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TRANSDEV PLC

VEHICLE MAINTENANCE AREA, LAND TO THE
NORTHERN PART OF CHERRY YARD, HOLLOWAY FARM,
HARMONDSWORTH ROAD, UB7 9JS

TRANSPORT STATEMENT

OCTOBER 2016

Contents

- 1.0 INTRODUCTION
- 2.0 SITE ACCESSIBILITY
- 3.0 POLICY CONTEXT
- 4.0 TRIP GENERATION & TRAFFIC IMPACT
- 5.0 ACCESS ROAD SIGHTLINES-HARMONDSWORTH ROAD SPEED SURVEY
- 6.0 SUMMARY

Figures

- 1. Site Location
- 2. Public Transport Map
- 3. Location of ATC box on Harmondsworth Road
- 4. Visibility Sightline Plot Looking Right on Exit
- 5. Visibility Sightline Plot Looking Left on Exit

Appendices

- A Site Boundary
- B Historic Photos showing the vehicle movements of the commercial plant nursery
- C MetroCount's 'Speed Analysis I – The 85 Percentile Speed' paper
- D Harmondsworth Road ATC Northbound Data
- E Harmondsworth Road ATC Southbound Data
- F DMRB: TA 22/81 Extract

Ref: File path P:\ P1571 Holloway Farm Transport Statement October 2016

I.0 INTRODUCTION

- I.1 Paul Mew Associates (PMA) is instructed by Transdev Plc in relation to retrospective planning application at Holloway Farm, Harmondsworth Road, UB7 9JS.
- I.2 The application site's location is presented on a map in Figure I of this report; the site's boundary is displayed on an Ordnance Survey (OS) map base in Appendix A.
- I.3 The site is located around two kilometers to the north of Heathrow Airport. The area adjoining the site is predominantly commercial and farmland in character.
- I.4 There are nearby bus routes and stops located on Harmondsworth Road which are within very close proximity to the site. The nearest train station to the site is West Drayton Rail Station which is around 2.2 kilometres to the north of the site following footpaths.
- I.5 The site is currently a vehicle maintenance depot and this is the use that is being sought retrospectively. Prior to this, the site has been used for a commercial plant nursery by varying business operators.
- I.6 The vehicle maintenance depot is accessed from Harmondsworth Road and shares access with other commercial operations that use the wider "Holloway Farm" area. These include CTS car transporter and John Train plant nursery which are located to the South of the CCH site. The access to the former commercial nursery was previously from Holloway Close, which is adjacent to the open agricultural land.
- I.7 The previous commercial plant nursery supplied and maintained plants for commercial premises. This would typically involve the parking and movement of Heavy Goods Vehicles to receive horticultural material and transport the plants to clients. Members of the public also visited the site from time to time.

- I.8 This report has been commissioned to accompany a full planning application to The London Borough of Hillingdon.

Vehicle Maintenance Operations

- I.9 The maintenance depot has two mechanics working during the weekday. The shifts for these mechanics are 04:00 - 13:00 and 10:00 - 19:00.
- I.10 Before the depot was erected, vehicles would have to be driven to nearby garages for repairs and services, this would increase traffic entering and exiting the site compared to keeping all operations within the site. However, due to various reasons the suppliers have relocated away from nearby Uxbridge with suppliers now having to relocate to Denham and Aylesbury.

This Report

- I.11 This Transport Statement (TS) has been produced to assess the transport and impacts of the existing development both on the site and the wider highway and show that the retrospective development will generate a reduction in traffic.
- I.12 The following chapter sets out the site's accessibility to all modes of transport and Chapter 3 presents the policy context for the proposals. Thereafter the retrospective parking provision, the traffic impact of the development.

2.0 ACCESSIBILITY

- 2.1 As explained in the introduction, the application site is located just off of the Harmondsworth Road, approximately 70 metres north of the A3044 roundabout.
- 2.2 The closest retail amenities are located on North of Harmondsworth Road approximately 1 kilometre north of the site, and includes a small convenience store, take-away food outlets.
- 2.3 In terms of public transport, the closest bus stops to the site are on Harmondsworth Road.
- 2.4 Bus services 350 and U3 can be accessed from bus stops on Harmondsworth Road to the north of the site.
- 2.5 A summary of the local bus services is presented in Table 1.

Table 1. Local Bus Service Summary

Bus	Route	Bus Frequency ¹	Operator
350	Hayes - Stockley Park - West Drayton - Harmondsworth - Colnbrook By-Pass - Heathrow Airport Terminal 5	3 per hour	Abellio
U3	Heathrow Airport Central - Harmondsworth - Wise Lane - West Drayton - Apple Tree Avenue - Colham Green - Pield Heath - Brunel University - Uxbridge	6 per hour	Metroline

Source: London Bus Route

¹Monday to Friday

- 2.6 The nearest train station to the site is West Drayton National Rail Station which is around 2.3 kilometres to the north of the site following footpaths. Trains operate to four trains per hour London Paddington, two trains per hour to Reading and two trains per hour to Oxford.
- 2.7 Figure 2 sets out the locations of nearby public transport access points in proximity to the site.

- 2.8 The walk routes to nearby bus stops are very direct and straightforward. Footpaths within proximity to the site appear to be well lit, sufficiently wide and in a reasonable state of repair.
- 2.9 Cycling will be encouraged through the provision of appropriate facilities, with the company currently offering a cycle to work scheme to the main depot, the cycle scheme will be extended to the vehicle maintenance staff.
- 2.10 The main vehicle access to the site is served from the Harmondsworth Road. The site's existing vehicle access will remain. The site access arrangements are assessed in detail later in this report.
- 2.11 The site is well connected to the wider road network being in very close proximity to the A3044 Holloway Lane and the M4 motorway.

3.0 POLICY CONTEXT

LONDON BOROUGH OF HILLINGDON

- 3.1 Policy AM7 of the Hillingdon Local Plan: Part Two - Saved Unitary Development Plan Policies (November 2012) considers whether the traffic generated by the proposed development is acceptable in terms of the local highway and junction capacity, traffic flows and conditions of general highway or pedestrian safety. For ease of reference it is shown below.

AM7: THE LOCAL PLANNING AUTHORITY WILL CONSIDER WHETHER THE TRAFFIC GENERATED BY PROPOSED DEVELOPMENTS IS ACCEPTABLE IN TERMS OF THE CAPACITY AND FUNCTIONS OF EXISTING AND COMMITTED PRINCIPAL ROADS ONLY, AND WILL WHOLLY DISCOUNT ANY POTENTIAL WHICH LOCAL DISTRIBUTOR AND ACCESS ROADS MAY HAVE FOR CARRYING THROUGH TRAFFIC.

THE LOCAL PLANNING AUTHORITY WILL NOT GRANT PERMISSION FOR DEVELOPMENTS WHOSE TRAFFIC GENERATION IS LIKELY TO:

- (i) UNACCEPTABLY INCREASE DEMAND ALONG ROADS OR THROUGH JUNCTIONS WHICH ARE ALREADY USED TO CAPACITY, ESPECIALLY WHERE SUCH ROADS OR JUNCTIONS FORM PART OF THE STRATEGIC LONDON ROAD NETWORK; OR*
- (ii) PREJUDICE THE FREE FLOW OF TRAFFIC OR CONDITIONS OF GENERAL HIGHWAY OR PEDESTRIAN SAFETY; OR London Borough of Hillingdon UDP Saved Policies September 2007 (Published Version) 252*
- (iii) DIMINISH MATERIALLY THE ENVIRONMENTAL BENEFITS BROUGHT ABOUT BY NEW OR IMPROVED ROADS; OR (iv) INFILTRATE STREETS CLASSED AS LOCAL ROADS IN THE BOROUGH ROAD HIERARCHY UNLESS SATISFACTORY TRAFFIC CALMING MEASURES CAN BE INSTALLED.*

THE LONDON PLAN

3.2 The Mayor of London's 'London Plan' (March 2015) has also been examined. Policy 6.1 'Strategic Approach' (Transport) states that the Mayor will work with TfL, the government, boroughs and other partners to ensure the integration of transport and development by:

- *encouraging patterns and nodes of development that reduce the need to travel, especially by car*
- *supporting development that generates high levels of trips at locations with high public transport accessibility and/or capacity, either currently or via committed, funded improvements including, where appropriate, those provided by developers through the use of planning obligations*

3.3 In relation to the retrospective development, London Plan Policy 6.3 'Assessing Effects of Development on Transport Capacity', sets out that:

- *Development proposals should ensure that impacts on transport capacity and the transport network, at both a corridor and local level, are fully assessed. Development should not adversely affect safety on the transport network.*
- *Where existing transport capacity is insufficient to allow for the travel generated by proposed developments, and no firm plans exist for an increase in capacity to cater for this, boroughs should ensure that development proposals are phased until it is known these requirements can be met, otherwise they may be refused. The cumulative impacts of development on transport requirements must be taken into account.*
- *Transport assessments will be required in accordance with TfL's Transport Assessment Best Practice Guidance for major planning applications. Workplace and/or residential travel plans should be provided for planning applications exceeding the thresholds in, and produced in accordance with, the relevant TfL guidance. Construction logistics plans and delivery and servicing plans should be secured in line with the London Freight Plan and should be co-ordinated with travel plans.*

3.4 With regards parking, Policies 6.9 'Cycling' and 6.13 'Parking' of the London Plan (March 2015) have been assessed. These set out the parking requirements for developments to include car, disabled and cycle parking provision.

NATIONAL PLANNING FRAMEWORK

3.5 On a wider level, the National Planning Policy Framework was published in March 2012 and is the relevant national policy pertaining to the development.

3.6 The policy has two key objectives: to facilitate economic growth by taking a positive approach to planning development; and to support reductions in greenhouse gas emissions and congestion, and promote accessibility through planning for the location and mix development. Relevant chapters from the National Planning Policy Framework are set out below.

3.7 Paragraph 30 of the National Planning Policy Framework sets out that *"Encouragement should be given to solutions which support reductions in greenhouse gas emissions and reduce congestion. In preparing Local Plans, local planning authorities should therefore support a pattern of development which, where reasonable to do so, facilitates the use of sustainable modes of transport"*.

3.8 Additionally, Paragraph 32 states that planning policies and decisions should consider whether:

- *"The opportunities for sustainable transport modes have been taken up depending on the nature and location of the site, to reduce the need for major transport infrastructure.*
- *Safe and suitable access to the site can be achieved for all people.*
- *Improvements can be undertaken within the transport network that effectively limits the significant impacts of the development. Subject to those considerations, development should not be prevented or refused on transport grounds unless the residual impacts of development are severe."*

3.9 Paragraphs 34 to 36 go on to set out how sustainable transport should be accommodated and promoted as part of new developments;

"Plans and decisions should ensure developments that generate significant movement are located where the need to travel will be minimised and the use of

sustainable transport modes can be maximised. However this needs to take account of policies set out elsewhere in this Framework, particularly in rural areas.

4.0 TRIP GENERATION & TRAFFIC IMPACT

- 4.1 The site's former use was a commercial plant nursery. The plant nursery building has been replaced by a vehicle maintenance depot which is the subject of this retrospective planning application.
- 4.1 Given that the site has been in use as a vehicle maintenance depot for a year it has not been possible to carry out a survey of traffic movements in relation to the site's previous consented use of a plant nursery.
- 4.2 It is a reasonable expectation that a plant nursery building has the potential to generate a significant number of vehicle throughout a typical weekday and at weekends.
- 4.3 Vehicle activity within the site has clearly been commonplace under the site's former use. Appendix B shows some historic pictures of vehicle activity under the sites former use. There are currently no restrictions to the commercial plant nursery and the number of vehicle trips.
- 4.4 The current aviation logistics operation have provided us details of the numbers of vehicles that enter and exit the site throughout the day. These numbers have not changed since the maintenance depot has been built. Below is a table outlining the difference in vehicle numbers entering and exiting the site pre erection of the vehicle maintenance depot and post erection.

Table 2. A table summarising the vehicles movements on a normal weekday before and after the maintenance was constructed

	Pre Maintenance Depot	Post Maintenance Depot
Number of trips generated from coach movements	A morning "run-out" requires 33 vehicles. An afternoon "run-out" requires 22 vehicles- Total 270 daily vehicle movements	A morning "run-out" requires 33 vehicles. An afternoon "run-out" requires 22 vehicles- Total 270 daily vehicle movements
Number of trips generated from staff vehicle movements	There are 55 drivers throughout the day, three controllers rostered to work each day, 04:00 - 14:00, 10:00 - 20:00 and 14:30 - 23:30 and three full time office staff. Total 122 daily vehicle movements	There are 55 drivers throughout the day, three controllers rostered to work each day, 04:00 - 14:00, 10:00 - 20:00 and 14:30 - 23:30 and three full time office staff. Total 122 daily vehicle movements
Number of trips generated from maintenance staff vehicle movements	None as maintenance is conducted off-site.	There are two mechanics on site. Total four daily vehicle trips
Number of trips generated from the erection of the maintenance depot	In terms of routine maintenance, each of the 44 vehicles receives a PMI (safety inspection) every 7 weeks. That equates to 14 trips per vehicle over the year and Combining all 44 vehicles the total number vehicle trips for safety inspections is 616 trips. There are two mechanical services a year per vehicle, 1 minor and 1 major, tyres are changed, on average, biannually and an annual aircon service. That equates to four vehicle movements per year per vehicle. Combining all 44 vehicles the total number vehicle trips for servicing is 176 trips. In addition to the vehicle movements of the coach which is being serviced an additional two vehicle movements are generated as a crew van would need to be used to transport the coach driver depositing or collecting the vehicle from the service site. Therefore the total vehicle movements over the year attributed to maintenance is 1584 trips per year and 7 per normal weekday.	None
Total number of trips per day	399	396

- 4.5 The daily trips generated on a normal weekday from the site before the depot was erected was 399 vehicle trips. This figure is reached by adding the 270 movements of the coaches entering and exiting the site plus the 122 staff trips entering and exiting the site and the daily seven trips generated from the maintenance vehicles driving to and from the local garages. After the vehicle depot was erected the daily trips was reduced to 396 a reduction of three. This figure is generated from adding the same 270 movements of the coaches entering and exiting the site plus the 122 staff trips entering and exiting the site and the four daily trips generated from the vehicle maintenance staff.
- 4.6 There will also be a huge reduction in the numbers of miles travelled on the public highway. If we estimate there to be seven trips generated a day and the nearest depot is in Aylesbury which is 40 miles away that would be 280 miles a day just on the vehicle maintenance element of the business. Keeping the vehicle maintenance within the site will mean that there will not just a reduction of the number of vehicles travelling to and from site but also will reduce the impact on the environment as well.
- 4.7 There is also an argument that the reduction of vehicles leaving the site will reduce any potential increases in link trips which could be generated by vehicles leaving the site. This might include vehicles being transferred from different garages before being returned to CCH or that staff might use the vehicles to conduct other trips linked to the business. All of these linked trips will impact the flow of traffic on the public highway and so keeping vehicles on site for maintenance will eradicate all of these trips.
- 4.8 In summary the proposals are therefore expected to result in a benefit to highway capacity, safety, and neighbouring amenity adjoining the site.
- 4.9 The following chapter of this report looks at the current site access.

5.0 ACCESS ROAD SIGHTLINES-HARMONDSWORTH ROAD SPEED SURVEY

- 5.1 In order to assess vehicle to vehicle sightlines from the position of the combined access from the highway, PMA has undertaken a vehicle speed and sightline survey on Harmondsworth Road.
- 5.2 The speed survey was undertaken with due attention to guidance within the Design Manual for Roads and Bridges (DMRB) Volume 5 Section 1 TA 22/81 *Vehicle Speed Measurement on All Purpose Roads*.
- 5.3 DMRB TA 22/81 Paragraph 1.3 *"The layout of major/minor junctions and accesses as described in Departmental Advice Note TA 20/81 (Ref3) is also, in a number of ways, dependant on a correct assessment of the 85 percentile vehicle speed. The advice herein should therefore be used as a basis."*
- 5.4 PMA performed a spot speed survey at the approximate position of the vehicle entrance onto Harmondsworth Road using a MetroCount roadside automatic traffic counter (ATC) unit attached to two rubber pneumatic tube axle sensors. The tube sensors were placed laterally across the road at an exact spacing of 1000 mm so as to accurately record vehicle speed. The ATC unit was installed for the period 9th September to 16th September 2016. Figure 3 shows the location of the ATC unit along Harmondsworth Road.
- 5.5 In assessing the design speed of the road, PMA has analysed the ATC data using 'free flow' traffic speeds. TA 22/81 states that there is no generally accepted definition of this term, *"however it may be stated that in free flow conditions headways and lateral displacements are usually so large as to ensure that drivers are in no way prevented, by the close proximity of other vehicles, from driving at the speed of their own choice."*
- 5.6 MetroCount's 'Speed Analysis I – The 85 Percentile Speed' paper dated July 2006 defines 'free flowing' vehicle speeds as follows (the full document is presented in Appendix C):

“Free flowing defined – A vehicle is considered to be operating under free flowing conditions when the preceding vehicle has at least 4 seconds headway.”

- 5.7 For the purpose of this assessment therefore, only vehicle speeds recorded in the weekday inter-peak period with headway of at least four seconds have been used to derive a free flow design speed for this stretch of road.
- 5.8 Whereas for speed limits the 85 percentile ‘dry weather’ spot speed of cars is required, for improvement of alignments and major/minor junctions or accesses, and for new major/minor junctions or accesses on existing roads (such as in this case), the normal design methods are based on the 85 percentile ‘wet weather’ journey speed of vehicles.
- 5.9 The weather conditions in the weekday inter-peak period used in this assessment were fine and dry; therefore the wet weather adjustment of minus 2.5 mph has been applied, in accordance with TA 22/81.
- 5.10 To get from the dry weather spot speed of vehicles measured to the wet weather journey speed used in design, one of the following correction factors should be used as defined in TA 22/81:
- For all purpose dual carriageways ... deduct 8 kph (5 mph)
 - For all purpose single carriageways ... deduct 4 kph (2.5 mph)
- 5.11 The weekday inter-peak 85 percentile wet-weather adjusted design speed of Harmondsworth Road outside the position of the proposed new site access is presented in Table I; full ATC output data is presented in Appendix D and E.

Table 3. Weekday Inter-Peak 85 Percentile Wet Weather Speed

Survey Hours	Average Weekday 85%ile Off-Peak Speed (mph)	
	Northbound	Southbound
0000-0100	39.3	46.0
0100-0200	40.7	47.0
0200-0300	40.3	42.4
0300-0400	39.1	44.8
0400-0500	40.6	45.7
0500-0600	40.9	45.3
0600-0700	39.9	44.9
0700-0800	40.0	43.2
0800-0900	39.1	41.9
0900-1000	39.9	42.9
1000-1100	39.0	42.9
1100-1200	39.0	43.2
1200-1300	39.6	42.5
1300-1400	39.5	43.2
1400-1500	39.5	42.9
1500-1600	39.0	43.2
1600-1700	39.6	43.2
1700-1800	39.8	42.7
1800-1900	39.4	42.6
1900-2000	39.8	42.4
2000-2100	39.3	43.4
2100-2200	39.4	42.8
2200-2300	39.3	43.3
2300-2400	38.4	43.4
Average	39.6	43.6
Wet-weather adjusted	37.1	41.1

Source: PMA Survey – 9th to 16th September 2016

- 5.12 The results in Table 3 show that Harmondsworth Road has a recorded design speed of 37 mph for northbound travelling traffic and 41mph for southbound travelling traffic (rounded).
- 5.13 The following chapter assesses the suitability of visibility sightlines from the position of a proposed vehicle entrance to the application site, in accordance with the design speed of this immediate stretch of Harmondsworth Road.

6.0 ACCESS SIGHTLINE ASSESSMENT

- 6.1 In determining the visibility requirements for a given access or junction it is necessary to look at all aspects of the nature of the road and all users.
- 6.2 Based on the 85th percentile speed of traffic during the seven days approaching from the left of the site egress 41 mph and from the right of the egress was 37 mph. Speeds were taken in dry weather and wet weather corrections and were applied as set out in Chapter 3 of TA 22/81 (See Appendix F).
- 6.3 If the speed is above 37 mph then the Design Manual for Roads and Bridges (DMRB) should be used to measure stopping distances.
- 6.4 However, in rural areas parts of the highway are subject to the national speed limit but have traffic speeds significantly below 60mph. In these situations where speeds are lower or near to 40mph Manual for Streets parameters are recommended.
- 6.5 As the speeds were closer to the Manual for Streets limit of 37 mph and just over 40mph it was decided to use the Manual for Streets visibility splay levels.
- 6.8 Table 7.1 of MfS prescribes SSD's in accordance with measured traffic speeds, directly extracted as follows:

Table 7.1 Derived SSD's for streets (figures rounded).

Speed	Kilometers per hour	16	20	24	25	30	32	40	45	48	50	60
	Miles per hour	10	12	15	16	19	20	25	28	30	31	37
SSD (metres)		9	12	15	16	20	22	31	36	40	43	56
SSD adjusted for bonnet length. See 7.6.4		11	14	17	18	23	25	33	39	43	45	59

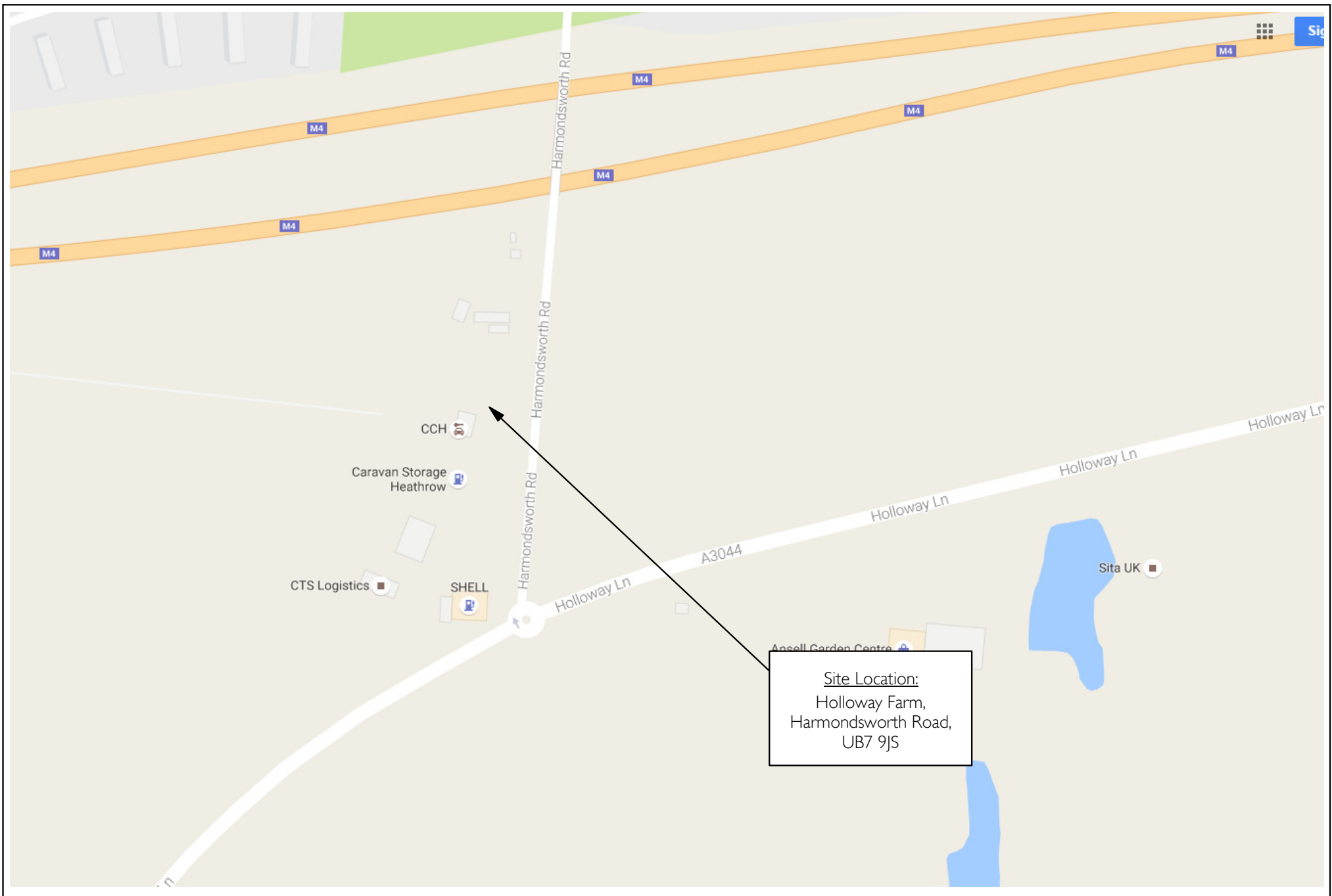
7.6.4 'The SSD figure relates to the position of the driver. However, the distance between the driver and the front of the vehicle is typically up to 2.4m, which is a significant proportion of shorter distances. It is therefore recommended that an allowance is made by adding 2.4m to the SSD'.

- 6.9 From the standards set out above and the measured speed of Harmondsworth Road, the SSD requirements from the vehicle entrance are 56 metres looking south and 64 metres looking north. The usual practice set-back distance from the highway verge is 2.4 metres for SSD measurement.
- 6.10 Figures 4 and 5 of this report presents the required SSD measurements plotted on an OS mapping base. As is shown in Figure 8, the access position can accommodate sufficient sightlines looking in both the leading and trailing directions within highway land or land within the applicant's ownership.
- 6.11 The proposed site access as shown satisfies the sightline requirements set out in MfS in accordance with the measured design speed of the road.
- 6.12 At present there are bushes and fences surrounding the perimeter of the application site's boundary adjoining Harmondsworth Road. Having observed on-site the maximum achievable sightlines are well over 50 metres in both directions.
- 6.13 However, PMA has based this assessment on the OS extract of the site and the surrounding street scene and it is concluded that the required sightlines can be achieved within highway land and land in ownership of the developer.
- 6.14 An accident assessment was conducted with TfL's database, there were no accidents attributed to the access in the last 5 years.

7.0 SUMMARY

- 7.1 The retrospective proposal will see the land to the north of the site turned into a vehicle maintenance depot built on the footprint of the original garden nursery.
- 7.2 This report has been commissioned to accompany a full retrospective planning application to The London Borough of Hillingdon.
- 7.3 The proposed development will generate a reduction of three total two-way vehicle trips on a typical weekday from 399 to 396 as derived from the current occupiers of the site. It has not been possible to estimate the number of trips generated by the site's previous use as a plant nursery.
- 7.4 In addition to the reduction in total two way trips there will be a significant decrease in the number of miles travelled by staff driving vehicles to Aylesbury garages for repairs, this will have a significant impact on the both on the environment and also additional link trips generated by vehicles leaving the site.
- 7.5 In summary the proposed net reduction in trips, access and servicing arrangements under the proposals are considered to be satisfactory and present an improvement on the previous situation.

FIGURES



Date: October-2016
 Scale: NTS
 Source: Google Maps
 Drawing No: PI571/TS/01



PI571: Holloway Farm, Harmondsworth Road, UB7 9JS

Figure 1
 Site Location



PAUL MEW ASSOCIATES
 TRAFFIC CONSULTANTS



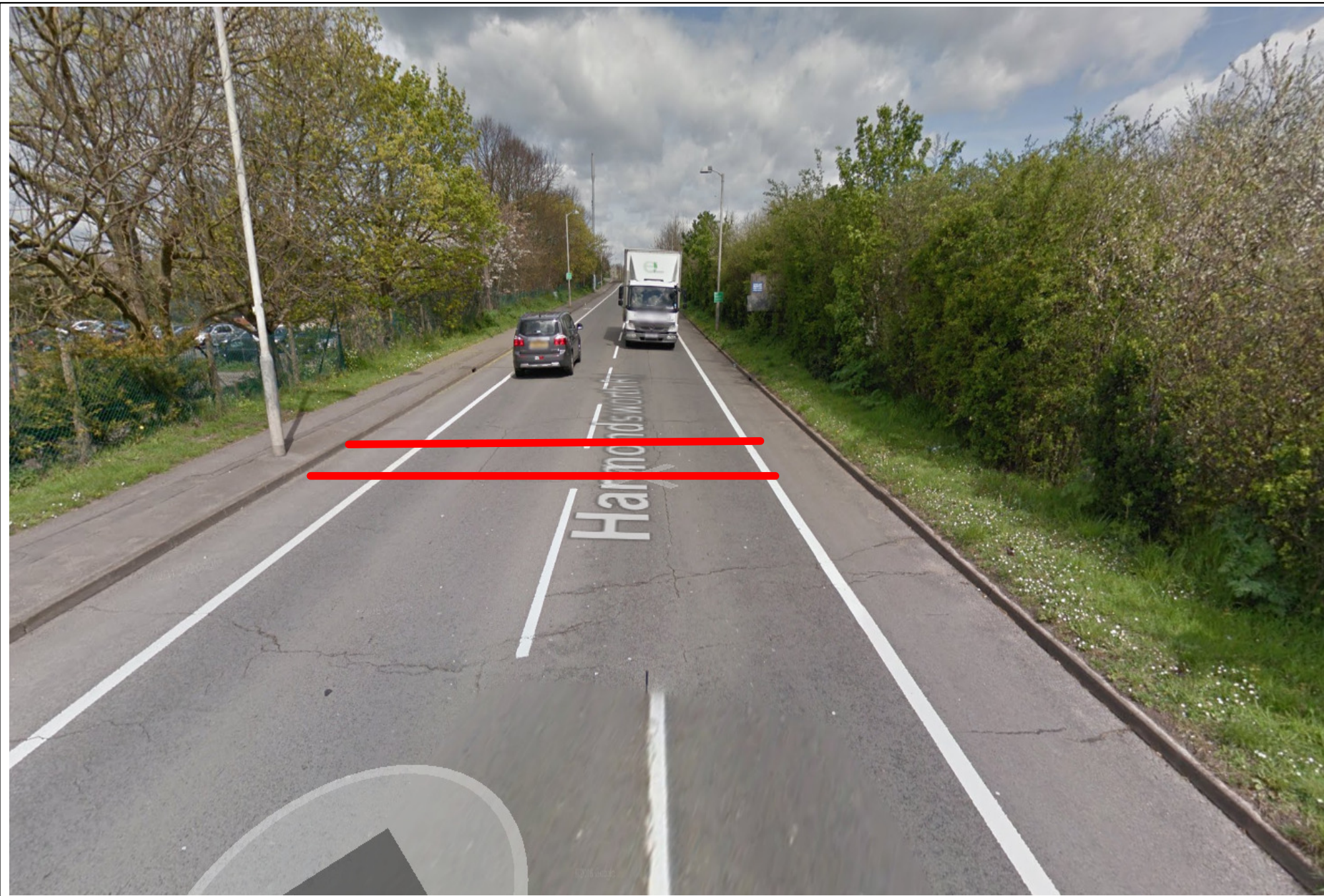
Date: October-2016
 Scale: NTS
 Source: Google Maps
 Drawing No: PI571/TS/02



PI571: Holloway Farm, Harmondsworth Road, UB7 9JS
 Figure 2
 Public Transport Map



PAUL MEW ASSOCIATES
 TRAFFIC CONSULTANTS



Date: October-2016
Scale: NTS
Source: Google Maps
Drawing No: PI571/TS/03



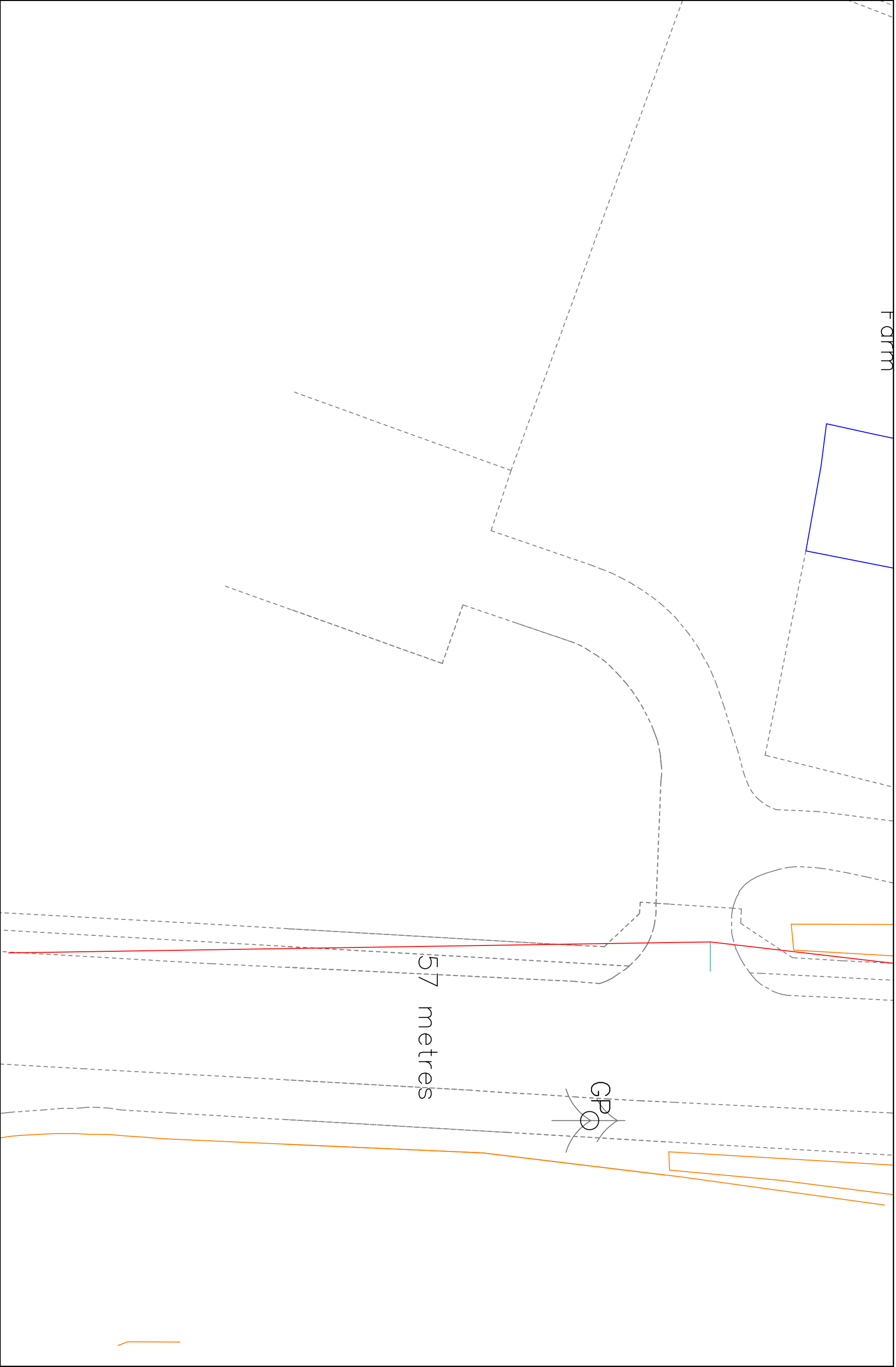
PI571: Holloway Farm, Harmondsworth Road, UB7 9JS

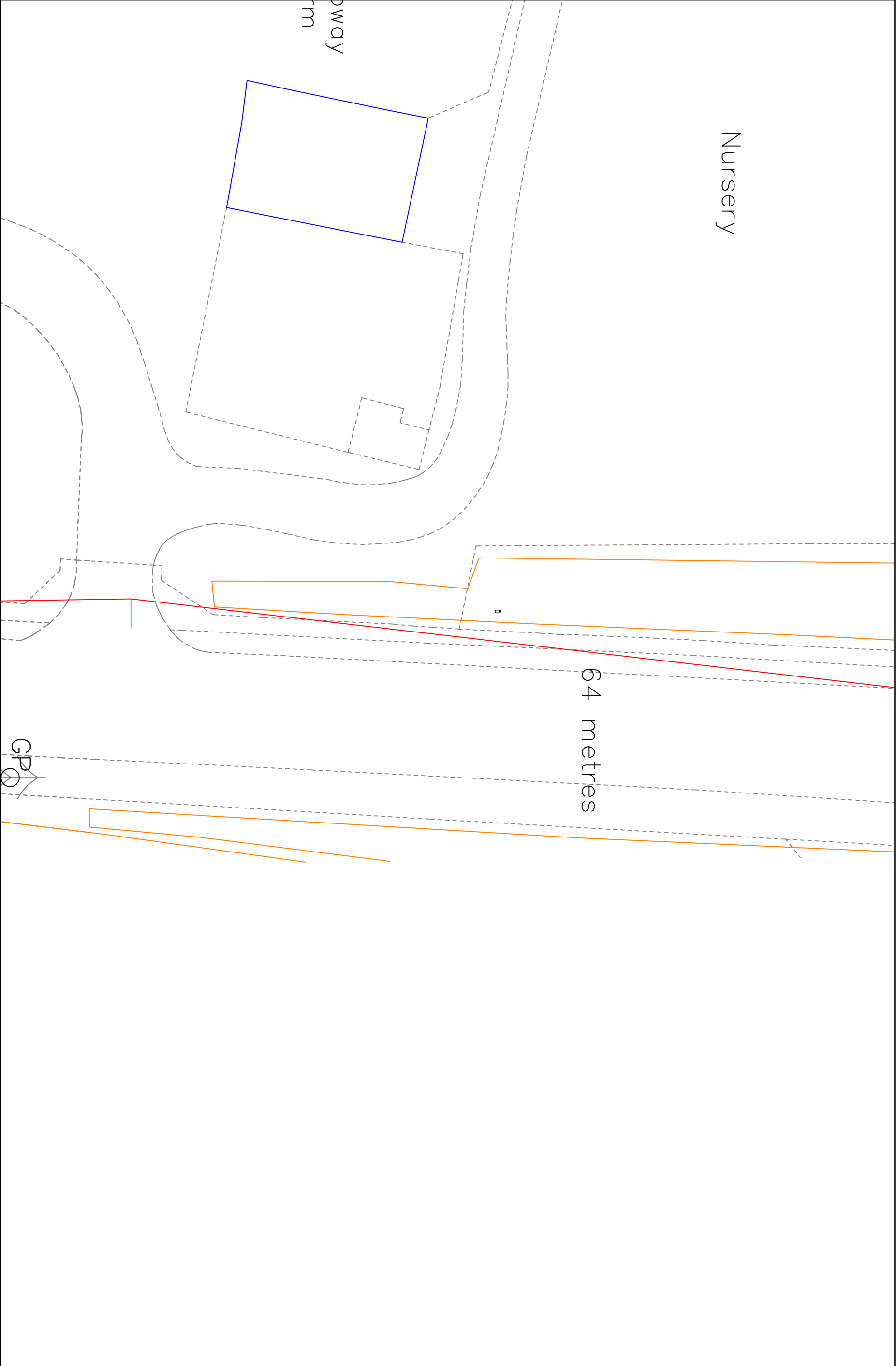
Figure 3

Location of ATC box on Harmondsworth Road

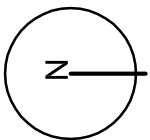


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Date: October-2016
Scale: 1:300@A3
Source: Ordnance Survey
Drawing No. P1571/TS/05



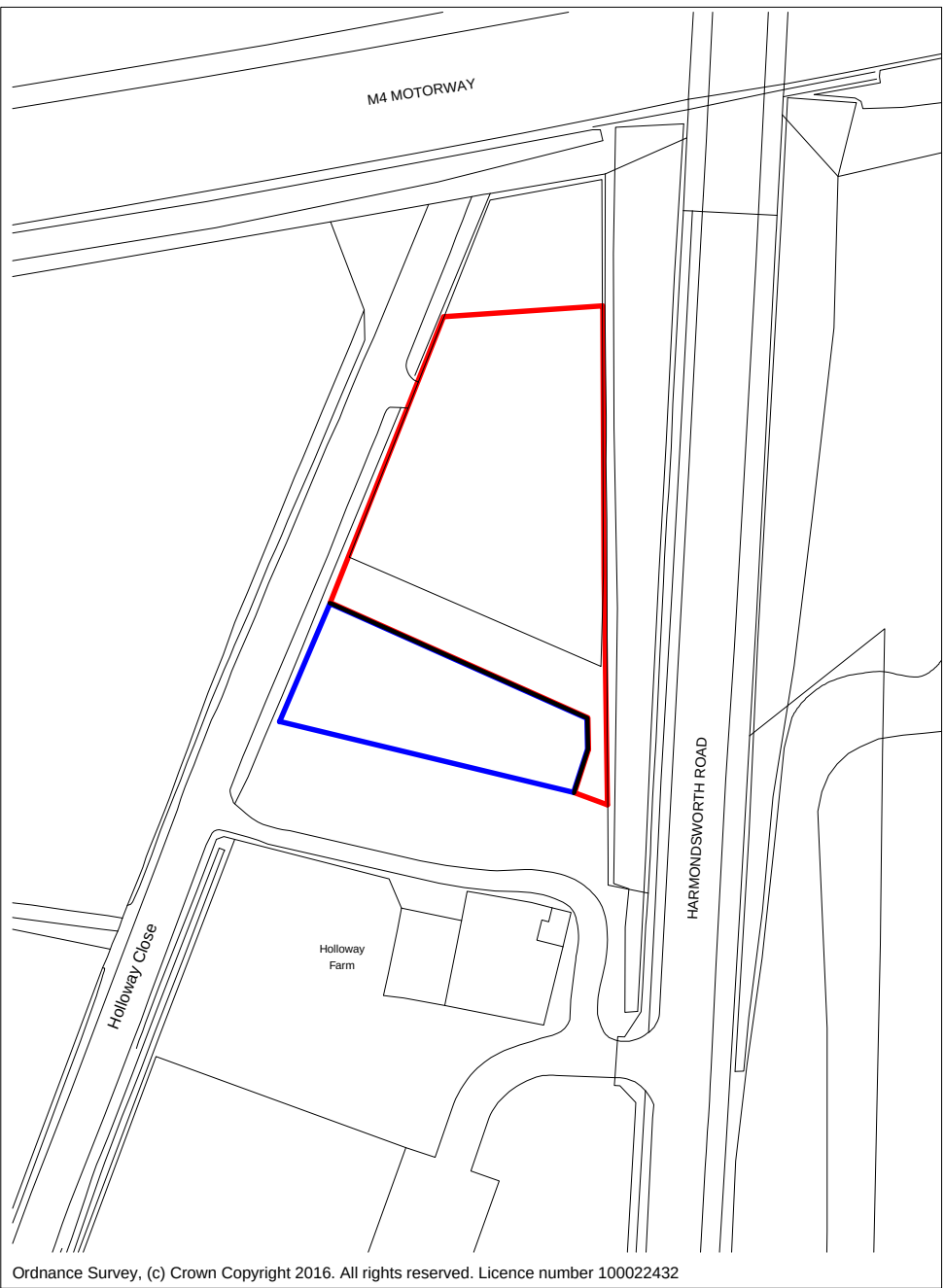
P1571: Holloway Farm, Harmondsworth Road, UB7 9JS
Figure 5: Visibility Sightline Plot Looking left on Exit

APPENDIX A

Site Boundary

M4 MOTORWAY

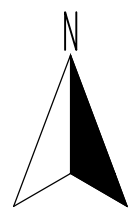
LOCATION PLAN 1:1250



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LEGEND

- GRAVEL
- CONCRETE
- GRASS
- 6M LIGHTING COLUMN
- BOLLARD LIGHT



Holloway Close

Holloway Farm

HARMONDSWORTH ROAD

STORAGE CONTAINER

STAFF ROOM

VEHICLE MAINTENANCE BUILDING

VEHICLE TOILET PUMP-OUT FACILITY

STORAGE SHED

notes
Any discrepancies in dimensions or detail to be reported to the architect immediately.
This drawing is to be read in conjunction with all relevant architectural, structural and services drawings.
This drawing remains the copyright of Savage & Pottinger Design and may not be copied or used without their prior consent

0 2.0 4.0 6.0 8.0 10.0 12.0
BAR SCALE IN METRES 1:200

revisions

client
COH Ltd.

project
HOLLOWAY FARM, HARMONDSWORTH ROAD, WEST DRAYTON, UB7 9JS

title
EXISTING SITE PLAN - MAIN SITE

scale 1:200 @A1 date SEP 16 drg. no. 1618/TP/01

WEA

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APPENDIX B

Historic Photos showing the vehicle movements of the commercial plant nursery



APPENDIX C
MetroCount's 'Speed Analysis I – The 85 Percentile Speed' paper

Speed Analysis 1 – The 85th Percentile Speed

Special information for the MetroCount Vehicle Classifier System and Traffic Executive software v3.1

The “85th percentile speed” is a major parameter used by traffic engineers and transport planners.

85th Percentile Speed Defined

Many standards (eg AS1742.4) and traffic engineering text books define the 85th percentile speed as:

“The speed at or below which 85% of all vehicles are observed to travel under free flowing conditions past a nominated point.”

Note the term “free flowing” in the definition.

“Free Flowing” Defined

A vehicle is considered to be operating under free flowing conditions when the preceding vehicle has at least 4 seconds headway.

QUESTION: Do you always use a 4 second headway filter for your 85th percentiles?

- ☐ Yes, I always use a 4 second headway filter with my 85th percentiles
- ☐ No, I don't use a headway filter

If you answered “NO”, you don't use a headway filter, then your 85th percentiles are probably **WRONG!** (Or, at the very least, not complying with most standards).

QUESTION: Why should you apply a 4 second headway filter to your 85th percentiles?

ANSWER: The 85th percentile speed is the speed that reasonable people (i.e. you and I) tend to adopt according to the road environment. The 85th percentile is called the “operating speed”, and it is not related to the roads posted speed limit.

All roads encourage us to travel at a certain speed, and every road is different.

Congestion Effects

If a road experiences traffic congestion, then there will be certain periods when motorists are impeded by vehicles in front, and are therefore unable to travel at their desired operating speed. If these impeded vehicles are included in your 85th percentiles, then your speed statistics will not accurately reflect the road's true operating speed.

Putting it another way, if you're not using a headway filter, then your 85th percentiles will be lowered for all vehicles, by including those stuck in congestion unable to go any faster.

Hence the need for the 4 second filter. It effectively removes the congestion, allowing you, the traffic analyst, to get a true operating speed. By applying the appropriate headway filter, you'll only be analysing motorists travelling at their chosen speed, unimpeded by vehicles in front.

Using a headway filter of at least 4 seconds gives you a much clearer picture of the true road environment, and much greater insight into safety and amenity issues. And, that's why it's mandated in standards.

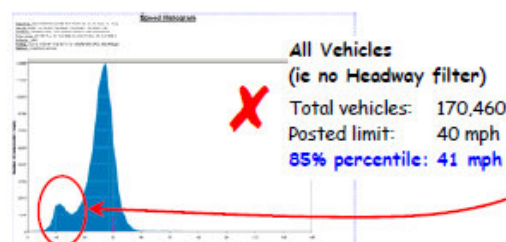
85th percentile speed

Free-flowing vehicles

Congestion effects

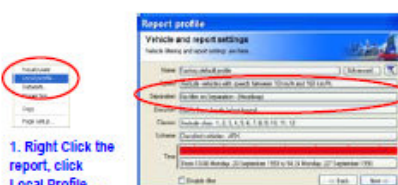
Let's look at the affect of applying a 4 second headway filter to a typical dataset:

Speed Histogram of an urban location...

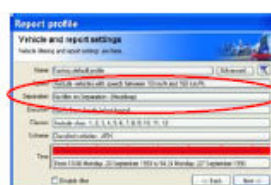


The speed limit at this location is 40mph, and the 85th percentile is 41mph, BUT...
Note the significant number of vehicles travelling around 15mph, indicating congestion!

How to remove congestion from your 85th percentiles using MCRReport...



1. Right Click the report, click Local Profile...

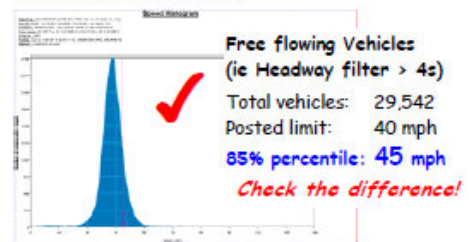


2. Click the Separation button...
NB: Separation needs to be defined as headway in the Advanced profile – this is the default setting.



3. Change separation to: More than 4 seconds...

Same data, but with a headway filter of more than 4 seconds...



4. Generate standard free flowing 85th percentiles!



Remember: With the MetroCount 5600, you capture the speed of EVERY vehicle, so your 85th percentiles are always calculated for EVERY vehicle. You can use other headway values, too!

MetroCount

Australia
P.O. Box 1182
Fremantle WA 6950
Ph: 08 9430 6164
Fax: 08 9430 6187
Email: sales@metrocount.com

United Kingdom
Unit 29, Rosemont Road
Wembley, Middlesex
London HA0 4PE
Ph: 020 8782 8999
Fax: 020 8782 8737
Email: uksales@metrocount.com

United States
18200 Georgia Ave, Suite J
Olney MD 20832
Ph: 800 576 5692
Fax: 866 440 8407
Email: usasales@metrocount.com

www.metrocount.com

APPENDIX D

Harmondsworth Road ATC Northbound Data

MetroCount Traffic Executive
Default

CustomList-24 -- English (ENG)

Datasets:

Site: [P1571] !P1571 Harmondsworth Road
Attribute: Holloway Farm
Direction: 1 - North bound, A trigger first. Lane: 0
Survey Duration: 14:54 08 September 2016 => 10:14 19 September 2016,
Zone:
File: P1571 0 2016-09-27 1132transformed.EC0 (Plus)
Identifier: K4442680 MC56-6 [MC55] (c)Microcom 02/03/01
Algorithm: Factory default axle (v4.06)
Data type: Axle sensors - Paired (Class/Speed/Count)

Profile:

Filter time: 14:55 08 September 2016 => 10:14 19 September 2016 (10.8052)
Included classes: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11
Speed range: 6 - 99 mph.
Direction: North (bound), P = North
Separation: Headway > 4 sec, Span 0 - 100 metre
Name: Default Profile
Scheme: Vehicle classification (DfT-UK)
Units: Part metric (metre, mi, m/s, mph, kg, tonne)

Column Legend:

0 [Time] 24-hour time (0000 - 2359)
1 [Total] Number in time step
2 [Cls] Class totals
3 [Mean] Average speed
4 [Vpp] Percentile speed

♀

* 08 September 2016

Time	Total	Cls 1	Cls 2	Cls 3	Cls 4	Cls 5	Cls 6	Cls 7	Cls 8	Cls 9	Cls 10	Cls 11	Mean	Vpp 85
1400	0	0	0	0	0	0	0	0	0	0	0	0	-	-
1500	0	0	0	0	0	0	0	0	0	0	0	0	-	-
1600	0	0	0	0	0	0	0	0	0	0	0	0	-	-
1700	0	0	0	0	0	0	0	0	0	0	0	0	-	-
1800	0	0	0	0	0	0	0	0	0	0	0	0	-	-
1900	0	0	0	0	0	0	0	0	0	0	0	0	-	-
2000	0	0	0	0	0	0	0	0	0	0	0	0	-	-
2100	0	0	0	0	0	0	0	0	0	0	0	0	-	-
2200	0	0	0	0	0	0	0	0	0	0	0	0	-	-
2300	0	0	0	0	0	0	0	0	0	0	0	0	-	-
07-19	0	0	0	0	0	0	0	0	0	0	0	0	-	-
06-22	0	0	0	0	0	0	0	0	0	0	0	0	-	-
06-00	0	0	0	0	0	0	0	0	0	0	0	0	-	-
00-00	0	0	0	0	0	0	0	0	0	0	0	0	-	-

* 09 September 2016

Time	Total	Cls 1	Cls 2	Cls 3	Cls 4	Cls 5	Cls 6	Cls 7	Cls 8	Cls 9	Cls 10	Cls 11	Mean	Vpp 85
0000	0	0	0	0	0	0	0	0	0	0	0	0	-	-
0100	0	0	0	0	0	0	0	0	0	0	0	0	-	-
0200	0	0	0	0	0	0	0	0	0	0	0	0	-	-
0300	0	0	0	0	0	0	0	0	0	0	0	0	-	-
0400	0	0	0	0	0	0	0	0	0	0	0	0	-	-
0500	0	0	0	0	0	0	0	0	0	0	0	0	-	-
0600	0	0	0	0	0	0	0	0	0	0	0	0	-	-
0700	0	0	0	0	0	0	0	0	0	0	0	0	-	-
0800	0	0	0	0	0	0	0	0	0	0	0	0	-	-
0900	0	0	0	0	0	0	0	0	0	0	0	0	-	-
1000	0	0	0	0	0	0	0	0	0	0	0	0	-	-
1100	0	0	0	0	0	0	0	0	0	0	0	0	-	-
1200	0	0	0	0	0	0	0	0	0	0	0	0	-	-
1300	0	0	0	0	0	0	0	0	0	0	0	0	-	-
1400	0	0	0	0	0	0	0	0	0	0	0	0	-	-
1500	0	0	0	0	0	0	0	0	0	0	0	0	-	-

Northbound ATC													
1600	0	0	0	0	0	0	0	0	0	0	0	0	-
1700	251	2	1	78	154	16	0	0	0	0	0	0	34.0
1800	270	1	6	92	161	10	0	0	0	0	0	0	35.1
1900	221	0	8	95	103	15	0	0	0	0	0	0	34.7
2000	167	0	4	59	92	11	0	0	1	0	0	0	35.3
2100	149	0	7	60	76	6	0	0	0	0	0	0	33.7
2200	140	0	5	47	81	7	0	0	0	0	0	0	34.2
2300	115	0	2	36	71	6	0	0	0	0	0	0	34.3
07-19	521	3	7	170	315	26	0	0	0	0	0	0	34.6
06-22	1058	3	26	384	586	58	0	0	1	0	0	0	34.6
06-00	1313	3	33	467	738	71	0	0	1	0	0	0	34.5
00-00	1313	3	33	467	738	71	0	0	1	0	0	0	34.5

* 10 September 2016

Time	Total	Cls 1	Cls 2	Cls 3	Cls 4	Cls 5	Cls 6	Cls 7	Cls 8	Cls 9	Cls 10	Cls 11	Mean	Vpp 85
0000	73	1	0	28	38	6	0	0	0	0	0	0	32.9	36.9
0100	42	0	0	13	29	0	0	0	0	0	0	0	34.1	40.7
0200	37	0	1	7	29	0	0	0	0	0	0	0	34.3	40.5
0300	26	0	1	11	13	1	0	0	0	0	0	0	33.4	37.4
0400	20	0	1	0	15	4	0	0	0	0	0	0	33.0	36.7
0500	32	0	0	5	21	6	0	0	0	0	0	0	36.6	43.4
0600	59	0	1	16	31	11	0	0	0	0	0	0	34.9	38.5
0700	95	0	3	24	54	13	1	0	0	0	0	0	34.1	40.5
0800	124	0	2	35	73	13	0	0	0	0	1	0	34.1	38.9
0900	156	1	0	48	93	13	0	0	1	0	0	0	34.4	39.8
1000	160	0	1	50	98	11	0	0	0	0	0	0	33.5	38.3
1100	191	0	1	56	120	14	0	0	0	0	0	0	35.3	39.8
1200	204	1	3	66	121	13	0	0	0	0	0	0	34.8	40.3
1300	219	0	2	72	134	10	0	0	0	0	0	1	33.7	38.7
1400	224	0	2	78	131	11	0	0	2	0	0	0	34.1	39.1
1500	207	1	1	67	124	14	0	0	0	0	0	0	33.8	39.1
1600	202	0	0	77	115	10	0	0	0	0	0	0	34.8	40.0
1700	222	0	3	86	124	8	0	0	1	0	0	0	35.2	39.8
1800	211	0	4	77	118	12	0	0	0	0	0	0	34.3	38.5
1900	182	1	1	64	106	10	0	0	0	0	0	0	34.7	40.0
2000	136	0	2	49	78	7	0	0	0	0	0	0	34.5	39.4
2100	132	0	3	44	78	6	0	0	1	0	0	0	34.0	38.9
2200	118	0	2	33	72	10	0	0	0	0	1	0	34.7	40.0
2300	75	0	1	24	43	6	0	0	1	0	0	0	34.5	39.6
07-19	2215	3	22	736	1305	142	1	0	4	0	1	1	34.4	39.4
06-22	2724	4	29	909	1598	176	1	0	5	0	1	1	34.4	39.4
06-00	2917	4	32	966	1713	192	1	0	6	0	2	1	34.4	39.6
00-00	3147	5	35	1030	1858	209	1	0	6	0	2	1	34.4	39.6

* 11 September 2016

Time	Total	Cls 1	Cls 2	Cls 3	Cls 4	Cls 5	Cls 6	Cls 7	Cls 8	Cls 9	Cls 10	Cls 11	Mean	Vpp 85
0000	69	0	0	27	38	4	0	0	0	0	0	0	33.5	37.6
0100	47	0	0	13	32	1	0	0	0	0	0	1	34.0	38.7
0200	33	1	1	10	21	0	0	0	0	0	0	0	34.5	41.8
0300	22	0	0	8	13	1	0	0	0	0	0	0	33.6	37.8
0400	24	0	0	4	17	3	0	0	0	0	0	0	38.2	46.3
0500	28	0	0	6	17	5	0	0	0	0	0	0	33.6	38.7
0600	61	0	0	25	31	5	0	0	0	0	0	0	35.0	40.7
0700	58	0	2	10	41	5	0	0	0	0	0	0	35.1	40.5
0800	73	0	1	28	34	10	0	0	0	0	0	0	34.7	39.6
0900	119	0	0	35	73	9	0	1	1	0	0	0	36.5	42.1
1000	155	2	1	58	85	9	0	0	0	0	0	0	35.0	39.4
1100	166	1	2	49	106	8	0	0	0	0	0	0	35.4	39.4
1200	189	1	1	69	110	5	0	1	2	0	0	0	35.1	39.1
1300	229	0	4	82	135	8	0	0	0	0	0	0	35.7	40.3
1400	273	0	3	119	143	8	0	0	0	0	0	0	35.7	40.9
1500	254	0	3	85	155	11	0	0	0	0	0	0	35.8	40.3
1600	243	2	3	98	131	8	0	0	1	0	0	0	35.7	40.5
1700	234	0	4	90	132	7	0	0	1	0	0	0	36.1	40.9
1800	233	0	1	85	142	4	0	0	1	0	0	0	35.7	39.6
1900	237	1	7	71	145	11	0	0	2	0	0	0	36.5	42.5
2000	210	1	2	68	132	7	0	0	0	0	0	0	34.0	39.6
2100	173	0	4	51	110	8	0	0	0	0	0	0	34.6	39.8
2200	122	0	1	39	72	10	0	0	0	0	0	0	34.2	38.0
2300	76	0	0	17	51	8	0	0	0	0	0	0	34.2	39.6
07-19	2226	6	25	808	1287	92	0	2	6	0	0	0	35.6	40.3

Northbound ATC														
06-22	2907	8	38	1023	1705	123	0	2	8	0	0	0	35.5	40.3
06-00	3105	8	39	1079	1828	141	0	2	8	0	0	0	35.4	40.3
00-00	3328	9	40	1147	1966	155	0	2	8	0	0	1	35.4	40.3

* 12 September 2016

Time	Total	Cls	Cls	Cls	Cls	Cls	Cls	Cls	Cls	Cls	Cls	Cls	Mean	Vpp
		1	2	3	4	5	6	7	8	9	10	11		85
0000	56	0	0	16	35	5	0	0	0	0	0	0	34.5	40.0
0100	24	0	1	6	17	0	0	0	0	0	0	0	36.5	41.8
0200	13	0	0	4	7	2	0	0	0	0	0	0	34.3	39.8
0300	21	0	0	6	13	2	0	0	0	0	0	0	32.5	39.4
0400	23	0	2	6	13	2	0	0	0	0	0	0	36.2	45.0
0500	46	0	0	14	25	5	1	0	1	0	0	0	35.3	40.7
0600	110	0	1	34	61	14	0	0	0	0	0	0	35.2	40.0
0700	230	0	2	68	135	23	1	0	0	0	0	1	35.5	40.3
0800	301	0	1	88	186	24	0	0	0	0	1	1	34.6	38.7
0900	239	1	0	63	153	20	0	0	0	0	1	1	35.4	40.0
1000	159	0	1	39	96	22	0	0	1	0	0	0	34.2	39.1
1100	192	0	0	52	115	20	2	0	2	0	1	0	34.0	38.7
1200	182	0	4	47	111	18	0	0	1	0	0	1	34.5	39.4
1300	194	0	1	59	114	19	0	0	0	0	1	0	35.2	39.1
1400	203	0	6	64	109	24	0	0	0	0	0	0	33.6	38.3
1500	228	0	2	73	129	22	0	0	0	0	0	2	34.2	38.7
1600	281	1	3	96	164	15	0	0	1	0	0	1	35.1	39.6
1700	299	2	3	113	161	18	0	0	2	0	0	0	35.3	40.0
1800	254	1	6	89	145	13	0	0	0	0	0	0	35.1	40.0
1900	210	0	8	71	118	12	0	0	1	0	0	0	34.4	38.7
2000	167	0	4	44	110	9	0	0	0	0	0	0	34.4	39.1
2100	127	1	3	43	73	7	0	0	0	0	0	0	33.2	38.0
2200	118	0	5	43	62	8	0	0	0	0	0	0	34.5	39.4
2300	92	0	2	30	52	8	0	0	0	0	0	0	34.7	39.6
07-19	2762	5	29	851	1618	238	3	0	7	0	4	7	34.8	39.4
06-22	3376	6	45	1043	1980	280	3	0	8	0	4	7	34.7	39.4
06-00	3586	6	52	1116	2094	296	3	0	8	0	4	7	34.7	39.4
00-00	3769	6	55	1168	2204	312	4	0	9	0	4	7	34.7	39.4

* 13 September 2016

Time	Total	Cls	Cls	Cls	Cls	Cls	Cls	Cls	Cls	Cls	Cls	Cls	Mean	Vpp
		1	2	3	4	5	6	7	8	9	10	11		85
0000	53	0	3	17	29	4	0	0	0	0	0	0	36.1	40.5
0100	30	0	0	11	19	0	0	0	0	0	0	0	36.2	41.6
0200	17	0	0	5	12	0	0	0	0	0	0	0	33.4	37.6
0300	14	0	1	2	10	1	0	0	0	0	0	0	33.6	39.6
0400	17	1	0	3	11	2	0	0	0	0	0	0	31.9	36.7
0500	51	0	0	18	27	5	1	0	0	0	0	0	35.2	41.4
0600	122	0	4	36	69	12	0	0	1	0	0	0	34.8	39.8
0700	211	2	1	74	108	22	1	0	1	0	1	1	34.8	38.9
0800	244	0	0	78	141	23	1	0	1	0	0	0	34.7	39.4
0900	180	0	2	59	97	20	1	0	1	0	0	0	34.0	37.8
1000	154	0	1	44	86	21	0	0	1	0	0	1	34.6	40.0
1100	171	0	3	53	91	24	0	0	0	0	0	0	34.1	39.1
1200	194	1	2	39	135	14	1	0	0	0	1	1	35.3	40.7
1300	190	0	8	55	105	19	1	1	0	0	1	0	34.6	39.4
1400	201	0	4	57	118	20	0	0	0	0	1	1	34.9	40.0
1500	246	0	3	79	142	17	0	0	3	0	1	1	34.6	38.3
1600	281	1	4	98	157	18	1	0	1	0	0	1	35.6	39.6
1700	311	1	6	109	176	19	0	0	0	0	0	0	35.1	40.0
1800	267	1	7	88	157	12	0	1	0	0	0	1	34.5	40.0
1900	195	0	5	70	104	15	0	0	1	0	0	0	33.9	38.3
2000	148	0	4	50	84	9	0	0	1	0	0	0	34.3	41.4
2100	120	0	3	44	67	6	0	0	0	0	0	0	34.8	40.3
2200	110	2	3	48	52	5	0	0	0	0	0	0	33.4	39.4
2300	88	0	2	31	47	7	0	0	1	0	0	0	32.7	37.1
07-19	2650	6	41	833	1513	229	6	2	8	0	5	7	34.8	39.6
06-22	3235	6	57	1033	1837	271	6	2	11	0	5	7	34.7	39.6
06-00	3433	8	62	1112	1936	283	6	2	12	0	5	7	34.6	39.6
00-00	3615	9	66	1168	2044	295	7	2	12	0	5	7	34.6	39.6

* 14 September 2016

Time	Total	Cls	Cls	Cls	Cls	Cls	Cls	Cls	Cls	Cls	Cls	Cls	Mean	Vpp
		1	2	3	4	5	6	7	8	9	10	11		85
0000	48	0	0	18	26	4	0	0	0	0	0	0	36.4	42.9
0100	24	0	0	6	17	0	0	0	0	0	0	1	35.7	38.9

Northbound ATC													
0200	15	0	0	4	10	1	0	0	0	0	0	0	38.1 44.3
0300	18	0	2	5	11	0	0	0	0	0	0	0	35.4 39.8
0400	24	0	1	4	16	3	0	0	0	0	0	0	35.2 38.5
0500	61	0	2	18	31	9	1	0	0	0	0	0	34.1 40.0
0600	112	0	6	32	59	13	2	0	0	0	0	0	35.1 39.4
0700	217	0	1	60	131	23	0	0	0	0	1	1	35.2 39.8
0800	259	0	3	78	155	21	0	0	1	0	0	1	34.5 39.1
0900	178	2	1	50	105	18	1	0	1	0	0	0	35.0 39.6
1000	154	0	2	51	78	18	1	0	2	0	1	1	34.3 38.3
1100	188	0	6	50	105	22	1	0	3	0	0	1	34.0 39.1
1200	183	0	3	68	92	18	1	0	1	0	0	0	34.4 39.1
1300	195	0	2	65	108	17	0	1	2	0	0	0	35.1 40.3
1400	193	1	4	67	100	19	0	0	1	0	0	1	34.4 39.8
1500	262	0	5	93	141	21	0	0	1	0	0	1	34.5 38.7
1600	291	0	4	87	171	25	0	0	4	0	0	0	34.5 38.9
1700	319	0	1	120	179	17	0	0	0	0	0	2	34.3 38.9
1800	288	0	6	111	153	17	0	0	1	0	0	0	34.7 39.1
1900	236	3	5	71	141	16	0	0	0	0	0	0	34.8 40.0
2000	160	0	4	57	86	11	0	0	1	0	1	0	33.6 38.9
2100	138	1	4	49	73	11	0	0	0	0	0	0	34.2 39.4
2200	115	2	3	35	67	8	0	0	0	0	0	0	33.4 40.0
2300	79	0	2	24	44	9	0	0	0	0	0	0	32.6 36.7
07-19	2727	3	38	900	1518	236	4	1	17	0	2	8	34.6 39.4
06-22	3373	7	57	1109	1877	287	6	1	18	0	3	8	34.6 39.4
06-00	3567	9	62	1168	1988	304	6	1	18	0	3	8	34.5 39.4
00-00	3757	9	67	1223	2099	321	7	1	18	0	3	9	34.5 39.4

* 15 September 2016

Time	Total	Cls	Cls	Cls	Cls	Cls	Cls	Cls	Cls	Cls	Cls	Cls	Mean	Vpp
		1	2	3	4	5	6	7	8	9	10	11		85
0000	47	0	1	13	28	5	0	0	0	0	0	0	32.7	38.0
0100	23	0	0	6	17	0	0	0	0	0	0	0	37.4	42.5
0200	18	0	0	4	13	1	0	0	0	0	0	0	33.8	37.8
0300	13	0	0	2	11	0	0	0	0	0	0	0	35.8	40.5
0400	25	0	2	3	17	3	0	0	0	0	0	0	35.2	40.5
0500	48	0	2	14	25	6	1	0	0	0	0	0	35.6	41.2
0600	124	0	3	36	68	17	0	0	0	0	0	0	36.0	41.2
0700	208	0	5	64	119	16	0	0	1	0	2	1	35.3	39.8
0800	261	0	0	74	164	23	0	0	0	0	0	0	34.7	38.9
0900	209	0	0	53	125	25	3	1	0	0	2	0	35.2	40.0
1000	164	0	3	53	89	15	1	0	2	0	1	0	34.3	39.1
1100	190	1	1	58	101	24	3	0	0	0	0	2	33.2	38.0
1200	205	0	2	66	118	17	0	0	1	0	0	1	34.4	39.1
1300	188	0	2	59	110	14	1	0	0	0	2	0	35.1	39.4
1400	211	0	5	62	119	24	1	0	0	0	0	0	33.9	38.7
1500	273	1	3	84	157	25	1	0	0	0	1	1	34.4	39.1
1600	282	0	3	99	161	16	0	0	1	0	1	1	34.5	38.9
1700	312	0	0	111	174	23	0	0	3	0	0	1	34.5	39.1
1800	304	0	4	108	165	26	0	0	0	0	0	1	34.8	38.9
1900	272	0	3	82	168	19	0	0	0	0	0	0	34.3	39.1
2000	198	0	1	65	116	16	0	0	0	0	0	0	33.5	37.1
2100	155	0	3	59	85	8	0	0	0	0	0	0	35.5	39.8
2200	108	0	3	35	68	2	0	0	0	0	0	0	33.7	38.7
2300	87	0	1	26	50	10	0	0	0	0	0	0	33.2	37.8
07-19	2807	2	28	891	1602	248	10	1	8	0	9	8	34.5	39.1
06-22	3556	2	38	1133	2039	308	10	1	8	0	9	8	34.6	39.1
06-00	3751	2	42	1194	2157	320	10	1	8	0	9	8	34.5	39.1
00-00	3925	2	47	1236	2268	335	11	1	8	0	9	8	34.5	39.4

* 16 September 2016

Time	Total	Cls	Cls	Cls	Cls	Cls	Cls	Cls	Cls	Cls	Cls	Cls	Mean	Vpp
		1	2	3	4	5	6	7	8	9	10	11		85
0000	52	0	1	20	25	6	0	0	0	0	0	0	33.2	37.8
0100	28	0	1	6	21	0	0	0	0	0	0	0	33.3	40.9
0200	25	0	0	4	21	0	0	0	0	0	0	0	37.1	42.3
0300	20	0	1	3	15	1	0	0	0	0	0	0	34.0	39.1
0400	23	0	0	5	17	1	0	0	0	0	0	0	34.8	40.9
0500	53	1	1	20	24	6	1	0	0	0	0	0	32.7	38.7
0600	104	0	0	33	64	7	0	0	0	0	0	0	33.5	38.0
0700	0	0	0	0	0	0	0	0	0	0	0	0	-	-
0800	0	0	0	0	0	0	0	0	0	0	0	0	-	-
0900	0	0	0	0	0	0	0	0	0	0	0	0	-	-
1000	0	0	0	0	0	0	0	0	0	0	0	0	-	-

Northbound ATC															
1100	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
1200	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
1300	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
1400	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
1500	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
1600	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
1700	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
1800	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
1900	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
2000	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
2100	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
2200	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
2300	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
07-19	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
06-22	104	0	0	33	64	7	0	0	0	0	0	0	0	33.5	38.0
06-00	104	0	0	33	64	7	0	0	0	0	0	0	0	33.5	38.0
00-00	305	1	4	91	187	21	1	0	0	0	0	0	0	33.7	39.1

* 17 September 2016

Time	Total	Cls 1	Cls 2	Cls 3	Cls 4	Cls 5	Cls 6	Cls 7	Cls 8	Cls 9	Cls 10	Cls 11	Mean	Vpp 85
0000	0	0	0	0	0	0	0	0	0	0	0	0	-	-
0100	0	0	0	0	0	0	0	0	0	0	0	0	-	-
0200	0	0	0	0	0	0	0	0	0	0	0	0	-	-
0300	0	0	0	0	0	0	0	0	0	0	0	0	-	-
0400	0	0	0	0	0	0	0	0	0	0	0	0	-	-
0500	0	0	0	0	0	0	0	0	0	0	0	0	-	-
0600	0	0	0	0	0	0	0	0	0	0	0	0	-	-
0700	0	0	0	0	0	0	0	0	0	0	0	0	-	-
0800	0	0	0	0	0	0	0	0	0	0	0	0	-	-
0900	0	0	0	0	0	0	0	0	0	0	0	0	-	-
1000	0	0	0	0	0	0	0	0	0	0	0	0	-	-
1100	0	0	0	0	0	0	0	0	0	0	0	0	-	-
1200	0	0	0	0	0	0	0	0	0	0	0	0	-	-
1300	0	0	0	0	0	0	0	0	0	0	0	0	-	-
1400	0	0	0	0	0	0	0	0	0	0	0	0	-	-
1500	0	0	0	0	0	0	0	0	0	0	0	0	-	-
1600	0	0	0	0	0	0	0	0	0	0	0	0	-	-
1700	0	0	0	0	0	0	0	0	0	0	0	0	-	-
1800	0	0	0	0	0	0	0	0	0	0	0	0	-	-
1900	0	0	0	0	0	0	0	0	0	0	0	0	-	-
2000	0	0	0	0	0	0	0	0	0	0	0	0	-	-
2100	0	0	0	0	0	0	0	0	0	0	0	0	-	-
2200	0	0	0	0	0	0	0	0	0	0	0	0	-	-
2300	0	0	0	0	0	0	0	0	0	0	0	0	-	-
07-19	0	0	0	0	0	0	0	0	0	0	0	0	-	-
06-22	0	0	0	0	0	0	0	0	0	0	0	0	-	-
06-00	0	0	0	0	0	0	0	0	0	0	0	0	-	-
00-00	0	0	0	0	0	0	0	0	0	0	0	0	-	-

* 18 September 2016

Time	Total	Cls 1	Cls 2	Cls 3	Cls 4	Cls 5	Cls 6	Cls 7	Cls 8	Cls 9	Cls 10	Cls 11	Mean	Vpp 85
0000	0	0	0	0	0	0	0	0	0	0	0	0	-	-
0100	0	0	0	0	0	0	0	0	0	0	0	0	-	-
0200	0	0	0	0	0	0	0	0	0	0	0	0	-	-
0300	0	0	0	0	0	0	0	0	0	0	0	0	-	-
0400	0	0	0	0	0	0	0	0	0	0	0	0	-	-
0500	0	0	0	0	0	0	0	0	0	0	0	0	-	-
0600	0	0	0	0	0	0	0	0	0	0	0	0	-	-
0700	0	0	0	0	0	0	0	0	0	0	0	0	-	-
0800	0	0	0	0	0	0	0	0	0	0	0	0	-	-
0900	0	0	0	0	0	0	0	0	0	0	0	0	-	-
1000	0	0	0	0	0	0	0	0	0	0	0	0	-	-
1100	0	0	0	0	0	0	0	0	0	0	0	0	-	-
1200	0	0	0	0	0	0	0	0	0	0	0	0	-	-
1300	0	0	0	0	0	0	0	0	0	0	0	0	-	-
1400	0	0	0	0	0	0	0	0	0	0	0	0	-	-
1500	0	0	0	0	0	0	0	0	0	0	0	0	-	-
1600	0	0	0	0	0	0	0	0	0	0	0	0	-	-
1700	0	0	0	0	0	0	0	0	0	0	0	0	-	-
1800	0	0	0	0	0	0	0	0	0	0	0	0	-	-
1900	0	0	0	0	0	0	0	0	0	0	0	0	-	-

														Northbound ATC	
2000	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
2100	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
2200	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
2300	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
07-19	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
06-22	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
06-00	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
00-00	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-

* 19 September 2016

Time	Total	Cls 1	Cls 2	Cls 3	Cls 4	Cls 5	Cls 6	Cls 7	Cls 8	Cls 9	Cls 10	Cls 11	Mean	Vpp 85
0000	0	0	0	0	0	0	0	0	0	0	0	0	-	-
0100	0	0	0	0	0	0	0	0	0	0	0	0	-	-
0200	0	0	0	0	0	0	0	0	0	0	0	0	-	-
0300	0	0	0	0	0	0	0	0	0	0	0	0	-	-
0400	0	0	0	0	0	0	0	0	0	0	0	0	-	-
0500	0	0	0	0	0	0	0	0	0	0	0	0	-	-
0600	0	0	0	0	0	0	0	0	0	0	0	0	-	-
0700	0	0	0	0	0	0	0	0	0	0	0	0	-	-
0800	0	0	0	0	0	0	0	0	0	0	0	0	-	-
0900	0	0	0	0	0	0	0	0	0	0	0	0	-	-
07-19	0	0	0	0	0	0	0	0	0	0	0	0	-	-
06-22	0	0	0	0	0	0	0	0	0	0	0	0	-	-
06-00	0	0	0	0	0	0	0	0	0	0	0	0	-	-
00-00	0	0	0	0	0	0	0	0	0	0	0	0	-	-

In profile: vehicles = 23159 / 68608 (33.76%)

APPENDIX E

Harmondsworth Road ATC Southbound Data

MetroCount Traffic Executive
Default

CustomList-25 -- English (ENG)

Datasets:

Site: [P1571] !P1571 Harmondsworth Road
Attribute: Holloway Farm
Direction: 1 - North bound, A trigger first. Lane: 0
Survey Duration: 14:54 08 September 2016 => 10:14 19 September 2016,
Zone:
File: P1571 0 2016-09-27 1132transformed.EC0 (Plus)
Identifier: K4442680 MC56-6 [MC55] (c)Microcom 02/03/01
Algorithm: Factory default axle (v4.06)
Data type: Axle sensors - Paired (Class/Speed/Count)

Profile:

Filter time: 14:55 08 September 2016 => 10:14 19 September 2016 (10.8052)
Included classes: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11
Speed range: 6 - 99 mph.
Direction: South (bound), P = North
Separation: Headway > 4 sec, Span 0 - 100 metre
Name: Default Profile
Scheme: Vehicle classification (DfT-UK)
Units: Part metric (metre, mi, m/s, mph, kg, tonne)

Column Legend:

0 [Time] 24-hour time (0000 - 2359)
1 [Total] Number in time step
2 [Cls] Class totals
3 [Mean] Average speed
4 [Vpp] Percentile speed

♀

* 08 September 2016

Time	Total	Cls 1	Cls 2	Cls 3	Cls 4	Cls 5	Cls 6	Cls 7	Cls 8	Cls 9	Cls 10	Cls 11	Mean	Vpp 85
1400	0	0	0	0	0	0	0	0	0	0	0	0	-	-
1500	0	0	0	0	0	0	0	0	0	0	0	0	-	-
1600	0	0	0	0	0	0	0	0	0	0	0	0	-	-
1700	0	0	0	0	0	0	0	0	0	0	0	0	-	-
1800	0	0	0	0	0	0	0	0	0	0	0	0	-	-
1900	0	0	0	0	0	0	0	0	0	0	0	0	-	-
2000	0	0	0	0	0	0	0	0	0	0	0	0	-	-
2100	0	0	0	0	0	0	0	0	0	0	0	0	-	-
2200	0	0	0	0	0	0	0	0	0	0	0	0	-	-
2300	0	0	0	0	0	0	0	0	0	0	0	0	-	-
07-19	0	0	0	0	0	0	0	0	0	0	0	0	-	-
06-22	0	0	0	0	0	0	0	0	0	0	0	0	-	-
06-00	0	0	0	0	0	0	0	0	0	0	0	0	-	-
00-00	0	0	0	0	0	0	0	0	0	0	0	0	-	-

* 09 September 2016

Time	Total	Cls 1	Cls 2	Cls 3	Cls 4	Cls 5	Cls 6	Cls 7	Cls 8	Cls 9	Cls 10	Cls 11	Mean	Vpp 85
0000	0	0	0	0	0	0	0	0	0	0	0	0	-	-
0100	0	0	0	0	0	0	0	0	0	0	0	0	-	-
0200	0	0	0	0	0	0	0	0	0	0	0	0	-	-
0300	0	0	0	0	0	0	0	0	0	0	0	0	-	-
0400	0	0	0	0	0	0	0	0	0	0	0	0	-	-
0500	0	0	0	0	0	0	0	0	0	0	0	0	-	-
0600	0	0	0	0	0	0	0	0	0	0	0	0	-	-
0700	0	0	0	0	0	0	0	0	0	0	0	0	-	-
0800	0	0	0	0	0	0	0	0	0	0	0	0	-	-
0900	0	0	0	0	0	0	0	0	0	0	0	0	-	-
1000	0	0	0	0	0	0	0	0	0	0	0	0	-	-

													Southbound ATC	
1100	0	0	0	0	0	0	0	0	0	0	0	0	-	-
1200	0	0	0	0	0	0	0	0	0	0	0	0	-	-
1300	0	0	0	0	0	0	0	0	0	0	0	0	-	-
1400	0	0	0	0	0	0	0	0	0	0	0	0	-	-
1500	0	0	0	0	0	0	0	0	0	0	0	0	-	-
1600	0	0	0	0	0	0	0	0	0	0	0	0	-	-
1700	173	0	0	75	86	12	0	0	0	0	0	0	36.6	42.1
1800	186	0	1	62	106	16	0	0	0	1	0	0	37.1	41.6
1900	173	0	4	58	95	15	0	0	0	1	0	0	36.5	42.5
2000	136	0	1	43	81	11	0	0	0	0	0	0	37.4	42.5
2100	119	0	2	48	61	6	0	0	2	0	0	0	36.9	42.1
2200	85	0	2	31	43	9	0	0	0	0	0	0	35.4	40.5
2300	83	0	1	23	49	10	0	0	0	0	0	0	37.6	43.2
07-19	359	0	1	137	192	28	0	0	0	1	0	0	36.9	41.8
06-22	787	0	8	286	429	60	0	0	3	1	0	0	36.9	42.3
06-00	955	0	11	340	521	79	0	0	3	1	0	0	36.8	42.3
00-00	955	0	11	340	521	79	0	0	3	1	0	0	36.8	42.3

* 10 September 2016

Time	Total	Cls	Cls	Cls	Cls	Cls	Cls	Cls	Cls	Cls	Cls	Cls	Mean	Vpp
		1	2	3	4	5	6	7	8	9	10	11		85
0000	53	0	0	18	29	6	0	0	0	0	0	0	37.8	44.1
0100	34	0	1	10	22	1	0	0	0	0	0	0	40.2	47.9
0200	19	0	0	5	14	0	0	0	0	0	0	0	37.0	40.9
0300	33	0	0	7	24	2	0	0	0	0	0	0	38.1	44.3
0400	62	0	1	15	40	6	0	0	0	0	0	0	37.7	45.2
0500	79	0	3	22	47	6	0	0	0	0	0	1	39.6	48.1
0600	84	0	1	23	52	8	0	0	0	0	0	0	40.2	45.4
0700	122	0	4	30	77	11	0	0	0	0	0	0	38.2	44.1
0800	141	0	2	40	86	13	0	0	0	0	0	0	37.7	43.8
0900	159	0	1	46	102	8	0	0	0	0	0	2	37.2	42.1
1000	177	0	1	59	100	17	0	0	0	0	0	0	37.4	42.9
1100	170	0	0	55	99	16	0	0	0	0	0	0	37.4	42.9
1200	183	0	2	59	113	8	0	0	0	0	0	1	36.1	42.7
1300	182	0	5	58	108	9	0	1	0	0	0	1	35.6	41.4
1400	175	0	0	54	107	13	0	0	0	0	0	1	35.0	40.9
1500	158	0	2	46	94	16	0	0	0	0	0	0	37.6	44.1
1600	150	0	0	54	87	9	0	0	0	0	0	0	36.4	42.5
1700	157	0	1	54	92	9	1	0	0	0	0	0	37.8	42.3
1800	187	0	3	66	106	12	0	0	0	0	0	0	37.5	42.9
1900	144	0	3	52	77	12	0	0	0	0	0	0	37.1	43.8
2000	138	0	1	49	80	8	0	0	0	0	0	0	37.7	45.2
2100	94	0	0	28	56	10	0	0	0	0	0	0	38.3	44.3
2200	83	0	1	21	54	7	0	0	0	0	0	0	37.7	42.7
2300	72	0	0	18	48	6	0	0	0	0	0	0	38.1	44.1
07-19	1961	0	21	621	1171	141	1	1	0	0	0	5	36.9	42.7
06-22	2421	0	26	773	1436	179	1	1	0	0	0	5	37.2	43.2
06-00	2576	0	27	812	1538	192	1	1	0	0	0	5	37.2	43.2
00-00	2856	0	32	889	1714	213	1	1	0	0	0	6	37.3	43.6

* 11 September 2016

Time	Total	Cls	Cls	Cls	Cls	Cls	Cls	Cls	Cls	Cls	Cls	Cls	Mean	Vpp
		1	2	3	4	5	6	7	8	9	10	11		85
0000	50	0	0	13	34	3	0	0	0	0	0	0	39.3	45.6
0100	36	0	1	5	30	0	0	0	0	0	0	0	41.2	49.7
0200	21	0	1	7	13	0	0	0	0	0	0	0	39.3	43.8
0300	25	0	1	2	19	3	0	0	0	0	0	0	38.2	43.4
0400	55	0	1	18	32	4	0	0	0	0	0	0	40.1	45.4
0500	64	0	1	13	45	5	0	0	0	0	0	0	38.6	45.0
0600	70	0	1	20	42	7	0	0	0	0	0	0	39.5	47.4
0700	70	0	1	22	39	8	0	0	0	0	0	0	39.9	46.8
0800	86	0	0	23	53	10	0	0	0	0	0	0	39.3	45.9
0900	128	0	5	36	80	6	0	1	0	0	0	0	38.9	45.0
1000	164	0	4	49	99	11	0	0	1	0	0	0	38.2	43.4
1100	172	0	2	65	95	10	0	0	0	0	0	0	38.0	43.2
1200	175	0	2	59	106	8	0	0	0	0	0	0	38.0	42.9
1300	206	0	3	72	123	8	0	0	0	0	0	0	37.7	42.1
1400	198	0	0	68	122	8	0	0	0	0	0	0	37.9	43.6

Southbound ATC

1500	184	0	1	66	104	13	0	0	0	0	0	0	37.8	43.2
1600	170	0	1	53	107	9	0	0	0	0	0	0	38.2	44.1
1700	185	0	2	58	116	9	0	0	0	0	0	0	38.7	44.7
1800	166	0	2	58	98	6	0	0	2	0	0	0	37.7	42.5
1900	158	0	2	48	99	9	0	0	0	0	0	0	36.4	41.8
2000	136	0	2	42	85	7	0	0	0	0	0	0	37.1	42.3
2100	98	0	1	31	59	6	0	0	0	0	0	1	36.5	40.9
2200	77	0	2	31	35	9	0	0	0	0	0	0	37.8	44.5
2300	49	0	0	15	29	5	0	0	0	0	0	0	37.2	43.2
07-19	1904	0	23	629	1142	106	0	1	3	0	0	0	38.2	43.6
06-22	2366	0	29	770	1427	135	0	1	3	0	0	1	38.0	43.4
06-00	2492	0	31	816	1491	149	0	1	3	0	0	1	38.0	43.6
00-00	2743	0	36	874	1664	164	0	1	3	0	0	1	38.1	43.8

* 12 September 2016

Time	Total	Cls	Cls	Cls	Cls	Cls	Cls	Cls	Cls	Cls	Cls	Cls	Mean	Vpp
		1	2	3	4	5	6	7	8	9	10	11	85	
0000	31	0	1	6	22	2	0	0	0	0	0	0	40.5	49.7
0100	11	0	0	4	7	0	0	0	0	0	0	0	40.3	48.1
0200	8	0	0	1	7	0	0	0	0	0	0	0	36.1	-
0300	35	0	3	8	21	3	0	0	0	0	0	0	36.3	43.2
0400	59	0	2	17	36	4	0	0	0	0	0	0	41.2	47.0
0500	102	0	4	20	62	15	1	0	0	0	0	0	38.9	44.3
0600	189	0	4	55	114	16	0	0	0	0	0	0	37.7	43.6
0700	227	0	3	67	134	21	0	0	1	0	1	0	35.6	42.1
0800	257	1	0	89	149	15	0	0	2	0	0	1	34.3	39.6
0900	161	0	2	49	86	19	1	0	3	0	0	1	36.5	41.8
1000	159	0	2	33	100	24	0	0	0	0	0	0	36.4	41.8
1100	178	0	1	52	99	24	1	0	0	0	0	1	36.1	41.4
1200	167	0	1	52	93	14	2	1	1	0	1	2	36.6	41.4
1300	168	0	5	48	97	15	0	0	1	0	0	2	38.0	43.8
1400	180	0	1	60	99	18	1	0	1	0	0	0	37.3	42.1
1500	186	0	1	51	117	15	0	0	0	0	1	1	37.9	42.9
1600	173	0	0	54	97	21	1	0	0	0	0	0	37.3	43.6
1700	197	0	2	65	117	12	0	0	1	0	0	0	36.5	42.1
1800	199	0	3	59	121	15	0	0	0	0	0	1	37.3	43.2
1900	169	0	0	59	95	14	0	0	1	0	0	0	37.1	42.3
2000	126	0	2	48	68	8	0	0	0	0	0	0	37.7	43.6
2100	115	0	2	42	61	10	0	0	0	0	0	0	38.1	43.6
2200	65	0	0	22	37	6	0	0	0	0	0	0	36.5	42.1
2300	55	0	1	17	29	8	0	0	0	0	0	0	37.8	42.7
07-19	2252	1	21	679	1309	213	6	1	10	0	3	9	36.6	42.3
06-22	2851	1	29	883	1647	261	6	1	11	0	3	9	36.8	42.5
06-00	2971	1	30	922	1713	275	6	1	11	0	3	9	36.8	42.5
00-00	3217	1	40	978	1868	299	7	1	11	0	3	9	37.0	42.7

* 13 September 2016

Time	Total	Cls	Cls	Cls	Cls	Cls	Cls	Cls	Cls	Cls	Cls	Cls	Mean	Vpp
		1	2	3	4	5	6	7	8	9	10	11	85	
0000	27	0	1	9	15	2	0	0	0	0	0	0	38.9	44.5
0100	15	0	0	6	9	0	0	0	0	0	0	0	42.2	46.3
0200	10	0	0	3	6	1	0	0	0	0	0	0	40.0	-
0300	32	0	3	8	19	1	1	0	0	0	0	0	38.1	46.3
0400	51	0	2	20	25	4	0	0	0	0	0	0	39.0	47.4
0500	106	0	3	31	54	18	0	0	0	0	0	0	38.7	45.0
0600	198	0	5	53	121	16	0	0	0	0	1	2	38.6	45.0
0700	231	0	2	65	137	25	0	0	1	0	0	1	36.6	41.6
0800	254	0	2	79	141	28	4	0	0	0	0	0	36.3	41.4
0900	169	0	0	47	103	19	0	0	0	0	0	0	37.8	43.6
1000	150	0	1	46	83	18	0	0	1	0	0	1	37.5	43.4
1100	161	0	0	48	96	15	1	0	0	0	1	0	37.8	43.2
1200	186	0	1	52	107	25	0	0	0	0	0	1	37.7	43.6
1300	175	0	3	36	113	20	0	0	1	0	1	1	38.1	44.1
1400	189	0	2	49	110	25	0	1	0	0	1	1	39.2	44.3
1500	177	0	1	55	98	20	0	1	1	0	1	0	38.2	43.4
1600	190	0	2	71	101	14	0	0	2	0	0	0	38.2	44.1
1700	199	0	3	66	118	12	0	0	0	0	0	0	37.5	42.9
1800	191	0	3	76	100	12	0	0	0	0	0	0	36.9	42.7

Southbound ATC

1900	175	0	4	53	105	13	0	0	0	0	0	0	37.4	43.2
2000	137	0	3	43	78	12	0	1	0	0	0	0	38.7	44.3
2100	102	0	0	51	46	5	0	0	0	0	0	0	38.3	43.4
2200	72	0	1	27	35	9	0	0	0	0	0	0	36.6	42.5
2300	50	0	0	11	34	5	0	0	0	0	0	0	37.5	42.9
07-19	2272	0	20	690	1307	233	5	2	6	0	4	5	37.6	43.2
06-22	2884	0	32	890	1657	279	5	3	6	0	5	7	37.7	43.4
06-00	3006	0	33	928	1726	293	5	3	6	0	5	7	37.7	43.4
00-00	3247	0	42	1005	1854	319	6	3	6	0	5	7	37.8	43.6

* 14 September 2016

Time	Total	Cls 1	Cls 2	Cls 3	Cls 4	Cls 5	Cls 6	Cls 7	Cls 8	Cls 9	Cls 10	Cls 11	Mean	Vpp 85
0000	21	0	1	3	12	5	0	0	0	0	0	0	38.8	47.4
0100	26	0	0	5	19	2	0	0	0	0	0	0	40.9	47.9
0200	10	0	0	2	7	1	0	0	0	0	0	0	38.9	-
0300	26	0	2	3	19	2	0	0	0	0	0	0	37.5	43.4
0400	59	0	3	14	37	5	0	0	0	0	0	0	37.2	43.4
0500	106	0	3	32	58	13	0	0	0	0	0	0	38.0	45.4
0600	173	0	4	48	100	19	0	0	1	0	1	0	39.0	44.5
0700	232	2	2	60	138	28	0	0	0	0	1	1	36.4	42.1
0800	241	0	5	81	139	15	0	0	0	0	0	1	35.0	40.5
0900	171	0	1	46	95	28	0	0	0	0	0	1	37.8	42.5
1000	160	0	2	43	92	21	2	0	0	0	0	0	37.4	43.2
1100	155	0	2	47	93	12	1	0	0	0	0	0	38.3	45.0
1200	165	0	1	51	93	17	2	0	0	0	1	0	37.5	42.7
1300	178	0	2	53	105	18	0	0	0	0	0	0	38.4	44.3
1400	179	0	2	63	90	21	0	1	1	0	0	1	37.3	43.4
1500	165	0	0	50	96	16	0	0	2	0	0	1	37.4	43.2
1600	185	0	0	64	106	15	0	0	0	0	0	0	37.5	42.9
1700	194	0	3	64	106	19	0	0	0	0	1	1	37.1	42.1
1800	199	0	4	75	101	19	0	0	0	0	0	0	36.9	41.8
1900	174	0	1	61	95	15	0	0	1	0	0	1	36.2	41.6
2000	133	0	2	49	73	9	0	0	0	0	0	0	36.5	42.3
2100	113	0	4	33	65	11	0	0	0	0	0	0	37.1	42.5
2200	77	0	0	26	39	12	0	0	0	0	0	0	38.3	45.0
2300	61	0	1	18	34	8	0	0	0	0	0	0	37.6	44.1
07-19	2224	2	24	697	1254	229	5	1	3	0	3	6	37.2	42.9
06-22	2817	2	35	888	1587	283	5	1	5	0	4	7	37.2	42.9
06-00	2955	2	36	932	1660	303	5	1	5	0	4	7	37.2	42.9
00-00	3203	2	45	991	1812	331	5	1	5	0	4	7	37.3	43.2

* 15 September 2016

Time	Total	Cls 1	Cls 2	Cls 3	Cls 4	Cls 5	Cls 6	Cls 7	Cls 8	Cls 9	Cls 10	Cls 11	Mean	Vpp 85
0000	22	0	0	3	16	3	0	0	0	0	0	0	39.5	44.5
0100	11	0	0	1	9	1	0	0	0	0	0	0	38.4	41.8
0200	10	0	0	1	8	1	0	0	0	0	0	0	38.5	-
0300	28	0	3	4	18	3	0	0	0	0	0	0	38.0	47.9
0400	62	0	2	16	40	4	0	0	0	0	0	0	38.2	45.6
0500	101	1	5	26	56	13	0	0	0	0	0	0	37.0	44.1
0600	187	0	3	60	105	19	0	0	0	0	0	0	37.8	43.4
0700	228	0	5	78	117	24	1	1	1	0	0	1	36.9	42.3
0800	231	0	2	71	134	21	0	0	1	0	1	1	34.5	40.3
0900	177	0	2	47	104	21	2	0	0	0	1	0	36.9	42.3
1000	152	0	1	45	82	23	1	0	0	0	0	0	37.4	42.7
1100	170	0	1	59	88	19	1	1	0	0	0	1	37.6	43.6
1200	182	0	1	54	109	15	1	0	1	0	0	1	36.6	41.6
1300	179	0	3	50	103	22	1	0	0	0	0	0	37.5	43.6
1400	188	0	3	66	105	13	1	0	0	0	0	0	37.2	43.2
1500	195	0	1	72	105	14	1	0	0	0	0	2	36.6	42.1
1600	188	0	1	70	97	20	0	0	0	0	0	0	36.1	41.8
1700	211	0	1	75	123	12	0	0	0	0	0	0	37.2	42.3
1800	198	0	1	72	105	20	0	0	0	0	0	0	37.6	42.5
1900	182	0	4	55	104	19	0	0	0	0	0	0	36.4	41.6
2000	124	0	3	32	78	10	0	0	0	0	0	1	36.9	42.5
2100	105	0	0	46	47	10	0	0	1	0	0	1	37.2	42.1
2200	87	0	1	32	46	8	0	0	0	0	0	0	37.7	42.7

Southbound ATC

2300	57	0	1	16	34	6	0	0	0	0	0	0	38.2	43.2
07-19	2299	0	22	759	1272	224	9	2	3	0	2	6	36.8	42.5
06-22	2897	0	32	952	1606	282	9	2	4	0	2	8	36.8	42.5
06-00	3041	0	34	1000	1686	296	9	2	4	0	2	8	36.9	42.5
00-00	3275	1	44	1051	1833	321	9	2	4	0	2	8	37.0	42.7

* 16 September 2016

Time	Total	Cls 1	Cls 2	Cls 3	Cls 4	Cls 5	Cls 6	Cls 7	Cls 8	Cls 9	Cls 10	Cls 11	Mean	Vpp 85
0000	35	0	2	12	18	3	0	0	0	0	0	0	39.4	47.0
0100	14	0	1	4	9	0	0	0	0	0	0	0	40.4	49.2
0200	15	0	0	2	13	0	0	0	0	0	0	0	36.2	41.2
0300	37	0	1	4	31	1	0	0	0	0	0	0	37.1	43.4
0400	60	0	2	12	41	4	1	0	0	0	0	0	36.6	41.8
0500	106	0	4	34	54	14	0	0	0	0	0	0	35.9	41.8
0600	163	0	5	50	89	17	0	1	1	0	0	0	34.9	40.7
0700	0	0	0	0	0	0	0	0	0	0	0	0	-	-
0800	0	0	0	0	0	0	0	0	0	0	0	0	-	-
0900	0	0	0	0	0	0	0	0	0	0	0	0	-	-
1000	0	0	0	0	0	0	0	0	0	0	0	0	-	-
1100	0	0	0	0	0	0	0	0	0	0	0	0	-	-
1200	0	0	0	0	0	0	0	0	0	0	0	0	-	-
1300	0	0	0	0	0	0	0	0	0	0	0	0	-	-
1400	0	0	0	0	0	0	0	0	0	0	0	0	-	-
1500	0	0	0	0	0	0	0	0	0	0	0	0	-	-
1600	0	0	0	0	0	0	0	0	0	0	0	0	-	-
1700	0	0	0	0	0	0	0	0	0	0	0	0	-	-
1800	0	0	0	0	0	0	0	0	0	0	0	0	-	-
1900	0	0	0	0	0	0	0	0	0	0	0	0	-	-
2000	0	0	0	0	0	0	0	0	0	0	0	0	-	-
2100	0	0	0	0	0	0	0	0	0	0	0	0	-	-
2200	0	0	0	0	0	0	0	0	0	0	0	0	-	-
2300	0	0	0	0	0	0	0	0	0	0	0	0	-	-
07-19	0	0	0	0	0	0	0	0	0	0	0	0	-	-
06-22	163	0	5	50	89	17	0	1	1	0	0	0	34.9	40.7
06-00	163	0	5	50	89	17	0	1	1	0	0	0	34.9	40.7
00-00	430	0	15	118	255	39	1	1	1	0	0	0	36.2	42.7

* 17 September 2016

Time	Total	Cls 1	Cls 2	Cls 3	Cls 4	Cls 5	Cls 6	Cls 7	Cls 8	Cls 9	Cls 10	Cls 11	Mean	Vpp 85
0000	0	0	0	0	0	0	0	0	0	0	0	0	-	-
0100	0	0	0	0	0	0	0	0	0	0	0	0	-	-
0200	0	0	0	0	0	0	0	0	0	0	0	0	-	-
0300	0	0	0	0	0	0	0	0	0	0	0	0	-	-
0400	0	0	0	0	0	0	0	0	0	0	0	0	-	-
0500	0	0	0	0	0	0	0	0	0	0	0	0	-	-
0600	0	0	0	0	0	0	0	0	0	0	0	0	-	-
0700	0	0	0	0	0	0	0	0	0	0	0	0	-	-
0800	0	0	0	0	0	0	0	0	0	0	0	0	-	-
0900	0	0	0	0	0	0	0	0	0	0	0	0	-	-
1000	0	0	0	0	0	0	0	0	0	0	0	0	-	-
1100	0	0	0	0	0	0	0	0	0	0	0	0	-	-
1200	0	0	0	0	0	0	0	0	0	0	0	0	-	-
1300	0	0	0	0	0	0	0	0	0	0	0	0	-	-
1400	0	0	0	0	0	0	0	0	0	0	0	0	-	-
1500	0	0	0	0	0	0	0	0	0	0	0	0	-	-
1600	0	0	0	0	0	0	0	0	0	0	0	0	-	-
1700	0	0	0	0	0	0	0	0	0	0	0	0	-	-
1800	0	0	0	0	0	0	0	0	0	0	0	0	-	-
1900	0	0	0	0	0	0	0	0	0	0	0	0	-	-
2000	0	0	0	0	0	0	0	0	0	0	0	0	-	-
2100	0	0	0	0	0	0	0	0	0	0	0	0	-	-
2200	0	0	0	0	0	0	0	0	0	0	0	0	-	-
2300	0	0	0	0	0	0	0	0	0	0	0	0	-	-
07-19	0	0	0	0	0	0	0	0	0	0	0	0	-	-
06-22	0	0	0	0	0	0	0	0	0	0	0	0	-	-
06-00	0	0	0	0	0	0	0	0	0	0	0	0	-	-

APPENDIX F
DMRB: TA 22/81 Extract

3. EXPLANATION OF TERMS AND CONCEPTS

The following explanations are given to amplify terms and concepts used in this Advice Note.

3.1 Spot speed/Journey speed

The former is the instantaneous vehicle speed measured at a point as distinct from the latter which is measured over a length of road. Spot speeds are measured using devices such as radar speed meters or inductive loops. Journey speeds are measured by moving observer methods or by recording and matching registration numbers at times of passing.

3.2 Free flow

There is no generally accepted definition of this term. However, it may be stated that in free flow conditions headways and lateral displacements are usually so large as to ensure that drivers are in no way prevented, by the close proximity of other vehicles, from driving at the speed of their own choice. These conditions cannot be measured precisely and so it must be a subjective judgement as to whether or not traffic is in a free flow condition. For the purposes of this document it is considered more helpful to suggest times and circumstances when free flow conditions are most unlikely to occur -

Well defined directional morning and evening peaks

Times of high heavy vehicle flow

Directional weekend peaks

Local events (market days,sports events, etc.)

Roadworks

Bad weather

Additionally, sections of the road under consideration where the layout is likely to restrict speeds to a level markedly below that at other points should be avoided. However, if most of the length consists of such features it is neither desirable nor possible to avoid them.

3.3 Speeds (speed limits)

For determining speed limits the 85 percentile dry weather spot speed of cars is used as a yardstick. This is the speed only exceeded by 15% of the cars. When the 85 percentile spot speed has been arrived at, as described later in this Advice Note,it is used to determine the speed limit in the way described in Ref 1.

3.4 Speeds (improvement of alignment and junctions)

Whereas for speed limits the 85 percentile dry weather spot speed of cars is required, for improvement of alignments and major/minor junctions or accesses, and for new major/minor junctions or accesses on existing roads, the normal design methods are based on the 85 percentile wet weather journey speed of vehicles. The precise point at which the measurements are taken and the timing is important. A point just before the scheme length and a time of free flow are suitable. Measurements must be taken at both ends of the scheme so that traffic approaching from both directions is covered. If different values are obtained the higher speed value should be used in the design process. To get from the dry weather spot speed of vehicles measured to the wet weather journey speed used in design one of the following correction factors should be used -

For AP Dual carriageways ... deduct 8kph

For AP Single carriageways ... deduct 4kph

3.5 Speeds (traffic signal design)

These remarks are confined to areas outside 30mph speed limits. Two types of signal equipment are currently in use related to the following conditions:-

- a) 85 percentile dry weather spot speed of vehicle approach between 55 and 72kph, double vehicle extensions with speed discrimination.
- b) 85 percentile dry weather spot speed of vehicle approach between 72 and 105kph with either triple vehicle extensions with speed discrimination or double vehicle extension with speed assessment.

For a) above measurements should be taken at not less than 80m in advance of the stop line (as seen by traffic) nor more than 100m.

For b) above the values should be 150m to 200m.

To ensure accuracy certain conditions are necessary which are listed at Appendix 1.