
Total Vehicles											
[]	2539	45	1.7	2078	81.3	303	12.3	107	4.2	6	0.5

0 POWYS				Site No: 00001235		Location	Site M1235 - C2035 W of C2034				
Sat 04-May-19 to Fri 17-May-19					Channel: Eastbound						
TIME	TOTAL	MOTOR-	MOTOR-								
PERIOD	VEHICLES	CYCLES	CYCLES%	CARS	CARS %	LGV	LGV %	HGV	HGV %	BUS	BUS %
Daily Totals											
Sat 04-May-19	207	6	2.9	169	81.6	29	14.0	3	1.5	0	0.0
Sun 05-May-19	172	4	2.3	150	87.2	11	6.4	7	4.1	0	0.0
Mon 06-May-19	194	5	2.6	165	85.1	17	8.8	7	3.6	0	0.0
Tue 07-May-19	201	3	1.5	163	81.1	28	13.9	6	3.0	1	0.5
Wed 08-May-19	198	0	0.0	159	80.3	29	14.7	8	4.0	2	1.0
Thu 09-May-19	207	0	0.0	172	83.1	24	11.6	10	4.8	1	0.5
Fri 10-May-19	191	2	1.1	155	81.2	25	13.1	8	4.2	1	0.5
Sat 11-May-19	167	1	0.6	147	88.0	15	9.0	4	2.4	0	0.0
Sun 12-May-19	157	8	5.1	135	86.0	9	5.7	5	3.2	0	0.0
Mon 13-May-19	214	5	2.3	166	77.6	30	14.0	12	5.6	1	0.5
Tue 14-May-19	210	1	0.5	169	80.5	33	15.7	6	2.9	1	0.5
Wed 15-May-19	197	5	2.5	157	79.7	26	13.2	8	4.1	1	0.5
Thu 16-May-19	202	5	2.5	159	78.7	23	11.4	14	6.9	1	0.5
Fri 17-May-19	53	0	0.0	42	79.3	10	18.9	1	1.9	0	0.0
Total Vehicles											
[]	2570	45	1.7	2108	82.1	309	12.2	99	3.7	9	0.3

APPENDIX B

TRICS Information

TRIP RATE CALCULATION SELECTION PARAMETERS:

Land Use : 02 - EMPLOYMENT Category : F - WAREHOUSING (COMMERCIAL) TOTAL VEHICLES

Sele	ected regions and areas:							
01	GREATER LONDON							
	BE BEXLEY	1 days						
	HD HILLINGDON	1 days						
	HO HOUNSLOW	1 days						
02	SOUTH EAST							
	EX ESSEX	1 days						
	HC HAMPSHIRE	1 days						
	KC KENT	1 days						
03	SOUTH WEST							
	DV DEVON	2 days						
04	EAST ANGLIA							
	SF SUFFOLK	2 days						
06	WEST MIDLANDS							
	WM WEST MIDLANDS	1 days						
07	YORKSHIRE & NORTH LINCOLNSHIRE							
	WY WEST YORKSHIRE	2 days						
09	NORTH							
	CB CUMBRIA	1 days						
	TW TYNE & WEAR	1 days						
10	WALES							
	BG BRIDGEND	1 days						
12	CONNAUGHT							
	GA GALWAY	1 days						
13	MUNSTER							
	CR CORK	1 days						
14	LEINSTER	-						
	CC CARLOW	1 days						
	LU LOUTH	1 days						
15	GREATER DUBLIN							
	DL DUBLIN	1 days						
17	ULSTER (NORTHERN IRELAND)							
	AN ANTRIM	2 days						

This section displays the number of survey days per TRICS® sub-region in the selected set

Primary Filtering selection:

This data displays the chosen trip rate parameter and its selected range. Only sites that fall within the parameter range are included in the trip rate calculation.

Parameter: Actual Range: Range Selected by User:	Gross floor area 190 to 50000 (units: sqm) 190 to 80066 (units: sqm)	
Parking Spaces Range:	All Surveys Included	
Public Transport Provision Selection by:	on:	Include all surveys
Date Range: 01/	01/12 to 15/10/19	

This data displays the range of survey dates selected. Only surveys that were conducted within this date range are included in the trip rate calculation.

3 days
3 days
3 days
7 days
7 days

This data displays the number of selected surveys by day of the week.

Selected survey types:	
Manual count	23 days
Directional ATC Count	0 days

This data displays the number of manual classified surveys and the number of unclassified ATC surveys, the total adding up to the overall number of surveys in the selected set. Manual surveys are undertaken using staff, whilst ATC surveys are undertaking using machines.
This data displays the number of surveys per main location category within the selected set. The main location categories consist of Free Standing, Edge of Town, Suburban Area, Neighbourhood Centre, Edge of Town Centre, Town Centre and Not Known.

Selected Location Sub Categories:	
Industrial Zone	18
Commercial Zone	2
Built-Up Zone	1
Out of Town	1
No Sub Category	1

This data displays the number of surveys per location sub-category within the selected set. The location sub-categories consist of Commercial Zone, Industrial Zone, Development Zone, Residential Zone, Retail Zone, Built-Up Zone, Village, Out of Town, High Street and No Sub Category.

Secondary Filtering selection:

Use Class:	
B1	1 days
B2	1 days
B8	20 days

This data displays the number of surveys per Use Class classification within the selected set. The Use Classes Order 2005 has been used for this purpose, which can be found within the Library module of TRICS®.

<u>Filter by Use Class Breakdown:</u> All Surveys Included

2 days
3 days
5 days
1 days
4 days
3 days
4 days
1 days

This data displays the number of selected surveys within stated 1-mile radii of population.

Population within 5 miles:	
5,001 to 25,000	3 days
25,001 to 50,000	4 days
50,001 to 75,000	1 days
75,001 to 100,000	1 days
125,001 to 250,000	6 days
250,001 to 500,000	4 days
500,001 or More	4 days

This data displays the number of selected surveys within stated 5-mile radii of population.

Car ownership within 5 miles:	
0.6 to 1.0	11 days
1.1 to 1.5	11 days
1.6 to 2.0	1 days

This data displays the number of selected surveys within stated ranges of average cars owned per residential dwelling, within a radius of 5-miles of selected survey sites.

<u>Travel Plan:</u>	
Yes	3 days
No	20 days

This data displays the number of surveys within the selected set that were undertaken at sites with Travel Plans in place, and the number of surveys that were undertaken at sites without Travel Plans.

PTAL Rating:	
No PTAL Present	20 days
1a (Low) Very poor	1 days
1b Very poor	1 days
2 Poor	1 days

This data displays the number of selected surveys with PTAL Ratings.

Sunday 21/02/21 Page 3 Licence No: 703105

LIST OF SITES relevant to selection parameters

1	AN-02-F-03 KENNEDY WAY	PACKAGING COMPA	NY	ANTRIM
2	BELFAST KENNEDY WAY IND. Suburban Area (PPS Industrial Zone Total Gross floor are <i>Survey date:</i> AN-02-F-04 APOLLO ROAD BELFAST BALMORAL	EST. 6 Out of Centre) a: TUESDAY TESCO DISTRIBUTIO	12234 sqm 11/10/16 ON CENTRE	Survey Type: MANUAL ANTRIM
3	Suburban Area (PPS Industrial Zone Total Gross floor are <i>Survey date:</i> BE-02-F-01 THAMES ROAD CRAYFORD	6 Out of Centre) a: <i>THURSDAY</i> FRESH FRUIT DISTR	11000 sqm 14/03/19 RIBUTOR	Survey Type: MANUAL BEXLEY
4	Edge of Town Industrial Zone Total Gross floor are <i>Survey date:</i> BG-02-F-01 PARC CRESCENT BRIDGEND WATERTON IND. ES	a: <i>THURSDAY</i> LOGISTICS COMPAN T.	20400 sqm <i>20/09/18</i> JY	Survey Type: MANUAL BRIDGEND
5	Edge of Town Industrial Zone Total Gross floor are <i>Survey date:</i> CB-02-F-01 COWPER ROAD PENRITH GILWILLY IND. EST/	a: <i>MONDAY</i> DOMINO'S PIZZA	3050 sqm <i>13/10/14</i>	Survey Type: MANUAL CUMBRIA
6	Industrial Zone Total Gross floor are Survey date: CC-02-F-01 O'BRIEN ROAD CARLOW	a: <i>TUESDAY</i> HYDRAULIC CYCLIN	2950 sqm <i>10/06/14</i> IDERS	Survey Type: MANUAL CARLOW
7	Edge of Town Industrial Zone Total Gross floor are <i>Survey date:</i> CR-02-F-03 POULADUFF ROAD CORK SOUTHSIDE IND. ES Edge of Town	a: <i>WEDNESDAY</i> FURNITURE DISTRI STATE	10500 sqm <i>25/05/16</i> BUTION	Survey Type: MANUAL CORK
8	Industrial Zone Total Gross floor are <i>Survey date:</i> DL-02-F-03 MAPLE AVENUE DUBLIN	a: <i>TUESDAY</i> BATHROOM TILES &	4800 sqm <i>15/10/19</i> TIMBER	Survey Type: MANUAL DUBLIN
9	SANDYFORD Suburban Area (PPS Industrial Zone Total Gross floor are <i>Survey date:</i> DV-02-F-01 ALDERS WAY PAIGNTON	6 Out of Centre) a: THURSDAY OPTICS WAREHOUS	650 sqm <i>26/09/19</i> E	Survey Type: MANUAL DEVON
	Edge of Town Industrial Zone Total Gross floor are <i>Survey date:</i>	a: FRIDAY	190 sqm <i>29/03/19</i>	Survey Type: MANUAL

LIST OF SITES relevant to selection parameters (Cont.)

10	DV-02-F-02 LIDL DISTRIBUT CHILLPARK BRAKE	ION CENTRE	DEVON
	CLYST HONITON Free Standing (PPS6 Out of Town)		
	Out of Town Total Gross floor area:	50000 sam	
	Survey date: WEDNESDAY	03/04/19	Survey Type: MANUAL
11	EX-02-F-01 SPORTS SUPPLEN BRUNEL WAY COLCHESTER	MENTS	ESSEX
	SEVERALLS INDUSTRIAL PK Edge of Town		
	Industrial Zone Total Gross floor area:	6560 sam	
	Survey date: FRIDAY	18/05/18	Survey Type: MANUAL
12	GA-02-F-01 LOGISTICS PARKMORE WEST GALWAY		GALWAY
	IDA BUS. & TECH. PARK Edge of Town Industrial Zone		
	Total Gross floor area:	11000 sqm	
13	Survey date: FRIDAY HC-02-F-02 LOGISTICS	12/10/12	Survey Type: MANUAL HAMPSHIRE
	BASINGSTOKE		
	Suburban Area (PPS6 Out of Centre) Commercial Zone		
	Total Gross floor area:	13200 sqm	
14	Survey date: THURSDAY	16/06/16 FOR	Survey Type: MANUAL
	NINE ACRES CLOSE HAYES		
	Edge of Town Industrial Zone		
	Total Gross floor area:	8673 sqm	
15	Survey date: THURSDAY HO-02-F-01 LOGISTICS AND	27/09/18 FREIGHT	Survey Type: MANUAL HOUNSLOW
	ASCOT ROAD FELTHAM		
	Suburban Area (PPS6 Out of Centre)		
	Total Gross floor area:	13500 sqm	
16	Survey date: WEDNESDAY	23/11/16 AREHOUSING	Survey Type: MANUAL
	MILLS ROAD		
	AYLESFORD OUARRY WOOD		
	Edge of Town		
	Industrial Zone Total Gross floor area:	11200 sam	
	Survey date: FRIDAY	22/09/17	Survey Type: MANUAL
17	LU-02-F-01 PACKAGING COM	IPANY	LOUTH
	DROGHEDA		
	LAGAVOOREN		
	No Sub Category		
	Total Gross floor area:	5350 sqm	
18	Survey date: FRIDAY SF-02-F-02 WAREHOUSING	19/06/15	Survey Type: MANUAL SUFFOLK
	WALTON ROAD FELIXSTOWE		-
	Suburban Area (PPS6 Out of Centre)		
	Total Gross floor area:	22270 sqm	
	Survey date: THURSDAY	11/07/13	Survey Type: MANUAL

LIST OF SITES relevant to selection parameters (Cont.)

19	SF-02-F-03 CENTRAL AVENUE IPSWICH WARREN HEATH Edge of Town Industrial Zone	ROAD HAULAGE		SUFFOLK
	Total Gross floor are	a:	4700 sqm	
20	Survey date: TW-02-F-01 MANDARIN WAY WASHINGTON PATTISON IND. EST. Edge of Town	FRIDAY ASDA DISTRIBUTIO	18/09/15 DN CENTRE	Survey Type: MANUAL TYNE & WEAR
	Total Gross floor are	a:	31000 sqm	
21	Survey date: WM-02-F-02 SOVEREIGN ROAD BIRMINGHAM KINGS NORTON Edge of Town	FRIDAY LOGISTICS FIRM	13/11/15	Survey Type: MANUAL WEST MIDLANDS
22	Commercial Zone Total Gross floor are <i>Survey date:</i> WY-02-F-01 MORTIMER STREET CLECKHEATON	a: MONDAY ELECTRONICS DIST	3625 sqm <i>09/11/15</i> FRIBUTION	Survey Type: MANUAL WEST YORKSHIRE
23	Edge of Town Centre Built-Up Zone Total Gross floor are <i>Survey date:</i> WY-02-F-02 STAITHGATE LANE BRADFORD NEWHALL Edge of Town	a: MONDAY DISTRIBUTION CO	1507 sqm <i>19/09/16</i> MPANY	Survey Type: MANUAL WEST YORKSHIRE
	Industrial Zone Total Gross floor are Survey date:	a: THURSDAY	10446 sqm <i>14/03/19</i>	Survey Type: MANUAL

This section provides a list of all survey sites and days in the selected set. For each individual survey site, it displays a unique site reference code and site address, the selected trip rate calculation parameter and its value, the day of the week and date of each survey, and whether the survey was a manual classified count or an ATC count.

TRIP RATE for Land Use 02 - EMPLOYMENT/F - WAREHOUSING (COMMERCIAL) TOTAL VEHICLES Calculation factor: 100 sqm BOLD print indicates peak (busiest) period

$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$			ARRIVALS		DEPARTURES			TOTALS		
Time Range Days GFA Rate Days GFA Rate Days GFA Rate Days GFA Rate 00:00 - 00:30 -		No.	Ave.	Trip	No.	Ave.	Trip	No.	Ave.	Trip
$\begin{array}{ c c c c c c c c c c c c c c c c c c c$	Time Range	Days	GFA	Rate	Days	GFA	Rate	Days	GFA	Rate
$\begin{array}{ c c c c c c c c c c c c c c c c c c c$	00:00 - 00:30									
$\begin{array}{ c c c c c c c c c c c c c c c c c c c$	00:30 - 01:00									
01:30 - 02:00 02:00 - 02:30 02:00 - 02:30 02:30 - 03:30 02:30 - 03:30 02:30 - 03:30 03:30 - 04:00 03:30 - 04:00 03:30 - 04:30 04:30 - 05:30 05:30 - 06:30 05:30 - 06:30 05:30 - 06:30 05:30 - 06:30 05:30 - 06:30 05:30 - 06:30 05:30 - 06:30 05:30 - 06:00 12667 0.034 8 12667 0.034 8 12667 0.033 8 12667 0.071 06:30 - 07:30 8 12667 0.044 8 12667 0.033 8 12667 0.014 8 12667 0.014 8 12667 0.038 8 12667 0.117 06:30 - 07:30 23 11107 0.044 23 11107 0.044 23 11107 0.145 09:30 - 07:00 8 12667 0.038 8 12667 0.038 8 12667 0.038 11107 0.145 23 11107 0.145 23 11107 0.145 23 11107 0.145 23 11107 0.14	01:00 - 01:30									
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	01:30 - 02:00									
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	02:00 - 02:30									
03:30 04:00 04:30 04:00 04:00 04:30 04:00 04:00 04:00 04:00 04:00 04:30 05:00 </td <td>02:30 - 03:00</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>	02:30 - 03:00									
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	03:00 - 03:30									
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	03:30 - 04:00									
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	04:00 - 04:30									
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	04:30 - 05:00									
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	05:00 - 05:30	8	12667	0.034	8	12667	0.020	8	12667	0.054
06:00 - 06:30 8 12667 0.048 8 12667 0.091 06:30 - 07:00 8 12667 0.099 8 12667 0.038 8 12667 0.137 07:00 - 07:30 23 11107 0.146 23 11107 0.146 23 11107 0.146 08:00 - 08:30 23 11107 0.146 23 11107 0.042 23 11107 0.188 08:30 - 09:00 23 11107 0.114 23 11107 0.045 23 11107 0.129 09:30 - 09:30 23 11107 0.066 23 11107 0.112 10:00 - 10:30 23 11107 0.052 23 11107 0.046 23 11107 0.112 11:00 - 11:30 23 11107 0.055 23 11107 0.056 23 11107 0.113 12:00 - 12:30 23 11107 0.057 23 11107 0.056 23	05:30 - 06:00	8	12667	0.044	8	12667	0.033	8	12667	0.077
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	06:00 - 06:30	8	12667	0.048	8	12667	0.043	8	12667	0.091
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	06:30 - 07:00	8	12667	0.099	8	12667	0.038	8	12667	0.137
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	07:00 - 07:30	23	11107	0.069	23	11107	0.056	23	11107	0.125
$\begin{array}{ c c c c c c c c c c c c c c c c c c c$	07:30 - 08:00	23	11107	0.146	23	11107	0.042	23	11107	0.188
$\begin{array}{ c c c c c c c c c c c c c c c c c c c$	08:00 - 08:30	23	11107	0.092	23	11107	0.044	23	11107	0.136
$\begin{array}{ c c c c c c c c c c c c c c c c c c c$	08:30 - 09:00	23	11107	0.114	23	11107	0.045	23	11107	0.159
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	09:00 - 09:30	23	11107	0.083	23	11107	0.046	23	11107	0.129
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	09:30 - 10:00	23	11107	0.066	23	11107	0.046	23	11107	0.112
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	10:00 - 10:30	23	11107	0.052	23	11107	0.049	23	11107	0.101
$\begin{array}{ c c c c c c c c c c c c c c c c c c c$	10:30 - 11:00	23	11107	0.056	23	11107	0.060	23	11107	0.116
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	11:00 - 11:30	23	11107	0.050	23	11107	0.054	23	11107	0.104
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	11:30 - 12:00	23	11107	0.057	23	11107	0.056	23	11107	0.113
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	12:00 - 12:30	23	11107	0.050	23	11107	0.065	23	11107	0.115
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	12:30 - 13:00	23	11107	0.057	23	11107	0.059	23	11107	0.116
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	13:00 - 13:30	23	11107	0.076	23	11107	0.070	23	11107	0.146
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	13:30 - 14:00	23	11107	0.079	23	11107	0.072	23	11107	0.151
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	14:00 - 14:30	23	11107	0.054	23	11107	0.066	23	11107	0.120
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	14:30 - 15:00	23	11107	0.063	23	11107	0.065	23	11107	0.128
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	15:00 - 15:30	23	11107	0.049	23	11107	0.078	23	11107	0.127
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	15:30 - 16:00	23	11107	0.046	23	11107	0.054	23	11107	0.100
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	16:00 - 16:30	23	11107	0.056	23	11107	0.079	23	11107	0.135
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	16:30 - 17:00	23	11107	0.040	23	11107	0.105	23	11107	0.145
$\begin{array}{ c c c c c c c c c c c c c c c c c c c$	17:00 - 17:30	23	11107	0.040	23	11107	0.107	23	11107	0.147
18:00 - 18:30 22 11544 0.030 22 11544 0.070 22 11544 0.100 18:30 - 19:00 22 11544 0.053 22 11544 0.061 22 11544 0.114 19:00 - 19:30 9 13526 0.028 9 13526 0.066 9 13526 0.094 19:30 - 20:00 9 13526 0.022 9 13526 0.031 9 13526 0.053 20:00 - 20:30 9 13526 0.022 9 13526 0.031 9 13526 0.053 20:30 - 21:00 9 13526 0.024 9 13526 0.043 9 13526 0.043 21:00 - 21:30 1 22270 0.018 1 22270 0.009 1 22270 0.022 21:30 - 22:00 1 22270 0.013 1 22270 0.009 1 22270 0.022	17:30 - 18:00	23	11107	0.041	23	11107	0.097	23	11107	0.138
18:30 - 19:00 22 11544 0.053 22 11544 0.061 22 11544 0.114 19:00 - 19:30 9 13526 0.028 9 13526 0.066 9 13526 0.094 19:30 - 20:00 9 13526 0.022 9 13526 0.031 9 13526 0.053 20:00 - 20:30 9 13526 0.016 9 13526 0.050 20:30 - 21:00 9 13526 0.024 9 13526 0.019 9 13526 0.043 21:00 - 21:30 1 22270 0.018 1 22270 0.009 1 22270 0.022 21:30 - 22:00 1 22270 0.013 1 22270 0.029 1 22270 0.022	18:00 - 18:30	22	11544	0.030	22	11544	0.070	22	11544	0.100
19:00 - 19:309135260.0289135260.0669135260.09419:30 - 20:009135260.0229135260.0319135260.05320:00 - 20:309135260.0169135260.0349135260.05020:30 - 21:009135260.0249135260.0199135260.04321:00 - 21:301222700.0181222700.0091222700.02721:30 - 22:001222700.0131222700.0091222700.022	18:30 - 19:00	22	11544	0.053	22	11544	0.061	22	11544	0.114
19:30 - 20:009135260.0229135260.0319135260.05320:00 - 20:309135260.0169135260.0349135260.05020:30 - 21:009135260.0249135260.0199135260.04321:00 - 21:301222700.0181222700.0091222700.02721:30 - 22:001222700.0131222700.0091222700.022	19:00 - 19:30	9	13526	0.028	9	13526	0.066	9	13526	0.094
20:00 - 20:30 9 13526 0.016 9 13526 0.034 9 13526 0.050 20:30 - 21:00 9 13526 0.024 9 13526 0.019 9 13526 0.043 21:00 - 21:30 1 22270 0.018 1 22270 0.009 1 22270 0.027 21:30 - 22:00 1 22270 0.013 1 22270 0.009 1 22270 0.022	19:30 - 20:00	9	13526	0.022	9	13526	0.031	9	13526	0.053
20:30 - 21:00 9 13526 0.024 9 13526 0.019 9 13526 0.043 21:00 - 21:30 1 22270 0.018 1 22270 0.009 1 22270 0.027 21:30 - 22:00 1 22270 0.013 1 22270 0.009 1 22270 0.022	20:00 - 20:30	9	13526	0.016	9	13526	0.034	9	13526	0.050
21:00 - 21:30 1 22270 0.018 1 22270 0.009 1 22270 0.027 21:30 - 22:00 1 22270 0.013 1 22270 0.009 1 22270 0.022	20:30 - 21:00	9	13526	0.024	9	13526	0.019	9	13526	0.043
21:30 - 22:00 1 22270 0.013 1 22270 0.009 1 22270 0.022	21:00 - 21:30	1	22270	0.018	1	22270	0.009	1	22270	0.027
	21:30 - 22:00	1	22270	0.013	1	22270	0.009	1	22270	0.022
22:00 - 22:30	22:00 - 22:30									
22:30 - 23:00	22:30 - 23:00									
23:00 - 23:30	23:00 - 23:30									
23:30 - 24:00	23:30 - 24:00									
Total Rates: 1.865 1.848 3.713	Total Rates:			1.865			1.848			3.713

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is: COUNT/TRP*FACT. Trip rates are then rounded to 3 decimal places.

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Parameter summary

Trip rate parameter range selected:	190 - 50000 (units: sqm)
Survey date date range:	01/01/12 - 15/10/19
Number of weekdays (Monday-Friday):	23
Number of Saturdays:	0
Number of Sundays:	0
Surveys automatically removed from selection:	1
Surveys manually removed from selection:	0

This section displays a quick summary of some of the data filtering selections made by the TRICS® user. The trip rate calculation parameter range of all selected surveys is displayed first, followed by the range of minimum and maximum survey dates selected by the user. Then, the total number of selected weekdays and weekend days in the selected set of surveys are show. Finally, the number of survey days that have been manually removed from the selected set outside of the standard filtering procedure are displayed.

TRIP RATE CALCULATION SELECTION PARAMETERS:

Land Use : 02 - EMPLOYMENT Category : F - WAREHOUSING (COMMERCIAL) TOTAL VEHICLES

Sele	ected regions and areas:			
01	GREATER LONDON			
	BE BEXLEY	1 days		
	HD HILLINGDON	1 days		
	HO HOUNSLOW	1 days		
02	SOUTH EAST	-		
	EX ESSEX	1 days		
	HC HAMPSHIRE	1 days		
	KC KENT	1 days		
03	SOUTH WEST	-		
	DV DEVON	2 days		
04	EAST ANGLIA			
	SF SUFFOLK	2 days		
06	WEST MIDLANDS			
	WM WEST MIDLANDS	1 days		
07	YORKSHIRE & NORTH LINCOLNSHIRE	-		
	WY WEST YORKSHIRE	2 days		
09	NORTH			
	CB CUMBRIA	1 days		
	TW TYNE & WEAR	1 days		
10	WALES			
	BG BRIDGEND	1 days		
12	CONNAUGHT			
	GA GALWAY	1 days		
13	MUNSTER			
	CR CORK	1 days		
14	LEINSTER	-		
	CC CARLOW	1 days		
	LU LOUTH	1 days		
15	GREATER DUBLIN			
	DL DUBLIN	1 days		
17	ULSTER (NORTHERN IRELAND)			
	AN ANTRIM	2 davs		

This section displays the number of survey days per TRICS® sub-region in the selected set

Primary Filtering selection:

This data displays the chosen trip rate parameter and its selected range. Only sites that fall within the parameter range are included in the trip rate calculation.

Parameter: Actual Range: Range Selected by Use	Gross floor area 190 to 50000 (units: sqm) r: 190 to 80066 (units: sqm)	
Parking Spaces Range	All Surveys Included	
Public Transport Provis Selection by:	ion:	Include all surveys
Date Range: 0'	1/01/12 to 15/10/19	

This data displays the range of survey dates selected. Only surveys that were conducted within this date range are included in the trip rate calculation.

3 days
3 days
3 days
7 days
7 days

This data displays the number of selected surveys by day of the week.

Selected survey types:	
Manual count	23 days
Directional ATC Count	0 days

This data displays the number of manual classified surveys and the number of unclassified ATC surveys, the total adding up to the overall number of surveys in the selected set. Manual surveys are undertaken using staff, whilst ATC surveys are undertaking using machines.

This data displays the number of surveys per main location category within the selected set. The main location categories consist of Free Standing, Edge of Town, Suburban Area, Neighbourhood Centre, Edge of Town Centre, Town Centre and Not Known.

Selected Location Sub Categories:	
Industrial Zone	18
Commercial Zone	2
Built-Up Zone	1
Out of Town	1
No Sub Category	1

This data displays the number of surveys per location sub-category within the selected set. The location sub-categories consist of Commercial Zone, Industrial Zone, Development Zone, Residential Zone, Retail Zone, Built-Up Zone, Village, Out of Town, High Street and No Sub Category.

Secondary Filtering selection:

Use Class:	
B1	1 days
B2	1 days
B8	20 days

This data displays the number of surveys per Use Class classification within the selected set. The Use Classes Order 2005 has been used for this purpose, which can be found within the Library module of TRICS®.

<u>Filter by Use Class Breakdown:</u> All Surveys Included

2 days
3 days
5 days
1 days
4 days
3 days
4 days
1 days

This data displays the number of selected surveys within stated 1-mile radii of population.

Population within 5 miles:	
5,001 to 25,000	3 days
25,001 to 50,000	4 days
50,001 to 75,000	1 days
75,001 to 100,000	1 days
125,001 to 250,000	6 days
250,001 to 500,000	4 days
500,001 or More	4 days

This data displays the number of selected surveys within stated 5-mile radii of population.

Car ownership within 5 miles:	
0.6 to 1.0	11 days
1.1 to 1.5	11 days
1.6 to 2.0	1 days

This data displays the number of selected surveys within stated ranges of average cars owned per residential dwelling, within a radius of 5-miles of selected survey sites.

<u>Travel Plan:</u>	
Yes	3 days
No	20 days

This data displays the number of surveys within the selected set that were undertaken at sites with Travel Plans in place, and the number of surveys that were undertaken at sites without Travel Plans.

PTAL Rating:	
No PTAL Present	20 days
1a (Low) Very poor	1 days
1b Very poor	1 days
2 Poor	1 days

This data displays the number of selected surveys with PTAL Ratings.

Sunday 21/02/21 Page 3 Licence No: 703105

LIST OF SITES relevant to selection parameters

1	AN-02-F-03 KENNEDY WAY	PACKAGING COMPAN	ΊΥ	ANTRIM	
	BELFAST KENNEDY WAY IND. Suburban Area (PPS Industrial Zone Total Gross floor are Survey date:	EST. 6 Out of Centre) a: 1 TUESDAY	12234 sqm 11/10/16	Survey Type: N	/ANUAL
2	AN-02-F-04 APOLLO ROAD BELFAST BALMORAL Suburban Area (PPS Industrial Zone	TESCO DISTRIBUTIO	N CENTRE	ANTRIM	
3	Total Gross floor are Survey date: BE-02-F-01 THAMES ROAD CRAYFORD	a: THURSDAY FRESH FRUIT DISTRI	11000 sqm <i>14/03/19</i> BUTOR	Survey Type: N BEXLEY	/ANUAL
4	Edge of Town Industrial Zone Total Gross floor are <i>Survey date:</i> BG-02-F-01 PARC CRESCENT	a: 2 THURSDAY LOGISTICS COMPANY	20400 sqm <i>20/09/18</i> Y	Survey Type: N BRIDGEND	/ANUAL
5	WATERTON IND. ES Edge of Town Industrial Zone Total Gross floor are <i>Survey date:</i> CB-02-F-01 COWPER ROAD PENRITH	T. a: <i>MONDAY</i> DOMINO'S PIZZA	3050 sqm 13/10/14	Survey Type: N CUMBRIA	/ANUAL
6	GILWILLY IND. EST/ Edge of Town Industrial Zone Total Gross floor are <i>Survey date:</i> CC-02-F-01 O'BRIEN ROAD CARLOW	ate a: <i>TUESDAY</i> HYDRAULIC CYCLINE	2950 sqm <i>10/06/14</i> DERS	Survey Type: N CARLOW	/ANUAL
7	Edge of Town Industrial Zone Total Gross floor are <i>Survey date:</i> CR-02-F-03 POULADUFF ROAD CORK SOUTHSIDE IND. ES	a: 1 <i>WEDNESDAY</i> FURNITURE DISTRIB	10500 sqm 25/05/16 SUTION	Survey Type: N CORK	ΛANUAL
8	Edge of Town Industrial Zone Total Gross floor are <i>Survey date:</i> DL-02-F-03 MAPLE AVENUE	a: <i>TUESDAY</i> BATHROOM TILES &	4800 sqm <i>15/10/19</i> TIMBER	Survey Type: N DUBLIN	/ANUAL
9	SANDYFORD Suburban Area (PPS Industrial Zone Total Gross floor are Survey date: DV-02-F-01 ALDERS WAY PAIGNITON	6 Out of Centre) ea: THURSDAY OPTICS WAREHOUSE	650 sqm 26/09/19	Survey Type: N DEVON	ΛΑΝUAL
	Edge of Town Industrial Zone Total Gross floor are Survey date:	ea: FRIDAY	190 sqm 29/03/19	Survey Type: N	/ANUAL

LIST OF SITES relevant to selection parameters (Cont.)

CHILLPARK BRA	KE	JITON CENTRE	DEVON
NEAR EXETER CLYST HONITON Free Standing (P Out of Town	PS6 Out of Town)		
Total Gross floor	area:	50000 sqm	
Survey d 11 EX-02-F-01 BRUNEL WAY	ate: WEDNESDAY SPORTS SUPPL	03/04/19 EMENTS	Survey Type: MANUAL ESSEX
COLCHESTER SEVERALLS IND Edge of Town Industrial Zone Total Gross floor	USTRIAL PK area:	6560 sqm	
Survey d 12 GA-02-F-01 PARKMORE WES GALWAY IDA BUS. & TECL Edge of Town	ate: FRIDAY LOGISTICS T H. PARK	18/05/18	Survey Type: MANUAL GALWAY
Total Gross floor Survey d 13 HC-02-F-02 RUTHERFORD RG BASINGSTOKE	area: ate: FRIDAY LOGISTICS DAD	11000 sqm <i>12/10/12</i>	Survey Type: MANUAL HAMPSHIRE
Suburban Area (Commercial Zon Total Gross floor <i>Survey d</i> 14 HD-02-F-01 NINE ACRES CLO HAYES	PPS6 Out of Centre) e area: <i>ate: THURSDAY</i> FOOD DISTRIB DSE	13200 sqm <i>16/06/16</i> SUTOR	Survey Type: MANUAL HILLINGDON
Edge of Town Industrial Zone Total Gross floor <i>Survey d</i> 15 HO-02-F-01 ASCOT ROAD FELTHAM	area: ate: THURSDAY LOGISTICS AN	8673 sqm <i>27/09/18</i> D FREIGHT	Survey Type: MANUAL HOUNSLOW
Suburban Area (Industrial Zone Total Gross floor <i>Survey d</i> 16 KC-02-F-02 MILLS ROAD AYLESFORD QUARRY WOOD Edge of Town	PPS6 Out of Centre) area: ate: WEDNESDAY COMMERCIAL N	13500 sqm <i>23/11/16</i> WAREHOUSING	Survey Type: MANUAL KENT
Industrial Zone Total Gross floor <i>Survey d</i> 17 LU-02-F-01 MATTHEWS LAN	area: ate: FRIDAY PACKAGING CO E	11200 sqm <i>22/09/17</i> DMPANY	Survey Type: MANUAL LOUTH
DROGHEDA LAGAVOOREN Edge of Town No Sub Category Total Gross floor <i>Survey d</i> 18 SF-02-F-02 WALTON ROAD FELIXSTOWE	area: ate: FRIDAY WAREHOUSING	5350 sqm <i>19/06/15</i> G	Survey Type: MANUAL SUFFOLK
Suburban Area (Industrial Zone Total Gross floor <i>Survey</i> d	PPS6 Out of Centre) area: ate: THURSDAY	22270 sqm <i>11/07/13</i>	Survey Type: MANUAL

TRICS 7.7.4 All Sites Rar	161220 B20.07 Database rig nk Order	ht of TRICS Consortium Limited	I, 2021. All rights reserved	Sunday 21/02/21 Page 5
HaskoningDH	V UK Ltd 11 Newhall Street	Birmingham		Licence No: 703105
0		0		
LIST	OF SITES relevant to selection p	parameters (Cont.)		
19	SF-02-F-03 ROAD HA CENTRAL AVENUE IPSWICH WARREN HEATH Edge of Town Industrial Zone	AULAGE	SUFFOLK	
	Total Gross floor area:	4700 sqm		
	Survey date: FRIDAY	18/09/15	Survey Type: MANUAL	
20	TW-02-F-01 ASDA DI MANDARIN WAY WASHINGTON PATTISON IND. ESTATE Edge of Town Industrial Zone	STRIBUTION CENTRE	TYNE & WEAR	
	Total Gross floor area:	31000 sqm		
21	Survey date: FRIDAY WM-02-F-02 LOGISTI SOVEREIGN ROAD BIRMINGHAM KINGS NORTON Edge of Town Commercial Zone	13/11/15 CS FIRM	Survey Type: MANUAL WEST MIDLANDS	
	Total Gross floor area:	3625 sqm		
	Survey date: MONDAY	09/11/15	Survey Type: MANUAL	
22	WY-02-F-01 ELECTRO MORTIMER STREET CLECKHEATON	DNICS DISTRIBUTION	WEST YORKSHIRE	

Edge of Town Centre Built-Up Zone Total Gross floor area: 1507 sqm Survey Type: MANUAL WEST YORKSHIRE Survey date: MONDAY 19/09/16 23 WY-02-F-02 DISTRIBUTION COMPANY STAITHGATE LANE BRADFORD NEWHALL Edge of Town Industrial Zone Total Gross floor area: 10446 sqm 14/03/19 Survey date: THURSDAY Survey Type: MANUAL

This section provides a list of all survey sites and days in the selected set. For each individual survey site, it displays a unique site reference code and site address, the selected trip rate calculation parameter and its value, the day of the week and date of each survey, and whether the survey was a manual classified count or an ATC count.

TRICS 7.7.4 161220 B20.07 Database right of TRICS Consortium Limited, 2021. All rights reserved All Sites Rank Order

HaskoningDHV UK Ltd 11 Newhall Street Birmingham

Licence No: 703105

RANK ORDER for Land Use 02 - EMPLOYMENT/F - WAREHOUSING (COMMERCIAL) TOTAL VEHICLES

Ranking Type: TO	TALS	-	Time Range:	07:30-08:30
15th Percentile = No.	20	DV-02-F-02	Tot: 0.156	
85th Percentile = No.	4	WY-02-F-01	Tot: 0.796	

Median Values		<u>Mean Values</u>			
Arrivals:	0.213	Arrivals:	0.309		
Departures:	0.170	Departures:	0.132		
Totals:	0.383	Totals:	0.441		

								Trip Rate (Sorted by Totals)		otals)
Rank	Site-Ref	Description	Town/City	Area	GFA	Day	Date	Arrivals	Departures	Totals
1	CC-02-F-01	HYDRAULIC CYCL	CARLOW	CARLOW	10500	Wed	25/05/16	1.133	0.105	1.238
2	DL-02-F-03	BATHROOM TILES	DUBLIN	DUBLIN	650	Thu	26/09/19	0.308	0.615	0.923
3	WY-02-F-02	DISTRIBUTION C	BRADFORD	WEST YORKSHIRE	10446	Thu	14/03/19	0.345	0.488	0.833
4	WY-02-F-01	ELECTRONICS DI	CLECKHEATON	WEST YORKSHIRE	1507	Mon	19/09/16	0.796	0.000	0.796
5	HO-02-F-01	LOGISTICS AND	FELTHAM	HOUNSLOW	13500	Wed	23/11/16	0.585	0.126	0.711
6	CB-02-F-01	DOMINO'S PIZZA	PENRITH	CUMBRIA	1976	Tue	10/06/14	0.354	0.304	0.658
7	WM-02-F-02	LOGISTICS FIRM	BIRMINGHAM	WEST MIDLANDS	3625	Mon	09/11/15	0.607	0.028	0.635
8	BG-02-F-01	LOGISTICS COMP	BRIDGEND	BRIDGEND	3050	Mon	13/10/14	0.295	0.328	0.623
9	KC-02-F-02	COMMERCIAL WAR	AYLESFORD	KENT	11200	Fri	22/09/17	0.321	0.134	0.455
10	HD-02-F-01	FOOD DISTRIBUT	HAYES	HILLINGDON	8673	Thu	27/09/18	0.277	0.127	0.404
11	LU-02-F-01	PACKAGING COMP	DROGHEDA	LOUTH	5350	Fri	19/06/15	0.374	0.019	0.393
12	SF-02-F-03	ROAD HAULAGE	IPSWICH	SUFFOLK	4700	Fri	18/09/15	0.213	0.170	0.383
13	AN-02-F-03	PACKAGING COMP	BELFAST	ANTRIM	9868	Tue	11/10/16	0.243	0.051	0.294
14	HC-02-F-02	LOGISTICS	BASINGSTOKE	HAMPSHIRE	13200	Thu	16/06/16	0.167	0.114	0.281
15	BE-02-F-01	FRESH FRUIT DI	CRAYFORD	BEXLEY	20400	Thu	20/09/18	0.225	0.054	0.279
16	EX-02-F-01	SPORTS SUPPLEM	COLCHESTER	ESSEX	6560	Fri	18/05/18	0.198	0.061	0.259
17	GA-02-F-01	LOGISTICS	GALWAY	GALWAY	11000	Fri	12/10/12	0.182	0.064	0.246
18	CR-02-F-03	FURNITURE DIST	CORK	CORK	4800	Tue	15/10/19	0.146	0.083	0.229
19	AN-02-F-04	TESCO DISTRIBU	BELFAST	ANTRIM	11000	Thu	14/03/19	0.118	0.082	0.200
20	DV-02-F-02	LIDL DISTRIBUT	NEAR EXETER	DEVON	50000	Wed	03/04/19	0.122	0.034	0.156
21	TW-02-F-01	ASDA DISTRIBUT	WASHINGTON	TYNE & WEAR	31000	Fri	13/11/15	0.052	0.023	0.075
22	SF-02-F-02	WAREHOUSING	FELIXSTOWE	SUFFOLK	22270	Thu	11/07/13	0.045	0.027	0.072
23	DV-02-F-01	OPTICS WAREHOU	PAIGNTON	DEVON	190	Fri	29/03/19	0.000	0.000	0.000

This section displays actual (not average) trip rates for each of the survey days in the selected set, and ranks them in order of relative trip rate intensity, for a given time period (or peak period irrespective of time) selected by the user. The count type and direction are both displayed just above the table, along with the rows within the table representing the 85th and 15th percentile trip rate figures (highlighted in bold within the table itself).

The table itself displays details of each individual survey, alongside arrivals, departures and totals trip rates, sorted by whichever of the three directional options has been chosen by the user. As with the preceeding trip rate calculation results table, the trip rates shown are per the calculation factor (e.g. per 100m2 GFA, per employee, per hectare, etc). Note that if the peak period option has been selected (as opposed to a specific chosen time period), the peak period for each individual survey day in the table is also displayed.

APPENDIX C

Passing Place Study



Department of the Environment Department of Transport

Design Bulletin 32

Residential roads and footpaths

layout considerations

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APPENDIX 4: STUDIES OF DELAYS TO TRAFFIC ON SINGLE-LANE CARRIAGEWAYS WITH PASSING PLACES

Introduction

 This Appendix contains a summary of studies undertaken at the Transport and Road Research Laboratory on behalf of the Housing Development Directorate of DOE into the use of single-lane carriageways with passing places.²⁹

2. While these results may be used as guidance in producing innovative schemes. It must be emphasised that they do not represent studies of systems in everyday use and that additional factors must be taken into consideration when determining carriageway widths, as outlined in paragraphs 8.04-8.21 of this bulletin.

 It is hoped, however, that the results provide sufficient guidance to enable schemes with single-lane carriageways to be produced where appropriate, and to enable follow-up studies to be conducted of their use.

4. Results from the TRRL studies indicate that simply in terms of their capacity for carrying moving traffic single-lane carriageways, correctly designed, are unlikely to incur significant increases in delay compared with traffic in free-flow conditions, at flow levels of up to 300 vph (total two-way).

The studies were undertaken in two stages:

- (a) first, a computer program was written representing the operation of a fixed length of single-lane carriageway, with passing places. From this a series of graphs of average delay against numbers of passing places was obtained for a range of flow levels (paragraphs 6-14);
- (b) second, a small-scale controlled experiment was carried out on the laboratory's test track to check the results of the simulation (paragraphs 15-29).

The simulation

6. A program, written in Fortran, was used to simulate the operation of a length of single-lane road. This length of road was split into 60 sections, some of which could be designated as passing places. No assumptions were made about the geometric configuration of the passing places since this has no effect on the operation of the program. From 0 to 5 passing places could be provided, uniformly spaced along the length considered; an additional section at each end was assumed to act as a passing place at all times, representing widening at each end of the single-lane road. The program operated under a fixed time cycle: during each cycle, vehicles could be generated at each end of the road and move along it at a constant speed of one section per time unit, unless impeded by other vehicles. For the purposes of this simulation the sections were assumed to be 3m long (giving a total of 180m) and the time unit was taken as half a second. This gives a speed of 3m/1/2 sec. i.e. about 22 km/h.

7. Traffic flows up to a two-way total of 300 vph (with various directional splits) were used in the simulation, and the entry times of vehicles into the single-lane road were determined by the computer's random number generator.

8. Simple rules were used to govern the movement of vehicles along the length of single-lane road. No two vehicles (regardless of their direction of movement) were allowed to be present at the same time in any 3m section unless it had been designated as a passing place (or was an end section). Vehicles had to wait in a passing place until the length of single-lane road up to the next passing place was clear of oncoming traffic. All vehicles moved with a fixed speed or were stationary: there was no acceleration/deceleration time or intermediate speed. Any number of vehicles were allowed to occupy a passing place (or end section).

9. For each simulation run (with a nominal traffic flow and number of passing places) the average iourney time was calculated from the vehicle entry and exit times for each direction separately. Since the vehicles had a constant speed, their unimpeded journey time was constant at 30 seconds, thus the average delay to vehicles in each direction was found, and the mean delay for all vehicles. Additionally, a record was produced of the use of each passing place and end section. In each case, the number of half-second periods during which nil, one, two, three or more vehicles were present was recorded. This was done for each direction separately and for the two directions combined. Finally, the maximum number of vehicles present at any passing place or end section was output.

Results

10. Eight different combinations of nominal flow were used with from nil to five passing places provided within the 180m length. For each case three separate one-hour-long operations were simulated using different random patterns of traffic arrivals. The three simulations were averaged for each case and it is these averages which are presented here.

11. Figure 1 shows the way in which average delay per vehicle (both directions of flow combined) varied with the number of passing places for eight different flow combinations. The flow values given are the nominal flow rates; the actual flows obtained by the random generation procedure are in most cases slightly different.

12. These results show that the delay per vehicle falls considerably with the provision of one or two passing places, but a law of diminishing returns rapidly sets in. It can also be seen that balanced flows produce higher overall average delays per vehicle than equivalent unbalanced ones. Figure 2 shows the average delay per vehicle plotted against total flows for the cases where the nominal flows are equal.

13. These results are discussed in paragraphs 22-29 after the controlled experiment has been described.

14. Figure 3 gives information on the use made of the passing places and end sections for the various flow combinations. In each case the end sections are considered separately and an average passing place is also considered. For each of these the number of seconds during which one vehicle is waiting (T_1) and two or more vehicles are waiting (T_{24}) is given. For the passing places this can include vehicles travelling in either direction, but only entering vehicles could be required to wait at the end sections. The figures are again the averages of three one-hour simulations. Also shown is the maximum number of vehicles ever required to wait in any passing place or end section. This figure is the highest occurring in any of the three simulations.

The single-lane experiment

15. In order to observe the operation of a single-lane road and to provide a check on the simulation output a small controlled experiment was carried out on the Laboratory's test track (the small roads system).

16. A straight stretch of 9m-wide road was narrowed using wooden blisters to 2.75m for 180m of its length. Three passing places marked out by cones were provided within the 180m, but two of these were blocked off in some tests. In addition to the 180m stretch of single-lane road, each end was entered through a widened section of road. Other parts of the small roads system were used to re-eirculate traffic taking part in the experiment (see Figure 4). The layout of the single-lane road and the detailed design of the passing places, is shown in Figure 5 and illustrated in Figure 6.

17. The traffic used for the experiment consisted of cars driven by members of the Traffic Engineering Department. Vehicles were released onto the test road at each end according to a prepared schedule which gave specified flow rates and random intervals between vehicles. The release times were based on the vehicle generation times used by the simulation, adjusted to give a more realistic time-gap between entering vehicles. Observers positioned at the entry points noted any deviations from the scheduled entry times. The observers also recorded the use made of the passing places and widened entries by noting the number of vehicles waiting and the duration of their wait. Finally, an observer at each end recorded the times at which vehicles left the system, from which journey times could be calculated.

18. Seven tests were carried out, each lasting 20 minutes. Six of the tests were directly comparable with output from the simulation; the seventh used higher flows (250 vph each way) than had been used in the simulation. Since average speeds were higher during the experiment than that assumed in the simulation, average delays rather than average journey times were used as a basis of comparison. The calculation of delay was not as straightforward for the experiment as for the simulation since the unimpeded journey time was not constant for all vehicles. In order to obtain a value for the unimpeded journey time, a space-time plot was constructed for every vehicle in each of the first six tests. All vehicles which had a completely free run, in the sense that they met no oncoming traffic, were noted and their journey times recorded. The average journey time of all such vehicles was 23 seconds (giving a free-run speed of 28 km/h): this was subtracted from the overall average journey time in every test to produce a value for average delay.

 The results of the seven tests are summarised in Figure 7. A comparison of these results with those from the simulation is made in paragraphs 22-29.

20. The space-time plots were also used to produce histograms of the journey time distribution for each test. As an example, Figure 8 shows the histogram for flows of 100/100 with three passing places, for both directions of flow combined. Also shown are the vehicles which had a completely free run (about 30% in this case, nearly 40% overall for the first six tests). In addition to these a number of vehicles were unimpeded because vehicles from the other direction let them pass. Since all these 'free-running' vehicles are included in the calculation of average delay, it follows that the delays actually incurred by some vehicles were considerably higher than the overall averages guoted: four of the 70 vehicles represented in Figure 8 suffered delays of more than 30 seconds, when the overall average delay was less than five seconds.



Variation of average delay with number of passing places and flow



3 Use of passing places and end sections

Flow (vph) in each	Number of passing places	Use of aver passing pla (seconds/h	age ce our)	Use of high end section (seconds/h	n-flow n our)	Use of low end section (seconds/h	-flow n our)	Maximu number waiting
direction	per 180m	T2+*	T1"	T2+	т1	T ₂₊	τ ₁	
25/25	0	1		29	95	0	82	3
	1	7	51	0	47	0	32	3
	2	1	43	0	25	0	25	2
	3	1	34	0	18	0	18	2
	4	0	32	0	15	0	13	2
	5	0	30	0	15	0	15	2
50/60	0			71	200	06	101	4
307.50	1	16	157	0	172	20	85	
	2	0	103	3	40	20	EC	2
	2		0.4		40	2	00	
	3		73		94		44	2
	e E	1	66		37		20	2
	2	· · ·					-30	
100/50	0			118	333	209	423	5
	1	61	303	31	160	26	144	4
	2	.18	181	4	97	10	98	4
	3	11	136	1	80	5	61	3
	4	5	118	1	69	1	53	3
	5	3	104	0	63	0	43	3
100/100	0			325	529	322	641	7
	1	125	432	49	256	45	285	6
	2	34	291	12	149	23	157	4
	3	22	211	11	116	2	117	3
	4	10	176	2	92	2	98	3
	5	6	151	0	79	0	84	3
150/50	0			170	312	347	504	5
150/50		346	520	27	215	47	207	4
		116	201	21	100	47	1207	
	2	FC	222	0	110		20	
	3	21	264	-	04	2	66	2
	- -	17	220		80	ĩ	44	3
NTIME TO A		<u></u>	200	1000				
150/150	0	0.96	10.000	682	483	708	549	14
	1	119	330	117	379	114	425	6
	2	32	222	26	233	29	270	6
	3	14	1/2	30	182	11	180	5
	4	8	148	10	165	10	137	3
	5	4	135	7	136	4	127	4
200/100	0			568	366	840	617	14
		360	546	105	345	120	472	7
	2	98	409	42	249	28	267	5
	3	47	324	23	202	7	157	4
	4	26	264	8	175	7	141	5
	5	15	229	6	155	2	105	3
260/50	0			263	287	746	637	8
200100	1	222	1007	205 AE	207	79	2027	
	2	54	340	26	200	17	206	
	2	36	262	0	101	10	129	4
	4	24	201	6	167	2	07	2
		10	100	4	107	5	50	3
	9	12	190	4	150	U	59	3

* T1 and T2+ are the average number of seconds per hour during which an average passing place or end section is occupied by one vehicle or by two or more vehicles respectively.

21. The records of the numbers of vehicles using the passing places were hard to analyse due to the difficulty of defining when a vehicle was actually using a passing place. In particular, a number of vehicles used passing places to perform 'moving passes' during which neither of them actually stopped. Vehicles were also adjusting their speed well in advance of a passing place to take advantage of particular traffic circumstances. However, both the records kept and the opinions of observers suggested that the passing places employed were adequate for all but the final test when exceptionally high flows (in the single-lane road context) were used. It seems unlikely that much smaller passing places could be used due to the need to accommodate large service vehicles.

Comparison of results between simulation and controlled experiment

22. The results of the first six tests during the controlled experiment are compared with the appropriate simulation results in Figure 9. The seventh test did not correspond to any simulated case; this test had only been included as an attempt to introduce more diverse driving conditions than seemed likely to occur during tests within the simulated range.

23. Figure 9 shows a systematic difference between the simulation and the experiment in the overall average delay per vehicle for the various flow combinations; the test-to-test differences were in close agreement. The experimental values were about 1% seconds higher in every case except that in which very unbalanced flows (250/50) were provided with only one passing place. This difference may be the result of the omission of certain factors (e.g. acceleration/deceleration delays) from the simulation.





24. The discrepancies between the simulation and the experiment with respect to the difference in average delay per vehicle between the two flow directions, was even more marked. In the simulation this difference was variable; being large when the flows were unbalanced. The driver behaviour observed during the experiment was more flexible than that assumed in the simulation and this may have led to a smoothing out of differences. The observed differences between delay per vehicle for the two directions ranged from 0 to 2.6 seconds, and averaged 1.3 seconds (see first six rows of Figure 7).



7 Summary of results from controlled experiment

6

Number of passing places	Approxi flow rat (vph)	imate e	Average per vehi (sec)		
	High	Low	High	Low	Combined
1	50	50	4.3	5.6	4.9
1	150	50	6.3	7.7	6.7
1	250	50	5.1	5.1	5.1
3	150	50	2.5	5.1	3.3
3	100	100	4.2	5.2	4.7
3	250	50	3.6	5.1	3.9
3	250	250	24.9	34.1	29.9



Journey time distribution from experiment. (Both directions of flow combined.) Three passing places. Nominal flow rate of 100 vph each way. (Total two-way count of 70 vehicles in 20 mins.)

Number Flow Average delay per vehicle both directions combined rate passing (vph) (sec) places Experiment Simulation Experiment minus simulation 50/ 50 4.9 3.4 +1.5150/ 50 6.7 5.1 +1.6250/ 50 5.1 5.3 - 0.2 150/ 50 3.3 2.2 +1.1100/100 47 3.1 + 1.6

2.6

+1.3

3.9

250/ 50

9

25. It was not possible to produce a delay/flow plot for the experiment like that for the simulation results given in Figure 2, because only seven tests were carried out. However, the seventh test with flows of 250 vph each way and three passing places showed a large increase in delay which suggests that the linear relationship between flow and delay in Figure 2 would not apply at higher flows, as the simplifying assumptions involved in the simulation (especially about driver behaviour) became increasingly unrealistic.

26. Since the simulation did not generally record individual journey times (this would have led to a large increase in proaram running time) no comparison is possible with the distribution of journey times recorded in the experiment (Figure 8). But a few extra simulation runs confirmed the experimental results, that a considerable proportion of vehicles were unimpeded, while a small proportion incurred delays well above the average; this must be borne in mind when assessing the acceptability of the various average delays recorded.

27. Although it was difficult to analyse the records of the use made of passing places during the experiment, they were clearly of adequate size for the flows used in the first six tests. The simulation showed that they were empty for much of the time and rarely occupied by more than two vehicles. Observers in the experiment agreed that this was an accurate representation of passing place use.

28. In making these comparisons it should be remembered that the simulation results are based on three one-hour simulated flows, whereas the tests during the controlled experiment were of only twenty minutes each.

29. It would seem, therefore, that while the results from the simulation may be suspect in detail, the values obtained for overall average delay per vehicle are of the right order. It also seems that the simulation provides reasonable guidance as to the frequency and size of passing place required. Figure 1 suggests that for two-way flows of up to 100 vph two passing places within 180m (i.e. a separation of 60m, centre-to-centre) are sufficient. For higher flows of up to a two-way total of 300 vph three passing places are probably necessary (separation of 45m, centre-to-centre).